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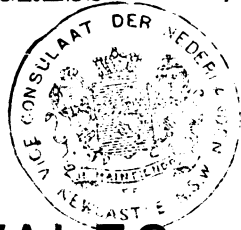
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THE INDUSTRIAL PROGRESS

OF



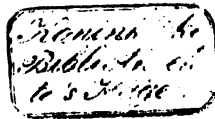
NEW SOUTH WALES:

BEING A

REPORT OF THE INTERCOLONIAL EXHIBITION
OF 1870, AT SYDNEY;

TOGETHER

WITH A VARIETY OF PAPERS ILLUSTRATIVE OF THE INDUSTRIAL
RESOURCES OF THE COLONY.



By Authority:

SYDNEY: THOMAS RICHARDS, GOVERNMENT PRINTER.

1871.

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PREFACE.

THE present publication derives its origin, as well as much of its interest, from the Intercolonial Exhibition held at Sydney in the year 1870. It was felt by the promoters of that undertaking that the opportunity should not be lost of taking a general survey of the material development and resources of the Colony. It was therefore determined that an Official Report, presenting a comprehensive view of the Industrial Progress and Products in that year, should be prepared by some competent hand, so as to form a fitting memorial of an event that would otherwise soon fade away. This resolve having been communicated to the Government, they cordially supported it;—sanctioned the use of the Government Press, and accepted the suggestion to allow the valuable information contributed by the Literary Staff of the Sydney Morning Herald, under the title “New South Wales in 1870,” and courteously placed at the disposal of the Government by the Proprietors of that Journal, to form part of the volume. Permission, at the same time, was obtained to give increased scope to the Work, by the introduction of a variety of Papers contributed gratuitously by persons recognized as authorities upon special branches of Science and Industry.

The Council of the Agricultural Society, who had undertaken to act as Commissioners for the London Exhibition of 1871, requested the gentlemen forming the Award Committee of the Sydney Exhibition to consider what should be the scope

and character of the Official Report. The determination of this question was mainly left to two members of this Committee—Professor Smith and Mr. Howard Reed—who further undertook the honorary duties of Editors; but owing to the absence, for a time, of the former from Sydney, and for other reasons, the editorial responsibilities connected with the whole of that portion of the Work relating to the Exhibition (Part I) devolved almost entirely on the last-mentioned gentleman. In the prosecution of their duties the Editors received the assistance of Andrew Garran, Esq., M.A., LL.D. To his care was entrusted the Official Report. His engagement occurred however only during the last week of the Exhibition. Had he been designated to this service a month earlier, the result would necessarily have been more perfect, for when the Exhibitors had left, and the Exhibits were removed, it became very difficult to get at the sources of information. He has spared no pains, however, to make up for this disadvantage, and his Report will be found to embrace all phases of Colonial industry that were not represented in the Exhibition, as well as those that were,—the whole being prepared specially for the information of readers in quarters whence skill and capital are to be attracted to these shores. Dr. Garran desires to acknowledge his obligations to several members of the Award Committee who helped him to collect materials, and particularly to Mr. Alex. Bruce.

The Catalogue of Exhibits has been revised and re-published with the Awards and Jurors' opinions, and is contained in Part I.

Part II comprises the information which appeared in the September Summary of the Sydney Morning Herald. With the laudable desire of presenting an accurate sketch of New South

Wales, for the purpose of making her claims to notice better known, and correcting a variety of misstatements concerning her, the proprietors of the Herald seized the opportunity afforded by the opening of the Exhibition for the publication of a series of original articles describing the Colony in 1870. These articles were written by several members of the Literary Staff of the Herald, viz. :—Mr. Howard Reed, Mr. Samuel Cook, Mr. Charles St. Julian, Mr. Charles De Boos, Mr. George Eld, Mr. Edward Reeve, Mr. W. E. Langley, Mr. Charles Robinson, and Mr. Edwin Burton. The Government having expressed a willingness to give a wide circulation to these articles in England and elsewhere, Messrs. Fairfax & Sons courteously placed them at their disposal for the purpose.

Some compression of this varied and valuable epitome having been found necessary in conformity with the prescribed bulk and compass of the Book, the work was performed under the direction of the Government; but it is hoped that no information of general importance has been sacrificed to the necessities of abbreviation.

In the revision of this matter thanks are due to the Public Departments collectively, and to many of their officers individually, for the assistance they have given in the verification of those facts and figures lying within their own special provinces. His Honor the Chief Justice (Sir Alfred Stephen) kindly undertook the revision of the article on the Administration of Justice, and Mr. G. K. Holden, the Senior Examiner in the Land Titles Department, of that portion of the same article which describes the working of our Land Transfer System. Mr. Barnet, the Colonial Architect, performed the same office for the paper entitled

Port and City of Sydney, and Lieutenant Gowlland, R.N., of the Coast Survey, has entirely recast the notice of the Harbours on the Coast. To Mr. Wilkins, the Secretary of the Council of Education, the Editors are indebted for the revision of the article on Primary Schools.

Attempts have heretofore been made to give partial glimpses of Colonial Progress. The opportunity was embraced, for instance, by the New South Wales Commissioners of the Victorian Exhibition, in 1867, to insert several Papers within the covers of the Official Report, bearing on the resources of this Colony. In the preparation of the present Work an effort has been made to produce something more complete than any publication of a similar character which has yet appeared. The Editors have done their best, with the materials at their command, to present such a *coup d'œil* of the Colony as may be useful for present guidance and future reference.

In Part III will be found a collection of Special Papers, contributed gratuitously by the gentlemen whose names they respectively bear, and who are recognized as authorities upon the subjects of which they treat.

The compilation of the Map and the Views was entrusted to Mr. J. A. C. Willis, of the Surveyor General's Department, a gentleman of special ability, and he has devoted himself to the task with a zeal and unflagging industry which will find their acknowledgment in the universal recognition of the accuracy and effectiveness of his workmanship.

The Map is printed in eight colours, and is undoubtedly the most comprehensive yet issued from the Government Press. It shows, in addition to the usual geographical features delineated on

modern maps, the localities of the various Mining, Pastoral, and Agricultural industries, the Railway and Telegraphic lines, and also the Coast Lighthouses along the entire seaboard of the Colony. The arrangement of numbers which is in general use in geological maps of a small scale, superseding the old and more complicated one of signs, has been adopted. The Vine, Sugar, Tobacco, Coal, and Gold districts, are printed in separate colours, so that each is distinguishable at a glance. The areas of the Pastoral districts are also as readily distinguishable. The Telegraph lines are shown in a distinct colour,—the water, by a light blue tint.

The three small diagrams attached are not without value ; those of Port Jackson and Port Hunter show the Lighthouses and Beacons ; the third gives a miniature outline of the Australian Continent, together with the boundaries of the various Colonies.

The larger sketch, entitled “The Harbour of Port Jackson and City of Sydney,” is taken from the residence of A. J. Ralston, Esq., and that of Mrs. Howell, on the North Shore ; it comprises the whole of Sydney, with its suburbs, and presents at a glance the lovely panorama of our Harbour, with its spacious Quays and Wharves, its diversified outline of buildings, its surface dotted with Islands, and broken by many an alternating Bay and Headland.

The smaller view is taken from a point in front of Ginahgulla, the residence of John Fairfax, Esq., and is interesting, as showing with accuracy all the Bays and Points of importance in the Harbour, from the City to the Heads,—the Coast being observable in one direction (over Manly Beach) to a distance of eight miles.

ERRATA.

CATALOGUE—

Omitted the names of Stewards in Sections II and III:—
Section II.—DR. W. MORRIS, W. E. LANGLEY, and H. KENNEDY.
Section III.—CHARLES MYLES, J. TE KLOOT.

Omitted the names of Judges of Hereford Cattle:—
Page 160.—HONORABLE G. H. COX, JOHN ROSS, R. DENNE.

Omitted the names of Stewards and Judges in Section XVIII.—Horticultural:—
Stewards:—E. P. RAMSAY, D. CRICHTON.
Judges:—W. H. CATLETT, F. FERGUSON, JOHN DUFF.

In page 192, for Section V read Section XII.

NOTE.—It has been thought desirable to allow the Sections to run on consecutively. The distinction of 1st and 2nd Department is therefore done away with, and the Sections now run from 1 to 20.

REV. W. B. CLARKE'S paper on Gold-fields:—Line 15, page 549; for "one island" read—the island.

ADDENDUM to REV. W. B. CLARKE'S paper on Gold-fields; after line 16, page 549:—

Since this paper was in print I have received intelligence that the ground has been tried, and that a parcel of detrital matter, weighing 2 tons 13 cwt., has been tested at the Sydney Mint, the produce being 45 ounces of standard gold with some ounces of silver.

In the *Moniteur de la Nouvelle, Calédonie*, 22 *Fevrier*, 1871, there is an Official Report on the position of the field, with Mining Regulations appended.

The region therefore mentioned by me has been *proclaimed* as the Muendine Gold-field. By the kindness of Mr. G. Milner Stephen, F.G.S., I have been enabled to compare the rock and gold with what I previously possessed, and I find that they fully agree with my former description.

W. B. C.

29th March, 1871.

THE INDUSTRIAL PROGRESS OF NEW SOUTH WALES

PART I.



The Exhibition of 1870

(INCLUDING THE REVISED CATALOGUE.)

INTRODUCTION

TO

OFFICIAL REPORT OF EXHIBITION.

THE Sydney Intercolonial Exhibition of 1870—and of which the present volume is issued as a record—had its origin in a variety of circumstances, and was designed to subserve a variety of purposes. New South Wales had previously sent its contributions to Exhibitions in London, in Paris, and in America. It had also displayed its products in friendly rivalry with those of the neighbouring Colony of Victoria, at the Melbourne Exhibition of 1867; but though the oldest of the Australasian Colonies it had not invited its neighbours to an Australasian display in the most ancient metropolis of the Southern land. There was a general feeling that Intercolonial Exhibitions would be of great advantage to all these Colonies, as helping to make them better acquainted with each other, to promote a mutual interchange of products, to furnish periodical records of progress, to stimulate to healthy emulation, and also to bring the industry of these Colonies formally under the notice of the World at large. This being the case, it was also felt that it was the turn of Sydney to be the next to issue invitations, and that the mother-city of Australasia would fall below its dignity and its duty if it allowed any younger and smaller metropolis to step in and take the lead.

But in addition to this, there was a special reason why the year 1870 should be adopted as the Exhibition-year in Sydney. It was the centenary anniversary of the discovery of the eastern coast of Australia by Captain Cook. One hundred years had passed since this great navigator—who scarcely foresaw the immortality he was earning—planted the British flag on the shores of Botany Bay. This event, so fruitful in its consequences to the British Empire, to the British race, and even to the future of Asia, could not be allowed to pass without some commemoration on the spot; and how could those who have inherited the results of the great discoverer's work better celebrate the occasion than by displaying how the peaceful industry of his countrymen had turned to account the natural resources of the land he laid open to civilization? It was a festival year, and there was no better way of giving expression to the popular sentiment than by an exposition of Australian industry—nothing more natural, nothing more expressive as a retrospect of the past, nothing more cheering as throwing the light of hope on the future. But the

public sentiment needed to be concentrated in order to find an adequate expression, and for a time it seemed as if what was everybody's wish was nobody's duty. There had never been in Sydney such a thing as an Intercolonial Exhibition. There were not even in the Colony many persons who had assisted at exhibitions in other parts of the world. There was no organized staff for carrying out such an undertaking, and the Government, already encumbered with administrative details, was not anxious to add to its labours the responsibility of conducting such an enterprise, or of incurring indefinite expense in connection therewith.

Under these circumstances the Agricultural Society of New South Wales offered itself as an agency through which the public duty might be performed. This Society, which for many years previously had been in a rather torpid condition, had lately renewed its youth. Owing to a variety of circumstances it had drawn into its ranks most of the leading persons identified with the advancement of the Colony, and was energetically stimulating agricultural and pastoral progress. In the year 1869 there was held under its auspices an Agricultural Exhibition in Sydney, which was the best of the kind the Colony had produced, which was well attended, and which only fell short of complete success in consequence of the persistently wet weather that prevailed during the Exhibition-week. On that occasion the Society obtained the use of the Public School-room at Redfern, in which to make a small exhibition of Fine Arts. The building however was ill-adapted for the purpose, and furnished altogether insufficient accommodation. The experience gained on that occasion by the Committee of the Society was held to prove—first, that a proper building was needed to ensure satisfactory results in future exhibitions; and secondly, that the public patronage would not be wanting to make such shows a financial success if the exhibits gathered together were worth looking at. But the Society possessed no land in Sydney, and had no funds wherewith to build. It accordingly entered into negotiations with the City Corporation, and after much discussion it was finally agreed that the City authorities should construct an Exhibition Building, of improved design, in the Prince Alfred Park; and that the Society, in order to secure the Corporation against loss, should guarantee to be its tenant for two months every year, at a rental of £1,000 per annum. To carry out this arrangement it was necessary that the Society should become incorporated, and for this purpose a Bill had to be passed through Parliament. These negotiations occupied considerable time, but when they were happily completed the Society found itself in a position not only to hold its own periodical Agricultural Show, but to undertake the more onerous responsibility of superintending a general Intercolonial Exhi-

biton of Industry. The Government, not at all unwilling to accept the proffered service, placed on the Estimates the sum of £3,000 as a grant to the Society, to cover the pecuniary risks attendant on the adventure, and to this was added the further grant of £1,000 to meet the cost of transmitting Colonial products to the London International Exhibition of 1871, the duty of seeing to which the Agricultural Society also undertook.

Matters being thus arranged, the outline of the plan of procedure was framed, the classification of exhibits was settled, and notification sent to all the surrounding Colonies. Meanwhile, the works connected with the Exhibition Building were as speedily as possible carried forward. Mr. Bell, the City Engineer, furnished the design, and the successful tenderer for the work of construction was Mr. John Young, a contractor of great experience, and who had previously constructed some of the largest buildings in Australia. It was fortunate that the task devolved on one of ample resources and of untiring perseverance, for from the time of laying the foundation-stone until the completion of the work the weather was unprecedentedly wet. No similar season is on record in Australian annals. The rain poured down in torrents. From all parts of the Colony there came news of floods and of devastation—of farms submerged, houses and produce carried away, bridges destroyed, and lives lost. A disheartening feeling of depression overspread the Colony, There were few who were not brought within the range of the general misfortunes, and it was seen that the year would be marked in our annals as one of unusual calamity and loss. Had these disasters been foreseen, it is probable that the Exhibition would have been indefinitely postponed, as the dispiriting influence of the season would have discouraged the expectation of success. But the works having been commenced, they were proceeded with, and it is fortunate that the start was effected in time, seeing that the ultimate result has gone far to neutralize the gloom of the earlier portion of the year, and to restore the tone to industrial enterprise.

The untoward weather, and the great difficulty many intending exhibitors experienced in pushing forward their preparations, brought to the Committee many urgent applications for a postponement of the day fixed on for the opening. But that date had been fixed on after long and careful deliberation, and it was felt that the inconveniences attendant on a change in the advertised time would be greater than any that could arise from putting exhibitors under pressure, and the most strenuous efforts were made to adhere rigidly to the advertised programme. But notwithstanding the utmost exertions of the members of the Committee, they were forced partly to yield their point. Nature and necessity were too strong for them. The hindrances from the

weather were so great that the contractor found it absolutely impossible to complete the work within the specified time, and one fortnight's grace was per force allowed, and the opening was postponed to August 30th.

The success of an Exhibition must depend upon the agency employed. There was something peculiar about the agency set to work by the Agricultural Society that is worthy of consideration. The Exhibitions that have marked the progress of human industry since 1851, the event of that year being included, have relied upon paid agencies. The agency employed by the Society was pecuniarily unremunerated, with the exception of the Secretary and a small staff of clerks. The simple motive which supported the officials in the discharge of their functions throughout the entire event was a desire to promote the interests of the Colony; and when it is understood what is meant by the "entire event," the remarkable character and worth of this service will the better appear.

It was evident that if a voluntary agency was to be employed, pains must be taken to lay down a clear plan of action, to engage gentlemen to share the responsibility who had the time and ability to do their part, and lastly, to infuse enthusiasm throughout the willing band. The plan embraced two divisions—AGRICULTURAL and NON-AGRICULTURAL. The Exhibition Committee having indicated the scope of the Agricultural department, and secured gentlemen to undertake the several sections, engaged them to prepare prize schedules for the same. By this means they were identified with the plan of the Exhibition to be carried out, and the error was avoided of calling a number of stewards in at the eleventh hour to execute arrangements about the making of which they have had no voice. They stood committed to their own notions, and were in honor bound to carry them through to the end. The idea was as good in practice as in theory, and really proved the secret of success. To a certain extent the same plan was adopted in the Non-agricultural department, saving that the classification suggested by the Chairman of the Exhibition Committee being adopted, the stewards were not required until later. All who accepted appointments as stewards became members of the Exhibition Committee, and therefore obtained the power to express their opinion upon all the arrangements. Upon those whose departments were not within the Pavilion, devolved the duty of making provision for the exhibits. The number and nature of these being known to the Society fully a month before the opening, time was allowed for this purpose. The stewards in this way were rendered mainly responsible for the prize schedules, the construction of the certificates of entry, the correctness of the entries, the by-laws of the Exhibition, the erection of suitable sheds for the stock or other

exhibits under their care, the government of the attendants allowed to them, the reception and placing of the exhibits, the care and feeding of such as required feeding during the Exhibition, and their subsequent removal.

The Executive or Exhibition Committee—answerable for all arrangements connected with the Exhibition—consisted of the following gentlemen :—

EXHIBITION COMMITTEE :

Adams, P. F.	Goodlet, J. H.	Nowlan, J.
Barnet, J.	Hill, E.	Onslow, Capt., R.N.
Beit, H.	Hill, F.	Peate, T.
Bray, H.	Hall, H.	Pye, J.
Brewer, F. C.	Hall, M.	Ramsay, E. P.
Brownlow, R.	Humphrey, C. H.	Reed, H., Chairman.*
Bruce, A.	Jackson, —	Rouse, R.
Calvert, J. J.	Jenkins, R. L.	Spring G.
Catlett, W. H.	Joubert, J., Secretary.	Te Kloot, J.
Chisholm, J. K.	Kennedy, H.	Thompson, J.
Cleeve, I. K.	Langley, W. E.	Thomson, Buchan
Cox, Hon. G. H.	Lowe, M.	Thomson, Dr. A. M.
Cracknell, E. C.	Lloyd, R.	Thorne, C.
Crichton, D.	Mann, G. K.	Trebeck, P. N.
Dawson, T.	M'Culloch, A. H.	Wallis, W.
Denne, R.	Moore, C.	Woolcott, C. H.
Ebsworth, F.	Morris, Dr. W.	Yeo, G. S.
Fairfax, J. R.	Myles, C.	

From the Exhibition Committee and the Council were formed Sub-committees, of which the following are chief :—

The Finance Committee consisted of Messrs. H. Beit, P. N. Trebeck (Treasurer), and the Hon. A. Campbell, to whom were added, for extra service during the month of Exhibition, Messrs. H. Dangar, Joseph Thompson, J. Living, and J. J. Calvert. It rested with these gentlemen to make all the arrangements necessary to the issue of tickets, the taking and banking of money, the payment of servants. The service of one member was required each day, at stated times, to check the money received by the dials upon the patent registering barriers.

The Printing Committee, which consisted of Messrs. A. Bruce, F. C. Brewer, M. Lowe, and W. Wallis, was responsible for the issue of the certificates of entry, the publication of the catalogue, the preparation and ordering of all tickets of admission, descriptive and prize cards, and for the insertion of advertisements and the posting of bills.

The External Buildings Committee consisted of Messrs. Buchan Thomson, A. Bruce, M. Lowe, W. Wallis, J. J. Calvert, F. W. Hill, R. Brownlow, C. H. Humphrey, R. Denne, and C. Thorne.

* Also Chairman of Sub-Committees.

These gentlemen were employed in arranging with the Corporation for the transformation of the Park in such a manner as to preserve its utility both for the Society and public recreation. Upon them devolved the duty of planning for the disposition of the buildings, and their adaptation to the nature and general character of the ground.

The Internal Committee, consisting of Dr. A. M. Thomson, Captain Onslow, Messrs. J. Barnet, W. Morris, C. H. Woolcott, — Jackson, D. Crichton, C. A. Myles, W. Wallis, and F. C. Brewer, undertook specially to superintend the fittings and painting of the Pavilion.

The Refreshment, Music, and Decoration Committee, consisting of Dr. Badham, Messrs. F. W. Hill, D. Crichton, J. J. Calvert, E. C. Cracknell, H. Beit, and C. Moore, engaged to see to the erection of buildings sufficient to accommodate those who might require refreshment; to agree with an efficient caterer for the period; and to do all other things implied under the above title.

The Police and Attendants Committee, consisting of Messrs. G. Spring, W. Wallis, C. Myles, J. J. Calvert, and R. Lloyd, undertook to engage with the police authorities for a competent force; to select attendants, whenever they might be wanted; and to see that their duties were faithfully discharged.

The Horticultural Committee, consisting of Messrs. James Chisholm, P. L. C. Shepherd, E. P. Ramsay, J. Seymour, D. Crichton, and W. H. Catlett, undertook the arduous duty of securing a fine display of plants and flowers; of making other floral decorations; of maintaining the same throughout the Exhibition, as well as of laying out the external garden.

To the Field Trials of Implements Committee, consisting of Messrs. G. S. Yeo, T. Dawson, C. H. Humphrey, and G. Spring, was entrusted all the work preliminary to and during the trials of machinery in the park and in the field, such as securing suitable ground, the supply of horses, fuel, and other necessary matters.

The Fodder Committee, consisting of Messrs. A. Bruce, H. Bray, M. Lowe, and C. Myles, undertook to provide all the live stock with food at stated periods of the day during their sojourn, and generally to see to their comfort.

Upon the Fine Arts Committee, consisting of Messrs. J. Barnet, C. Martens, C. T. Gedye, and C. H. Woolcott, devolved the duty of gathering the materials of a non-competitive fine art collection. This involved an arduous house to house visitation, for the purpose of selecting objects suitable for exhibition. They undertake also to superintend the removal and return of these art treasures, and their effective display in the gallery.

The Ceremonial Committee, consisting of His Excellency the Governor, Sir William Macarthur, The Hon. E. Deas Thomson,

Captain Beresford, The Hon. John Hay, and Messrs. H. Kennedy and J. J. Calvert, undertook to make the necessary arrangements connected with the opening of the Exhibition.

The Award Committee, consisting of Sir William Macarthur, Knt., Professors Thomson and Smith, Captain Mann, and Messrs. Wm. Morris, W. Wallis, A. Bruce, Hugh Kennedy, J. Barnet, C. A. Myles, Joseph Thompson, C. Moore, E. C. Cracknell, and John Alger, was appointed after the opening of the Exhibition. Their duty was to take charge of the award-papers from the Stewards; to see that they were properly filled up and signed; to determine the justice of the recommendations and awards where there was any departure from the instructions; and also to hear complaints, and take notice of exhibits accidentally overlooked. In addition to this thankless and arduous duty, this Committee also prepared the official list of the awards made, and attended to other matters pertaining thereto. They also undertook the labour of collecting and arranging the materials found within the covers of this volume.

The attention given by these Committees to the discharge of their duties was unremitting.

The Exhibition being intended to display the industrial products of the Australasian Colonies, it devolved upon New South Wales to issue the invitations. The invitation to Queensland was immediately responded to by the appointment of Commissioners—Mr. Walter Hill, Mr. L. A. Bernays, and Mr. P. R. Gordon, who speedily got to work. South Australia also was alive to the policy of seizing such an opportunity, and responded pretty freely to the solicitations of Mr. P. C. Campbell, an agent appointed by the Agricultural Society of New South Wales. The notice was too late to allow of any preparation of exhibits in Western Australia. Tasmania agreed to appear; also New Caledonia, though not a British Colony; New Zealand replied in the negative; and Victoria treated the invitation with silence. But her silence was not to be allowed; there was the pledge of 1867 to be redeemed—the pledge made by the Victorian Commissioners to display as much zeal for New South Wales as the New South Wales Commissioners displayed during the representation of this Colony in the Melbourne Exhibition. Advantage was taken of the visit of the Hon. C. Cowper and the Hon. Saul Samuel, to Melbourne, on the business of the Customs Convention. Those gentlemen undertook to incite the Government of Victoria to set the machinery in motion for the collection of exhibits for Sydney. Their action resulted in the appointment of the Victorian Commission, which got to work very late in the day, but worked with so good a will that the Colony was very well represented. This body was composed of the following gentlemen:—

VICTORIAN COMMISSIONERS :

HON. SIR REDMOND BARRY, President.

Hon. Sir W. F. Stawell.	Hon. A. Michie, M.L.A.
" Sir W. J. F. Palmer, M.L.C.	" J. G. Francis, M.L.A.
" Sir Francis Murphy, M.L.A.	" T. T. A'Beckett, M.L.C.
" D. C. Macarthur, Esq.	" S. H. Bindon.
" T. H. Fellows.	" J. A. Macpherson, M.L.A.
" J. O'Shanassy, C.M.G., M.L.C.	C. E. Bright, Esq.
" C. G. Duffy, M.L.A.	Rev. J. J. Bleasdale, D.D.
" Sir James M'Culloch, M.L.A.	John Badcock, Esq.
	E. L. Montefiore, Esq.

EXECUTIVE COMMITTEE :

G. C. LEVY, Secretary.

Rev. J. J. Bleasdale, D.D., Chairman.	C. E. Bright, Esq.
Hon. J. Macpherson, M.P.	E. L. Montefiore, Esq.

The Government did not confine its assistance to the Society by the grant already alluded to. They aided the project by imparting an official character to it, and this did much to magnify the event in the estimation of the neighbouring Colonies. They also placed such aids at the disposal of the Society as were in their power.

The free use of the telegraph lines was allowed, and the Customs barriers were raised to admit the exhibits from beyond the Colony. Exhibitors within the Colony were allowed the free use of the railways, except for exhibits sold, which were charged return fare, and special trains were run for the convenience of the public. For a similar service the Society is indebted to the P. & O. Steamship Company (who, through their agent, the Hon. Henry Moore, offered to convey goods and passengers at reduced fares), the A.S.N. Co., the N.H.R.S.N. Co., the C. & R.S.N. Co., the Illawarra, and other companies, who devised liberal things for the occasion.

Owing to the delays already mentioned, the necessity to go to Parliament for incorporation, and the time occupied in making the required agreements with the Corporation, it was February before the Society could announce its determination to open an exhibition representing the Industries of the Australian Colonies in the following August. They did not consider it safe to do this until the Exhibition building was commenced, and the contractor bound to give it up complete on the 1st of August to the Exhibition Committee.

Previous to this the Stewards had been at work upon the prize schedules, which, so soon as they could be safely issued, were distributed by thousands through the Colonies. Abstracts of the same appeared in all the principal papers, and money was liberally spent in advertising. It may here be observed, that the issue of the prize schedules took place before it was known what

the Government would grant, or that they would grant anything at all. The Society undertook the responsibility of an Exhibition, therefore, it will be seen, before they knew that any assistance would be forthcoming from the public exchequer, and were prepared to carry out the project alone. This circumstance obliged them to confine the money prizes to the agricultural department, which most properly belonged to them. In relinquishing the Exhibition building to the non-agricultural department, and offering one medal as the prize in each class, it was considered that the Society was doing all that the occasion required and prudence warranted; and when the grant was made it came too late to admit of any change in the plan. The benefit of a grant of £3,000 was experienced in the confidence and spirit it infused into the Exhibition Committee; for without it many expenses necessary to the success of the affair, and essential to its completeness, would have been avoided as unjustifiable. It is necessary to make this statement in order to account for what otherwise appears to be defective in the classification. Had the Society been earlier assured that the Assembly would allow the sum placed on the Estimates for the Exhibition, instead of allotting one medal to each class, the classes would have been subdivided, and more medals offered.

The foundation-stone of the Pavilion was laid, amid floods of rain, on the 9th of March, by Mr. Walter Renny, Mayor of Sydney, in the presence of the Corporation of the City, and the chief members of the Agricultural Society.

This building covers a space of half-an-acre, and was erected by the Corporation for a sum of £20,000.

The materials are mainly brick, iron, glass, and wood. It stands on a terrace above the level of the Park. It is light in appearance and handsome in design, being somewhat Saracenic in character. Although relinquished from courtesy in 1870 to the exhibitors of articles classed as non-agricultural, it is constructed for agricultural exhibitions, the floor-space being specially designed to carry live stock, heavy machinery, farm and horticultural produce. Irrespective of vestibules, lobbies, and offices, the area measures 198 feet by 130 feet. A gallery 15 feet wide traverses the entire length on both sides, the two sides being united by end galleries, 25 feet wide.

The entrances to the building are ten in number. The galleries are gained by four flights of stairs—two in the south vestibule, and two ascending from the main floor. From the vestibules at either end the central transept is approached through two large arched openings. This central space, which is floored, measures 60 feet \times 198 feet, the space being broken only by a fountain with nine jets, the major one conducting the water to the principals of the vaulted roof, which are 75 feet from the floor.

The building is well lighted by day by means of double rows of plate-glass balanced windows; by night a copious supply of gas, burned beneath sun-reflectors, affords light enough for the examination of the most minute objects.

While this building was progressing under the determinate hand of Mr. Young, the contractor, the face of the park was completely transformed. Banks were carted down into hollows, roads, plantations, and paths were made, and the ground shaped for the joint convenience of the Society and the public. When the weather, extremely adverse throughout to such operations, allowed of the erection of the sheds for the live stock and other exhibits, they were commenced also by Mr. Young, under the supervision of Mr. Backhouse, who designed them from instructions received from the Society. These buildings, together with one large and several smaller refreshment pavilions, were very extensive. They cost the Society £3,174 2s., the materials remaining the property of the contractor, who removed them at the close of the meeting. Spacious stalls, built of sawn-wood, and covered with iron, were erected for 129 horses and 176 cattle, around the exercising rings. 209 dogs and 308 birds were accommodated in sheds of different construction but similar materials. The sheep and pigs were housed in the same way, and a fine shed was put up for machinery in motion. Altogether, these sheds numbered upwards of eighty, and covered several acres of ground.

As the 16th of August drew near, it was evident that neither the main building nor the grounds around would be ready on that day. Mr. Young sued for a fortnight's reprieve, which was granted. In yielding, however, to his necessity, the plans of the Society were seriously disarranged. The original intention of the Committee was to begin to admit the exhibits to the building on the 1st of August, and to have them arranged for inspection by the 8th. One week's uninterrupted work on the part of the Judges would have enabled them to make their awards, and for those awards to be confirmed and published. The visitors in this case, when admitted on the 16th, would have been put into immediate possession of authentic information, for which they had to wait, in some cases, till the close of September. The weather, however, which defeats the best-laid schemes, defeated this.

At last the day arrived on which the results of all this preparation were to be made public. The previous week had been one of incessant toil to the Stewards, on whom devolved the duty of receiving and placing the exhibits. Large as was the building, their ingenuity and patience had been taxed to find space for all the articles presented. The contemplated arrangement of the sections was disturbed, for as each section arrived it was found to overrun space reserved for the section next to it, till at last the latest arrivals had to be put where a place could be found for

them ; and thus it was that the Judges were sometimes at a loss to find the articles specified in their classes. Amid the spluttering of painters, the hammering of carpenters, and cries of decorators, however, these preliminaries were brought to a conclusion on the night of the 29th, and the auspicious sun of the 30th rose upon the scene.

The opening day was one worthy of the occasion. Heaven smiled on the event, and as the Imperial flag was unfurled from the Pavilion, and each of the numerous buildings in the ground displayed its ensign, and crowds of gay visitors thronged the stately terraces, and expressions of unqualified approbation were bestowed upon the labour of months, the labourers forgot their toil and weariness in the joy which pertaineth to accomplishments that have reached the final stage.

The following account of the opening is from the *Sydney Morning Herald* of the day following :—

THE opening of the Intercolonial Exhibition yesterday was an occasion of general rejoicing. A public holiday was proclaimed, and a numerous and brilliant company assembled at noon to take part in the ceremony intended to celebrate the centenary of Captain Cook's landing on these shores, and afford some indication of the wonderful progress made by Australia during the first hundred years of its existence as a portion of the British Empire. A more appropriate place could not have been selected for such a purpose than Sydney, the capital of the oldest of the Australian sisterhood, and which, if not the "fastest" and most self-asserting, may yet claim to be the most highly-favoured and stable of the group. Among the crowd were numbers from remote parts of New South Wales, and many from distant Colonies. Flags of all nations floated in the breeze ; the Park—which bears the name of Prince Alfred—was partially covered with machinery of the most approved construction ; stock of the best breeds, produce in great variety and of choice quality, shrubs and flowers of rare beauty, and manufactured articles of various kinds ; while the building challenged general admiration, not only on account of its interior arrangements, but also as a splendid commemorative monument, affording evidence alike of architectural taste, mechanical skill, and public spirit.

Although heavy masses of ominous clouds skirted the horizon in the morning, there was a blue sky overhead. The bright rays of the sun gladdened the hearts of the visitors, and gave promise of more genial weather.

At an early hour the city presented a gay appearance. Shops were closed ; flags were hoisted ; crowds of well-dressed people moved towards the Park ; omnibuses, cabs, and carriages filled the roads leading to the Exhibition, and the officers in charge of the Park gates had a difficult task. By noon five or six thousand people were admitted. At 11 o'clock the lady visitors began to take their places in the space of the building allotted to them at the northern end, from the fountain to the dais, and also in the gallery. Gentlemen who had cards of entrée to the space in front of the dais also began to assemble shortly after 11. Subsequently, a number of other gentlemen were admitted, and filled up the remainder of the available space.

The Highland Brigade mustered in front of the Hyde Park Barracks at 10 o'clock, under the command of Captain Thomson, and proceeded down Castle-reagh-street to the Exhibition, followed by a large number of people. Upon arriving at the front of the building the men fell into position as a guard of honor to receive His Excellency the Governor.

At 12 o'clock His Excellency the Governor and the Countess of Belmore arrived at the Exhibition, and were received by the Ceremonial Committee, by whom they were conducted to seats on the dais during a performance on the organ of the National Anthem.

The appearance of the interior of the building at this time will long be remembered by all who witnessed it. From end to end the Exhibition was thronged with spectators, the crowd being most dense in those places from which a better view could be obtained of the ceremony.

The public bodies specially invited occupied a reserved space around the dais. There were present—

The Executive Council.
 The Legislative Council.
 The Legislative Assembly.
 The Heads of Civil Service in Sydney.
 The Heads of Clergy of Church of England.
 The Heads of Clergy of Church of Rome.
 The Heads of Clergy of Presbyterian Church.
 The Heads of Clergy of Wesleyan Church and other religious denominations.
 The Judges.
 The Foreign Consuls.
 The Senate of the University.
 The Head of Medical Association.
 The Council of Education.
 The Commanding Officers of the Navy.
 The Commanding Officers of the Army.
 The Commanding Officers of the Volunteers.
 The Commanding Officers of the Naval Brigade.
 Mayor and Corporation of Sydney.
 President and Vice-President of the Royal Society.
 Sir Daniel Cooper.
 Officers of the Commissariat Department.

Shortly after His Excellency had taken possession of the chair Sir William Macarthur stepped forward and read the following address :—

“To His Excellency SOMERSET RICHARD, EARL OF BELMORE, P.C., M.A.,
 Governor of New South Wales, &c., &c., &c.,—

“May it please your Excellency :

“We, the President and members of the Agricultural Society of New South Wales, beg leave, on the occasion of your Excellency's presence at the opening of the Exhibition, to express to you our acknowledgments for having consented to take the principal part in its inauguration, as well as for the uniform countenance and support which you have afforded to us in the performance of our duties, and in the promotion of the objects of the society.

“We have also to acknowledge the co-operation given to us by the Ministers, and to thank them and the Legislature for the liberal grant they have made towards the expenses of the undertaking.

“As this is the centenary year of the discovery of New South Wales by the great navigator Captain Cook, we have thought that it afforded a favourable opportunity of inviting the co-operation of the several Colonies of the Australian group, and we have to acknowledge the readiness with which they have responded to our invitation. We sincerely trust that a friendly and honorable rivalry in the competition for the prizes may be the means of creating greater excellence in the various articles of Colonial production, and of cementing those feelings of friendship and goodwill which it is so desirable should subsist between the inhabitants of Colonies having a common origin, and owing allegiance to the same gracious Sovereign, who, at the instance of

the late lamented Prince Consort, first instituted these national competitions, which have so materially contributed to the improvement of human industry.

"For the reasons above stated, the objects of the Exhibition have not been confined to those appertaining more particularly to the Agricultural Society, but have been extended to every description of Colonial production, in order to render the display more worthy of the occasion, and to show how vast has been the progress of colonization during the comparatively brief period of eighty-two years which has elapsed since the foundation of the Australian Colonies.

"We have to acknowledge the readiness with which the Colonists have come forward as exhibitors. The number of entries in the various classes is 2914, and of these 2,362 have been contributed by New South Wales, and the separate exhibits are nearly 5,000.

"We must not omit to convey to the Mayor and Corporation of Sydney our thanks for the zealous co-operation and assistance which they have afforded to us in all matters having reference to the undertaking, and especially for having provided, upon liberal and satisfactory terms, a building of such magnitude and of such fine proportions as that in which we are now assembled. By the energy of the contractors, and the active industry of the workmen employed by them, a building has been erected within the short period of six months covering a space of one acre, measuring 198 feet in length and 130 feet in breadth, and affording an area for the exhibition of goods of 36,936 superficial feet. This has been accomplished amidst difficulties, arising from the constant inclemency of the weather, which would have daunted men of any less energetic character. The above accommodation is independent of that which is provided for the exhibition of live stock and other animals in the buildings and yards constructed for the purpose, and also for the display of implements of husbandry and agricultural machinery.

"The number of subsidiary buildings and yards is eighty, and they occupy an area of 150,000 superficial feet. In fact a large portion of the Prince Alfred Park, which comprises 19 acres, has been rendered available for the accommodation of exhibitors and the convenience of the public.

"The exhibition is divided into two great departments, namely, agricultural and non-agricultural.

"The first department comprises live stock and other animals, wool, wine, sugar, farm produce, vegetables, fruits, flowers, and implements. The second embraces sculpture and fine arts, apparatus of liberal arts, furniture manufactures, minerals, woods, textile fibres, machinery, and preserved food.

"In the first department the prizes will be awarded in money, and in the second in medals. The value of these prizes amount to £1,500.

"Three judges have been appointed for each class from men distinguished by their competency to decide upon the comparative merits of the objects submitted to them; and the competing Colonies were asked to nominate in each case a judge, to be associated with those appointed by the Society, so as to ensure an impartial and satisfactory award in matters of intercolonial interest.

"If the whole arrangements have not been completed within the period originally contemplated, this has occurred from circumstances beyond our control. We greatly regret the necessity which arose, from the cause already mentioned, for the postponement of the opening of the Exhibition; but we hope that the delay of a fortnight will not have been attended with any material inconvenience to the exhibitors or public.

"The council of the Society having been appointed by the local Government Commissioners for the collection and transmission of articles, the produce or manufacture of this Colony, to the London Exhibition of 1871, and the sum of £1,000 having been voted by the Legislature to meet the necessary expense, some of the present exhibits will, at the proper time, be forwarded accordingly free of expense to the exhibitors.

"We congratulate your Excellency on the occurrence of this interesting and auspicious event during your administration, and we sincerely trust that it may prove the harbinger of many other intercolonial exhibitions, whereby the great and diversified resources of the Australian Colonies may, under the blessing of Divine Providence, be more fully developed and represented.

"Sydney, New South Wales,
"30th August, A.D. 1870."

His Excellency the Governor read the following reply :—

"Mr. President and Gentlemen,—I receive with great gratification the address which you have presented to me on behalf of the Agricultural Society of New South Wales on the opening of this Intercolonial Exhibition, in commemoration of the centenary of the landing upon the shores of Australia of the great navigator Captain Cook.

"I join with you in acknowledging the readiness with which the other Colonies of the Australian group have responded to your invitation to unite with you in celebrating that interesting event; and in the hope that their friendly and honorable rivalry with New South Wales may be the means of obtaining greater excellence in Colonial productions, as well as of cementing those feelings of friendship and loyalty which should subsist between neighbouring communities speaking the same language, and living under the rule of the same Sovereign—Her Most Gracious Majesty Queen Victoria.

"I concur with you that this Exhibition will show how wonderful has been the progress of colonization in Australia since the year 1788, when the first Governor, Captain Phillip, arrived. I believe that for upwards of 20 years the Colony made little or no advancement, and that the progress, of which we are now enjoying the fruits, has been made since the assumption of the Government by General Macquarie, in 1810. At that time the Australian settlement, with the exception of the small dependency then known as Van Diemen's Land, which now constitutes the Colony of Tasmania, consisted of little more than the occupation of the present county of Cumberland, and part of that of Camden.

"In 1840 a new era commenced, which led to rapid strides in pastoral, agricultural, and commercial, together with other industrial pursuits, and the gold discovery in 1851 caused an advance more remarkable than could have been anticipated by the most sanguine mind. The production of gold in Australia from its first discovery has exceeded in value one hundred and eighty millions sterling.

"On the 26th January, 1788, the first settlers—1,030 in number—landed at the head of Sydney Cove; and Governor Phillip proclaimed the limits of the new Colony to be—on the east the ocean, from South Cape, in 43° 40' south latitude, to Cape York, in 10° 42' south latitude; on the west, the 135° of east longitude; on the north and south, the ocean.

"In 1803 Tasmania was settled, and Lieutenant-Governor Collins assumed the Government on 16th February, 1804. South Australia, about half of whose geographical limits were included in the original Colony, was settled in 1836. Victoria was separated from New South Wales in 1851, and Queensland in 1859. The limits of New South Wales after these successive subdivisions still comprise an area of 207,000,000 acres. The statistics of New South Wales, as it now exists, would give a very inadequate idea of the results achieved within the boundaries of the original Colony in 1788, in the short space of eighty-two years. It is proper to include in such a statement a statistical estimate of the present position of all the Colonies embraced

within the original limits of the parent Colony, and if we do so we shall now find an aggregate of population approaching two millions, of revenue exceeding seven millions, and an aggregate import and export trade of fifty millions sterling. In 1796 there were in the whole of Australia but 57 horses, 227 domesticated cattle, and 1,531 sheep; in 1870, I believe I am correct in saying the horses number half-a-million, the horned cattle four millions, and the sheep forty millions.

"Our coal-fields, extending as they do over a vast territory, are of inestimable value, and will, I trust, tend to develop great manufacturing industries, and largely promote the extension of commerce and the general prosperity of the people.

"If evidence were wanted of the vast progress the Colony has made, it is in the grand scene which we now witness. We are assembled in a building of vast proportions, containing an exhibition of the arts, sciences, manufactures, commerce, and other elements of wealth and proofs of social advancement. To those who have planned and carried out with great rapidity under peculiar difficulties the great object designed, the highest credit is due.

"Permit me to offer my congratulation to the gentlemen who have established this Society, to the Mayor and Corporation of the City of Sydney, and to the enterprising contractor, Mr. Young, on the successful result of this great and important undertaking.

"Let us not forget, gentlemen, in conclusion, to ascribe to the Giver of all Good the glory and the praise for that success with which He has blessed their efforts, and for the bountiful goodness which He has manifested to this land.

"I now declare the Exhibition open." (Cheers.)

Upon the termination of the reply, Sir William Macarthur called for three cheers for His Excellency, which were given with great enthusiasm, the crowd outside heartily joining in. The organ at once struck up "Rule Britannia;" after which, renewed cheers were given in honor of His Excellency, and also three for the Countess of Belmore, with "one cheer more" for the "little ones" who were present. The Governor then left the dais, and made a tour of the exhibits.

The Exhibition continued open for one month. At the close of the first week the live stock were removed. Subsequently, the Exhibition Building was thrown open at night, and was well attended. Organ and band performances were added to the attractions, and several popular concerts were given. The half of one day was set apart for the school-children of the Colony, and free admission was granted to the inmates of several of the Charitable Institutions of the city. The floricultural decorations were frequently renewed; and on his return to Sydney in the middle of September the Duke of Edinburgh kindly allowed his young elephant to bivouac in the Park for the amusement of visitors.

The interest taken by the public in this event is apparent from the following tabulated statement of the numbers who visited the Exhibition at Alfred Park, and the amount taken at the gates. Comparing the population of the Colony (450,000) with the totals, it may be safely affirmed that in no other country has so large a proportion of the population passed through the Exhibitions provided for them as in this Colony:—

Date.	Day of the week.	No. of persons paying at the gates.	Ent'ce Fees.	Amount received at the gates.	Season and Exhibition Tickets, &c.	School Children and Teachers.	Total Number who entered daily.
			s. d.	£ s. d.	*		
1870.							
Aug. 30 ...	Tuesday	3,302	5 0	825 10 0	6,120	.....	9,422
31 ...	Wednesday ...	20,205	1 0	1,010 5 0	5,790	.....	25,995
Sept. 1 ...	Thursday ...	3,984	2 6	498 0 0	2,340	.....	6,324
2 ...	Friday	14,172	1 0	708 12 0	4,620	.....	18,792
3 ...	Saturday	10,890	1 0	544 10 0	2,800	.....	13,690
5 ...	Monday	6,216	1 0	310 16 0	3,350	.....	9,566
6 ...	Tuesday	3,837	1 0	191 17 0	2,000	.....	5,837
7 ...	Wednesday ...	1,642	2 6	205 5 0	1,160	.....	2,802
8 ...	Thursday	2,366	1 0	118 6 0	970	.....	3,336
9 ...	Friday	2,509	1 0	175 9 0	1,200	.....	4,709
10 ...	Saturday	1,821	1 0	91 1 0	1,000	.....	5,797
11 ...	.....	2,976	0 6	74 8 0	870	.....	4,443
12 ...	Monday	3,573	1 0	178 13 0	1,300	.....	5,369
13 ...	Tuesday	4,069	1 0	203 9 0	650	.....	2,799
14 ...	Wednesday ...	2,149	1 0	107 9 0	420	15,649	18,047
15 ...	Thursday	1,978	1 0	98 18 0	1,140	.....	4,470
16 ...	Friday	3,330	1 0	166 10 0	570	.....	3,923
17 ...	Saturday	3,353	1 0	167 13 0	1,260	.....	5,421
19 ...	Monday	4,161	1 0	208 1 0	340	.....	1,118
20 ...	Tuesday	778	1 0	38 18 0	400	.....	2,043
21 ...	Wednesday ...	1,643	1 0	82 3 0	620	.....	2,702
22 ...	Thursday ...	2,082	1 0	104 2 0	780	.....	2,759
23 ...	Friday	2,979	1 0	148 19 0	350	.....	2,275
24 ...	Saturday	1,925	1 0	96 5 0	600	.....	3,414
26 ...	Monday	2,814	1 0	140 14 0	930	.....	4,258
27 ...	Tuesday	3,328	1 0	166 8 0	410	.....	2,781
28 ...	Wednesday ...	2,371	1 0	118 11 0	500	750	3,534
29 ...	Thursday ...	2,284	1 0	114 4 0	3,000	.....	7,649
30 ...	Friday	4,649	1 0	232 9 0	.....	.....	.....
		122,386	.....	7,128 5 0	45,490	16,399	184,275

* In this column are included the children from the Deaf and Dumb and Blind Institutions; also, the visitors from the Parramatta and Gladesville establishments.

INDUSTRIAL PROGRESS OF NEW SOUTH WALES.

CATALOGUE

OF THE

INTERCOLONIAL EXHIBITION

OF

1870.

CATALOGUE.

SECTION I.—FINE ARTS.

Judges

IN CLASSES 480, 481, 482a, 483, 484, 486 to 494.

CONRAD MARTENS,		HENRY C. DANGAR,
JOHN RAE,		W. WALLIS.

Stewards:

JAMES BARNET,		CHAS. WOOLCOTT.
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Prizes:—Bronze and Silver Medals.

OIL-COLOURS (FOR PROFESSIONALS).

Class 480.—Historical Picture, or Tableau de Genre.

- 2375 Assumption and Coronation of the Virgin, copied by Bartelli at Rome, after Raffaele.* Rev. Peter Young, Liverpool.
2376 St. Cecilia.* Chas. Michael, 71, Elizabeth-street.
2377 Old Man telling his Beads. Price, 8 guineas. J. T. Dennis, Campbelltown.
2378 St. Peter's Release from Prison. Price, £30. Ditto.
2379 Cavalier and Ladye.* G. B. Shaw, Castlereagh-street.
2380 Dutch Fair.* A. Steel, Devonshire-street.
2381 Portrait.* Price, 3 guineas. T. Douglas, George-street North.
2382 Tamar and Judah.* Price, £20. Geo. Moore, Pitt-street.
2385 A day's Picnic on Clark Island. Price, £200. Montagu Scott, Hunter-street.
2386 Narcissus. Price, 100 guineas. Jas. Dennis, Parramatta.
2387 Crucifixion.* A. Parrot, Hunter-street.
2388 The Smithy. Price, 25 guineas. F. Woodhouse, Geelong.
2389 Rachel at the Well, after Goodall.* Jno. W. Burt, Collins-street, Melbourne.
2390 The Smithy, after Herring.* Ditto.
2391 The Game-seller, after Van Schendel.* Ditto.

* Disqualified.

AWARD:—No. 2386; commended.

Class 481.—Landscape.

- 2392 On the Manning River. Geo. B. Shaw, Castlereagh-street.
2393 Macleay Heads and Trial Bay. Price, 18 guineas. Ditto.
2394 Glen Esk, near Launceston. Price, 50 guineas. F. L. Montague, Kent-street North.
2395 Australian Bush Scene. Price, £10. J. W. Burt, Collins-street, Melbourne.
2396 Ditto. Price, £10.

- 2397 Temple of Vesta, &c. Eugene Von Guerard, Melbourne.
 2398 Sunset in New South Wales. Price, 60 guineas. Ditto.
 2399 The First Lesson. Price, 25 guineas. John Woodhouse, Geelong.
 2400 Green Lanes, near Stoke Newington, near London. Price, 15 guineas.
 Hy. Hart, Melbourne.
 2401 Victorian Scenery. Price, 20 guineas. J. B. Henderson, St. Kilda.
 2402 Ditto. Price, 20 guineas. Ditto.

AWARDS:—No. 2400; highly commended.
 2394; commended.

JURORS' OPINION.—The bronze medal would have been awarded to Nos. 2395 and 2396 had there not been some doubt as to their authorship.

Class 482.—Marine.—No entry.

Class 482a.—Heraldry.

- 2403 Heraldic Painting. Thos. Stevenson, Melbourne.
 AWARD:—Bronze medal.
-

WATER-COLOURS (FOR PROFESSIONALS).

Class 483.—Historical Picture, or Tableau de Genre.

- 2404 Dutch Burgomaster and Daughter. S. T. Leigh, 70, Hunter-street.
 2405 Shylock and Jessica. Ditto.
 2406 Greek Soldier. Ditto.
 2407 Digger's Return. Ditto.
 2408 The Gleaners. Ditto.

NO AWARD.

Class 484.—Landscape.

- 2409 Bondi Bay. Price, 7 guineas. Harold Brees, Hunter-street.
 2410 Botany Bay. Price, 6 guineas. Ditto.
 2411 Port Jackson. Price, 6 guineas. Ditto.
 2412 Robertson's Point, North Shore. Price, 12 guineas. J. R. Setwright,
 Bourke-street.
 2413 Little Willoughby Falls. Price, 10 guineas. E. T. Spencer, Pitt-street.
 2414 Bondi. Price, £33. Jno. E. Liardet, Waverley.
 2415 Scenes on Burke and Wills' Expedition, by Gill. Exhibited by R.
 Lloyd, Esq.

AWARD:—No. 2411; commended.

Class 485.—Marine.—No entry.

PROFESSIONAL AND AMATEUR (OPEN TO ALL).

Class 486.—Portraits (miniature).

- 2416 Duke of Edinburgh, Earl and Countess Belmore, &c. Thomas Price,
 Burwood.
 2417 Portraits, &c. Mr. and Mrs. Oswald Allen.

AWARDS:—No. 2417; highly commended "as colored photographs."
 2416; commended "as colored photographs."

Class 487.—Animals, &c.

- 2418 Australian Birds. Price, 4 guineas. Mrs. Paterson, Illalong, Yass.
 2419 Australian Animals. Gerard Krefft, Museum.

NO AWARD.

Class 488.—Fruits and Flowers.

- 2420 Magnolia, and two groups of Flowers. E. Du Faur, Rialto-terrace.
 2421 Fruit. Mrs. Charles Read, William-street.
 2422 Fuchias, &c., on screen. Miss Oliver, Victoria-street.
 2423 Australian Flowers. Price, 3 guineas. Mrs. Paterson, Yass.
 2424 Peony, Anemone, &c. E. B. Salisbury, Newtown.
 2425 Flowers, Frogs, &c. L. A. Meredith, Hobart Town.

AWARD :—No. 2425 ; bronze medal.

AMATEURS.**Class 489.—Oil-painting.**

- 2426 Weatherboard Waterfall. W. J. Jordan, King-street.
 2427 ———— Louis Steffanoni, Woollahra.
 2428 Lithgow Valley, Zigzag. Price, £55. John E. Grube.
 2429 Mountaineer and Child. Mrs. Charles Read, William-street.
 2430 Landscape and Figures. C. J. Paterson, Marlborough-street.
 2431 Ship in Distress. W. Andrews, jun., Princes-street.
 2432 Raft Scene—Sunset. Ditto.
 2433 Red Riding Hood. Ditto.
 2434 Cattle Piece. Ditto.
 2435 Self-Denial—" Shall I offer unto the Lord of that which shall cost me nothing?" Miss Felton, Castlereagh-street.
 2436 St. Malo. Mrs. Lee, Wollongong.
 2437 Caledonian Canal, Scotland. Price, £8. Wm. Buist, Pyrmont.
 2438 Blackwattle Cove. Price, £6. Ditto.
 2439 The Horse Doctor.* W. J. Holland, Redfern.
 2440 Ecce Homo.* Ditto.
 2441 Dutch Peasant.* Ditto.
 2442 Boro Creek. Edward Thomson, Gwydirdale.
 2443 On the Gwydir, near Bingara. Ditto.
 2444 Boro Creek, below the Falls. Ditto.
 2445 On the Gwydir, above Boro Creek. Ditto.
 2446 Free Selectors, Boro Creek. Ditto.
 2447 On the Gwydir, below Bingara. Ditto.
 2448 Myall Creek, near Mr. Dangar's. Ditto.
 2449 Fruit and Game Stall. Price, £45. A. J. Liddington, Bringelly.
 2450 Bandicoot. Price, 5 guineas. Ditto.
 2451 Basket of Peaches and Apples. Price, 8 guineas. Ditto.
 2452 Govett's Leap. Price, £25. W. H. Jarrett, Melbourne.
 2454 Hope and Love. 7 guineas. A. R. Pullin, Pitt-street.
 2455 Madonna (copy from Sasso Ferrato).* Price, 100 guineas. Charles Bacon, Braidwood.

* Disqualified.

AWARDS :—No. 2431 ; highly commended.

2430 }
 2449 } commended.

Class 490.—Water-colours.

- 2456 The Gap, Kurrajong. Mrs. Charles T. Gedye, Darling Point.
 2457 Valley of the Horton River. Mr. Edward Thomson, Gwydirdale.
 2458 On the Gwydir, near the mouth of Boro Creek. Ditto.
 2459 On the Rocky Creek. Ditto.
 2460 On the Gwydir, near Bingara. Ditto.
 2461 On the Coast of France (2). E. Du Faur, Darlinghurst.
 2462 Australian Scenery. Jos. Docker, Macleay-street.
 2463 Ditto. Ditto.
 2464 Waterfall at Penang, Straits of Malacca, on common brown parcel paper. Ditto.
 2465 Falls of Tapeia, near Rio Janeiro, on brown paper. Ditto.
 2466 Flying Squadron. F. Garling, Sydney.
 2467 Parramatta. Mrs. D. C. F. Scott, Liverpool-street.
 2468 Rushcutter's Bay. Ditto.
 2469 Grey Cliff, Sydney Harbour. Ditto.
 2470 In the Interior; pencil. Ditto.
 2471 Gipsy Fortune-telling. Mrs. Chas. Read.
 2472 Chinese Nurse and Infant.* T. S. Douglas, George-street.
 2473 Landscape. W. Elliott, Pitt-street.
 2474 Water-colour drawing, on cotton cloth. Mrs. Milner Stephen, Darlinghurst.
 2475 Ditto. Ditto.
 2476 In Sydney Harbour. E. Hinton, Camperdown.
 2477 South Head. Ditto.
 2478 "Silver Eye" on Wild Fig. Price, 3 guineas. E. Paterson, Yass.
 2479 Half Figure. Price, 2 guineas. Mrs. Barton, Gladesville.
 2480 The Hermitage, North Kurrajong. Arthur Stopps, Surveyor General's Office.
 2481 Boy Blowing Bubbles. Price, 2 guineas. R. H. Reilly, George-street.
 2482 On the Blue Mountains. Annie J. Boulton, Gloster-terrace.
 2483 Waterfall, near Sydney. Mrs. Wallace, Woolloomooloo-street.
 2484 The Peak, Derbyshire. Mrs. John Tait.
 2485 In the Channel where the Coal crops out. John Abbott, Hobart Town.
 2486 From Darling Point. (After Martens.) Miss M. D. Martin, Macquarie-street.
 2487 North Head. (Ditto.) Ditto.
 2488 The Gap. (After Terry.) Ditto.
 2489 From Milson's Point, North Shore. Ditto.
 2490 Copy from lithograph, by Harding. Ditto.
 2491 Balmain. (After Martens.) Ditto.
 2492 Falls, Mossman's Bay. Ditto.
 2493 Island Scenery. Ditto.
 2494 On Wollongong Road. (After Terry.) Ditto.
 2495 Perspective Drawing, Town Hall, Ballarat. Borough Council, Ballarat West.

* Disqualified.

AWARDS:—No. 2456; bronze medal.
 2464; highly commended.
 2466 }
 2467 } commended.
 2476 }

Class 491.—Pen and Ink, Sepia, &c.

- 2496 Kensington Gardens and Animals. Price, £7. J. C. Fitzjohn Hall.
 2497 Heads. Price, 2 guineas. F. Nixon, Balmain.
 2498 Somnus.* H. Corbett, Fitzroy-street.
 2499 The Lord's Prayer. R. Stelling Barker.
 2500 The First Christmas Eve. Louis Lamy, 113, Stanley-street.
 2501 View of Nuremburg. Ditto.
 2502 Etchings in aqua fortis on copper. E. L. Montefiore, Melbourne.

* Disqualified.

AWARDS:—No. 2497 } highly commended.
 2502 }

Class 492.—Crayon.

- 2503 Portraits. Mr. and Mrs. Oswald Allen, George-street.
 2504 Antique Head. Price, 1 guinea. F. Nixon, Balmain.
 2505 Mother and Child. Miss M. Felton, Castlereagh-street.
 2506 Satyr. Alick Longmuir, Waterloo.
 2507 Head. E. A. Bayley.
 2508 Portrait. Fred. Howe, jun., Liverpool-street.
 2509 Illawarra, from Westmacott's Pass. Price, 5 guineas. Henry Wise,
 Savings' Bank.
 2510 Boy Asleep. E. Hinton, Camperdown.
 2511 Sculpture. Ditto.
 2512 Queen of Hungary. Miss Healey, West Maitland.
 2513 Landscape. Ditto.
 2514 Preparing for the Chase. Mrs. John Tait.
 2515 Near Leamington. Ditto.
 2516 Jephtha's Vow. Ditto.
 2517 Master Frank. Ditto.
 2518 Sisterly Affection. Ditto.
 2519 Flora. Ditto.
 2520 Massacre Lake, Central Australia. Master A. A. Dircks, Ivy-street.
 2521 Pencil drawing. Miss Chapman, Newtown.
 2522 The Doctors. * (After Doré.) F. Nixon, Balmain.

* Disqualified.

AWARDS:—No. 2512 } highly commended.
 2503 }
 2507 ; commended.

Class 493.—Chalk.

- 2523 Ornament. Price, £1 10s. F. Nixon, Balmain.
 2524 Head. Price, 2 guineas. Ditto.
 2525 Italian Nobleman. Mrs. C. Read, William-street.
 2526 Cap of the Victorian Period. Price, £3. Joshua Moxon, Balmain.

AWARD:—No. 2524 ; highly commended.

Class 494.—Illumination.

- 2527 Specimen of Illumination, 17th chapter of Acts, 26th verse, in 103 languages. S. T. Leigh & Co., Hunter-street.
 2528 ——— George Bishop, Land Titles Office.
 2529 Illuminated address. L. Steffanoni, Woollahra.
 2530 Illuminated placard. Alex. Ogilvie, Myrtle-street.
 2531 Gilding, enamelling, and illuminating on plate-glass. Designed by Thos. Whitelaw, and executed by L. S. Blair during the last year of his apprenticeship.

AWARDS :—No. 2527 }
 2529 } bronze medal.

AWARD COMMITTEE :—Their awards having been referred to Jurors for re-consideration, it was determined by the Award Committee, on the reception of their report, to give a medal to the competitors specified.

Judges

IN CLASS 495.

JOHN RAE, | VICTOR A. PROUT,
 HENRY C. DANGAR.

Class 495.—Photography.

- 2532 Twelve landscapes. E. B. Docker, Macleay-street.
 2533 Twelve stereographs. Ditto.
 2534 Portraits, landscapes, and architectural views. John Degotardi, George-street.
 2535 Enlarged photographs. J. W. F. Wilshire, Waverley.
 2536 Plain and colored. D. Scott, Pitt-street.
 2537 Portraits. Mr. and Mrs. O. Allen, George-street.
 2538 Portraits, mezzo-tint. B. C. Bouke, George-street.
 2539 Panoramic views of Sydney. Price, 2 guineas. Ditto.
 2540 Children. Ditto.
 2541 Enlarged, untouched. Price, 4 guineas. Elijah Hart, West Maitland.
 2542 Kangaroo Dogs—instantaneous. J. S. Gordon, E. S. & A. C. Bank.
 2543 Water Spaniels and Terriers. J. S. Gordon, E. S. & A. C. Bank.
 2544 Portraits. Baron de Balk, George-street.
 2545 Enlarged-colored. W. G. Freeman, George-street.
 2546 Portraits. S. H. Newman, South Head Road.
 2547 Various. F. R. Robinson, George-street.
 2548 ——— J. T. Gorus, King-street.
 2549 ——— Samuel Clifford, Hobart Town.
 2550 Various. W. C. Pigurint, ditto.
 2551 ——— W. Nelson, Bathurst.
 2552 Specimens from Australian Museum. G. Krefft, Museum.
 2553 Paintings, Dresden School. Trustees, Melbourne Public Library.
 2554 Members of Ballarat Fire Brigade. Joseph Davey, Hon. Sec., Ballarat.
 2555 Seven views of Melbourne. John Noone, Crown Lands Office, Melbourne.
 2556 Stereoscopic views. Price, 1s. each. H. A. Severn, Melbourne.
 2557 Longford Viaduct, 2 views. H. A. Severn.
 2558 South Esk Bridge, Tasmania. Doyne, Major, & Willett, Melbourne.
 2559 Portraits from life, large size, and cartes de visite.* Mayall & Sons, Collins-street, Melbourne.

2560 Design, Public Library, Sydney; Post Office, and Zigzag; six copies of engravings. T. Richards, Government Printer, Sydney.
2560A Ballarat. Price, £6. William Bardwell, Ballarat.

AWARDS :—No. 2546; bronze medal.

2534	} highly commended.
2536	
2537	
2552	
2560	

2555; commended.

JURORS' OPINION.—The Judges have had considerable difficulty in separating the various *kinds* of photographs, and they recommend that in future, portraits, landscapes, reproductions, &c., should be placed in separate classes, and judged accordingly. They regret the want of competition in landscape photography, but have pleasure in commending the general excellence of the exhibits.

* No. 2559.—The large photographs are magnified in the solar camera, printed direct on chloride of silver, and finished in sepia. The negatives are taken in the half-length carte de visite style with a large lens, securing by this means perfect definition. The negative being on a plane surface, enlarging the same cannot, from the very nature of the process, admit of distortion.

Judges

IN CLASSES 496, 497.

THOS. RICHARDS, | ARTHUR J. STOPPS,
JAMES A. WILLIS.

Class 496.—Lithography.

- 2561 Exhibition Building. S. T. Leigh & Co.
2562 Various specimens, including Fern Nature-printing, done from the plant itself, and not drawn; chromo-lithography, commercial lithography, and chalk work. Gibbs, Shallard, & Co.
2563 Sample-book of chromo.* J. C. H. Baass.
2564 Ditto. A. Randall, Hobart Town.
2565 Various. G. Krefft, Museum.
2566 Specimens of projected work on "Parrots of Australia," 7s. 6d. each part. Rev. R. Laishley, Melbourne.
2567 Forty-two photo-lithographs of wood engravings. John Noone, Crown Lands Office, Melbourne.
2568 Two specimens photo-lithography, by John Noone. Wurten, Melbourne Public Library.
2570 Three specimens of photo-lithography; executed by John Sharkey, Government Printing Office, Sydney. Exhibited by T. Richards, Government Printer.

* Disqualified.

AWARDS :—No. 2570; silver medal. [The award is made on account of the originality, utility, and excellence of Mr. Sharkey's invention.]

2561	} bronze medal.
2567	
2568	
2565	} highly commended.
2566	
2562	} commended.
2564	

JURORS' OPINION.—Nos. 2567, 2568, and 2570.—All these exhibits are very good specimens of the art, but those executed by Mr. Sharkey possess a clearness and brilliancy of unusual merit. No. 2561.—Taken as a whole, a very good exhibit. No. 2565.—These exhibits are principally lithographs of snakes and native animals, which were drawn on stone by Mrs. Forde and Miss Helena Scott, and are deserving of very high commendation. These remarks equally apply to the lithographs printed and exhibited by the Government Printer, of native animals,—drawn by the same ladies for the Council of Education. No. 2566.—This specimen gives promise of a work in the highest degree creditable to all concerned in its production; the typography also is excellent.

While the awards in Nos. 2567, 2568 and 2570 (photo-lithographs) were being made, Mr. Richards withdrew from the Jurors.

Class 497.—Engraving.

- 2571 Dies, monograms, &c. S. T. Leigh & Co., Hunter-street.
 2572 Knifeography. C. J. Singleton, Gloucester-street.
 2573 Hawking.* Dennis Kearney, George-street.
 2574 Various specimens. Gibbs, Shallard, & Co., Pitt-street.
 2575 Mercantile specimens. Sands & M'Dougall, Melbourne.

* Disqualified.

AWARDS :—No. 2571 ; bronze medal.
 2575 ; highly commended.
 2572 } commended.
 2574 }

Judges

IN CLASSES 498, 499, 500.

SIR JAMES MARTIN, KNT., | EDMUND T. BLACKETT,
 JAMES BARNET.

Class 498.—Architecture.

- 2576 Collection of Drawings. Harold Brees, Hunter-street.
 2577 Design for Town Hall. J. H. Hunt, Pitt-street.
 2578 Design for Anglican Cathedral. Ditto.

AWARD :—No. 2576 ; bronze medal.

JURORS' OPINION.—It would have been more satisfactory if there had been more competition.

Class 499.—Modelling.

- 2579 Pot of Mignonette : Paper. Price, 2 guineas. Mrs. Andrews, Enmore.
 2580 Five Busts. Francis Danby, Paddington.
 2581 Statuette. Ditto.
 2582 Sketch. Ditto.
 2583 Villa and Garden with South Sea Island shells. Samuel Gale, Double Bay.

- 2584 Grotto. J. Callaghan, Crown-street.
 2585 Wax Flowers, Leather-work, &c. Mrs. and Miss Redgrave, Palmer-street.
 2586 Vase of Flowers. Mrs. Phelps, Balmain.
 2586½ Working Model. Sydney Heads with Vessels. T. P. Newman, New-town.

AWARDS :—No. 2580 ; bronze medal.
 2579 } commended.
 2585 }

JURORS' OPINION.—No. 2580.—These busts are very good likenesses, but are not very highly finished.

Class 500.—Carving.

- 2587 Landscape, animals, birds, &c., made from cuttle-fish—£10. Mrs. Davis, Waterloo.
 2588 Castle and pleasure-grounds, made from cuttle-fish—£9. Miss M. A. Davis, Waterloo.
 2589 Elizabethan frame from solid piece of cedar, with music trophy, ribbon, and double knot, from the solid. J. H. Ferris, Little Norton-street.
 2590 A cap—£5. Josh. Moxon, Balmain.
 2591 Incised carving Sydney sandstone—£2 10s. T. Newman, King-street, West.

AWARDS :—No. 2589 } commended.
 2590 }

SPECIAL PRIZE.

Judges :

CONRAD MARTENS,
 JOHN RAE,

HENRY C. DANGAR,
 W. WALLIS.

Class H.—Oil or Water-colours.

Messrs. Fairfax and Sons' Special Prize—£10 10s. and £5 5s.—for best and second-best oil or water-colour painting, by an Australian artist, or one who has resided in the Colony at least two years.

- 2592 Dutch Burgomaster and Daughter. S. T. Leigh & Co., Hunter-st.
 2593 Shylock and Jessica. S. T. Leigh & Co.
 2594 Greek Soldier. Ditto.
 2595 Digger's Return. Ditto.
 2596 The Gleaners. Ditto.
 2597 Lithgow Valley, Zigzag. John E. Grube.
 2598 St. Malo. Mrs. Lee, Wollongong.
 2599 Sydney Heads (moonlight). Wm. E. Langley, *Herald Office*.
 2600 Harbour View, from Double Bay. G. B. Shaw, Castlereagh-street.
 2601 The Gap, Kurrajong. Mrs. Charles T. Gedye, amateur.
 2466 Flying Squadron. F. Garling.

AWARDS :—No. 2601 ; 2nd prize of £5 5s.
 2599 ; highly commended.

JURORS' OPINION.—The Judges are of opinion that no work submitted for competition in this class is entitled to the award of the first prize of ten guineas.

NON-COMPETITIVE.

- 2602 Portraits of Governor Lachlan Macquarie and Governor Sir Thos. Brisbane, Bart., G.C.B., G.C.H., oil-p. The Earl of Belmore.
- 2603 Portrait of Governor Sir Ralph Darling, G.C.H., oil-p., by A. Morton, 1838. Ditto.
- 2604 Portrait of Governor Sir Richard Bourke, K.C.B., oil-p., by A. Morton, 1840. Ditto.
- 2605 Portrait of Governor Sir George Gipps, oil-p. Ditto.
- 2606 Portrait of Governor-General Sir Chas. Augustus Fitzroy, K.C.B., K.C.H., oil-p., by R. Buckner. Ditto.
- 2607 Portrait of Governor-General Sir William T. Denison, K.C.B., oil-p. Ditto.
- 2608 Portrait of Governor the Right Honorable Sir John Young, Bart., P.C., K.C.B., G.C.M.G., oil-p., by R. Buckner. Ditto.
- 2609 Captain Cook, plaster bust and pedestal, by Brain. Ditto.
- 2610 Admiral Lord Nelson, plaster bust and pedestal, by Brain. Ditto.
- 2611 Major-General Sir Maurice O'Connell, plaster bust and pedestal, by C. Abrahams. Ditto.
- 2612 Sir George Gipps, plaster bust and pedestal, by C. Abrahams. Ditto.
- 2613 Sir Charles A. Fitzroy, plaster bust and pedestal, by C. Abrahams. Ditto.
- 2614 Sir John Young, plaster bust and pedestal, by T. Duckett. Ditto.
- 2615 Design for proposed Houses of Parliament, Sydney, water-c., by W. Henry Lynn. The Colonial Architect.
- 2616 Design for new General Post Office, Sydney, water-c., by James Barnet. Ditto.
- 2617 Design for new Free Library, Art Galleries and Schools, Technological Museum, &c., Sydney, water-c., by James Barnet. Ditto.
- 2618 Design for new Public Offices, Bridge-street, Sydney, water-c., by James Barnet. Ditto.
- 2619 Julia, oil-p., by T. F. Dicksee. H. C. Dangar, Esq.
- 2620 Llyn Dulin, Wales (morning), oil-p., by S. R. Percy. Ditto.
- 2621 Llyn Idwall, Wales (evening), oil-p., by S. R. Percy. Ditto.
- 2622 The Butterfly, oil-p., by R. Fox. Ditto.
- 2623 A Trout stream, Wales, oil-p., by J. Adams. H. C. Dangar, Esq.
- 2624 Mother and Child, oil-p., by Poole. Ditto.
- 2625 The Birth-place of Queen Elizabeth, oil-p., by H. Pether. Ditto.
- 2626 Dutch Coast, oil-p., by Wainright. Ditto.
- 2627 Bay Middleton, oil-p., by J. F. Herring, senr. Ditto.
- 2628 Ruins of Cleghorn Mills, oil-p., by E. Gill. Ditto.
- 2629 A Shower, Harvest-time, water-c., by J. Jenkins. Ditto.
- 2630 Castle of Ischia, water-c., by W. Webb. Ditto.
- 2631 A Sketch, water-c., by T. M. Richardson. Ditto.
- 2632 H.M.S. "Nelson," 90 guns, water-c., by C. Taylor. Ditto.
- 2633 Coast Scene, Stormy Weather, water-c., by Knibbs. Ditto.
- 2634 Coast Scene, Indian Ashore, water-c., by Knibbs. Ditto.
- 2635 View from above Wiseman's Ferry, Hawkesbury, N.S.W., water-c., by C. Martens. Ditto.
- 2636 Landscape, oil-p., by Neimann, junr. S. A. Joseph, Esq.
- 2637 Landscape, oil-p., by Gustave Van Hoorde. Ditto.
- 2638 Landscape, oil-p., by Gustave Van Hoorde. Ditto.
- 2639 Landscape, oil-p., by E. Turner, junr. Ditto.
- 2640 The Toilet, oil-p., by H. Newman, junr. Ditto.
- 2641 Portrait of a Lady, oil-p., by Rembrandt. Ditto.
- 2642 Figures and Cattle, oil-p., by Berchem. Ditto.

- 2643 Fording the Dam, oil-p., by Ommegannk. S. A. Joseph, Esq.
 2644 Scene in New Zealand, oil-p., by Gilfillan. Henry Moore, Esq.
 2645 On the Dart, water-c., by Mrs. C. T. Gedye, amateur.
 2646 Views from Mount Keira, water-c., by Mrs. C. T. Gedye, amateur.
 2647 View from Mount Bowen, Kurrajong, water-c., by Mrs. C. T. Gedye, amateur.
 2648 View on the Grose, Kurrajong, water-c., by Mrs. C. T. Gedye, amateur.
 2649 Coast Scene, water-c., by F. C. Terry. By C. T. Gedye, Esq.
 2650 Ruins, Interior Lisbon, water-c., by Wm. H. Burnett. Ditto.
 2651 An Autumnal Evening, Returning Home, oil-p. Ditto.
 2652 On the Thames, near Richmond, oil-p., by Collins. Ditto.
 2653 The Ford, oil-p., by J. Waldren. Ditto.
 2654 View in Scotland, oil-p., by Miss Stoddart. Dr. Boyd.
 2655 Weary Travellers, water-c., by G. W. Wright. Ditto.
 2656 Italian Peasants, oil-p., by Wagner. Ditto.
 2657 Coming from Mass, oil-p. Ditto.
 2658 Game, oil-p., by Wainwright. J. Jacobs.
 2659 Reading the Will, oil-p. Ditto.
 2660 Venus and Adonis, oil-p. Mrs. McCulloch.
 2661 Interior, oil-p., by Jansen. Ditto.
 2662 Landscape, oil-p., by Bylandt. Ditto.
 2663 Proserpina, marble bust, by Power. J. G. Ross.
 2664 Copperplate Etching, by A. Durer. Miss Boulton.
 2665 Morning Hymn in Paradise, oil-p., by David Scott, R.A. Dr. J. Le Gay
 Brereton.
 2666 Cupid sharpening his Arrows, oil-p., by David Scott, R.A. Ditto.
 2667 Interior, oil-p., by Teniers. Ditto.
 2668 Harbour of Greenock, oil-p., by Stanfield, R.A. Ditto.
 2669 Billet-doux, oil-p., by Leslie, R.A. Ditto.
 2670 Shoalhaven, water-c., by C. Martens. Mr. Slade.
 2671 Wild Rose, chromo-litho. Mr. James Morton.
 2672 Dogs and Ducks, Lincolnshire Fens, oil-p., by Armfield. Mr. W. Tucker.
 2673 Off Tangiers, oil-p., by Henry Johnston. Ditto.
 2674 Murillo painting Peasants at Catalonia, water-c., by W. H. Kearney.
 Ditto.
 2675 Cattle and Sheep, oil-p., by H. Park. Mr. Vincent Giblin.
 2676 Landscape, oil-p. Ditto.
 2677 River Scene, Moonlight, oil-p., by Williams. Ditto.
 2678 Mid-day Rest, oil-p. Ditto.
 2679 Pastoral Scene, Kent, oil-p., by Jno. J. Wilson. Ditto.
 2680 Original Design of Great West Window (45 ft. x 25 ft.) in Norwich
 Cathedral—Memorial of Bishop Stanley, oil-p., by Geo. Hedgeland,
 1853. Mr. George Hedgeland.
 2681 Memorial Window to Lord Somers, Rockingham Church, North Hamp-
 shire, oil-p., by Geo. Hedgeland. Ditto.
 2682 Arran, from the large Cumbræ, oil-p., by J. Milne Donald. Mr. John
 Alger.
 2683 Portrait of Benjamin West, oil-p., by himself. Sir James Martin.
 2684 Boy with Peach, oil-p., by Greuse. Ditto.
 2685 Portrait of Charles V, oil-p. Ditto.
 2686 Mother of Phaeton pointing out the Chariot of the Sun, oil-p., by Maria
 Cosway. Ditto.
 2687 Scarecrow, oil-p. Ditto.
 2688 Sheep, oil-p. Ditto.
 2689 Landscape, with Cart, oil-p. Ditto.
 2690 Tranquility—Sunrise, oil-p. Ditto.
 2691 Fishing Party, oil-p., by Watteau. Ditto.

- 2692 **Buchan Mountain, on the Gloucester, water-c., by Conrad Martens.**
Mr. Henry Norton.
- 2693 **Norton Basin, Nepean, water-c. Ditto.**
- 2694 **Madonna Di San Sisto, Dresden Gallery, photo. J. Mullens.**
- 2695 **Landscape, with Cattle, oil-p., by H. Birtter. Ditto.**
- 2696 **The Consultation, water-c., after Meissonnier. Ditto.**
- 2697 **Portrait, crayon, by Adelaide S. Ironside. Mrs. Francis Lord.**
- 2698 **Ditto Ditto.**
- 2699 **Two carved Book-rests, cut from the solid without joint or pin, by E. Oram. Edward Oram.**
- 2700 **The Blow-hole, water-c., by Roberts. Mr. Austin.**
- 2701 **On the Barwon, water-c., by Roberts. Ditto.**
- 2702 **View in New England, water-c., by Roberts. Ditto.**
- 2703 **Liverpool Plains, water-c., by Roberts. Ditto.**
- 2704 **Scene in Wales, water-c., by Creswick. Ditto.**
- 2705 **Italian Bowlers, oil-p., by Munnis. Mr. Charles Smith.**
- 2706 **Medallion (bronze) of the late D. H. Deniehy, Esq., by W. Lorando Jones. Mrs. Deniehy.**
- 2707 **Holy Family—Zachariah, Elizabeth, and St. John, by Farasyn, 1651.**
Mr. Sidney Douglas.
- 2708 **Boyne Water, by W. G. Wall. Ditto.**
- 2709 **Landscape Watermill, by P. Nasmyth. Ditto.**
- 2710 **Woodland Scene, by P. Nasmyth. Ditto.**
- 2711 **Landscape, by R. Wilson. Ditto.**
- 2712 **Sunset. Ditto.**
- 2713 **Landscape Cattle, by W. Rocloss. Ditto.**
- 2714 **Dutch Boors, by Van Ziel. Ditto.**
- 2715 **Little Red Riding Hood, by R. Chilton. Ditto.**
- 2716 **Female reading Letter, by Boucher. Ditto.**
- 2717 **Sparring Fish, by T. Balcombe. Ditto.**
- 2718 **Cupid, by Wm. Bone. Ditto.**
- 2719 **Flowers. Ditto.**
- 2720 **Bloodhound with armour, by H. S. Melville. Mr. Sidney Douglass.**
- 2721 **Autolyces as the Pedlar, "Winter's Tale," by Stacey Marks, R.A. Mr. John Sands.**
- 2722 **Henry IV., Part I., Act 2, Scene 4, oil-p. Price, £75. Mrs. Salomons.**
- 2723 **Henry IV., Part II., Act 2, Scene 4, oil-p. Price, £75. Ditto.**
- 2724 **Merton College Chapel, water-c., by Nash. W. J. Stephens, Darlinghurst Road.**
- 2725 **Queen's College Chapel, water-c., by Nash. Ditto.**
- 2726 **Queen's College Hall, water-c., by Nash. Ditto.**
- 2727 **View in Egypt, water-c., by Warren. Ditto.**
- 2728 **English Landscape, oil-p., by Meadows. Wm. Wallis, Potts' Point.**
- 2729 **Beach Scene, Holland, oil-p., by Isaac Van Ostade. Ditto.**
- 2730 **Adoration of the Kings, oil-p., by Ugalini. Ditto.**
- 2731 **St. John in the Wilderness, oil-p., by Correggio. Ditto.**
- 2732 **The Halt after a Day's Sport, oil-p., by Kuytenbrouwer Verboeckhoven. Ditto.**
- 2733 **Death of St. Francis, oil-p., by Vandyke. Ditto.**
- 2734 **Holy Family (pre-Raffaeleite), oil-p., by Palma Vecchia. Ditto.**
- 2735 **Religion, oil-p., by Sir Joshua Reynolds. Ditto.**
- 2736 **Mountain Landscape, oil-p., by Southerburg. Ditto.**
- 2737 **Altar of Juno, oil-p., by Billardet. Ditto.**
- 2738 **Girl Feeding Sheep, Wales, oil-p., by Cooper and Panmore. Ditto.**
- 2739 **Nature's Child, oil-p., by Sir Joshua Reynolds. Ditto.**
- 2740 **Encampment, oil-p., by Wouvermann. Ditto.**
- 2741 **Dante in Exile, oil-p., by Rochefoucault. Ditto.**

- 2742 A Little too Late, oil-p., by Armfield. Ditto.
 2743 Wounded Pheasant, oil-p., by Armfield. Ditto.
 2744 St. Catherine, oil-p., by Guido. Ditto.
 2745 Rinaldo and Annido (from Tasso), oil-p., by Vandyke. Ditto.
 2746 Morning—Coast of Holland, oil-p., by Musan. Ditto.
 2747 Studio, oil-p., by G. Dow. Ditto.
 2748 Interior in Rome—Gamblers or Card Players, oil-p., by Anavaggio.
 Ditto.
 2749 Flowers, oil-p., by Van Os. Ditto.
 2750 Venice, oil-p., by Canaletti. Ditto.
 2751 Religious ceremony, oil-p., by Canaletti. Ditto.
 2752 Abraham and Isaac, oil-p., by Lorenzo Lippi. Ditto.
 2753 The Lovers, oil-p., by Woolpert. Ditto.
 2754 Chief of Abruzzi, oil-p., by E. Verboeckhoven. Ditto.
 2755 Candlelight Scene, oil-p., by E. Verboeckhoven. Ditto.
 2756 Card-playing, oil-p., by Ghemar. Ditto. *
 2757 Draughts, oil-p., by Ghemar. Ditto.
 2758 Golden Tints of Autumn, oil-p., by Whittle. Ditto.
 2759 The Expectant, oil-p., by Gale. Ditto.
 2760 Dog Fanciers, oil-p., by Delcourt. Ditto.
 2761 Village Pets, oil-p., by Delcourt. Ditto.
 2762 The Thames, from Plumstead Common, by Buchanan. Ditto.
 2763 Perthshire—Morning, oil-p., by Buchanan. Ditto.
 2764 Culzean Castle, Ayrshire, oil-p., by Buchanan. Ditto.
 2765 Loch Dochart, Ross-shire, oil-p., by Buchanan. Ditto.
 2766 Loch Grill and Carrick Castle, oil-p., by Buchanan. Ditto.
 2767 Kilchurn Castle, Loch Awe, oil-p., by Buchanan. Ditto.
 2768 Loch Katrine, from the Trossachs, by Buchanan. Ditto.
 2769 Loch Lomond, oil-p., by Buchanan. Ditto.
 2770 Stock, in Perthshire, oil-p., by Buchanan. Ditto.
 2771 Loch Auchry, Perthshire, oil-p., by Buchanan. Ditto.
 2772 Close of a Summer Day, oil-p., by Leslie. Ditto.
 2773 Girl Feeding Chickens, oil-p., by Gresmore. Ditto.
 2774 Winter, oil-p., by Van Ostade. Ditto.
 2775 Portrait, oil-p. Ditto.
 2776 The Bass Rock, oil-p., by Bough. Walter Lamb, Esq.
 2777 Madonna and Child, oil-p. After Carlo Dolce. Sir W. Macarthur.
 2778 Sybil, oil-p. After Romanelli. Sir W. Macarthur.
 2779 Music, oil-p. After Gerard. Ditto.
 2780 Modesty and Vanity, oil-p. After Leonarda da Vinci. Ditto.
 2781 Grand Canal, Venice, oil-p. After Canaletti. Ditto.
 2782 Landscape, oil-p. After Rembrandt. Ditto.
 2783 Magdalen, oil-p. After Titian. Ditto.
 2784 Madonna and Child, oil-p. After Correggio. Ditto.
 2785 Madonna and Child, oil-p. After Juini. Ditto.
 2786 Virgin, oil-p. After Andrea del Sarto. Ditto.
 2787 Oliver Cromwell; portrait, oil-p. After Sir Peter Lely. Ditto.
 2788 Madonna del Rosario, oil-p. After Cignani.
 2789 Landscape, oil-p. After Salvator Rosa. Ditto.
 2790 Portrait of Ann Boleyn, oil-p. Ditto.
 2791 Girl of Albano, oil-p. Original, by Mazzuoli. Ditto.
 2792 Portrait of Raffaele, oil-p. After Raffaele.
 2793 Madonna, oil-p. After Sasso Ferrato. Ditto.
 2794 Wayside scene in Italy during a Storm, oil-p. Modern. Ditto.
 2795 Flight into Egypt, oil-p. After Correggio. Ditto.
 2796 Hope, oil-p. After Guido. Ditto.
 2797 Madonna, oil-p. After Raffaele. Ditto.

- 2798 The Bad Neighbours, by C. Verlat.
 2799 Study. After Samuel Prout. R. Coombes, Glamire.
 2800 Coast Scene, moonlight. F. Terry.
 2801 Approaching Gale. J. W. Terry.
 2802 Windmill. F. Nixon.
 2803 The Torrent Brook. Deakin.
 2804 Time clipping Cupid's Wings. Van Dyke. Rev. J. Slattery, Bega.
 2805 Woodland Scenery, oil-p., by Deakin. Alfred Cane.
 2806 Captain Cook, oil-p., by Marshall Claxton. Saul Lyons.
 2807 Fisherman leaving Home, oil-p., by Collins. Ditto.
 2808 Landscape, oil-p., by Artois. Ditto.
 2809 Brace of Snipe, oil-p., by Newall. Ditto.
 2810 Henley-on-Thames, oil-p., by Boddington. Ditto.
 2811 Fisherman selling Fish, oil-p., by Collins. Ditto.
 2812 Dr. Delamar calling the People together, oil-p., by B. C. Bóhe. Ditto.
 2813 Sheep, oil-p., by Ansdell. Ditto.
 2814 Landscape View in Surrey, oil-p., by Baker. Ditto.
 2815 Farm with Donkeys and Poultry, oil-p., by Sykhardt. Ditto.
 2816 Farms in Cornwall, oil-p., by Vickers. Ditto.
 2817 Raffaella's "La Madonna della Seggiola," oil-p., by W. Silvester.
 J. W. Goodlet.
 2818 Pass of Glencoe, oil-p., by Macneil Macleay. Ditto.
 2819 Titian's Flora, oil-p., miniature copy. Ditto.
 2820 Catharine of Russia, oil-p., by Mieris. George Hurley.
 2821 Burial of Christ, oil-p., by Teniers, sen. Ditto.
 2822 Titian's Daughter, oil-p. Hon. Thos. Holt.
 2823 Captain Cook's Landing-place, water-c., by Terry. Ditto.
 2824 View from the Warren, Cook's River, water-c., by Terry. Ditto.
 2825 Girondin, engraving. Ditto.
 2826 Reign of Terror, engraving. Ditto.
 2827 Veiled Bust, marble. Ditto.
 2828 Arc de L'Etoile, bronze. Ditto.
 2829 Obelisk in the Place de la Concorde, bronze. Ditto.
 2830 Statue of Napoleon in the Place Vendôme, bronze. Ditto.
 2831 Two Venetian Soldiers, bronze. Ditto.
 2832 Two Females, bronze. Ditto.
 2833 Bernard and Amid, bronze. Ditto.
 2834 Faust and Marguerite, bronze. Ditto.
 2835 Shepherd Boy, bronze. Ditto.
 2836 Bust of Sappho. Mr. D. Fletcher.
 2837 Fancy sketch of Boy, oil-p., unfinished, by Gainsborough. Dr. A. Roberts.
 2838 Knight between Sin and Death (sometimes called Sintram), engraving,
 by Albert Durer. Miss Anne Jane Bolton.
 2839 The Tangled Skein, oil-p., by Marshall Claxton. S. H. Smyth.
 2840 John Anderson my Joe, oil-p., by W. Kidd. Ditto.
 2841 Female Curiosity Reproved, oil-p., Gabriel Metz. Ditto.
 2842 The Lace-maker, oil-p., by Gertrard Terburgh. Ditto.
 2843 On the Thames at Shiplake, oil-p., by Boddington. Ditto.
 2844 On the Thames at Streatley, oil-p., by Boddington. Ditto.
 2845 Landscape with Cattle, oil-p., by Horlot. Ditto.
 2846 The Love Letter, oil-p., by Francis S. Cary. Ditto.
 2847 Lover's Quarrel, oil-p., by Francis S. Cary. Ditto.
 2848 Willesden Church, Middlesex, water-c., by Noble. Ditto.
 2849 Hayes Common, near Bromley, Kent, water-c., by R. V. Titford. Ditto.
 2850 Ditto ditto. Ditto.
 2851 Landscape, oil-p. John Yeomans.
 2852 Go to Sleep, statuette. Mr. J. L. Sheriff.

- 2853 Two fire-screens, needlework. Miss E. A. Conseley.
 2854 Taming of the Shrew, act III, scene I., by Charlotte Bubb. W. Ferris.
 2855 Baptism of Christ, autotype, by Francisco Francia. J. R. Linsley.
 2856 The Nativity, autotype, by Francisco Francia. J. R. Linsley.
 2857 From Michael Angelo's cartoon of Kisa, autotype. W. Ferris.
 2858 Adam and Eve, autotype, by Raffaella. Ditto.
 2859 Noah's directions to build the Ark, autotype, by Raffaella. Ditto.
 2860 Venus and Cupid, autotype, by Raffaella. Ditto.
 2861 Burial of Christ, autotype, by F. Barracci. Ditto.
 2862 Day Dream, pencil. Miss Chapman, Newtown.
 2863 Peace, chromo-lithograph, by Ritchie. J. R. Linsley, 19, Fort-street.
 2864 War, chromo-lithograph, by Ritchie. Ditto.
 2865 The Favorite, chromo-lithograph, by Ritchie. Ditto.
 2866 Animal life in Australia, series of coloured lithographs. Government Printing Office.
 2867 Colyton Church, Devonshire, by C. Martens. Sloper Cox.
 2868 A collection of rubbings from monumental brasses from Churches in England. Rev. W. F. Greeny.
 2869 A Smart Breeze. G. K. Mann.
 2870 The Storm Wave off the Cape. Ditto.
 2871 A Falling Glass, Stanford Light, Yarmouth Roads, water-c. J. W. Deering.
 2872 Melbourne Buildings, series of photographs. Trustees of Melbourne Free Library.
 2873 Melbourne Scenery. Ditto.
 2874 Eight charts in vellum, historical and biographical account of Italian Painters of various schools. Ditto.
 2875 Italian Beggar Boys, from Murillo. J. Dennis, Parramatta.
 2876 Head, Rubens' Mother, supposed by Rubens. Rev. Allan W. Webb.
 2877 Bust of Girl. W. Webb.
 2878 Portrait of a Lady, crayon, by M. Scott. Newman & Co.
 2879 Portrait of Mr. H. Parkes, crayon, by M. Scott. Ditto.
 2880 Portrait of Mr. W. B. Dalley, crayon, by M. Scott. Ditto.
 2881 Horse's Head, crayon, by M. Scott. Ditto.
 2882 View of Waratah Colliery, oil-p., by W. Bray, a coal-miner at the Colliery. D. N. Joubert.
 2883 Lake Pukaki and Mount Cook, water-c., by Gully. F. W. Hill.
 2884 View of the Upper Wiari, water-c., by Gully. Ditto.
 2885 Mount Cook, from the head of the Waikato, water-c., by Gully. Ditto.
 2886 Mount Cook, from the Godley Glacier, water-c., by Gully. Ditto.
 2887 Ashburton Glacier, water-c., by Gully. Ditto.
 2888 Hooker-glacier, water-c., by Gully. Ditto.
 2889 Medallion. W. C. Wentworth, by Woolner. Ditto.
 2890 Celebrated ram from New Zealand, oil-p. Ditto.
 2891 Europe (figure), cast in iron, and coated $\frac{1}{4}$ th of an inch in thickness with copper, by Oudrey's process. Hon. Thomas Holt.
 2892 Asia. Ditto, ditto.
 2893 Africa. Ditto, ditto.
 2894 America. Ditto, ditto.
 2895 Madonna and Child, after Murillo. Mr. H. Kennedy.
 2896 Portrait of Garibaldi.
 2897 3 specimens bolts and screws, coppered on iron, Oudrey's process. Hon. Thomas Holt.
 2898 Dog of the Hospital, pencil. Miss Higgins.
 2899 Ruins near Canterbury, tinted, (2). Ditto.
 2900 Water-colour. Mr. Nixon.
 2901 Crayon. Ditto.

- 2902 The Enquiry, water-c., by H. Gill. C. J. Pattison.
 2903 The Attack, water-c., by H. Gill. Ditto.
 2904 The Ranges, water-c., by H. Gill. Ditto.
 2905 Landscape—cattle, oil-p., by Cooper. Ditto.
 2906 View in Normandy, oil-p. Price, £10. Mrs. Lee, Wollongong.
 2907 Landscape—waterfall, oil-p. Price, £4. Ditto.
 2908 Landscape, oil-p. Price, £4. Ditto.
 2909 Peak Down Copper Mine (model), by J. T. Mitchell. D. N. Joubert.
 2910 Dancing Girl Reposing (statuette). G. V. Giblin.
 2911 Innocence (statuette). Ditto.
 2912 Solitude (statuette). Ditto.
 2913 Clyde (statuette). Ditto.
 2914 Nelson Column, Trafalgar-square, iron tazza. Ditto.
 2915 Sketch, water-c., Copley Fielding. D. Fletcher.

OLEOGRAPHS.

- 2916 Madonna della Sedia, after Raffaello. C. T. Sandon.
 2917 The Entombment, after Fra Bartolomio. Ditto.
 2918 The Baptism, after Cartoldi. Ditto.
 2919 Romance, after Barrachi. Ditto.
 2920 The Kiss, after F. Hayez. Ditto.
 2921 The Betrothed, after Michis. Ditto.

SECTION II.—APPARATUS AND APPLICATION OF LIBERAL ARTS.

Judges

IN CLASSES 501, 504, 520, 521, 522, 525.

D. NICHOL, | THOS. R. YEO,
 JAS. R. FAIRFAX.

Prizes :—Bronze and Silver Medals.

PAPERS.

Class 501.—Specimen of Writing and Blotting Paper.

1362 Liverpool Paper Company, Liverpool Mills. Blotting Paper.

JURORS' OPINION.—This paper is deficient in purity of texture and finish ; its absorbing power is good, but irregular. It presents the elements of good blotting, but is deficient in manufacture. We cannot award it any special notice.

Class 502.—Bristol Board, Cardboard, and Drawing.—No entry.

Class 503.—Tissue and Tracing.—No entry.

Class 504.—Brown, Packing, and Cartridge.

1363 Liverpool Paper Company. Brown and Packing.

AWARD :—No. 1363 ; bronze medal.

JURORS' OPINION.—The samples shown contain a considerable per centage of New Zealand flax, which imparts strength and durability to the paper. It is well made, but slightly deficient in finish and appearance. We consider this a good and useful paper for general purposes, and commend it for a bronze medal.

Class 505.—Printing.

1364 Liverpool Paper Company. News Printing Paper.

JURORS' OPINION.—No. 1364.—We can only class this as a common article of printing. It is deficient in purity and strength, and wants finish. It will, however, be found serviceable for many ordinary purposes. We cannot commend it for special notice. We have no information relative to the materials used in the manufacture of the above papers, nor respecting the prices at which they are sold.

Class 506.—Bank Note.—No entry.

Class 507.—Best Specimen of Hand-ruled.—No entry.

Class 508.—Best Specimen of Machine-ruled.

1365 R. Dennis, 30, Bridge-street. Machine-ruling.

NO AWARD.

STATIONERY, &c., &c.

Class 509.—Ink for other purposes.

1366 William Bartram, Buckland-street, Waterloo. Black ink for shoe-finishing.

NO AWARD.

Class 509a.—Specimen of Writing Ink—Black or Blue.

1367 Lewis and Whitby, Curzon and Victoria streets, Hotham. Blue-black ink. Price—small size, 7s. 6d. per gross. This ink writes greenish-blue, but afterwards turns intensely black. It is indelible.

NO AWARD.

Classes 510 to 519.—No entries.**Class 520.—Crayons of Colours.**

1368 Benjamin Waters, 161, Pitt-street. Coloured crayons in boxes. Price, from 5s. each, according to size of box.

AWARD :—No. 1368 ; highly commended.

I. P. 4

Class 521.—Artists' Oil-colour, set.—No entry.**Class 522.—Artists' Water-colours, set.**

1369 Lewis Steffanoni, 92 and 94, Market-street. Set of Artists' water-colours. Price, £25. Complete for landscape, portrait, and flower painting. Contains one of every colour made; also full set of materials for illuminating, gilding with gold leaf, gold shell, pure gold and silver, various bronzes, raised gilding, &c. Ordered from London as a complete set for all purposes.

AWARD:—No. 1369; highly commended.

Class 523.—Paints for Houses, Ships, and Decorative purposes.

1370 A. Chisholm, 183 and 185, Pitt-street. Samples of white lead and paints for house purposes.

Class 524.—Best specimen of Camel Hair Pencils, set.—No entry.

AWARD:—Comprehended in award to general exhibits.

Class 525.—Sable Pencils, set.

1372 Benjamin Waters. Set of sable pencils. Price, from 6d. to 12s.

AWARD:—Highly commended.

Class 526.—Other Pencils, set.—No entry.

Class 527.—Best specimens Envelopes, one dozen packets each.—No entry.

Class 528.—Visiting Cards, sizes, 100 each.—No entry.

Class 529.—Playing Cards, one dozen packs.—No entry.

Judges

IN CLASSES 530 to 536.

GEO. BENNETT, M.D., | THOS. R. YEO,
ROBERT DOWNING.

Class 530.—Best specimen of Printing, plain.

1373 Gibbs, Shallard, & Co., Pitt-street. Specimens of printing.

1374 John Sands, 392, George-street. Ditto.

1375 Charles Boyd, Sturt-street, Ballarat. Ditto.

1376 John Abbott, George-street, Hobart Town. Tasmanian scraps from an Australian Native. Part I obtained a medal at the Melbourne Exhibition. Part II now binding.

AWARDS:—No. 1374; bronze medal.

1373; highly commended.

1375; commended.

Class 531.—Best specimen of Printing in Colours.

- 1377 Gibbs, Shallard, & Co., 108, Pitt-street. Specimens of printing.
 1378 Apprentices of Gibbs, Shallard, & Co. Ditto.
 1379 Charles Boyd, Sturt-street, Ballarat. Ditto.

NON-COMPETITIVE.

- 1380 Hall & Thomas, *Western Examiner* Office, Orange. Three samples of printing in colours and on silk.

AWARDS :—No. 1377 ; bronze medal.
 1378 } highly commended,
 1379 }

Class 532.—Printing, Illuminated.

- 1380A H. F. Lewis, Upper Forbes-street, Woolloomooloo. Address to the Prince and Princess of Wales on the celebration of their marriage.
 1381 Ditto ditto Ditto.
 1382 Charles Boyd, Sturt-street, Ballarat.

NON-COMPETITIVE.

- 1383 Frederick Scholer, 103, Bathurst-street. Block zinc letters for signs, &c. Price, according to size.

NO AWARD.

Class 533.—Best Specimen of Binding.

- 1384 Thomas Corbett, 147, Fitzroy-street, Surry Hills. One glass case, 24 x 14, containing books.
 1385 R. Dennis, 30, Bridge-street. Specimen of bindings.
 1386 H. Roberts, 234, Pitt-street. One volume of Shakspeare, bound in morocco, gilt edges, extra. Price, 30s.

AWARDS :—No. 1385 ; bronze medal.
 1386 ; highly commended.

Class 534.—Best Printed and Bound Book.

- 1387 John Sands, 392, George-street. Printed and bound book.
 1388 Gibbs, Shallard, & Co., Pitt-street. Printed and bound book—Poems, by F. S. Wilson, gilt cloth; and book of specimens of types (Sharpwood's), morocco.

AWARDS :—No. 1387 ; bronze medal.
 1388 ; highly commended.

Class 535.—Best Illustrated Book.

- 1389 Gibbs, Shallard, & Co. 1 volume *Illustrated Sydney News*. In case. Class 530.

AWARD :—No. 1389 ; highly commended.

Class 536.—Best set of Mercantile Account-books, Day-book, Journal, and Ledger.

1890 John Sands, George-street. Day book, journal, and ledger.

1891 R. Dennis, 30, Bridge-street. Ditto, ditto.

NON-COMPETITIVE.

1892 John Sands, George-street. Various account-books.

1893 Sands & M'Dougall, Collins-street West, Melbourne. Mercantile account-books.

AWARDS :—No. 1891 ; bronze medal.
1890 ; highly commended.

PHOTOGRAPHIC APPARATUS.

Class 537.—For the best, complete.—No entry.**Class 538.—Photographic Chemicals, best collection.**

1894 L. Carmichael, Queen-street, Brisbane. Chloride of gold.

NO AWARD.

Judges

IN CLASSES 539, 541, 542, 546.

CHARLES PACKER, | CARL SCHMIDT,
JOHN THOMAS HILL, K.S., R.A.M.

MUSICAL INSTRUMENTS.

Class 539.—Organ.

1895 W. Davidson, 35, Edward-lane. Organ Pipes. Made in the Colony by exhibitor.

1896 C. J. Jackson, organ-builder, Newtown Road. Organ. Price, £320.

AWARD :—No. 1896 ; silver medal. [For Organ of Colonial Manufacture.]

JURORS' OPINION.—Considering the circumstances connected with the building of the organ, the shortness of the period in which it was completed (little more than seven weeks), and the many difficulties encountered by the builder in carrying out his labours, in a building itself in course of erection, we consider the result as highly creditable, both to the builder and the Colony.

Class 540.—Pianoforte, full Concert, Grand.—No entry.

Class 511.—Cottage Pianoforte.

- 1397 William Henry Paling, 83, Wynyard-square. Walnut Grand Oblique Pianoforte, by Erard, of Paris. Price, 90 guineas. 7 octaves, trichord throughout, patent repeater action, pedal-forte pedal.
- 1398 Ditto. Walnut demi-droit Pianoforte, by Aucher Brothers, of Paris. Price, 70 guineas. 7 octaves, trichord throughout, patent repeater action, carved trusses, mounted, lamp sconces with screens.
- 1399 Wilkie, Kilner, & Co., 174, Queen-street, Melbourne. Trichord Cottage Piano. Price, £60. Manufactured from Colonial materials; outside case of polished muskwood, grown on the ranges at Dandenong. Of 7 octaves, trichord throughout, with metallic bridge with brass down-bearing; metallic plates, horizontal and curved, four-fold wrest-plank, extra screwed, bolted, dove-tailed and cleeted with 7 braces in wood, bolted with half-inch x 8 inch iron bolts passing through the horizontal plate; likewise, two strong iron tension props, 3 inches wide by 3 feet long and 1 inch thick, also firmly attached to the horizontal and sweep plates, thus forming a foundation of unusual strength, capable of carrying this high-tensioned and heavily-weighted instrument of IMPROVED CONSTRUCTION. The principal woods used in the making of this class of instrument are—cedar from Sydney, Victorian blackwood, Brisbane pine, Victorian muskwood, and New Zealand pine for the sounding-boards; myrtle, oak, beech, lime, and sycamore, are also worked in smaller quantities. The woods are used as follows:—For casing, Sydney cedar veneered with Victorian muskwood, blackwood for the groundwork of the plank, sweep side, bottom block mouldings, columns and drops, Brisbane pine for groundwork, pedal cranks, &c., New Zealand pine for sounding-board exclusively; the other woods are used for action-work, &c. Sydney Agents, Elvy & Co., 321, George-street, Sydney.
- 1400 Ditto. Trichord Pianette. Price, £45. Manufactured from Colonial woods; Victorian muskwood case. Similar to the above.
- 1401 Ditto. Bichord Pianette. Price, £35. Manufactured from Colonial woods; Victorian blackwood case. Ditto, ditto.
- 1401A Elvy & Co., 321, George-street. A 6½ octave model trichord Pianette, in American walnut, by A. Bord, Paris. Exhibited, as combining brilliant tone, elastic touch, and an excellent quality of work, with a low price—£28. Larger models on sale at the Rooms, 321, George-street.
- 1402 Samuel Marshall, Adelaide. Cottage trichord check action walnut case Pianoforte. Price, 65 guineas.
- 1403 Ditto. Semi-cottage rosewood case check-action Pianoforte. Price, £52 10s.
- 1404 Lewis Moss, 5, Hunter-street. { English model Cottage, by Chappelle. Price, 45 guineas.
Chappelle's Piano. Price, 28 guineas.
- 1405 Giuseppe de Martini, Pension Italienne, Stephen-street, Melbourne. March for Pianoforte, £20.

AWARDS:—No. 1397 } bronze medals.
1399 }
1398 }
1400 }
1401 } highly commended.
1402 }
1404 }
1404A }

JURORS' OPINION.—In reference to the awards made upon the Pianofortes, there cannot be any doubt that, as regards positive excellence, the instruments of "Erard" and "Aucher" are justly entitled to the highest award that could possibly be made; but it is for the Council to determine whether, knowing the world-wide reputation enjoyed by these celebrated makers, there be any necessity for any other reference being made to their exhibits, than to notice them in the highest terms of commendation. In respect to the Pianofortes of Colonial manufacture, the Judges have unhesitatingly awarded the bronze medal, as first prize, to the instrument "No. 1399," from the manufactory of Messrs. Wilkie, Kilner, & Co., of Melbourne, as being in every way worthy of that distinction, not only as being up to a high standard in every respect upon which the points have been awarded, but also as being an exceedingly cheap instrument. No. 1440, from the same firm, is also specially commended, and No. 1401 highly commended for similar reasons.

The instruments Nos. 1402, 1404, and 1404A, have also been highly commended, although, as will be seen from the number of points awarded, not possessing relatively to the same extent the characteristics indicated.

The AWARD COMMITTEE considered it desirable to award a bronze medal to Messrs. Paling for the instrument exhibited, by "Erard."

Class 542.—Harmoniums.

1406 W. H. Paling, Wynyard-square. Grand Organ Harmonium, by Alexandre, of Paris, in handsome walnut. Price, 180 guineas. 82 stops, 11 rows of vibration, 2 key boards, 3 swells, 2½ octaves of pedals, with extra pedal for sustaining notes, extra blower; size, 4 ft. 6 in. by 5 ft. 6 in.; height, 5 ft. 1 in.

1407 Lewis Moss, 5, Hunter-street. Exhibition Harmonium, by Alexandre. Price, 40 guineas. With 14 stops, 4 rows of vibrators, viz.:—Flute, clarinette, fifre, hautbois, cor Anglais, bourdon, clairon, basson, grand jeu, expression, sourdine, tremolo, and two forte stops; with the addition of the new Venetian swell, worked by the heel of the right foot, by which means a *crescendo* can be produced without the use of the expression stop; size, 3 ft. 10 in. by 2 ft. 2 in.; height, 3 ft. 3 in.; oak case; also, in walnut or rosewood. This instrument gained the prize medal, with the following award:—"Novelty of construction of the harmonium, cheapness, combined with excellence of manufacture, and fine quality of tone."

AWARDS:—No. 1406 } highly commended.
1407 }

Class 543.—Harps, with double action.—No entry.

Class 544.—Concertinas, with English scale, tenor or baritone.—No entry.

Class 545.—Automatic Musical Instruments.—No entry.

Class 546.—Best collection of Brass and Reed Instruments, including side and brass Drums, to form a Military Band.

1408 Lewis Moss, 5, Hunter-street. Brass Instruments. Digitorium and Tuners' Assistan.

AWARD:—No. 1408; bronze medal.

NON-COMPETITIVE.

- 1409 George Sherar, Burwood. Highland Bag-pipes, tulip-wood. Price, £10 10s. The pipe of tulip-wood mountings, whale teeth; bag, goat-skin; cover of bag, tweed; all the produce and manufacture of New South Wales.

NO AWARD.

- Class 547.—Best collection Brass, Reed, and String Instruments, to form an Orchestral Band.—No entry.

NOT SPECIFIED IN PRIZE SCHEDULE.

- 1410 S. Carroway, Prospect-place, Corio-street, Geelong. Violin.

NO AWARD.

Judges :

CHARLES M'KAY, M.D., | H. G. A. WRIGHT, M.D.,
G. FORTESCOUE, M.D.

Class 548.—Best collection of Surgical Instruments.

Of primary necessity, and of simple form and use—as amputating knives, bistouries, saws, cutting forceps, forceps for extracting bullets, &c., tourniquets, ligature needles, splints, and other apparatus for adjustment and retention of fracture, and others.

- 1411 George Guyatt, 46, Market-street. Four glass cases, containing surgical instruments and appliances; one fracture apparatus.

AWARD :—Bronze medal.

JURORS' OPINION.—Very excellent workmanship.

- Class 549.—Best collection of Obstetric Instruments.—No entry.

- Class 550.—Best collection of Ophthalmic Instruments.—No entry.

- Class 551.—Best collection of Aural Instruments.—No entry.

- Class 552.—Best collection of Dental Instruments.—No entry.

Class 553.—Best collection of Apparatus and Models.

For anatomical study, for medical investigation, and for hygienic and other purposes collateral to the practice of surgery.

- 1412 J. Spencer, dentist, 352, George-street. Artificial teeth, set in gold and vulcanite. Price, £100.

- 1413 J. B. Easton, 181, Liverpool-street. Ditto.

- 1414 Charles Lange, 64, Collins-street East. Specimens, artificial teeth.

AWARDS :—No. 1412; bronze medal.

1413 } highly commended.
1414 }

Class 554.—Best collection of Water-beds, Mattresses, and Cushions.—No entry.

Class 555.—Best specimen of Invalid Beds.—No entry.

ASTRONOMICAL INSTRUMENTS & SURVEYING INSTRUMENTS.

Class 556.—Telescopes.—No entry.

Class 557.—Sextants and Quadrants.—No entry.

Class 558.—Solarizing Apparatus.—No entry.

Class 559.—Spectroscopes.—No entry.

Class 560.—Mathematical Drawing Instruments.—No entry.

Class 561.—Balances.—No entry.

Class 562.—Microscopes and Accessory Apparatus.—No entry.

Class 563.—Stereoscopes.—No entry.

Class 564.—Light-house Apparatus.—No entry.

Judges

IN CLASSES 565, 567, 570, 578, 579.

J. SMITH, M.D., | P. ADAMS,
A. TORNAGHI.

Class 565.—Magnetic and Meteorological Instruments.

1415 H. C. Russell, Observatory. Self-registering Pluviometer; an instrument for recording on paper the amount of rain falling throughout the day. Designed by H. C. Russell, and made in Sydney.

1415A Ditto. Humidity-table, to facilitate finding the humidity of the air.

AWARDS :—No. 1415 } silver medals. [For originality
1415A } of invention with utility and
1417A } cheapness.]

Class 566.—Electric Apparatus.—No entry.

Class 567.—Galvanic Apparatus.

1416 Alfred Cane. Medical galvanic apparatus, for rheumatism, paralysis, &c. Price, £10.

1417 Henry Augustus Severn. Constant galvanic battery. Price, 12s. 6d. per cell or battery. Zinc and composition carbon. These batteries will remain in good working order for two years without any additions whatever.

Class 568.—Barometers.—No entry.

Class 569.—Thermometers.—No entry.

Class 570.—Anemometers.

- 1417A H. C. Russell, Observatory. Hand Anemometer. Price, 25s. Designed by H. C. Russell, and made in Sydney.

AWARD :—Included in Class 565.

Class 571.—Pyrometers.—No entry.

Class 572.—Hydrometers.—No entry.

Class 573.—Lactrometers.—No entry.

Class 574.—Pressure and Vacuum Gauges.

Class 575.—Air-pumps.—No entry.

Class 576.—Astronomical or Celestial Globes.—No entry.

Class 577.—Chemical Apparatus.—No entry.

Class 578.—Miscellaneous Instruments.

- 1418 Alfred Cane, Stanley-street. Caladrophical Lantern, for producing large images on a screen, similar to the magic lantern, from opaque objects, engravings, photographs, and natural objects in all their colors. Price, £40.

NO AWARD.

Class 579.—Geological and Topographical Maps and Models, including Terrestrial Globes.

- 1419 James Fussell, Crescent House, Crescent-street, Sydney. Map of Australia, varnished, and mounted on rollers French polished. Price, £2 10s. Contains the divisions of the Colonies, differently colored, routes of the explorers, roads, post towns, rivers, and railway lines. Justus Perkins' Map of the World, colored, varnished, and mounted on rollers. Price, £3 3s. Contains the steam and sailing routes, and distance from port to port, telegraph and submarine cables, oceanic currents, &c.
- 1420 George Butterfield, Homebush. Map of Southern Circumpolar Stars, for the latitude of Sydney, showing their position at any time, and on any day of the year. Ditto, ditto, with the name and character of each constellation and star, together with the meridian lines and circles of declination. Not competitive.

NOT SPECIFIED IN PRIZE SCHEDULE.

- 1421 John Mailler, for Secretary of New South Wales Bible Society. Bibles in English and Foreign languages.
- 1422 W. J. Wainwright, 5, Bayles' Buildings, George-street, South. Colonial-made flute and case. Made from Namoi River myall wood, with eight sterling silver keys and mountings, cork joints, slide head, and screw top.

AWARD :—No. 1419, Map of the World, highly commended.

GENERAL REPORT ON THE ASTRONOMICAL, METEOROLOGICAL, AND OTHER INSTRUMENTS.

Classes 556 to 579.

In this department the display is very meagre. The leading exhibits are those of H. C. Russell, Esq., Government Astronomer. They comprise a self-registering Pluviometer, by which rainfall is continuously recorded by means of a simple arrangement not of unduly expensive character. A piston, moving vertically in a vessel which receives the rain, causes a horizontal cylinder, covered with graduated paper, to revolve on its axis. A pencil is drawn horizontally along this cylinder at an equable rate by means of clock-work. When there is no rain the pencil makes a straight line parallel to the axis of the cylinder; but as soon as rain begins to fall the piston rises and turns the cylinder round under the pencil. The graduations on the paper show the quantity of rain in any given time.

Mr. Russell's anemometer is an ingenious adaptation of Robinson's. It is portable, and can be used on board ship as well as on land. The inventor says that "a long series of experiments has shown that the instrument is perfectly trustworthy, and that the results obtained are comparable with those from larger instruments on the same principle." This elegant little anemometer has the further recommendation of cheapness.

Mr. Russell's humidity-table (or rather diagram) is intended for use with the wet and dry bulb hygrometer, and gives the proportional humidity of the air without any calculations.

For these three exhibits, combining originality of invention with utility and cheapness, we have recommended a silver medal.

The medical galvanic apparatus exhibited, by Mr. Alfred Cane, is probably a serviceable instrument, but shows no novelty, or particular excellence of construction.

Mr. Cane also exhibits a lantern for throwing images of opaque bodies or pictures on a screen, in the manner of a magic lantern. Without actual trial, which we have had no opportunity of making, we cannot pronounce on its merits. Its exhibition will however serve to draw attention to this method of enlarging the scope of the magic lantern.

Two cells of a "constant galvanic battery" are exhibited by Mr. H. A. Severn. Each consists of a plate of zinc within a hollow cylinder of prepared carbon. The exciting liquid is not stated, but probably a solution of common salt is used. A serviceable battery, where a strong current is not wanted, might be so constructed.

Mr. Fussell exhibits a map of Australia, executed apparently in the Colony; and a Map of the World, on Mercator's projection, executed in Germany. There is a great contrast between the execution of these maps. In the former the physical features of the country are not well shown, and the lines and words so run into each other as to produce, in some parts, inextricable confusion. In the Map of the World the details and lettering are remarkably clear and distinct. The ocean currents, principal ocean steam routes, prevailing winds, magnetic variation, &c., are shown in this map.

Among the non-competitive exhibits there is a Map of the Circumpolar Stars that never set in the latitude of Sydney, constructed by Mr. Geo. Butterfield. It is intended to show the position of these stars at any date and hour.

Messrs. Flavelle Bros. and Roberts show in this department an excellent refracting telescope, by Ross, of London, solidly mounted as an equatorial; also a binocular microscope, a theodolite, and magneto-electric apparatus.

J. SMITH, M.D.
P. F. ADAMS.
A. TORNAGHL

SECTION III.—FURNITURE AND OTHER OBJECTS
FOR THE USE OF DWELLINGS.**Judges**

IN CLASSES 580 TO 584.

ALEXR. W. NORTON, | ANDREW LENEHAN,
WALTER BRADLEY.*Prizes—Bronze and Silver Medals.***Class 580.—Furniture, Upholstery, and Decorative Work.**

- 1423 Gustavus Fitte, Junee. Rustic seat and flower-stand. Price, £50.
- 1424 H. F. Delarue, 396, George-street. A clock-case. Price, £50. Made by Charles Wigger, Pitt-street, from 23 different kinds of Colonial wood.
- 1425 W. Davies, 294, Castlereagh-street. Escritoire. Price, £20.
- 1426 Frederick Stack, 3, Walker-street, Redfern. Octagon inlaid table. Price, £20. 4 feet 4 inches, composed of 168 pieces and 12 different kinds of Colonial wood.
- 1427 William Voges, Riley-street. French etagère. Price, £18 18s. Glass case, with looking-glass back, intended for silver and fancy articles.
- 1428 Alexander A. Robertson, 233, Clarence-street. Two leather, one powdering, and three stencilling plates. Price, £15. It has two sides, with six different patterns.
- 1429 W. P. Welch, 296, Pitt-street. Venetian blind, green. Fitted with patent action and turning wires.
- 1430 Ditto ditto. Curve top gauze wire-blind. Ornamented with embossed scroll in gold.
- 1431 A. Chisholm, 183 & 185, Pitt-street. Four iron and brass bedsteads.
- 1432 J. A. Penson, 357, Pitt-street. Improved, self-acting water-closet. Price, £8 10s.
- 1433 T. W. Crawley, Markets. Secrétaire. Price, £50. Made from Colonial wood.
- 1434 W. A. F. Ellis, Underwood-street. Whatnot. Made of Melaine wood.
- 1435 Ditto ditto. Alexandra table. Cedar wood.
- 1436 Ditto ditto. Music stool. Price, £1 10s. Colonial beech, stained to imitate walnut.
- 1437 Alfred Lance, 140, Clarence-street. Self-acting closet cistern. Designed to obviate the waste of water in ordinary closets, the cistern only containing enough water for once using; and as the water is being used the further supply is discontinued until the outlet pipe is again stopped.
- 1438 Charles Williams, 180, Castlereagh-street, North. Collection of imitated woods and marbles; woods—maple, mahogany, root of oak; marbles—sienna, jasper, black, and gold. Each pattern 6 feet by 1 foot 10 inches.
- 1439 Benjamin Baston, Isabella-terrace, Duke-street, Woolloomooloo. Panel for wall of drawing-room, with ornamental pilasters; door and dado painted. Ornamental pilasters, 5s. per foot.

- 1440 T. S. Douglas, 223, George-street North. Hat-stand, table, ladies' cabinet, girls' cabinet, gents' cabinet, writing-desk, ladies' writing-desk, tea-caddy, handkerchief-box, note-paper box, rosewood tray, square tray, cigar-holder, ladies' jewel-box, ivory glove-box, and work-box. Japanese furniture made in Japan, Nagasaki, Archdadi.
- 1441 Grube & Speck, 65, Market-street. Compo. frames. Price, £30.
- 1442 J. O'Brien, 49, Botany-street, Surry Hills. Specimen of Mosaic, painted in oil. It consists of 4,500 pieces, and 40 different shades of colour; size, 3 feet high by 3 feet wide.
- 1443 David F. Aitchison, 404, Sussex-street. Album case and album. Not for sale. Of fancy Colonial woods, 50 different kinds; top inlaid with 170 pieces, with fancy wood covers to album; inside of album-case cereted myall.
- 1444 John Tracey, 18, Bridge-street. Venetian and other window blinds. Tracey's newly invented and patented Venetian blinds.
- 1445 James Lawson, 249, George-street. Countess of Belmore sewing-chair and couch. Price, £24. Manufactured from New South Wales walnut-wood, by James Lawson.
- 1446 E. Zuccani, 253, George-street. 7 feet walnut wardrobe, plate-glass centre door, projecting front pillared. Price, £42 10s.
- 1447 Ditto ditto. 8 feet handsome cedar wardrobe, projecting centre, plate glass in end. Price, £45.
- 1448 R. T. Carter, 404, George-street. Collection of furniture—large sideboard, with plate-glass back, price, £37 10s.; pedestal toilet-stand with cheval glass, price, £18; Eugene couch, price, £12 10s.; shell pattern of a lady's chair, price, £4 18s.; library or reading chair, £8 8s.; toilet-glass, 26 by 18, price £6; toilet-glass, 26 by 18, oval marble slab, price, £5 10s. Colonial manufacture.
- 1449 John Buchanan, 343, Sussex-street. Twisted towel-horse, price, 14s. each; twisted stair banisters, price, 13s. to 18s. per dozen.
- 1450 Jones & Son, Ross-street, Glebe. 4 feet 3 inch bookcase. Price, £20.
- 1451 J. H. Knibbs, 760, George-street South. Embroidery work. Price, £2 10s.
- 1452 George Hill, 86, William-street. Ladies' inlaid work-table. 4 feet 9 inches in circumference, and 2 feet 6 inches high, and contains 204 pieces of various woods.
- 1453 Benjamin Waters, 161, Pitt-street. Wood hangings for interior decorations. Price, about 3d. per foot.
- 1454 W. J. Stuart, 208, Castlereagh-street. Specimens of graining and writing.
- 1455 Joseph Pitz, St. Mary-street, Newtown. 4 small inlaid table-tops. Price, £2 10s. to £40. One draft-board table, eight kinds of wood, each square forms a draft-board of itself; one five-point star table, ten kinds of wood, outside mounted, two kinds of wood in squares; also one mounted in diamonds, and one of a different pattern.
- 1456 W. Sterry & Sons, 149 and 151, Russell-street, Melbourne. A spring roller-blind. Price, 1s. per superficial foot. These blinds can be fitted to skylights or book-cases, and the rollers can be used for maps.
- 1457 W. Sterry & Sons. A patent self-acting Venetian blind. Price, 1s. per superficial foot. This blind requires no tying up; when required to be lowered it can be done by pulling the check-string, with tassel attached, to any distance required.

- 1458 Alcock & Co., Russell-street, Melbourne. Billiard-table of New South Wales tulipwood ; the bed of Victorian slate ; cue-rack of blackwood, muskwood, and Huon pine ; marking-board of tulipwood ; billiard-cues with inlaid butts of fancy New South Wales and Victorian woods. Price, £140.
- 1459 Ditto. Patent combination dining and billiard table, made of New South Wales cedar. Price, £35. These tables can be converted into a billiard or dining table in two seconds.
- 1460 John Rain, Melbourne. Loo-table, inlaid with Colonial woods. Price, 25 guineas. Top of table of elaborate geometric design, veneered with 17 of the choicest Colonial woods, in pieces numbering about 800 ; pillar and claws of blackwood.
- 1461 Edward Chandler, Post Office Place, Melbourne. Venetian blind, with registered tapes. Price, £1, or to order 11d. per foot, superficial. The registered tape having the cross tape registered with eyelets instead of being sown with cotton, preventing them dropping off.
- 1462 Stephen Forster, 84, Harrington-street. Tubular iron bedstead. Price, £3 15s. Manufactured in the Colony.

NON-COMPETITIVE.

- 1463 Richard Tremain. Colonial loo-table, inlaid. Price, £18.
- 1464 John Buchanan, 343, Sussex-street. Turned work. Price, 12s. to 18s. per dozen.
- 1465 James E. Woodward, Antrim Villa, Potts' Point. Table-tops made of New Zealand woods, inlaid.
- 1465A Alfred Roberts, M.D., 117, Castlereagh-street. Round chess-table of Colonial woods (inlaid), made by Hudson & Sons, Redfern. This table was made ten years since, and is exhibited to prove the capabilities of the Australian woods for veneering purposes. The stem is myall, the top contains cedar, tamarra, blackbutt, myall, stringy-bark, loquat, mountain pine, bunga wadda, cypress pine, forest oak, tulip, ironbark, satinwood, glebe-wood.
- 1465B John Andrew Kean. Imitations of wood and marble.

AWARDS :—No. 1458 ; silver medals. [For a Colonial-made billiard-table.]

1426 } bronze medals. [For excellence of
1438 } work.]

1457 ; do. [New invention and finish.]

1462 ; do. [Made in the Colony.]

1423

1429

1430

1432

1434

1435

1437

1443

1444

1445

1446

1448

1450

1455

} highly commended.

Class 581.—Flint and other Glass, Stained Glass.

- 1466 John Falconer, 531, Pitt-street. A stained glass window, representing the Crucifixion. Price, £60. Made for St. Francis' Church, Haymarket, Sydney.
- 1467 Joseph Ross. Glass bottles.
- 1468 Reading, Son, & Steffanoni. Imitation stained glass, called diaphanic.
- 1469 Charles Davis, 175, Pitt-street. Painted glass (ancient style), three subjects: "The Crucifixion," "Touch me not," and "Mary at the feet of Jesus." This glass is from the firm of Warrington and Sons, London, was exhibited in London in 1862, and gained honorable mention.
- 1470 T. F. Warrington, 93, Elizabeth-street. Painted glass (modern style), two subjects: "The Salutation," and "Miriam Dancing." Price, 25 guineas. This glass is from the firm of Warrington and Sons, London, and gained honorable mention in 1862.
- 1471 Ferguson, Urie, & Lyon, Curzon-street West, Melbourne. Samples of stained glass.
- 1471A John Wiper, 66, Collins-street, Melbourne. Bent and cut glass.
- AWARDS:—No. 1466 }
 1467 } bronze medals. [Colonial made.]
 1471; highly commended.
 1471A; highly commended.

Judges :

EDWARD BELL,

| JAMES BARNET.

Class 582.—Porcelain, Earthenware, Fancy Pottery.

- 1472 H. Granville, 208, Castlereagh-street. A collection of broken China and glass articles, made serviceable by the riveting process.
- 1473 Australian Patent Tile Company, 602, Brickfield Hill. Roofing-tiles. Price, £2 7s. 6d. per square (*i.e.* 100 feet), to £2 17s. 6d.
- 1474 T. S. Douglas, 223, George-street North. One pair of vases, one double washing-set, one sponge-basket, one tea-set, two spill-holders. Price, £27. The above were made in Japan.
- 1475 A. Chisholm, 183 and 185, Pitt-street. Filters.
- 1476 Robert Turton, Waratah Pottery. One gross ginger-beer-bottles, six jam-jars, two wine-bottles, one water-bottle, one spirit-keg. Ginger-beer-bottles, 18s. per gross; wine and water bottles, 1s. 3d. per gallon; jam-jars, 1s. per gallon.
- 1477 John Bedwin, Newtown Post Office. Smoking clay-pipes. Price, from 3s. to 4s. per gross.
- 1478 G. D. Guthrie, Bendigo Pottery, Sandhurst. Glazed stoneware pottery.
- 1479 R. T. Adams, Victoria Filter Works, Fitzroy. Filters in pottery. Price, £1 5s. to £2.

NON-COMPETITIVE.

- 1480 Miss Pemell, Newtown. Pair of porcelain landscapes.

AWARDS:—No. 1476; bronze medal.
 1473 }
 1477 } highly commended.
 1478 }

JURORS' OPINION.—No. 1473.—This is a very good exhibit, and forms a cool roof-covering, but wants the simplicity of application of No. 1768.

Class 583.—Carpets, Tapestry, Furniture Stuffs, Matting, &c.

- 1481 Mrs. B. Bridgen, 47, Point-street, Pyrmont. Patchwork quilt. Price, £20. This quilt is composed of about 12,000 pieces; each piece was basted on paper previous to being sewn together. It was made by Mrs. Bridgen when she was a single woman, principally of an evening after following her usual employment.
- 1482 John C. Read, Gaol, Darlinghurst. Coir-matting and door-mats. Price—matting from 2s. 6d. per square yard, and door-mats from 9d. per lb. Manufactured by prisoners in Darlinghurst Gaol. Not for competition.
- 1483 Farmer & Company. Carpets—
- | | |
|---|---------|
| 1. Tapestry carpet, 18 x 13 ft. 6 in. | £7 15 0 |
| 2. Ditto 21 x 13 ft. 6 in. | 8 15 0 |
| 3. Ditto 21 ft. 6 in. x 13 ft. 6 in. | 9 0 0 |
| 4. Ditto 21 x 15 ft. 9 in. | 10 10 0 |
| 5. Brussels carpet, white and crimson, 21 x 15 ft. 9 in. | 15 15 0 |
| 6. Ditto drab chintz, 22 ft. 6 x 15 ft. 9 in. | 17 0 0 |
| 7. Ditto green Persian, 21 ft. 9 x 15 ft. 9 in. | 16 10 0 |
| 8. Tapestry carpets, per yard | 0 4 3 |
| 9. Brussels carpets, ditto | 0 4 9 |
| 10. Best Brussels carpets, ditto | 0 6 6 |
| 11. Velvet carpets, ditto | 0 8 0 |
| 12. Wilton carpets, ditto | 0 10 6 |
| 13. Furniture damask for curtains and suites. | |
- 1484 Farmer & Company. Matting.
- 1485 Ditto. Floor-cloths.
- 1486 Ditto. Furniture stuffs.
- 1487 A. Chisholm, 183 and 185, Pitt-street. Sample case silks for upholstery fittings.
- 1488 Ditto ditto. One parcel floor-cloth patterns.
- 1489 Miss Rosina Starkey, Model Public School, Fort-street, Sydney. A picture in Berlin wool: Scene from Shakespeare's play, Henry VIII: "Queen Catherine reproaching Cardinal Wolsey." Worked by exhibitor at fifteen years old. Size, 6 feet in height, 5½ feet in breadth.
- 1490 A. Barnes, Holmwood, Newtown. Pair of Windsor curtains and pin-cushion. Price—Windsor curtain, £2; pin-cushion, 6s. Exhibitor's own work.
- 1491 T. S. Douglas, 223, George-street. One roll checked matting.
- 1492 Mrs. W. H. Mullen, West Maitland. Wool-worked picture. Subject: "Finding of Moses in the bulrushes." Price, £100. Framework of leather.
- 1493 Mrs. F. L. Cotton, 489, Bourke-street. Embroidery. Price, 2 guineas.
- 1494 Miss Kemp, Shoalhaven. Tatting (6 pieces). Price, £3; 10s. per piece.
- 1495 David Jones & Co. Carpets and Communion cover, with monogram.
- | | |
|--|--------------------------------------|
| Tapestry carpets, per yard... 4s. 3d. | Velvet carpets, per yard... 8s. 0d. |
| Brussels ditto, ditto ... 4s. 9d. | Wilton ditto, ditto ... 8s. 6d. |
| Best Brussels ditto, ditto ... 6s. 6d. | Patent felt ditto, ditto ... 4s. 0d. |

NON-COMPETITIVE.

- 1496 Inspector General, Penal Department. Six coir door-mats.

AWARD :—No. 1489; bronze medal. [For excellence of work for so young a girl.]

Class 584.—Paper-hangings.

- 1497 Benjamin Waters, 161, Pitt-street. Samples of paper-hanging, decorations and paper.
- 1498 Walter Renny. Decorative paper-hangings, suitable for ball, drawing, and dining rooms. Price, 4s. per superficial yard when on walls finished and complete.

AWARD :—No. 1498 ; highly commended.

Judges :

GOTHER K. MANN, | THOS. S. NOSSITER,
MALCOLM MACDONALD.

Class 585.—Cutlery, Gold and Silver Plate.

- 1499 G. Modini, Brickfield Hill. Cutlery. Price, £60. Knives and scissors for domestic use.
- 1500 Mason & Carlross, 530 and 675, George-street. Glass case plated-ware. Price, plated candelabra,—50 guineas. Plated by electro-magnetic process.
- 1501 F. Lassetter & Co., Sydney. Two cases cutlery. Specimens of the best value for general household use.
- 1502 Ditto. One case silver plate. Some of the newest designs now fashionable in Europe.
- 1503 H. F. Delarue, 396, George-street. Silver claret jug. Price, £70. Manufactured by exhibitor. Flower-vase. Price, £20.
- 1504 S. A. Jennings, 276, George-street. Cutlery and Veterinary Surgeons' instruments.
- 1505 Hardy Bros., 5, Hunter-street. The exhibits under this and Nos. 587 and 624 will be placed in one case.
- 1506 H. Berthold. Silver centre-piece, with emu and kangaroo, on wood stand. Price, £220. Colonial manufacture.
- 1507 George Wragg, South Yarra. Butchers' knives and steels. Price,—knives, 26s. per dozen ; steels, 4s. 6d. to 18s. each. Made by exhibitor. Handles of New South Wales ironbark.
- 1508 J. M. Wendt, Adelaide, S. A. One sterling silver claret jug, aboriginal on lid,—£35 ; one emu egg-cup, silver gilded Sturt pea on top,—£12 12s. ; one emu-egg jewel-casket and inkstand, silver gilded alligator on top,—£25 ; one sterling silver cup, wound with Sturt peas,—£23 ; one sterling silver candelabra, representing a fern tree,—£210 ; one sterling silver mounted emu-egg jewel-casket and inkstand, native fern tree in the middle, fern trees each side, kangaroos and emus, &c., in front, and aboriginals at the back ; figures are silver gilt,—£115.

NON-COMPETITIVE.

- 1508A Alfred Roberts, M.D., 117, Castlereagh-street. Silver claret jug and salver.
- 1509 Captain Rountree, Balmain. Trophy of cups won by yacht "Annie Ogle."

AWARDS :—No. 1499)
1505) bronze medals.
1508)
1504 ; highly commended.
1501 ; commended.

JURORS' OPINION.—No. 1499.—Colonial-made. No. 1501.—English-made. No. 1504.—Colonial-made.

Class 586.—Bronzes, Artistic Castings, &c.

- 1509A Messrs. F. Lassetter & Co. Specimens of artistic bronzes.
- 1510 T. S. Douglas, 223, George-street North. 1 pair of large bronze vases; 1 pair of small-size bronze vases; 1 bronze inkstand; 1 pair bronze cups; 1 bronze smoking arrangement. The articles were made at Japan.
- 1511 Joseph Laughton, Vulcan Foundry, Beckett-street, Melbourne. Specimen of ornamental castings, brackets, spandrels, frieze works, and ballant leading iron gates and palisading castings in bronze and zinc work, iron fittings for church work; iron verandah—price, £2 12s. per foot; tomb railings, Nos. 1, 2, and 3. Colonial design and workmanship.
- 1511A R. Lloyd, Australian Club. Group, by Méne.
- 1512 Inspector General, Penal Department, Pentridge. Umbrella-stands, garden-chairs.

AWARDS :—No. 1509A }
 1510 } highly commended.
 1511 }

Class 537.—Clock and Watchwork.

- 1513 Hardy Brothers, 5, Hunter-street.
- 1514 H. F. Delarue, 396, George-street. One case containing an assortment of watchworks, materials, and watchmakers' and jewellers' tools. Imported by exhibitor.
- 1515 John F. Newman, Newtown. Electric clock. Acting forces, electricity and magnetism; requires no winding or attention when once set going; the battery supplying the moving force will last at least ten years, and can be renewed at a cost of 10s.
- 1516 T. T. Jones, 330, George-street. Watches and clocks. Crystal-case watches and clocks, as used on railways in England.
- 1517 Thomas Gaunt, 14, Bourke-street east. Turret-clock and bell complete, entirely made in the Colony.
- 1518 E. K. Pearson, Geelong. One gold compensated eccentric regulated hunter's watch.

NON-COMPETITIVE.

- 1519 Benjamin Braun. Clock. Price, 75 guineas.

AWARDS :—No. 1513 }
 1517 } bronze medals.
 1514 }
 1515 } highly commended.
 1516 }
 1518 }

JURORS' OPINION.—No. 1513.—Deserving of special mention, being all goods of the highest order. No. 1517.—The construction of the escapement worthy of the medal.

Judges :

THOMAS ROWE, | CHARLES MAYES,
GOTHER K. MANN.

**Class 588.—Apparatus and Processes for Heating and Lighting
Cooking, Washing, &c.**

- 1520 George Owen, 329, George-street. Cooking-stove. Price, £13, without boiler. Ditto. Price, £18, with boiler and cistern.
- 1521 A. Chisholm, 183 and 185, Pitt-street. One billiard-table lamp. Will burn for 17 hours without attention, consuming one gallon of oil; the wick will last for six months.
- 1522 Ditto ditto. Four Norwegian cooking-stoves, and sample refrigerator. For roasting, boiling, stewing, &c., by a very short use of fire, after which the cooking completes itself in the portable apparatus without any further fire or attention. It is also used for keeping ice.
- 1523 Ditto ditto. One Simmons' patent kerosene bracket-lamp. Non-explosive, cleanly, and economical.
- 1524 Ditto ditto. One Bradford's washing, wringing, and mangling machine.
- 1525 Ditto ditto. One "Diamond" cooking-range.
- 1526 F. R. Robinson, 486, George-street. Collection of heating-stoves. "Excelsior," price, £2 10s.; "Sylph," price, £1 15s. For heating rooms without chimneys or fire-places.
- 1527 Ditto ditto. "Trumpeter" American cooking-stove, with utensils, but without roasting apparatus. Price, from £5 to £8. For great capacity of oven, efficiency of cooking; easily fitted for burning wood or coal.
- 1528 Ditto ditto. The golden stove, "Little Eva." Price, £2 10s. Children's picnic-stove, complete as ordinary house-stove, with utensils.
- 1529 Ditto ditto. "Empress," Anglo-American cooking-stove. Price, £8 10s. The best stove in this style extant.
- 1530 Ditto ditto. "The World" high-class cooking-stove. Price, £15. No setting or brickwork required.
- 1531 Ditto ditto. Pacific Anglo-American ship's stove. Price, £13 10s.
- 1532 Ditto ditto. Atmospheric-gas cooking-stove. Price, £2 10s.
- 1533 Ditto ditto. Portable laundry-boiler. Price, £4 10s.
- 1534 Ditto ditto. The Sun-light Parabola gas reflector. Price, from £5 to £25, according to size.
- 1535 Ditto ditto. Portable laundry-boiler. Price, £7 10s. and £8 10s., copper; £5, galvanized iron.
- 1536 Ditto ditto. "The Every Man's" bath. Price, £2 5s.
- 1537 J. A. Penson, 351, Pitt-street. Improved gas lamp, with double reflector. Price, £7. For the use of markets, shop-doorways, or porticos.

- 1538 J. A. Penson, 351, Pitt-street. Twenty-burner double sun-light reflector. Price, £10. For the use of public buildings, churches, or chapels.
- 1539 Ditto ditto. Twenty-light double reflector. Price, £13 10s. For the use of public buildings, churches, or chapels.
- 1540 M. B. Juleff & Son, Botany Road, Redfern. 4 ft. 6 in. cooking-stove, with two ovens. Price, £16.
- 1541 Richard Slee, 165, Bourke-street. Imperial cooking-stove, 4 feet long, with two ovens. Price, £16. Colonial-made.
- 1542 Fletcher Brothers, 32, Park-street. Register grate. Price £1 10s. Colonial-made, by exhibitor.
- 1543 Ditto ditto. Colonial oven. Price, £2 10s. A square wrought-iron apparatus for fixing in the bottom of an open fire-place.
- 1544 Ditto ditto. Register grate, extra quality, with steel bar. Price, £3^s 5s. Made and finished by exhibitors.
- 1545 Ditto ditto. Fire-proof safe (Champion), 36 feet by 27 feet and 24 $\frac{1}{2}$. Price, £26 10s. Colonial-made.
- 1546 Lawrence Swan, 155, Pitt-street. Slate-bath. Made of Colonial materials.
- 1547 Thos. J. Bown, 99, Bathurst-street. Assortment of gas stoves. Large cooking-stove, £6; small cooking-stove, 16s.; atmospheric-gas stove, 5s. 6d.
- 1548 Messrs. F. Lassetter & Co., Sydney. Lamps, &c.
- 1549 Ditto ditto. Apparatus for washing, mangling, &c.
- 1550 Ditto ditto. Apparatus for cooking.
- 1551 Henkel and Paterson. Urn for heating wine or beer.
- 1552 Taylor Brothers, Richmond, Melbourne. Half-gross matches. Price, 3s. per gross.

NON-COMPETITIVE.

- 1553 E. Reilly, 424, George-street. Cooking-stoves.

AWARDS :—No. 1538	}	bronze medals.		
1541				
1545	}	highly commended.		
1520				
1524				
1526				
1527				
1533				
1537				
1540				
1542				
1546				
1547				
1522			}	commended.
1525				
1529				
1531				
1536				
1543				
1544				
1548				

Judges :

FRANK SENIOR,
E. C. CREE,AUGUSTUS PARROT,
J. NORRIE.**Class 589.—Perfumery, Fancy Articles, Basketwork, Toys, &c.**

- 1554 Richard Green, basketmaker, 123, York-street. Baskets and sofa and 7 chairs in basketwork, 1 round-table, 2 foot-stools, and basket shop. Price, £30 complete.
- 1555 Charles Griffiths, 770, George-street. Fancy basketware. Price, from 4s. 6d. to £1.
- 1556 C. E. Wiggell, 143, South Head Road. 1 glass-case, 4ft. 4in. by 20in., containing bust of Her Most Gracious Queen Victoria and of Prince Consort, showing the wigs made by the exhibitor. Also, a fan, &c., used in hair-dressing.
- 1557 Mr. and Mrs. Caffyn, hairdressers, George-street. Glass-case, 5 feet by 5, containing wax figure full dressed, 5s.; 4 ladies' wigs, 85s., 90s., 105s., 126s.; 2 ladies' fronts, 25s., 30s.; 1 loop of straight hair, 63s.; 1 curled head-dress, 30s.; 2 gentlemen's wigs, 84s. and 105s.; 2 gentlemen's scalps, 50s. and 63s.; 1 postillion wig, 90s.; 1 coachman's wig, 100s.; 1 bottle life of the hair, 3s. 6d.; 1 bottle of pomade, 2s. 6d.; 1 packet bloom of Ninon, 1s. None of the above-named work imported.
- 1558 Cooke & Robins, 131, Pitt-street. Artificial hairwork. Our exhibit will consist of artistic hairwork, mounted in gold, the whole being our own workmanship.
- 1559 Mrs. Edgar Cox, 103, Palmer-street. Chain-necklets and bracelets of grass, manufactured in India. Non-competitive.
- 1560 C. F. Meurer, 150, Castlereagh-street. 1 glass case, containing 1 dozen pipes, Nos. 1 to 12, 18s. to 30s. per dozen; stockwhip handles, Nos. 1 to 6, 20s. to 44s. per dozen; 3 walking-sticks, 10s. each. Manufactured of myall, tulip, and mahogany wood grown in the Colony.
- 1561 L. Carmichael, Brisbane. Fine perfumes—Queensland bouquet, bouquet of sweets, Brisbane waters, essence of orange, essence of jasmine. The spirit of these was distilled from Queensland rum.
- 1562 Miss A. Campbell, Gladesville. A set of crochet antimacassars (three) and a Spanish point lace crochet-collar.
- 1563 Mrs. J. C. Taylor, Petersham. Duck-egg, worked with beads and silk.
- 1564 Matilda Lee, 99, Princes-street. Artificial paper flowers. Price, £5. All purely Colonial manufacture.
- 1565 Dr. J. Emanuel & Son, dentists. Tinctures for the teeth. Price, from 2s. 6d. to £1 per bottle.
- 1566 Reading, Son, & Steffanoni. A collection of fancy articles for the use of dwellings.
- 1567 Ditto. Paperflowers. Manufactured by exhibitor.
- 1568 Mrs. M'Cullagh, 116, Phillip-street. Australian pomade. 1s. to 8s. per pot.
- 1569 Mrs. M. Alexander, 48, Margaret-street. Ornamental leatherwork frame, with mirror, mounted with figures, flowers, and England's coat of arms, &c.
- 1570 Daniel Wiley, Park-street. Basketwork.
- 1571 Miss Rebecca Heather, 42, Parramatta-street. Flower-basket, the flowers made of leather. Price, £2 10s.
- 1572 Miss Thomas, Newtown. Landscape carved in cuttle-fish. Price, £4.
- 1573 The Sydney Chemical Works. Pomades and hair-washes.

- 1574 Lewis & Whitley, Curzon and Victoria streets, Hotham. Perfumed hair-oils for the toilette. Prices, half-pints, 6s. per dozen; 3-8ths, 5s. per dozen in 6 dozen bottles. Prepared by exhibitors from the purest vegetable oils, and scented by various perfumes. The 3-8ths-bottles are the produce of Victoria; the half-pint-pottles imported from England.
- 1575 Alcock & Co., Russell-street, Melbourne. Spiral-turned work of several descriptions. Of N.S.W. myall, N.Z. kauri, Tasmanian huon pine, Victorian blackwood and red gum.
- 1576 John Ritchie, 231, Sussex-street. Walking-sticks. 100 walking-sticks, all of Colonial growth, of various kinds of wood, mounted and unmounted.

NON-COMPETITIVE.

- 1577 John Baird, 13, Botany-street. One shade, feather flowers.
- 1578 J. Danby, Watson's Bay. Case of Port Jackson seaweed. Price, £5.
- 1579 H. O. Booth, 197, Clarendon-street, Emerald Hill. 8 egg cups, 2s. each; 3 sheep-calls, 1s. each; not for sale. Turned out of *Casuarina glauca* silt.

AWARDS :—No. 1555	} bronze medals.
1557	
1558	
1560	} highly commended.
1566	
1567	
1571	
1575	
1554	} commended.
1576	

JURORS' OPINION.—No. 1557.—Superior finish. 1558.—Exquisite workmanship. 1575.—Excellence of workmanship and finish. 1577.—Tasteful and novel.

REPORT ON SECTION III, CLASS 589.

Perfumery, fancy articles, basketware, and toys.

WE have carefully examined the objects exhibited in this class. They consist of fancy articles, including Berlin woolwork, paper-flowers, hairwork of different kinds, walking-sticks, pipes, leatherwork, basketware, perfumery, etc.

Of fancy articles but few were exhibited, and of toys none. Perfumery was meagrely represented, and in basketware the fancy work predominates over the exclusion of the more useful kinds. This is to be regretted, as in the finer class the Colonial manufacturers cannot compete with those imported.

In hairwork the exhibits are worthy of the highest encomium; that of Messrs. Cooke & Robins, of 231, Pitt-street, is deserving of special notice for tasteful design, exquisite workmanship, and moderate price. Nothing can exceed the delicacy of design of the device in the centre of this case.

These remarks apply in an equal degree to the beautiful and elegant exhibits of Mr. and Mrs. Caffyn, of George-street. The lady's wig on the left-hand side of this case is a perfect piece of art.

Mrs. Reading, Son, & Steffanoni, of Market-street, makes a beautiful display of Berlin woolwork, which, with regard to workmanship and price, are quite equal to the best imported. The two hand-screens are most beautifully executed and are a credit to their establishment.

The same firm exhibits also a stand of paper-flowers, which have a very natural appearance, and are most artistically arranged.

Miss Matilda Lee, of 99, Princes-street, also exhibits paper-flowers, which display good taste and execution.

Mr. Ch. Griffiths, of 770, George-street, makes a fine show in fancy baskets, which are elegant in form and good in workmanship. He also exhibits two chairs of Colonial manufacture, of good design and appearance.

Mr. Richard Green, of 123, York-street, exhibits a suite of furniture in basketwork of Colonial manufacture; it is of graceful design and solid workmanship; the coat of varnish is rather detrimental to its appearance than otherwise. The same exhibitor shows also a variety of fancy and other baskets, good in quality and moderate in price.

Mr. C. F. Meurer, of 150, Castlereagh-street, is an exhibitor of pipes, stockwhip-handles, and walking-sticks, made of myall, tulip, and mahogany wood, which deserve commendation for faithful workmanship and finish, and for their moderate price.

Miss Rebecca Heather, of 42, Parramatta-street, exhibits a very pretty flower-basket in leatherwork, displaying refined taste. An absence of the ordinary leatherwork varnish adds very materially to its elegant appearance.

Mrs. Alexander, of 48, Margaret-street, exhibits a looking-glass frame, very elaborately worked in leather.

Mr. John Ritchie, of 231, Sussex-street, makes a fine show of walking-sticks, all of Colonial woods and curious shapes.

Messrs. Alcock & Co., of Melbourne, show some excellent samples of spiral-turned work in various coloured woods.

Miss A. Campbell, of Gladesville, exhibits some most elaborate crochet-work. The Spanish point-lace-collar is especially worthy of notice.

The duck-egg, exhibited and embroidered by Mrs. J. C. Taylor, of Petersham, is a most curious and delicate piece of workmanship, and reflects great credit on the patience of this lady.

Mrs. M'Cullagh, of 116, Phillip-street, made a good display of her excellent Australian pomade, the good qualities of which are certified to by several of the medical men of Sydney.

The tinctures for the teeth, by Dr. J. Emanuel & Son, appear to be of nice quality.

The display of perfumery was meagre in the extreme, and requires much more care, attention, and skill in getting up.

The essential oils especially are very inferior. Pomades, soaps, also require more refined taste and quality to fix them as articles for general consumption.

AUGUSTUS PARROT.
FRANK SENIOR.
EDWARD C. CREE.
J. NORRIE.

Judges :

RICHARD KEITH, | ELIAS DEEPER,
HENRY MILGROVE.

Class 590.—Brushware, &c.

- 1580 Samuel Taylor, 42, York-street. Brushware and materials.
1581 M. McMahon. Colonial-manufactured brushware.
1582 George Hurley, Wynyard-square. Brushware of all kinds.
1583 John Zevenboom, 12, a'Beckett-street West, Melbourne. Brushware.

NON-COMPETITIVE.

- 1584 Ellis Robinson. Small show-case. Articles, the work of the pupils of the N.S.W. Deaf and Dumb and Blind Institution.
 1585 James Campbell, Waverley. One case of shells.
 1586 S. Zollner, 84, York-street. Collection of bellows.
 1587 Ditto. Collection of galvanized iron.
 1588 Eastway Brothers, 425, George-street. A collection of wire-work.
 1589 Ditto. Fishing tackle.
 1590 George Wacey, 166, Castlereagh-street. Chimney-pieces in scagliola and Keen's patent cement.
 1591 Inspector General, Penal Settlement, Pentridge. Tin utensils used in Government establishments.

AWARDS :—No. 1580 }
 1586 } bronze medals.
 1587 }
 1581 ; highly commended.

JURORS' OPINION.—No. 1580.—The assortment of brushware is very large and good, embracing every article in its line, and of superior finish. No. 1584.—Deserving of great merit. No. 1586.—The house-bellows are of superior quality; the blacksmiths' bellows are equal to any imported, and cost less. No. 1587.—The assortment small, but of very superior quality. No. 1581.—The foot-brush in this exhibit is a beautiful piece of workmanship; the other exhibits, although limited, are of excellent finish.

SECTION IV.—CLOTHING, INCLUDING FABRICS
 AND OTHER OBJECTS WORN ON THE
 PERSON.

Stewards :

JOSEPH THOMPSON, | F. C. BREWER,
 FRED. EBSWORTH.

Judges

IN CLASSES 591-594, 596-598.

W. DRYNAN, | A. B. RUSSELL,
 C. K. MOORE.

Prizes :—Bronze and Silver Medals.

WOOLLEN FABRICS.

Class 591.—Broadcloths.

- 1592 Farmer & Company, Pitt-street. Broadcloths.
 1593 Jos. Turner, Market Cloth Hall, 484, George-street. Black broadcloth.
 1594 Ditto ditto. Blue broadcloth.

AWARDS :—No. 1593 }
 1594 } highly commended.

Class 592.—Doeskins.

- 1595 Joseph Turner, George-street. Fancy doeskin.
 1596 Ditto ditto. Black doeskin.
 1597 Ditto ditto. Blue doeskin.

JURORS' OPINION.—Useful every day goods.

Class 593.—Fancy Tweeds.

- 1598 Joseph Turner. Piece West of England fancy tweed.
 1599 Henry Zions. Six ends of Colonial tweeds. Price, 3s. 6d. per yard. Made by Alfred French, of Coorwall Mills, Bowenfells.
 1600 O. B. Ebsworth (late), Tweed Factory. Fancy tweed. Price, 4s. 3d. to 5s. 9d. per yard. Made by hand power and Jacquard loom.
 1601 Alexander Gray & Co., Albion Mills, Geelong. Tweeds. Price, 4s. 6d. per yard.
 1602 Victorian Woollen and Cloth Manufacturing Company (limited), Geelong. 19½ yards black mixture tweeds, No. 3594a/112; 28 yards drab twist tweed, No. 3659/89; 25 yards twist tweed, No. 2841a/46. Price, 4s. 3d. per yard. These tweeds were not made for exhibits specially, but are taken from ordinary stock as a fair exposition of present manufacture.
 1603 Victorian Woollen and Cloth Manufacturing Company (limited), Geelong. 21½ yards black drab heavy tweed, No. 3251a/66; 20½ yards striped twist tweed, No. 3301a/83; 21½ yards steel and white heavy tweed, No. 3260a/67. Price, 4s. 9d. per yard. Taken from stock on hand as a fair exposition of present make.
 1604 Victorian Woollen Cloth Manufacturing Company (limited), Geelong. 10 yards check twist heavy tweed, No. 3916a/118; 19 yards check twist heavy tweed, No. 3783/145; 16½ yards check twist heavy tweed, No. 3901/146. Price, 6s. 6d. per yard. Taken from stock on hand as a fair exposition of present make.
 1605 Alexander Gray & Co., Geelong. 12 ends fancy tweeds. Price, 4s. 6d. per yard.
 1605A E. Kron, 289, George-street. 4 lengths fancy tweeds, 2½ yards each, waterproof.

AWARDS :—Nos. 1601, 1605; silver medal. [For the excellence of their tweeds.]
 1600; bronze medal.
 1602 & 1604; highly commended.
 1598; commended.

JURORS' OPINION.—Nos. 1601, 1605.—Specially deserving as Colonial manufacture, for quality and workmanship. No. 1600.—For suitability and general use, and as Colonial manufacture.

Class 594.—Plain Tweeds.

- 1606 O. B. Ebsworth (late), Tweed Factory. Plain tweed. Price, 4s. per yard. Made by hand power and Jacquard loom.
 1607 Joseph Turner. Plain tweed.
 1608 Victorian Woollen and Cloth Manufacturing Company (limited), Geelong. 23 yards mixture tweed, No. 3756a/77; 22 yards mixture tweed, No. 3573/30. These tweeds were not made to exhibit, but have been taken from ordinary stock in hand.
 1609 Victorian Woollen and Cloth Manufacturing Company (limited), Geelong. 20 yards Oxford melton, No. 2965a/279. Price, 4s. 3d. per yard. This tweed was not made to exhibit, but has been taken from ordinary stock in hand.

AWARDS :—No. 1608; bronze medal. [For extra quality and workmanship.]
 1606; commended.

Class 595.—Kerseys.—No entry.**Class 596.—Fancy Trouserings.**

- 1610 Farmer & Company, Pitt-street. Fancy trouserings.
 1611 Joseph Turner. Piece fancy trousering.

AWARD :—No. 1611 ; commended.

JURORS' OPINION.—No. 1610.—Best colorings and most suitable textures for general use.

Class 597.—Flannels.—No entry.**Class 598.—Blankets.**

- 1612 Farmer & Company, Pitt-street. Blankets.
 1613 Inspector General, Penal Department, Pentridge, Victoria. Four pairs blankets :—1, issued to aboriginals ; 2, issued to Industrial Schools ; 3, issued to prisoners ; 4, ———
 1614 Sloper Cox, Hobartville. Austrian prize blanket.

AWARD :—No. 1614 ; commended.

JURORS' OPINION.—No. 1613.—Durable, but high in price.

Class 599.—Railway Wrappers.—No entry.**Class 600.—Shawls.—See Class 613.****Judges**

IN CLASSES 601, 602.

J. J. M. RICHARDSON, | W. SEAWARD,
 G. O. ETHERIDGE.

SILKS AND COTTON.**Class 601.—Raw or Manufactured.**

- 1615 Farmer & Company. Silks, Satins, and Mixed Materials.
 1616 T. S. Douglas, 223, George-street North. Four pieces striped silk and four pieces striped gauze. These are manufactured in Japan and China.
 1617 A. Chisholm, 183 and 185, Pitt-street. Sample case Irish linens.
 1618 Ditto. Samples of silks.

NON-COMPETITIVE.

- 1619 J. M. May, Superintendent, Randwick Asylum. Raw silk.

AWARD :—No. 1619 ; highly commended.

JURORS' OPINION.—No. 1615.—Very elegant designs, and showing an improvement in Colonial taste.

Class 602.—Mixed Fabrics.

- 1620 Farmer & Company. Mixed fabrics.
 JURORS' OPINION.—Very good in design ; the only exhibit of mixed silk, wool, or cotton.

Judges

IN CLASSES 603-607, 610, 611.

W. DRYNAN, | A. B. RUSSELL,
C. K. MOORE.

CLOTHING.*For both sexes, made up or manufactured in the Colony.***Class 603.—Men's Hats of Silk.**

- 1621 Farmer & Company. Selection of gentlemen's silk hats.
1622 B. Mountcastle, George-street. Hats, finished and unfinished.
1623 C. F. Priddy, 450, George-street. Black silk hats of various shapes,
made in Sydney from imported material.

AWARDS :—No. 1622 ; bronze medal.
1623 ; commended.

JURORS' OPINION.—No. 1622.—Superior in quality and finish. 1623.—
Good quality and best variety.

Class 604.—Men's Hats of Felt.

- 1624 C. F. Priddy, 450, George-street. Felt hats of various shapes, made in
Sydney from material imported from abroad.
1625 Farmer & Company. Selection of gentlemen's felt hats.

NON-COMPETITIVE.

- 1626 Benjamin Braun, 349, George-street. Felt hats. Price, 69s. per dozen,
wholesale only. Made solely from the fur of the Australian rabbit, by
Louis Braun, London.

AWARD :—No. 1624 ; bronze medal.

JURORS' OPINION.—No. 1624.—Most suitable shapes, and best variety most
suited for this climate.

Class 605.—Men's Hats of Fur.

- 1627 T. W. Crawley, Markets. Caps. Price, 15s. to 20s.

NO AWARD.

Class 606.—Men's Hats of Cabbagetree, or any other material.

- 1628 C. F. Priddy, 450, George-street. Mens' and youth's Merino hats,
made in Sydney from imported material.
1628A Curator of Museum, New Caledonia. Six hats, made out of Pandannus
fibre by convicts.

NON-COMPETITIVE.

- 1629 J. M. May, Superintendent, Randwick Asylum. Cabbagetree plait.
1629A Miss Taylor, 9, Marlborough-street, Surry Hills, Plaited paper hat.

AWARD :—No. 1628 ; highly commended.

Class 607.—Caps, Cloth.

- 1630 Farmer & Company. Selection of gentlemen's cloth caps.
 1631 C. F. Priddy. Hats covered with cloth, and caps made with cloth.

AWARD :—No. 1631 ; commended.

JURORS' OPINION.—No. 1630.—Superior quality and good workmanship.

Class 608.—Caps, Tweed.—No entry.**Class 609.—Caps, Felt—No entry.****Class 610.—Caps, Fancy Embroidered, &c.**

- 1632 Farmer & Company. Gentleman's velvet smoking-cap, embroidered gold. Price, £3 5s.

AWARD :—No. 1632 ; highly commended.

Class 611.—Gentlemen's ready-made Clothing, in suits or single garments.

- 1633 Thompson & Giles, Sydney. Gentlemen's ready-made clothing.
 1634 Farmer & Company. Gentlemen's ready-made clothing, suits, and single garments.
 1635 Dora Parker, Camden. Fancy Crimean shirt. Price, £1 5s.
 1636 Henry Zions, 409, George-street. 2 suits Colonial tweed. Price, £3 15s. per suit.
 1637 Joseph Myers, 548, George-street. Oil-skin coats, trousers, and leggings. Colonial-made.
 1638 Joseph Turner, George-street. All wool, black cloth suit, as made to order. Price, £3.
 1639 Ditto. Double-breasted black frock coat. Colonial workmanship.
 1640 Ditto. All wool, fancy tweed suit, as made to order. Price, £2 10s.
 1641 Ditto. Fashionable style of suit.
 1642 William Smith, 312, George-street. Gentlemen's under-clothing.
 1643 Inspector General, Penal Department, Pentridge, Victoria. Suit of clothing worn by prisoners.
 1644 Ditto. Suit of clothing worn by boys on board the "Nelson."
 1645 David Jones & Co. Boys', youths', and gentlemen's clothing, made to order.
 1646 Ditto. Court dress (Minister of the Crown), embroidered in the Colony.
 1646A Theophilus Stephens & Co., 141, Pitt-street. Gentlemen's fashionable tweed suit, with silk dust coat. Manufactured in the Colony by the exhibitors.

AWARDS :—No. 1642 }
 1645 } bronze medals.
 1646 }
 1633 } highly commended.
 1635 }
 1643 ; commended.

JURORS' OPINION.—No. 1634.—Approved for general utility. No. 1642.—Award for excellence of workmanship and neatness of finish. No. 1644.—Very suitable. Nos. 1645, 1646.—Specially recommended for excellence of quality, style, and finish.

Judges :

Mrs. MARY HENFREY, | Mrs. M. M. RIDLEY.
Miss LIZZIE JEFFERS.

Class 612.—Ladies' Bonnets, Millinery.

- 1647 Thompson & Giles, Sydney. Ladies' bonnets.
1648 Farmer & Company. Ladies' bonnets and millinery.
1649 Sophy Anna Hayes, 157, Elizabeth-street. Exact copy of French paper model of dress.
1650 David Jones & Co., George-street. Millinery.
1651 Mrs. Hopson, 598, George-street. Millinery. Price, £20.

AWARDS :—No. 1650 ; bronze medal.
1647 ; highly commended.

JURORS' OPINION.—No. 1650.—Worthy of great praise for elegance of finish, combined with lightness of make and tasteful blending of colours. No. 1647.—Excellent materials and well put together. No. 1648.—Style and finish all that could be desired. No. 1651.—Very creditable.

Judges

IN CLASSES 613-620.

J. J. M. RICHARDSON, | W. SEAWARD,
G. O. ETHERIDGE.

Class 613.—Shawls.

- 1652 Farmer & Company, Pitt-street. Shawls.
1653 Cable & Tickle, 664, George-street. Mantles and fancy drapery.

AWARD :—No. 1653 ; bronze medal.

JURORS' OPINION.—No. 1653.—Principally Colonial-made. No. 1652.—First-class quality and style.

Class 614.—Tapestry.

- 1654 M. G. Mitchell, 119, Albion-street. Baby's long robe, tatted front.
Price, £5 5s.

Class 615.—Lace.

- 1655 David Jones & Co., George-street. Specimens of Honiton and other laces; Honiton bridal fall, &c.

AWARD:—No. 1655; highly commended with 1664.

Class 616.—Woolwork.

- 1656 Miss Landers, Penrith. Highland boy and dog.
 1657 Mrs. Andrews, Enmore. Picture in woolwork, copy of Landseer's picture, "Bolton Abbey in the olden time." Size, 6 feet 2 inches by 4 feet 10 inches.
 1658 Mrs. Apted, 55, South Head Road. Hawking party. Not for sale.

AWARDS:—No. 1657; bronze medal.
 1658; highly commended.

JURORS' OPINION.—No. 1657.—Beautiful specimen of woolwork.

Class 617.—Embroidery.

- 1659 Reading, Son, & Steffanoni, 92 and 94, Market-street. Gold, silver, and silk embroidery; manufactured by exhibitors.
 1660 Samuel Nathan, 26, Kensington-street. Lady's stamped embroidery skirt. Price, 20s.
 1661 Miss Kate Emanuel, Strawberry Hills. Tatting (infant's robe), hand-work.
 1662 Gordon & Gotch, 281, George-street. Samples of sewing-machine embroidery and work. Not for sale. All these samples are worked by Grover & Baker's sewing-machines, and are Colonial manufacture.
 1663 T. S. Douglas, 223, George-street. Gold lace embroidered cushion, chair-cover, white satin hand-screen, pair scarlet cloth cushions, scarlet satin hand-screen, black satin cushion (birds), black satin flowers and birds, embroidered crape scarf, one puggaree. Price, £22. Manufactured at Japan, Soochow, Canton, and Hong Kong.
 1664 David Jones & Co., George-street. Embroidery in gold and silk.
 1665 Mrs. Robinson, 3, Bay-street, Glebe. Needlework; quilts. Price, £8 10s. and £5.
 1666 Miss Phillis Solomon, 157, Castlereagh-street. Infant's dress—tatting.
 1667 Benjamin Braun, 25, Lower Fort-street. Cock and hen. Not for sale. Japanese needlework in silk.

NON-COMPETITIVE.

- 1668 A. Parrot, Hunter-street. Embroidery.

AWARDS:—No. 1659; bronze medal.
 1664; highly commended with No. 1655.
 1665; commended.

JURORS' OPINION:—No. 1659.—Colonial manufacture, and very creditable to the tastes of the exhibitors.

Class 618.—Ladies' Hosiery.

1669 Farmer & Company. Hosiery.

NO AWARD.

Class 619.—Ladies' Gloves.

1670 Farmer & Company.—Gloves.

1670A S. H. Lewis, 10, Hunter-street. French kid gloves. The new brilliant tints. Green, 6s. per pair; all other colours, 5s. per pair. Same class and quality of glove obtained medals at the New York Exhibition of 1853.

NO AWARD.

JURORS' OPINION.—No. 1670A.—Very choice.

Class 620.—Clothing in General.

1671 Thompson & Giles, Sydney. Ladies' clothing.

1672 Farmer & Company. Ladies' clothing in general.

1673 Mrs. Grocott, 75, Coveny's Buildings, Market-street. Pair of lady's stays. Price, £3 3s. Made in the Colony.

1674 J. W. Taylor, 37a to 39, Erskine-street. A variety of English-made baby linen, to contrast with the Colonial-made goods exhibited by him.

1675 J. W. Taylor. A general assortment of infant's, ladies', and children's underclothing. Every garment was designed and manufactured in the Colony of New South Wales by the exhibitor.

1676 Mrs. Shaw, 160, Castlereagh-street. Case containing stays and belt.

1677 David Jones & Co., George-street. Ladies' underclothing.

NON-COMPETITIVE.

1678 Superintendent, Randwick Asylum. Clothing in general. Clothing made and worn by the children in the Institution.

AWARDS :—No. 1672; silver medal. [For excellence and variety of exhibits, particularising the canopy and dais in Section III.]

1675; silver medal. [For ladies' and children's underclothing.]

1671; bronze medal.

1676 } highly commended.

1677 } highly commended.

1678; commended.

JURORS' OPINION.—No. 1671.—A collection of great merit. No. 1672.—Beautiful in design and workmanship, and well worthy of distinction. No. 1675.—The Judges are of opinion this exhibitor deserves special credit and mention for his display of Colonial industry, the development of which is calculated to introduce a large and profitable field of labour to the young and increasing population of the Colony, whilst the exhibits themselves are far superior in quality, workmanship, and finish, to any others of the same description imported, and at the same time the prices are greatly in favour of the Colonial production.

AWARD COMMITTEE :—Nos. 1672, 1675.—There is nothing in these exhibits to warrant the award made. A bronze medal would have sufficed in each case; but silver medals having been awarded by the Judges, confirmed by the Stewards, and announced by the Exhibitors before this Committee got to work, it was considered undesirable to disturb the adjudication.

Judges

IN CLASSES, 621-23.

E. VICKERY, | T. BENNETT,
B. COCKS.

BOOTS AND SHOES.

Class 621.—Men's.

- 1679 T. O. Dadswell, King-street. Men's boots and shoes. Various prices.
 1680 W. Teece, Goulburn. Men's boots, Colonial-made. The leather of which these boots are made is manufactured by the exhibitor.
 1681 Wright, Davenport, & Co., 794, George-street. Men's Colonial boots. Made in the Colony from our own Colonial leather.
 1682 Callaghan & Son, 397, George-street. Men's boots and shoes. These are imported goods, and are exhibited for style and quality.
 1683 Joseph Patterson, Campbell-street. Men's and women's boots and shoes. Not for sale.
 1684 H. Richards (late John Lobb), 239, Pitt-street. Pair kangaroo Wellington boots; pair dress Wellington's, kangaroo; pair jockey boots; pair short dress enamelled kangaroo.
 1685 Charles Gillespie, Goulburn. Men's boots, Colonial-made.
 1686 Hilder & Abigail, 577, George-street. Boot uppers.
 1687 Inspector General, Penal Department, Pentridge, Victoria. Boots and shoes. Made by prisoners.

NON-COMPETITIVE.

- 1688 Superintendent, Randwick Asylum. Men's boots.
 1688_A S. H. Lewis, 10, Hunter-street. German kid boots and shoes, elastic-sides, 16s. 6d. to 20s. per pair.
 1688_B Charles Bovis, 62, Market-street. 6 pairs men's boots and shoes; Colonial manufacture.

Class 622.—Women's.

- 1689 Callaghan & Son, 397, George-street. Women's boots and shoes. Imported goods.
 1690 Wright, Davenport, & Co., 794, George-street. Women's Colonial-made boots. Made in the Colony from our own leather.
 1691 William Teece, Goulburn. Women's boots, Colonial-made. The leather of which these boots are made, manufactured by exhibitor.
 1692 T. O. Dadswell. Women's boots. Various prices.
 1693 Charles Gillespie, Goulburn. Women's boots, Colonial-made.

NON-COMPETITIVE.

- 1694 Superintendent, Randwick Asylum. Women's boots.
 1694_A Charles Bovis, 62, Market-street. 5 pairs ladies' boots and shoes; Colonial manufacture.
 1694_B S. H. Lewis, 10, Hunter-street. French and German satin and kid boots, 13s. 6d. to 18s. 6d. per pair.

Class 623.—Children's.

- 1695 Callaghan & Son. Children's boots and shoes. Imported goods.
 1696 T. O. Dadswell. Children's boots. Various prices.
 1697 Wright, Davenport, & Co., 794, George-street. Children's Colonial-made boots. Made in the Colony, from our own Colonial leather.
 1698 William Teece, Goulburn. Children's Colonial-made boots. The leather of which these boots are made, manufactured by exhibitor.
 1699 Charles Gillespie, Goulburn. Children's boots, Colonial-made.

NON-COMPETITIVE.

- 1700 Superintendent, Randwick Asylum. Children's boots and shoes.
 1700A S. H. Lewis, 10, Hunter-street. Children's Marcella and kid boots, 6s. to 10s. per pair.

AWARDS:—No. 1680	
1691	} bronze medals.
1698	
1681	
1690	} bronze medals.
1697	
1685	} bronze medals.
1693	
1699	
1684	highly commended.

JUDGES' REPORT and AWARD in Section IV, Classes 621, 622, and 623, being Boots, Shoes, &c.

MEMO.—The award paper, furnished by the Stewards, is not adapted to the goods (in quantities) under examination. Theoretically, the given number of points may appear easy and correct, but here it is impracticable. The Judges respectfully submit that no proper or satisfactory competition can take place unless on goods previously particularized, as one competitor has the best Wellington, another the best elastic-side, and a third the best men's Balmoral, but all of equal merit, though of different kinds. They therefore suggest that for future competitions prizes should be offered for specified kinds in each class, as—

Men's calf Wellingtons, sewn, pegged, or riveted.

Ladies' elastic-side kid boots, ditto, ditto, ditto.

Boys' calf elastic-sides, ditto, ditto, ditto.

Children's calf Balmorals, ditto, ditto, ditto.

At same time each competitor should be allowed to exhibit other goods but *non-competitive*.

Under present arrangements the Judges are compelled to report upon exhibits *in globo*.

1694 & 1700 is a case of boots from the Randwick Destitute Children's Asylum. Very creditable for juvenile's work.

1687 Two cases containing fancy boots, suitable for the stage, from the Pentridge Prison. The ornamentation is elaborate and beautiful, and evidently the product of skilled cordwainers of the old school.

— Case containing two pairs of strong boots, suitable for police, and a beautiful cabbage-tree hat of much greater merit than the boots, manufactured in the Brisbane Gaol.

1682, 1689, & 1695 are chiefly imported goods of superior workmanship. Machine-sewing on the uppers is here seen to perfection. These are exhibited by Messrs. Callaghan & Son, of George-street.

- 1688A is a case containing foreign goods of superior quality, from the establishment of Mr. S. H. Lewis, of Hunter-street.
- 1688B Mr. C. Bovis exhibits six pairs of boots and shoes, the work of good practical hands, but behind the times in style.
- 1684 Mr. H. Richards, of Pitt-street, exhibits three pairs of men's sewn boots, one pair of which, the kangaroo Wellingtons, is worthy of special note. As a pair of hand-sewn boots the workmanship is exquisite, and every thoroughly practical craftsman of the old school would doubtless insist upon awarding 1st prize to this pair of boots. The Judges, however, while admitting the superior excellence of the kind, do not recommend a prize. The extravagance of labour to produce such boots, and consequent cost and unsuitableness for general use, detract from their merit in present times. They are suited only for a London West End trade, where the aristocracy are educated to pay £5 or £6 for boots that are neither better in appearance, wear, nor reality, than ordinarily would be sold for £1 10s.
- 1681, 1690, & 1697 A case of men's, women's, and children's boots, all stand-made, riveted or pegged, manufactured in Sydney by Wright, Davenport, & Co.
- 1685, 1693, & 1699 A case of men's, women's, and children's boots, pegged and riveted, part hand-made and part stand-made, the manufacture of Mr. C. Gillespie, Goulburn.
- 1689, 1691, & 1698 A case of men's, women's, and children's boots, pegged and riveted, part hand-made and part stand-made, manufactured by Mr. W. Teece, of Goulburn.
- These latter three exhibits surpass all the others in real merit, and are so very nearly equal that the Judges have found it difficult to decide which is best. Had they the power, they would award a silver medal to each. These three exhibitors are evidently thorough masters of their trade. In their work is manifest suitability and excellence of material, good workmanship throughout, and suitableness for general use. The Judges desired to express their estimate of the merit of these exhibits in accordance with the schedule, by awarding a medal to one for men's, another for women's, and the third for children's, but as this would not fully meet the case, they recommend that a medal be given to each without distinguishing whether for men's, women's, or children's. And they specially commend the hand-made work of Mr. Chas. Gillespie.
- 1679, 1692, & 1696 comprise an extensive assortment of boots for all ages and sexes, Sydney make, all good, useful, every-day work, from Mr. Dads-well's pegging and riveting establishment. These are plain serviceable goods, but not near equal in merit to the three exhibits previously mentioned.
- 1686 This is a case of closed boot uppers. The machine-closing very good, but patterns and fitting defective. Both the clicker and the fitter of these goods will be advantaged by a few lessons from a good tradesman.

E. VICKERY,
T. BENNETT,
BENJ. COCKS, } Judges.

JOS. THOMPSON,
F. C. BREWER,
FRED. EBSWORTH, } Stewards.

Judges

IN CLASSES 624-627.

ARTHUR J. STOPPS, | HENRY C. DANGAR,
T. T. JONES.

JEWELLERY AND ORNAMENTS.**Class 624.—In Gold.**

- 1701 C. L. Qwist, 11, Hunter-street. One case of gold and silver work. Manufactured by exhibitor.
 1702 Hardy Brothers, 5, Hunter-street.
 1703 J. W. Hall, 299, George-street. 1 case, containing Colonial hair and gold jewellery, and gold Colonial manufactured watch.
 1704 T. T. Jones, 330, George-street. Brooches, locket, chains, &c.; gold-mounted operecula, from Fiji Islands.

AWARD :—No. 1701; bronze medal.

JUDGES' OPINION.—No. 1702.—The Judges, understanding that Messrs. Hardy Brothers' exhibit is non-competitive, have refrained from making an award in respect of their highly creditable display.

Class 625.—In Silver.

- 1705 T. T. Jones, 330, George-street. Silver-mounted emu-eggs.
 1706 C. L. Qwist, 11, Hunter-street. Silver work.

AWARD :—No. 1706; commended.

Class 626.—In Electroplate.

- 1707 John McLean, 70, York-street. Colonial manufactured electroplate.

AWARD :—No. 1707; highly commended.

Class 627.—In Metals or Mixed Metals.

- 1708 B. Rittenberg, 363, George-street. Collection of aluminum jewellery and personal ornaments. Price, from 3s. 6d. to 50s. Aluminum is a metal which has, within the past few years, taken the place of gold in the manufacture of a variety of articles of general utility. It is extensively used for brooches, chains, earrings, and the many other articles of personal adornment, and bijouterie, and in the manufacture of watches of a useful class it is fast superseding all other metals. It is capable of a high polish and finish, thus rendering it useful for articles such as are exhibited, enabling manufacturers to place the designs of the best artists within the reach of persons of limited means, in articles of ornament, in a metal sufficiently distinguished from the more costly metal,—gold.

AWARD :—No. 1708 ; bronze medal.

JURORS' OPINION.—Classes 624 to 627.—It is to be regretted that there is so little competition in these classes ; also, that there are no exhibits calling for special commendation. The non-competitive exhibits of Messrs. Hardy Brothers furnished a great contrast in design and style to Colonial manufacturers ; and it is in these highly important particulars that the Jurors are of opinion that the Colonial maker should strive principally to effect improvement.

Judges

IN CLASSES 630, 631.

GOTHER K. MANN, | MALCOLM MACDONALD.

'PORTABLE ARMS.

Class 628.—Swords.—No entry.

Class 629.—Daggers.—No entry.

Class 630.—Pistols, &c.

1709 F. Lassetter & Co., George-street. Stand of pistols.

1710 Charles Cowles, 205, Pitt-street. Pistols, powder-flasks, shot-flasks, cartridge-carriers, and cartridge-making implements.

AWARD :—No. 1710 ; highly commended.

Class 631.—Rifles, Fowling-pieces, &c.

1711 F. Lassetter & Co., 421, George-street. Trophy of rifles and shot guns.

1712 Charles Cowles, 205, Pitt-street. Rifles and guns. One gun partly made to show the process.

1713 Volunteer Authorities. Armstrong Gun, 40-lb. Stand of military arms.

AWARD :—No. 1712 ; bronze medal.

JURORS' OPINION.—No. 1712.—Sample of double-barrelled muzzle-loading gun, made in this Colony.—No. 1713.—A good sample of regulation-pattern stand of arms. The Henry-Martini rifle, exhibited by the Volunteer authorities, appears to us a remarkably efficient weapon.

Judges

IN CLASSES 632, 633.

W. F. NORRIE, | JAMES DONALD,
 PROFESSOR A. M. THOMSON, PH. D.

TOYS, TO INCLUDE MODELS OF VESSELS, &c.**Class 632.—Models of Steam Engines.**

- 1714 John Cuthbert, Miller's Point. Six models of vessels.
 1715 Henry Beattie, 14, Harris-street, Pyrmont. Ships' models.
 1716 Gordon & Gotch, 281, George-street. Working model steamship, and models of sailing vessels. Instructive toys; English manufacture.

NON-COMPETITIVE.

- 1717 Mort's Dock and Engineering Company, Balmain. Model of a screw steamer for the Queensland Government.

AWARDS :—No. 1714; bronze medal.
 1715 } highly commended.
 1717 }

JUDGES' OPINION.—No. 1717.—Deserving of high commendation for design, rig, and finished workmanship.

Class 633.—Models of Pumps and Machines of all kinds.

- 1718 Allan A. Marshall & Co., Bon Accord Works, Macquarie-place. Model of tallow-gas apparatus. Model of an apparatus for the manufacture of gas from tallow, suitable for villa residences, country shops, stores, &c.

NON-COMPETITIVE.

- 1719 G. A. Green, Balmain. Model of centre-wheel life and pilot boat, with plans explaining same.
 1720 William Mills, Newtown. Model of safety-raft.

AWARDS :—No. 1718; highly commended.
 1719; commended.

JUDGES' OPINION.—No. 1718.—This is a model of an apparatus by which illuminating gas can be manufactured from tallow and refuse fatty material in an economical and simple manner. The method is perfectly successful, and has been frequently adopted. It would no doubt have come into general use in country places had it not been for the introduction of kerosene oil. The model deserves high commendation. No. 1719.—Deserves commendation for ingenuity, but we consider it impracticable for the purpose intended. No. 1720.—Impracticable for ships; may be useful in case of floods.

SCIENTIFIC TOYS.

Class 634.—Bats and all kinds of Boys' Toys.—No entry.

Class 635.—Dressed Dolls, and all Girls' Toys, including all for the amusement of Children.—No entry.

SECTION V.—PRODUCTS, RAW AND MANUFACTURED, OF MINING INDUSTRY, FORESTRY, &c.

Judges

IN CLASSES 636-689, 641, 642

CHARLES WATT, | ROBERT HUNT,
F. B. MILLER.

Stewards:

PROF. A. M. THOMSON, PH.D., | W. WALLIS.

MINING AND METALLURGY.

Class 636.—Specimens of Gold Quartz and Auriferous Ores.

1721 Professor A. M. Thomson, University. Labelled collection geological and mineralogical specimens.

1722 Secretary of Mines, Victoria. Collection geological and mineralogical specimens:—

1. Auriferous quartz.—Maryborough District.
2. Auriferous quartz.—Stanley, half a mile from Hurdle Flat.
3. Auriferous quartz, with mundic and galena.—Castlemaine.
4. Auriferous quartz.—Staffordshire Reef, Ballarat.
5. Auriferous quartz.—Lucky Reef, No. 1, Mount Pleasant Diggings.
6. Auriferous quartz and pyrites, on slate.—Cattle's Reef, in the Australian United G. M. Company's Mine, Fryerstown. Yield of gold to the ton, 10 dwts.
7. Auriferous quartz.—This specimen will be found to be very interesting to the mineralogist, from the peculiar structure of the cavities, and the occurrence of gold in them.—From the North Star Claim, Energetic Reef, Lauriston. Depth from the surface at which the specimen was obtained, 110 feet; depth of the water-level, 110 feet; width of the reef, 22 feet; average yield of gold per ton, 1 oz. 10 dwts. (Quartz of a similar character to this specimen is called "honeycomb quartz" by the miners.)
8. Auriferous quartz.—The gold occurs in the cavities of the laminations of the specimen in association with a pale greenish clay-slate. Some of the gold is extremely fine.—From the North Star Claim, Energetic Reef, Lauriston. Depth from the surface at which the specimen was obtained, 132 feet; depth of the water-level, 110 feet; width of the reef, 2 feet; average yield of gold per ton, 2 ozs.
9. Auriferous quartz, with galena and pyrites.—The association of gold in this specimen with the sulphides is remarkable.—From Clunes.

- 1723 Professor A. T. Abel, Mair-street, Ballarat. Case of auriferous ores and samples of gold obtained therefrom. Not for sale. The exhibit contains a variety of auriferous ores, chiefly from the Ballarat District, and have been selected with the view of showing the efficiency of a new chemical compound (to be used with quicksilver in the ordinary way) in the extraction and saving of the fine particles of free and pyritous gold.
- 1724 Latham & Watson, Sandhurst, Victoria. Specimens of quartz.

NON-COMPETITIVE.

- 1725 Thomas Ireland, Lloyd's Chambers. Gold quartz.

AWARDS:—No. 1722; silver medal. [To R. Brough Smyth, Esq., for his valuable collection of auriferous specimens, geological and mining maps, mineral ores, and fossils of Victoria.]

JURORS' OPINION.—No. 1721.—Specimens of gold quartz. A comprehensive collection of small specimens of gold quartz and gold ores, excellent for variety; contains remarkable specimens of gold in calcite and gold in chalcidony. No. 1722.—Varied collection of fine specimens of gold quartz, pyrites, and other ores, models of nuggets, &c., highly interesting collection of specimens of gold quartz and ores, with samples of gold extracted therefrom, intended to illustrate a new but undescribed process of amalgamation. No. 1723.—Auriferous Minerals.—1. The exhibit contains a variety of auriferous minerals from the gold-fields of Victoria, selected with the view of showing the efficacy of Professor Abel's chemical compound, used in combination with quicksilver in the ordinary way, in the extraction and saving of the fine particles of free and pyritous gold, which constitute such a large percentage of the loss in the usual method of treatment by quicksilver alone. 2. Some of the specimens of minerals, such as the slaty sandstones (*see* Nos. 27 to 34 in the following list and corresponding numbers in the case), the ironstone, No. 36, and globular trap, No. 1, have perhaps, never before been proved to be remuneratively auriferous by any system of analysis, and afford an illustration of the inexhaustible golden treasures of the Colony of Victoria. 3. The samples of gold have been extracted by the Professor's process from the minerals exhibited with the corresponding numbers. It should be noted that the gold obtained by the process is of equal standard to the ascertained value of the gold of the districts named, and also that the granulated or dust condition of the gold is in its natural state as in the matrix, and is unaltered in form by the Professor's process. 4. The fine quality of gold from the Cypress Quartz Company, No. 3, obtained, has never been equalled by any system of treatment hitherto. The stone was too poor to work by the ordinary system, but yielded 6 dwts. per ton by the Professor's process upon a trial of 5 tons. (*See* also the samples of gold from the sandstones yielding from 2 to 5 dwts. per ton, No. 8.) 5. The samples of pure pyrites and the gold extracted therefrom (No. 63) are both important and interesting, as showing the extract of gold from the sulphides without calcining or roasting. In fact, the chemical agent used possesses the property of desulphurizing the pyrites, and at the same time of preventing the sickening of the mercury. 6. The present is the first public exhibit of the result of the trial of the Professor's process for practical mining purposes, and it should be added that arrangements are now in progress to test its capability to operate upon large quantities with equally successful results as upon small quantities. Finally, the cost of the process is comparatively nominal, and its use will materially reduce the cost of the present system of treatment with quicksilver only.

No.	Name.	Where from.	Remarks.
1—3	Globular trap ...	Ballarat	Contains by analysis 2 dwts. of gold per ton.
3	Basalt	"	Not analysed.
4	Milky quartzs	"	Pure quartzs.
5	Quartzs (gold visible)..	Majorca	Yield, 8 ozs. per ton.
6	" " " " ..	Beechworth—U. Happy Valley Co.	Yield, 25 ozs. per ton. (See sample No. 1.)
7	" " " " ..	Ballarat—Sovereign Co.	Yield, 2 dwts. 10 grs. per ton.
8	" " " " ..	Cypress Co., Linton ...	Yield, 6 dwts. per ton (from a trial of 5 tons at Black Hill works, Ballarat. (See sample No. 3.)
9	" (coloured) ...	" " " " ..	" " " " ..
10	Ferruginous quartzs...	Ballarat	Yield, 8 dwts. per ton.
11	Coloured " " " ..	Gordon	" 3 " " "
12	Graphitic " " " ..	Isis Co., Stuartmill ...	" 21 " " "
13	White " " " ..	Ossiris and Isis Co. ...	" 21 " " "
14	Slaty " " " ..	Gordon	" 21 " " "
15	" " " " ..	Egerton	" 21 " " "
16	White " " " ..	Llanberris Co., Ballarat	" 2 " " "
17	Antimony, with gold visible.	Costerfeld Co., Meathcote.	" 4 " " "
18	Sulphuret of antimony	Gippsland	" 10 dwts. "
19	Quartzs	Carngham	" 2 ozs. "
20	Arsenical pyrites ...	Dunolly	Interesting specimen.
21	Mixed ore, containing sulph. of lead, zinc, and iron.	" " " " ..	Yield, 2 ozs. of gold per ton.
22	Pyritous quartzs ...	Figgoreet... ..	" 10 dwts. " "
23	Quartzs, containing chlor. and bomite of silver and gold.	St. Arnaud	Rare and valuable specimen.
24	Antimony and ochre.	Gippsland	Yield, 10 dwts. per ton.
25	Quartzs	Llanberris Co., Ballarat	" 8 " " "
26	" " " " ..	Tibbett's Co., Linton ...	" 1 oz. " "
27	Slaty red ironstone ...	Gordon	" 3 dwts. " "
28	ochre sandstone	Ballarat	" 5 " " "
29	" (light) sandstone	" " " " ..	" 2½ " " "
30	" sandstone	" " " " ..	" 4 " " "
31	Grey sandstone, containing arsenical pyrites.	Sovereign Co., Ballarat..	" 3 " " " (The stone taken from 300 feet deep.)
32	Grey sandstone, with pyrites.	" " " " ..	Yield, 2½ dwts. per ton.
33	" " " " ..	" " " " ..	" 2½ " " "
34	" " " " ..	Black Hill	" 3 " " "
35	Clay slate	Ballarat	No gold. "
36	Slaty hydro-oxide of iron.	" " " " ..	Yield, 4 dwts. "
37	Iron pyrites in clay slate.	Stelglitz	" 10 " " "
38	Ferruginous quartzs...	Ballarat	" 4 " " "
39	Carbonate of iron ...	" " " " ..	" 6 " " "
40	Sediment of carbonate of iron.	Warrenhelp	From a well. "
41	Hydro-oxide of iron...	Linton	Yield, 3 dwts. per ton.
42	Grey sandstone ...	Ballarat	" 5 " " "
43	Carbonate of iron and prase quartzs.	Black Hill, Ballarat ...	Mineral specimen. "
44	Chlorite quartzs ...	" " " " ..	" " " " "
45	Cement	Ballarat	Yield, 4 dwts. per ton.
46	Pailomelane (manganese, barytes, &c.)	Linton.	" " " " "
47	Prase quartzs	Black Hill	Specimen.
48	Hyalite on basaltic rock.	Ballarat	" " " " "
49	Aranganite on basaltic rock.	" " " " ..	" " " " "
50	Kaolin	Lal-lal	" " " " "
51	Olivine in basalt ...	Buninyong	" " " " "

No.	Name.	Where from.	Remarks.
52	Tungstate of iron, imbedded in quartz.	Linton	Specimen.
53	Avanturene quartz ...	Egerton	Yield, 2½ dwts. per ton.
54	Amber	Rokewood	Specimen.
55	Opal	Footscray	"
56	External crust of meteorite, No. 57.	Cranbourne	The meteorite is in Melbourne Museum.
57	Specimen of A. T. Abel's meteorite.	Western Port.	"
58	Chemical preparations (5) for colours, from antimony ore.	... ..	Prepared by Professor Abel.
59	Pure pyrites, being refuse after gold extracted at rate of 141 ozs. per ton (see gold sample No. 7).	Carngham.	"
60	Pyritous sand ...	Daylesford	Yield, 1 oz. 36 gra. per ton.
61	Refuse tailings of No. 60 after gold extracted.	... ..	"
62	Pyritous sand... ..	Scottish and Cornish Co., Buninyong.	" 2 ozs. "
63	Concentrated pyrites	Stieglitz	" 11 "
64	Quartz tailings ...	Pleasant Creek	" 5 dwts. 5 gra. "

Samples of gold extracted from the minerals by Professor Able's process:—

1. From United Happy Valley, quartz.—See No. 6 mineral.
2. From tailings from ditto.—See No. 6 mineral.
3. From Cypress Company, quartz.—See Nos. 8 and 9 minerals.
4. From pyrites, Llanberris Company.—See mineral No. 25.
5. From quartz tailings, Little Bendigo.—Yield, 5 dwts. per ton.
6. From black sand, Wimmera.—Yield, 8 ozs. per ton.
7. From pyrites (No. 59), Carngham.
8. From slaty sandstone, Ballarat.—Mineral No. 28.
9. From antimony, Gippsland.—Mineral No. 24.
10. From 1 oz. soot from the furnace-chimney, Oriental Bank, Melbourne.—Yield, 60 ozs. per ton.

No. 1724.—Highly interesting collection of fine specimens of gold quartz from depths of 50 to 500 feet; also samples of pyrites, gold quartz, and crystals.

Class 637.—Models, Drawings, Samples, &c., to illustrate the treatment of Auriferous Ores.

1726 Trustees of Public Library, Melbourne. Stampers, used in crushing quartz reef, and models of mining machinery and boring machines, and processes used in amalgamating.

AWARD:—No. 1726; bronze medal.

JURORS' OPINION.—No. 1726.—A series of interesting models, illustrating the treatment of auriferous ores.

Class 638.—Specimens, to show various modes of occurrence of Gold.

- 1727 Professor Alex. M. Thomson, University. A labelled collection of specimens.
- 1728 Latham & Watson, Sandhurst, Victoria. Specimens of auriferous quartz.

AWARD :—No. 1727 ; bronze medal. (See 1791 also.)

JURORS' OPINION.—No. 1727.—The same collection as No. 1721, class 636 ; shows occurrence of gold in many and some rare instances. No. 1728.—Modes of occurrence of gold. The same collection as No. 1721 ; shows gold in quartz, in pyrites, associated with graphite.

Class 639.—Collections of Diamonds and Precious Stones.

- 1729 Professor Alex. M. Thomson, University. Labelled collection of specimens.
- 1730 T. T. Jones, 330, George-street. Diamonds, sapphires, rubies, &c. ; Colonial diamonds, cut and rough ; also, rubies, sapphires, amethysts, emeralds, &c.
- 1731 G. Milner Stephen, F.G.S., &c., Roslyn-street, Darlinghurst. A collection of Australian diamonds and other precious stones, classified according to the best authorities ; together with another collection of East Indian gems. Sapphires, hyacinths (red zircons), and blue and white topazes of considerable value, size, and lustre, are found in many localities in New South Wales ; whilst diamonds, of the first water, and of three carats in weight, have been frequently found, and subsequently cut in Europe.
- 1732 T. T. Jones, 330, George-street. Jewellery, gems, &c.
- 1733 Trustees of Public Library, Melbourne. Gem stones.

*Rev. Dr. Bleasdale's collection of Colonial and other Gem Stones.—
Exhibited by the Commissioners.*

CORUNDUM.

- (1.) Sapphires, blue.—From Beechworth, Malsbury, and Gippsland Diggings ; all in the rough state.
- (2.) Ruby.—From William Wallace Creek, 45 miles from Melbourne.
- (3.) Oriental Emerald.—From Donnelly's Creek, Gippsland, mounted as a ring stone, cut by Power, of London ; another, from near Glenlyon (Jimcrow Ranges), cut by Spink, of Melbourne ; both perfect gems of the rarest kind. Other specimens of the same, both opaque and transparent, from Jimcrow and William Wallace Creek.
- (4.) Oriental topaz in the rough.—From William Wallace Creek.
- (5.) Oriental aqua-marine ; two specimens, cut by Spink ; others in the rough.—From William Wallace Creek.
- (6.) Oriental amethyst ; one cut small ; others in the rough state ; mostly small.
- (7.) Hair-brown star sapphires ; two cut.—From Gippsland.
- (8.) Others in the rough, both blue and green.—From Jimcrow and Donnelly's Creek.
- (9.) Barlyite (opaque ruby) from Beechworth.
- (10.) Miscellaneous collection, showing the materials in which sapphires are usually found.

TOPAZ.

- (1.) White.—From Victorian Gold-fields generally.
- (2.) Blue.—From Beechworth, Gippsland, and Mount Greenock, near Talbot.
- (3.) Pink.—One from Ceylon in ring; others in the rough, from Brazil.
- (4.) Brown.—From Brazil.
- (5.) Yellow.—From Saxony.

SPINELLE.

From near Ballarat and Beechworth.

GARNETS.

From Beechworth and the Goulburn Gold Fields.

ZIRCONS.

From nearly all Victorian Gold-fields, being very common; one fine specimen cut in London.

HYACINTH.

Common in Victoria, but seldom of large size.

QUARTZ SERIES.

(a.) *Transparent.*

Rock crystal, cairngorm of all shades, rose quartz, amethyst.—All from the Ovens and Beechworth district.

(b.) *Translucent and Opaque.*

Chalcedony, sard, sardonyx, onyx; and their transition samples over to agate and flint.

JASPER.

Of several shades.—From about Omeo.

1734 N. Bartley, Brisbane. Group (60) of Queensland agates, chalcedon, bloodstone, onyx, cornelian, cameo, &c., collected at Cave Creek, head of Gilbert River, Gulf of Carpentaria, Agate Creek, and at Barambah Creek, Burnett River. Group (50) of pyrope, carbuncle, or fire garnet, collected in the South Burnett District.

AWARD :—No. 1729.

JURORS' OPINION.—No. 1729.—A varied collection of rough stones, including diamonds, and most of the rare gems, carefully arranged and labelled, highly interesting, and very instructive as an educational series. No. 1733.—Collection of various gems, rough and cut, containing small and beautiful specimen of cut Oriental topaz. No. 1734.—Beautiful collection of silicious stones, cornelians, agates, &c., together with garnets.

Judges :

CHARLES WATT, | PROF. A. M. THOMSON, PH. D.,
DR. A. LEIBIUS.

Class 640.—Apparatus and Processes for the Extraction of Gold, Diamonds, and Precious Stones.

- | | | |
|------|---|---|
| 1735 | Mort's Dock and Engineering Company, Balmain. | Quartz-crushing machine. Stamper-heads, each weighing 400lbs. |
| 1736 | Ditto ditto ditto ditto. | Quartz-crushing machine. Patented by Dr. Beer. |

- 1737 G. Milner Stephen, F.G.S., Darlington. The "Prospector's Friend," being a portable quartz-crushing machine for prospecting parties, with Stephen's amalgamator attached. This machine is invented to enable quartz-working miners to employ their own stamping machinery and prospectors to travel with it through the country, piecemeal, if necessary. Its portability, cheapness, and effectiveness, will make quartz-reefing a less hazardous occupation. The powerful spiral springs, which are a new principle introduced by the exhibitor, give an enormous increase of force to the stampers—equal to many hundreds of pounds weight—shod with steel, secure durability, with lightness; the lifting cams being in two parts, facilitates the removal of a broken arm.
- 1738 G. Milner Stephen, F.G.S., Darlington. "Patent Gold and Diamond Cradle Amalgamator," for washing auriferous soils, tin-streaming, cleaning ores, saving diamonds, and other precious stones, fine and coarse gold, or other broken-up minerals (being metalliferous), including tin sands, amalgamating gold dust—all operations being simultaneous; or of crushing calcined quartz, cements, dried clay balls, and washing out and amalgamating the gold. It weighs under 9 cwt. Price, £75, including license or royalty. This machine has been invented to suit every description of gold-mining, though specially adapted for alluvial operations; and as it has got through a ton at a time, at the rate of 96 to 120 tons of wash-dirt in 24 hours, *by the watch* (one-third being pipeclay), and never lost one gem or grain of gold during seven weeks operations, its great commercial value to the mining community, and to the Colony at large, can scarcely be overrated, as its low price brings it within the reach almost of every working miner.
- 1739 G. Milner Stephen, F.G.S., Darlington. "The Hammer Battery." This light and effective stamping battery, on entirely new principles, is invented by the exhibitor to enable the working miners to dispense with steam-engines and the heavy cost and carriage of the ordinary stamping-mills and plant. It may be used either with "Stephen's Amalgamator" only, or in connection with his "Patent Gold and Diamond Cradle," the tailings being then crushed coarser and ground into flour by the rollers, an immense increase of work being the consequence.

AWARDS :—No. 1735 }
 1736 } bronze medals.
 1738 }

JURORS' OPINION.—No. 1735.—Mort's Quartz-crushing Machine (1735 & 1790), ten head-stampers, each weighing 400 lbs., is the ordinary battery with recent improvements, and is considered the simplest, most effective, and economical permanent quartz-crushing plant. It is necessarily more cumbersome than the two other machines exhibited, which have been recently invented with the special view of providing a more portable apparatus. The quartz-crushing machine, invented by Dr. Beer, is not urged downwards simply by the force of gravity, but its velocity is augmented by the action of a spring, whereby an increase of force is obtained without adding to the weight of the apparatus. This new principle is introduced in a very simple and practicable manner, thus affording to reef prospectors an easily portable machine of the requisite power. Whether in economy of working it is likely to supersede the ordinary apparatus, it will require the test of experience to decide. A small form of Dr. Beer's machine, consisting of a single stamper, and workable by hand-power, is called the "Independent Reefer." From its easy portability and its working power the inventor regards it suitable for

testing the auriferous value of reefs in the most inaccessible parts of the country, thus unfolding one of the most important mineral resources of the Colony. In Mr. G. Milner Stephen's "Hammer Battery" (1739), the chief aim is to provide a light and easily portable, and, at the same time, an inexpensive, quartz-crushing apparatus, possessing the requisite power. The work is done by a battery of hammers, instead of stampers, as in the ordinary machines. The momentum of the hammers as they descend is increased by the action of a spiral spring. The handles to which the hammer-heads are attached are not perfectly rigid; they are made of stout steel rods; and the inventor considers it advantageous to let them retain a particular degree of elasticity. This facilitates the cracking of the larger stones into smaller fragments, which the succeeding blows of the hammer reduce to powder. As far as we are aware the machine has not been put into actual operation. Mr. G. Milner Stephen's Patent Gold and Diamond Cradle Amalgamator (1738), as well as Hunt's Patent Gold and Diamond Saving Machine (2088), might have been included in class 656, apparatus for washing and dressing ores. As these machines are not comparable with the quartz-crushing apparatus exhibited in class 640, we take the liberty of transferring them to class 657, so as to compare their respective merits, and to make a special award. Mr. Stephen's apparatus combines several operations. It has been submitted to several public trials, and was found to be rapid and effective in working. The Judges would award a bronze medal for this exhibit in class 656. Mr. Hunt's machine is well known in connection with the diamond workings at Two-mile Flat, near Mudgee. Under careful management it has been found a trustworthy method of extracting precious stones; it deserves high commendation. In estimating the respective merits of the above exhibits the Judges have consulted some of the best authorities in engineering and mechanical skill, and in the practical working of auriferous materials.

Class 641.—Ores of the Various Metals.—Gold, Silver, Copper, Lead, Iron, Mercury, Tin, Antimony, Bismuth, Manganese, Zinc, Nickel, Cobalt, &c.

- 1740 Professor Alex. M. Thomson, University. Labelled collection of geological and mineralogical specimens.
- 1741 Eldred & Spence, Margaret-street. Silver, lead, and other ores.
- 1742 Saul Samuel, 3, Spring-street. Specimens of ores of various metals. Not for sale.
- 1743 John Moore, Armidale. Mineral specimens. Collection of specimens from Oban, N. England District.
- 1744 John Abbott, George-street, Hobart Town. Specimens of iron ore.
- 1745 Woolgarlo Lead Mining Company (limited). 44 pigs of lead, specimen of ore, specimen of dressed ore. Woolgarlo is situated about 15 miles from Yass, and near the junction of the Yass and Murrumbidgee Rivers. The lead is the first produced in this Colony; it contains about 17 ozs. of silver to the ton. The dressed ore contains 80 per cent. of lead, and is valued at from £12 to £13 in the English market.
- 1746 Benj. H. Dods, Belmore Freehold, Bombala. Sample of lead-ore as it comes out of the mine; sample of lead-ore, dressed ready for smelting; one ingot of pig lead, smelted from same ore.

NON-COMPETITIVE.

- 1747 W. K. Nesbitt, 19, King-street. Malachite specimens. Price, £21.
 1748 John Woodward, Orange. Samples of copper-ore. The copper is from the Canoblas and Cadia Copper Mines, near Orange.
 1749 William Selwood, Springside, near Orange. Case of specimens of copper-ore.
 1750 Thomas Ireland, Lloyd's Chambers. Antimony-ores.
 1750A Josiah Holman, Cadia. Specimens of copper-ore from Cadia Copper Mines.

AWARDS :—No. 1742 }
 1745 } bronze medals.

JURORS' OPINION.—No. 1742.—Extensive collection, comprising specimens of ores of most of the useful metals, as well as gold and silver ores, and some of the rare minerals; many of the specimens very beautiful. No. 1743.—Remarkable specimens of crystallized quartz and feldspar, isolated and associated. No. 1749.—Pleasing specimens of sulphides, carbonates, and oxides of copper, with native moss copper.

Judges

IN CLASSES 642, 643, 654, 654A.

JOHN RUSSELL, | J. P. FRANK.

Class 642.—Metals and Alloys.—Crude, refined, and wrought.

- 1751 A. Chisholm, 183 and 185, Pitt-street. Specimens of lead, encased block-tin for conducting gas, water, and liquid. For preventing lead-poisoning in water and other potent liquids. Same price as common lead pipe.

NON-COMPETITIVE.

- 1752 Lewis Lloyd Icely, *per* Walter Friend, Esq., York-street. One ingot of copper.

AWARD :—No. 1752; highly commended.

JURORS' OPINION.—No. 1751.—If sold at the same price as common lead pipe ought to be highly recommended. No. 1752.—A very fine sample of copper, and is deserving of notice, although non-competitive.

Class 643.—Iron and Steel.

- 1753 City Iron Works, Pyrmont. Iron-bars, tires, rails, and angles. Price, £11 10s. and upwards. Scrap-iron, hammered and rolled.
 1754 A. Chisholm, 183 and 185, Pitt-street. Samples of iron and steel.

AWARD :—No. 1753; silver medal. [For the introduction of new manufactures of iron into the Colony, especially plates and railway-tires.]

JURORS' OPINION.—No. 1753.—First-class samples of girder-plates, tire iron, angle-iron, &c., &c.; and being Colonial products we would recommend the highest prize to be given.

Judges

IN CLASSES 644, 645.

CHARLES WATT,

| Dr. A. M. THOMSON.

Class 644.—Coal and other Mineral Fuels.

- 1755 Thomas Saywell, 4, Park-street, and John Garsed, Bowenfells. Coal from Vale of Clwydd Colliery, Hartley. Price, 5s. per ton at the pit. The Vale of Clwydd Colliery is on the northern edge of the Great Hartley Coal Basin. This coal was discovered cropping out on the south side of a high mountain, 200 feet from the base. On being opened up it gave a working width of nearly 11 feet, without fault or band. It has been found to be a good steaming coal, leaving little or no clinker; its co-operative qualities equal to coal from the best Welsh mines. On the north side of the said mountain is Lithgow Valley; on this side the exhibitors have commenced sinking a shaft, and anticipate bottoming on the seam at a depth of 300 feet. The same seam crops out at Bowenfells. The distance from station is 2½ miles.
- 1756 Woolley & Anderson, Lithgow. Coal from Hermitage Colliery, Bowenfells.
- 1757 Thomas Brown, Esk Bank, Hartley. Coal.
- 1758 Newcastle Wallsend Coal Company, Sydney. Sample of coal. Seam worked by the Company is 8 feet 6 inches thick. The Company's mines are situated at Wallsend, 8 miles from the port of Newcastle, with appliances for producing over 1,000 tons per day.
- 1759 John M'Kenzie and Edward Gell, Bathurst. Specimen of coal. From the Bowenfells Coal Mining Company's mine, showing a depth of seam 10½ feet.
- 1760 Eldred & Spence, 62, Margaret-street. Coal and shale. From a new seam at Anvil Creek.
- 1761 Edward Campbell, Cook's River. Coal from Mr. Campbell's own mine, Rix Creek, near Singleton.
- 1762 Ditto ditto. Coke manufactured from coal out of Mr. Campbell's own mine, Rix Creek, near Singleton.
- 1762A Laidley, Ireland, & Co. Sample of coal and coke.
- 1762B James Shoobert, Exchange. One block of coal from the Bulli Coal Company's mine. Exhibited merely as a sample of Southern Mine steam coal.
- 1762C L. Wallace Barnett, Brisbane. A chess-table, an obelisk, and a toilet-table casket, made of marble from the Calliope Quarries: and eighteen pieces of polished marble.

AWARDS :—No. 1758; bronze medal.

1757	} highly commended.
1760	
1755	} commended.
1761	
1762A	
1762B	

JURORS' OPINION.—No. 1758.—Thick and uniform seam of clean coal, analytical particulars as follows :—The exhibitors of coal have not furnished any particulars which can guide either the public or the Judges in estimating the respective merits of their fuel for the various purposes of manufacturing or domestic use. It would be desirable to know in each case at least the percentage of ash in the coal, as well as its gas producing and evaporating

qualities. In the absence of these particulars the Judges have felt great diffidence in making any award in this class; but they consider that the award, if made deservedly, falls to the Wallsend Coal Company, inasmuch as this exhibit is one of the thickest, finest, and most compact blocks shown; also, the character of the coal is well known, and analytical certificates have been furnished respecting it. It yields 43 parts of ash and 12 parts of clinker in 1,000, and evaporates 8½ lbs. of water to 1 lb. of coal consumed. In the case of no other exhibit have similar particulars been obtainable. The Judges would highly commend many other samples of coal exhibited, all of which they well know to possess their respective special points of excellence. Particular attention is invited to the various exhibits from the coal-field in the Western district, of which Mr. Thomas Brown exhibited the finest specimens, and which are of the greatest importance, as tending to develop manufacturing and mining industries in that part of the Colony. An average sample of one of these exhibits, which was submitted to trial by the Judges, gave 17 per cent. of ash. No. 1760.—Ash, sulphur, evaporating power, yield of gas unknown; several varieties exhibited. No. 1757.—Great thickness and uniformity of seam. No. 1762A.—One of the thickest blocks exhibited. The seam shows a few bands and a little pyrite. No. 1762B.—Fine block of coal of uniform character, more friable than other varieties exhibited.

Class 645.—Kerosene Shale.

- 1763 The Western Kerosene Oil Company, (limited.) Kerosene shale. Taken from the Western Kerosene Oil Company's Mines, near Mount Victoria.
 1764 John Abbott, George-street, Hobart Town, per T. Barker, Esq., Brinelly. Two bushels Senie bituminous steam coal.

NON-COMPETITIVE.

- 1765 Edward Latham, 10, Comber-street, Paddington. Pillar of Hartley coal, and product in the shape of a bust. Not for sale.

AWARD :—No. 1763; (see also 1802.)

Judges :

A. W. NORTON, W. HALLEY,	|	WM. ALDERSON, EDWARD BELL,
JAMES BARNET.		

Class 646.—Brick Tiles, Drain-pipes, &c.

- 1766 A. Tornaghi, 312, George-street. Paving-tiles.
 1767 Thomas Field, George-street, south. Collection of pottery.
 1768 Arthur T. Holroyd, Sherwood Scrubs, Parramatta. Bricks, drain-pipes, roofing-tiles, flooring-tiles, &c. Prices as follows, delivered at the works :—Drain-pipes (inside diameter), 1-inch, 25s.; 1½-inch, 30s.; 2-inch, 45s.; 3-inch, 80s. per 1,000; 6-inch, 3d. per foot; □ 4-inches by 8½-inches, 1½d.; junctions and bends of all kinds and sizes; roofing-tiles—pantiles (170 to the square), £10; plain tiles (412 to the square), £4; Gothic tiles (412 to the square), £5 per 1,000; ridge-tiles, 14 inches, 1s. 6d. each; flooring-tiles, 25 to the square yard, £10 per 1,000.
 1769 Rupert Cook, Marrickville. Sand stock-bricks, slop-bricks, paving-bricks.

- 1770 Abel Harber, Marrickville. Sand stock-bricks.
 1771 Goodlet & Smith, 483, George-street, near Bathurst-street. Drain-pipes, bricks, doors, sashes, and building materials.
 1772 Luke Nowlan, Gillbrook Pottery, Brunswick, Melbourne. Stoneware patent damp proof course, for preventing damp rising up the wall, and for ventilating under the floor. 9-inch course, 6d. each; 14-inch course, 9d. each. This is a stoneware tile or flag, 2½ inches thick, perforated along its length for laying along the top of the foundations of a building, prior to the bricks being commenced; the perforation prevents the damp rising and secures ventilation; the two sizes sent are for walls 9 inches thick and 14 inches thick.
 1773 William Gordon, Lambeth Pottery, Brunswick, Melbourne. Stoneware pottery. Made from clay found at Brunswick, near Melbourne.
 1774 J. B. Guthrie, Bendigo Pottery, Sandhurst. Glazed stoneware piping.

AWARDS:—No. 1768 }
 1771 } bronze medals.
 1767; highly commended.
 1772; commended.

JURORS' OPINION.—No. 1767.—A collection of good glazed drain-pipes for sewage, and paving-bricks of good quality. No. 1768.—An excellent collection of unglazed earthenware, consisting of first-class subsoil drain-pipes, of various shapes and sizes, suitable for agricultural drainage; also, bricks of good quality, and pantiles suitable for shed-roofs; also, plain tiles of superior make, and commendable for their simplicity of application to roofing in general, and flooring-tiles of good quality. The whole of these articles are offered at very reasonable prices. No. 1771.—This exhibit we consider to be the best collection of glazed earthenware, consisting of sewage-pipes, flooring or paving-bricks, air-bricks, and damp-course; also, good specimens of terracotta, applicable to building purposes, and bricks of good quality for ornamental purposes. No. 1772.—This exhibit is of fair quality.

Judges

IN CLASSES 647-651.

EDWARD BELL, | JAMES BARNET.

Class 647.—Stones for Building and Ornaments.—Marble, Granite, Slate, Serpentine, Porphyry, Basalt, &c.

- 1775 Castlemaine Paving Company. One hearth-stone, sawn and planed; one ditto, sawn and quarry-faced; one piece of shelving, sawn and planed both sides; one ditto, ditto.

NON-COMPETITIVE.

- 1776 John Woodward, Orange. Samples of marble. Quarries near Orange.

AWARD:—No. 1775; bronze medal.

JURORS' OPINION.—No. 1775.—This is a valuable exhibit, and no doubt will be extensively employed.

Class 648.—Stone for Macadamizing Roads, Kerbing, and Guttering.

1777 Larkin & Co., Sydney. Blue metal.

AWARD :—Commended.

JURORS' OPINION.—A sample of good road-making material.

Class 649.—Flagging for Pavements.

1778 A. Chisholm, 183 and 185, Pitt-street. Design for encaustic and geometrical tile pavements. For churches, entrance-halls, public buildings, &c.

1779 A. Tornaghi, 312, George-street. Geometrical, Mosaic, and plain tiles, for pavement. Price, from 10s. to 14s. per square yard. Quality equal to the best imported, and lower in price; made from clay obtained at Enfield, Sydney.

1780 Castlemaine Paving Company. One piece of street-flagging, sawn 3 inches thick.

AWARD :—No. 1779; bronze medal.

JURORS' OPINION.—No. 1779.—This exhibit is of remarkable merit, being a Colonial manufacture, combining with a durable material geometrical accuracy and artistic design in form and colour, forming a flooring material well-adapted to halls, passages, and verandahs, for houses in this Colony.

Class 650.—Mill, Grind, and Hone Stones.

1781 F. Lassetter & Co., George-street. Grindstone of New South Wales stone.

AWARD :—No. 1781; commended.

JURORS' OPINION.—Fair sample of Colonial grindstone.

Class 651.—Kaolin, Fire, and other Clays.

1782 Thomas Brown, Eskbank. Fire-brick.

1783 Ditto. Fireclay.

1784 G. D. Guthrie, Sandhurst. Pipeclay, stoneware, and fireclay.

AWARDS :—Nos. 1782 and 1783; bronze medal.

JURORS' OPINION.—Nos. 1782 and 1783.—These are valuable exhibits and should be encouraged.

Class 652.—Plumbago.—No entry.**Class 653.—Plaster and Cements.—No entry.**

Judges :

GOTHER K. MANN, |

J. SMITH, M.D.

Class 654.—Models, Drawings, &c.

To show the working of mines and quarries, with appliances used for lifting, pumping, draining, ventilating, lighting, blasting, driving, timbering, &c.

1785 Anthony Fenwick Errington, engineer, Ballarat. Model of submarine and exploring machine, to take up auriferous ground, to extract the gold at the same time; capable of raising 15 tons per hour on scale of present model; estimated cost to be £7,000; guaranteed to realize £2,000 per week in rivers (golden), New Zealand. The principle being unlimited can discharge cargoes, take up treasure, &c., from sunken vessels at any depth.

NON-COMPETITIVE.

1786 D. N. Joubert, Sydney. Model of the Peak Downs Copper Mine, by J. S. Mitchell.

AWARD :—No. 1785; bronze medal.

JURORS' OPINION.—No. 1785.—A working model to the scale of $\frac{1}{4}$ -inch to the foot. Ingeniously constructed. No. 1786.—The model is very complete, and well made.

Class 654a.—In Coal Mines.

1787 John M'Kenzie, Wallerawang, and E. Gell, Bathurst. Model, showing the outcrop and dip of the 10 ft. 6 in. seam of coal running throughout the Bowenfells Coal Mining Company's property. The seam of coal which underlies the area has been proved by shafts and adits on and surrounding it, and at the outcrop near the railway, as shown in the model, to be of an equal thickness of 10 $\frac{1}{2}$ ft. all through. Of the quality of the coal the Rev. W. B. Clarke's report states that it is denser than that of Anvil Creek, contains less sulphur, is non-caking, and burns freely, and that from its structure it can be cut out in large, clean, solid blocks, without much slack, therefore offering every favourable condition for transport. Mr. Keene, Government Examiner of Coal Fields, in his report, recently published, states that from his own examination he can confirm all that Mr. Clarke has reported as to the extent, thickness, quality, and facility of working the coal. The outcrop is situated above the level of the railway, and immediately contiguous to it, so that it can be worked by open cuttings or tunnels, from which the coal can be conveyed by gravitation on to the line. About 700 acres of the land are to the rise of the proposed levels, so that 6,552,000 tons of coal can be won above water-level, and without any expense being incurred for drainage.

JURORS' OPINION.—No. 1787.—A very good style of showing the mines, &c.

Class 654b.—In Alluvial Gold Working.—No entry.

Class 654c.—In Quartz Reefs.—No entry.

Class 654d.—In Mines of other descriptions and Quarries.—No entry.

Judges :

J. SMITH, M.D., | ROBERT HUNT,
CHAS. WATT.

Class 655.—Models, Drawings, Samples, &c.

To illustrate various metallurgical processes—roasting of ores, smelting, refining, &c.

- 1788 Francis Bowyer Miller, Royal Mint. Apparatus for refining and toughening gold by means of chlorine gas. The claim for notice is for invention. Patent: The object of this invention is the separation and recovery, simply and cheaply, of the silver contained in Australian gold, most of which has hitherto been lost to the Colonies, and also the effectual toughening of brittle gold, without the evolution of the deleterious fumes which arise when the usual method of toughening with corrosive sublimate is employed; it is in use on a large scale in the Sydney Mint and in the Bank of New Zealand, Auckland; and it is to be employed in the Melbourne Mint.

AWARD:—No. 1788; silver medal. [For the originality and utility of his invention for purifying gold.]

JURORS' OPINION.—The process illustrated by this exhibit is entirely new, and is specially adapted to the extraction of the silver from gold, such as is produced in these Colonies, and to the toughening of all brittle gold alloys without the use of the objectionable means hitherto adopted. Many thousand pounds worth of silver have hitherto been exported in gold coin and bullion, without the Colony deriving any benefit therefrom; by means of this invention nearly the whole of the silver will be saved to the benefit of the producer of the gold. The process is easy and economical, very rapid, and the plant required is inexpensive, and takes up but little room. The Judges recommend that a silver medal be awarded to Mr. Miller for the originality and utility of this invention.

Judges :

CHAS. WATT, | PROF. THOMSON, PH. D.,
DR. A. LEIBIUS.

Class 656.—Models, Drawings, &c., of Apparatus for Stamping and crushing Ores.

- 1789 P. N. Russell & Co., Sydney Foundry. Drawings of improved quartz machinery.
- 1790 Mort's Dock and Engineering Company. Quartz-crushing machine. 10 heads of stampers, each weighing 400 lbs.

AWARD:—No. 1,790 (see No. 1,735.)

Judge :

REV. W. B. CLARKE.

Class 658.—Maps, or collections to show the geological structure of any District.

1791 Professor Alex. M. Thomson, University. Labelled collection of geological and mineralogical specimens.

NON-COMPETITIVE.

1792 Campbell Mitchell, 3, Craighend-terrace. Section of the Western Coal Field, with specimens of coals, kerosene, minerals, and clays of Pulpit Hill, Great Western Railway. The three seams of kerosene mineral vary in extent and character. No. 1 is found on a few acres of land; No. 2 over about 60 acres; whilst No. 3 extends over 320 acres. The last is a 4-ft. seam, half of which is rich cannel and half common coal, separated by an inch band of clay. On the adjoining land the cannel and clay band disappear. By the analysis of Mr. Humfrey and Professors Silliman and Watt the cannel from these seams is equal in quality to any yet discovered.

AWARD :—No. 1,791; bronze medal. [Awarded to Dr. Thomson for the whole of his exhibits.]
1,792; highly commended.

JURORS' OPINION.—No. 1,791.—The diligence and intelligence displayed in these collections deserve high commendation, and fairly entitle the collector to distinction as an able and energetic geologist. No. 1,792.—Very interesting and instructive as to the true position of certain beds in the carboniferous formation. From these beds came the specimens of "Wollongongite" of Silliman, wrongly inscribed to Illawarra.

Additional Remarks by REV. W. B. CLARKE.

THE notices above given are, owing to absence occasioned by sickness, of a very limited kind; and I am perhaps scarcely justified in extending them beyond the remarks to which I am committed on the award paper relating to classes 658 and 659 in section V. Nevertheless, as officially intimated to me, a passing comment on the general features of the Exhibition within the range of subjects connected with geology may not be altogether useless. I venture, therefore, to record a few additional observations on some of the collections other than those more directly brought under my notice in making the awards to which my name is attached as one of the Judges.

The first and last impression made upon my mind by the display in the cases devoted to mineralogical and geological specimens, was that, taken as a whole, it has given a very fair idea of the geological structure and mineral wealth of a large portion of Australia.

Circumstances, connected chiefly with the rapidity necessary to meet the exigencies of the Exhibition, rendered it impossible for a more connected series of collections to be brought together, and this has operated to the prejudice of New South Wales. In spite, however, of these and other impediments, owing to the labours of the Stewards in Section V., those who have chosen to study what has been presented to them have without doubt gained much information.

1. The valuable and magnificent collection of Mr. Brough Smyth, including the lower tertiary shells of Schnapper Point, the middle tertiary of Ge-long, and the upper tertiary of Flemington, exhibit those formations as they occur on Port Phillip.

Some casts of plants from the quartzite of Jerrawa (in the miscellaneous collection, 1793, class 659) show the fresh-water middle tertiary group as it occurs in one part of New South Wales, in which Colony, so far as is known at present, no marine relics of tertiary age occur.

Above all these come in the post-pliocene osseous remains of the Wellington Caves and of Darling Downs, and the various alluvial deposits in the superficial gold diggings, which find numerous illustrations here and there, so that the post-cretaceous deposits are all more or less represented by Victoria, Queensland, and New Zealand, as well as by New South Wales.

2. The existence of one group of the cretaceous formations is also slightly indicated in the collection 1793A, class 659, exhibited by the undersigned, as two or three specimens from the Flinders' River in Northern Queensland are included.

3. In the same case are found a goodly series of upper mesozoic fossils from the Maranoa and Barcoo and Peak Downs districts in Middle-western Queensland, and an equally good series of middle and lower mesozoic fossils from Western Australia, none of which have ever before been exhibited in this Colony, and of which the species (as well as those of the upper beds from Queensland) have been determined by careful comparison with typical species in England, showing 20 species out of 56 from Western Australia common to England, a service rendered to the undersigned by the zealous and associated kindnesses of eminent palæontologists at Home.

4. Forming a passage to the palæozoic formations is a collection formed by Professor Thomson from the fresh-water coal-seams of Ipswich, and the marine deposits of Maryborough, in Queensland, all of which, however, show the strongest possible contrast with the carboniferous deposits and associated palæozoic fossils of the Hunter River, the Illawarra, and the Western coal region.

5. The latter are well pronounced in 1793c, class 659, the result of combined energies in default of any single effort to display a unique collection. But taken in combination with the various groups of massive selections from the coal-beds themselves, little more is needed to point out the true character of the carboniferous formation of New South Wales.

6. There are also suggestions of the Devonian epoch in fossils from various parts of this and the Queensland territory, which are highly suggestive and very interesting.

7. The lower palæozoic rocks are illustrated by fossils from Victoria and Wellington, and from the Canoblas in this Colony, together with slates from Orange, presented by the Honorable the Treasurer of New South Wales, and by the Llandeilo flags sent from Victoria by the Minister of Mines.

8. The various igneous rocks of each formation are also well represented; and, in addition, the granite of New England (whatever may be its age) is separately displayed in a singular but striking collection of gigantic crystals of quartz and feldspar from Oban. (1910, class 701.)

9. There have therefore been brought together, accidentally as it were, many general as well as local features of the grand geological family, extending from a very distant period to the present time; and to assist the understanding of the history thus revealed, there are series of maps, sections, and models, which can only have here a passing notice.

10. Various ores of metals, including iron, lead, copper, tin, zinc, antimony, arsenic, chrome, mercury (the cinnabar of New South Wales being contrasted with that of New Zealand and California), and the modes in which gold is found in these Colonies and in Victoria are admirably shown, leaving a wide margin for commercial suggestions arising from scientific exertions.

11. Nor has the existence of non-metallic minerals been ignored, for there are several collections of various extensiveness and different values—especially to be noticed that of the late Mr. Want; of diamonds there are a few good examples, and a variety of such common gem-stones as zircon, topaz, ruby, spinelle, corundum, &c.; but this part of the exhibition is not so striking as might have been anticipated. The Rev. Dr. Bleasdale has sent some fine specimens of stones from Europe.

12. From what has now been brought under the eye of the public in a somewhat hasty manner, and without any connected organization of separate districts, one may fairly assume what might have been produced had better opportunities occurred for the systematic union of capabilities known to be available.

13. It is to be hoped that on future occasions some special rules will be formed for the guidance of collectors and exhibitors, as well as for judges, who have the difficult and almost impossible duty laid upon them of deciding as to merits where actual competition must be altogether excluded.

For instance, in the matter of coal, what possible meritorious competition can there be between different patches of one great continuous seam, such as that of Lithgow Valley and Hassan's Walls? Or, how can comparisons of merit, in contending for a single prize, exist in regard to such different substances as bituminous coal, and those woody and resinous deposits, though passing into true coal, which are so widely aberrant from the latter as the hydro-carbons of the oil-producing Companies?

In only one instance (it is believed) has any exhibitor seen fit to enable a just conclusion to be come to as to positive value of his material, by production of the analytical data, on which alone any sound opinion can rest.

A passing remark may also be hazarded here, as to the uselessness of attempts to improve or preserve natural objects in which fracture surfaces are important characters, by the application of a varnish or oil, which has deteriorated one very fine example of a magnificent coal seam from a new and most important locality.

14. Notwithstanding all drawbacks of this or other kinds, the present Exhibition confirms to this Colony its prestige as to carboniferous wealth, and it is hoped this fact will be more completely tested in future displays by competition with the carboniferous and "carbonaceous" products from other parts of Australia. Before another year, it is to be wished that the Western districts may be in a condition to contest the claims of the coast region in the amount and value of coal, which will find a remunerating market in the former, if it be deemed impossible to extend it to the latter owing to the cost of transport.

15. Lastly, there are in the present Exhibition illustrations of some important physical facts which have led to controversy.

For instance, the restoration, by Mr. Krefft, of the jaw of the singular creature called *Schizodon*, by the late Mr. Stutchbury, but now known as the *Thylacoleo* of Richard Owen, when placed side by side with the perfect natural jaw, is seen to be perfect.

Again, the present existence of a fish in the rivers of Queensland, which belongs to or is allied to a genus only before known to exist in the Triassic period, is exhibited in the instance of a *Ceratodus*, named specifically after a late Minister of Lands, the Honorable W. Forster.

As giving the scientific as well as the modern history of this offshoot from the world of antiquity, the following lines, written by request, may serve to imprint this fact on the memory of such as do not disdain any legitimate means of conveying information respecting any portion of the most complete and interesting of the exhibitions which have taken place in New South Wales.

CERATODUS FORSTERI.

1.

Just seven and twenty years ago
 Did naturalists discuss
 The finding of some *horny* teeth,
 Thence called *Ceratodus*.

2.

No bones (if fish true bones possess)
 Of head, or tail, or sides—
 No scales or vertebrae had they
 To be their certain guides.

3.

All that they learn'd was that the teeth
 In middle life-time grew,
 Yet fourteen species were assigned—
 To what they hardly knew.

4.

Of these the generous Agassiz
 A dozen gave to Trias,
 (With one reserved to Stonesfield *Slate);
 All borrowed from the Lias.

5.

But never since that period,
 As all the books avow,
 Did scientific eyes behold
Ceratodus till now.

6.

Lucullus ate *Murena* rare,
 In Rome the daintiest dish,
 And squatters on the Burnett dined
 On geologic fish.

7.

But all the while no savant knew
 More than the squatter guessed,
 Who ordered a *Ceratodus*
 To be for *salmon* dressed.

8.

So things went on till FORSTER's act
 No further question left,
 By sending down the fish itself
 To be described by KREFFT.

9.

Thus, in Australia we behold
 Another instance found,
 How in the far Antipodes
 Science completes her round.

* Poissons fossiles—III., 387.

10.

"What is *Ceratodus*?" You ask—
Mud-eel,* may some reply;
 But 'tis no *Eel*, as any one
 Can easily espy.

11.

The creature partly reptile is,
 And partly fish besides,
 And has some queer affinities
 With tailless *Batrachidea*.†

12.

Yet though great difficulties seem
 Its status to environ,
 It is, without the slightest doubt,
 Related to a *Siren*.‡

Judge :

PROFESSOR A. M. THOMSON, PH. D.

Class 659.—Collections of Rocks, Minerals, and Fossils.

1793 Professor A. M. Thomson, University. Labelled collection of geological and mineralogical specimens.

NON-COMPETITIVE.

1793A Rev. W. B. Clarke, M.A., F.G.S., &c., Sydney. Lower mesozoic fossils from N. W. Coast Western Australia.

1793B Mrs. R. J. Want. Mineral specimens, from the collection of the late R. J. Want, Esq., Sydney.

1793C Fossils, &c., of the New South Wales carboniferous rocks, from the collections of the Surveyor General, the Australian Museum, the University, &c.

1793D John Lucas, Camperdown. Stalactite, from the Binda Caves. These are formations from the thickness of the human hair to pillars 6 feet through and 40 feet high.

1793E Phillip G. King, Esq., Sydney. Crystals of quartz from the Peel River Diggings.

AWARDS :—No. 1793A ; bronze medal.

1793B }
 1793C } highly commended.
 1793E }

* *Lepido-siren*.

† "*Anouros Batrachia*." ‡ Owen (*Vertebrates*) 1, 3165.

JUROBS' OPINION.—No. 1793A.—This exhibit is by the Rev. W. B. Clarke, M.A., F.G.S., &c., who is so well known in all scientific quarters from his researches upon the geology of Australia. It is of the highest interest to all who study this branch of natural science. It represents quite a new feature in the geology of the Australian Continent, and supplies a link that had long been missing. The Rev. W. B. Clarke was the first to recognize the important scientific indication which these fossils afforded, and has incurred considerable trouble and expense in securing specimens, in having them compared at Home with other known organisms, and in having the fossils figured and published along with the results of his own researches. A full account of these will be found in a paper by Mr. Moore, F.G.S., of Bath, in the last number of the Quarterly Journal of the Geological Society, where lithographed figures are given. Mr. Clarke has shown that at the time the well known liassic, oolitic, and chalk deposits of Europe were in progress, portions at least of the Australian Continent were submerged, and were receiving similar accumulations. Previously to Mr. Clarke's discovery, a view contrary to this fact had prevailed. Another scientific doubt that Mr. Clarke's researches has finally settled is, that the plants of the New South Wales coal-beds are not the contemporaries of European mesozoic fossils. It was the intention of the exhibitor to send a much more extensive collection of fossils to illustrate Australian geology; but, owing to illness, the only part that could be prepared in time was the valuable selection exhibited. No. 1793B.—Very interesting, but lacking nomenclature. No. 1793C.—A useful collection, containing valuable specimens of typical Australian carboniferous fossils, vegetable and marine. No. 1793E.—A curious example of the crystallization of quartz, but not uncommon in New South Wales.

Objects of Natural History.

- 1793F Mrs. R. J. Want. Shells, from the collection of the late R. J. Want, Esq., Sydney.
- 1793G G. Krefft, Sydney Museum. Skeletons of man, dog, horse, pony, bull, ram, alpaca, and boar; the whole articulated by Mr. Henry Barnes, Museum. Specimens of stuffed animals—wallabies and wombats, fishes and reptiles—prepared by Mr. Thorpe. Birds, skins, and insects; prepared in various ways by Mr. George Masters, assistant curator.
- 1793H G. Krefft, Museum. Casts of fossils by Mr. Robert Barnes, and fossils collected by Professor Thomson and Mr. Krefft, at the Wellington Caves; fossils collected by Mr. Mildred Creed and Mr. Surveyor Vernon, at Scone; glass models of Zoophytes; wood models of *Chrystate*; plaster models of *Foraminefera* to assist teaching natural history; the food fishes of the Colony, principally fresh water species; food fishes of the harbour, by Mr. Alexander Owen; fresh water species, by Mr. Krefft; native weapons and domestic implements, by Mr. Masters and Dr. Creed.

AWARDS (—No. 1793G } bronze medals.
 1793H }
 1793F; commended.

JUROBS' OPINION.—No. 1793G.—Shewing skill and diligence. No. 1793H.—Most important to the natural history of the Colony, and instructive in various ways. No. 1793F.—A valuable collection, but in its present condition not suitable for educational purposes, being without names or arrangement of species.

Objects of Natural History connected with the Colony.**CAPTAIN COOK SERIES.**

- 1793i G. Krefft, Museum. Figure-head of Captain Cook's ship "Resolution"; a collecting bottle, such as Banks and Solander used in their time (one of the original bottles), in which the first Australian specimens were preserved; a glass star, originally presented by Captain Cook to a South Sea Island Chief.

EDUCATIONAL SERIES.

- 1793j G. Krefft, Museum. Portable collection of the snakes of Australia, the heads only preserved; series of skulls, showing the principal differences in various Australian animals; photographs of natural history, specimens by Mr. Henry Barnes and V. A. Prout; lithographs of ditto, by Mrs. Forde and Miss Scott.
- 1793k J. A. Thorpe, Barcom-street, Darlinghurst. Case of stuffed Australian birds. Price, £35. River birds, collected and mounted by J. A. Thorpe, principally obtained at Cape York during 1868.

AWARD :—1793j; bronze medal to Mr. Krefft's assistant, Mr. Barnes.

JURORS' OPINION.—Nos. 1793j and 1793k.—Most important to the natural history of the Colony, and instructive in various ways.

Judges

IN CLASSES 660-67, 669-77, 679, 80.

J. SMITH, M.D., | CHAS. WATT,
DR. A. LEIBIUS.

CHEMICAL AND PHARMACEUTICAL PRODUCTS.**Class 660.—Acids, Alkalies, Salt, and other Chemicals.**

- 1794 Venters & Frost, Lime-street Wharf, Sydney. Colonial salt. Price, 60s. per ton.
- 1795 Elliott Brothers, 110, Pitt-street. Acids and other chemicals.
- 1796 W. B. Jones, 149, Collins-street West, Melbourne. Bi-sulphite of lime. Price, 5s. per gallon in Victoria.

AWARDS :—No. 1795; bronze medal.
1794; commended.

JURORS' OPINION.—No. 1795.—Excellent commercial acids. No. 1794.—Stated to be made from sea water, at Newington, Parramatta River.

Class 661.—Animal and Vegetable Oils.

- 1797 Thomas George Hewitt, Grafton, Clarence River. Neatsfoot oil.
- 1798 John Hamilton, 133, Botany Road. Norwegian cod-liver oil. Price, $\frac{1}{2}$ -pint bottles, 15s. per dozen. Manufactured from fresh livers of the cod-fish, in C. Jordan's oil steam factory, Throughhjan.
- 1799 Manning & Staiger, Town Marie, Ipswich. Neatsfoot oil.

NON-COMPETITIVE.

- 1799A John McGarvie, Terrara. One case of horse oils.

AWARDS :—No. 1798; highly commended.
1799; commended.

JURORS' OPINION.—No. 1798.—Norwegian; almost free from taste and smell.

Class 662.—Illuminating and Lubricating Oils.

- 1800 Sydney Chemical Works, Grafton Wharf. Railway grease.
 1801 George Hewitt, Pitt-street. Antifriction grease. Price, £30 per ton.
 Refined palm oil.

AWARD :—No. 1800 ; commended.

JURORS' OPINION.—No. 1800.—Recommended for trial in the Railway Department.

Class 663.—Mineral Oils.

- 1802 The Western Kerosene Oil Company (Limited). Kerosene oil. Produced from shale taken out of the Company's mine, near Mount Victoria.

AWARD :—No. 1802 ; silver medal. [For the excellence of their burning oil, and their successful introduction of a valuable Colonial industry.]

JURORS' OPINION.—Important Colonial industry ; excellent quality of burning oil.

Class 664.—Tallow, Fat, Stearins, Glycerine.

- 1803 T. G. Hewitt, Grafton, Clarence River. Ox tallow.
 1804 Tooth & Cran, Yengarie, Maryboro', Queensland. Tallow (beef). Price, £35 per ton.
 1805 Ditto ditto ditto. Tallow (mutton). Price, £36 per ton.
 1806 S. Dickson, Waverley. Tallow, purified and impure. Process for sale. Cost of purifying does not exceed one half-penny per lb.
 1807 Manning & Staiger, Town Marie, Ipswich. Tallow (beef and mutton).

AWARDS :—No. 1806 }
 with } bronze medal.
 1812 }
 1807 ; highly commended.
 1804 }
 1805 } commended.

JURORS' OPINION.—Nos. 1806 and 1812.—Tallow brought to a fair degree of whiteness by a process said to be new and inexpensive. No. 1807.—Good colour ; carefully rendered.

Class 665.—Paraffine, Wax, Spermaceti.

- 1808 George Hewitt, Pitt-street. Wax, spermaceti, and candles. Price—wax, 2s. 6d. per lb. ; spermaceti, 2s. 6d. per lb. ; candles, 2s. 6d. per lb. Wax derived from bees, and boiled. Spermaceti from the whale, and refined. Candles made from wax and spermaceti.
 1809 J. Beeston. Wax.

Class 666.—Candles, Tallow, Stearine, and Wax.

- 1810 J. & W. Pritchard, Glebe-street, Glebe. One box and stand of tallow candles.
- 1811 J. H. Leonard, Petersham. Candles, tallow.
- 1812 S. Dickson, Waverley. Purified candles. Manufactured from tallow, at Bondi, Waverley.
- 1813 P. Mulcahy, Botany Road, Redfern. Candles manufactured from tallow. Price, £1 5s. 10d.
- 1814 J. Kitchen & Sons, Melbourne. Candles, tallow, and stearine.
- 1815 Allen Brothers, 634, Brickfield Hill. Tallow candles. Price, 4½d. per lb.
- 1816 John Melly, Bay-street, Sydney. Tallow candles. Price, 5d. per lb.
- 1817 Bendigo Agricultural and Horticultural Society. One box candles.

AWARDS :—No. 1814 } bronze medal.
 1824 }
 1810; highly commended
 1811 }
 1815 } commended.
 1817 }

JURORS' OPINION.—No. 1812.—Best burning tallow candles exhibited; good colour. Nos. 1814 and 1824.—Candles; good wick, and of fair burning quality, but the tallow has been imperfectly saponified. No. 1810.—Best in colour, but not in burning quality. No. 1811.—Good wick and burning quality. No. 1815.—Commended for colour. No. 1817.—Good wick and burning quality.

Class 667.—Soap.

- 1818 John Melly, Bay-street, Sydney. Soap. Price, 25s. per cwt.
- 1819 Sydney Chemical Works, Grafton Wharf. Fancy soaps.
- 1820 A. Chisholm, 183 and 185, Pitt-street. Samples of fancy scented soaps.
- 1821 James Henry Leonard, Petersham. Soap, white and yellow. Price, 28s. per cwt. These goods are exhibited as being of superior quality.
- 1822 Elliott Brothers, 110, Pitt-street. Soft soap. Price, £32 per ton. Manufactured from black oil and potash only, in Colonial-made drums.
- 1823 S. Dickson, Waverley. Soap. Price, £25 per ton, box included. Manufactured from tallow, at Bondi, Waverley.
- 1824 J. Kitchen & Sons, Melbourne. Soap, household and toilet.
- 1825 Cowan & Israel. Soaps. Colonial manufacture.
- 1826 P. Mulcahy, Botany Road, Redfern. Soap. Price, £1 6s.
- 1827 Allen Brothers, 634, Brickfield Hill. Soap.
- 1828 C. W. Lane, Soap Works, Orange. Orange-soap.
- 1829 Melbourne Soft-soap Works, 78, Collins-street West, Melbourne. Soft soap. Price, £32 per ton. Guaranteed free from soda.
- 1830 Bendigo Agricultural and Horticultural Society. Soap.

AWARDS :—No. 1825; bronze medal.
 1823 }
 1827 } highly commended.
 1829 }
 1818 }
 1821 } commended.
 1822 }
 1826 }

JURORS' OPINION.—No. 1824.—Toilet and household soaps of excellent quality. No. 1825.—For collection of excellent household and woolwashing soaps.

Class 668.—Tar and other products therefrom.—No entry.

Class 669.—Caoutchouc, Gums, Resins, and Dyes.

1831 A. Chisholm, 183 and 185, Pitt-street. Specimens of galvanized India-rubber and gutta percha.

Class 670.—Varnishes.

1832 Grube & Speck, 65, Market-street. Varnishes. Price, £30. Manufactured in Sydney.

1833 Alexander Borthwick, 36, Market-street, Melbourne. Tins of Victoria Varnish Company's varnishes and specimen panels. Price, 6s. 6d. to 16s. per gallon. Specially manufactured to suit the Australian climates, and can be obtained at two-thirds of the cost of imported varnishes.

Class 671.—Artists' and Painters' Colours.

1834 Benjamin Waters, 161, Pitt-street. Artists' and Painters' colours. Price according to quality, &c.

1835 Alexander Borthwick, 36, Market-street, Melbourne. Two drums of patent paint for ships' bottoms as an anti-fouling composition, and board with names of vessels now painted by this process. No. 1 drum, Japan zinc paint; price, 60s. per cwt. No. 2 drum, anti-fouling composition; price, 80s. per cwt. These paints are used as a quick mode of painting ships' bottoms. The Japan zinc paint, No. 1 drum, is a fine protective paint for iron, especially if immersed in water, and dries so quickly that a ship may be painted three coats in twelve hours; it will also form a protective paint for any anti-fouling composition at present known. The anti-fouling composition, No. 2 drum, is applied after two or three coats of No. 1 drum, and has in every case proved highly successful.

1836 Ditto. Case showing patent anti-fouling composition, with names of vessels coated.

AWARDS :—No. 1833 }
 1835 } bronze medal.
 1836 }
 1832; highly commended.

JURORS' OPINION.—No. 1833.—Accompanied by panels varnished with the specimens.

Class 672.—Blacking, &c.

1837 D. J. Monk, Steam Works, Wattle-street, Chippendale. Blacking made from kerosene shale. Price, 3s., O; 6s., B; and 8s., A,—per dozen bottles; penny paste, 6s. per gross. The chief material used in the composition of this blacking is kerosene, which possesses oleaginous and polishing properties in a high degree.

1838 James Evans, Wellington-street, Chippendale. Paste and bottle blacking. Price—paste, 6s. per gross; bottles, 3s. 6d., 7s., and 12s. per dozen.

- 1839 Lewis & Whitley, Curzon and Victoria streets, Hotham, Melbourne. Diamond oil blacking. Price, 5s. per gross in parcels. This blacking is composed of commodities imported from England, and manufactured by the above firm at the above address, and is about 10 per cent. less than the English article.

AWARDS :—No. 1837 }
1838 } commended.

JURORS' OPINION.—No. 1837.—Good paste blacking. No. 1838.—Good liquid blacking.

Class 673.—Essential Oils.

- 1840 L. Carmichael, Brisbane. Six essential oils. Oil of sweet smelling gum, oil of cedar, oil of lemon, oil of orange, oil of lemon grass.

Class 674.—Albumen, Gelatine, Glue, Bone Black.

- 1841 W. Walker, Botany. Light, dark, and coloured glue. Price—best light glue, £60 per ton; good dark glue, £40 per ton. This glue is manufactured at Botany; the best light quality is made from ox-hides, and the common quality from sheep-skins, supplied in the Colony.
- 1842 J. S. Berry, Botany. Colonial glues of three qualities. Price,—No. 1, 80s. to 84s. per cwt.; No. 2, 50s. to 56s. per cwt.; No. 3, 35s. to 42s. per cwt. These Colonial glues are made from the pelts of sheep or hide pieces; No. 1 glue is similar to best Russian, but takes up one-fourth more water in melting; No. 2 compares with Scotch, and No. 3 is the common glue of the factory.

AWARDS :—No. 1842; bronze medal.
1841; highly commended.

JURORS' OPINION.—No. 1842.—Collection, showing varieties of glue, and stages of process. 1841.—Good quality.

Class 675.—Disinfectants.

- 1843 Sydney Chemical Works, Grafton Wharf. Insecticide.
- 1844 D. J. Monk, Wattle-street, Chippendale. Disinfecting and remedial fluid. Price—half-pints, 12s. per dozen; pints, 24s. per dozen. Besides detecting and destroying dangerous organic matters in water, and rendering it deliciously pure and drinkable, this invaluable fluid is used for destroying bad smells, freshening the air of close places and sleeping apartments; freeing meat from taint and rendering it eatable and wholesome, dressing poisoned wounds, and as an antidote for all organic poisons taken into the system.

Class 676.—Materials used for Scouring and Bleaching.

- 1845 Ward & Co., 53, George-street, Sydney. Glycerine washing powders. Price, according to quantity. Manufactured in Sydney, New South Wales, and are acknowledged by all consumers to be superior to any imported.
- 1846 D. J. Monk, Wattle-street, Chippendale. Soap powders. Price, 6s. per gross; in quantities of 100 gross, 5s. Made by the judicious mixture of glycerine and various alkalies, forming a compound much esteemed for its power of cleansing linen and woollen fabrics without injuring them.

- 1847 Lewis & Whitley, Curzon and Victoria streets, Hotham, Victoria. Washing chemicals. Price,—6s. per gross, packets; 5s. and 9s. per dozen, bottles. The above are not injurious to the fabric, and greatly facilitate washing operations. They are manufactured by the above firm, at the above address, and are 50 per cent. less than the English article.

JURORS' OPINION.—Nos. 1845–47.—The Judges have no means of deciding on the merits of these exhibits.

Class 677.—Materials used for Dyeing.

- 1848 John Clump, 743, George-street. Hair-dye. Price, 3s. 6d. Really a genuine and permanent dye; prepared by the exhibitor.
 1849 Robert Reardon, Botany Road. Liquid washing-blue.
 1850 E. W. Rudder, East Kempsey. Madder roots for dyeing. Price, 40s. per cwt. Very largely used for dyeing in England, and has a commercial value of about 40s. per cwt. It is one of the most durable and fast scarlet dyes known; will yield 16 cwt. per acre, more or less, according to circumstances.

AWARD :—No. 1849; commended.

Class 678.—Materials used for Tanning and Currying.—No entry.

Class 679.—Medical Products and Preparations.

- 1851 I. J. Josephson, 253, Macquarie-street. Australian ointment. Price, 28 lb. jars, 10s. 6d. per lb. Made from wild plants of the Colony.
 1852 Edward Row & Co., Pitt-street. Row's embrocation. Price—30s. per dozen bottles, packed in cases of three dozen each; cases, 2s. each extra.
 1853 Charles Bird, Tenterfield. Simpson's specific for foot-rot in sheep, &c., &c. Price, 60s. per dozen.
 1854 W. B. Jones, 149, Collins-street West, Melbourne. Sulphur and tobacco sheepwash. Price, 2d. per gallon, and bisulphate of lime.
 1854A James Henry, George-street. Inventor and manufacturer of Henry's Colonial Ointment, in four-sized pots—1st., 1s.; 2nd., 1s. 6d.; 3rd., 2s.; 4th., 2s. 6d.;—consists principally of vegetables, mostly Colonial, and a little animal matter, carefully and scientifically combined so as to form an elegant, useful, and popular ointment.
 1854B T. P. Palmer, Ballarat. The Australian magic mixture for gout, rheumatism, &c., 5s. per bottle of 4 ozs.

JURORS' OPINION.—No. 1851.—A patented preparation, said to be from leaves of native plants.

Class 680.—Chemical Objects of Scientific Interest.

- 1855 Dr. F. Von Mueller, C.M.G., Melbourne. Chemicals and pharmaceutical collection. (Victorian Catalogue, p. 48 to 59.)
 1856 The Colonial Secretary, New Caledonia. Ditto, ditto:—1. Fontainea planchoin oil (Heckel), new extract of purgative seeds of fontainea planchoin tree; is a strong purgative and revulsive, like the croton-tiglium oil; classed in the family of the erymorbiaciæ (preciousness). 2. Essential oil of niaouli (Melalencæ viridiflora), known as a sort of myrtle; used against rheumatic pains. 3. Hydrolat of niaouli

- (*Melalencia viridiflora*), used against dysentery. 4. Hydrolat of balm (*Andropogon-schœnanthus*), a gramineous, used for dressing of ulcerated wounds, and as adjuvant in excitant potions. 5. Essential oil of Kauri (extract of *Araucaria Cookii*), used in friction against rheumatic pains. 6. Essential oil of balm (*Andropogon-schœnanthus*), a gramineous, used in excitant potions, and as an aromatic in some pharmaceutical preparations, like pastilles, &c. 7. Essence of lemons (*citrus aurantiacum*), extract from the lemon peel, used as an aromatic. 8. Oil of Indian spur nuts (*Tatropa coccus*), a faint drastic purgative. 9. rosset grease (*pteropus?*), used in friction against rheumatic pains. 10. Sirop of bulinus (*Bulinus-porphyrostromus*), used against sickness of the breast and of the windpipe. 11. Ben oil (*Moringa pterigostegia*), used as grease in clock-work, and for marine watches, also to extract the volatile perfumes of flowers. 12. Castor oil (*Ricinus communis*), prepared by cold pressure. 13. Bankaul oil (*Aleurites triloba*), a slight purgative, also used as lamp oil. 14. Lime-juice (*Citrus aurantiacum*), antiscorbutic medicine.
- 1857 Peter Alroe, Ballarat. Pit-ash. Ashes used for the making of patent manure, found at a depth of 225 feet, lying between clays, and under two rocks 80 and 90 feet thick respectively; the thickness of deposit, 2 feet; area unknown; locality, Sebastopol, Ballarat. The manure manufactured from the above pit-ash is sold in Melbourne at £7 10s., per ton.

AWARDS:—No. 1855; silver medal. [For his extensive and valuable vegetable productions of Victoria.]
1856; bronze medal.

JURORS' OPINION.—No. 1856.—Recommended for these articles, taken in conjunction with the excellent exhibits of sugar, coffee, fibres, rum, &c., which fell under other classes.

GENERAL REPORT.

(PHARMACEUTICAL PRODUCTS—CLASSES 660 TO 680.)

THE objects comprised in the above division are numerous, and some of them are of so much importance that we, the Judges, have taken great pains to arrive at a correct estimation of their respective merits. In some respects we should have been glad if our duties had been more onerous, and that a greater number of chemical products of Colonial manufacture had been exhibited on this occasion. The Colonies have made little more than a beginning in this department; but it is gratifying to observe that already, in some cases, the Colonially-manufactured article compares favourably with the imported.

Class 660.—Acids, Alkalies, Salts.

- 1794 Messrs. Venters & Frost, Sydney, exhibit common salt, said to be made from sea-water, on the Parramatta River. It is a white, coarse-grained salt, such as is commonly used for dairy purposes, and it is "commended on account of its Colonial origin." Attempts have frequently been made to establish the manufacture of salt in New South Wales, but hitherto without profitable results, owing to the cheapness of the imported article. Besides this renewed attempt on the Parramatta River, we understand that the manufacture has recently been recommenced at Newcastle.

1795 Messrs. Elliott Bros., Sydney, exhibit sulphuric, nitric, and hydrochloric acids, together with sulphate of iron, this last being in coarse powder as a cure for fluke in sheep. The acids are very good commercial articles, all manufactured by the firm at their works near Sydney. They are not sold as chemically pure. From an examination made by Mr. Charles Watt, it appears that the specific gravities are as follows:—Sulphuric, 1·844; nitric, 1·455; hydrochloric, 1·156. The sulphuric acid is colourless, and is reported to contain only a small quantity of lead, the final concentration being made in platinum stills. The nitric is reported free from sulphuric acid, and with only slight traces of chlorine. The hydrochlorine (which has but a slight straw colour) contains very little iron, and much less arsenic than is usually found in imported acid,—in fact, only a mere trace, and with only a trace of sulphuric acid.

The importance of the manufacture of these acids in the Colony can scarcely be over-estimated. The great risk incurred in shipping them from England has acted as a serious impediment to the establishment of many branches of industry; and it is to be hoped that the time is not far distant when the soda manufacture from sea-salt, together with allied products, such as bleaching powder, may be profitably taken up through the supply of good and cheap sulphuric acid.

To these exhibits, from the Messrs. Elliott, we have awarded a bronze medal.

1796 Mr. W. B. Jones, Melbourne, exhibits bisulphite of lime in clear solution, for preserving meat, &c., a purpose for which this substance has been found valuable. We have not ascertained the strength or purity of these samples.

Class 661.—Animal and Vegetable Oils.

Neatsfoot oil, of fair quality, is exhibited by Mr. T. G. Hewitt, Grafton (1797), and by Manning & Staiger, Ipswich (1799); the latter is commended.

1798 Mr. John Hamilton, Botany Road, contributes Norwegian cod-liver oil, clear and bright, almost free from smell, and taste not unpleasant. It is highly commended.

1799A A case of horse oils, from Mr. John M'Garvie, Terrara,—a black oil said to be an excellent external application for all kinds of injuries to horses.

Class 662.—Illuminating and Lubricating Oils.

The railway grease of the Sydney Chemical Works (1800) is commended for its appearance, but nothing short of a prolonged trial would satisfactorily test the merits of such an article. We think that such a trial should be afforded to this Colonial production by the Railway Department.

Mr. Hewitt's entry (1801) is not exhibited.

Class 663.—Mineral Oils.

The only entry under this head is that of the Western Kerosene Oil Company (1802), and this may be considered along with their entry under class 645, No. 1763, of so-called Kerosene shale. The mineral worked by this Company occurs in a thick seam near Mount Victoria, but the manufacturing operations are, for economic reasons, carried on in the

neighbourhood of Sydney. The works have been in full operation nearly twelve months, and it is stated that they are now yielding about 6,000 gallons of burning oil per week. This quantity could be very considerably increased by merely adding to the number of retorts, as the other appliances already erected for refining are equal to the production of probably double the quantity above stated. It is the opinion of those acquainted with the trade in this article that the Western Company, conjointly with the works carried on near Wollongong by Mr. Graham, could readily supply all the burning oil required for consumption in this Colony; and it is probable that before long they will be in a position to export illuminating oils, at any rate to the adjacent Colonies.

It is gratifying to us to be able to pronounce the burning oil exhibited an article of excellent quality—creditable to the Colony and to the gentleman in charge of the Company's works. As regards colour it bears a very favourable comparison with the best samples met with in this market; and in illuminating power it was not equalled by any of the best brands that were examined by one of our number (Mr. Charles Watt), who undertook this investigation. The "flashing point" of the oil exhibited was found to range from 118° Fahrenheit to 126° Fahrenheit, depending upon the time employed in raising its temperature. The "flashing point" of the samples of imported oils that were tried at the same time and under the same circumstances was about 100°. It is clear therefore that this oil of the Western Company is a safer article for ordinary use in a warm climate than the oils which are imported, some of which would not be allowed to pass into household consumption in countries where the "flashing point" is regulated by legislative enactment. The specific gravity of the Western oil is 804 at 60° Fahrenheit, which is about the same as the best qualities of foreign oil now in this market.

We think it our duty to record our feeling of satisfaction at the establishment on so large a scale of such an addition to our industries, more especially as we are aware that the Company has had a large amount of discouragement during the greater part of its career, arising from overstocked markets and consequent low prices, which naturally act unfavourably upon a young industry requiring the investment of a large capital.

We have pleasure in recommending that a silver medal be awarded to the Western Kerosene Company, for the excellence of their burning oil, and their successful introduction of a valuable Colonial industry.

Class 664.—Tallow, Fat, Stearine, Glycerine.

There are four exhibitors of beef and mutton tallow, namely:—1803, Hewitt, Grafton; 1804-5, Tooth & Cran, Maryborough; 1806, Dickson, Waverley; and 1807, Manning & Staiger. All the samples are worthy of commendation. Those shown by Manning & Staiger, produced at their factory near Ipswich, Queensland, are most free from colour, and are therefore highly commended. Tooth & Cran's tallow would probably become equally white by keeping, as it was evidently bleaching on the surface when exposed to light. Mr. Dickson exhibits tallow refined by a process not described to us, but said to be inexpensive.

Class 665.—Paraffine, Wax, Spermaceti.

Two entries appear in this class, but the articles were not produced. This is to be regretted, as the candles made from wax and spermaceti (1808), would have proved an interesting exhibit. All the candles actually shown being (with one exception) of tallow, and a tallow candle is properly becoming more and more a thing of the past.

Class 666.—Candles.

There were seven exhibits of tallow candles, some of fair and others of good quality. Their colour was in most cases good, and in one instance excellent. The latter were shown by J. & W. Pritchard, Glebe, and were highly commended. We compared the burning qualities of the candles by taking a specimen at random from each exhibit, setting them alight together, and leaving them to burn for a considerable time. It then appeared that in some cases sufficient attention had not been paid to the wicks, the cotton being coarse and not well twisted. The best burning tallow candle was one of Mr. Dickson's, made from his refined tallow. This purified article, compared with the original tallow from which it was stated to have been made, we counted very creditable, and for these two exhibits (refined tallow and candles made from it) we award a bronze medal.

Stearine candles were exhibited by Kitchen & Sons, Melbourne (1814). They were of fair quality, had good plaited wicks, and burned well; the tallow, however, had not been fully saponified. The price of these candles was not stated, and we do not know whether they are intended to compare with stearine candles imported from Europe.

We regret that there was no exhibit of stearine candles the produce of this Colony. The consumption is very large, and there is a plentiful supply of the raw material. It appears to us that the freight both ways and other charges ought to be sufficient protection to induce some one to establish this important industry.

Class 667.—Soap.

There were twelve exhibitors of household, fancy, and soft soaps:—

Household Soap.—Under this denomination we place the ordinary yellow rosin soaps. The whole of these were of really good quality, and gave us no little trouble in the selection of the best. The only sample having a marked distinction from the rest was one shown by Cowan & Israel. The article to which we refer had a brighter colour and cleaner look, possibly arising from the fact that their boiling operations are carried on by means of steam, while the other manufacturers use direct fire under their pans. Messrs. Cowan & Israel exhibited also mottled and other soaps adapted for different purposes, and to their collection (1825) we award a bronze medal. The common yellow soap, shown by Allen Brothers (1827), seemed on the whole to be superior to the remaining samples, and was therefore "highly commended." Mr. Dickson's (1823) was also counted worthy of being "highly commended."

Fancy Soap.—The only exhibit of any importance of Colonial manufacture, was that of Kitchen & Sons, Melbourne, who also sent a very excellent sample of yellow soap. The whole display was very creditable, and received the award of a bronze medal.

Soft Soap.—This is quite a recent manufacture in this Colony, having been established here by Messrs. Elliott Brothers during the last year in consequence of the demand for this article for wool-washing, &c. The sample shown by them appeared good. That shown by Kitchen & Sons, and by the Melbourne Soft-soap Works, we consider equal to anything that could be made from the same materials. The soft soap of the latter Company (1829) was "highly commended."

Class 668.—Tar and its Products.

No entries appear under this class, although several samples of wood-tar were sent by Dr. Von Mueller, of Melbourne. No products from tar were exhibited. In the last Exhibitions in London and Paris the magnificent display of coal-tar derivations, especially the much-prized coal-tar colours, astonished and delighted the visitors; and no doubt the time will come when Colonial manufacturers will utilize the tar now wasted, and equally attract the wondering gaze of visitors at future Exhibitions here.

Class 669.—Caoutchouc, Gums, Resins, and Dyes.

Mr. A. Ohisholm, Sydney (1831) exhibits specimens of vulcanized Indiarubber and gutta-percha (imported). The absence of gums and resins, with the exception of the collection of Dr. Von Mueller, is remarkable.

Class 670.—Varnishes.

- 1832 Collection of varnishes manufactured by Messrs. Grube & Speck, Sydney, "highly commended."
 1833 Mr. A. Borthwick, Melbourne, sends a collection of varnishes, with specimen panels showing the excellent quality of these articles. Mr. Borthwick also exhibits (in next class) two kinds of "anti-fouling composition" for painting the bottoms of ships. We cannot of our own knowledge give an opinion as to the efficacy of these paints, but from a list of vessels said to have been coated with them they seem to be recognized as possessing considerable merit. To Mr. Borthwick's collective exhibit we award a bronze medal.

Class 671.—Artists' and Painters' Colours.

- 1834 Mr. B. Waters, Sydney, exhibits a good collection of colours (imported). Mr. Borthwick's exhibit (1835) has been noticed above.

Class 672.—Blacking.

- 1837 The paste blacking, made by Mr. D. J. Monk, Chippendale, is "commended." The introduction of kerosene mineral into its manufacture appears to be novel.
 1838 The liquid blacking of Mr. James Evans, Chippendale, is "commended" as giving a high polish.
 1839 The paste blacking of Lewis & Whitley appears to be a good article.

Class 673.—Essential Oils.

Only one entry appears in this class, that of Mr. L. Carmichael, Brisbane (1840), but essential oils were also sent by Dr. Von Mueller. Mr. Carmichael sends six varieties of volatile oils; the peculiar odours are rather faint, and in some cases the preponderating smell is that of alcohol.

Class 674.—Albumen, Gelatine, Glue, Bone Black.

Mr. J. S. Berry, Botany (1842), shows different varieties of glue of excellent quality, and specimens illustrating the intermediate stages of manufacture. To this collection we have awarded a bronze medal. 1841—Varieties of glue, exhibited by Mr. W. Walker, Botany, are highly commended.

Class 675.—Disinfectants.

- 1843 Insecticide, from Sydney Chemical Works. This is a paste of strong unpleasant odour, which is intended to be mixed with water and sprinkled on plants, in order to kill insects. It is therefore wrongly placed in this class.
- 1844 Disinfecting fluid, exhibited by Mr. D. J. Monk, Chippendale. This is the well-known Condy's fluid—solution of permanganate of potash—the merits of which appear to be generally recognized in England.

Class 676.—Materials used for Scouring and Bleaching.

In this class we find nothing but washing powders, of which there are three exhibitors.

1845 Ward & Co., Sydney. 1846—D. J. Monk, Chippendale. 1847—Lewis & Whitley, Victoria. Probably they are all useful articles, but we cannot express an opinion of their relative merits.

Class 677.—Materials used for Dyeing.

- 1848 Mr. John Clump, Sydney, exhibits hair-dye.
- 1849 Mr. Robert Reardon, Sydney, exhibits liquid washing-blue. This seems a good article, and is commended. 1850—Madder root from Mr. Rudder, East Kempsey—not exhibited.

Class 678.—Materials for Tanning and Currying.—No entry.

Class 679.—Medicinal Products and Preparations.

There are six exhibitors under this head, namely :—1851—Mr. I. J. Josephson, Sydney, Australian ointment; 1852—Messrs. Edward Row & Co., Row's embrocation; 1853—Mr. Charles Bird, Tenterfield, Simpson's specific for foot-rot in sheep; 1854—Mr. W. R. Jones, Melbourne, sulphur and tobacco sheep-wash; 1854A—Mr. James Henry, Sydney, Colonial ointment; 1854B—Mr. T. P. Palmer, Ballarat, Australian magic mixture for gout and rheumatism.

The value of these preparations could be judged of only after long experience of their use. We have no personal knowledge of any of them, and cannot single out any one for special commendation; but we believe that several are favourably known to the public. The Australian ointment is a patented preparation. The active part consists of the powdered leaves of several indigenous trees. We are assured that it meets with a ready sale, and that several medical men occasionally order it.

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Class 680.—Chemical objects of Scientific Interest.

- In this class we find an interesting series of preparations and products obtained from some of the common trees of Victoria. These are contributed by Dr. F. Von Mueller, C.M.G., on behalf of the Victorian Government, and are intended to illustrate the economic value of these trees, and to pave the way towards new Colonial industries. Prominent in this collection we find a series of products obtained by dry distillation from sheoak, blackwood, honeysuckle, tea-tree, wattle, ironbark, red-gum, blue-gum, stringy-bark, and spurious apple; the products being acetic acid, wood spirit, tar, and charcoal. The proportion of pure hydrated acetic acid is stated by Dr. Mueller to vary from 1½ to 2¼ per cent. of the abovenamed woods.
- There is a specimen of crude potashes from the ash of branch-wood of *Eucalyptus viminalis*. A ton of this wood (according to a recent report by Dr. Mueller) furnishes about 3 lbs. of pure potash.
- Dr. Von Mueller also exhibits the resin of *Callitris verrucosa*, resembling the sandarac resin of the Mediterranean, and probably equally valuable for the manufacture of varnishes; and Mr. Bosisto exhibits grass-tree resin, from which a varnish is exhibited by Dr. Mueller, prepared by dissolving the resin in wood-spirit obtained from blue-gum timber; also picric acid obtained by the action of nitric acid on the resin.
- Several specimens of gum-resin are seen in this collection from different species of Eucalyptus, and one specimen of gum from the myall-tree.
- Two collections of essential oils from Victorian trees have been sent—one by Dr. Mueller, and the other by Mr. Bosisto. The tree that has been found most prolific in essential oil is the peppermint (*E. amygdalina*). Of the freshly-gathered leaves, 100 lbs. yielded upwards of 3 pints of oil. A full account of these oils is given in the Report on Indigenous Vegetable Substances at the Victorian Exhibition of 1861. So far as we know they have not yet become of importance as articles of commerce.
- Dr. Mueller exhibits "manna" and "lerp," the former an exudation from the leaves and twigs of *Eucalyptus viminalis*, and the latter a secretion of an insect found chiefly in the mallee scrub. Neither of these have been applied to any useful purpose; also some specimens of fixed vegetable oils, such as castor, olive, almond, linseed, &c., all of which seem to be of good quality. A specimen of liquorice root is also shown, and various samples of astringent barks suitable for tanning.
- The remainder of Dr. Von Mueller's extensive collection, embracing polished sections of indigenous timber, vegetable fibres, paper made from a variety of indigenous materials, a large collection of cereal and other grains, specimens of garden labels, a model of the *Victoria Regia* leaf and flower, &c., falls under classes that have been allotted to other judges. For his valuable illustrations of the vegetable productions of Victoria we have pleasure in recommending the award of a silver medal.

- 1856 The Colonial Secretary of New Caledonia contributes a collection of fixed and volatile oils, some of which are stated to possess powerful medicinal properties, and others are of known commercial value. Other valuable contributions from the same officer, such as coffee, sugar, rum, &c., fall to be considered under other classes. For the whole collection a bronze medal has been awarded.
- 1857 The last entry in this division is from Mr. P. Alroes, Ballarat. It is described as pit-ash, forming a layer 2 feet in thickness at a depth of 225 feet. Used in the manufacture of a patent manure. No analysis has been furnished with this substance, or any statement of its composition.

J. SMITH, M.D.
CHAS. WATT.
A. LEIBIUS, PH. D.

Judges

IN CLASSES 681, 683, 684-690, 691.

W. M. ALDERSON,	|	A. W. NORTON,
JOHN E. BEGG,	|	W. HALLEY.

RAW PRODUCTS AND FOREST INDUSTRIES.

Class 681.—Bones, Horns, Hides.

- 1858 T. G. Hewitt, Grafton. Ox hides.
1859 Tooth & Cran, Yengarie. Hides. Price, 26s. each.
1860 Manning & Staiger, Town Marie, Ipswich. Hides.

AWARD :—No. 1859 ; bronze medal.

JURORS' OPINION.—No. 1859.—Best cured and flayed.

Class 682.—Ivory, Tortoiseshell, Sponge, Shells.—No entry.

Class 683.—Indigenous Timber.

- 1861 Hudson Brothers, Botany Road, Redfern. Colonial woods. Building woods and woods suitable for cabinet-makers, &c.
1862 Hudson Brothers, Botany Road, Redfern. An assortment of coopers' work. The staves are prepared by machinery,—the only part performed by skilled labour being the trussing up of the cask or keg.
1863 John Abbott, George-street, Hobart Town. Section of a large blue gum tree, 6 inches thick.
1864 Hudson Brothers, Botany Road, Redfern. An assortment of steam-made joiners' work.

1864A John Lucas, Camperdown. No. 1. Portion of an iron-bark sapling, cut off a rafter of an old barn, built about 52 years ago, the timber having been cut 4 years previously. No. 2. A piece of ground joist, taken from the same building, and has always been immersed in water during wet weather. No. 3. A piece of box-sapling, which has only been cut four years, and is nearly rotten. No. 4. Ironbark cog, from the pit-wheel of the old Brisbane mill, supposed to be 44 years old; is perfectly sound, although more or less under water for a month at a time during that period. No. 5. Portion of a pile taken from a railway bridge near Hexham, which has only been constructed a few years.

NON-COMPETITIVE.

1865 James Shoobert, Exchange. Log of ironbark and log of turpentine. Exhibited for the purpose of showing the adaptability of the turpentine wood, as compared with ironbark, for wharf piles or ground sleepers.
1866 John Woodward, Orange. Samples of sawn timber—viz., red box, white box, stringy-bark, Orange ash, Orange oak, from Canoblas, near Orange.

AWARDS:—No. 1864; silver medal. [For the excellence and variety of their steam-made joinery work.]

1861 } highly commended.
1862 }
1866; commended.

JURORS' OPINION.—No. 1864.—Strongly recommended for perfection of workmanship, and large assortment. No. 1864A.—From description and appearance is worthy of attention. No. 1865.—From description and appearance durability of turpentine is very apparent.

Class 684.—Building and Fancy Woods.

1867 John Cuthbert, Miller's Point. A quantity of Colonial and other timber.

AWARD:—No. 1867; highly commended.

JURORS' OPINION.—Highly commended for care shown in preparing the collection.

Class 685.—Bark, Cork, &c.—No entry.

Class 686.—Materials for Basket, Wicker, or Plait Work.

1868 J. Duffin & Son, 23, King-street, Sydney. 100 hands of cabbage-tree plait. Price, 10s.

AWARD:—No. 1868; commended.

Class 687.—Skins.

- 1869 T. W. Crawley, Markets.
 1870 David Hayes, 612, Crown-street, Surry Hills, Sydney. Belts.
 1871 J. Coates, 25, South Head Road. Birds in skins, and birds mounted.
 1872 J. A. Thorpe, Barcom-street, Darlinghurst. Case of stuffed Australian birds. Price, £35. Rare birds, collected and mounted by J. A. Thorpe, principally at Cape York during 1868.
 1873 John Charles M'Closky, 25, Hosking's-place. Case of snake-skin belts.
 1874 Acclimatisation Society of Victoria, 30, Swanston-street, Melbourne. 3 Angora goat-skins, some ostrich feathers, pair of ostrich eggs; a trout in spirits, the first caught in Victoria.
 1875 Henry Wreden, Marysville, Victoria. Two dressed skins of the mountain opossum.

AWARDS :—No. 1871 } highly commended.
 1874 }
 1872 } commended.
 1870 }

Class 688.—Furs.

- 1876 T. W. Crawley, Markets. Furs of all descriptions.
 1876A H. Meden, Mangoville, Melbourne. Two dressed skins of the mountain opossum.

Class 689.—Feathers, Down, Hair, Bristles.

- 1877 William Large, 3, Parramatta-street. Glass case, containing ostrich feathers and kid gloves.
 1878 John Williamson & Co., 86, Elizabeth-street, South Melbourne. Colonial curled hair. Price, 1s. 6d. per lb.

NON-COMPETITIVE.

- 1879 Thomas Patmore, 5, Goulburn-street. Samples of Colonial horse-hair. Price,—black hair, 5s. per lb.; white, 10s. to 15s. per lb. Manufactured by Thomas Patmore.

AWARDS :—No. 1877 } highly commended.
 1879 }
 1878 ; commended.

Class 690.—Raw Silk.

- 1880 Thomas J. Silk, Cambridge House, 67, George-street. One case raw silk. The case exhibits the product of the silk-worm, its different stages, also the silk wound off the cocoon while life is in the chrysalis, and when destroyed, &c.

- 1881 Ann Chalmers, Ballarat. Specimen of raw silk. The raw silk manufactured by the exhibitor from worms fed from mulberries.
- 1882 Acclimatisation Society, Swanston-street, Melbourne. Collection of raw silk in various forms.
- 1883 James Kellick, Pitt and Hay streets. Two cases of raw silk.

AWARDS :—No. 1883 ; bronze medal.

1882 ; highly commended.

Class 691.—Leather, Plain and Manufactured.

- 1884 George Henry Elliott, Hobart Town, Tasmania. Leather, dressed kid, kangaroo, kip, &c. Price, various. Fourteen samples or specimens of Tasmanian leather, manufactured to suit the requirements of the trade of the various Colonies, also the English market ; the articles always realized extreme market value.
- 1885 James Forsyth & Sons, 91 and 92, Parramatta-street. Morocco, morocco roan, Memel calf, Memel goat, bookbinders' skins.
- 1886 James Forsyth & Sons, 91 and 92, Parramatta-street. Sole leather. Price, 11d. per lb.
- 1887 Joseph Mandelson, Goulburn. Leather modelling.
- 1888 T. C. Ludowici, Post Office, Hunter's Hill. Fire-bucket. Manufactured from raw material, the produce of New South Wales.
- 1889 Wright, Davenport, & Company, 794, George-street. Leather. Manufactured from Colonial hides and skins, tanned and dressed with Colonial materials.
- 1890 John E. Begg, Glenmore Tannery. Leather.
- 1891 T. C. Ludowici, Hunter's Hill. Leather hose
- 1892 Ditto. Mill belt-laces
- 1893 Ditto. Single mill-belt
- 1894 Ditto. do.
- 1895 Albert Radke, Burn's Bay, near Hunter's Hill. Mill-driving-belt, laces, lace-hides, copper and rivet leather hose, hide-ropes, &c. These goods manufactured at Burn's Bay, near Hunter's Hill, Parramatta River.
- 1896 John Clark & Sons, Stafford Tannery, Richmond, and 112, Swanston-street, Melbourne. Two sides crop and one crop butt.

AWARDS :—No. 1890 } bronze medals.

1896 }

1888 }

1891 }

1892 }

1893 }

1894 }

1895 }

highly commended.

JURORS' OPINION.—No. 1890.—Best assortment and quality.

Class 692.—Other Animal and Vegetable Products not specified.—
No entry.

FIBROUS SUBSTANCES FOR THE MANUFACTURE OF ROPE,
PAPER, FABRICS, &c.

Class 693.—Cotton, not less than 10 lbs.—No entry.

NON-COMPETITIVE.

- 1897 William Scott, of Ovalu, Fiji. Sea Island cotton. Realized 4s. per lb. in Liverpool, England. No special care has been taken in the growth of this cotton, although great care was taken in picking. The ginning was done by M'Carthy's knife-gin (Platts), which leaves the staple in its original length.

Judges

IN CLASSES 694, 695, 697-699, 700.

G. FERGUSON,
B. MOLINEAUX,

JOHN-G. COHEN,
HUGH DIXSON.

Class 694.—Flax, not less than 10 lbs.

- 1898 A. Forsyth, Australian Rope Works, Sydney. Sample New Zealand flax.
- 1899 William L. Hawkins, Christchurch, New Zealand. Flax dressed by machinery. The machinery adopted in preparing this flax is such that large quantities can be passed through the mills. The sample now exhibited is similar to shipments made to England and San Francisco, but no account sales are yet to hand to enable the price to be quoted.

AWARD :—No. 1899 ; bronze medal.

Class 695.—Hemp, not less than 10 lbs.

- 1900 A. Forsyth, Australian Rope Works, Sydney. Sample Manilla hemp.

Class 696.—Jute, not less than 10 lbs.—No entry.

Class 697.—Fibres, Yarns, Rope, String, &c.

- 1901 A. Forsyth, Australian Rope Works, Sydney. Four coils rope.
- 1902 Hoff & Marie, New Caledonia. Pine-apple thread and agave thread. Manufactured in N. Caledonia.

AWARD :—No. 1902 ; highly commended.

Class 698.—Other Vegetable Fibres.—No entry.

Class 699.—Tobacco (manufactured), not less than 112 lbs.

- 1903 E. T. Penfold, 394, George-street. Quarter-tierce "Negrohead" tobacco, No. 1. Manufactured in Sydney by the exhibitor from imported American leaf.
- 1904 Ditto ditto. Quarter tierce "Mirror" tobacco, No. 2. Manufactured in Sydney by the exhibitor from imported American leaf.
- 1905 Ditto ditto. Quarter tierce "Twist" tobacco, No. 3. Manufactured by the exhibitor in Sydney, from leaf grown in the Colony of New South Wales.
- 1906 Ditto ditto. Quarter tierce "Nailrod" tobacco, No. 4. Manufactured by the exhibitor in Sydney from leaf grown in the Colony of New South Wales.
- 1907 George Norrie, West Maitland. Colonial manufactured tobacco. Price, 1s. 6d. per lb.
- 1908 Hoff & Marie, New Caledonia. 15 kilograms tobacco. Manufactured and grown in New Caledonia.

AWARD :—No. 1907 ; bronze medal.

Class 700.—Cigars, not less than 1,000.

- 1909 Dixon & Sons, 193, York-street. Cigars manufactured by Dixon & Sons from imported leaf.

Class 701.—Snuff, not less than 14 lbs.—No entry.**SPECIAL PRIZE.****Judges :**

CHAS. WATT, | ROBERT HUNT,
F. B. MILLER.

Hon. Saul Samuel, £5 for best collection of Mineral Specimens, the production of the Colony.

- 1910 John Moore, Armidale. Mineral specimens. Price, £80. These specimens are from Oban Gold Field, a distance of about 40 miles from Armidale, and were taken out of the earth in the same state as exhibited.

JUDGES' OPINION.—The Judges consider that the exhibit of Mr. Moore does not meet the intention of the donor of this prize, comprising as it does but two varieties of minerals and those of but little, if any commercial, value, namely quartz and feldspar ; at the same time they consider the collective exhibits of Dr. A. Thomson to fulfil all the conditions required, and therefore recommend that the prize should be awarded to him, although he has not entered for it.

STEWARDS' REMARKS.—The Stewards cannot endorse the recommendation of the Judges for the award of this Special Prize, as the object of Dr. Thomson in not entering for the prize was to prevent the possibility of the award being made to a Steward in the Section ; moreover, Dr. Thomson would decline to accept it.

SECTION VI.—APPARATUS AND PROCESSES USED IN THE COMMON ARTS.

Stewards:

G. K. MANN,

| J. H. GOODLET.

Judges

IN THIS SECTION.

JOHN STRUTH,
FRANCIS NAPIER,
RICHARD KEITH,| ELIAS DEEPER,
HENRY MILGROVE,
E. O. MORIARTY.

Class 702.—Prime Movers.—Boilers and Engines.

- 1911 P. N. Russell & Co., 399, George-street. Four horse-power horizontal engine. Manufactured by Clayton & Shuttleworth, of England, with improved expansion gear and steam jackets to cylinders.
- 1912 Lawrence Swan, 155, Pitt-street. Model of engine and boiler, with pumps attached. Made in Sydney by exhibitor, and adapted for working sewing-machines.

NON-COMPETITIVE.

- 1913 Montefiore, Joseph, & Co., O'Connell-street. One six horse-power portable engine. Price, £300. Manufactured by Messrs. Fox, Walker, and Co., Atlas Engineering Works, Bristol; this engine has not been got up for exhibition, but is really six horse-power, as stated.
- 1913A Locomotive engine. Manufactured at the Railway Workshops.
- 1913B Locomotive engine. Manufactured at Messrs. Mort & Co.'s Works, Waterview Bay.

AWARDS:—No. 1913A; silver medal. [For their Locomotive engine, made principally of Colonial material.]

1913B; silver medal. [For Locomotive engine, made principally of Colonial material.]

1911; bronze medal.

JURORS' OPINION.—No. 1911.—Imported engine, very highly finished. Nos. 1913A and 1913B.—Both these engines are substantially constructed, highly finished, and exceedingly creditable to their respective establishments; we recommend them for special prizes.

Class 703.—Locomotive Engines.—No entry.

Class 704.—Railway Carriages, Wheels, Axles, Tires, Breaks.

- 1914 P. N. Russell & Co., Sydney Foundry. Ordinary enclosed second-class railway carriage. Colonial manufactured, with the exception of wheels and axles.
- 1915 P. N. Russell & Co., Sydney Foundry. Ordinary open second-class railway carriage. Colonial manufactured, with the exception of wheels and axles.
- 1916 P. N. Russell & Co., Sydney Foundry. First-class railway carriage. This carriage is specially designed for night travelling, having a compartment for ladies as well as general saloon and smoking-room; it is adapted for going round the sharpest curves, being fitted with radial axle-boxes, which adjust themselves to the curve of line, and prevent the flange of the wheel from grinding against the inner edge of rail; the whole is of Colonial manufacture, except the wheels.

AWARDS:—No. 1916; silver medal. [For their first-class railway carriage, made principally of Colonial material.]

JURORS' OPINION.—No. 1916.—A very creditable specimen of Colonial manufacture, and worthy, in our opinion, of special commendation. It would in our judgment have been better had the bottom frame been of iron, and its connection with the wheel-work more secure.

Class 705.—Machines and Tools.

- 1917 John Bain, 17, Park-street, Sydney. Butcher's scale with double pillars, price £8; butcher's scale with one pillar, price £4; tea scales, price £3; butter scales (brass), £3.
- 1918 A. Chisholm, 183 and 185, Pitt-street. Wire strainers for fencing purposes.
- 1919 Messrs. F. Lassetter & Co., Sydney. Specimen of machine driving band. Colonial manufacture.
- 1920 Ditto ditto. Collection of machine and tools, suited for sheep and cattle stations.
- 1921 Saddington & Sons, 152, Pitt-street. Tanners' bark fork. Price, £1 1s.
- 1922 Ditto ditto. Blocking machine. Price, £14.
- 1923 Ditto ditto. Self-acting eye-letting machine. Price, £6 10s. Can be adapted to any size of eyelets.
- 1924 Ditto ditto. Leather splitting machine, with extra knife. Price, £15. Can be adjusted to split or shave any thickness of leather.
- 1925 Thomas J. Bown & Co., Bathurst-street. One tanner's brass leather roller, mounted on cast-iron box for weighing. Price, £15. Colonial-made.
- 1926 Ditto ditto. Sausage-filling-machine.
- 1927 Ditto ditto. Two corn-crackers. Price, £5 10s.
- 1928 John Watson, druggist, 601, George-street. Pill-making machinery, made by Pindar, London.

- 1929 William Smith, engineer, Botany Road. Curving-machine, price £28; parallel and circular cutters, £10; three feet rollers, £8; bedding-machine, £6; circular-cutter, £6; folding-machine, £2 10s.; wiring-machine, £3 10s.; paring-down-machine, £2 10s.; large thick edge, £3 10s.; small thick edge, £3; large burr, £2 10s.; small burr, £2 6s.
- 1930 John Bain, 17, Park-street. Gold scale on triangle, to weigh 1,000 ounces; price, £21. Letter-scale up to 4 lbs.; price, £1 10s.
- 1931 Curtis & Co., Daylesford. A nest of pabyth scoops. No. 1, price, 2s. 6d.; No. 2, price, 2s. 9d.; No. 3, price, 3s. 3d.; No. 4, price, 4s. Invented by Mr. Henry Curtis, Daylesford, gas engineer, and are patented in Victoria, England, France, and America.
- 1932 John Perry, 85, Lonsdale-street, Melbourne. Collection of articles of Victorian manufacture.

NON-COMPETITIVE.

- 1933 Charles Joseph Arnold, 91, William-street, Woolloomooloo. Portable blasting fan and blacksmith's forge, with vice and tool-chest attached. Price, £14. Portable blasting fan can be used for sinking holes where there is foul air.

AWARDS:—No. 1917; bronze medal.

1918; bronze medal. [For introduction of new and useful articles into the Colony.]

1929; highly commended.

1922-4; commended.

JURORS' OPINION.—Nos. 1922-4.—A very useful class of machines, displaying great ingenuity and adaptation to the ends sought.

—

Class 706.—Lathes, Punching, Shaving, and Riveting Machines.—
No entry.

—

Class 707.—Sawing, Planing, Morticing, Moulding, and Tenoning.

- 1934 Greville & Co., George-street. Merrett & Gibbs' patent boring and morticing machine, with wood frame. Price, £19. More particularly intended for wire and post and rail fencing.
- 1935 Greville & Co., George-street. Merrett & Gibbs' patent boring and morticing machine with iron frame. Price, £18. More particularly intended for wire and post and rail fencing.

—

Class 708.—Stone Breakers.

- 1936 P. N. Russell & Co., Sydney. Stone breakers worked by 10 h.p. portable engine by Clayton and Shuttleworth, Lincoln, and to be under steam.

1937 **Mort's Dock and Engineering Company.** Battery, 10 head quartz-crusher. Weight of each stamper, 400 lbs.

AWARDS:—No. 1936; bronze medal.

1937 (See 1735.)

Class 709.—Brickmaking, Tile, Drain-pipe making, &c.

1938 **Thomas Field, George-street South.** A tile and pipe making machine. All manufactured on premises in George-street.

1939 **William Shortus, Marrickville.** Bricks, common clay-pressed.

Class 710.—Shoe-pegging, Peg-cutting.

1940 **Saddington & Sons.** Shoemaker's head block. Price, 20s. By means of the double motion the workman has a thorough command over his boot.

1941 **Saddington & Sons.** Northampton hand-pegging machine, with pegging-jack and extras. Price, £16 16s.

1942 **Ditto ditto.** American hand-pegging machine, with pegging-jack. Price, £18.

1943 **Ditto ditto.** Le Mercier's screw-riveting machine. Price, £30. This machine cuts the wire, forms the screw, places it in position, and unites the sole to the upper.

AWARDS:—No. 1941; bronze medal.

1942; highly commended.

JURORS' OPINION.—Great ingenuity displayed in the whole of the machines in this class.

Class 711.—Printing, Type-making.

1944 **Greville & Company, George-street.** A complete newspaper plant. Price, £500.

1945 **Archibald Wright, 52, George-street.** Type manufacture and type.

1946 **Ditto ditto.** Type-casting machine.

1947 **Gordon & Gotch, 281, George-street.** One of Berry's hand-printing press and printing materials, types, &c. Price, £5 10s. Useful to amateurs.

1948 **Oliver Levey, Bourke-street, Melbourne.** Printing material.

NON-COMPETITIVE.

1949 **Arthur A. Baker, 23, Hunter-street.** The American rubber hand-stamp, with specimens on show cards.

AWARDS:—No. 1945 } bronze medal.
1946 }

JURORS' OPINION.—No. 1946.—Manufactured in the Colony and of Colonial materials; deserving of special notice.

Class 712.—Spinning, Rope-making, &c.

- 1950 A. Chisholm, 183 & 185, Pitt-street. Specimens of patent improved wire-rope.

Class 713.—Weaving, Cloth-making, &c.—No entry.**Class 714.—Sewing-machines.**

- 1951 Robert Miller, 93, Crown-street, Sydney. Sewing-machine. Price, £9. The said machine was made by the exhibitor in Sydney.
- 1952 Gibbs, Shallard, & Co., 108, Pitt-street. Little Wanzer lockstitch sewing-machine. Price, £5 5s. for working by hand; £6 10s., with stand, for working by hand or foot.
- 1953 Ditto ditto. Wanzer lockstitch sewing-machine. Price, £10 10s. The Wanzer machines were awarded highest prize at Paris Exhibition, 1867 (see *Illustrated London News*, Dec. 7, 1867).
- 1954 Ditto ditto. Wanzer sewing-machine. Price, £12. The "Little Wanzer" and "Wanzer" machines are also got up more elaborately, and at higher prices. Those exhibited claim the most important features in sewing-machines, namely, *quality* and *rapidity of work*, with low price.
- 1955 A. Fowler, 316, Castlereagh-street. The Home sewing-machine, double lockstitch, suitable for domestic, tailoring, boot-making, and general work. Prices:—A, £12; B, £13; C, £14.
- 1956 Stanford & Co., 307, George-street. Singer & Co.'s sewing-machines.
- 1957 Gordon & Gotch, 281, George-street. Three Grover & Baker's sewing-machines.
- 1958 A. Chisholm, 183 and 185, Pitt-street. Raymond's patent hand sewing-machines. Price, £3 18s.
- 1959 Saddington & Sons, 152, Pitt-street. Hand sewing-machine, chain-stitch. Price, £3 5s., exclusive of stand.
- 1960 Ditto ditto. Hand sewing-machine, lock-stitch. Price, £4 4s., exclusive of stand.
- 1961 Ditto ditto. Waxed-thread sewing-machine. Price, £37 10s. By this machine boots are "sided" right-side out, thus avoiding the laborious process of tanning and rubbing down the seam.
- 1962 Vennard & Stevens, 220, Pitt-street. Sewing-machines.
- 1963 J. B. Tickle, 311, George-street. Newton & Wilson's sewing-machine. Price, £15 15s.
- 1964 Ditto ditto. "Little Stranger" sewing-machine; a lockstitch machine. Price, £7 7s.
- 1965 Ditto ditto. Sewing-machine on Wheeler & Wilson's principle. Price, £8 10s.
- 1966 Ditto ditto. Alberta sewing-machine. Price, £10 10s.
- 1967 Ditto ditto. The "Arm Tudor" sewing-machine. Price, £12 12s.
- 1968 Ditto ditto. The Tudor sewing-machine, suitable for tailors, bootmakers, &c. Price, £12.
- 1969 Samuel Hebblewhite, 432, George-street. Sewing-machine. Price, £8.

1970 John Paterson, 215, King-street, Melbourne. Improved Singer sewing-machine. Price, £12 in Melbourne.

AWARDS:—No. 1952; bronze medal.

1951	}	highly commended.
1956		
1957		
1959	}	highly commended.
1960		
1961		
1967	}	highly commended.
1970		

JURORS' OPINION.—Nos. 1959-61.—Machines mainly adapted for working in leather. 1951.—Colonial workmanship.

Class 715.—Bread-making Machines, Biscuit ditto.—No entry.

Class 716.—Mills, Boilers, Vacuum Pans, Centrifugal Machines, &c.

- 1971 P. N. Russell & Co., George-street. Small cane-mill, for horse-power, and centrifugal machines for drying sugar, with engine for working same. The mill specially adapted for small farmers.
 1972 Mort's Dock and Engineering Company. Sugar-mill; rollers 48 x 24.
 1973 Ditto ditto. Centrifugal machine for sugar. Size, 30".
 1974 Ditto ditto. Sugar centrifugal machine, 30° underdriven.

AWARDS:—No. 1971 } bronze medals.
 1972 }

JURORS' OPINION.—We consider these two machines are essentially different, and each deserving of the award.

Class 717.—Distillery and Brewing Apparatus.—No entry.

Class 718.—Ice-making Machine.

- 1975 Mort's Dry Dock and Engineering Company. Freezing machine.
 1976 W. Boam & Co., 249, Pitt-street. Ice-cream fountain apparatus. Price, £75.

AWARD:—No. 1976; highly commended.

Class 719.—Aerated Water Machinery.

- 1977 T. J. Bown & Co., 99, Bathurst-street. One sodawater generator and acid bottle. Price, £17.
 1978 Curtis & Co., Daylesford, Victoria. Electro-plated fountain for mineral or aerated water. Price, 3 guineas. This high-pressure fountain was designed and patented by Mr. Henry Curtis, Daylesford.
 1979 Hepburn Mineral Water Company, Daylesford. Fountain for mineral waters. Price, £2. Used in connection with the cylinders.

- 1980 Edward Hogben, Creswick. Syrup and aerated water pumps; also applicable to other purposes. Royalty for using same. Saves the labour of two men, and dispenses with cork, wire, and string, in connection with patent stopper for bottles.

AWARDS:—No. 1980; bronze medal.
1977; highly commended.

Class 720.—Bottling-machine.—No entry.

Class 721.—Pumps.

- 1981 Messrs. F. Lassetter & Co. Collection of pumps suitable for domestic purposes.
- 1982 T. J. Bown & Co., 99, Bathurst-street. An English-made double-action force pump, 3½ in., brass barrel. Price, £40.
- 1983 Ditto ditto. One Colonial-made double-action force-pump. Price, £40. One 3-in. brass Colonial-made force-pump. Price, £10. One Colonial-made butcher's salting-pump. Price, £5.
- 1984 Allan A. Marshall & Co., Bon Accord Works, 8, Macquarie-place. Force and lift pump. Price, £8 10s.
- 1984A Joseph Miller, 507, George-street. Improved salting-pump.

AWARD:—No. 1984A; highly commended.

NON-COMPETITIVE.

- 1985 Thomas Nossiter & Co., 62, New Pitt-street. A double-acting steam pump, 3½ in. diameter. Price, £35.

Class 722.—Cranes.—No entry.

Class 723.—Gauges, Registering Instruments, &c.

- 1986 P. N. Russell & Co., 399, George-street. Brass engine-fittings and ornamental castings.

Class 724.—Fire-engines, Extincteurs, &c.

- 1987 Thomas J. Bown & Co., 99, Bathurst-street. 3 English manual power fire-engines, and 1 three-barrel equilibrium steam fire-engine. No. 1 steam fire-engine; price, £800. No. 2, large brigade-engine; price, £280. No. 3, medium brigade fire-engine; price, £216. No. 4 curricule fire-engine; price, £172.
- 1988 Thomas J. Bown & Co., ditto. 2 Colonial-made manual power fire-engines. No. 1 engine, as per schedule; price, £100. No. 2 engine, as per schedule; £65.
- 1989 Thomas J. Bown & Co., ditto. 1 London fire-brigade hand-pump; price, £3 10s. 1 pail fire-pump; price, £5 10s.
- 1990 Thos. J. Bown & Co., ditto. 2 firemen's helmets. Price—men's, 30s.; officer's, 40s. 1 canvas fire-bucket; price, 5s. Firemen's axes and belt; price, 20s.

- 1991 Thomas J. Bown & Co., 99, Bathurst-street. Two leather fire-buckets ; price, 15s. each. 1 length of copper-riveted leather suction hose ; price, 8s. per foot. 1 length ditto delivery hose ; price, 3s. 3d. per foot. Brass unions tied in, 20s. per pair.
- 1992 Allan A. Marshall & Co., Bon Accord Works, 8, Macquarie-place. Ship's fire-engine, pump, and hose ; price, £48. Used for general purposes, both on shore and on board ship.
- 1993 Ballarat Fire Brigade. Hose-carriage. Improved winding gear and break, and carriage mounted on springs.
- 1994 Ballarat West Fire Brigade, Ballarat. 2 couplings with hose, 2 buckets, 1 belt, axe and spanner, 1 helmet. Manufactured in Ballarat.

AWARDS :—No. 1988 ; bronze medal. [For large engine.]
 1988 ; highly commended. [For small engine.]
 1990 }
 1993 } highly commended.
 1994 }

Judges

IN CLASSES 725, 736.

J. DE V. LAMB, | G. BINGHAM,
 J. BENNETT.

Class 725.—Carriages, &c., Bicycles, Velocipedes, Perambulators, Phaetons, Landaus, Broughams, Sociables, Waggonettes, Barouches, Coaches, Omnibuses, Gigs, Dogcarts, Buggies, Hansoms, Cabs, &c.

- 1995 H. Vickers & E. Cooke, Glebe. Saloon omnibus. Price, £130. Fitted up in a first-class manner, with Indian ventilation roof ; also improvement in working of break arms ; it is also made a proper width inside, without being any heavier to work. It is also made with bell and roof lamp inside ; springs are also fixed to the frames to keep them from making a noise ; the wheels of the coach are so fixed as to be as easy with one passenger as to carry thirty.
- 1996 O'Brien, Kerridge, & McKay, 267 and 269, Castlereagh-street. Queen's pattern top buggy. Price, £80. Fitted with shafts, registered lamps, burnished driving rail, $\frac{1}{4}$ -plated joints on head, plated stock hoops on wheels, gutta-percha outwattlers, and safety-straps to shafts ; eccentric wheel plates, to allow of turning in a small space ; registered rein-holder on dash. Timber used in construction—English oak, ash, hickory, and cedar ; iron used—Best BBH with crown ; English elliptic spring, and mail axles trimmed with blue morocco leather ; cloth and lace to match ; silk curtains, cushions and squab stuffed with best curled horsehair ; painted lake ; tops of sides of panels mock-caned, fine-lined vermilion, and glazed with crimson lake varnish. Sides of head remove, and make a light open head for warm weather.

- 1997 O'Brien, Kerridge, & M'Kay, 267 and 269, Castlereagh-street. Cut under turn-out seat buggy. Price, £60. Fitted with shafts and plated lamps; registered rein-holder on dash; burnished driving rail hung on elliptic springs; half-patent axles, full wheel plates, plated stock-hoops on wheels. Timber used—Hickory, ash, cedar, &c. Iron used—Best BBH with crown; trimming enamelled leather; patent horse-hide on dash; painted Hutton green, picked out black, fine lined, light chrome, gutta-percha outwattlers and safety-straps and shafts.
- 1998 O'Brien, Kerridge, & M'Kay, ditto. Sydenham phaeton. Price, £150. Fitted with shafts, pole and bar, polished swivel, crab and pole chains; registered plated lamps, wings, &c., hung on side and cross springs. Timber used in construction—English ash in body-work and under carriage, Colonial cedar in panels. Iron used—Best BBH with crown; plated stock-hoop on wheels; Colinges' patent axles; trimmed green, morocco leather and drab cloth, silk lace, &c., to match; cushions and squabs stuffed with best horsehair (curled); English enamelled leather on head; patent horse-hide on dash and wings; registered rein-holder, half-plated joints to head; painted dark green, picked out, and fine lined white.
- 1999 O'Brien, Kerridge, & M'Kay, ditto. Sociable. Price, £60. Fitted with pole-shafts, break, plated lamps, registered rein-holder on dash, plated hoops on wheels, full wheel plates, half-patent axles, elliptic springs. Timber used—Light wood, ash, cedar, hickory, &c. Iron used—Best BBH and crown; trimmed with maroon leather, painted brown, fine lined orange, gutta-percha outwattlers and safety-straps on shafts.
- 2000 O'Brien, Kerridge, & M'Kay, ditto. Bicycle. Price, £10 10s.
- 2001 Norman Selfe, Balmain. Bicycle. Price, £20. The exhibitor was the maker of the first bicycle in New South Wales, for his own use, six months before one arrived in the Colony, or was made by any other Colonial maker; the break is an original design of the exhibitor's, and was the first one of its kind.
- 2002 Samuel Taylor, Dixon-street. Perambulator, Prince Arthur. Price, £7.
- 2003 Messrs. Fitzgerald & Collins, 290, Castlereagh-street. 1 Queen's phaeton. Price, £90.
- 2004 Ditto ditto ditto. 1 Tray buggy. Price, £50.
- 2005 Ditto ditto ditto. 1 Hampshire buggy. Price, £65.
- 2006 Ditto ditto ditto. 1 Concord buggy. Price, £45.
- 2007 John Robertson, 489, Pitt-street. Eureka buggy. Price, £50.
- 2008 Ditto ditto. Barouche. Price, £130: Spanish Prince Albert buggy, 70 guineas.
- 2009 Halley & Clyde, 381 and 383, Pitt-street. Tray buggy. Price, £75. Very light for one horse; built of hickory and ash; best material; eccentric lock, and furnished with Halley & Clyde's patent break.
- 2010 Halley & Clyde, ditto. Barouche, light and fashionable, for two horses. Price, £155. Built in the British style, of well-seasoned hickory, ash, and cedar; Collins' patent axle and powerful break.
- 2011 Halley & Clyde, ditto. Carriole carriage, for one or two horses. Price, £165. Built in the American and French styles; the body of the carriage is built of hickory, ash, and cedar; the wheels of hickory; axles Collins' patent; the iron-work best description; the lock eccentric, with two half-circle Transome plates; the break very powerful and capable of stopping hind wheels instanter.

- 2012 Halley & Clyde, 381 and 383, Pitt-street. Hampshire buggy, with pole and shafts for one or two horses. Price, £65. Built of ash and hickory; the body of Colonial beech; varnished; trimmings, ironwork, &c., of best description; furnished with Halley & Clyde's break, patented July, 1870; acts without noise or vibration, and enables the driver to set the hind wheels fast in a moment; the tires are solid, with gutta-percha, whereby the vehicle is rendered noiseless.
- 2013 John Aaron Parfitt & Son, William-street. Stanhope driving phaeton. Price, £50. It is a new design of body, with seat for four or two persons.
- 2014 Ditto ditto. Bicycle. Price, £15.
- 2015 Thos. Moore, 205, South Head Road. A hansom cab. £100.
- 2016 Ditto ditto. 1 tumbler-seat buggy. Price, £65. The panels and frame of body are of Colonial beech and light wood, the carriage of ash and hickory; it is fitted with mail-axles, poles, and shafts; a light and effective spring-break, lamps, and removable knee-boot apron. 1 spider buggy, to carry two persons, fitted with mail-axles. £37.
- 2017 Thos. Moore, ditto. A cabriole phaeton. Price, £100. It has a concealed occasional seat, pole; and shafts; shortening lock-plate and lamps.
- 2017A Thos. Moore, ditto. Concord buggy, with leather boot; removable top; pole and shafts, break and lamps. Price, £70.
- 2018 Thos. Moore, ditto. 1 invalid perambulator, £14. 2 childrens' perambulators, 50s. to 60s.
- 2019 Thos. Moore, ditto. A single-seat Concord buggy, with removable top, pole, shafts, and break, and patent axles. Price, £75.
- 2020 W. T. Angus, Castlereagh-street. Cut-up sociable turn-out seat buggy. Price, £60. A light buggy, admits of turning readily, having a neat appearance, closed or open, with the advantage of ready access to hind seats.
- 2021 W. T. Angus, ditto. Queen's phaeton buggy. Price, £80. Very handsome, and finished with everything of the best.
- 2022 W. T. Angus, ditto. A spring barouche. Price, 250 guineas. An extremely light, easy, and elegant carriage, with self-acting steps.
- 2023 Cobb & Co., Pitt-street. Abbott no-top buggy. Price, £60.
- 2024 Adams & Webber, Newtown. Improved omnibus car, for utility.
- 2025 Cobb & Co., Pitt-street. Abbott's express waggon buggy. Price, £55.
- 2026 Stevenson & Elliott, Melbourne. A C spring barouche.
- 2027 Ditto ditto. Varnished round-back light buggy.
- 2028 Ditto ditto. Varnished French Pellow light buggy.
- 2029 Ditto ditto. Canterbury four-in-hand drag.
- 2030 William Vial, 259 and 261, Castlereagh-street. Concord buggy. Price, £40. Fitted with shafts for one horse, and silver-mounted lamps.
- 2031 William Vial, 259 and 261, Castlereagh-street. Tray buggy. Price, £53. Fitted with patent break, pole and shafts for one or two horses, and silver-mounted lamps.
- 2032 William Vial, 259 and 261, Castlereagh-street. Cut under buggy. Price, £55. Fitted with best mounted lamps and shafts for one horse.
- 2033 William Vial, 259 and 261, Castlereagh-street. Full-size family barouche. Price, £190. Fitted with water-tight canopy, patent break, and silver-mounted lamps, silver-plated stock hoops and joints.

2033A W. D. Jones, St. Leonard's. A water-bicycle. Price, £40. The boats are twine, propelled by manual force with wheels, and sailed with centre-board and pulled with outriggers and sculls; can be used with one or two appliances.

AWARDS:—No. 1995; bronze medal. [For saloon omnibus.]

1996	}	bronze medal.	}	[For their general exhibit of carriages.]
to				
2000				
2009	}	bronze medal.		
to				
2012				

2029; bronze medal. [For Canterbury four-in-hand drag.]

2003	}	highly commended.
2016		
2017A		
2033A		

2004; commended.

JURORS' OPINION.—No. 1995.—A very creditable piece of Colonial workmanship. 2026.—Workmanship and material good; faulty in construction of wood and hanging of body.

Class 726.—Carts, Drays, Waggons, &c.

2034 James & Cormick Smith, Gipps and Parker Streets. Carcass butcher's cart.

2035 Ditto ditto. Farm waggon.

2036 Ditto ditto. Carrier's waggon.

2037 Wm. Bull & Son, George-street, South. Night horse waggon, with patent screw break; warranted to carry 3 tons. Price, £38. Made of Colonial timber and iron, with the exception of axle and boxes.

2038 A. J. Goodwin, 85, Bathurst-street. Challenge squatters' or farmers' waggon. Price, £40.

2039 Wm. Bull & Son, George-street South. Two-horse dray, with patent screw break, to carry one ton and a half. Price, £12. Made of Colonial timber and workmanship, with exception of axle and boxes; of Colonial iron.

2040 Wm. Bull & Son, George-street South. Tip-up dray for one horse, to carry a ton. Price, £8. Made of Colonial timber and workmanship, with exception of axle and boxes; of Colonial iron.

2041 Adams & Webber, Newtown. One flour waggon. Not for sale. To carry 5 tons, with spring mail patent axles and break, complete. Has been constantly at work for 19 months.

AWARDS:—No. 2041; bronze medal.

2038; highly commended.

2034	}	commended.
2037		

JURORS' OPINION.—No. 2041.—Piece of first-class workmanship.

Judges

IN CLASSES 727, 728.

BUCHAN THOMSON, | JOHN BRUSH.

Class 727.—Wheelwrights' Work, Tools, and Materials.

- 2042 Charles Beggs, Liverpool-street west. Six pairs of stocks for wheels. From 3s. 6d. to 4s. per pair.
- 2043 John Perry, 85, Lonsdale-street, Melbourne. Collection of articles, being steam-bent timber for carriage-builders and wheelwrights; all of Victorian manufacture.

AWARDS :—No. 2043; bronze medal.
2042; highly commended.

JURORS' OPINION.—No. 2043.—These specimens exhibit the suitability of the Colonial woods, when properly treated, for many purposes of the Arts.

Class 728.—Harness and Saddlery.

- 2044 W. Gaydon, William-street. Four saddles. Price, £5 to £8.
- 2045 D. M'Call, Hunter-street. Eleven saddles from £5 to £9 10s.
- 2046 Pansacker & Evans, 10, Lonsdale-street west, Melbourne. Solid leather portmanteau. Price, £7 10s. Made from leather, and nearly all other materials being the produce of Victoria.
- 2047 Ditto ditto. Solid leather lady's trunk. Price, £15. Made from leather and nearly all other materials being the produce of Victoria.
- 2048 John Hatton, Latrobe-street east, Melbourne. Collar, buggy saddle, and register back-band and tugs. Price, £5. In this back-band the centre of the band, formerly tight, is left loose, and the buckle can be taken in and out without difficulty.
- 2049 Tomillas Mappin, Sandhurst. American hames. Price, No. 1, 60s. per dozen pairs; No. 2, 60s. ditto; No. 3, 90s. ditto.
- 2050 John Keystone, 36, Bourke-street west, Melbourne. One card assorted whips. All made in the Colony, chiefly of Colonial materials.

NON-COMPETITIVE.

- 2051 H. C. Brookes, 1, Barrack-street. One glass-case, 6 ft. 8 in. by 2ft. 6in., containing one best quilted all-over side-saddle, with leaping head; can be used to ride on either side, £18. One quilted all-over gentleman's Somerset saddle, £10. Two quilted seat race-saddles, without a tree, £3. One set of Scotch shaft harness, £7. One ditto leading, £4.

AWARDS :—No. 2045; bronze medal.
2044 } highly commended.
2049 }
2046 } commended.
2047 }

Class 729.—Railway Apparatus.

- 2052 Hudson Brothers, Botany Road. Railway-keys. Price, £8 10s. per 1,000. Made of cedar, kiln-dried, saturated with crude petroleum, and hydraulic-pressed.
- 2053 Charles Lewis, 201, Phillip-street. One distance-signal; price, £40. One station-signal; price, £50.
- 2054 Henkel & Patterson, 30, Little Collins-street, Melbourne. One railway-engine head-lamp, tri-color hand-signal-lamp, and a variety of coach and buggy lamps.

AWARDS :—No. 2053 ; bronze medal.
 2052 } highly commended.
 2054 }

Class 730.—Telegraphic Apparatus.

- 2055 A. Chiaholm, 183 & 185, Pitt-street. Specimens of telegraph materials.

CIVIL ENGINEERING.**Class 731.—Bridges, Docks, Weirs, and Dams, Sewerage, Lighthouses.****Diving Apparatus, Building Materials (Natural and Artificial).**

- 2056 Thomas Hole, 220, Crown-street, Woolloomooloo. Model of self-supporting spiral staircase, without framing or newal posts (diameter of model 21 inches by 2 feet 10 inches in height). Price, £20. The structure of this principle of staircase is the great strength of the outside strings when in a position, and carriages fixed could be carried any height required for two-thirds the usual price that one on the old principle of framing could be done.
- 2057 William M'Burney, 36, Thomson-street, Darlinghurst. Model pontoon bridge. Constructed to resist pressure of current and force of tides. Inventor, Sam Donaldson, Bondi Station, near Gunnedah. Size of model—Length, 8 feet; breadth, 2 feet 2 inches; depth, 1 foot 6 inches.
- 2058 A. Chisholm, 183 and 185, Pitt-street. Specimens of iron shutter work. Of great strength and complete security; suitable for openings of any size, worked with the best worm and wheel gearing; fire-proof and thief-proof.
- 2059 John Law, cabinet-maker, East Maitland. One two-inch panelled door, framed and secured by screws, bolts, and nuts. Price, £1 2s. 6d. In lieu of the mortice and tenon an iron bolt screw is passed through the stile or upright of the frame and into the end of the cross-rail, where the nut (to receive the screw) is sunk from the edge about an inch below the panel groove, and is hidden by the panel and moulding.
- 2060 James Scott, Newcastle. Atmospheric ship lift.

JURORS' OPINION.—No. 2056.—Defective in principle.

Class 733.—Steering Apparatus.

- 2061 Archibald McFarlan, Phoenix Wharf. Iron steering-wheel, with brass centre. Price, £4. The advantages claimed for the iron steering wheel over the wooden one are its durability, cheapness, and extra safety, for vessels taking bar harbours.
- 2062 James Porter & Co., 20, Junction-street, off Brisbane-street, Sydney. Patent tiller. An improved apparatus for steering ships. Price, £20 and upwards, according to tonnage of vessel. A specification, with full particulars, will be attached to the machine.

NOT CLASSIFIED.

- 2063 James Partridge, Bathurst-street. Six Colonial ovens. Extra sizes and shapes not on exhibitor's list.
- 2064 Ditto ditto. Two portable washing-furnaces with galvanized iron and copper complete. Galvanized at the Works, Bathurst-street.
- 2065 Ditto ditto. Seven bundles and two galvanized buckets.
- 2066 Ditto ditto. Six nests of galvanized tubs.
- 2067 Ditto ditto. Five kegs of galvanized nails. Price, 14s. per cwt.
- 2068 Ditto ditto. Galvanized ridge-caps, gutters, and down-pipes, with heads and shoes complete.
- 2069 Ditto ditto. Two bundles galvanized flat sheet-iron.
- 2070 Ditto ditto. Two bales of galvanized hooping; three register and three half-register-stoves.
- 2071 Ditto ditto. Two bundles of electric telegraph wire.
- 2072 Ditto ditto. Specimens of iron-work, galvanized at Partridge's works, Bathurst-street.
- 2073 Ditto ditto. Two galvanized iron-tanks. Price, 2½d. per gallon.
- 2074 Ditto ditto. Twelve Colonial ovens.
- 2075 Thomas J. Bown & Co., 99, Bathurst-street. Two brass castings. Price, 20s. each. Cast by Thomas J. Bown & Co., and are exhibited to show that any work of the kind can be done in the Colony.
- 2076 Robert Macfarlane, Victoria-place, off Liverpool-street. One set of brass scales, Colonial-made; with brass weights, complete. Price, £20.
- 2077 Mark Stephenson, 13, Princes-street. Sculls, blocks, oars, &c.
- 2078 A. Chisholm, 183 and 185, Pitt-street. Urinal with lamp.
- 2079 Ditto ditto. Macfarlane's patent drinking-fountains, Nos. 5, 6, 7, and 8.
- 2080 Ditto ditto. Macfarlane's patent closet.
- 2081 Ditto ditto. Photographs of machinery; framed and mounted.

- 2082 John Beeston, Menangle. Improved cottager's bee-hive on the humane or depriving system. Price, 25s., complete; or with bees, £2. This bee-hive protects the bees from hot or wet weather, giving ventilation at same time. See part 1: Box 2 is the inside box or permanent home of the bees, which is never robbed. No. 3 is a wood super, which fits on the top of No. 2, and can be removed at pleasure when full of honey. No. 4 is a glass super, and is used the same as No. 3, or, if required, on the top of it.
- 2083 J. H. Dunning, 1, Barrack-street. Mowle's patent dry-earth closet; price, £4. Dry-earth closet, varnished pine, commode; price, £5. Dry-earth closet, French polished cedar, commode, £7.
- 2084 Allan A. Marshall, Bon Accord Works. Brass window-frame, and manufactured articles in brass.
- 2085 James Gagen & Sons. Empty casks—one oil-cask, two brewer's casks, two tallow, and two beef, casks; made of Colonial wood.
- 2086 Norman Selfe, Balmain. Drawing of marine-engines, for screw. Designed by exhibitor, and manufactured by Mort's Dock and Engineering Company.
- 2087 John & Samuel Danks, 42, Bourke-street west, Melbourne. General brass foundry-work, for engineers', plumbers', &c.
- 2088 P. N. Russell & Co., Sydney. Gold-washing-machine. Price, £40. This is Hunt's patent gold and diamond saving machine.
- 2089 R. T. Adams, Victoria Filter Works, Melbourne. Dahlke's filters. Price, No. 6, five gallons, £2 10s. No. 7, two gallons, £1 5s.
- 2090 Ditto ditto. Dahlke's filters. Price, No. 1, £6 6s. No. 2, canvas, £4 10s. No. 3, canvas, £1 5s. No. 4, ball filter, £1. No. 5, travelling, 5s. 9d.
- 2090A Double-crank-shaft for marine-engine. Mort's Dock and Engineering Company.
- 2090B Sets of railway-wheels; Colonial manufacture. Ditto.

AWARDS :—No. 2069 }
 2084 } bronze medals.
 2089-90 }
 2063 }
 2064 }
 2079 } highly commended.
 2087 }
 2088 }
 2090A }
 2090B }
 2075 ; commended.

JURORS' OPINION.—No. 2065-74.—The assortment of galvanized-iron goods is large and of very good quality; is deserving of high commendation, the manufacturer having gone to considerable expense in constructing new apparatus for galvanizing special articles.

AWARD COMMITTEE :—There were classes for all these "non-classified" articles; it would have saved much trouble had they been correctly placed.

SECTION VII.—FOOD—FRESH, PRESERVED, AND IN VARIOUS STATES OF PRESERVATION.

Stewards:

E. C. CRACKNELL, | CAPT. ONSLOW, R.N.

Judges:

D. WILLIAMSON, | G. A. LLOYD.

CEREALS.

Class 733.—Wheat, Flour, 1st and 2nd Quality.

- 2091 W. Bowman & Co. (C. Wilson, agent), Middleton, S.A. Bag of Adelaide superfine flour.
- 2092 Joseph Wearne, foot of Bathurst-street, Sydney. Superfine silk-dressed flour. Price, £14 per ton.
- 2098 S. Holmes, King-street. Superfine flour. Price, £13 10s. per ton.
- 2094 Dalton Brothers, Orange. 1st, 2nd, and 3rd qualities.
- 2095 Henry Thompson, Camden. Wheat flour, 2nd quality. Price, 12s. per 100 lbs. Manufactured from spring wheat, a wheat that has been extensively cultivated in the Camden district, and which is found to be least affected by rust.
- 2096 William Colman (per C. Wilson, 64, Margaret-street), Strathalbyn, S.A. One bag superfine flour.
- 2097 Breillat & Co., 1, Sussex-street. Flour, extra superfine, 1st quality, made from Adelaide and New South Wales wheat; flour, 2nd quality, made from New South Wales wheat. Price—15s. per 100 lbs., 1st quality; 14s. per 100 lbs., 2nd quality.
- 2098 Breillat & Co., 1, Sussex-street. Flour, 1st and 2nd quality. Price—18s. per 100 lbs., 1st quality; 16s. for 2nd quality. Made from a mixed wheat, viz., Adelaide and New South Wales.
- 2099 James Pemell & Co., George-street South. Superfine flour, from Adelaide wheat. Price, £14 per ton.
- 2100 Ditto ditto. Superfine flour, from Colonial wheat. Price, £13 per ton.
- 2101 Ditto ditto. Flour, 2nd quality. Price, £11 per ton.
- 2102 Nelson Brothers, Orange. Flour.
- 2103 Barker & Co., York-street. 1st flour.
- 2104 Murray & Christie, Castlemaine. Flour, 1st quality. Made from wheat grown in the Castlemaine district.
- 2105 G. Bencraft & Co., Melbourne. Flour, 1st quality.
- 2106 Thomas Brunton, Australian Mills, Spencer-street, Melbourne. Wheat flour, 1st quality, silk-dressed. Price, 30s. per bag of 200 lbs.
- 2107 Beilby & Scott, Pitt-street. Collection of flours—Adelaide superfine silk-dressed—W. Duffield & Co., Victoria Mills, Gawler; Magarey & Co., Adelaide; W. Bowman & Co., Middleton Mills, Port Victor; H. Warren, Two Wells, Port Gawler; Mount Gambier, S.A., superfine silk-dressed; Victoria superfine silk-dressed; Tasmanian ditto ditto.

AWARDS :—2091 } bronze medals.
 2097 }
 2092 ; highly commended.
 2098 } ditto. [First quality.]
 2103 }
 2107 ; ditto.

JURORS' OPINION.—The exhibits, Nos. 2091 and 2097, are so near alike in excellence that we have determined to recommend that a medal be awarded to each. We also recommend that the first prize certificate, without the medal, be awarded to No. 2103, and certificates of high commendation to Nos. 2092, 2098, and 2107.

Judges

IN CLASSES 784, 786, 788, 741, 742.

THOMAS PEATE, | G. A. LLOYD.

Class 734.—Barley, Malt, Meal, and Pearl Barley.

- 2108 Johnston & Sands, 777, George-street South. Colonial-made malt. Price, 8s. per bushel. Made in Sydney from barley grown in the Camden district.
 2109 R. & F. Tooth & Co., Sydney. Malt. Made in Sydney from New Zealand barley.
 2110 Combes & Co., Glanmire, N.S.W. Malt. Price, 7s. per bushel.
 2111 Bencraft & Co., Melbourne. Pearl barley and patent groats.
 2112 W. Ferrin, Stephenson-street, Richmond, Victoria. Victorian malt. Price, 7s. per bushel.

AWARDS :—No. 2109 ; bronze medal.
 2110 ; highly commended.

JURORS' OPINION.—No. 2111.—Very fine sample.

Class 735.—Oats, Oatmeal.—No entry.

Class 736.—Maize-meal, Maizena, Maize Malt.

- 2113 Matthew A. Munn, Merimbula. Maizena.
 2114 James Pemell & Co., George-street South. Maize-meal (white). Price, £9 per ton.
 2115 Barker & Co., York-street. Maize-meal.
 2116 James Pemell & Co., George-street South. Maize-meal (yellow). Price, £9 per ton.
 2117 Joseph Wearne, foot of Bathurst-street. First and second class yellow corn-meal. First class, £10 per ton ; second class, £8 10s. per ton.
 2117A Ditto ditto. First and second class white corn-meal.

AWARDS :—No. 2113 ; bronze medal ; (also 2124.)
 2114 } bronze medal.
 2116 }
 2117 } highly commended.
 2117A }

Class 737.—Buckwheat Meal.—No entry.**Class 738.—Rice.**

2118 G. Bencraft & Co., Melbourne. Rice (dressed).

JUBORS' OPINION.—Very superior quality.

Judges :

THOMAS PEATE, | H. DE JOSSELIN.

Class 739.—Arrowroot.

2119 G. & T. Grimes, Manufacturers, Brisbane. No. 1, purple arrowroot, Price, £36 per ton in bulk.

2120 Ditto ditto. No. 2, white arrowroot. Price, £40 per ton.

2121 W. Cole & Sons, Tomago. 1 canister of manufactured arrowroot. Price —8d. per lb. in bulk; 9d. to 10d. in small quantities.

2122 Barker & Co., York-street. Arrowroot.

2123 John Sharpe, Prospect Sugar Works, Richmond River Heads, Ballina. Arrowroot from the plant, with purple bulbs or tubers. About 6d. per lb. in the local markets. 1½ acre of land produced last season 5 tons of this article, easily cultivated; great care and cleanliness required in the manufacture.

AWARDS :—No. 2120; bronze medal.

2119; highly commended.

Class 740.—Hops.—No entry.**Class 741.—Starch.**

2124 Mathew A. Munn, Merimbula. Starch.

2125 Thompson & Co., Kennedy-street Flour Mills and Starch Works, Castle-maine, Victoria. Victorian starch. 4½d. per lb. in Melbourne. Manufactured from wheat; packed, 12 packages in a box weighing 56 lbs. nett.

AWARD :—No. 2124; (see 2,113.)

JUBORS' OPINION.—No. 2124.—Quality very superior.

Class 742.—Tapioca, Sago, or any other Farinaceous Preparation.

2126 Mrs. Annie Bloor, 31, Napier-street, Fitzroy, Melbourne. New farinaceous food. Price—retail, ¼ lb., 1s.; 1 lb., 2s.; 4 lbs., 6s.

2127 George Bencraft, 72, Flinder's-lane West, Melbourne. Farinaceous food. Food in various stages of preparation.

2128 John Hughes, 93, York-street. 1 box, 14 1-lb. packets, 1 box, 28 ½-lb. packets, J. & J. Colman's British corn-flour. Price, 6d. per lb. This corn-flour is made from rice, and is unequalled for blancmange, custards, puddings, &c., and is the most wholesome and easily digestible food for children and invalids.

AWARDS :—No. 2126; bronze medal. [Very superior quality.]

2127; highly commended.

Judges

IN CLASSES 743, 744, 746, 749

JAMES SPRING, | H. DE JOSSELIN.

BREAD AND PASTRY.**Class 743.—Bread (Machine-made), including Aerated.**

- 2129 John Hamilton, 28, Hunter-street. Aerated bread. Price, 4d. 2-lb loaf.
- 2130 Lewis & Whitley, Curzon and Victoria streets, Hotham, Victoria. Baking-powder, in tins and packets. Price—tins, 4s. 6d. per dozen; packets, 18s. per gross, or 9s. per box. This powder is composed chiefly of the products of Victoria, and is manufactured by the above firm at 10 per cent. less than the English article.

NO AWARD.

Class 744.—Bread, Hand-made.

- 2131 D. Newton, King-street. Hand-made bread. Colonial wheat, grown in Western district.
- 2132 John Atkinson, Orange. Hand-made bread.

AWARD :—2132; bronze medal.

Class 745.—Fancy Bread.—No entry.**Class 746.—Biscuits.—Ship, Cabin, &c.**

- 2133 S. Holmes, King-street. Cabin, navy, and meat biscuits. Price—cabin, 19s.; navy, 14s.,—per 100 lbs.
- 2134 John Hamilton, 28, Hunter-street. Cabin biscuits. Price, 20s. per 100 lbs.
- 2135 Hardie & Mitchell, George and Pitt streets. Ship and cabin biscuits.
- 2136 Swallow & Ariell, Sandridge. Pilot and cabin biscuits. Price—pilot, £15; cabin, £22—per ton of 2,000 lbs., at Melbourne.
- 2137 T. B. Guest & Co., William-street, Melbourne. Ship and cabin bread. Price—ship, 15s.; cabin, 22s.,—per 100 lbs.

AWARDS :—No. 2135, 2137, together with 2143, bronze medals.

Class 747.—Biscuits, fancy.

- 2138 S. Holmes, King-street. Fancy biscuits. Price, from 4½d. to 1s. 6d., per lb.
- 2139 Swallow & Ariell, Sandridge. Fancy and machine biscuits. Price from 4½d. to 10d. per lb., in Melbourne.
- 2140 D. Newton, King-street. Fancy biscuits.
- 2141 Thomas Cripps. Fancy biscuits. From 4d. per lb.
- 2142 John Hamilton, Hunter-street. Fancy biscuits.
- 2143 Hardie & Mitchell, George & Pitt streets. Fancy biscuits.

AWARD :—2143; (see 2,135.)

Class 748.—Biscuits, water.

- 2144 Swallow & Ariell, Sandridge. Water, thin, captain's, wafer biscuits.
Price, 3½d., 4½d., and 4½d.

AWARD :—No. 2144 ; bronze medal.

Class 749.—Pastry, best collection.

- 2145 D. Newton, King-street. Scotch short bread.
2146 Thomas Cripps, 566, George-street. Ornamental cakes. Price, from 10s.

NO AWARD.

Judges

IN CLASSES 750, 755, 758, 760.

F. NORTON MANNING, M.D., | BENJN. FYFFE, M.R.C.S., L. & E.,
REGINALD BLIGH READ.

FATTY SUBSTANCES.**Class 750.—Lard.**

- 2147 William Weir, 226, Pitt-street. Lard. Price, 9d. per lb.
2148 Matthew A. Munn, Merimbula. Lard.
2149 Henry Thompson, Camden. Bladder of lard. 5d. per lb.
2150 John Shearwin, Bodalla Store, Sydney.

AWARD :—No. 2150 ; bronze medal.

Class 751.—Preserved Milk.—No entry.**Class 752.—Best method of Preserving Eggs.—No entry.****Class 753.—Best method of Preserving Butter.**

- 2151 Edwd. S. V. Spencer, 168, Pitt-street. Drawing of machinery, and
description of process for the preservation of butter.
2152 M. E. Robson, Kiama. Butter in an earthen jar.
2153 George Oaks, Quiraing.
2153A Alexander Bovard, Dapto.

NO AWARD.

Class 754.—Best method of Preserving Milk.—No entry.**MEAT AND FISH.****Class 755.—Preserved Meat, not less than 28 lbs.**

- 2154 T. Harden, 18, Macquarie-place. Lavers's patent preserved meat. Pre-
served 14th July, 1870. Two sides of mutton.
2155 George Stenning, 220, William-street. One cwt. cask preserved fresh
beef. Price, £2 10s. per cwt. cask. The process is by George's, of Mont-
Video, carried on by him successfully upon a large scale.
2156 William Weir, 226, Pitt-street. Spiced-beef-ham. Price, 5d. per lb.
Suitable as a breakfast-meat fried, or for sandwiches, or boiled.

- 2157 Henry Beit, Sydney. Preserved meat. Price, 5d. per lb. Not for competition.
- 2158 Manning & Staiger, Town Marie, Ipswich. Three casks of fresh preserved meat, viz., two of beef and one of mutton, without bones.
- 2159 George W. Perry, 49, Elizabeth-street, Melbourne. Tin of preserved meat. Preserved by Jones's patent vacuum process.
- 2160 John Edwards, Bellevue, Waverley. This exhibit embraces a process for freezing by compressing and expansion of atmospheric air; and for packing the frozen material in ice in cases rendered non-conductive of heat.
- 2161 Orr & Honeyman, Brisbane. Bencraft's desiccated mutton. Product of one sheep weighing 44½ lbs. net; desiccated mutton, 11½ lbs.; fat, 7 lbs.; bones, 4½ lbs.
- 2162 Orr & Honeyman, Brisbane. Bencraft's desiccated beef. Product of one bullock weighing 836 lbs. net; desiccated beef, 231 lbs.; fat, 60 lbs.; bones, 80 lbs.

Special Exhibits.

- 2163 William Weir, 226, Pitt-street. Pressed ox-tongues. Price, 1s. 6d. per lb.
- 2164 Ditto ditto. Pickled sheep-tongues. Price, 50s. per keg, or 1s. 6d. per dozen.
- 2165 Ditto ditto. Pressed sheep-tongues. Price, 1s. per lb.
- 2166 Ditto ditto. Smoked ox-tongues. Price, 3s. each, or 30s. per dozen.
- 2167 Manning & Staiger, Town Marie, Ipswich. Fresh beef and mutton in casks without bone. Price, 6d. per lb.

AWARDS:—No. 2158; silver medal. (See Special Report, p. 133.)
 2159; bronze medal.
 2156; highly commended.
 2166; commended.

JURORS' OPINION.—No. 2154.—The time (seven weeks) is hardly sufficient to decide the merits of this exhibit. Nos. 2158 A, B, C.—Specially recommended for silver medal. The Award Committee deferred this prize, to allow of the sample being sent for a voyage to Galle. No. 2159.—Is superior to every other exhibit, and the Judges recommend it to the special notice of the Society. The Judges desire to express their great satisfaction at the excellent character and general practical usefulness of almost all the exhibits in this class.

Class 756.—Preserved Meat, Cooked, not less than 28 lbs.

- 2168 E. Towns & Co., Miller's Point. Boiled mutton without bone. Preserved at Redbank, Queensland, 1870.
- 2169 William Weir, 226, Pitt-street. German sausage. Price, 6d. per lb.
- 2170 The Australian Meat Preserving Company, Duke's Wharf, Miller's Point, Sydney. Six 6-lb. tins boiled beef, without bones. Ditto ditto mutton, ditto.
- 2171 The Warrnambool Meat Preserving Company (Limited), Warrnambool, Victoria. Fourteen 2-lb. tins preserved wild rabbits. 2s. per tin.
- 2172 Ditto ditto. Preserved mutton, cooked. Six 2-lb. tins sheep's kidneys, price 9d. per lb.; 5 ditto ditto tongues, 8½d. ditto; 5 4-lb. tins loin of mutton with bones, 6d. ditto; 6 ditto ditto, boiled without bone, 6½d. ditto; 3 ditto ditto, ditto, 5d. ditto.

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- 2173 The Warrnambool Meat Preserving Company (Limited), Warrnambool, Victoria. Preserved mutton, cooked. Six 2-lb. tins of ox-palates, price 8½d. per lb.; 5 ditto ditto ox-tail soup, 9d. ditto; 5 3-lb. tins ox-cheek, 8d. ditto; 3 ditto ditto ox-tripe, 7d. ditto; 4 4-lb. tins spiced beef, 8½d. ditto; 3 ditto ditto corned beef, 8d. ditto; 3 ditto ditto plain gravy, 8d. ditto; 3 ditto ditto ox-tongues, 3s. each; 3 6-lb. tins soup and bouilli, 5d. per lb.; 3 ditto ditto boiled beef, 6½d. ditto; 3 ditto ditto corned beef, 7d.
- 2174 Echuca Meat Preserving Company, Echuca. One case, containing 44 tins, each 2 lbs., sheep's tongues
- 2175 Ditto ditto. One case of 12 tins, each 6 lbs., boiled beef; 1 ditto ditto, corned beef.
- 2176 Ditto ditto. One case 12 tins, each 6 lbs., boiled mutton.
- 2177 Bendigo Agricultural and Horticultural Society. Game and meat preserved in tins; 6 tins. Price—game, 2-lb. tins, 21s. per dozen; mutton, 3-lb. tins, 16s. ditto. Preserved by the Lake Bogo Company.

AWARDS :—No. 2175; bronze medal.

2173 { highly commended. [For beef.]
 { commended. [For preserved ox-tails and soups.]
 2177; commended. [For mutton.]

JURORS' OPINION.—No. 2175.—Firm and of excellent flavour. 2177.—The kangaroo insipid; the wild-goose had a strong flavour of gum (Eucalypti) leaves. W. B. Tooth exhibited beef and mutton from Clifton, Darling Downs. If this exhibit had been in competition it would have taken a high place.

Class 757.—Preserved Meat, Salted, not less than 28 lbs.

- 2178 Tooth & Cran, Yengarie, Maryborough. Ox-tongues.
- 2179 Ditto ditto. Sheep-tongues.
- 2180 George Stenning, 220, William-street. Ox and mutton hams, pickled and smoked. Price—pickled tongues, 36s. per dozen; smoked tongues, 42s. ditto.
- 2181 Ditto ditto. Sheep's tongues, pickled and smoked. Price—pickled, 2s. per dozen; smoked, 2s. 6d. per dozen.
- 2182 Ditto ditto. Three tierces salt beef. Price, £4 10s. per tierce.
- 2183 William Weir, 226, Pitt-street. Prime mess beef. Price, £3 15s. per tierce.
- 2184 James Taylor, 166, Pitt-street. Salted beef and mutton, consisting of 2 tierces beef; price, £5 per tierce; 2 pieces spiced ditto, 6d. per lb.; 2 ditto smoked ditto, 6d. ditto; 12 smoked ox-tongues, 3s. each; 6 smoked mutton hams, 6d. per lb.
- 2185 P. Harper, Paddington. Smoked ox-tongues, summer-cured, without the mark of a knife. Price, 3s. each.
- 2186 Watson & Patterson, Melbourne. One tierce salted mess pork. Price, £5 10s. per 200 lbs. Cured in Victoria.

AWARDS :—No. 2178; bronze medal.

2184; bronze medal. [For salt meats only.]

2182; highly commended.

2184; highly commended. [Ox tongues.]

JURORS' OPINION.—No. 2178.—Excellent in all respects.

Class 758.—Spiced Meat, Essences and Extracts.

- 2187 T. H. Wiseman & Co., Windsor. Extract of mutton. Price, 8s. per lb. This extract is formed from only the best parts of the carcase, and each lb.-weight represents 56 lbs. of mutton.
- 2188 Robert Pretious, St. John's Road, Glebe. Extract of meat. Price, from 6s. to 8s. in $\frac{1}{2}$, $\frac{3}{4}$, and 1-lb. packages. This sample, 2 lbs., is produced from 48 lbs. of meat, is 36 days old, and will keep fresh and sweet any length of time in any climate.
- 2189 Robinson Brothers, Baffle Creek, Queensland. Extract of preserved meat in tins. Price, 8s. per lb.
- 2190 Tooth & Cran, Yengarrie, Maryboro', Queensland. Extract of meat.
- 2191 W. Holmuth, Ballarat, Victoria. German sausages preserved in fat.
- 2192 Manning & Staiger, Town Marie, Ipswich. Essence of beef. Price, 1s. 6d. per lb.

AWARDS:—No. 2187 ; bronze medal.
 2188 } highly commended.
 2189 }

JURORS' OPINION.—No. 2192.—Bitter and unpalatable.

SPECIAL REPORT ON PRESERVED MEAT.

IN our General Report on the preserved meats, exhibited at the Intercolonial Exhibition, held in Sydney, in September, 1870, we recommended the award of a silver medal to Messrs. Manning & Staiger for their process ; but at the same time stated our opinion that the time (about two months) which had elapsed since the meat was preserved, was scarcely sufficient to test the preservative effects of the "weaker" solution with which the meat which met with our more especial commendation had been treated.

The Commissioners of the Intercolonial Exhibition decided that a sample of the meat thus preserved should be sent to Galle and again submitted to us after passage through the tropics, and the elapse of time necessary to complete the between voyage. On February 7th, 1871, two casks, having attached to them certificates from Captain Farquhar, of the P. and O.S.S. "Avoca," that they had been in that vessel to Galle and back, were opened in our presence at the Agricultural Society's Rooms, and meat taken from them was on the same day cooked at M. Courvosier's, and submitted to us for examination.

Cask No. 1.—Containing mutton "winter-cured," preserved by the weaker solution had been to Galle and back once. On opening the cask the meat was found perfectly sweet, and though somewhat pale at first became on exposure to the air of good colour. Its consistence was firm, and its general appearance that of newly-killed meat. When cooked it was found very palatable, though with the very slightest sulphurous taste. We consider that cooking the meat almost immediately after its removal from the cask and before the preservative solution had had time to evaporate from its surface, was subjecting it to a most severe test, and we are aware that the meat when cooked after an exposure of some hours to the air has no taste whatever of sulphur, and that this taste also completely disappears in the process of making soup.

Cask No. 2 contained beef preserved by the "stronger" solution, and also winter-cured, had been to Galle and back twice. When opened it was perfectly sweet, of excellent colour, and having almost the appearance of fresh meat; when cooked it was found wholesome and palatable, but the taste of sulphur was more distinct than in the mutton.

We have no hesitation whatever in repeating our recommendation that the silver medal of the Society should be awarded to Messrs. Manning & Staiger for their process.

Appended are certificates from Mr. Lee, the Manager of the City Night Refuge and Soup Kitchen, and Captain Scott, P.M., and others, who tasted the soup made from the mutton taken from cask No. 1 above mentioned.

FC. NORTON MANNING, M.D.
BJN. FYFFE, M.R.C.S., L. & E.
REGINALD BLIGH READ.

Sydney, 10 February, 1871.

City Night Refuge and Soup Kitchen,
535, Kent-street south,
Sydney, 7 February, 1871.

I OBTAINED a small cask of Manning and Staiger's fresh preserved mutton from the Agricultural Society's Rooms, which was opened yesterday before the Judges of the Exhibition. The cask was three-parts full, and, although said to have been cured six months, and to have been to Galle and back in the mail steamer, it was perfectly sound and good. I had the whole contents of the cask placed in a separate boiler for soup making, and it was treated precisely like ordinary meats for similar purposes. The soup produced from it was in every way as good as any made from our fresh meats; it was entirely without any objectionable flavour, and the meat obtained after this boiling for soup was perfectly good, and in no way distinguishable from any other boiled mutton, unless, perhaps, that the texture of the fibre seemed a little more than usually tender. The whole of the soup and meat was consumed here at the one meal, and not only were no complaints made, but the demand for more of it was often repeated.

H. B. LEE,
Manager, C.N.R.

I BEG to say that I sent a sample of the soup and meat cooked to-day at the Soup Kitchen (preserved by the Manning & Staiger process, and received from the Agricultural Society's office, being a portion of a cask that had been to India and back) to Captain Scott, Police Magistrate, which he and others declared sound, as per certificate below.

H. B. LEE,
Manager, City Night Refuge and Soup Kitchen,
535, Kent-street, Sydney.

Feb. 7th, 1871.

THIS is to certify that we tasted the soup made from the mutton preserved by Messrs. Manning & Staiger's process, and sent to City Night Refuge and Soup Kitchen from J. Joubert's office in George-street, being the mutton that had been to Galle and back, and that we found the same wholesome and palatable, and that we consider it in every way sound and good. We also tasted the mutton plain boiled, and declare it fresh and good.

Feb. 7th, 1871.

Police Office, Sydney.

D. C. F. SCOTT, P.M.
CHAS. E. PILCHER.
WILLIAM HELLYER.
WILLIAM LOVE, J.P.

REPORT OF JUDGES IN SECTION VII.

WE have the honor to submit the following brief report on the articles submitted to us for examination and adjudication in section VII, classes 755, 756, 757, and 758:—

In class 755 eight specimens of preserved meat, uncooked and unsalted, were exhibited. Four of these were preserved by Manning & Staiger's patent process; one by the Monte Video process of George; one by Lavers's patent process; and two by Bencraft's process of desiccation. The specimens preserved by Manning & Staiger's process (one of which was exhibited by Mr. Beit), consisted of beef and mutton, two months in preservation; beef, four months; and beef, twelve months in preservation. All of these were in wooden casks, and the latter had been twice through the tropics, and opened for examination on two previous occasions. The meat which had been twelve months in cask was in an excellent state of preservation, but tasted very decidedly of the chemicals employed, and was therefore somewhat unpalatable, but the meats more recently preserved, and especially one specimen, which had been only two months in cask, were very palatable and in all respects good. The strength of the preservative solution appears to have been considerably reduced in the preparation of these samples. The mutton was much superior in flavour to the beef preserved at the same time and by the same process.

The beef preserved by the Monte Video process, and exhibited in a wooden cask, was in a fair state of preservation, but unpalatable, owing to its strongly acid and sulphurous taste.

The mutton preserved by Lavers's patent process was covered with a blue mould; it was however in a fair state of preservation, and had a remarkably fresh appearance when cooked, but tasted strongly of sulphurous acid. The time (seven weeks in winter) cannot be considered an altogether satisfactory test of the value of this process.

Bencraft's desiccated beef and mutton were found to be unpalatable and considered to possess little practical value.

We beg to recommend to the Committee to bestow a silver medal on the exhibits of Messrs. Manning & Staiger, in consideration of their excellent quality, their cheapness of manufacture, great commercial value, and special importance to the Australian Colonies at this time. We wish, however, to state our opinion that the period of two months *in winter* cannot be considered an altogether satisfactory test of the value of the process as now carried out.

In class 756 the whole of the exhibits, with perhaps one exception, were in an excellent state of preservation, and free from all objectionable smell or taste; several, and especially those sent by the Echuca Company (to which the prize was awarded), and those sent by the Warrnambool and Lake Bogo

Company (which were commended), and samples sent from Clifton, Darling Downs, were of good flavour. Most of the exhibits possessed a high nutritive value, but all, with the exception of the small exhibit by Mr. George Perry, of Melbourne, were decidedly overcooked. This fault, which it seems almost impossible to avoid in Appert's process, seriously impairs the flavour, the nutritive value, and in some cases the appearance of the exhibits. As a whole, the exhibits in this class were much superior to the usual samples of cooked and tinned meats preserved in England, and were most creditable to the preserving establishments in the Australian Colonies, the majority of which have only been at work for a short period. A small specimen, exhibited by Mr. George Perry, of Melbourne, and preserved in England by Jones's patent vacuum process, was in every respect the best specimen of preserved cooked meat submitted for examination. It was firm in texture, excellent in flavour, and of the highest nutritive value. We are however unaware how far this was a selected or an average specimen of the process, and how far the cost of the process will allow of the production of meat thus preserved at a cheap or marketable rate. The specimen was disqualified for competition because the quantity sent was under 28lbs.

The kangaroo and wild goose, exhibited by the Lake Bogo Company, were inferior in every particular to the mutton exhibits by the same Company.

The exhibits in class 757, comprising salt beef and pork, mutton and beef hams, pressed and smoked tongues, German sausages, &c., varied almost as much in the quality as in the character of the exhibits. The salted and smoked beef, exhibited by Mr. Taylor, to which the prize was awarded, were remarkably good. Mr. Stenning's exhibit of beef met with commendation; and Mr. William Weir's sample of mess beef, offered at a much lower price than any other exhibit, was highly creditable.

In class 758—essences and extracts—five specimens were submitted for examination, of which four were of high nutritive value, palatable, and in excellent preservation.

The specimens exhibited by Messrs. Wiseman & Co., of Windsor, and Mr. R. Pretious, of the Glebe, left nothing to be desired in exhibits of this character, and show a marked improvement in the manufacture of the extract of meat since its first introduction as an article of commerce. The amount of gelatine in all the specimens was small. It is a subject worthy of remark that the extract of mutton was superior to all those made from beef.

The specimens exhibited by Messrs. Manning & Staiger, which they produce for sale at the extremely low price of 1s. 6d. per lb., was deficient in keeping property, and was not nearly so palatable as the other exhibits. We much doubt if this exhibit possesses any commercial value, except under very exceptional circumstances. No chemical analysis was made of any of these exhibits.

Having experienced considerable difficulty in arriving at satisfactory conclusions under the classification now adopted in section 7, classes 750 to 762, we venture to suggest the following for future use:—

Preserved Meat, Game, Fish, &c.

Class—Beef or mutton ...	} unsalted	{ uncooked ...	... { not less than
— Do. do. ...				{ cooked ...	{ 14 lbs.
— Do. do. ...	} salted	... ..	do.
— Pork			
— Beef or mutton ...	} ...spiced or smoked	... ..	do.
— Do. do.			
		...essences or extracts,	not less than 1 lb.

Class—Sundries, as ox palate, tripe, ox and sheep tongues, sheep kidneys, &c. ...	} unsalted & uncooked	{ not less than 14 lbs.
— Do. do. ... ..			...cooked ... .. do.
— Do. do. ... ..	...salted	do.
— Do. do. ... ..	...spiced or smoked...	do.
— Sausages.		
— Soup.		
— Game or rabbit ... ..	...cooked	{ not less than
— Fish ... ..	... do.	7 lbs.
— Do. ... ..	...dried	do.
— Do. ... ..	...salt	do.
— Trepanng or Beche-de-mer	}	{ not less than
— Isinglass ... ..			... ..	1 lb.

Preserved lard, butter, eggs, and milk should be placed after these articles in a fresh state among farm and dairy produce in section 10. The whole of the exhibits should be lodged with the Secretary of the Agricultural Society at least two months before the time of exhibition or the time of being submitted to the Judges.

No article should be allowed to compete unless the wholesale price per lb. is stated. We beg further to suggest that so far as practicable the exhibits should be submitted to the Judges free from all labels, showing the names of exhibitors, and distinguished only by a number or mark.

F. NORTON MANNING, M.D.
REGINALD BLIGH READ.
BJN. FYFFE, M.R.C.S., L. & E.

SALTED FISH.

Class 759.—Dried Fish.—No entry.

Class 760.—Fresh Fish (Preserved).

2193 Bendigo Agricultural and Horticultural Society, Joshua P. Gray, Secretary, Sandhurst. Six tins preserved fish. Price, 12s. per dozen 2lb.-tins. Preserved by the Lake Bogan Company.

AWARD :—Bronze medal.

JURORS' OPINION.—Two specimens exhibited (bream and cod), the bream much firmer and better flavoured, both being very good.

Class 761.—Trepanng, or Beche-de-mer.—No entry.

Class 762.—Isinglass.—No entry.

Judges

IN CLASSES 763, 765, 767, 772, 773, 775, 777, 780-82, 784, 786, 787, 789, 793-95.

THOS. PEATE,

| H. DE JOSSELIN.

PRESERVED VEGETABLES AND FRUITS.**Class 763.—Potatoes, best collection.**

2194 A. Chisholm, 183 and 185, Pitt-street. One tin preserved potatoes.
Price, £21 per ton in England. Manufactured by Denton & Co.,
Liverpool, England.

Class 764.—Fruits, best collection.—No entry.**Class 765.—Dried Fruits, best collection.**

2195 Sir W. Macarthur, Camden Park. Collection of dried Fruits.

Class 766.—Raisins.—No entry.**Class 767.—Currants, Figs, &c.**

2196 Sir W. Macarthur, Camden Park. Currants.

AWARD :—Highly commended.

JURORS' OPINION.—Quality very good.

Class 768.—Nuts, Walnuts, Filberts, Almonds.—No entry.**Class 769.—Bananas, &c.—No entry.****Class 770.—Prunes, Peaches.—No entry.****Class 771.—Apples, Preserved or other Ginger.—No entry.****Class 772.—Fruits, preserved whole in Brandy.**

2197 Sir William Macarthur, Camden Park. Fruits preserved whole in
brandy—apricot, cherry, nectarine, peach, plum.

AWARD :—Silver medal. [For preserved fruits and other exhibits in this
section, including olive oil.]

Class 773.—Fruits, preserved in Syrups.

2198 Samuel James Breathour, Parramatta. Comquats.

2199 G. Bencraft & Co., Melbourne.

JURORS' OPINION.—No. 2198.—Bitter; supposed not preserved at proper
time.

Class 774.—Fruits, preserved in Water.—No entry.

Class 775.—Jams.

- 2200 Johnson, Brothers, & Co., Hobart Town, Tasmania. Collection of jams : 1-lb. tins, 7s. 6d. per dozen ; jars, 7d. per lb., jars included.
- 2201 Samuel James Breathour, Parramatta. Lemon marmalade. 8s. 6d. per dozen, in 1-lb. glass bottles. The marmalade is made without the peel.
- 2202 Ditto ditto. Orange marmalade. 8s. 6d. per dozen, in 1-lb. glass bottles. The marmalade is made without the peel.
- 2203 W. H. McKeown. Orange marmalade.
- 2204 W. Alfred Chance, Unley Road, South Australia. Jams : 1 case, 4 dozen 2-lb. tins, assorted, 6d. per lb. ; 1 case, 4 dozen 1-lb. tins, assorted ; 1 case, 4 dozen 1-lb. tins, orange marmalade.
- 2205 Beilby & Scott, Pitt-street. Jams (Adelaide) ; brand—Wattleville, Craiglee.

AWARD :—No. 2205.—Bronze medal for Wattleville only.

JUROBS' OPINION.—No. 2200.—Colour very dark. 2203.—Very bitter. 2205.—Very superior.

Class 776.—Jellies.

- 2206 Sir W. Macarthur, Camden Park. Jellies.
- 2207 Manning & Staiger, Town Marie, Ipswich. Sweet jelly.

AWARD :—No. 2206 } highly commended.
2207 }

JUROBS' OPINION.—These exhibits are both ready for table use.

Class 777.—Fruit in Sugar.

- 2208 Samuel James Breathour, Parramatta. Candied-peel. 1s. per lb.

AWARD :—Highly commended.

JUROBS' OPINION.—Very superior quality.

Class 778.—Crystallized Fruit.—No entry.

Class 779.—Comfits, Bon-bons, &c.—No entry.

CONDIMENTS.**Class 780.—Salt.**

- 2209 Sydney Chemical Works, Grafton Wharf. Salt.

AWARD :—Highly commended.

JUROBS' OPINION.—Colour and appearance good.

Class 781.—Pepper.—Red, White, Black.

- 2210 Sir W. Macarthur, Camden Park. Red pepper.

JUROBS' OPINION.—Rather coarse.

Class 782.—Vinegar.—Malt and Wine, &c.

- 2211 Sir W. Macarthur, Camden Park. Vinegar.
 2212 D. J. Monk, Steam Works, Wattle-street, Chippendale. Vinegar made from malt, and vinegar made from wine. Price—malt vinegar, 1s. 6d. per gallon; wine vinegar, 7s. per gallon.
 2213 William Redman, Burwood. Vinegar—malt and white wine vinegar. Wine vinegar, three years old.
 2214 Julius F. Martens, Adelong. Vinegar made on the Adelong from refuse of grapes of last year's growth.

AWARD :—No. 2212; bronze medal.

Class 783.—Ginger, Dry.—No entry.**Class 784.—Capers, Olives, &c.**

- 2215 Sir W. Macarthur, Camden Park. Capers and olives.
 JUBORS' OPINION.—Olives shrunk from strength of salt.

Class 785.—Mustard.—No entry.**Class 786.—Curry Powder.**

- 2216 Robert Lavers, Swanson-street, Melbourne. Curry powder. Price—1lb.-canisters, 20s.; $\frac{1}{2}$ -lb. ditto, 10s. 6d.; $\frac{1}{4}$ -lb. ditto, 7s. 6d.

AWARD :—Highly commended.

Class 787.—Sauces.

- 2217 W. Alfred Chance, Unly Road, South Australia. One case three-dozen-pints tomato sauce; price 10s. 6d. per dozen. One case two-dozen-half-pints Prince of Wales' sauce. One case, two-dozen-pints Chutney sauce. One case, two-dozen-pints mushroom ketchup sauce.

AWARD :—Highly commended.

JUBORS' OPINION.—Chutney; quality good. Mushroom ketchup; quality very good. Tomato sauce; no colour, no flavour, and too hot.

Class 788.—Spices.—No entry.**Class 789.—Coffee, or Substitute.**

- 2218 James Macgregor, 320, George-street. Coffee, raw and manufactured, foreign. Various prices.
 2219 Gillespie & Martin, Christchurch, New Zealand. Samples of Canterbury chicory.
 2220 Pion & Albaret, New Caledonia. Coffee.

AWARD :—No. 2220; bronze medal.

JUBORS' OPINION.—No. 2220.—Very superior quality.

Class 790.—Tea.—No entry.

Class 791.—Chocolate.—No entry.

Class 792.—Cocca.—No entry.

Class 793.—Pickles.

- 2221 D. J. Monk, Wattle-street, Chippendale. Pickles of various kinds. Price, 7s. per dozen.
 2222 W. Alfred Chance, Unly Road, South Australia. Assorted pickles, three-dozen-pints. Price, 9s. dozen.

AWARD :—No. 2221 ; bronze medal.

JUROES' OPINION.—No. 2221.—Quality very good.

Class 794.—Collection of Confectionery.

- 2223 Biddell, Brothers, 495 and 497, George-street. Collection of confectionery.
 2224 Alexander Irwin, 27, Rundle-street, Adelaide. Collection of confectionery. Price, 6½d. per lb.

AWARD :—No. 2223 ; bronze medal.

Class 795.—Honey.

- 2225 John Beeston, Menangle. Virgin honey in glass, in glass supers. Price, as in glass, 1s. 6d. per lb. This virgin honey is taken from the bees on the humane or depriving system, i.e., without killing or driving them, and is therefore perfectly pure ; the method shown by bee-box, non-competitive, accompanying the honey.
 2226 W. C. Curtis, Darlinghurst. Box of honeycomb (glass).

AWARD :—No. 2225 ; bronze medal.
 2226 ; highly commended.

Judges

IN CLASSES 796, 797, 798, 799, 800, 801, 802.

W B. WALFORD, | HUGH KENNEDY,
 ALFRED NATHAN.

FERMENTED DRINKS.

Class 796.—Beer.

- 2227 Fitzgerald & Prendergast, Castlemaine Brewery, Hay-street, Sydney. One cask beer XXX, Colonial manufacture. Price, 1s. 4s. per gallon.
 2228 Henfrey & Toohey, Metropolitan Brewery, 116, Castlereagh-street, Sydney. Beer. Price, 1s. 4d. per gallon.

- 2229 E. Latham & Co., Carlton Brewery, Melbourne. Beer. Price, £5 5s., nett. We usually brew from malt, hops, and sugar, but the above is brewed from malt and hops only; date of brew, 16th June, 1870.
- 2230 A. Fitzgerald, Castlemaine, Victoria. Light hoppy Castlemaine beer. Price, £4 5s. per hhd. Brewed specially for summer use, and Colonial malt and Tasmanian hops alone used.

AWARD :—No. 2227 ; highly commended.

Class 797.—Ale and Porter.

- 2231 Thomas Graham, Simpson's Road Brewery. Ale. Price, £5.
- 2232 Ditto ditto. XXXX ale. Price, £5.
- 2233 F. Taegtow, Williamstown. Half-hogshead ale. Price, £3.
- 2234 Ditto ditto. Ale in bottle, 2 dozen. Price, 7s. 6d. per dozen.
- 2235 Ditto ditto. Porter in bottle, 2 dozen. Price, 7s. 6d. per dozen.
- 2236 Joseph Marshall, Paddington. Two hogsheads ale and one hogshead porter. Price—Ale, 1s. 4d. per gallon; porter, 1s. 9d. per gallon.
- 2237 Fitzgerald & Prendergast, Castlemaine Brewery, Hay-street, Sydney. Ale and porter, 2 dozen each, quarts. Price—Ale, 7s. per dozen; porter, 7s. per dozen.
- 2238 Ditto ditto. One cask XXX amber ale. Price, 2s. 3d. per gallon.
- 2239 Ditto ditto. One cask of ale (amber) and porter. Price—Amber ale, 2s. per gallon; porter, 1s. 9d.
- 2240 Henfrey & Toohy. Ale and porter. Price, 2s. 6d. per gallon.
- 2241 Ditto. Ale and porter. Price, 7s. 6d. per dozen; 2s. per gallon.
- 2242 R. & F. Tooth & Co., Kent Brewery. Bottled porter. Price, 6s. per dozen.
- 2243 Ditto ditto. Bottled ale. Price, 7s. 6d. per dozen.
- 2244 Ditto ditto. Bulk porter (Colonial). Price, £4 14s. 6d. per hogshead.
- 2245 Ditto ditto. XXX ale. Price, £3 12s. per hogshead.
- 2246 Ditto ditto. Pale ale. Price, £5 per hogshead.
- 2247 Ditto ditto. No. 3 ale. Price, £6 10s.
- 2248 A. Chisholm, 183 and 185, Pitt-street. 1 jar ale, 1 jar porter, with patent syphon tap.
- 2249 G. F. Hunter, Sandhurst, Victoria. 1 hogshead ale. Price, £5.
- 2250 N. Fitzgerald, Castlemaine, Victoria. Pale ale. Price, £4 10s. per hogshead.
- 2251 Edward Latham & Co., Carlton Brewery, Melbourne. Porter. Price, £5 5s. per hogshead, net. Brewed from malt and hops, 24th June, 1870.
- 2252 Ditto ditto. Ale. Price, £4 5s. per hogshead. Brewed from malt, sugar, and hops, 9th June, 1870.
- 2253 J. Wood & Son, Yorkshire Brewery, Melbourne. 1 case 4-dozen Colonial stout. Price, 9s. per dozen.
- 2254 Ditto ditto ditto. 1 hogshead Colonial ale, XX. Price, £5.
- 2255 Ditto ditto ditto. 1 hogshead Colonial ale, XXX. Price, £5.

- 2256 R. M'Cracken & Co., City Brewery, Melbourne. 1 barrel XXX stout. Price, £2 16s. 8d., in Melbourne, net. This stout is brewed from Colonial malt entirely, and without any sugar. Cask marked A over 9.
- 2257 Ditto ditto ditto. 1 hogshead pale bitter ale. Price, £4 5s., in Melbourne, net. Marked A over 9.
- 2258 Martin & Seggo, Ballarat. 1 hogshead common ale. Price, £4 per hogshead. All the malt used in the manufacture of this ale was made from Cape barley, grown in the Ballarat district.
- 2259 Fawns & Bruce, Sandhurst. 1 hogshead ale. £4 10s. per hogshead.
- 2260 Ditto ditto. 2 dozen bottled ale and porter. Price, 10s. per dozen.
- 2261 Walter Sheldrick, Warrnambool New Brewery, Warrnambool. 1 case 4 dozen bottled ale. Price, £1 14s.
- 2262 Ditto ditto ditto ditto. 1 case 4 dozen bottled porter. Price, £1 14s.
- 2263 Ditto ditto ditto ditto. 1 hogshead Crown ale. Price, £6 per hogshead.
- 2264 A. Thunder & Co., Sandhurst. One hogshead ale. Price, £4 10s.; cask, 15s.
- 2265 Edward Wyld, Collingwood. Two dozen WILD No. 3, pale ale. Price—wholesale, 6s. per dozen; retail, 7s. 6d. The above is brewed *a la* Carlisle ale.
- 2266 Edward Wyld, Collingwood. Two dozen WILD No. 4, pale ale. Price—wholesale, 7s. 6d. per dozen; retail, 9s. Brewed *a la* Edinburgh ale.
- 2267 Ditto ditto. Two dozen WILD XXX stout. Price, wholesale, 7s. per dozen, packed. Brewed *a la* London stout.
- 2268 Ditto ditto. Two dozen WILD Dublin stout. Price, wholesale, 8s. per dozen, packed. Brewed *a la* Dublin stout.
- 2269 T. & A. Aitken, Melbourne. One case stout, price, 24s.; one hogshead ale, price, £4 5s. net; one hogshead ale, price, £4 5s. net.
- 2270 William Hornby, Williamstown, Victoria. One barrel ale. Price, £3 6s. 8d.
- 2271 R. M'Cracken & Co., City Brewery, Melbourne. One hogshead ale. Price, £5 8s. per hogshead net, in Melbourne. Cask marked B over 9.

AWARDS:—No. 2237	} bronze medal.	{ In bottle.
2239		
2245	} ditto.	{ In wood.
2247		
2252; ditto.		
2265; ditto.		
2227	} highly commended.	
2236		
2243		
2246		
2258		
2263		

JUDGES' OPINION.—No. 2237.—Good condition. No. 2239.—Good sound full-bodied beer. No. 2245.—The best of its class (light beer). No. 2247.—A strong ale, nearly approaching to English. No. 2252.—The best of its class (pale ale). No. 2263.—A sound ale of medium strength. No. 2227.—Approaches very nearly to No. 2245. The similarity of the remaining samples of Victorian beer is such that the Judges deem it unnecessary to enumerate their details—in keeping, properly they rank low.

Class 798.—Aerated Waters.

- 2272 L. Carmichael, Brisbane. Seltzer-water and Carlsbad-water, in soda-water bottles.
- 2273 Henfrey & Toohey. Aerated-waters. Price, 2s. 6d. per dozen.
- 2274 William Butler, George-street, Bathurst. Two and half dozen aerated waters; soda-water, aerated-water, tonic-water, lemonade, sarsaparilla. Price, 3s. per dozen.
- 2275 John Starkey, 140, Phillip-street. Lemonade, soda-water, and tonic-water.
- 2276 Rowlands & Lewis, Dana-street, Ballarat. Soda and tonic water. Price, 2s. 6d. per dozen.
- 2277 Robertson & Bower, Bacchus Marsh, Victoria. Coimadia-water.
- 2278 Joske & Morton, 5, Little Collins-street East, Victoria. Aerated-water. Price, 6s. 6d. per dozen.
- 2279 S. Segar, 124, Liverpool-street. Aerated-waters. Price—2s. 6d. per dozen, single wire; double wire, 2s. 3d.; large syphons, 5s. each.

AWARDS:—No. 2272 } [Jointly with No. 2280.]
 2276 } bronze medals.
 2279 } [Jointly with No. 2291.]
 2275; highly commended. [Lemonade.]

JURORS' OPINION.—No. 2275.—Lemonade highly commended; the accompanying samples of soda and tonic waters not so good.

Class 799.—Mineral Water.

- 2280 L. Carmichael, Brisbane. Fluid magnesia, half-pint bottles.
- 2281 Hepburn Mineral Water Company, Daylesford, Victoria. Two cylinders of mineral water. Price, 2s. 6d. per gallon in Victoria.

AWARD:—No. 2280; bronze medal. [Jointly with No. 2272.]

Class 800.—Syrups.

- 2282 John Starkey, 140, Phillip-street. Raspberry-syrup.
- 2283 W. Nitschke, 109, Hindley-street, Adelaide. Fruit, honey, or the syrup; three bottles. Price, 4s. per lb.
- 2284 J. E. Seppell, Seppellsfield, South Australia. Two bottles raspberry-vinegar; two bottles peppermint-syrup; two bottles cloves-syrup; two bottles lemon-syrup.

AWARDS:—No. 2283; bronze medal.
 2284; bronze medal. [Jointly with No. 2300.]

Class 801.—Cordials.

- 2285 L. Carmichael, Brisbane. Orange bitters and Ayaphana bitters, in brandy bottles.
- 2286 John Starkey, 140, Phillip-street. Ginger-wine.
- 2287 W. Butler, George-street, Bathurst. Two dozen assorted cordials—ginger-wine, raspberry-vinegar, gingerette, cherry-brandy, ginger-brandy, stomachic-bitters, orange-bitters, milk-punch, noyau, curaçoa, maraschino, rum-shrub. At prices from 12s. to 36s. per dozen, in Bathurst.
- 2288 Henfrey & Toohey. Cordials.

- 2289 William Bruce, Eagle Hawk, Sandhurst. Collection of cordials. Price, 20s. per dozen, assorted.
- 2290 J. E. Seppell, Seppellsfield, South Australia. Cordials—2 bottles doctors' bitters, 2 bottles stomach-bitters, 2 bottles orange-bitters, 2 bottles Angostura-bitters, 2 bottles Warmuth-bitters, 2 bottles Calmus-bitters.
- 2291 S. Segar, 124, Liverpool-street. Cordials. Price, from 9s. to 24s.
- 2292 Edward Powell, Richmond. Cordial. The produce of grapes.

AWARDS :—No. 2291 ; bronze medal. [Jointly with No. 2279.]
2288 ; highly commended. [Lemon syrup.]

Class 802.—Spirits, from Grape, Cane, Grain, Roots, &c.

- 2293 Honorable L. Hope, Cleveland, Brisbane. Spirits from cane.
- 2294 W. Nitschke, 109, Hindley-street, Adelaide. Spirits—3 bottles Dulcino *ex Asperis*, 3 bottles Kimmel, 3 bottles peppermint, 3 bottles gin, 3 bottles brandy, 3 bottles rum, 3 bottles doctors' bitters, 3 bottles bitters. Price, 3s. per bottle.
- 2295 Ballarat Distillery Company, Ballarat. Rectified spirits of wine, half gallon. Price, 4s. per gallon in bond. Average strength, 59 to 62 o.p. ; manufactured from grain ; two distinct distillations.
- 2296 Ditto ditto. 6 bottles of cordial old tom. Price, 20s. per case of 12 bottles, equal to 2 gallons. Manufactured from malt and rye grain.
- 2297 Ballarat Distillery Company, Ballarat. 6 bottles of Colonial geneva. Price, 30s. per case duty paid of 15 bottles, equal to 3 gallons. Bulk geneva of the same quality at 4s. per proof gallon in bond.
- 2298 Warrenheip Distillery, 26, King-street, Melbourne. 3 cases Warrenheip whiskey.
- 2299 Ditto ditto. 3 cases Warrenheip geneva.
- 2300 J. E. Seppell, Seppellsfield, South Australia. Spirits—2 bottles pale brandy, 2 bottles gin, 2 bottles spirits of wine, 2 bottles cherry liqueur, 2 bottles vanilli, 2 bottles maraschino, 2 bottles curaçoa, 2 bottles parfait d'amore, 2 bottles roselly, 2 bottles kimmel, 2 bottles annisette, 2 bottles peppermint, 2 bottles ginger-wine, 2 bottles ginger-brandy.
- 2301 Edward Powell, Richmond. Spirits, from grapes.
- 2302 T. & A. Aitken, Melbourne. 1 case old tom. Price, 30s.
- 2303 Ditto ditto. 1 case malt whiskey. Price, 28s.

AWARDS :—No. 2294 ; bronze medal.
2300 ; highly commended.

CLASS M.—W. G. WHITING'S PRIZE, £5 5s.

- 2304 James Kellick, Pitt and Hay streets. 2 cases of raw silk, and collection of worms in the different stages.

NO AWARD.

SECTION VIII.—HORSES.

Stewards:

BUCHAN THOMSON, | I. K. CLEEVE.

Judges:

J. LACKEY, | E. C. CLOSE, | A. THOMPSON,
 SLOPER COX, | T. RUTLEDGE, | J. DE V. LAMB,
 R. W. ROBERTS, | W. CHAUVEL, | R. RIDGE.

Class 1.—Blood Stallion, 3 years and over.

Thoroughbreds, for General Purposes.—1st prize, £5; 2nd, £2 10s.

Those marked * are also entered for Special Prize, A1.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
1	Velocity	I. K. Cleeve, Bungarrabee	W. Phillips, Oxford	Y. M. 12 0	Vortex .....	.....
2	Priam	* R. Bowman, Richmond	Late G. P. Bowman, Singleton	Aged	New Warrior	Lady Julia.
3	.....	Richard R. Bligh, Bega		10 0	Pompey	Miss Bennett.
4	Ivanhoe	Frederick Shepherd, Ryde	Capt. Zouch, Goulburn	Aged	Old Waverley	Lady Jane.
5	Farham	A. A. Dangar, Singleton	Sheik M. el Meywell, Syria...	8 4	Dahman	K. el Zohao.
6	Tarragon	* A. Town, Richmond	W. Clarke, Bomera	11 10	New Warrior	Ludia.
7	Rioter	B. Richards, Windsor	B. Richards, Windsor	10 11	Magus	Georgiana.
8	Corebus	A. & W. Busby, Cassilis	The late Lord Eglington .....	.....	Slane	Gala.
9	Livingstone	Joseph Page, Ramornie	Lord Stamford, England...	10 0	Fandango	Mar. of Anjou.
10	Sprite	Sir W. Macarthur, Camden.	J. & W. Macarthur, Camden	3 8	Staford	Sylph.
11	Kyogle	* A. Bowman, Oaklands	Mr. Findale, Clarence River	11 0	William Tell	Cassandra.
12	Bulgimbar	Ditto	Bundock & Barnes, Grafton...	7 0	Pitsford	Banshee.
13	Spartan	Ditto	Late G. P. Bowman, Singleton	11 0	New Warrior	Lady Alice.
14	.....	James White, Martindale	Unknown	9 0	Unknown	Unknown.
15	Yattendon	* E. K. Cox, Penrith	Mr. Findale, Clarence River	8 0	Sir Hercules	Cassandra.
16	Lord of Lynne	Ditto .....	.....	10 0	Heir of Lynn	Fabula.

17	Volunteer	* Alfred Cobcroft, Singleton ...	J. Cobcroft, Singleton	12	0	New Warrior ...	Miss Langer.
18	.....	William Budd, Kisma	John Lee, Bylong	8	0	Sir Hercules	Topoy.
19	Stafford	Sir W. Macarthur, Camden...	E. Phillips, Staffordshire.....	10	0	Koh-i-noor	Lady Sale.

AWARDS:—No. 6; 1st prize and Challenge Cup, and Lord Belmore's special prize, £25.
16; 2nd prize.
19; highly commended.

Class 2.—Blood Stallion, 2 years.

1st prize, £3; 2nd, £1 10s.

20	The Swell	Andrew Town, Richmond ...	Andrew Town, Richmond ...	2	7	New Warrior ...	Lady Mary.
21	Grandmaster	A. A. Dangar, Singleton	W. Blenkiron, England	2	4	Gladiateur	Cellarina.
22	Caliph	Sir W. Macarthur, Camden...	J. & W. Macarthur, Camden...	2	9	Stafford	Calypso.
23	Spartan	Ditto	Ditto	2	9	Ditto	Sylph.
24	Ganymede	Ditto	Ditto	2	9	Ditto	Galatea.
25	Little Prince	A. Bowman, Singleton	W. Dines, Singleton	2	0	Lord of Hills	Little Queen.
26	Clarion	Wyndham Bros., Bukkulla...	Wyndham Bros., Bukkulla...	2	10	Kelpie	Chalice.

AWARDS:—No. 21; 1st prize.
22; 2nd prize.
20; highly commended.

Class 3.—Blood Stallion, 1 year.

1st prize, £3; 2nd, £1 10s.

27	.....	A. Town, Richmond	A. Town, Richmond	1	7	Tarragon	Lady Mary.
28	Priam	Thomas Stewart, junr.	C. Reynolds, Paterson	1	10	New Warrior ...	Poppet.
29	Greyskin	E. H. Weston, Albion Park..	E. K. Cox, Penrith	1	8	Yatendon	Esperance.
30	.....	Sir W. Macarthur, Camden...	J. & W. Macarthur, Camden...	1	9	Stafford	Gondola.
31	.....	Ditto	Ditto	1	11	Ditto	Galatea.

AWARDS:—No. 27; 1st prize.
28; 2nd prize.
29; highly commended.

Class 4.—Blood Mare, 3 years and over.
1st prize, £5 ; 2nd, £2 10s.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
32	Young Ludia	Andrew Town, Richmond ..	W. Town, Richmond	Y. M. 6 0	Protector	Ludia.
33	Rose of Australia...	Ditto	John Eales, Morpeth	Aged	Flying Plover	Days of Old.
34	Eugenie	Alex. Bowman, Singleton ..	Late G. P. Bowman, Singleton	13 0	Cossack	Lady Alice.
35	.....	Joseph Holland	T. Ford, Monaro	6 0	Alkaizer	Merry Legs.
36	.....	E. B. Parnell, Woolloomooloo	E. B. Parnell, Woolloomooloo	7 0	Velocity	Virago.
37	.....	Ditto	Ditto	4 0	Ditto	Butterfly.

AWARDS :—No. 36 ; 1st prize.
 37 ; 2nd prize.

Class 5.—Blood Filly, 2 years.

1st prize, £3 ; 2nd, £1 10s.

38	Illumination	Andrew Town, Richmond ..	C. W. Lawson, Mudgee	2 6	Tarragon	Fairy.
39	.....	Capt. Johnson, Annandale ..	T. Rutledge, Carwoola.....	2 0	Yattendon	Young Lady.
40	Maud	A. Bowman, Singleton.....	A. Bowman, Singleton.....	2 0	Spartan	Mimosa.

AWARDS :—No. 39 ; 1st prize.
 40 ; 2nd prize.

Class 6.—Blood Filly, 1 year.

1st prize, £3 ; 2nd, £1 10s.

41	Virago	B. Richards, Windsor	John Lee, Bylong	1 10	Kingston	Persiani.
42	.....	Andrew Town, Richmond ..	A. Town, Richmond.....	1 8	Lord of Hills	Regina.
43	Xarifa	Ditto	C. W. Lawson, Mudgee	1 7	Tarragon	Fairy.

AWARDS :—No. 42 ; 1st prize.
 41 ; 2nd prize.

Class 7.—Blood Mare and Foal.

1st prize, £5 ; 2nd, £2 10s.

44	Ludis #	A. Town, Richmond	W. Clarke, Bomera	Aged	Waverley	Peri
45	†	J. T. Ryan, Emu Ferry	C. Reynolds, Paterson	7 0	Vanguard	By Bolivar
46	Days of Old	Edward K. Cox, Penrith	Mr. Jaques, England	15 0	I. Birdcatcher	Days of York

* With foal at foot by Kingston (imported).
 † With foal by Yastendon.

AWARDS :—No. 46 ; 1st prize and Challenge Cup, £5.
 44 ; 2nd prize.

PONIES.

Class 10.—Pony, not exceeding 14 hands.

Prize, £3.

47	The Countess	Jabez Brown, Ultimo	Unknown	9 0	Unknown	Unknown
48		Alex. Steel, Devonshire-street	Ditto	6 0	Ditto	Ditto
49		Henry Dodds, Randwick		4 0		
49A		Ditto		4 0		
50		T. Stewart, junr., Petersham	Unknown	11 0	Arab	Thoroughbred.
51		Thos. Andrews, Penrith	William Dent, Penrith	4 0	Whalebone	Annie Marie.
52		Thos. Lee, Bathurst	Thos. Lee, Bathurst	Aged	Saladin	Creamy.
53		M. J. Caraher, Gloucester-st.	M. Sharpe	7 0	King Tom	Piebald Mare.

AWARDS :—No. 52 ; prize.
 50 ; highly commended.
 51 ; commended.

Class 11.—Pony, not exceeding 12 hands, any age.

Prize, £3.

54		C. C. Skarratt	C. C. Skarratt, Royal Hotel	18 0	Prince	Agnes.
55		John Duffin, King-street	John Russell, Wollongong	6 0	Imported	Imported.
56		W. C. Curtis, Darlinghurst Rd.		5 0		
57		Arthur Sands, Waverley				
58		Thos. Holt, The Warren	Thos. Holt, The Warren	5 0		
59		Ditto		Aged		
60		E. H. Weston, Illawarra	E. H. Weston, Illawarra	7 0		

AWARDS :—No. 58 ; prize.
 54 ; highly commended.

DRAUGHT.

Class 12.—Heavy Stallion, 3 years and over.

Best adapted for getting Dray Horses of pure race.—1st prize, £5; 2nd, £2 10s.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
61	Young Drayman.....	W. Ward, Bankstown.....	Jas. Taylor, Lincoln.....	Y. M. 9 0	England's Glory	By Country Led.
62	.....	R. Roberts, Cadia Creek.....	.....	4 0	Drayman	.....
63	.....	Ditto.....	R. Roberts, Cadia Creek.....	4 0	Ditto	Kitty.
64	.....	J. Maxwell, Sussex-street ..	Mr. Chaseling, Pitt Town ..	3 8	True Briton	Bett.
65	Young Champion..	John Ticknor.....	John Ticknor.....	5 0	Champion	.....
66	Galatea.....	John Mayo, Hinton.....	.....	4 0	.....	.....
67	Young Shakspeare	M. Gleeson, Mudgee.....	.....	6 0	.....	.....

AWARDS :—No. 61; 1st prize.
67; 2nd prize.

Class 13.—Draught Heavy Stallion, 2 years.

1st prize, £3; 2nd, £1 10s.

68	True Briton.....	James Upton, Windsor.....	James Upton, Windsor.....	2 7	True Briton	Diamond.
69	.....	John Aitken, Albion Park ..	Mr. Halcumb, Hunter.....	2 6	Magenta.....	Blossom.
70	.....	J. F. Downes, Brownlow Hill	Mr. Chanel.....	2 7	Samson.....	Gypsy.

AWARDS :—No. 70; 1st prize.
68; 2nd prize.

Class 14.—Heavy Stallion, 1 year.

1st prize, £3; 2nd, £1 10s.

71	Young Atlas.....	A. Town, Richmond.....	A. Town, Richmond.....	1 7	Atlas.....	Sof.
72	Prince.....	Ditto.....	Ditto.....	1 7	Imported.....	Young Peg.
73	.....	W. Ward, Bankstown.....	W. Ward, Bankstown.....	1 5	True Briton	Blossom.
74	.....	J. Ferguson, senr., Marulan...	J. Ferguson, senr.....	1 8	Hero.....	Nelly.

AWARDS :—No. 71; 1st prize.
72; 2nd prize.

Class 15.—Heavy Mare, 3 years and over.

Best adapted for producing Dray Horses of pure race.—1st prize, £5; 2nd, £2 10s.

75	Perfection	A. Brown, Lithgow	5	0	Defiance	Hockey.
76	Blossom	A. Town, Richmond	7	0	Champion Hero	By Scotch Jock.
77	.....	Ditto	6	0	Ditto	Lancola.
78	.....	Thomas Cupit, Windsor	7	9	Wiltshire Champ	Blossom.
79	.....	J.n. Ferguson, senr., Marulan	7	0	Hero	Nelly.
80	.....	W. Henderson, Bondi	6	0	.....	.....
81	.....	M. E. Robson, Kiama	5	0	Young Captain	Kate.
82	.....	John Elliott, Kiama	4	0	Ditto	Ditto.

AWARDS :—No. 82; 1st prize.
77; 2nd prize.

Class 16.—Heavy Filly, 2 years.

1st prize, £3; 2nd, £1 10s.

83	Beauty	A. Town, Richmond	2	5	Atlas	Bonny.
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AWARD :—No. 83; 1st prize.

Class 17.—Heavy Filly, 1 year.

1st prize, £3; 2nd, £1 10s.

84	Diamond	A. Town, Richmond	1	7	Atlas	Young Sof.
85	.....	M. E. Robson, Kiama	1	0	Briton's Son	Jenny.
86	.....	John Pigott, Bowral	1	7	Hero	Fars. Daughter.

AWARDS :—No. 84; 1st prize.
86; 2nd prize.

Class 18.—Heavy Mare and Foal.

1st prize, £2; 2nd, £1 10s.

87	Young Peg	A. Town, Richmond	Aged	Young Drayman	Peg.
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Foal, 6 months, by Atlas.

AWARD :—No. 87; 1st prize.

Class 19.—Heavy Draught Gelding.
1st prize, £3; 2nd, £1 10s.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
88	Jolly	A. Town, Richmond	Late W. Town, Richmond	Y. M. 8 0	Invincible	Peg.
89	Lion	Ditto	O. W. Lawson, Mudgee	Aged 4 0	Atlas	Unknown.
90	.....	Fitzgerald & Pendergast, Hay-street Brewery.	.....	.....	.....	.....

AWARDS :—No. 88; 1st prize.
89; 2nd prize.

FARMING.

Class 20.—Stallion, of any age.

Best adapted for getting Farm Horses.—1st prize, £5; 2nd, £2 10s.

91	.....	A. Brown, Lithgow	D. Grey, Scotland	11 0	Cornet	Bob Roy, mare.
92	.....	B. Clayton, Appin	J. Vardy, Campbelltown	3 6	Sampson	Jessie.
93	Suffolk	Barnes & Smith, Clarence Rr.	T. Crisp, England	8 0	.....	.....
94	.....	W. Ward, junr., Bankstown	J. Bowden, West Maitland	5 0	Magenta	Empress.
95	.....	W. Ward, Bankstown	Mr. Libburn, England	9 0	Blyth	By Industry.
95A	.....	R. Rutter, Wilberforce	R. Rutter, Wilberforce	3 6	Champion	Dump.
96	.....	W. Cunningham, Kiama	John Elliott	3 0	Young Captain	Kate.
97	.....	S. P. Cutmore, Tarrago	Thomas Crisp, England	7 3	Conqueror	Not known.
98	.....	E. Simpson, Camden	J. D. Brown, Wilberforce	8 0	Iron Duke	By Imported.
99	Boxer	J. Nowlas, West Maitland	Walter Scott, Seaham	6 7	Jock .....	.....

AWARDS :—No. 95; 1st prize.

94; 2nd prize.

97; highly commended.

Class 21.—Pair of Farm Horses or Mares.

1st prize, £3; 2nd, £1 10s.

100 | Poppet and Sof ... | A. Town, Richmond..... | Late W. Town, Richmond ... | Aged | Diamond

AWARD :—No. 100; 1st-prize.

MISCELLANEOUS.

Class 22.—Horse or Mare.

For single-harness.—1st prize, £3; 2nd, £1 10s.

101	W. Moses, Windsor.....	6 0	Yorkshire Hero..	Judy.
102	F. W. Hill.....	7 0	Norfolk Trotter..	Beesy.
103	C. Campbell, Newtown	15 0	Bookworm.....	By Ali Pasha.
104	Jas. Neill, William-street	8 0	.....	.....
105	A. Wadsworth, Mill-st., Fmt.	6 0	.....	.....
106	F. Tooth, Goodrich.....	9 0	.....	.....
107	T. Dawson, Homebush.....	Aged.	.....	.....
108	E. H. Weston, Albion Park..	16 0	Camerton.....	Old Whisker.
109	J. Mandelson, Goulburn.....	.....	Waverley.....	An Arab mare.
110	John Fewing, Windsor.....	.....	.....	.....
111	R. Rouse, Mudgee.....	Aged	Besborough.....	Arab mare.
112	Ditto.....	.....	Fisherman.....	By Blk Diamond.
113	G. Hill, junr., Bent-street ..	9 0	Unknown.....	Unknown.

AWARDS :—No. 113; 1st prize, 108; 2nd prize.

Class 23.—Pair of Carriage Horses.

1st prize, £5; 2nd, £2 10s.

114 }	T. M'Culloch, Newtown.....	6 7	Maroon.....	.....
115 }	.....	.....	.....	.....

AWARD :—Nos. 114 and 115; 2nd prize.

Class 25.—Hunter, Horse or Mare.

1st prize, £3; 2nd, £1 10s.

116	Prince.....	6 0	Lyttleton.....	Moggy.
117	Gamecock.....	8 0	Whalebone.....	.....
118	The Monk.....	Aged	Not known.....	Not known.
119	Magnet.....	Aged	Marina.....	.....

AWARDS :—No. 119; 1st prize, 118; 2nd prize.

Class 27.—Hackney (Horse or Mare), combining Symmetry and Pace.
1st prize, £3; 2nd, £2 10s.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.		Age.		Name of Sire.	Name of Dam.
			Y.	M.	Y.	M.		
120	.....	W. A. Long, M'Leay-street...	Sir W. Macarthur	.....	11	0	Glaucus	Clifden.
121	.....	J. W. F. Wilshire, Waverley	.....	.....	7	0	.....	.....
122	.....	Ditto	.....	.....	7	0	.....	.....
123	.....	E. H. Woodhouse, C'llowen...	E. H. Woodhouse, C'llowen...	.....	6	0	Providence	Cantator.
124	Pilot.....	R. L. Tooth, Kent Brewery...	.....	.....	6	0	Penic	Modesty.
125	Slyboots	H. A. Thompson, Potts' Pt.	.....	.....	Aged		Little John	.....
126	.....	F. N. Burt, Rushcutter's Bay	Sloper Cox, Richmond.	.....	9	0	Kaffir	.....
127	Chester	W. O. Gilchrist, Sydney	Herbert, Murrumbidgee	.....	8	0	Little John	.....
128	Merry Boy	Henry Beit, Wynyard-street	Messrs. Dight	.....	13	0	Bezur	.....
129	.....	Benj. Richards, Windsor	Arthur Dight	.....	5	0	Lord of Hills.....	Snorer.
130	.....	Arthur Dight, Richmond	.....	.....		

AWARDS:—No. 125; 1st prize.
 129; 2nd prize.
 130; highly commended.
 120 } commended.
 124 }

Special Class A1.—T. Dawson & Co.'s Prize for best Blood Stallion.
Prize, £3 3s.

131	Priam	Robt. Bowman, Richmond ...	Late G. P. Bowman, Singltn.	Aged	New Warrior	Lady Julia.
132	Tarragon	Andrew Town, Richmond	W. Clark, near Coolah.....	11 11	Ditto	Ludia.
133	Kyogle	A. Bowman, Oaklands	W. Tindale, Clarence	11 0	William Tell	Cassandra.
134	Bulgumbar	Ditto	Bundock, Barnes, & Co., Graf.	7 0	Pittsford	Banshee.
135	Spartan	Ditto	Late G. P. Bowman, Singltn.	11 0	New Warrior	Lady Alice.
136	Yattendon	E. K. Cox, Penrith	Mr. Tindale, Clarence River	8 0	Sir Hercules	Cassandra.
137	Lord of Lynne.....	Ditto	.....	10 0	Heir of Lynne	Tabula.
138	Volunteer	A. Cobcroft, Singleton	John Cobcroft, Singleton.....	12 0	New Warrior	Miss Langer.

AWARD:—No. 132; prize.

CHALLENGE CUP.—Best male animal (Gelding excepted) in this Section, £5. No. 6. Best female animal in this Section, £5. No. 46.
 LORD BELMORE'S SPECIAL PRIZE.—Best animal in this Section, £25. No. 6.

Classes 8, 9, 24, and 26.—No entries.

SECTION IX.—CATTLE—DURHAM OR SHORT HORNS.

Stewards:

A. BRUCE, | M. LOWE,
HON. GEO. H. COX.

Judges:

B. MOERTON, | P. G. KING,
A. BROWN.

Class 28.—Bulls, 3 years and over.

1st prize, £5; 2nd, £2 10s.

139	Imp. Purple	Walker Lamb, Greystanes ...	R. McDougall, Victoria	4	5	Prince Purple	Emengarde.
140	Garibaldi 4th	A. A. Dangar, Rosemount ...	T. Robinson, Burt-on-Trent ...	3	8	Garibaldi 2nd. ...	Harmony.
141	.....	J. W. Chisholm, Goulburn ...	L. C. Crisp, England	3	0	Merry Monarch. ..	Rosebud.
142	Grand Prince	W. J. Dangar, Singleton ...	R. McDougall, Victoria	5	0	Pr. of the Pur. ...	Grace Reglan.
143	Noble Arthur 2nd	R. L. Jenkins, Nepean Tows. ...	R. L. Jenkins, Nepean Tows. ...	3	7	Noble Arthur ...	Princess Royal.
144	.....	W. J. R. Jenkins, Illawarra ..	Ditto	3	7	Ditto	Princess Alice.
145	Grendon Oxford....	Gilchrist, Watt, & Co., Sydney	Sturgeon & Sons, Essex	3	9	12th Dk. of Oxf. ..	Rose of Thornridge.

AWARDS:—No. 140; 1st prize.

142; 2nd prize.

139; highly commended, and W. J. Dangar's prize.

145; commended.

Class 29.—Durham or Short Horn.

1st prize, £3; 2nd, £1 10s.

146	Daisy Duke	G. Marsden, Haslem's Creek ..	W. W. Slye, near Lancaster ..	2	2	Gd. Dke. of Lan. ..	Daphne 3rd.
147	.....	Thomas Lee, Bathurst.	William Lee, Bathurst	2	2	Yng. Grandmaster ..	Duchess.
148	Theodore	R. L. Jenkins, Nepean Tows. ...	Imported	2	10	Heir of York.....	Vanvil.
149	Reform	Gilchrist, Watt, & Co.	Sturgeon & Sons, Essex	2	6	Palmerston	Cleopatra.

AWARDS:—No. 148; 1st prize; the Challenge Cup and Lord Belmore's special prize, £15.

146; 2nd prize.

Class 30.—Durham or Short-Horn Bull, 1 and under 2 years.
1st prize, £3; 2nd, £1 10s.

Those marked with * are also entered in Class A

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.		Name of Sire.	Name of Dam.
				Y.	M.		
150	Champion	*Barnes & Smith, Casino	Barnes & Smith, Casino	1	2	Prætor	Prince Prussia.
151	Duke of Richmond	*Ditto	Ditto	1	2	Ditto	Prince Imperial.
152	Thorndale	*Mrs. Clark Irving, Casino	Mrs. Clark Irving, Casino	1	2	Count de Gramsey	Drawing-run. Rese.
153	Prince of South	W. R. Hindmarsh, Ulladulla	W. R. Hindmarsh, Ulladulla	1	0	Sandyayke	Princess.
154	.....	*J. W. Chisholm, Goulburn	J. W. Chisholm, Goulburn	1	8	Inkermann	Snowdrop.
155	.....	*Ditto	Ditto	1	7	Ditto	Blue Cap.
156	.....	Alex. Cruickshank, Dubbo	Walter Lamb, Greystanes	0	11	Imperial Purple	Doutta Galla.
157	Young England	Thomas Baker, Waterloo	Thomas Baker, Waterloo	1	4	.....	.....
158	Rl. Butterfly 11th	*R. L. Jenkins, Nepean Towers	R. L. Jenkins, Nepean Towers	1	4	Rl. Butterfly 6th	Dora.
159	Rl. Butterfly 29th	*Ditto	Ditto	1	2	Ditto	Poppy.
160	Rl. Butterfly 7th	*Ditto	Ditto	1	7	Ditto	Violet.
161	Cornet	W. & C. Durham, Singleton	W. Durham, senior	1	7	Sandyayke	Duchess.
162	.....	W. Bowman, jun., Mus'brook	W. Bowman, jun., Mus'brook	1	11	Imported	Ditto.
163	British Prince	W. J. Dangar, Neotsfield	R. M'Dougall, Victoria	1	10	Grand Prince	Purple Nugget.
164	Grand Prince 9th	*Ditto	W. J. Dangar, Neotsfield	1	2	Ditto	Dinah 2nd.
165	Grand Prince 6th	*Ditto	Ditto	1	4	Ditto	Queen.
166	.....	Thomas Lee, Bathurst	Thomas Lee, Bathurst	1	10	Yng. Grandmaster	Sorina.
167	.....	*Ditto	Ditto	1	1	Forty Guineas	Pretty Face.
168	.....	*Ditto	Ditto	1	1	Ditto	Blue Bell.
169	.....	A. & W. Busby, Casalis	A. & W. Busby, Casalis	1	2	Old Michael	Dewdrop.
170	.....	W. J. E. Jenkins, Illawarra	W. J. E. Jenkins, Illawarra	1	2	Rl. Butterfly 6th	Matilda.
171	.....	Ditto	Ditto	1	0	Ditto	Matilda 3rd.
172	.....	Ditto	Ditto	1	0	Ditto	Ditto.
173	Emperor	R. Rouse, Mudgee	W. C. Lowe, Mudgee	1	7	Prince	Dove.

AWARDS :—No. 151; 1st prize.
 160; 2nd prize.
 150 } commended.
 168 }

Class 31.—Bull-calf, 6 and under 12 months.

1st prize, £8; 2nd, £1 10s.

Those marked with * are also entered in Class A. Those marked with † entered in Class B.

174	.....	.....	0	11	Imperial Purple	Doutia Galla.
175	Defiance	†A. Omichbank, Dubbo.....	0	7	Prétor	Prince Imperial.
176	Napoleon	††Barnes & Smith, Cl. River.....	0	8	Ditto	Prince Prussia.
177	Dispute	*Ditto	0	7	Ditto	Prince Imperial.
178	New Year's Day.....	†Ditto	0	6	Duke of Grafton	Michaelmas Day.
179	Imperl. Purple 8th	*Mrs. C. Irving, Casino	0	6	Imperial Purple	Pet.
180	Imperl. Purple 7th	††W. Lamb, Greystanes	0	7	Ditto	Pet 3rd.
181	Imperl. Purple 6th	*†Ditto	0	10	Ditto	Misttoe.
182	Imperl. Purple 5th	†Ditto	0	10	Ditto	Minnie.
183	Rl. Butterfly 36th	††R. L. Jenkins, Nepean Tl.....	0	10	Rl. Butterfly 6th	Sybil.
184	Rl. Butterfly 39th	*†Ditto	0	9	Ditto	Violet.
185	Rl. Butterfly 44th	†Ditto	0	8	Ditto	Princess Alice.
186	Sandysyke	†W. & C. Durham, Wambo	0	7	Sandysyke	Queen of Trumps.
187	Butterfly	Ditto	0	8	Ditto	Champion.
188	Brandon	Ditto	0	6	Ditto	Ditto.
189	Littlebury 2nd	†W. J. Dangar, Singleton	0	9	Littlebury	Bracelet.
190	Littlebury 3rd	†Ditto	0	8	Ditto .....	.....
191	Littlebury 4th	†Ditto	0	8	Ditto	Purple Nugget.
192	.....	Thomas Lee, Bathurst.....	0	8	Model Count.....	Wildfire.
193	.....	Ditto	0	4	Yellow Roan.....	Tuberose.
193A	.....	W. J. Dangar, Singleton.....	0	10	Grand Prince .....	.....

AWARDS :—No. 185; 1st prize—R. L. Jenkins and W. Lamb's prizes.

180; 2nd prize.

183; highly commended and R. L. Jenkins' prize.

179

181 } commended.

193A }

Class 32.—Cow, 3 years and over.

1st prize, £5; 2nd, £2 10s.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.		Name of Sire.	Name of Dam.
				Y.	M.		
194	Coax 6th	Mrs. Clark Irving, Casino ...	Mrs. Clark Irving, Casino ...	3	10	The Baron	Coax 3rd.
195	Kate No. 1	R. L. Jenkins, Nepean Towr.	R. L. Jenkins, Nepean Towers	3	4	Noble Arthur ...	Kate.
196	Princess Royal	Ditto	Ditto	8	9	Ditto	Cameo.
197	Fairy	E. K. Cox, Fernhill	E. K. Cox, Fernhill	11	0	Inkermann	Favourite.
198	Jessamine 25th	W. J. Dangar, Singleton.....	Morton Brothers & Co.	3	9	Rl. Butterfly 16th	Jessamine 12th.
199	White Kate.....	Walter Lamb, Greystanes ...	Walter Lamb, Greystanes ...	5	10	Prince of Purple	Kate Cameron.

AWARDS :—No. 196; 1st prize.

194; 2nd prize.

199; W. J. Dangar's prize.

195; highly commended.

Class 33.—Heifer, 2 and under 3 years.

1st prize, £3; 2nd, £1 10s.

200	Richmond Rose ...	Mrs. Clark Irving, Casino ...	Mrs. Clark Irving, Casino ...	2	4	Duke of Waterloo	Draw.-rm. Rose.
201	Venecia	A. A. Dangar, Rosemount ...	— Sheldon, England	2	5	Duke of Brailles...	Hyam Psa.
202	Princess Louise ..	W. A. B. Greaves, Armidale	R. L. Jenkins	2	5	Duke of Oxford...	Cameo.
203	Camilla	James White, Denman	R. Stratton, Wilts, England	2	5	Duke of York ...	Cashmere.
204	Careless	W. & C. Durham, Singleton	W. Durham, Wambo	2	8	Young Champion	G. Champion.
205	Fashion 2nd	R. Rouse, Mudgee	R. Rouse, Mudgee	2	2	Sir W. Armstrong	Fashion 1st.

AWARDS :—No. 201; 1st prize.

204; 2nd prize.

Class 34.—Heifer, 1 and under 2 years.

1st prize, £3; 2nd, £1 10s.

206	Princess Royal	Barnes & Smith, C. & E. Rvs.	Barnes & Smith, Clar. & R. Re.	1	0	Prestor	By Carlisle.
207	Lady Bird	Ditto	Ditto	1	0	Ditto	By Pr. Imperial.
208	Tulip	Ditto	Ditto	1	7	Yng. Pr. Imperial	By Carlisle.
209	Wild Rose	Ditto	Ditto	1	7	Prestor	.....
210	Rose	Ditto	Ditto	1	8	Ditto	By Pr. Prussia.
211	Waterloo 32nd	Mrs. Clark Irving, Casino	Mrs. Clark Irving, Casino	1	5	Dk. Cambrge 2nd	Waterloo 28th.
212	Coax 7th	Ditto	Ditto	1	4	Ditto	Coax 1st.
213	.....	W. A. B. Greaves, Armidale	R. Morton, Mt. Derrimat, Vic.	1	1	Imp. Butterfly 2nd	Rosa's Butterfly.
214	.....	R. L. Jenkins, Nepean Towers	R. L. Jenkins, Nepean Towers	1	10	Bl. Butterfly 6th	Venus 1st.
215	.....	Ditto	Ditto	1	9	Ditto	Heartease.
216	.....	Ditto	Ditto	1	9	Ditto	Dora 1st.
217	Princess Matilda	Ditto	Ditto	1	6	Ditto	Princess Alice.
218	Modesty	James White, Denman	R. Stratton, Wilts, England	1	8	James 1st	Dgt. Hern's Oak.
219	Eleanor	W. & C. Durham, Singleton	W. Durham, Wambo	1	10	Sandysyke	.....
220	Tulip	Ditto	Ditto	1	10	Ditto	.....
221	.....	E. H. C. Chauvel, Tabulam	.....	.....	.....	.....	.....
222	.....	Ditto	.....	.....	.....	.....	.....
223	.....	Thomas Lee, Bathurst	Thomas Lee, Bathurst	1	2	Forty Guineas	Cherry.
224	Elegance 2nd	W. J. Dangar, Singleton	W. J. Dangar, Singleton	1	0	Grand Prince	Elegance.
225	Ladylike 2	Ditto	Ditto	1	0	Ditto	Ladylike.
226	Empress 3	Ditto	Ditto	1	0	Sinecure, imp'dd.	Empress.
227	Princess	Ditto	Ditto	1	0	Grand Prince	Princess.
228	Beauty 2nd	R. Rouse, Mudgee	R. Rouse, Mudgee	1	10	Sir W. Armstrong	Beauty 1st.
229	Daisy 3rd	Ditto	Ditto	1	0	Frederick	Daisy 1st.
230	.....	Francis M'Mahon, Ulladulla	Francis M'Mahon, Milton	1	3	Mariner	Nancy.

AWARDS:—No. 221; 1st prize.

212; 2nd prize.

211 } 1st subscription prize.

212 } highly commended, and 2nd subscription prize.

209 } highly commended, and 2nd subscription prize.

226; highly commended.

Class 35.—Heifer Calf, 6 and under 12 months.
1st prize, £3; 2nd, £1 10s.
 Those marked * are also entered in Class C.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
231	Penelope	*John De V. Lamb, Sydney	John De V. Lamb, Sydney	Y. M. 0 6	Young Lablache	Duchess.
232	Princess Purple 1st	*Walter Lamb, Greystanes	Walter Lamb, Greystanes	0 9	Imperial Purple	Diana the 6th.
233	Princess Purple 2nd	*Ditto	Ditto	0 8	Ditto	Snowdrop.
234	Princess Purple 3rd	*Ditto	Ditto	0 7	Ditto	Young Lilly.
235	Rosa's Butterfly 4th	*W. B. Greaves, Armidale	R. Morton, Victoria	0 11	Im. Butterfly 2nd	Rosa's Butterfly.
236	Roan Fairy 2nd	*E. K. Cox, Penrith	E. K. Cox, Penrith	0 10	Essendon	Roan Fairy.
237	Flora 6th	*Ditto	Ditto	0 9	Ditto	Flora the 5th.
238	Ruby 2nd	*W. J. Dangar, Singleton	W. J. Dangar, Singleton	0 10	Littlebury	Ruby.
239	.....	Thomas Lee, Bathurst	Thomas Lee, Bathurst	0 9	Forty Guineas	First Love.
240	.....	*Ditto	Ditto	0 11	Ditto	Countess.
241	Fairy	*W. & C. Durham, Singleton	W. Durham, Wambo	0 11	Sandysyke	California 3rd.
242	Princess Augusta	*R. L. Jenkins, Nepean Towers	R. L. Jenkins, Nepean Towers	0 9	Rl. Butterfly 6th	Princess Royal.
243	.....	*Ditto	Ditto	0 10	Ditto	Kate 1st.
244	.....	Ditto	Ditto	0 10	Ditto	Kate.
245	.....	Ditto	Ditto	0 7	Ditto	Fortunate.

AWARDS :—No. 242; 1st prize, and W. Lamb's special prize.

243; 2nd prize.

242 } 1st subscription prize.
 243 }

233 } highly commended, and 2nd subscription prize.
 234 }
 244; highly commended.

HEREFORD.

Class 36.—Bull, 3 years and over.

1st prize, £5; 2nd, £2 10s.

246 | Oscar | John Nowlan, West Maitland | John Nowlan, West Maitland | 4 8 | Oakley 2nd |

247 | Garibaldi 2nd..... | John Nowlan, West Maitland | John Nowlan, West Maitland | 3 | 4 | Garibaldi | Countess:
 AWARDS :—No. 246 ; 1st prize.
 247 ; 2nd prize.

Class 37.—Bull, 2 and under 3 years.

1st prize, £3 ; 2nd, £1 10s.

248 | .....	| Sloper Cox, Richmond.....	| 2 | 6 | Garibaldi .....	| Miss May.
249 | .....	| G. H. Cox, Mudgee .....	| 2 | 3 | Zealous .....	| Cressy Cow.

AWARD :—No. 248 ; 1st prize.

Class 38.—Bull, 1 and under 2 years.

1st prize, £3 ; 2nd, £1 10s.

250 | Vemison .....	| Charles Reynolds, Paterson... | 1 | 4 | Carlyle .....	| Daisy.	
251 | .....	| G. Loder, Abbey Green .....	| 1 | 10 | Garibaldi .....	| May Flower.
252 | Osman .....	| John Nowlan, West Maitland | 1 | 6 | Oscar .....	| Zoe.	

AWARDS :—No. 252 ; 1st prize.
 250 ; 2nd prize.

Class 39.—Bull-calf, 6 and under 12 months.

1st prize, £5 ; 2nd, £1 10s.

253 | Regent.....	| Barnes & Smith, C. & R. River | William Lyall, Melbourne ... | 0 | 8 | Starling .....	| Edith.	
254 | Melbourne .....	| Ditto .....	| 0 | 9 | Ditto .....	| Beauty.
255 | .....	| George Loder, Abbey Green.. | George Loder, Abbey Green.. | 0 | 11 | Garibaldi .....	| Whitefoot.	
256 | .....	| John Nowlan, West Maitland | John Nowlan, West Maitland | 0 | 10 | Oscar .....	| Clove.	

AWARDS :—No. 255 ; 1st prize.
 254 ; 2nd prize.

Class 40.—Cow, 3 years and over.

1st prize, £5; 2nd, £2 10s.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
257	Dewdrop	Barnes & Smith Clarence River	William Lyall, Melbourne ..	Y. M. 6 0	Jerry	Sylph.
258	Isis	Ditto	A. Mackellar, Kyogle	5 0	Imported Bull ..	.....
259	Duchess	J. White, Martindale	Her Majesty the Queen	3 11	Deception	Phoebe.
260	.....	G. Loder, Abbey Green	— Rae, England	10 0	.....	.....
261	.....	Ditto	G. Loder, Abbey Green	4 6	Garibaldi	Victoria.
262	Wynnstay	James White, Martindale ..	T. Duckham, England	5 3	Franken	Wynnstay.
263	Clove	J. Nowlan, West Maitland ..	J. Nowlan, West Maitland ..	4 5	Clarendon	Miss Hampton.
264	.....	Ditto	T. B. Bsitley, Tasmania	10 0	Cesar	Cressy Cow.

AWARDS:—No. 260; 1st prize.
258; 2nd prize.

Class 41.—Heifer, 2 and under 3 years.

1st prize, £3; 2nd, £1 10s.

265	.....	Sloper Cox, Richmond	— Lyall, Esq., Melbourne ..	2 9	Staring	Dewdrop.
266	Minnie	G. Loder, Abbey Green	G. Loder, Abbey Green	2 4	Abbey Green	Miss May.
267	.....	Sloper Cox, Richmond	Ditto	2 6	Garibaldi	Ditto.
268	.....	John Nowlan, West Maitland ..	John Nowlan, West Maitland ..	2 6	.....	.....

AWARD:—No. 265; 1st prize.

Class 42.—Heifer, 1 and under 2 years.

1st prize, £3; 2nd, £1 10s.

269	.....	G. Loder, Abbey Green	G. Loder, Abbey Green	1 7	Garibaldi	Dowager 2nd.
270	Ledy Richmond ...	Messrs. Wyndham, Dalwood ..	Messrs. Wyndham, Dalwood ..	1 3	Duke of Richmond ..	lbr by Washington

271 | Richmond Lass ... | Messrs. Wyndham, Dalwood | Messrs. Wyndham, Dalwood | 1 | 6 | Duke of Richmond | cow by Post Cap.
 272 | | John Nowlan, West Maitland | John Nowlan, West Maitland | 1 | 6 | Oscar |
 AWARDS:—No. 269; 1st prize and Challenge Cup.
 270; 2nd prize.
 272; commended.

Class 43.—Heifer-calf, 6 and under 12 months.

1st prize, £3; 2nd, £1 10s.

273	Georgians	Barnes & Smith	0	8	Birthday	Milkmaid.
274	Catty	Ditto	0	8	Starling	Lady.
275	.....	G. Loder, Abbey Green	0	7	Rigemold	May Flower.
276	The Bee	Messrs. Wyndham, Dalwood	0	6	Duke of Richmond	hr by Washington
277	Wynnstay 3rd.....	James White, Martindale	0	5	Avon 3rd	Wynnstay.
278	.....	John Nowlan, West Maitland	0	7	Oscar	Miss Hampton.

AWARDS:—No. 275; 1st prize.
 278; 2nd prize.

DEVON.

Class 44.—Bull, 3 years and over.

1st prize, £5; 2nd, £2 10s.

278A | | Charles Reynolds, Paterson... | | ... | |
 AWARD:—1st prize.

Class 46.—Bull, 1 and under 2 years.

1st prize, £3; 2nd, £1 10s.

279 | Red Rover..... | Charles Reynolds, Paterson... | Charles Reynolds, Paterson... | 2 | 0 | |
 AWARD:—1st prize.

FAT CATTLE—DURHAM OR SHORT-HORN.

Judges:

GEO. ROUSE, | GEO. OAKES,
W. BUTTLE.

Class 52.—Ox, 3 years and over.

Prize, £3.

No.	Name of Animal	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.		Name of Sire.	Food.
				Y.	M.		
280	Barnes & Smith, R. & C. Ryrs.	.....	3	0	.....	Grass.
281	Sloper Cox, Richmond.....	.....	4	0	.....	Grass and lucerne.
282	W. Bowman, junr., Muslbk....	.....	10	0	.....	Ditto.
283	W. J. Dangar, Neotsfield.....	W. J. Dangar, Neotsfield.....	7	0	.....	Ditto.
284	John Lee, Bylong.....	John Lee, Bylong.....	5	0	.....	Ditto.
285	Ditto	Ditto	5	0	.....	Ditto.
286	Ditto	Ditto	5	0	.....	Ditto.

AWARD:—No. 283; prize.

Class 54.—Cow, 3 years and over.

Prize, £3.

287	.....	W. J. Dangar, Singleton.....	W. J. Dangar, Singleton.....	7	0	Baronet.....	Grass.
288	.....	Ditto	Ditto	6	0	Ditto.....	Ditto.
289	.....	W. Bowman, junr., Muslbrok..	.....	9	0	.....	Ditto.
290	.....	Barnes & Smith, C. & R. Ryrs.	.....	.....	.....	.....	.....
291	.....	C. H. Chauvel, Tabulam.....	.....	.....	.....	.....	.....
292	.....	Ditto	.....	.....	.....	.....	.....
293	.....	W. & C. Durham, Singleton	W. Durham, Singleton.....	6	0	.....	Grass.

294	.....	W. & C. Durham, Singleton	W. Durham, Wambo	.....	5 0	.....	Grass.
295	Grizzle 4th	E. King Cox, Penrith	R. McDougall, Melbourne	.....	12 0	Northampton	Grass & pumpkin.
296	.....	John Lee, Bylong	John Lee, Bylong	.....	6 0	.....	Lucerne and grass.
297	.....	Ditto	Ditto	.....	6 0	.....	Ditto.

AWARDS:—No. 295; prize.
 288; highly commended.
 287 } commended.
 293 }

FAT CATTLE—HEREFORD.

Class 55.—Ox, 3 years and over.

Prize, £3.

298	.....	James White, Denman	James White, Denman	.....	6 0	Cronkell	Lucerne.
299	.....	G. H. Cox, Mudgee	G. H. Cox, Mudgee	.....	4 6	Duke	Grass.
300	.....	George Loder, Abbey Green	George Loder, Abbey Green	.....	4 0	Garibaldi	.....
301	.....	Sloper Cox, Hobartville	Sloper Cox, Hobartville	.....	4 6	.....	Grass and lucerne.
302	.....	John Nowlan, West Maitland	John Nowlan, West Maitland	.....	8 0	.....	Grass.
303	.....	Ditto	Ditto	.....	7 0	.....	Ditto.

AWARDS:—No. 298; prize.
 303; highly commended.
 302; commended.

Class 57.—Cow, 3 years and over.

Prize, £3.

304	.....	Barnes & Smith, C. & E. River	Charles Reynolds, Tocal	.....	3 0	.....	Grass.
305	.....	Messrs. Wyndham, Dalwood	Messrs. Wyndham, Dalwood	.....	9 6	Post Captain	Ditto.
306	.....	George Loder, Abbey Green.	Late F. Turner, England	.....	9 0	Big Ben	Grass and lucerne.
307	.....	John Nowlan, West Maitland	John Nowlan, West Maitland	.....	9 0	Post Captain	Grass.
308	.....	Ditto	Chas. Button, Maitland Vale	.....	8 0	.....	Ditto.

AWARDS:—No. 307; prize.
 308; highly commended.
 304 } commended.
 305 }
 306 }

FAT CATTLE—DEVON.
Class 58.—Ox, 3 years and over.
Prize, £3.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Food.
309	Dandy	C. Reynolds, Paterson	C. Reynolds, Paterson	Y. M.	.....	Grass.
310	.....	Sloper Cox, Richmond	Sloper Cox, Richmond	3 0	.....	Grass and lucerne.
311	Duke	C. Reynolds, Paterson	C. Reynolds, Paterson	4 0	.....	Grass.
		AWARDS :—No. 309; prize. 311; highly commended.				

Class 59.—Steer, 2 and 3 years.
Prize, £2.

312	Sloper Cox, Richmond	Sloper Cox, Richmond	Grass and lucerne.
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Class 60.—Cow, 3 years and over.
Prize, £3.

313	Sloper Cox, Richmond	Sloper Cox, Richmond	Grass and lucerne.
		AWARD :—Prize.				

CROSSES AND OTHER BREEDS.

Class 61.—3 years and over.

Prize, £3.

314	| .....	| Sloper Cox, Richmond .....	| Sloper Cox, Richmond .....	| 5 to 7	| .....	| Grass and lucerne
315	| .....	| Ditto .....	| Ditto .....	| 6 0	| Hereford & Durham	| Ditto.
316	| .....	| W. Bowman, junr., Skellater .....	| .....	| 10 0	| .....	| Grass.
317	| .....	| W. J. Dangar, Singleton .....	| W. J. Dangar, Singleton .....	| 5 0	| .....	| Ditto.
317A	| .....	| R. L. Jenkins, Nepean Towers .....	| R. L. Jenkins, Nepean Towers .....	| 3 0	| Noble Arthur ...	| .....

AWARDS :—No. 317; prize.

314; highly commended.

Class 63.—Cow, 3 years and over.
Prize, £3.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
318	.....	Alexander Mackellar	Alexander Mackellar	Y. M. 3 0	Hereford	Durham.
319	Grassy	W. J. Dangar	W. J. Dangar	7 0	Imported Bull	Ordinary cow.
320	.....	W. Bowman, junr., Skellater .....	.....	6 0	.....	.....

AWARDS :—No. 318; prize.
319; highly commended.

DAIRY CATTLE.

Class 64.—Dairy Cow, any age or breed.
1st prize, £5; 2nd, £2 10s.

321	Lilly	A. W. McMinn, Marrickville. | George Goodrey, Picton	8 0	.....	.....
322	Beauty	A. W. McMinn	7 0	.....	.....
323	.....	M. E. Robson, Kiama	5 0	.....	Cherry.

AWARDS :—No. 323; 1st prize.
321; 2nd prize.

Classes 45, 47, 48, 49, 50, 51, 53, 56, and 62.—No entries.

CHALLENGE CUP.—Best male animal in this section, No. 148.

CHALLENGE CUP.—Best female animal in this section, No. 269.

SPECIAL CLASS.—LORD BELMORE'S PRIZE.—The best animal in this section.—£15—No. 148.

W. J. DANGAR'S SPECIAL PRIZE.—Importer and Exhibitor of the greatest number of pure bred stock in this section.—£10.

W. J. DANGAR'S SPECIAL PRIZE, No. 2.—For the best Durham bull, cow, and offspring in this section.—£5.

SPECIAL CLASS A.

R. L. Jenkins' Prize for best pair of Short-horn Bulls under 2 years.

Prize, £5.

The exhibits in this Class, with the exception of numbers, stand at Classes 30 and 31.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.		Name of Sire.	Name of Dam.
				Y.	M.		
324	.....	Thomas Lee, Woodlands, Bathurst	Thomas Lee, Woodlands, Bathurst	1	2	Forty Guineas ...	Pretty Face.
325	Champion Dk. of Richmond...	Barnes & Smith, Clarence and Richmond Rivers	Barnes & Smith, Clarence and Richmond Rivers ...	1	2	Ditto	Blue Bell.
326	Thorndale New Year's Day	Mrs. C. Irving, Casino.....	Mrs. C. Irving, Casino.....	0	6	Count de Gramsey Duke of Grafton	By Prin. of Prussia. By Prince Imprl.
327	.....	J. W. Chisholm, Goulburn...	J. W. Chisholm, Goulburn {	1	8	Inkermann.....	Drawing-rm. Rose. Michaelmas Daisy.
328	Bl. Butterfly 11 Bl. Butterfly 29	R. L. Jenkins, Nepean Towers	{ R. L. Jenkins, Nepean Towers	1	4	Ditto	Snowdrop. Blue Esp.
329	Bl. Butterfly 7 Bl. Butterfly 36	Ditto	Ditto	1	7	Royal Butterfly 6	Dora.
330	Defiance Napoleon	Barnes & Smith, Clarence and Richmond Rivers	Barnes & Smith, Clarence and Richmond Rivers ...	0	7	Ditto	Poppy.
331	Imp. Purple ...8 Imp. Purple ...7	W. Lamb, Greystanes	W. Lamb, Greystanes {	0	6	Imperial Purple..	Violet. Sybil.
332	Imp. Purple ...6 Imp. Purple ...5	Ditto	Ditto	0	10	Ditto	By Pr. Imp. 15098. By Prin. of Pruss.
333	Grand Prince 9 Grand Prince 6	W. J. Dangar, Singleton.....	W. J. Dangar, Singleton ...	1	1	Grand Prince.....	Pet. Pet 3rd.

AWARD :—No. 329.

SPECIAL CLASS B.
Walter Lamb's Prize for best Bull-calf under 12 months old, Durham breed.
Prize, £5.

The exhibits in this Class stand at Class 31.

334	Defiance	A. Cruickshank, Dubbo	Walter Lamb, Greystanes ...	0 11	Imperial Purple.	Doutis Galla.
335	.....	Barnes & Smith, Clarence and Richmond Rivers.	Ditto	0 7	Prætor	By Prince Imp.
336	Dispute	Ditto	Ditto	0 7	Ditto	Ditto.
337	New Year's Day	Mrs. Clark Irving	Mrs. Clark Irving	0 6	Duke of Grafton.	Michælmas Daisy
338	Imperial Purple 8	Walter Lamb, Greystanes	Walter Lamb, Greystanes	0 6	Imperial Purple.	Pet.
339	Imperial Purple 7	Ditto	Ditto	0 7	Ditto	Pet. 3rd.
340	Imperial Purple 6	Ditto	Ditto	0 10	Ditto	Mistletoe.
341	Imperial Purple 5	Ditto	Ditto	0 10	Ditto	Minnie.
342	Royal Butterfly 36	R. L. Jenkins, Nepean Towers	R. L. Jenkins, Nepean Towers	0 16	Royal Butterfly 6	Sybil.
343	Royal Butterfly 39	Ditto	Ditto	0 9	Ditto	Violet.
344	Royal Butterfly 44	Ditto	Ditto	0 8	Ditto	Princess Alice.
345	Sandysike	W. & C. Durham, Singleton	W. Durham, Wambo	0 7	Sandysike	Queen of Trumps.
346	Littlebury 2nd	W. J. Dangar, Singleton	W. J. Dangar, Singleton	0 10	Littlebury	Bracelet.
347	Littlebury 3rd	Ditto	Ditto	0 9	Ditto .....	.....
349	Littlebury 4th	Ditto	Ditto	0 9	Ditto	Purple Nugget.
349A	.....	Thomas Lee, Woodlands	Thomas Lee	0 8	Model Count	Wildfire.

AWARD:—No. 344.

SPECIAL CLASS C.
Walter Lamb's Prize for best Heifer-calf under 12 months old, Durham breed.
Prize, £5.

The exhibits in this Class stand at Class 35.

				M. D.		
350	Penelope	J. de V. Lamb, Sydney	J. de V. Lamb, Sydney	6 14	Young Tablach	Duchess.
351	Princess Purple 1	W. Lamb, Greystanes	W. Lamb, Greystanes	9 24	Imperial Purple.	Diana 6.
352	Princess Purple 2	Ditto	Ditto	8 17	Ditto	Snowdrop.
353	Princess Purple 3	Ditto	Ditto	7 13	Ditto	Young Lilly.
354	Butterfly 4	W. A. B. Greaves, Richmond	R. Morton, Victoria	11 12	Imp. Butterfly 2	Rosa's Butterfly.
355	Roan Fairy 2	E. King Cox, Penrith	E. King Cox, Penrith	10 15	Essendon	Roan Fairy.

SPECIAL CLASS C—continued.

No.	Name of Animal.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Name of Sire.	Name of Dam.
356	Flora 6.....	E. King Cox, Penrith	E. King Cox, Penrith	D. M. 9 17	Essendon	Flora 5.
357	Fairy	W. & C. Durham, Wambo	W. Durham, Wambo	11 15	Sandysike	California 3.
358	Princess Augusta..	E. L. Jenkins, Nepean Towers Ditto	E. L. Jenkins, Nepean Towers Ditto	10 0	Royal Butterfly 6	Princess Royal.
359	.....	.....	.....	10 5	Ditto	Kate 1.
360	.....	Thomas Lee, Bathurst.....	Thomas Lee, Bathurst.....	11 21	Forty Guineas	Countess.
361	Ruby 2.....	W. J. Dangar, Singleton. ...	W. J. Dangar	11 25	Littlebury	Ruby.

AWARD :—No. 358.

SPECIAL CLASS C C.

Thomas Dawson & Co.'s Prize for the best pen of five Fat Bullocks.
Prize, £5 5s.

No.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Pedgree.	How fed.
362	Barnes & Smith, Clarence and Richmond Rivers.	Barnes & Smith, Clarence and Richmond Rivers.	.....	.....	Natural grass of country
363	W. Bowman, Shellater	W. Bowman, jun., 1; J. Williams, 1; Unknown, 3	7 to 10 years	.....	Natural grass, bush land.
364	G. H. Cox, Mudgee	G. H. Cox, 4; G. Rouse, 1	Various .....	.....	Grass paddocks.
365	James White, Denman .....	.....	.....	Hereford	Natural grasses.
366	W. J. Dangar, Singleton	W. J. Dangar, 4; W. Hamilton, 1.	5 to 7 years..	.....	Principally grass; had lucerne 4 months ago.
366A	Sloper Cox, Richmond	Various	Various .....	.....	Grass and lucerne.
367	William Redman, Burwood	Sir John Young .....	.....	.....	.....
	.....	Ditto .....	.....	.....	.....

Extra Stock (Non-competitive).

Sir John Young

Buffalo Bull

Buffalo Cow.*

* Yields rich milk; six quarts of cream equal to twelve quarts of ordinary cow.

AWARDS :—No. 366; prize.

365; highly commended.

SECTION X.—SHEEP.

Stewards:

C. H. HUMPHREY, | R. H. DENNE.

Judges:

C. A. MASSEY, | J. J. RILEY,
G. S. YEO, | E. KING COX,
N. P. BAYLY, | A. GIBSON,
A. LODER, | H. BELL.

FINE WOOL SHEEP.

Class 65.—Two Merino Rams of any age.

1st prize, £10; 2nd, £5.

No.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Breed.	How Fed.
368	W. J. Dangar, Singleton	W. J. Dangar, Singleton...	2 and 3	Saxon and imported ram...	Grass, chaff, pumpkin.
369	E. K. Cox, Rawden, Kyalstone	E. K. Cox, Rawden, Kyalstone	2 to 5	Saxon and merino	Natural grasses, hay.
370	E. B. Parnell, William-street	E. B. Parnell, William-st. ....	.....	Sturgeon's rams	Grass fed.
371	Geo. Campbell, Dumtroom	Geo. Campbell, Dumtroom.. ..	2 and 3	Pure and half-bred Neg. ...	Ditto.
372	Ditto	Ditto	2 to 3	Ditto	Ditto.
	Dangar, Gedye, & Co.	Sturgeon & Sons, Essex .....	.....	Ditto *	Ditto.
	Ditto	Ditto .....	.....	
	Ditto	Ditto .....	.....	

* From the pure flock originally purchased by Sturgeon & Sons from His late Majesty George III. On view during Exhibition, at the Quarantine Ground. AWARDED 1.—No. 368; 1st prize.

Class 66.—Two Merino Ewes.

1st prize, £10; 2nd, £5.

No.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Breed.	How fed.
373	Alex. Bowman, Singleton	Alex. Bowman, Singleton.....	.....	Merino	Natural grasses.
374	E. K. Cox, Rawden, Rylstone	E. K. Cox, Rawden, Rylstone	2 to 5	Saxon merino	Natural grasses and hay
375	D. H. Campbell, Binalong	J. D. Macanish, Cunningham's Plains	5	Out of selected ewes by Imported Rambouillet ram.	Grass.
376	E. B. Parnell, William-street	E. B. Parnell, William-st. ....	.....	Sturgeon's rams, imported	Grass fed.

Class 67.—Two Two-toothed Merino Rams.

1st prize, £6; 2nd, £3.

377	E. K. Cox, Rawden, Rylstone	E. K. Cox, Rawden, Rylstone 2-tooth Saxon merino	Natural grasses and hay
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Class 68.—Two Two-toothed Merino Ewes.

1st prize, £6; 2nd, £3.

378	A. Bowman, Singleton	A. Bowman, Singleton.....	Merino	Natural grasses.
379	E. K. Cox, Rawden, Rylstone.....	E. K. Cox, Rawden, Rylstone | 2-tooth | Pure Saxon .....	.....	.....	Natural grasses and hay

COARSE WOOL SHEEP.

Class 69.—Leicester Ram of any age.

1st prize, £3; 2nd, £2.

380	J. F. Doyle, Kaloudah	J. F. Doyle, Kaloudah.....	.....	.....	Grass.
381	B. A. McInnes, Clifton, Picton.....	From New Zealand	4	.....	Natural grasses.
381½	Ditto	Ditto	4	.....	Ditto.
	Ditto	Ditto .....	.....	.....	Ditto.

AWARDS :—No. 381; 1st prize.
381½; 2nd prize.

Class 70.—Leicester Ewe of any age.

1st prize, £3; 2nd, £2.

382	Thos. Dawson, Homebush.....	Thos. Dawson, Homebush	6-tooth	.....	Grass.
383	R. A. McInnes, Clifton, Picton.....	In New Zealand.....	3 years	.....	Natural grasses.
384	J. F. Doyle, Kaloudah.....	J. F. Doyle, Kaloudah.....	.....	.....	Grass fed.

AWARD :—No. 384; 1st prize.

Class 71.—Southdown Ram of any age.

1st prize, £3; 2nd, £2.

385	R. H. Woodhouse, Campbelltown.....	W. Bigden, England.....	3 years	Imported Southdown.....	Grass, hay, and bran.
386	Ditto.....	Ditto.....	2 years	Ditto.....	Ditto.
387	W. J. Dangar, Singleton.....	W. J. Dangar, Singleton.....	2 years	By imported ram.....	Grass fed.
388	Ditto.....	Ditto.....	2 years	Ditto.....	Grass.

AWARDS :—No. 386; 1st prize, Challenge Cup, and Lord Belmore's prize, £10.
385; 2nd prize.

Class 72.—Southdown Ewe.

1st prize, £3; 2nd, £2.

389	George Loder, Abbey Green.....	George Loder, Abbey Green	4½	Dam and sire imported ...	Natural grasses.
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AWARD :—No. 389; 1st prize.

FAT SHEEP.

Class 73.—Best five Merino Wethers.

1st prize, £5; 2nd, £2.

390	George Loder, Abbey Green.....	George Loder, Abbey Green	4 to 5	Merino.....	Natural grasses.
391	A. Bowman, Singleton.....	A. Bowman, Singleton.....	.....	Ditto.....	Ditto.

AWARD :—No. 390; 1st prize.

Class 74.—Best five Wethers of any other Breed than Merino.
1st prize, £3; 2nd, £2.

No.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	Breed.	How Fed.
392	Clayton & Hume, Gunning	Clayton & Hume, Gunning	3	.....	Na. gr. & lucerne.
393	Sloper Cox, Hobartville	Sloper Cox, Hobartville	2	Southdown and Merino ...	Grass-lucerne.
394	T. Dawson, Homebush	T. Dawson, Homebush	4 to 5	.....	Grass.
395	George Loder, Abbey Green	George Loder, Abbey Green	4	Southdown and Merino ...	Natural grasses.
396	J. F. Doyle, Kaloudah	J. F. Doyle, Kaloudah .....	.....	.....	Grass-fed.
396A	Andrew Gibson, Goulburn	Massey, Lake George	4	.....	Grass.

AWARDS :—No. 396A; 1st prize.
 392; 2nd prize.
 395; highly commended and Dawson & Co.'s prize.

CHALLENGE CUTS :—Best prize animal in this section, wethers excepted—Male, £5 (No. 386); female, £5.

SPECIAL PRIZE :—Lord Belmore's prize for the best animal in this section, £10. C. C. :—T. Dawson & Co.'s prize for the best pair of fat wethers, £3.

Class 75.—Angora Goats (pair), any age.

Prize, £3.

SPECIAL PRIZE :—J. Black, Esq.; Prize for the best pair of pure-bred Angora goats, £3.

396† J. Black, Muswellbrook.....| J. Black, Muswellbrook ...| |

AWARD :—Prize, No. 396†.

SECTION XI.—PIGS.

Stewards:

C. H. HUMPHREY, | R. H. DENNE.

Judges:

P. DERNELLY, | P. ANDREAS,
E. DUCKHAM.

LARGE BREED.

Class 76.—Boar of any age.

1st prize, £2; 2nd, £1.

	Y.	M.	
397 I. K. Cleeve, Bungarribee	3	0	Rice-dust, milk, and wash.
398 C. H. Richardson, Darling Point ...	1	7	Pollard and scraps from house.
399 T. W. Smart, Darling Point	3	8	Kitchen refuse.
400 John Figott, Bowral	0	9	Slop-fed.
401 E. Moriarty, St. Leonards	2	0	Green food and bran.

AWARDS :—No. 399; 1st prize.
397; 2nd prize.

Class 77.—Sow of any age.

1st prize, £2; 2nd, £1.

	Y.	M.	
402 I. K. Cleeve, Bungarribee	1	8	Rice-dust, milk, and wash.
403 C. T. Richardson, Darling Point ...	1	7	Pollard and scraps from house.
404 Ditto	1	8	Ditto.
405 J. King Lethbridge, Penrith	4	0	Dairy-fed.

AWARDS :—No. 405; 1st prize and Challenge Cup.
404; 2nd prize.

Class 78.—Sow and Litter of Pigs.

1st prize, £2; 2nd, £1.

No.	Name and Address of Exhibitor.	Name and Address of Breeder.	Age.	How fed.
406	John Pigott, Bowral.....	.....	Y. M. 2 6	Slop-fed.
407	Saddington & Sons, South Creek ...	Saddington & Sons, South Creek ...	4 0	Pollard.

AWARDS:—No. 407; 1st prize.
406; 2nd prize.

Class 79.—Fat Pig.

1st prize, £2; 2nd, £1.

408	Gulford D., Hay, near Binda.....	Unknown	2 4	Pollard and grain.
409	James Stroud, Illawarra	James Stroud, Illawarra.....	1 7	Boiled barley and milk.
410	Joseph Onus, Richmond	— Smith, Windsor Road	2 6	Maize.

AWARDS:—No. 410; 1st prize.
408; 2nd prize.
409; highly commended.

SMALL BREEDS.

Class 80.—Boar.

1st prize, £2; 2nd, £1.

411	B. Clayton, Rockwood, Appin.....	B. Clayton, Rockwood, Appin	0 7	Slim-milk, boiled grain, &c.
412	Walter Lamb, Greystanes	James Taylor, Morpeth	0 2	On meal, rice, sweepings, mangolds.
413	James Campbell, Waverley	E. O. Moriarty, North Shore.....	1 7	Slops.
414	R. L. Jenkins	R. L. Jenkins	2 0	From imported stock.

AWARDS:—No. 414; 1st prize.
413; 2nd prize.

Class 81.—Sow.

1st prize, £2; 2nd, £1.

415	B. Clayton, Rockwood, Appin.....	B. Clayton, Rockwood, Appin	0	7	Skim-milk, boiled grain, &c.
416	Ditto	Ditto	0	7	Ditto.
417	Walter Lamb, Greystanes	James Taylor, Morpeth	0	2	Meal, rice, sweepings, mangolds, &c.

AWARDS :—No. 415; 1st prize.

416; 2nd prize.

417; highly commended.

Class 82.—Sow and Litter of Figs.

1st prize, £2; 2nd, £1.

418	R. L. Jenkins, Nepean Towers	R. L. Jenkins, Nepean Towers	1	1	Slops and sorghum.
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AWARD :—1st prize.

Class 83.—Fat Figs.

1st prize, £2; 2nd, £1.

419	Frederic King, Ashfield	R. W. Cox, Pitt-street	1	1	Kitchen scraps.
420	F. Harper, Paddington	F. Harper, Paddington	4	0	
421	Henry Thompson, Camden	Henry Thompson, Camden	1	0	Farm refuse.

AWARDS :—No. 419; 1st prize.

420; 2nd prize.

421; highly commended.

LONG-BODIED BREEDS.

Class 84.—Boar.

1st prize, £2; 2nd, £1.

422	E. H. Woodhouse, Campbelltown ...	A. T. Hobroyd, near Parramatta ...	2	0	Mixed food, cooked.
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AWARD :—1st prize and Challenge Cup.

CHALLENGE CUP.—Best animal in this section (fat Figs excepted)—Male, £2; female, £2.

Classes 85, 86, and 87.—No entries.

SECTION XII.—POULTRY.

Stewards :

CHAS. THORNE, | R. BROWNLOW.

Judges :A. T. HOLROYD, | VICKERS MOYSE,
J. WEIR, JUNR.**Class 88.—Black Spanish.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 423 J. S. Gordon, E., S., & A. C. Bank.
 424 W. Bradley, Randwick.
 425 T. W. Crawley, Markets, Sydney.
 426 C. J. Pattison, Surry Hills. One hen, black Spanish.
 427 A. M'Culloch, junr., Pitt-street.
 428 S. D. Gordon, Double Bay.
 429 William Stephens.
 430 P. Harper, Paddington.
 431 Ditto ditto.

AWARDS :—No. 426 ; 1st prize.
 429 ; 2nd prize.
 423 ; 3rd prize.

Class 89.—Cochin China.—Buffs.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 432 J. S. Gordon, E., S., & A. C. Bank.
 433 S. D. Gordon, Double Bay.
 434 J. H. Maddocks, Waverley.
 435 J. Pemell, junr., Stanmore House.
 436 Ditto ditto.
 437 Ditto ditto.
 438 W. Wheeler, Petersham.
 439 Ditto ditto.
 440 T. W. Crawley, Markets.
 441 Ditto ditto.

AWARDS :—No. 432 ; 1st prize.
 436 ; 2nd prize.
 435 ; 3rd prize.

Class 90.—Cochin China.—Dark.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 442 T. W. Crawley, Markets.
 443 J. Pemell, junr., Stanmore House.
 444 Ditto ditto.

AWARD :—No. 443 ; 1st prize.

Class 91.—Cochin-China—White.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

445 J. S. Gordon, E., S., & A. C. Bank.

446 T. W. Crawley, Markets.

447 Ditto ditto.

448 J. H. Maddocks, Waverley.

449 J. R. Elliott, Balmain.

AWARDS :—No. 448 ; 1st prize.
445 ; 2nd prize.**Class 92.—Bramah Pootra—Light.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

450 A. Onslow, Camden Park.

451 T. W. Crawley, Markets.

452 Ditto ditto.

453 Ditto ditto.

AWARD :—No. 451 ; 1st prize.

Class 93.—Bramah Pootra—Dark.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

454 J. R. Hill, Randwick.

455 Ditto ditto.

456 Ditto ditto.

457 Mrs. E. Greville, Undercliffe. Price, £6, under 9 months.

458 Ditto ditto. Price, £30.

459 T. W. Crawley, Markets.

460 Ditto ditto.

461 Ditto ditto.

AWARDS :—No. 457 ; 1st prize.
459 ; 2nd prize.
461 ; 3rd prize.**Class 94.—Dorkings.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

462 A. Onslow, Camden Park.

463 A. L. Bray, Concord.

464 T. W. Crawley, Markets.

465 Ditto ditto.

466 G. Saunderson, Melbourne.

467 George Thorne.

468 W. B. Allen, Toxteth Park. Cock and hen, both 10 months, from imported stock.

469 W. J. Dangar, Singleton.

470 Ditto ditto.

471 Ditto ditto.

472 W. Henderson, Bondi.

473 E. S. Rouse, Rouse Hill.

474 J. S. Gordon, E., S., & A. C. Bank.

AWARDS :—No. 464 ; 1st prize.
468 ; 2nd prize.

Class 95.—Malay.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 475 W. Gaydon, William-street.
 476 J. S. Gordon, E., S., & A. C. Bank.
 477 Jas. Little, Hyde Park.

Class 96.—Black Reds.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 478 Jas. Kellick, Pitt-street. Price, £5.
 479 Walter Bradley, Randwick.
 480 Ditto ditto.
 481 Ditto ditto.
 482 Henry Dodds, Randwick. Black and Red Derby's.
 483 Ditto ditto.
 484 T. W. Crawley, Markets.
 485 J. W. Fleming, Brunswick, near Melbourne.
 486 J. Pemell, junr., Stanmore House.
 487 A. S. Bray, Concord.
 488 G. Sharp, Hunter-street.

AWARDS :—No. 485 ; 1st prize.
 481 ; 2nd prize.
 480 ; 3rd prize.

Class 98.—British Game—Black Reds—best Cock.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 489 Jas. Kellick, Pitt-street. Price, £1 10s.
 490 S. Wickham, Parramatta. Price, £1 10s.
 491 W. M. H. Gibbons, Parramatta.
 492 Walter Bradley, Randwick.
 493 Ditto ditto.
 494 Ditto ditto.
 495 E. Greville, Undercliff. Price, £2 2s.
 496 J. R. Hill, Randwick.
 497 Ditto ditto.
 498 T. W. Crawley, Markets.
 499 C. W. J. Oliver, Victoria-street.
 500 J. Pemell, junr., Stanmore House.
 501 Ditto ditto.
 502 P. Williams, Australian Inn.

AWARDS :—No. 493 ; 1st prize.
 492 ; 2nd prize,
 495 ; 3rd prize.

Class 99.—Duckwings.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 503 J. W. Fleming, Melbourne.
 504 J. R. Hill, Randwick.
 505 T. W. Crawley, Markets.
 506 Ditto ditto.
 507 J. Pemell, junr., Stanmore House.

AWARDS :—No. 503 ; 1st prize.
 506 ; 2nd prize.
 504 ; 3rd prize.

Class 100.—British Game—Duckwings—best Cock.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 508 J. Kellick, Pitt and Hay streets.
 509 W. M. H. Gibbons, Parramatta.
 510 J. Pemell, junr., Stanmore House.
 511 T. W. Crawley, Markets.
 512 Ditto ditto.
 513 Mrs. E. M. Betts, Parramatta.

AWARDS :—No. 510 ; 1st prize.
 512 ; 2nd prize.
 513 ; 3rd prize.

Class 101.—British Game—any other colour.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 514 S. Wickham, Parramatta. Male and two females. £2 8s.
 515 W. Bradley, Randwick.
 516 Ditto ditto.
 517 W. H. Hillas, 213, Clarence-street. Black.
 518 E. K. Cox, Fernhill. White.
 519 W. Gaydon, William-street.
 520 J. S. Gordon, E., S., & A. C. Bank.
 521 Walter Hill, Brisbane.

AWARD :—No. 515 ; 1st prize.

Class 102.—British Game—any other colour—best Cock.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 522 W. M. H. Gibbons, Parramatta.
 523 W. Bradley, Randwick.
 524 Ditto ditto.
 525 T. W. Crawley, Markets.
 526 Ditto ditto.
 527 J. Cavey, Marrickville. Grey duckwing, 18 months.
 528 J. S. Gordon, E., S., & A. C. Bank.
 529 J. C. Rutter, Parramatta. Grey.
 530 E. Greville, Undercliff.

AWARD :—No. 530 ; 1st prize.
 522 ; 2nd prize.

Class 103.—Colonial Game.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 531 W. H. Hillas, Clarence-street. Buff and black.
 532 Ditto ditto. Mottled brown and red.
 533 A. S. Bray, Concord.
 534 J. Kellick, Pitt and Hay streets. Price, £2 2s.
 535 W. Bradley, Randwick.
 536 J. C. Rutter, Parramatta. Pile cock and two black hens.
 537 P. H. Henry, Pemell's Mills.
 538 D. Murphy, 406, Crown-street.

- 539 T. W. Crawley, Markets.
 540 Ditto ditto.
 541 W. Gaydon, William-street.
 542 J. R. Hill, Randwick.
 543 J. S. Gordon, E., S., & A. C. Bank.
 544 W. Monks, Parramatta.
 545 W. Gaydon, William-street.
 546 T. Moore, Camperdown.
 547 G. S. Yeo, Lands Office.
 548 P. Williams, Kent and Market streets. Silver grey, bred from silver pheasant.

AWARD:—No. 532; 1st prize.
 546; 2nd prize.
 533; 3rd prize.

Class 104.—Colonial Game—best Cock.

1st prize, £1; 2nd, 10s.; 3rd, 5s.

- 549 B. G. Chatto, Burnett-street, Redfern.
 550 Ditto ditto. Pile.
 551 W. H. Hillas, 213, Clarence-street. One hen-feather cock.
 552 Jas. Kellick, Pitt and Hay streets. Price, £1 10s.
 553 Francis Murphy, 423, Crown-street.
 554 P. H. Henry, Pemell's Mills.
 555 Jas. Meek, Marrickville. One duck-winged cock, brassy-grey.
 556 Ditto ditto. Ditto black red.
 557 Jas. R. Hill, Randwick.
 558 Ditto ditto.
 559 Ditto ditto.
 560 Ditto ditto.
 561 J. S. Gordon, E., S., & A. C. Bank.
 562 Aubrey M. P. Mowle, Miller's Point.
 563 John Korff, Alma Cottage, Pyrmont Bridge Road.
 564 Wm. Ward, jun., Upper Bankstown.
 565 P. H. Henry, Pemell's Mills.
 566 J. C. Butter, Parramatta.
 567 Peter Deanes, Parramatta.

AWARDS:—No. 551; special prize.
 556; 1st prize.
 552; 2nd prize.
 557; 3rd prize.

Class 105.—Houdans.

1st prize, £1; 2nd, 10s.; 3rd, 5s.

- 568 T. W. Crawley, Markets.

AWARD:—2nd prize.

Class 106.—No entry.

Class 107.—La Fleche.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

569 W. Henderson, Bondi.

AWARD :—1st prize.

Class 108.—Silver-spangled Hamburg.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

570 George Wales, 90, York-street, Sydney.

571 W. English, 8, Botany-street, Waterloo.

572 Jas. Pemell, jun., Stanmore House.

573 Ditto ditto.

574 W. B. Allen, Toxteth Park. Cock and both hens, 7 months old.

575 Ditto ditto. Cock, 18 months old ; both hens less than 10 months old.

576 J. Marland, Waterloo.

AWARD :—No. 570 ; 2nd prize.

Class 109.—Gold-spangled Hamburg.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

577 J. S. Gordon, E., S., & A. C. Bank.

578 Jas. Pemell, jun., Stanmore House.

579 T. W. Crawley, Markets.

AWARDS :—No. 578 ; 1st prize.

579 ; 2nd prize.

577 ; 3rd prize.

Class 110.—Silver-pencilled Hamburg.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

580 J. S. Gordon, E., S., & A. C. Bank.

581 T. W. Crawley, Markets.

582 Jas. Pemell, jun., Stanmore House.

583 Ditto ditto.

AWARDS :—No. 583 ; 1st prize.

580 ; 2nd prize.

Class 111.—Gold-pencilled Hamburg.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

584 Jas. Pemell, jun., Stanmore House.

585 T. W. Crawley, Markets.

AWARD :—No. 584 ; 1st prize.

Class 112.—No entry.

Class 113.—White-crested Black Polands.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

585½ T. W. Crawley, Markets.

586 I. K. Cleeve, Bungarribee.

587 Jas. Pemell, jun., Stanmore House.

AWARDS :—No. 585½ ; 1st prize.
587 ; 2nd prize.**Class 114.—Silver-spangled Bantams.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

588 Jas. Jones, Thomas-street, Chippendale.

589 T. W. Crawley, Markets.

AWARDS :—No. 589 ; 1st prize.
588 ; 2nd prize.**Class 115.—Golden-spangled Polands.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

590 W. M. H. Gibbons, Parramatta.

AWARD :—2nd prize.

Class 116.—Buff Polands.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

591 Jas. Pemell, jun., Stanmore House.

Class 117.—Rumpless Fowls.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

592 I. K. Cleeve, Bungarribee.

593 Benjamin James, junr. (Barker & Co.), York-street.

AWARD :—No. 592 ; 1st prize.

Class 118.—Spangled or Laced Bantams.*1st prize, 10s. ; 2nd, 5s.*

594 Jabez Brown, Macarthur-street, Ultimo.

595 Charles F. Lamb, Paddington.

596 John B. Borton, Elizabeth-street, Paddington.

AWARD :—No. 594 ; 2nd prize.

Class 119.—Silk Fowls.*1st prize, 10s. ; 2nd, 5s.*

597 T. W. Crawley, Markets.

Class 120.—Bantams—any variety.*1st prize, 10s. ; 2nd, 5s.*

- 598 I. K. Cleeve, Bungarribee.
 599 John Wright, 341, Sussex-street.
 600 Walter Hill, Brisbane. Game black reds.
 601 Wm. Ward, jun., Bankstown.
 602 G. B. Gough, 7, Hutchinson-street. Golden pheasant bantam.
 603 T. W. Crawley, Markets. Duck-winged.
 604 Ditto ditto. ditto.
 605 Edward Wrench, Ashfield. Japanese.
 606 Jas. Pemell, jun., Stanmore House. Black red game.
 607 C. J. Pattison, Surry Hills. Black red.
 608 Ditto ditto. Duck-winged.
 609 W. M. H. Gibbons, Parramatta.

AWARDS :—No. 606 ; 1st prize.
 600 ; 2nd prize.
 601 ; commended.

Classes 121 and 122.—No entries.**Class 123.—Pea Fowls.***1st prize, 10s. ; 2nd, 5s.*

- 610 Walter Bradley, Randwick.

AWARD :—1st prize.

DUCKS.**Class 124.—Aylesbury.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 611 Alfred S. Bray, Concord.
 612 Walter Bradley, Randwick.
 613 Ditto ditto.
 614 Ditto ditto.
 615 Mrs. Meek, sen., Marrickville.
 616 William Wheeler, Petersham.
 617 J. S. Gordon, E., S., & A. C. Bank.
 618 Thomas L. Coombe, 1, Sussex-street. £10 10s.
 619 James Pemell, jun., Stanmore House.
 620 Ditto ditto.

AWARDS :—No. 615 ; 1st prize.
 611 ; 2nd prize.
 617 ; 3rd prize.

Class 125.—Rouen.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 621 J. B. Hill, Randwick.
 622 Ditto ditto.
 623 Ditto ditto.
 624 James Pemell, jun., Stanmore House.

AWARDS :—No. 624 ; 1st prize.
 623 ; 3rd prize.

Class 126.—No entry.**Class 127.—Muscovy.***1st prize, 10s. ; 2nd, 5s.*

- 625 J. S. Gordon, E., S., & A. C. Bank.
 626 Walter Bradley, Randwick.
 627 William Ward, jun., Bankstown.
 628 Jules Joubert, Hunter's Hill. White.

AWARDS :—No. 625 ; 1st prize.
 628 ; 2nd prize.

Class 128.—Ducks—any other breed.*1st prize, 10s. ; 2nd, 5s.*

- 629 A. S. Bray, Concord.
 630 J. W. Maddocks, Waverley. } Mules, bt. Rouen and Muscovy.

GEESE.

Class 129.—White Emden.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 631 Walter Bradley, Randwick.
 632 Ditto ditto.
 633 Ditto ditto.

AWARDS :—No. 633 ; 1st prize.
 632 ; 2nd prize.

Class 130.—Toulouse.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 634 A. Town, Richmond.
 635 R. L. Jenkins, Nepean Towers.
 636 Ditto ditto.
 637 J. W. Fleming, Brunswick, near Melbourne.
 638 James Pemell, jun., Stanmore House.
 639 Ditto ditto.

AWARDS :—No. 637 ; 1st prize.
 635 ; 2nd prize.
 638 ; 3rd prize.

Class 131.—Geese—any other breed.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 640 Andrew Town, Richmond. Old English geese.
 641 Walter Bradley, Randwick. Amoy geese.*
 642 Ditto ditto. ditto.
 643 Ditto ditto. ditto.

* Imported from China ; breed all the year round ; will weigh 15 lbs. at 14 weeks ld.

AWARDS :—No. 642 ; 1st prize.
 643 ; 2nd prize.
 640 ; 3rd prize.

Class 132.—Turkeys.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

- 644 Alfred S. Bray, Concord. Dark buff.
 645 W. Ward, Bankstown.
 646 J. R. Hill, Randwick.

AWARDS :—No. 646 ; 1st prize.
 645 ; 2nd prize.
 644 ; 3rd prize.

PIGEONS.**Judges :**

W. FORDE, | R. EASTWAY.

Class 133.—English Carriers.*1st prize, 10s. ; 2nd, 5s.*

- 647 J. S. Gordon, E., S., & A. C. Bank.
 648 Walter Bradley, Randwick.
 649 T. W. Crawley, Markets.
 650 Jabez Brown, Macarthur-street, Ultimo.
 651 J. B. Allpress, 10, King-street.
 652 Ditto ditto. Black.

AWARDS :—No. 651 ; 1st prize.
 652 ; 2nd prize.

Class 134.—Antwerp Carriers.*1st prize, 10s. ; 2nd, 5s.*

- 653 J. S. Gordon, E., S., & A. C. Bank.
 654 Walter Bradley, Randwick.
 655 Ditto ditto. Male bird.*
 656 John R. Baker, 126, South Head Road.
 657 Jabez Brown, Macarthur-street, Ultimo.
 658 J. B. Allpress, 10, King-street. Blue chequered.

* Flew home with a letter from Goulburn to Randwick.

AWARDS :—No. 655 ; 1st prize.
 654 ; 2nd prize.

Class 135.—Almond Tumblers.*1st prize, 10s. ; 2nd, 5s.*

659 William Gaydon, William-street.

660 John R. Baker, 126, South Head Road.

AWARDS :—No. 659 ; 1st prize.
660 ; 2nd prize.**Class 136.—Long-faced Tumblers.***1st prize, 10s. ; 2nd, 5s.*

661 W. Deane, Burwood.

662 George Sharp, Hunter-street.

663 Ditto ditto.

664 Ditto ditto.

665 Ditto ditto.

666 Ditto ditto.

667 Ditto ditto.

668 Ditto ditto.

AWARDS :—No. 665 ; 1st prize.
662 ; 2nd prize.**Class 137.—Mottled Tumblers.***1st prize, 10s. ; 2nd, 5s.*

669 William Gaydon, William-street.

670 J. B. Allpress, 10, King-street.

AWARDS :—No. 670 ; 1st prize.
669 ; 2nd prize.**Class 138.—Birmingham Rollers.***1st prize, 10s. ; 2nd, 5s.*

671 J. S. Gordon, E., S., & A. C. Bank.

672 Ditto ditto.

673 Jabez Brown, Macarthur-street, Ultimo.

AWARDS :—No. 671 ; 1st prize.
673 ; 2nd prize.**Class 139.—Bald Heads.***1st prize, 10s. ; 2nd, 5s.*

674 J. S. Gordon, E., S., & A. C. Bank.

675 Albert Sharp, Newtown Road. Colonial-bred, black.

676 Jabez Brown, Macarthur-street, Ultimo.

677 J. B. Allpress, 10, King-street. Red.

678 Ditto ditto. Black.

679 Ditto ditto. ditto.

AWARDS :—No. 675 ; 1st prize.
679 ; 2nd prize.
677 ; recommended for special 2nd prize.

Class 140.—Beards.*1st prize, 10s. ; 2nd, 5s.*

- 680 J. S. Gordon, E., S., & A. C. Bank.
 681 Jabez Brown, Macarthur-street, Ultimo.
 682 J. B. Allpress, 10, King-street. Blue.
 683 Ditto ditto. ditto.
 684 George Sharp, Hunter-street.
 685 Ditto ditto.

AWARDS :—No. 682 ; 1st prize.
 680 ; 2nd prize.

Class 141.—Jacobins.*1st prize, 10s. ; 2nd, 5s.*

- 686 J. S. Gordon, E., S., & A. C. Bank.
 687 Walter Bradley, Randwick.
 688 William Deane, Burwood. Yellow ; Colonial-bred.
 689 Ditto ditto. White ; ditto.
 690 Jabez Brown, Macarthur-street, Ultimo.

AWARDS :—No. 689 ; 1st prize.
 687 ; 2nd prize.

Class 142.—Turbits.*1st prize, 10s. ; 2nd, 5s.*

- 691 Walter Bradley, Randwick.
 692 J. S. Gordon, E., S., & A. C. Bank.
 693 William Deane, Burwood. Bred Tasmania.
 694 Jabez Brown, Macarthur-street, Ultimo.
 695 J. B. Allpress, 10, King-street. Blue.
 696 William Harris, jun., 10, Buckingham-street.

AWARDS :—No. 691 ; 1st prize.
 695 ; 2nd prize.

Class 143.—Nuns.*1st prize, 10s. ; 2nd, 5s.*

- 697 J. S. Gordon, E., S., & A. C. Bank.
 698 Walter Bradley, Randwick.
 699 William Deane, Burwood. Colonial-bred.
 700 Jabez Brown, Macarthur-street, Ultimo.

AWARDS :—No. 698 ; 1st prize.
 699 ; 2nd prize.
 700 ; commended.

Class 144.—Pouters.*1st prize, 10s. ; 2nd, 5s.*

- 701 William Deane, Burwood. Colonial bred.
 702 Jabez Brown, Macarthur-street, Ultimo.
 703 Major Lowe, Redfern.*

*These birds were imported in the "La Hogue," in 1868, and obtained Society's prizes in 1869.

AWARDS :—No. 702 ; 1st prize.
 703 ; 2nd prize.

Class 145.—Fantails.*1st prize, 10s. ; 2nd, 5s.*

- 704 J. S. Gordon, E., S., & A. C. Bank.
 705 W. H. Harris, Ultimo. White.
 706 Ditto ditto. ditto.
 707 J. Brown, Macarthur-street, Ultimo.

AWARDS :—No. 707 ; 1st prize.
 704 ; 2nd prize.

Class 146.—Pigeons—any other variety.*1st prize, 10s. ; 2nd, 5s.*

- 708 Walter Bradley. White barb.
 709 A. Sharp, Newtown Road. Short-faced English tumblers.
 710 W. Deane, Burwood. Owls, blue.
 711 Ditto ditto. Trumpeters ; black.
 712 J. Brown, Macarthur-street, Ultimo.

AWARD :—No. 708 ; 1st prize.

CANARIES.

Class 147.—Belgian (pair).*1st prize, 10s. ; 2nd, 5s.*

- 713 J. Booth, Camperdown.
 714 J. Pemell, junr., Stanmore House.
 715 T. Crane, Bathurst-street.

AWARDS :—No. 715 ; 1st prize.
 713 ; 2nd prize.

Class 148.—Jonque (pair).*1st prize, 10s. ; 2nd, 5s.*

- 716 J. Booth, Camperdown.
 717 J. Pemell, junr., Stanmore House.
 718 T. Crane, Bathurst-street.

AWARDS :—No. 718 ; 1st prize.
 716 ; 2nd prize.

Class 149.—Lizard (pair).*1st prize, 10s. ; 2nd, 5s.*

- 719 T. W. Crawley, Markets.
 720 J. Booth, Camperdown.
 721 J. Pemell, junr., Stanmore House.
 722 T. Crane, 89, Bathurst-street.

AWARDS :—No. 722 ; 1st prize.
 721 ; 2nd prize.

Class 150.—Turncrown (pair).*1st prize, 10s. ; 2nd, 5s.*

723 J. Kellick, Pitt-street. Cage and birds, £2 10s.

724 J. Pemell, junr., Stanmore House.

725 J. Booth, Camperdown.

AWARDS :—No. 725 ; 1st prize.

724 ; 2nd prize.

Class 151.—Canaries—best collection—not less than twelve.*1st prize, 10s. ; 2nd, 5s.*

726 J. Pemell, junr., Stanmore House.

727 Ditto ditto.

728 T. Crane, 89, Bathurst-street.

AWARDS :—No. 726 ; 1st prize.

727 ; 2nd prize.

MISCELLANEOUS.**Class 152.—Collection of Native Birds.***1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

729 T. W. Crawley, Markets.

730 W. Hill, Brisbane. 1 pair of Regent birds, 1 pair of Satin birds, 1 pair Moreton Bay Rosella Parrots, 1 pair of Crimson-wing Parrots, 1 pair of King Parrots, 1 pair of Burdekin ducks.

AWARD :—No. 730 ; 1st prize.

Class 153.—Kangaroo.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

731 T. W. Crawley, Markets.

AWARD :—No. 731 ; 1st prize.

Class 154.—Best Emu.*1st prize, £1 ; 2nd, 10s. ; 3rd, 5s.*

732 T. W. Crawley, Markets.

Class 155.—Rabbits (pair).*1st prize, 10s. ; 2nd, 5s.*

733 Mrs. W. Harris, 10, Buckingham-street.

734 T. W. Crawley, Markets.

735 J. S. Gordon, E., S., & A. C. Bank.

AWARDS :—No. 735 ; 1st prize.

733 ; 2nd prize.

Class 156.—No entry.**Class 157.—Ferrets (pair).***1st prize, 10s. ; 2nd, 5s.*

736 I. K. Cleeve, Bungarribee.

737 J. S. Gordon, E., S., & A. C. Bank.

AWARDS :—No. 737 ; 1st prize.

736 ; 2nd prize.

REPORT.

SECTION V.—PIGEONS.

Class 133.—Carriers.

651 & 652.—The whole of the exhibits were very good. The first prize was given to the best male bird, and the second to the next pair. Mr. Gordon's birds (especially the female) were worthy of a prize.

Class 134.—Antwerp Carriers.

655 & 656.—This is a class of bird we do not consider worth a place in an Exhibition of this kind. The first prize was given to 655, being the best color and form generally.

Class 135.—Almond Tumblers.

659 & 660.—There were only two exhibits in this class. No. 660 was by far the best in strain of breed. The beak of the male bird was crossed, and a white patch on the lower part of the back, besides his general color, gave the prize to the inferior pair. The birds now under review are worthy of a prize, such as a silver medal or a money prize of high value, say £10, to encourage the true fancy of the best kind of pigeon. The female bird of the pair, receiving second prize, is, probably, the best in the Colony. The birds receiving first prize were excellent in color, and the male bird of high strain; the female was the most inferior bird of the class, having nothing to recommend it but color.

Class 136.—Long-faced Tumblers.

665 & 662.—Every exhibit was good, and the awards appear to have given satisfaction. Reds, first; whites, second.

Class 137.—Mottled Tumblers.

670 & 669.—670, red, first; 669, dun mottles, second. The duns are scarcely worthy of a prize at all; but the prize list justified it. The reds were excellent birds.

Class 138.—Birmingham Rollers.

671 & 673.—The exhibits were all inferior. The prize was given to the most uniform pair. This class should be expunged from the list next year.

Class 139.—Bald Heads.

675, 678 (special), & 679.—The whole were very good as blacks. A special prize is awarded to the reds, No. 678.

Class 140.—Beards.

682 & 680.—These were not of a high order. First prize, given for best cut, to blue, 682; the second, for color, black, to 680.

Class 141.—Jacobins.

689, 687, 690.—These exhibits were all very good. White, 689, being the best show birds, were selected first; No. 687, second. The yellows have a special prize awarded, and the reds certainly deserve a prize. These birds seem so nearly alike that it is almost better that prizes should be given to the best of each color. The bald-head Jacobins are faulty in the color of thighs, &c.

Class 142.—Turbits.

691 & 695.—691 is the first prize; 695, the second. These exhibits were all inferior, compared with the best birds known to be in the Colony.

Class 143.—Nuns.

698 & 699.—These were only average. The prize was given to the best cut, as the whole were faulty in other respects. 698, first; 699, second.

Class 144.—Pouters.

702 & 703.—The white pair, 702, were by far the best bred; 703 got second prize for their uniform color; they were, however, a very coarse pair of birds.

Class 146.—Any other variety.

708, 710, 711, & 712.—The prize list had to be extended in this class, and some special prizes of merit given, viz.:—One pair of white barbs, 708; one pair blue owls, 710—the best fancy birds in the show; one pair black trumpeters; one pair white runts, making three extra prizes to be given.

Generally.

We suggest that next year this branch of the Society's Exhibition be given greater attention, by revision of the list of exhibits, and having color prizes as well as class. The varieties of pigeons might be extended, and several, now included, expunged. We suggest that a medal be given for the best almond tumblers, and a prize of £10; that the entrance in this class be £1; that carriers be £5 and a medal; entrance, 10s.

THE JUDGES.



SECTION XIII.—DOGS.

Stewards:

JOHN J. CALVERT, Esq., | F. W. HILL, Esq.

Judges:

D. HOWELL, | P. WILLIAMS,
GEO. GUEST, SENR.

SPORTING DOGS.

Class 158.—Kangaroo Smooth Dogs.

1st prize, £1; 2nd, 10s.

No.	Name and Address of Exhibitor.	Age.	Height.	Weight.	Pedigree.
		yr. mo.	ft. in.	lbs.	
738	George S. Yeo, Lands Office	1 0	2 6	96	
739	E. H. Weston, Albion Park, Illawarra	1 3	2 5	75	
740	John Craig, Richmond Terrace	6 6	2 0	...	By an imp. greyhound dog out of greyhd. slut.
741	E. J. H. Knapp, Ashfield	1 0	2 4½	40	Out of my slut Fly, by Mr. R. Hill's dog Rover.
742	Ditto	1 0	2 4	40	Ditto.
743	T. W. Crawley, Markets	0 8	.....	...
744	James Pennell, junr., Newtown	0 11	.....	...
745	Thomas M'Mahon, Milton	4 0	.....	...
746	C. York, Fyrmont Bridge Road	1 3	2 0	...	
747	Richard Hill, 35, Bent-street	7 0	2 5	50	
748	J. R. Hill, Randwick	2 6	.....	...	By imported dog; grandmother imported.
749	Ditto	2 6	.....	...

AWARDS:—No. 747; 1st prize.

746; 2nd prize.

748; highly commended.

Class 159.—Kangaroo Smooth Sluts.

1st prize, £1; 2nd, 10s.

750	Joseph Mandelson, Goulburn.....	1	6	.....	...
751	James Pemell, junr., Newtown.....	0	11	.....	...
752	Albert J. Manton, Bourke-street.....	4	0	2 1	62
753	E. J. H. Knapp, Ashfield.....	6	0	2 1	40
754	Ditto.....	1	0	2 0	35
755	Ditto.....	1	0	2 2½	40
756	James E. Stewart, Paddington.....	3	0	2 3	68
757	George S. Yeo, Lands Office.....	3	0	2 3	55
758	Thomas M'Mahon, Milton.....	0	9	.....	...

AWARDS :—No. 757; 1st prize.
758; 2nd prize.

By Neco, out of D. Bell's slut, imported.
Bred by Hugh Lord, Taralga.
Out of my slut Fly, by dog Rover.
Out of slut Gray Lass, by Rover.

By Swarric, out of imported Swarric.

Class 160.—Kangaroo Rough Dogs.

1st prize, £1; 2nd, 10s.

759	John P. Smith, 312, George-street.....	3	0	.....	...
760	George S. Yeo, Lands Office.....	0	7	2 3	58
761	Honorable C. Campbell, Newtown.....	0	11	2 6	80
762	John Tait, Randwick.....	3	0	2 0	56
763	Ditto.....	3	0	2 0	56
764	E. O. Moriarty, St. Leonards.....	2	6	.....	...
765	Henry S. Badgery, junr., Sutton Forest.....	3	6	2 3	98

AWARDS :—No. 762; 1st prize.
763; 2nd prize.

Bred on Richmond River.
By imported Hermit, out of Juno.
Out of thbred. Scotch greyhd. by thbred. staghd.
Imported.
Imported.

By Scotch staghound out of greyhound slut.

Class 161.—Kangaroo Rough Sluts.

1st prize, £1; 2nd, 10s.

766	George S. Yeo, Lands Office.....	2	0	2 3	64
767	Richard Hill, 35, Bent-street.....	1	8	2 4	...

AWARD :—No. 767; 1st prize.

By imported deerhound.
Imported.

Class 162.—Greyhound Dogs.

1st prize, £1; 2nd, 10s.

No.	Name and Address of Exhibitor.	Age.		Height.		Weight.		Pedigree.
		yrs.	mo.	ft.	in.	lbs.	ozs.	
768	F. M. Speer, Darling Point.....	2	5	2	3	41		
769	James Howlett, Parramatta	2	3	2	0	70		
770	C. York, Fyrmont Bridge Road.....	1	6	2	0	...		

AWARD :—No. 770; 1st prize.

Class 163.—Greyhound Sluts.

1st prize, £1; 2nd, 10s.

771	J. R. Hill, Randwick	4	0	2	2	30	Imported.
772	Walter Hill, Brisbane	4	0	2	4	58	Out of Belle of Queensland, by King Death.
773	J. S. Gordon, E. S., & A. C. Bank	6	0	2	3	48	
774	W. H. Harris, Ultimo.....	5	0	1	10	50	From imported stock.

AWARDS :—No. 772; 1st prize.
771; 2nd prize.**Class 164.—Foxhounds (couple)—Dogs or Sluts.—No entries.****Class 165.—Fox Terrier Dogs.—No entries.****Class 166.—Fox Terrier Sluts.**

1st prize, £1; 2nd, 10s.

775	James Horan, 192, Cumberland-street	1	4	1	1	14	Out of imported dog.
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AWARD :—No. 775; 1st prize.

Class 167.—Beagles (couple)—Dogs or Sluts.

1st prize, £1; 2nd, 10s.

776	F. A. Thomas, 30, Hunter-street	2	6	1	8	17
777	D. Holbrow, Ashfield	0	9	1	8	27
778	Ditto	0	9	1	8	27

Imported dog and slut.
Ditto.

AWARDS:—No. 777; 1st prize.
778; 2nd prize.

Class 168.—Pointer Dogs.

1st prize, £1; 2nd, 10s.

779	C. Muller, 162, Phillip-street	0	8	1	4	25
780	Ditto	6	0	2	0	55
781	T. May, Parramatta.....	2	0	2	2	62
782	J. Manderson, Goulburn	4	0	.....	.....	..
783	J. C. Rutter, Parramatta.....	6	0	1	11	54
784	F. A. Thomas, Hunter-street	6	6	1	11	50
785	A. Rose, Campbelltown	0	8	1	11	58
786	Ditto .....	.....	.....	.....	.....	..
787	A. A. Dangar, Singleton	3	0	1	10½	47
788	Henry Newcombe, Woollahra	1	8	1	11	58
789	Ditto	10	0	1	10	58
790	William Sibson, Parramatta	5	0	1	10½	85
791	William Deane, Burwood	2	0	2	2	75

Sire, Dr. Muller's Leader; dam, Cheeke's Dora
Imported dog.

Believed by Mrs. McQuade's dog and Dr.
[Muller's slut.

Bred by Justice Cheeke.
Bred by Sir M. W. Ridley.
By Dash; imported.
Imported.

AWARDS:—No. 788; 1st prize.
786; 2nd prize.

Class 169.—Pointer Sluts.

1st prize, £1; 2nd, 10s.

792	W. J. Dangar	10	0	.....	.....	..
793	William Deane, Burwood	0	9	2	9	55
794	G. H. Lovett, Markets.....	4	0	1	11½	68
795	William Deane, Burwood	2	0	2	0	65

Imported.

Class 169.—continued.

No.	Name and Address of Exhibitor.	Age.	Height.	Weight.	Pedigree.
		yr. mo.	ft. in.	lbs.	
796	E. K. Cox, Penrith	7 0	.....	..	Out of slut bred by Marquis of Westminster. Imported.
797	W. J. Cox, 347, Liverpool-street	7 0	1 9	48	
798	A. A. Daugar, Singleton	2 0	1 8½	43	
AWARDS:—No. 798; 1st prize. 797; 2nd prize.					
Class 170.—Retriever (black curly) Dog.					
1st prize, £1; 2nd, 10s.					
799	J. de V. Lamb, Sydney	2 0	1 9	40	Imported Irish retriever.
AWARD:—No. 799; 1st prize.					
Class 171.—Retriever (black curly) Slut.					
1st prize, £1; 2nd, 10s.					
800	Dr. Paterson, Surry Hills	6 0	.....	..
AWARD:—No. 800; 1st prize.					
Class 172.—Retriever (black wavy) Dog.					
1st prize, £1; 2nd, 10s.					
801	W. J. Cocks, 347, Liverpool-street.....	4 0	2 0	63	Bred by Mr. Baxter, Burwood.
AWARD:—No. 801; 1st prize.					
Class 173.—Retriever (black wavy) Slut.					
1st prize, £1; 2nd, 10s.					
802	John Wilson, Burwood	0 18	1 10	30	Imported.
AWARD:—No. 802; 1st prize.					

Class 174.—Retriever (other coloured) Dogs.

		1st prize, £1; 2nd, 10s.		
803	Walter Bradley, Randwick .....	.....	2 0	60
804	Fred. Gannon, Cook's River	4 0	1 6	50
805	Henry Newcombe, Woollahra.....	5 0	1 9	56

By Pero out of Gipay.
By J. R. Yorke's imported dog Sailor out of imported slut Beauty.
Colonial-bred out of Beauty by Sailor; both imported by J. R. Yorke, of Cook's River.

AWARDS:—No. 805; 1st prize.
808; 2nd prize.

Class 175.—Retriever (other coloured) Sluts.

		1st prize, £1; 2nd, 10s.		
806	Frederick Gannon, Cook's River	5 0	1 6	50
807	H. Newcombe	5 0	1 10	64
808	J. C. Butler, Parramatta.....	3 6	1 8	34
809	F. Williams, Wynyard-square	2 0	2 0	35

By J. R. Yorke's imported dog Sailor out of an imported slut.
Colonial-bred by Sailor out of Beauty.
Sire, J. R. Yorke's imported dog, out of W. M'Quade's slut.
Out of 1st prize retriever slut got by 2nd prize [dog.]

AWARDS:—No. 807; 1st prize.
809; 2nd prize.

Class 176.—Setter Dogs.

		1st prize, £1; 2nd, 10s.		
810	J. R. Hill, Randwick	3 0	1 11	40
811	Charles Muller, 162, Phillip-street.....	0 8	1 4	25
812	Ditto	3 6	2 0	50
813	A. Rose, Campbelltown	0 16	2 1	62
814	Ditto	Aged...	2 2½	75
815	Ditto	3 6	1 10	45
816	George Guest, Richmond	7 0	2 0	65
817	J. W. Jackson, Parramatta-street	6 0	1 11	54

Imported.
Sire, Rose's Tapo; dam, Cheeke's Juno.
Sire, Tapo; dam, Juno.
Ditto.
Sire and dam imported.
Sire, Tapo; dam, Juno.
Out of Thorn's imported Irish slut.
Dog by black and tan English setter.

Class 176.—continued.

No.	Name and Address of Exhibitor.	Age.	Height.	Weight.	Pedigree.
818	W. Maxwell, Glebe Road	2 0	2 1	67	Out of thoroughbred slut. Sire, Buke imported, out of Benson's slut. Sire, imported dog; bred by Cobcroft.
819	J. C. Butler, Parramatta	2 5	1 11	44	
820	H. D. Ardler, Newtown	3 0	1 11	56	
821	E. B. Farnell, William-street	2 10	2 0½	56	

AWARDS:—No. 810; 1st prize.
818; 2nd prize.

Class 177.—Setter Sluts.

1st prize, £1; 2nd, 10s.

822	Charles Muller, 162, Phillip-street	4 0	1 10	35	Sire, Rose's Tapo; dam, Juno. Sire, Tapo; dam, Cheeke's Juno. By English black and tan setters. Sire, imported; grand-dam, imported. Thoroughbred. Bred by M. Guest, Richmond.
823	A. Rose, Campbelltown	1 4	1 9½	44	
824	James W. Jackson, Parramatta-street	6 0	1 9	62	
825	A. Rose, Campbelltown	1 9	1 9	35	
826	Edward Wilson, Parramatta-street	3 6	1 11	60	
827	A. Rose, Campbelltown	Aged ...	1 11	45	

AWARDS:—No. 826; 1st prize.
822; 2nd prize.

Class 178.—Spaniel (large-sized) Dogs.

1st prize, £1; 2nd, 10s.

828	I. K. Cleve, Bungarribee	7 0	1 4½	33	Unknown, imported Cocker. Father and mother both imported. By Cleve's prize dog out of Dorra.
829	W. C. Freeman, Surry Hills	6 0	1 5	38	
830	J. S. Gordon, E. S., & A. C. Bank	0 11	1 5	35	
831	Thomas Dixon, George-street	5 0	1 6	60	
832	Fred. A. Thomas, 30, Hunter-street	7 0	1 4	30	

AWARDS:—No. 831; 1st prize.
830; 2nd prize.

Class 179.—Spaniel (large-sized) Sluts.

1st prize, £1; 2nd, 10s.

833	I. K. Cleeve, Bungaribee	6 0	1 2	22	Unknown, imported Cocker.
834	J. S. Gordon, E., S., & A. C. Bank	0 11	1 3	28	By Cleeve's prize dog out of Dora.
835	Ditto	3 0	1 3	35	Imported.
836	H. F. Delarue, George-street	2 0	1 5	24	Out of spaniel slut by imported retriever.
837	E. S. Rouse, Rouse Hill	3 0	1 5	27	Imported.

AWARDS :—No. 834; 1st prize, 835; 2nd prize.

Class 180.—Spaniel (under 20 lbs.) Dogs.—No entries.

Class 181.—Spaniel (under 20 lbs.) Sluts.—No entries.

NON-SPORTING CLASS.

Judges:

G. GUEST, | G. HOWELL,

| J. WILLIAMS.

Class 182.—St. Bernard (rough-coated)—Dogs or Sluts.

1st prize, £1; 2nd, 10s.

838	W. G. W. Freeman, George-street.....	5 0	2 8	120	Mount St. Bernard.
839	W. F. Drewitt, Woolhara	3 0	2 2	90	Cross—Newfoundland slut and St. Bernard [dog.

AWARDS :—No. 838; 1st prize, 839; 2nd prize.

Class 183.—St. Bernard (smooth-coated)—Dogs or Sluts.

1st prize, £1; 2nd, 10s.

840	F. Tooth, Goderich	2 6	.....	...	|
841	George Thorne, Waverley	2 0	.....	...	|

AWARDS :—No. 841; 1st prize, 840; 2nd prize.

Class 184.—Mastiff Dogs.
1st prize, £1; 2nd, 10s.

No.	Name and Address of Exhibitor.	Age.		Height.		Weight.	Pedigree.
		Yrs.	mo.	ft.	in.		
842	George Allen, Tortexth Park	5	3	2	4	150 lbs.	Sire and dam both prize dogs.

AWARDS:—No. 842; 1st prize.

Class 185.—Mastiff Sluts.—No entries.

Class 186.—Newfoundland Dogs.

1st prize, £1; 2nd, 10s.

843	S. de Liass, Barrack-street	1	8	2	3½	128	Imported.
844	Beresford Hudson, Randwick	1	9	2	4	91	Sire, celebrated dog Toby.
845	Sloper Cox, Hobartville	2	0	2	6	112	
846	T. A. Godson	1	9	2	6	120	Out of M'Lean's Juno.
847	Mrs. Hy. Irwin, Lady Young's-terrace	3	0	2	7	70	
848	J. M. May, Randwick	3	0	3	0	113	
849	John Musson, Glebe Point	6	0	2	3	...	
850	E. T. Poole, King-street	5	0	.....	.....	160	
851	H. D. Bray, Concord	0	11	2	4	130	
852	G. R. Cadell, Windsor	3	5	2	10	108	By Carney's Nelson out of Madley's Nep.
853	J. A. Read, Enfield	4	0	2	1	101	

AWARDS:—No. 849; 1st prize.

853; 2nd prize.

850 } highly commended.

852 } highly commended.

845 } commended.

847 } commended.

Class 187.—Newfoundland Sluts.

		1st prize, £1; 2nd, 10s.					
854	Samuel Hunt, Colonial Secretary's Office	3	0	3	2	109	Father and mother Newfoundland.
855	William Garrett, Victoria-street	2	6	2	0	100	
856	Edward Gould, Parramatta	2	0	2	2	106	Out of Judge Meymott's slut.
857	J. M. May, Randwick	4	0	2	10	99	
858	George Basher, Pitt-street	2	6	2	6	115	

AWARDS :—No. 858; 1st prize.
856; 2nd prize.
855; commended.

Class 188.—Sheep Dogs.

		1st prize, £1; 2nd, 10s.					
859	John Pigott, Bowral	3	0	1	9	54	
860	Mrs. J. Mitchell, Newtown	7	0	.....	.....	35	Pure bred sheep-dog.
861	Alfred Barnett, Liverpool	1	0	1	7	.....	By imported dog Bob.
862	F. Myers, Goulburn	3	2	1	11	48	

AWARDS :—No. 862; 1st prize.
861; 2nd prize.
859; highly commended.

Class 189.—Sheep Sluts.

		1st prize, £1; 2nd, 10s.					
863	E. S. Rouse, Rouse Hill	4	0	1	9½	51	Imported from Scotland.

AWARD :—No. 863; 1st prize.

Class 190.—Cattle Dogs.

		1st prize, £1; 2nd, 10s.					
864	E. S. Rouse, Rouse Hill	4	0	.....	.....	60	Imported from England.
865	George S. Yeo	2	6	1	11	60	

Class 190—continued.

No.	Name and Address of Exhibitor.	Age.	Height.	Weight.	Pedgree.
866	George S. Yeo	yrs. mo.	ft. in.	lbs.	
867	W. Ward, junr., Bankstown	5 0	1 6	56	
868	E. S. Rouse, Rouse Hill	1 8	1 9	45	
		0 3	1 3	17	From imported stock.
		AWARDS:—No. 867; 1st prize.			
		864; 2nd prize.			
		865 } highly commended.			
		866 }			

Class 191.—Cattle Sluts.

1st prize, £1; 2nd, 10s.

869	E. S. Rouse	0 3	1 2	15	From imported stock.
		AWARD:—No. 869; 1st prize.			

Classes 192 and 193.—Bloodhound Dogs and Sluts.—No entries.

Class 194.—Bull-dogs.

1st prize, £1; 2nd, 10s.

870	J. T. Stewart, Paddington	4 0	1 2	28	
871	W. Ward, junr., Bankstown	2 0	1 5	50	
		AWARD:—No. 870; 1st prize.			

Class 195.—Bull-Sluts.

1st prize, £1; 2nd, 10s.

872	J. Winterbottom, Upper William-street	2 0	1 1½	20	By King's Prince out of Violet.
873	James Callanan, Elizabeth-street	4 3	1 5½	47	
		AWARD:—No. 873; 1st prize.			

Class 196.—Bull Terrier Dogs.

1st prize, £1; 2nd, 10s.

874	George Smith, O'Connell-street, Newtown	3	9	1	6½	46	By imported dog Cribb. Out of English terrier, by imported bulldog. By Billy out of Fan. Venom, by imported dog out of Vixen. Out of Nelly by dog Billy Blue.
875	John Weston, Globe	5	0	1	3	26½	
876	C. J. Pattison, Marlborough-street	5	0	1	4	26	
877	G. A. McDonald, Potts' Point	4	0	1	2½	19	
878	Edmund Arnold, Newtown	3	0	1	7	36	

AWARDS:—No. 875; 1st prize.

Class 197.—Bull Terrier Sluts.

1st prize, £1; 2nd, 10s.

879	William Rose, Pitt-street	2	0	1	5	20	By Voss' 2nd prize show bull-dog, 1869. Imported. By Jock out of imported slut Rose.
880	J. S. Gordon, E., S., & A. C. Bank	2	0	1	5	30	
881	J. Fennell, junr., Newtown	1	6	.....	.....	27
882	Ditto	.....	.....	.....	.....	30
883	J. S. Gordon	0	10	1	2	13	

AWARDS:—No. 881; 1st prize.
879; 2nd prize.

Class 198.—Terrier Dogs (smooth, black and Tan.)

1st prize, £1; 2nd, 10s.

884	J. Overall, 1, Pleasant-street, Redfern	2	0	16	Thoroughbred.
885	J. P. Hubbard, Botany Road, Redfern	2	0	15	18	
886	John Scott, Globe	4	0	14	35	Imported.
887	F. Tooth, Goderich	4	0	11	12	
888	A. J. Cape, Pitt-street	6	0	11	12	
889	W. Davies, Campbell-street	4	0	.....	.....
890	S. Neale, Upper Forbes-street	2	6	11	8	
891	J. Overall, Redfern	2	0	14½	18	

AWARDS:—No. 888; 1st prize.
889; 2nd prize.

Class 199.—Terrier Sluts (smooth, black and tan.)
1st prize, £1; 2nd, 10s.

No.	Name and Address of Exhibitor.	Age.		Height.	Weight.	Pedigree.
		Yrs. mo.	Aged ...			
892	A. Rose, Campbelltown	14	18	14	18	
893	F. Kosten, Camperdown	12	13½	12	13½	
894	Jabez Brown, Ultimo	4	6	.....	..
895	Walter Bradley, Randwick .....	.....	.....	12	10	
896	W. M. Forbes, Darlinghurst	2	6	13½	11	
897	R. L. Tooth, Kent Brewery	3	0	9½	8	
898	W. H. Harris, Ultimo	2	0	.....	14	
899	W. E. Langley, <i>Herald's Office</i> .....	.....	.....	.....	..	Imported.

AWARDS:—No. 899; 1st prize.
 897; 2nd prize.
 894; highly commended.

Class 200.—Terriers, smooth; other colour Dogs.—No entries.

Class 201.—Terriers, smooth; other colour Sluts.

1st prize, £1; 2nd, 10s.

900	F. A. Thomas, Hunter-street	5	0	13	10	
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Class 202.—Terrier Dogs Skye.

1st prize, £1; 2nd, 10s.

901	W. O. Gilchrist, Edgecliffe Road	3	6	10½	17	
902	Walter Bradley, Randwick .....	.....	.....	12	9½	
903	J. J. Shaw, North Shore	1	0	.....	..

AWARDS:—No. 901; 1st prize.
 903; 2nd prize.
 902; highly commended.

Class 203.—Terrier Sluts Skye.

1st prize, £1; 2nd, 10s.

904 | W. Davis, 151, Campbell-street	7	0	.....	.....	.....
905 | Ditto	1	6	.....	.....	.....
906 | J. J. Shaw, North Shore	1	0	.....	.....	12

AWARDS :—No. 906; 1st prize.
904; 2nd prize.
905; highly commended.

Classes 204 and 205.—Terriers (Dandie Dinmont), Dogs and Sluts.—No entries.

Class 206.—Terrier Dogs, broken hair.

1st prize, £1; 2nd, 10s.

907 | J. S. Gordon, E., S., & A. C. Bank .....	.....	1	0	13	Imported.
908 | A. Bruce, Lands Office	3	0	1	0	15
909 | J. Pemell, jun., Newtown	3	0	.....	.....	8
910 | George S. Yeo, Lands Office	1	6	0	7	10
911 | Fred. Campbell, Campbell's Wharf	5	0	0	10	13

Out of a Scotch terrier by Lochghey.

AWARDS :—No. 910; 1st prize.
908; 2nd prize.
911; highly commended.

Class 207.—Terrier Sluts, broken hair.

1st prize, £1; 2nd, 10s.

912 James Pemell, jun.	1	1	8
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AWARD :—No. 912; 1st prize.

Class 208.—Terrier (Toy) Dogs, smooth hair, under 7 lbs.
1st prize, £1; 2nd, 10s.

No.	Name and Address of Exhibitor.	Age.		Height.		Weight.	Pedigree.
		Yrs.	mo.	ft.	in.		
913	Samuel Neale, Darlinghurst	0	9	4½	By J. Hart's dog out of imported slut. Sire and dam both imported.	
914	Ernest F. Stephen, Woolahra	1	6	.....	6	
915	William Beattie, York-street	2	7	10	4		

AWARDS:—No. 915; 1st prize.
914; 2nd prize.

Class 209.—Terrier (Toy) Sluts, smooth hair, under 7 lbs.
1st prize, £1; 2nd, 10s.

916 | W. C. Curtis, Darlinghurst Road | 2 | 2 | 6" | 3½ | Dam unknown, by J. Hart's dog Johnny.
 AWARD:—No. 916; 1st prize.

Class 210.—Terrier (Toy) Dogs, broken hair, under 8 lbs.—No entries.

Class 211.—Terrier (Toy) Sluts, broken hair, under 8 lbs.
1st prize, £1; 2nd, 10s.

917	Aubrey M. P. Mowle, Miller's Point.....	1	0	7	6
918	E. J. H. Knapp, jun., Ashfield	4	0	7	5
919	Ernest F. Stephen, Woolahra	4	0	9	7½
920	George S. Yeo, Lands Office	1	0	6	7

AWARDS:—No. 917; 1st prize.
918; 2nd prize.
919 } highly commended.
920 }

Class 212.—King Charles, or Blenheim Dogs.

1st prize, £1; 2nd, 10s.
 921 | R. W. Skinner, 361, Pitt-street | 1 | 3 | | 6½ | Out of thoroughbred King Charles' slut.
 AWARD:—No. 921; 2nd prize.

Class 213.—King Charles, or Blenheim Sluts.*1st prize, £1; 2nd, 10s.*

922	W. Hardy, 450, Pitt-street	1	5	8	4	King Charles.
923	J. H. Maddock, Waverley .....	.....	.....	.....	.....	Ditto.

AWARD:—No. 922; 1st prize.

Class 214.—French Poodle Dogs.*1st prize, £1; 2nd, 10s.*

924	Jabez Brown, Ulkimo .....	.....	.....	.....	.....	.....
925	B. W. Skinner, 361, Pitt-street	3	4	.....	8½	Thoroughbred dog.

AWARD:—No. 924; 1st prize.
925; 2nd prize.

Class 215.—French Poodle Sluts.—No entries.**Class 216.—Manilla Poodle Dogs.***1st prize, £1; 2nd, 10s.*

926	Joseph Holland.....	3	0	0	8	7
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AWARD:—No. 926; 1st prize.

Class 217.—Manilla Poodle Sluts.—No entries.**Class 218.—Italian Greyhound Dogs.***1st prize, £1; 2nd, 10s.*

927	George S. Yeo, Lands Office	2	0	1	0	20
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AWARD:—No. 927; 1st prize.

Class 219.—Italian Greyhound Sluts.
1st prize, £1; 2nd, 10s.

No.	Name and Address of Exhibitor.	Age.		Height.		Weight.	Pedigree.
		Yrs.	Mo.	ft.	in.			lbs.
928	T. W. Crawley, Markets	2	0	.....	.....	4	Imported.

AWARD :—No. 928; 1st prize.

Class 220.—Pug Dogs.

1st prize, £1; 2nd, 10s.

929	John Barnett, Parramatta-street	2	0	1	2½	23	
930	William Wheeler, Petersham .....	.....	.....	.....	.....	..

AWARDS :—No. 930; 1st prize.
 929; 2nd prize.

Class 221.—Pug Sluts.—No entries.

Class 222.—Other kinds of Dogs, not specified.

1st prize, £1; 2nd, 10s.

931	Joseph Holland, 210, Pitt-street	2	0	0	10	9	From imported English terrier.
932	H. Fletcher, Paddington	6	0	0	10	13	Prussian poodle dog.
933	E. K. Goddard, 183, Macleay-street	2	6	2	6	85	By Sp. pointer out of Newfoundland.

AWARDS :—No. 933; 1st prize.
 932; 2nd prize.
 931; highly commended.

Class 223.—Other kinds of Sluts, not specified.

1st prize, £1; 2nd, 10s.

934	Edward Stanley, Parramatta-street	2	0	2	4	84	Russian poodle.
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AWARD :—No. 934; 1st prize.

NON-COMPETITIVE DOGS.

No.	Name of Exhibitor.	Nature of Breed.	Age.	Height.	Weight.
			yrs. mo.	ft. in.	lbs.
935	Mrs. Calvert, Glebe Point	Newfoundland pup and St. Bernard pup in same box.	0 4	.....	...
936	John J. Calvert, Glebe Point	Black curly retriever	6 6	2 0	50
937	Ditto	4 terriers, broken hair, in same box; 1st and 2nd prizes, 1869.	from 8m. to 6 yrs.	.....	...
938	Miss Scott, Glebe Point	St. Bernard dog, imported, 1st prize, 1869.....	5 0	2 6	110
939	W. G. Freeman, 320, George-street	Pair Mount St. Bernard male pups	0 5	.....	45
940	Henry Mort, Mount Adelaide	Clumber Spaniel.....	0 2	1 4	30
941	Mrs. Merrett, Pitt-street, Redfern.....	} Toy terriers, smooth hair	0 5	0 6½	2
942	Ditto		3 0	0 9½	7
943	Edward S. Hill, Rose Bay	Kangaroo dog .....	.....	.....	...
944	Ditto	Kangaroo slut .....	.....	.....	...
945	Henry Dodds, Randwick.....	.....	3 0	.....	...
946	Henry Freeman, Lands Office	Spaniel, out of imported dog	3 6	0 13	18
947	Ditto	Ditto, imported	3 0	0 12	17

AWARDS :—No. 935
 936
 937
 938
 940 } highly commended.
 943
 944
 946
 947 }

SPECIAL PRIZE :—The Stewards' (Messrs. J. J. Calvert and F. W. Hill) prize for best exhibits (not less than four) in above section—22 2s.—awarded to G. S. Yeo.

SECTION XIV.—WOOL

Stewards:

G. H. COX, H. BEIT,
P. N. TREBECK.

Judges:

E. KUMMERER, A. HINCHLIFFE,
D. M. PARKER.

Class 224.—Washed Wool.

For the most valuable 30 fleeces of ewes' wool, entire, and without being skirted.—1st prize, £10; 2nd, £5.

No.	Distinguishing Motto.	Age of Wool.	Age of Sheep.	Owner's Name and Address.	Prizes.	Weight.
948	Double diamond, ewes.....	354 days...	5 0	Hon. G. H. Cox, Mudgee .....	.....	131 lbs.
949	AB 1	373 " "	5 0	D. H. Campbell, Cunningham Plains...	.....	154 lbs.
950	F.....	348 " "	Aged	J. B. Bettington, Merriwa .....	.....	106 lbs.
961	Double triangle.....	368 " "	2 0	C. C. Cox, Mudgee .....	.....	106 lbs.
952	Non sine spe	358 " "	2, 4, 6 tooth	E. Traill, Collaroy	2nd prize	134 lbs.
953	† † A I	370 " "	2 to 5 yrs..	E. K. Cox, Mudgee	1st prize.....	139 lbs.

Class 225.—Washed Wool.

For the most valuable 30 fleeces of ewes' clothing wool, entire, without being skirted.—1st prize, £7; 2nd, £3.

254	F.....	356 days...	J. B. Bettington, Merriwa.....	82 lbs.
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Class 226.—Washed Wool.

For the most valuable 20 fleeces of hogget ewes' wool, entire, without being skirted.—1st prize, £7; 2nd, £3.

955	Double diamond, hoggeta ewes...	13½ mths.	1 1½	Hon. G. H. Cox, Mudgee .....	.....	89 lbs.
956	F.....	13 " "	1 1	J. B. Bettington, Merriwa	1st prize.....	80 lbs.
957	Oujus hic est.....	12 " "	1 0	E. Traill, Collaroy	2nd prize	74 lbs.

Class 227.—Washed Wool.

For the most valuable 20 fleeces of hogget rams' wool, entire, without being skirted.—1st prize, £7; 2nd, £3.

958	F	.....	13 months.	1	1	J. B. Betington, Merriwa	.....	2nd prize	.....	78 lbs.
959	Double triangle	.....	12 "	1	0	C. C. Cox, Mudgee	.....	1st prize	.....	90 lbs.

Class 228.—Washed Wool.

For the best washed bale, not less than 200 lbs. of wool, washed on the sheep's back.—1st prize, £5; 2nd, £2.

960	Fortuna	.....	.....	0	10	Travers & Gibson, Queensland	.....	.....	.....	250 lbs.
961	Ella	.....	.....	.....	.....	Peel River Company, Ellan Gowan	.....	.....	.....	246 lbs.
962	Clouhie	.....	.....	.....	.....	D. Gunn, Queensland	.....	.....	.....	not exhibited
963	K K over 2 in diamond	.....	.....	2	to 3 yrs.	T. Kibe, Kangarooby	.....	.....	.....	270 lbs.
964	Success depends on condition	.....	12 months.	4	0	R. L. Jenkins, Queensland	.....	.....	.....	263 lbs.

Class 229.—Washed Wool.

For the best scoured bale of wool, not less than 200 lbs.—1st prize, £5; 2nd, £2.

965	Class 6	.....	.....	.....	.....	C. Oatton, Hay	.....	1st prize	.....	.....
966	Siletia	.....	385 days	3	to 5 yrs.	W. J. Dangar, Singleton	.....	.....	.....	.....
967	Placeat	.....	.....	.....	.....	R. Traill, Collaroy	.....	.....	.....	.....
968	N in diamond	.....	.....	.....	.....	J. R. Oshappell, New England	.....	2nd prize	.....	.....
969	AA over A in diamond	.....	.....	.....	.....	F. J. C. Wildash, Warwick	.....	.....	.....	.....
970	Tarlo	.....	.....	.....	.....	Thos. Gale, Goulburn	.....	.....	.....	not exhibited

Class 230.—Wool in Grease.

For the most valuable 30 fleeces of ewes' wool, entire, and without being skirted.—1st prize, £7; 2nd, £3.

971	H 7	.....	369 days	5	0	D. H. Campbell, Cunningham Plains	.....	.....	.....	288 lbs.
972	A C in oblong over 1869	.....	388 "	.....	.....	A. Armstrong, Geelong, Victoria	.....	2nd prize	.....	294 lbs.
973	Laudatur ab his culpatur ab illis	.....	847 "	2,	4, 6 teeth	R. Traill, Collaroy	.....	1st prize	.....	252 lbs.
974	Semaphore	.....	979 "	3	3	J. Smith, Bathurst	.....	.....	.....	276 lbs.
975	AC	.....	895 "	.....	.....	J. L. Currie, Lisamore, Victoria	.....	.....	.....	258 lbs.
976	B in diamond, 404	.....	365 "	.....	...	L. M'Beau, Deniliquin	.....	.....	.....	299 lbs.

Class 231.—No entry.

No.	Distinguishing Mark:	Age of Wool.	Age of Sheep.	Owner's Name and Address.	Prize.	Weight.
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Class 232.—Special Prize.

A Silver Cup, value £5, given by N. P. Bayly, Mudgee, for the best conditioned and most valuable bale of washed wool, that has not been skirted more than one-third.

977	F.....	345 days	Aged	J. B. Bettington, Merriwa .....	.....	|
978	††A.....	360 "	"	E. K. Cox, Mudgee .....	.....	| 1st prize.

Class 233.—Angora Goats' Wool.

For the best 15 lbs. Angora goats' wool.—prize, £8.

979	o over Y, 10	270 days	...	J. Black, Muswellbrook	prize.
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NON-COMPETITIVE.

980	Exhibition (care)	393 days	2 3	J. Smith, Bathurst	
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Alpaca Wool.—No entry.

VICTORIAN WOOL EXHIBITS.

These exhibits arrived too late. Will be kept until the January, 1871, Show.

J. Haworth, Malop-street, Geelong. 1 bale combing-wool, No. 1; 2/9 $\frac{1}{2}$ lb.; from skins only, fellmonger's getting up, having been scoured on River Barwon.

J. Haworth, Malop-street, Geelong. 1 bale clothing-wool, No. 2; 2/6 $\frac{1}{2}$ lb.; from skins only, fellmonger's getting up, having been scoured on river Barwon.

G. Reeves, Collingwood. Scoured wool.

SECTION XV.—WINE.

Stewards:

HENRY HALL, | HENRY BRIT.

Judges:

A. T. HOLROYD, | S. A. JOSEPH,
D. N. JOUBEET.

WHITE WINES.

Class 234.

1st prize, £4; 2nd, £2.

No.	Name of Exhibitor.	Locality where grown.	Variety of Grapes.	Age.	Colour.	Character.	Full-bodied or sweet.	Awards.
981	Mrs. G. Cox	Winbourne	Verdelho	1868	White	Light	Dry	Hon. men.
982	Messrs. Wyndham	Dalwood	White Pineau	1868	"	"	"	2nd prize.
983	Ditto	Ditto	Ditto	1869	"	"	"	Hon. men.
984	Ditto	Ditto	Pineau & Madeira	1869	"	"	"	
985	Sir Wm. Macarthur	Camden Park	Reising	1869	"	"	"	
986	Messrs. Kelman	Hunter River	White Hermitage	1869	"	"	"	
987	Ditto	Ditto	Madaira	1868	"	"	"	
988	James Doyle	Kaludah	Verdelho	1868	"	"	"	
989	C. McKay, M.D.	Eastern Creek	Black Hamburg	1869	"	"	"	
990	John Smith	Kyamba	Verdelho	1868	White	Light	"	

Class 235.

1st prize, £4; 2nd, £2.

No.	Name of Exhibitor.	Locality where grown.	Variety of Grapes.	Age.	Colour.	Character.	Full-bodied or sweet.	Award.
991	Mrs. G. Cox	Winbourne	White Burgundy	1868	White	Full-bodied	Dry	2nd prize.
992	William Jacobs	Mooroo, S. A.	Reising	1868	"	"	"	"
993	Messrs. Wyndham	Dalwood	Madeira	1869	"	"	"	Hon. men.
994	Ditto	Bukkulla	Shiraz and Sherry	1868	"	"	"	"
995	Ditto	Ditto	Shiraz	1868	"	"	"	"
996	P. F. Adams	Albury	Verdeilho and Shiraz	1868	"	"	"	"
997	Ditto	Ditto	Muscad.	1868	"	"	"	"
998	Ditto	Ditto	Reising	1868	"	"	"	"
999	R. L. Jenkins	Nepean Towers	Verdeilho	1868	"	"	"	1st prize.
1000	David Randall	Glen Parra, S.A.	Reis, Verd., Tokay	1869	"	"	"	Hon. men.
1001	Ditto	Ditto	Ditto	1869	"	"	Very sweet.	"
1002	Thomas Barker	Maryland	Verdeilho	1869	"	Light	Dry.	"
1003	Joseph B. Holmes	The Wilderness	Ditto	1868	"	Not light	I. to fl.-bo'ied	"
1004	Chas. McKay, M.D.	Eastern Creek	Madeira	1869	"	Full-bodied	Dry.	"
1005	Ditto	Ditto	Lambruscat.	1868	"	"	"	"
1006	Ditto	Ditto	Madeira	1868	"	"	"	Hon. men.
1007	Ditto	Ditto	Shepherd's Reislg.	1868	"	"	"	"
1008	Frank M. Statham	Parramatta	Verdeilho	1868	"	"	"	"

Class 236.

Prize, £3.

No.	Name of Exhibitor.	Locality where grown.	Variety of Grapes.	Age.	Colour.	Character.	Full-bodied or sweet.	Award.
1009	Joseph Gillard	Norwood, S.A.	R. & W. Mabeirs	1868	White	Sweet	"	2nd prize.
1010	William Jacob	Mooroo, S.A.	Verdeilho	1868	"	"	"	"
1011	Messrs. Wyndham	Bukkulla	White Pineau	1868	"	"	"	1st prize.
1012	David Randall	Glen Parra, S.A.	Reis, Verd., Tokay	1869	"	"	"	Hon. men.
1013	Joseph B. Holmes	The Wilderness	Shiraz	1869	"	"	Full-bodied	"

RED WINES (DRY).

Class 237.

1st prize, £4; 2nd, £2.

1014	John Glennie	Orindinna	Black Hermitage	1869	Red	Light	Dry		Hon. men.
1015	Ditto	Ditto	Lambruscat	1869	"	"	"		
1016	Messrs. Wyndham	Dalwood	Hermitage and Malbec	1869	"	"	"		2nd prize.
1017	Ditto	Ditto	Black Spanish	1869	"	"	"		1st prize.
1018	John Glennie	Orindinna	Hermitage	1869	"	"	"		
1019	Messrs. Kelman	Branxton	Red Hermitage	1868	"	"	"		
1020	Ditto	Ditto	Ditto	1868	"	"	"		

Class 238.

1st prize, £4; 2nd, £2.

1021	Messrs. Wyndham	Bukkulla	Verdt	1868	Red	Full-bodied	Dry		1st prize.
1022	Ditto	Ditto	Hermitage	"	"	"	"		Hon. men.
1023	Ditto	Ditto	Hermitage and Malbec	"	"	"	"		2nd prize.
1024	Ditto	Ditto	Black Spanish	"	"	"	"		Hon. men.
1025	P. F. Adams	Albury	Hermitage and Malbec	1869	"	"	"		
1026	David Randall	Glen Fars, S.A.	Shiraz, Crbt., and Mto.	1869	"	Light	"		
1027	Thomas Barker	Maryland	Hermitage	1868-9	"	Not light	Full-bodied		Hon. men.
1028	J. B. Holmes	The Wilderness	Ditto	1868-9	"	Full-bodied	Dry		
1029	Chas. McKay, M.D.	Minchinbury	Burgundy	1869	"	"	"		
1030	Ditto	Ditto	Hermitage	"	"	"	"		
1031	Ditto	Ditto	Lambruscat	"	"	"	"		
1032	A. J. Liddington	Liverpool	Hermitage	1870	"	"	Sweet		

Class 239.
Prize, £3.

No.	Name of Exhibitor.	Locality where grown.	Variety of Grapes.	Age.	Colour.	Character.	Full-bodied or sweet.	Awards.
1033	Joseph Gillard	Norwood, S.A.	Frontignac	1868	Red	Sweet	Dry	1st prize.
1034	William Jacob	Mooroo, S.A.	Carbinet	"	"	"	"	
1035	R. L. Jenkins	Nepean Towers	Cbt., Bl., Cla., & Burgdy.	1869	"	Light sweet	Dry.	
1036	David Randall	Glen Para, S.A.	Shiraz, Carbt., & Mataro	1869	"	Sweet	Rather fl.-bd.	
1037	Sir W. Macarthur	Camden Park	Blk., Wt., & Rd. Mascat	"	Pale red	Sweet	Full	2nd prize.
1038	Joseph B. Holmes	The Wilderness	Hermitage and Shiraz	1868	Light "	"	"	
1039	Ditto	Ditto	Hermitage	1869	Red	"	"	
1040	Ditto	Ditto	Ditto	"	"	"	"	
1041	Joseph Gillard	Norwood, S.A.	Shiraz	1861	"	"	"	Hon. men.

WHITE WINES (DRY).

Class 240.

1st prize, £3; 2nd, £2.

No.	Name of Exhibitor.	Locality where grown.	Variety of Grapes.	Age.	Colour.	Character.	Full-bodied or sweet.	Awards.
1042	Joseph Gilbert	Pewsey Vale, S.A.	Verdelho	1860	White	Light	Dry	Hon. men.
1043	Ditto	Ditto	Realing	1863	"	"	"	
1044	John Glennie	Orindina	Verdelho	1865	"	"	"	Ditto
1045	Ditto	Ditto	Ditto	1865-6	"	"	"	
1046	David Randall	Glen Para, S.A.	Realing	1863	"	"	"	Ditto
1047	Sir W. Macarthur	Camden Park	Ditto	1867	"	"	"	Ditto
1048	Ditto	Ditto	Ver., Gous., & Aucarot	1866	"	"	"	Ditto
1049	Ditto	Ditto	V., G., R., A., and Muscat	1864	White	"	"	Ditto
1050	Ditto	Ditto	Ver., Gous., and Aucarot	1865	"	"	"	Ditto
1051	Ditto	Ditto	Ver., Gou., R., Muscat	1866	"	"	"	Ditto
1052	Messrs. Kellman	Branxton	White Hermitage	1867	"	"	"	} 2nd prize.
1063	Ditto	Ditto	Ditto	1865	"	"	"	
1064	James Doyle	Kaludah	Verdelho	1866	"	"	"	

1055	Ditto	Pinseau	1867	"	"	.....	Hon. men.
1056	Ditto	Shepherd and Reising	1867	"	"	.....	Ditto
1057	Ditto	Shiraz and Verdelho	1867	Light	"	.....	} 1st prize.
1058	Ditto	Reising	1867	White	"	.....
1059	Ditto	Shiraz	1867	"	"	.....	Hon. men.
1060	John Smith	Verdelho	1865	"	"	.....	Ditto
1061	B. L. Jenkins	Ditto	1866	"	Dry	.....

WHITE WINES (DRY).

Class 241.

1st prize, £3; 2nd, £2.

1062	Mrs. G. Cox	White Frontignac	1867	White	Full-bodied	Dry	.....	1st prize.
1063	Ditto	Verdelho	1866	"	"	"	.....	Hon. men.
1064	Archibald Windeyer	Madeira	1867	"	"	"	.....	2nd prize.
1065	Ditto	Ditto	1860	"	"	"	.....	1st prize.
1066	E. Powell	Muscat	1864	"	"	"	.....	Hon. men.
1067	Joseph Gillard	Ver. and Madeira	1863	"	"	"	.....
1068	William Jacob	White Spanish Kinds	1867	"	"	"	.....
1069	Ditto	Reising	1867	"	"	"	.....
1070	Messrs. Wyndham	White Pinseau	1868	"	"	"	.....
1071	Ditto	Madeira	1867	"	"	"	.....
1072	Ditto	Ditto	1865	"	"	"	.....
1073	Ditto	Pinseau and Madeira	1867	"	"	"	.....
1074	Ditto	Shiraz and Reising	1866	"	"	"	.....
1075	P. F. Adams	Verdelho and Shiraz	1867	"	"	"	.....	1st prize.
1076	R. L. Jenkins	Verdelho	"	"	"	"	.....	Hon. men.
1077	Thomas Barker	Ditto	1867-8	"	Nt. light	"	n. v. f. bodied	
1077A	Ditto	Ditto	1866	"	"	"	"	
1078	J. B. Holmes	Shiraz	1867	"	Full-bodied	Dry	.....	1st prize.
1079	James Doyle	Muscatel	"	Light	"	"	"	
1080	Ditto	Verdelho	"	"	"	"	"	
1081	Ditto	Shiraz	"	"	"	"	"	

RED WINES (DRY).

Class 242.

1st prize, £3; 2nd, £2.

No.	Name of Exhibitor.	Locality where Grown.	Variety of Grapes.	Age.	Colour.	Character.	Full-bodied or sweet.	Awards.
1082	Joseph Gillard	Norwood, S.A.	Mataro	1863	Red.....	Light	Dry	1st prize.
1083	Joseph Gilbert	Pewsey Vale	Shiraz	1858	" ..	" ..	" ..	Hon. men.
1084	Ditto	Ditto	Carbinet	"	" ..	" ..	" ..	2nd prize.
1085	John Glennie	Oriandina	Black Hermitage	1867	" ..	" ..	" ..	Hon. men.
1086	Messrs. Wyndham	Dalwood	Malbec	"	" ..	" ..	" ..	
1087	Ditto	Ditto	Black Spanish	1866	" ..	" ..	" ..	Hon. men.
1088	Ditto	Ditto	Ditto	"	" ..	" ..	" ..	2nd prize.
1089	Ditto	Ditto	Burgundy	1867	" ..	" ..	" ..	1st prize.
1090	Ditto	Ditto	Verdöt.....	1865	" ..	" ..	" ..	
1091	David Randall	Glen Para, S.A. ...	Shiraz	1860	" ..	" ..	" ..	
1092	Ditto	Ditto	Shiraz Carbinet	1863	" ..	" ..	" ..	Hon. men.
1093	Sir. W. Macarthur	Camden Park	Shiraz, C.V., Sauvg. ...	1864	" ..	" ..	" ..	Ditto.
1094	Messrs. Kellman	Branxton	Red Hermitage	"	" ..	" ..	" ..	
1095	James Doyle	Kaludah.....	Hermitage	1867	" ..	" ..	" ..	
1096	Ditto	Ditto	Lambruscat.....	"	" ..	" ..	" ..	
1097	R. L. Jenkins	Nepean Towers	Carbinet	1868	" ..	" ..	" ..	

RED WINES, FULL-BODIED.

Class 243.

1st prize, £2; 2nd, \$2.

1098	Archibald Windeyer	Kinross	Hermitage	1866	Red	Full-bodied	Dry	1st prize.
1099	Ditto	Ditto	Burgundy	1865	"	"	"	2nd prize.
1100	Joseph Gillard	Norwood, S.A.	‡ Mataro, ‡ Shiraz	1867	"	"	"	Hon. men.
1101	William Jacob	Morocco, S.A.	Shiraz	1866	"	"	"	1st prize.
1102	Messrs. Wyndham	Dalwood	Hermitage	1866	"	"	"	2nd prize.
1103	Ditto	Bakkulla	Ditto	1867	"	"	"	Ditto
1104	Ditto	Ditto	Ditto	1867	"	"	"	Ditto
1105	R. L. Jenkins	Nepean Towers	Car, Saa, and Bur.	"	"	"	"	Hon. men.
1106	David Randall	Glen Para, S.A.	Carbinet	1861	"	Lt. Port	"	"
1107	Ditto	Ditto	Ditto	1863	"	"	"	"
1108	Ditto	Ditto	Shiraz and Carbinet	1865	"	"	"	"
1109	Ditto	Ditto	Carbinet	1860	"	"	"	"
1110	Ditto	Ditto	Shiraz and Carbinet	1863	"	"	"	"
1111	Thomas Barker	Maryland	Hermitage	1867-8	"	A. liquor	V. full-bodied	"
1112	Sir W. Macarthur	Camden Park	Shiraz, C. V., Sauvg.	1858	"	Nt. light	Full-bodied	"
1113	Joseph B. Holmes	The Wilderness	Red Hermitage	1867	"	Full-bodied	Dry	"

WHITE WINES (DRY).

Class 243a.

1114	R. L. Jenkins	Nepean Towers	Verdelho	1866	White	Dry	Full-bodied	Hon. men.
1115	Sir W. Macarthur	Camden Park	B, R, W, & Muscat	1867	"	"	"	2nd prize.
1116	Ditto	Ditto	White Muscat	1863	"	Sweet	"	"
1117	Ditto	Ditto	Ditto	1852	"	"	"	"
1118	Ditto	Ditto	B, R, & W. Muscat	1851	"	"	"	1st prize.
1119	John Smith	Kyanba	Verdelho	1867	"	"	"	Not in time.

Class 243a.—No entries.

VICTORIAN WINE EXHIBITS.

NOTE.—These Wines not having been sent in time, were submitted to a jury for classification, the result of which is appended.
(See page 227.)

Name of Exhibitor.	Name of Grower.	Locality where grown.	Name of variety or varieties of Grapes.	Age of Wine.	Colour.	Character.
Carl Pohl	Carl Pohl	Emu Creek	Hermitage	1868	Red...	Full-bodied.
Hubert de Castella	Hubert de Castella	Yering, Lillydale	Ditto	1868	"	Light wine.
J. G. Francis	J. G. Francis, Sunbury	Sunbury	Ditto, from 3 years old cut.	1867	"	Full-bodied.
Thos. Meredith	Thos. Meredith	Chewton, Victoria	Hermitage	1867	"	"
J. G. Francis	J. G. Francis	Sunbury	Ditto from 4 years old cut.	1868	"	"
Bruhn, Bros.	Bruhn, Bros.	Emu Creek, Sandhurst	Hermitage, pure	"	"	"
Henry Hudson, Geelong	H. Muhleback, Geelong	Warnambool River	Ditto	1868	"	"
Heine and Graffenhagen	Heine and Graffenhagen	Strathfieldsaye	Ditto	1869	"	"
Ditto	Ditto	Ditto	Ditto	1868	"	"
Ditto	Ditto	Ditto	Ditto	1867	"	"
Weber Bros.	Weber, Bros.	St. James' Vineyard	Ditto	1868	"	"
Abram Gascard	Unknown	Geelong District	Ditto	1867	White	Light.
Ditto	Ditto	Ditto	Ditto	1867	"	"
L. Kitz	Stein and Anker	Berramango, Geelong	Chasselas and Burgundy	1868	W, R.	Igt.-bodied.
Ditto	Ditto	Ditto	Chasselas	1868	White	Light.
Abram Gascard	Unknown	Geelong	Ditto	1870	"	"
R. Moorhead, Sandhurst	Vlaeminck, Bros.	Axe Creek, Bendigo	Ditto	1868	"	Full-bodied.
Henry Hudson, Geelong	Jacob Deppeler, Geelong	Moorabool	Ditto	1868	"	Fl.-b., extra.
Abram Gascard	Unknown	Geelong	Ditto	1866	"	Light.
J. G. Francis, Sunbury	J. G. Francis, Sunbury	Sunbury	Verdelho, from 3 years cut.	1867	"	Full-bodied.
Heine and Graffenhagen	Heine and Graffenhagen	Strathfieldsaye	Verdelho, vines 4 years old	1868	"	"
Ditto	Ditto	Ditto	Verdelho, vines 5 years old	1869	"	"
W. M'Donald	W. M'Donald	North Wangaratta	Mataro, Carignan Greensach, Brown Muscat.	1866	Red...	Liquor.

Ditto	Ditto	Ditto	Brown Muscat	1867	Brwn.	Claret.
J. G. Francis, Sunbury	J. G. Francis	Sunbury	Mataro, 3 years old cuttings	1867	Red	Light.
Aug. Heine, Sandhurst	Augustus Heine	Sandhurst	Mataro	1869	"	Full-bodied.
R. Moorhead, Sandhurst	Julius Kronk	Emu Creek, Bendigo	Ditto	1869	White	Med.-bo'ied.
Ditto	Ditto	Ditto	Madeira	1869	"	"
Abram Gascard	Unknown	Geelong	Rousette	1866	"	Light.
Thomas Meredith	Thomas Meredith	Chewton, Victoria	Reising, Hermitage, Mataro	1867	Red	"
Ditto	Ditto	Ditto	Reising and Gony	1866	White	"
Aug. Heine, Sandhurst	Augustus Heine	Sandhurst	Reising	1869	"	Full-bodied.
R. Moorhead, Sandhurst	Vlaeminck, Brothers	Axe Creek, Bendigo	Verdeilho and Reising	1869	"	Med.-bo'ied.
Ditto	Julius Kronk	Emu Creek, Bendigo	Reising	1869	"	Light wine.
Bruhn, Brothers	Bruhn, Brothers	Emu Creek, Sandhurst	Reising and Pedro Ximenes	1870	"	Full-bodied.
Weber, Brothers	Weber, Brothers	St. James' Vineyard	Reising	1868	Red	Light wine.
L. Kitz	Stain and Anker	Berramango, Geelong	Burgundy	1868	"	Light.
Henry Hudson, Geelong	Charles Giles, Geelong	Geelong	Miller's Burgundy	1868	"	"
Heine and Graffenhagen	Heine and Graffenhagen	Strathfieldsaye	Ditto	1868	"	"
Abram Gascard	Unknown	Geelong	Burgundy	1867	"	"
Ditto	Ditto	Ditto	Ditto	1870	"	"
Heine and Graffenhagen	Heine and Graffenhagen	Strathfieldsaye	Frontignac	1868	White	Sweet.
Thomas Meredith	Thomas Meredith	Chewton, Victoria	Geelong Tokay	1868	"	Light.
Henry Hudson, Geelong	Northcote Knight	Geelong	Princeaux Blanc	1868	"	"
Abram Gascard	Unknown	Ditto	Goucus	1866	"	"
Carl Pohl	Carl Pohl	Emu Creek, Sandhurst	Cabinet Sauvignon	1868	Red	Full-bodied.
R. Moorhead, Sandhurst	Vlaeminck, Brothers	Axe Creek, Bendigo	Carbinet	1869	"	"
Bruhn, Brothers	Bruhn, Brothers	Emu Creek, Sandhurst	Cabinet Sauvignac (pure)	1870	"	"
Heine and Graffenhagen	Heine and Graffenhagen	Strathfieldsaye	Cabinet Souvignac	1869	White	Light.
J. G. Francis	J. G. Francis	Sunbury	Pineau Blanc	1867	"	"
Charles Brache	J. Ford, Wahgunyah	Wahgunyah	Pure Shiraz	1869	Dark	Full-bodied.
T. Schroeder	T. Schroeder	Castlemaine*	Red and white table grapes	1869	White	Med.-bo'ied.
Ditto	Ditto	Ditto	Black cluster	1869	Red	Light.

* This wine was not shown for its general approbation, but as an illustration what proper fermentation and careful treatment of inferior grapes will do.

REPORT of the Wine Jury, who examined the Wines sent from Victoria to the Intercolonial Exhibition of Sydney, 1870.

1. The jury consisted of Sir William Macarthur (chairman), Mr. D. N. Joubert, the Rev. Dr. Bleasdale, Mr. Henry Hall, and Mr. Howard Reed, chairman of the Exhibition Committee, who attended on behalf of the Society.

2. These wines were sent too late to compete for positions and prizes with the produce of New South Wales and the other Colonies which took part in the Exhibition. This circumstance is much to be regretted, since, in all probability, the Victorian samples would have been vastly more numerous and varied, had the stimulus of *competition* been in existence when the collection was made, and the owners of vineyards and the preparers of wine been more directly interested in the result. Not being in a position to compete, they were submitted to a special and careful examination on their respective merits. The collection was one of several made by the Victorian Commissioners in their zeal to cause that Colony to be as adequately as possible, under the circumstances, represented in the first New South Wales Intercolonial Exhibition.

3. The Victorian wine exhibits comprised twenty-four samples of white and twenty-six samples of red wines, with two or three belonging to the class of sweet or liqueur wines. They were, however, by no means an adequate, though certainly a fair specimen of the vinous produce of our sister colony.

In the opinion of the Judges the white wines were, as a class, and even as individual samples, superior to the reds. There was evidence of a knowledge shown in their making and after-treatment, which can be referred only to the practical experience gained by the South German school of vignerons. And the mere names of the makers and exhibitors of these fine wines, especially reising, and the astonishment of vignerons—the chasselas—show they were made either by Germans, or persons who have learned and adopted the German methods. With one exception, a Pineau Blanc, the white wines were all sound, free from acetous change, and mostly either really good now, or promising to ripen into high class wines under proper management. Few of none exhibited any appearance of having been tampered with or fortified with spirit or sugar. That the Tokay—always a peculiar wine—and the Verdeilho—the principal Madeira grape—should not yield their produce in perfection in Victoria, is probably owing in a higher degree to the circumstances of ignorance and neglect of the ascertained successful methods of treating and maturing their musts, than to any deficiency in the ripening capabilities of the climate; or the after considerations of temperature, &c., during the process of fermentation, upon which depend the formation of those ethers which impart to every wine its distinctive bouquet.

Regarding the spirit strength of these white wines, it had a wide range, probably from 18 to 25 per cent. *proof spirit*.

The Judges would particularize one or two of these exhibits. The Sunbury white wines, exhibited by the Hon. J. G. Francis, had each and all a more or less clearly pronounced flavour of muscatel, and also a slightly earthy taste. They were, however, well assured by the Rev. Dr. Bleasdale, who stated he had made special studies of these and a few other wines from the same geological formation, that the muscatel odour and taste would always pass away by or before the fourth year of the wine's age, and then assume a character of the higher order of bouquet; and that while wines made by Sir William Macarthur, of the muscatel variety, changed their taste after ten or more years, these Sunbury wines, the produce of new vineyards, effected their changes in four years.

4. In the opinion of the Judges the best single sample of white wine was that of Vlaeminck, Brothers, of Axe Creek, near Sandhurst, in the Bendigo

district. It was a wine of apparently medium spirit strength, and excellent in all its vinous properties. Immediately after this sample came the wines of Mr. Francis' vineyard, at Sunbury, and those of Heine and Griffenhagen, of Sandhurst, and one of Meredith's, of Chewton, near Castlemaine, all exceedingly sound and good, but each with a character of its own.

5. Much interest and curiosity were felt by the Judges about the specimens of white wine exhibited as sold in Melbourne by retail at 2d. and 4d. per tumbler respectively. Their remarks are of the most complimentary character, and tend largely to encourage the abundant production of these cheap wines, which compare more than favourably with the cheap wines in general consumption in the wine countries of Europe, and promise ere long to supplant the use of beer and spirits in the classes most accustomed to use and abuse those beverages; for experience has long proved that men will drink wine in hot and dry climates in preference to all other beverages, if they can get it abundant, cheap, and good in its kind.

6. Although the Judges had no opportunity of comparing the Victorian with New South Wales and South Australian white wines, and though in their opinion none of those exhibited came up to all the best points of well known New South Wales wines, such as Lindeman's, Wyndham's, Fallon's, or Camden Park choicest brands, yet taking into consideration the vast difference in the prices at which the Victorian samples are vended, the verdict on the whole must be highly favourable. The Victorians seem to aim at rendering theirs a wine-drinking population, and to attain this end two or three things are indispensable,—quantity, fair quality, and cheapness.

A noble painting by a consummate master, a beautiful toy machine, an achievement in some recondite investigation may each in its kind command our highest appreciation; and so also may a rare and happy result like Amontillado sherry call forth unlimited esteem and admiration. Still while giving honour where honour is due, in an exhibition of an industrial and practical character, men look naturally to the success achieved in the establishment of an industry, and its value in the market and among the masses of consumers. No industry affecting the every-day-life of a people can be said to be established in a new country until it supplies in a reasonably cheap and ready form the demands of the bulk of the people.

The cheap and wholesome wines sold in Melbourne at 2d. and 4d. per tumbler all over the city, and even a better class of wines retailed at 1s. per quart bottle, are the outward evidences of the hold which pure wine is taking on the masses in the sister colony. With whom does the hindrance rest that our second and third class wines find no market? Of course, with the high duties levied in all the neighbouring Colonies on even our native wines, it is folly to think of exporting them. Why, however, should the inhabitants of New South Wales—who live in a climate and on a land second to none in the wide world, and with hundreds of thousands of acres of vine-land, suitable for nothing else—be behind California, South Australia, or Victoria, each of which is vastly ahead of this Colony, both in the quantity produced and the facility for disposing of it?

An intelligent writer in the public papers, himself largely interested in the wine industry, only a day or two ago stated that he had to depend *solely* on his *best* wines for remuneration; that he had no means of disposing of the good, but second and third rate qualities; and that these were mostly thrown away! Yet these are the kinds and qualities of wines which form so large a portion of the fluid food of the populations of the wine-producing districts of Europe, and the use of which has ever rendered them the spectacle of sobriety and health so much to be desiderated in the British populations of Australasia.

RED WINES OF VICTORIA.

1. These comprised several kinds, the produce of grapes of very dissimilar character, conspicuous among which were the Black Cluster, Mataro, Carbinet Sauvignon, Hermitage, Burgundy, and mixtures of several of these varieties; in all 26 samples. These wines were grown and made in climates varying from each other as widely as those of the Rhine and Moselle do from the South of Spain or Portugal.

2. Generally speaking, each and all were quite sound, and giving promise of improving under judicious treatment. The younger wines are of course more likely to improve. It was remarked by the Judges that the most part of the Victorian red wines showed a want of thorough knowledge on the part of the makers and tasters. They consider that the superiority in red wines generally conceded to New South Wales, is owing in no small degree to the fact of the methods commonly adopted in the central and western departments of France having been early introduced and almost universally used, both as to the maturity of the fruit, the mode of crushing and fermenting, and the after management in the cellar.

3. The most remarkable of the Victorian red wines were those of Weber Brothers of the Geelong District, for strong full-bodied qualities; and those of Mr. J. G. Francis, grown at Sunbury. These wines showed altogether a different style of preparation and treatment from the rest of the reds. They were plainly the pure natural product of ripe grapes without a suspicion of being fortified or sweetened; of fine general qualities, moderate spirit strength, with great capabilities for maturing still further and improving in their best vinous properties. The Judges particularized these exhibits because in many points so different from all others.

4. Next, in opinion of the Judges, came the wines of the Sandhurst District (known also as Bendigo), on the north of the Dividing Range. Viewed as a class, their characteristics may be briefly summed up as fulness of body, depth of colour, high spirit strength, smoothness of taste, and very moderate bouquet, but quite agreeable as far as it is developed.

5. Considered as a separate class, the exhibits from Castlemaine also were curious and interesting, because they had been produced in an intermediate climate, between the austere Geelong and Yering Hills on one side, and the hot plains of Bendigo on the other; and on a soil not greatly differing from that of the greater part of the county of Cumberland. As might have been expected, they were firm, well-flavoured wines, and of medium strength. From Meredith's vineyard the Judges had two of the few blended wines that commended themselves to the judgment of the wine jury. The jury would once more express their regret that these interesting products were unavoidably too late to enter into competition with the produce of New South Wales and South Australia.

The following will convey in general terms the views briefly jotted down as the examination proceeded in both the white and red varieties.

WM. MACARTHUR, KNT.,
(Chairman of Wine Jury.)

D. N. JOUBERT.

JOHN J. BLEASDALE, M.D.

HENRY HALL.

HOWARD REED.

WHITE WINES OF VICTORIA.

- No. 1. Reising and Pedro Ximenes, 1870. Clear, very sweet, and fermenting; not yet ready for use. Exhibited by Bruhn, Brothers, of Emu Creek, Sandhurst.
2. Reising, 1869. Clear, good condition, fair bouquet, nice flavoured wine. Exhibited by August Heine, of Sheepwash Creek, Bendigo.
3. Muscat, of Alexandria, and ten other kinds of grapes mixed, 1869. In good condition, bright colour, but deficient in bouquet and flavour. Exhibited by E. Schroeder, of Castlemaine.
4. Sparkling Reising, 1869. Bright colour, very sparkling, good flavour, but rather too sweet; promises to become an excellent wine, of the Bucellas character. Exhibited by Mr. Julius Kronk, of Emu Creek, Sandhurst.
5. Mixed grapes, 1869. Fair, strong wine, in good condition, but not much flavour. Exhibited by J. Davies, of Moonee Ponds, 4 miles from Melbourne.
6. Sandhurst Verdelho, 1869. Clear, deep sherry colour, a strong wine, rather sweet yet, and too new for use. Exhibited by Heine and Graffenhagen, of Strathfieldsaye, Sandhurst.
7. Tokay, 1868. Colour and condition good, a sound dry wine, deficient in flavour. Exhibited by Thomas Meredith, of Chewton, Castlemaine.
8. Chasselas, 1868. Bright colour, good condition, slight taste of the grape seed. Exhibited by Jacob Duppeler, of Moorabool, Geelong.
9. Pineau, Blanc, 1868. Bright colour, very clear, but sour. Exhibited by Northcote Knight, of Sutherland's Creek, Steiglitz.
10. Chasselas, 1868. Bright colour, good condition, a fair sound wine, sold in Melbourne at *twopence* per tumbler. Exhibited by Stamin and Ankor, of Barrabool Hills, Geelong.
11. Bendigo Reising, 1868. Clear bright colour, in very good order, a powerful fine-flavoured wine. Exhibited by Weber, Brothers, of Leigh Road, Geelong.
12. Sandhurst Chasselas, 1868. A very good light wine, in first-rate condition, a wholesome daily drink, retailed in Melbourne at *fourpence* per tumbler. Exhibited by A. Gascard, of Melbourne.
13. Sandhurst Verdelho, 1868. Very good condition, bright colour, nice nutty flavour, not so sweet as No. 6; from the same cellar. Exhibited by Heine and Graffenhagen, of Strathfieldsaye, Sandhurst.
14. Frontignac, 1868. Bright colour, with nice bouquet, dry flavour (no sweetness perceptible). Exhibited by Heine and Graffenhagen, of Strathfieldsaye, Sandhurst.
15. Gascard's No. 2, 1868. Retailed in Melbourne at *fourpence* per tumbler, a nice light wine, with agreeable flavour, and in first-rate condition. Exhibited by Mr. Gascard, of Bourke-street, Melbourne.
16. Pineau Blanc, 1867. Bright colour, good condition, with a peculiar muscat and earthy flavour.
17. Verdelho, 1867. Clear colour, good condition, a fine strong wine, with the same peculiar flavour as No. 16. This is attributed to the soil, and is said to pass away completely after the wine has been kept four years. Exhibited by Hon. J. G. Francis, of Sunbury.
18. Brown Muscat, 1867. Sherry colour, bright, strong muscat bouquet; very sweet taste. Exhibited by W. M'Donald, of Wangaratta.
19. Vlaeminck Brothers, 1869. Fine bright colour, nice bouquet, very good taste, clean on the palate, and excellent wine. *The best* in the opinion of the Judges. Exhibited by Mr. Moorhead for Vlaeminck Brothers, of Axe Creek, near Sandhurst.
20. Kronk's Reising, 1869. (First bottle in bad order—a bad cork.) Second—bright colour, nice bouquet, sound, pleasant to the taste. Exhibited by Mr. Moorhead for J. Kronk, of Emu Creek, Sandhurst.

21. Chasselas, 1870. A good cheap wine. Exhibited by A. Gascard, of Bourke-street, Melbourne.
22. Chasselas, 1868. Fine sound wine. Made by Vlaeminck Brothers, of Emu Creek, Sandhurst.
23. Roussette, 1866. A good agreeable wine. Exhibited by A. Gascard, of Bourke-street, Melbourne.
24. Reisling and Gouais, 1866. Very bright and clear, nice bouquet, a very good wine. Exhibited by Thomas Meredith, of Chewton, Castlemaine.

VICTORIAN RED WINES.

1. Carbinet Sauvignon, 1870. Fine deep colour, strong bouquet, rather rough taste. Exhibited by A. Gascard, of Bourke-street, Melbourne.
2. Castlemaine Black Cluster, 1869. Fine deep colour, a strong wine, but rather new for tasting. Exhibited by T. Schroeder, of Castlemaine.
3. Mataro, 1869. Light claret colour, not much bouquet, or flavour. Exhibited by August Heine, of Sandhurst.
4. Mataro, 1869. Very deep colour, no bouquet, very sweet. Exhibited by R. Moorhead, of Sandhurst.
5. Hermitage, 1869. Fine rich colour, nice bouquet, clean on the palate, not rough. Exhibited by Heine and Graffenhagen, of Strathfieldsaye.
6. Sandhurst Burgundy, 1869. Light colour, clear, slightly burnt bouquet, nice flavoured wine. Exhibited by Heine and Graffenhagen, of Strathfieldsaye.
7. Carbinet and Hermitage. Slight bouquet, pleasant sound flavour. Exhibited by Carl Pohl, of Emu Creek, Sandhurst.
8. Geelong Burgundy, 1868. Bright colour, little bouquet, and deficient in flavour, but quite sound and clean. Exhibited by Charles Giles, Sutherland's Creek, near Steiglitz.
9. Geelong Hermitage, 1868. Nice light colour, good bouquet, fruity, middling flavour, a very fair sample of useful wine. Grown by H. Muhleback, Glendarriwell, Moorabool.
10. Burgundy, 1868. Retailed at 2d. per tumbler, very light colour, no bouquet, indifferent taste, but a sound wine, ripe and wholesome. Grown by Stamin and Ankor, Barrapool Hills, Geelong.
11. Shiraz and Mataro, 1868. Fine bright colour, slight bouquet, rather unpleasant after taste; wants care and keeping. Exhibited by J. Davies, Moonee Ponds, near Melbourne.
12. Yering Hermitage, 1868. Fine deep colour, not very much bouquet, earthy and nutty flavour. Exhibited by H. de Castilla, of Yering.
13. Hermitage, 1868. Fine deep colour, excellent bouquet, nice rich taste; soft and clean on the palate. Exhibited by Hon. J. G. Francis, of Sunbury.
14. Hermitage, 1867. Fine deep clear colour, very good bouquet, nice rich taste, quite clean on the palate; considered the best red wine shown. Exhibited by the Hon. J. G. Francis, of Sunbury, 25 miles from Melbourne.
15. Mataro, 1867. Light, bright colour, nice bouquet, deficient in taste, very clean. Exhibited by the Hon. J. G. Francis, of Sunbury.
16. Liqueur Wine, 1866, made from mixed grapes. Light tawny colour, burnt bouquet, sweet, and strong taste. Grown by W. McDonald, of North Wangaratta.
17. Hermitage, 1867. Deep colour, not much bouquet, rough taste, sound wine. Exhibited by Heine and Graffenhagen, of Strathfieldsaye.
18. Castlemaine Hermitage and Mataro, 1867. Light, bright colour, nice bouquet, very good taste; a wine highly admired by the Judges. Exhibited by Thomas Meredith, of Chewton.
19. Hermitage, 1867. Deep colour, nice bouquet, sweet and rough taste. Exhibited by Thomas Meredith, of Chewton.

20. Black Cluster, 1869. An agreeable thin wine, bouquet fair, clean on palate. Exhibited by E. Schroeder, of Castlemaine.

21. Pure Shiraz, 1869. Deep colour, strong, fine wine; wants keeping to develop full bouquet. Exhibited by Charles Brache, of Melbourne. Grown by E. Ford, of Wahgunyah.

22. Hermitage, 1868. Rich deep colour, fine bouquet, plenty of body, rather rough but pleasant taste; a really good wine. Exhibited by Weber Brothers, of Leigh Road, near Geelong.

23, 24, 25, 26. Two Hermitage and two of Burgundy. Exhibited by Mr. A. Gascard, of Melbourne. These were examined with much interest, as being the wines sold retail at very moderate prices, forming an idea of the growing taste for pure wine in Melbourne. Such wines as these are also heated in cold weather, and slightly spiced and sweetened, and are great favourites with the humbler classes of artisans and labourers.

SECTION XVI.—SUGARS.

Stewards:

M. HALL,

T. PEATE.

Judges:

Q. DELOITTE,

CHAS. LAMB.

H. P. PALSER.

Class 244.—Sugar from Cane not less than 28 lbs.

1st prize, £10; 2nd, £5; 3rd, £2 10s.

No.	Name and Address of Exhibitor.	Acres planted.	Variety of Cane.	Where made.	Tons per acre.	Price. £ s. d.
1120	Joseph Marshall, Paddington	65	Tahitian, Bourbon, Ribbon	Lake Maquarie	2	.....
1121	Isaac Peck, Waterloo .....	..	.....	Port Maquarie .....	..	.....
1122	Hon. L. Hope, Cleveland Bay .....	..	.....	.....	..	152 0 0
1123	Tooth & Cran, Yengarie, Maryborough	10	Ribbon	Yengarie, Maryborough	1½	37 10 0
1124	Ditto ditto	130	Bourbon	Ditto	1½	40 0 0
1125	Ditto ditto	130	Ditto	Ditto	1½	42 0 0
1126	*John Sharpe, Richmond River Heads	10½	Violet Ribbon	Prospect Sugarworks	3	38 0 0
1127	Joseph Marshall, Paddington .....	..	.....	Lake Maquarie .....	..	.....
1127A	Francis Longworth, Ghinni Ghinni	30	Bourbon, Ribbon, Yellow and Black.	.....	..	.....

* This sample made from the Violet variety, boiled in open pans, and dried with the centrifugal machine.

† Unrefined, £30; refined, £36 to £52.

AWARDS:—No. 1121; 1st prize.
1124; 2nd prize.

Class 245.—Sugar, from Imphee, not less than 28 lbs.—No entries.

Class 246.—Sugar from Planters' Friend or Sorghum, not less than 28 lbs.

1st prize, £10; 2nd, £5; 3rd, £2 10s.

1128	Edward Holland, Liverpool	1½	Planter's Friend	Campbelltown	1½	30 0 0
1129	*R. G. Yeomans, W. Maitland	...	Ditto	W. Maitland	...	36 0 0
1130	J. Dean, Maitland	...	.....	.....	...	.....

* This exhibit is from the manufactory.

AWARDS :—No. 1128; 1st prize.
1129; 2nd prize.

Class 247.—Sugar from Beet, not less than 28lbs.

1st prize, £10; 2nd, £5; 3rd, £2 10s.

1131	*J. F. Clements, Summerhill, Bathurst	None	White Silesian	Summerhill	1½	46 0 0
1132	Hon. L. Hope, Cleveland, Esy	1	.....	.....	...	.....
1133	Enoch W. Rudder, E. Kempsey	1	New Caledonian, Tahitian, Fiji, Java, Mauritius.	.....	...	.....

* Want of proper machinery prevented a fair season's work. Roots yielded from 6" to 14" Beaume.

AWARD :—No. 1131; 1st prize.

Highly commended.

Class 248.—Sugar-canes (named), collection, six each.

AWARD :—E. W. Rudder, Kempsey; 1st prize.

Class 249.—Imphee, &c.—Collection, six each.—No entries.

Class 250.—Sugar Beet Roots, six.—No entries.

SECTION XVII.—FARM PRODUCE.

Stewards:

J. K. CHISHOLM, | H. BRAY.

Judges:

J. WILSON, | J. YEOMANS,
S. PRIESTLY.

Class 251.—Wheat, White, one bushel.

1st prize, £5; 2nd, £3; 3rd, £1 10s.

- 1134 Alfred Cobofoft, Charlton, Singleton.
 1135 Samuel Irving, Orange; the Orange Prolific.
 1136 Samuel and W. S. Sweetman, Dennis' Island, near Bathurst. The wheat is known as the white plum, and grows best on hilly, stiff ground; not so well on flat or sandy soils. It is a spring wheat; best time for sowing in this district is about June. The yield last harvest was about 30 bushels per acre.
 1137 Beilby & Scott, Pitt-street. White Wheat. Varieties: Adelaide, Port Macdonnell, Victorian, Tasmanian, New Zealand, New South Wales; do. Northern; do. Egyptian; do. Spring, Western, Southern.
 1138 Thomas Brunton & Co., Australian Mills, Melbourne. White Tuscan Wheat, grown in Victoria; value, 10s. per bushel of 60 lbs.
 1139 Nelson Brothers, Orange.
 1140 Goodsir Fowler, Porcupine Ridge, Glenlyon, Victoria.
 1141 Donald McAndrew, Geelong.

AWARDS:—No. 1140; 1st prize.

1136; 2nd prize.

1137; commended as a collection of white wheats.

NON-COMPETITIVE.

- 1142 Dalton Brothers, Orange. Marked B and C; grown 5 miles from Orange; average, 30 bushels to acre.

AWARD:—No. 1142; highly commended.

Class 252.—Wheat, Red, one bushel.

1st prize, £5; 2nd, £3; 3rd, £1 10s.

- 1143 Alfred Cobofoft, Charlton, Singleton.
 1144 John Frame, Burnbank, Mount Barker. This wheat was raised from purple straw and tuscan, by me, last year; crop yielded 30 bushels to the acre.
 1145 Beilby & Scott, Pitt-street. Red wheat.
 1146 Goodsir Fowler, Porcupine Ridge, Glenlyon, Victoria.
 1147 Donald McAndrew, Geelong.

AWARD:—No. 1145; 1st prize.

NON-COMPETITIVE.

1148 Dalton Brothers, Orange. Grown in the district of Orange; 40 bushels to the acre.

AWARD :—No. 1148; highly commended.

Class 253.—Maize, Large Yellow or Flint, one bushel.

1st prize, £3; 2nd, £1 10s.

1149 W. Timmins, Richmond.

1150 Sir W. Macarthur, Camden Park.

1150A John Hannabus, jun., Windsor.

AWARDS :—No. 1150; 1st prize.
1149; 2nd prize.

Class 254.—Maize, Smaller Yellow or Flint, one bushel.

1st prize, £3; 2nd, £1 10s.

1151 Sir W. Macarthur, Camden Park.

1152 Donald Robertson, Windsor.

AWARDS :—No. 1151; 1st prize.
1152; commended.

Class 255.—Maize, earliest, one bushel.

1st prize, £2; 2nd, £1.

1153 Sir W. Macarthur, Camden Park.

AWARD :—No. 1153; 1st prize.

JURORS' OPINION.—No competition; very clean, even, and heavy exhibit.

Class 256.—Maize, White (Soft), one bushel.—No entries.

Class 257.—Barley, Malting, one bushel.

1st prize, £3; 2nd, £1 10s.

1154 John Booth, Prospect.

1155 Gregory & Thompson, Sandridge, Victoria.

AWARD :—No. 1154; 1st prize.

JURORS' OPINION.—Good heavy grain, unequal in colour, and rather uneven.

Class 258.—Barley, Cape, one bushel.

1st prize, £2; 2nd, £1.

1156 John Booth, Prospect.

AWARD :—No. 1156; 1st prize.

Class 259.—Rye, one bushel.*1st prize, £2 ; 2nd, £1.*

1157 Sir W. Macarthur, Camden Park.

1158 John Booth, Prospect.

AWARD :—No. 1157 ; highly commended ; purity, evenness, and colour deficient.

Class 260.—Oats, one bushel.*1st prize, £2 ; 2nd, £1.*

1159 John Booth, Prospect.

1160 Donald McAndrew, Geelong.

AWARDS :—No. 1160 ; 1st prize.
1159 ; 2nd prize.**Class 261.—Peas, one bushel.—No entry.****Class 262.—Horse Beans, one bushel.—No entry.****Class 263.—Sorghum, in grain, and in heads of twelve.***1st prize, £2 ; 2nd, £1.*

1161 Sir W. Macarthur, Camden Park.

1162 Hugh Colley, Kiama.

AWARD :—No. 1161 ; 1st prize.

JUROBS' OPINION.—Even, clean, and well got up.

**Class 263A.—General collection of all sorts of Farm Produce.—
No entries.****Class 264.—Imphee, in grain, and in heads of twelve.***1st prize, £2 ; 2nd, £1.*

1163 Sir W. Macarthur, Camden Park.

AWARD :—No. 1163 ; 1st prize.

Class 265.—Broom Millet, in grain, and in heads of twelve.*1st prize, £2 ; 2nd, £1.*

1164 Sir W. Macarthur, Camden Park.

AWARD :—No. 1164 ; 1st prize.

JUROBS' OPINION.—Great excellence.

**Class 266.—Grass Seeds, collection in bags of 10 lbs. each.—
No entries.**

**Class 267.—Farm Seeds, collection in bags of 10 lbs. each.—
No entries.**

Class 268.—Complete collection of Agricultural Produce.

1st prize, £10 ; 2nd, £5.

The exhibits in this section to be judged by the excellence in their qualities, taken in the order as herein specified :—Purity of sample, weight, size, plumpness, evenness, color.

1165 Sir W. Macarthur, Camden Park.

AWARD :—No. 1165 ; 1st prize.

JUDGES' OPINION.—The Judges feel bound to report upon this as a collection, and not enter upon the merits of the separate exhibits. They cannot too highly commend the general excellence of the varieties, and they would request the exhibitor to furnish the Society with particulars as to cultivation, yield, use, and value of each article, as a most valuable record of a complete assortment of agricultural products. The remark may be permitted that purity, evenness, and colour were shown in every variety to a marked degree.

Class 269.—Roots and Hay.

Swedes, collection not less than six each variety.

Roots to be judged in accordance with their excellence in the following points, in the order stated, viz. :—Perfection of form, including, in respect to the first four sorts named, fineness of neck and of tap roots, as well as fineness and smoothness of skin, solidity, weight, size. Such roots as an experienced judge would select as the most true and perfect for producing seed, rather than the greatest size, to be preferred.

1st prize, £3 ; 2nd, £2 ; 3rd, £1.

1166 B. Clayton, Rockwood, Appin. Drilled in well-cultivated land, 2 ft. 6 in. between drills, and 12 in. between the plants, with 1 ton bone-dust per acre ; yield, 8 tons per acre ; value, £4 10s. per ton.

AWARD :—No. 1166 ; 1st prize.

Class 270.—Mangolds, collection, not less than six each variety.

1st prize, £3 ; 2nd, £2 ; 3rd, £1.

1167 Walter Lamb, Greystanes, Prospect. This mangold was sown about September, and was fit to pull in March ; in May I put in another crop, which appears flourishing ; therefore two crops may be annually obtained ; the yield (each crop) I estimate at 20 to 30 tons per acre. The value for feeding almost any description of stock cannot be over-estimated, and yet how greatly is this valuable root neglected ? I am using my mangold chiefly for pigs, mixed with pollard or rice sweepings ; a copper full (100 gallons) feeds about 100 pigs.

AWARD :—No. 1167 ; 1st prize.

JUDGES' OPINION.—Only entry, mixed kinds, fair quality and weight, well-grown. The yellow variety shows most keeping qualities.

Class 271.—Carrots, field.*1st prize, £2 ; 2nd, £1.*

1168 Sir W. Macarthur, Camden Park.

AWARD :—No. 1168 ; 1st prize.

JURORS' OPINION.—Very excellent in growth, size, evenness, and weight.

Class 272.—Parsnips.—No entries.**Class 273.—Potatoes, collection, not less than 14 lbs. each variety.***1st prize, £3 ; 2nd, £2.*

1169 Joseph Cole, Sittingbourne, Kangaloon.

1170 Charles Bradman, Mittagong, Nattai. Present value at Mittagong £3 10s. per ton.

AWARD :—No. 1169 ; 1st prize.

JURORS' OPINION.—The Judges consider the quantities shown too small to form any opinion as to crop and yield.

**Class 274.—Feed Pumpkins, collection not less than two each.—
No entries.****Class 275.—Hay, two bales, each 112 lbs.**

[The duplicate trusses of hay to be opened for examination, and none to be considered worthy of award unless in its colour and condition there be evidence of having undergone ample fermentation in stack ; no mere fineness of growth, in the absence of this essential condition, to compensate for defective manufacture.]

1st prize, £2 ; 2nd, £1.

1171 John Moore, Greenwood, Singleton.

AWARD :—No. 1171 ; commended.

JURORS' OPINION.—The Judges fail to see that the entry in this class comes up to the conditions. It shows no fermentation. For quality, fineness of growth, and pressing, it is commended.

Class 276.—Lucerne, two bales, each not less than 112 lbs.*1st prize, £2 ; 2nd, £1.*

1172 A. Town, Richmond.

1173 Sloper Cox, Hobartville. Cultivation, cannot be too particular ; 4 tons per acre per annum, if season is favourable ; use, horse or cattle feed ; value at present time, from £4 10s. to £5 10s.

1174 John Moore, Greenwood, Singleton.

AWARDS :—No. 1174 ; 1st prize.

1173 ; 2nd prize.

Class 277.—Hay, Oaten, two bales, each not less than 112 lbs.*1st prize, £2 ; 2nd, £1.*

- 1175 Michael Kinchela. Was grown by me at Prospect; the yield was about 26 cwt. per acre, and is out of a stock of about 25 tons.

Class 278.—Hay, Wheaten.*1st prize, £2 ; 2nd, £1.*

- 1176 A. Town, Richmond.

AWARD :—No. 1176 ; 1st prize.

JURORS' OPINION.—The quality of this exhibit entitles it to a prize, although without competition.

Class 279.—Rye Grass, or other cultivated Grass.*1st prize, £2 ; 2nd, £1.*

- 1177 John Moore, Singleton.

AWARD :—No. 1177 ; commended.

JURORS' OPINION.—For growth and pressing no prize awarded, as not coming within the conditions of the exhibitions of hay.

Class 280.—Tobacco, in leaf, not less than 28 lbs.—No entries.

DAIRY AND OTHER PRODUCE.

Class 281.—Butter (fresh), not less than 6 lbs.*1st prize, £2 ; 2nd, £1.*

- 1178 Q. C. & R. Farrant, Tottenham Park, South Creek.
 1179 J. K. Lethbridge, Penrith.
 1180 Henry Thompson, Camden.
 1181 James Campbell, Wingecarribee.
 1182 M. E. Robson, Kiama.
 1183 Charles Bradman, Mittagong, Nattai. Each cow yields at present season 8lbs. per week, and its value 10d. per lb. at Mittagong.
 1184 T. G. Lane, Bathurst.
 1185 Sir W. Macarthur, Camden Park.
 1185A George Oakes, Quirang.

AWARDS :—No. 1185 ; 1st prize.
 1180 ; 2nd prize.
 1179 ; highly commended.

Class 282.—Butter (Salt), one keg.*1st prize, £2 ; 2nd, £1.*

- 1186 Q. C. & R. Farrant, Tottenham Park, South Creek.
 1187 John Elliott, Longbrush, Kiama.
 1188 M. E. Robson, Kiama.
 1189 Hugh Colley, Kiama.
 1190 William Colley, Kiama.
 1190A Stephen Knapp, Ulladulla.

- 1191 William Walter Ewin, Woodstock, Ulladulla.
 1192 Thomas Brook, Milton, Ulladulla.
 1193 William Foulk, Woodburn, Ulladulla.
 1194 W. R. Hindmarsh, Milton, Ulladulla.
 1195 David Warden, Ulladulla.
 1195A Alex. Bovard, Dapto.

AWARDS :—No. 1186; 1st prize.
 1188; 2nd prize.

Class 283.—Cheese.

1st prize, £2; 2nd, £1.

- 1196 C. T. Bagot, Armidale.
 1197 A. Fleming, Greenwell Point, Shoalhaven.
 1198 James Moore, The Oaks.
 1199 R. L. Tooth, Kent Brewery.
 1200 Q. C. & R. Farrant, Tottenham Park, South Creek.
 1201 John Shearwin, Bodalla Stores, Sydney.
 1202 James Timmins, Oaks, Picton.
 1203 George Blacker, Black Range, Bega.
 1204 Edward Collins, Bellarine East, Victoria.
 1204A A. Holden, senr., Paterson River.

AWARDS :—No. 1201; 1st prize.
 1204; 2nd prize.
 1200; commended.

Class 284.—Hams (two).

1st prize, £2; 2nd, £1.

- 1205 A. Town, Richmond.
 1206 Sloper Cox, Hobartville. Corn-fed; yield good, twelve months' old pig weighing from 170 to 190 lbs. for sale or home use; value as pork, 4d. to 5d.; hams, 1s. and upwards.
 1207 John Shearwin, Bodalla Stores, Sydney.
 1208 Matthew A. Munn, Merimbula.
 1208A William Redman, Burwood.
 1209 W. Weir, 226, Pitt-street.
 1210 Sir W. Macarthur, Camden Park.
 1211 Edward Ham, Singleton.
 1212 P. Harper, Paddington.
 1213 Watson & Paterson, Melbourne. Value, 1s. 2d. per lb.
 1214 Allan & Wood, Warragubra, Bega.
 1215 S. Henderson, 100, Victoria-street W., Melbourne.

AWARDS :—No. 1213; 1st prize.
 1207; 2nd prize.
 1214; highly commended.
 1208; commended.

Class 285.—Bacon, two sides.

1st prize, £2; 2nd, £1.

- 1216 John Shearwin, Bodalla Stores, Sydney.
 1217 P. Harper, Paddington.
 1218 Edward Ham, Singleton.
 1219 W. Weir, 226, Pitt-street.

- 1220 Sloper Cox, Hobartville. Corn-fed; for sale or house use; value, 1s. and upwards.
 1221 A. Town, Richmond.
 1222 Ditto ditto.
 1223 Henry Thompson, Camden.
 1224 Sir W. Macarthur, Camden.
 1225 Matthew A. Munn, Merimbula.
 1226 William Redman, Burwood.
 1227 Watson & Paterson, Melbourne. Value, 10d. per lb.
 1228 Allan & Wood, Warragubra, Bega.
 1229 S. Henderson, 100, Victoria-street West, Melbourne.

AWARDS:—No. 1227; 1st prize.
 1216; 2nd prize.
 1229; highly commended.
 1223; commended.

Class 286.—Hops.—No entry.

OIL.

Class 287.—Olive, six bottles.

1st prize, £2; 2nd, £1.

- 1230 Sir William Macarthur, Camden Park.

AWARD:—No. 1230; 1st prize.

Class 288.—Oils (Vegetable, except Olive) collection.—No entry.

Class 289.—Collection Cereals.

Prize, Bronze Medal.

- 1231 Law, Somner, & Co., 258 and 260, Pitt-street. Including skinless oats, potato oats, Tartarian oats, Tartarian oats (black), Cape barley, English barley, skinless barely, rye, spelt wheat.
 1232 E. & W. Halkitt, 73, Rundle-street, Adelaide. Two bushels of wheat, one ditto peas, one ditto linseed, marked E. and W. H.

AWARD:—No. 1231; 1st prize, for number, quality, and value of exhibits.

Class 290.—Collection Grass Seeds.

Prize, Bronze Medal.

- 1233 Law, Somner, & Co. Including rye grass, perennial, and Italian, prairie grass, cocksfoot, couch grass, crested dogtail, wood-meadow grass, smooth-meadow grass, rough-meadow grass, Fescue red, ditto sheep's tail oat, ditto meadow, yellow, ditto hard sweet vernal, ditto Darnal spiked, ditto Timothy, meadow Foxtail, ginned grass.

AWARD:—No. 1233; bronze medal.

Class 291.—Collection, Farm Seeds.

Prize, Bronze Medal.

- 1234 Law, Somner, & Co., Pitt-street. Including tick beans, buck wheat, grey, blue, and white peas, carrot, white, Belgian, and Altringham, Chicory, sheep's parsley, rape, sorghum, imphee, planter's friend, broom millet, tares (golden); grey tobacco seed—Virginia, Havannah, Connecticut; turnip sorts; maize sorts; clovers—white, red; cow grass and alsyke; lucerne—Colonial and English; mangold wurzel sorts.

1235 C. F. Crosswell, Murray-street, Hobart Town, and Swanston-street, Melbourne.

AWARDS:—No. 1235; bronze medal.
1234; highly commended.

Class 292.—Collection, Roots.
Prize, Bronze Medal.

1236 George Bowen, Bowenmount.

1237 Joseph Cole, Sittingbourne, Kangaloon.

AWARD:—1237; commended.

Not Specified.

1238 Alfred Cobcroft, Singleton. Skinless barley.

1239 B. Clayton, Rockwood, Appin. One bushel canary seed; cultivation as for cereals, yield 16 bushels of 60lbs. per acre, used for feeding aviary and other birds; value, 15s. per bushel wholesale.

Collection of cereals from Tasmania—(non-competitive and unclassified.)
Highly commended.

AWARD:—No. 1239; highly commended.

REPORT.

WE regret to notice the want of concentration of the exhibits in this Section, and the arrangements made seem totally inadequate to the importance of the Section. Many exhibits scattered here and there bear no tickets, and many entries are absent according to the numeration. We have dealt solely with the numbered exhibits, as we believed they only came within the sphere of competition.

In awarding prizes we have given numbers for the points only in competition; values are attached in the award-paper. In roots we regret to say there was no competition to warrant values of points being given.

We consider the maximum of value attachable to each point should be settled by the Society, and placed on each column; and for the purpose of receiving more notice as a Section, and to guide the Judges in deciding, we think the quantities should be increased as more likely to represent bulk.

In future award-papers we are opinion that the description, age, time of growth, soil, yield, &c., should be filled in so as to ensure a full knowledge of these particulars as bearing upon each exhibit; we have had no data of this sort to guide us and may have erred in consequence.

By so doing, another objection would be obviated—that of carrying catalogues naming exhibitors, which renders the task doubly invidious.

If it were possible, the Judges would submit the advisability of all exhibits pertaining to agricultural production being placed in one *annexe* of the building, whether they be competitive or not.

We are strongly of opinion that this Section ought to be, and would be better represented, if sufficient importance were attached to it.

We have done our best with the classes as we found them, and only regret the absence of competition in so many.

JAMES WILSON.
JOHN YEOMANS.
SAML. J. PRIESTLY.

AGRICULTURAL.

SECTION XVIII.—HORTICULTURAL, viz. :—VEGETABLES, FRUITS, AND FLOWERS.

(Ex. P. G., means Exhibitors employing Professional Gardeners.)

PART I.—POT PLANTS IN FLOWER.

Class 294.—Twelve Miscellaneous Plants of distinct Species.—Nurserymen.*1st prize, £3 ; 2nd, £1 10s.*

2305 John Baptist & Son, "The Gardens," Sydney. Twelve miscellaneous plants of distinct varieties.

2306 Hon. S. D. Gordon, Glenyarrah.

AWARD :—No. 2305 ; 1st prize.

Class 295.—Twelve Miscellaneous Plants of distinct Species. (Exhibitors employing Professional Gardeners.)*1st prize, £3 ; 2nd, £1 10s.*

2307 Joseph Thompson, Esq., Potts' Point.

AWARD :—1st prize.

Class 296.—Six Miscellaneous Plants of Distinct Species.—(Amateurs).—No entry.**Class 297.—Single Specimen Plants (Nurserymen and Exhibitors employing Gardeners.)***1st prize, 10s. ; 2nd, 5s.*

2308 John Baptist & Son, "The Gardens," single specimen plants.

AWARD :—2nd prize.

Class 298.—Single Specimen Plants.—(Amateurs).—No entry.**Class 299.—New Plant, shown for the first time in flower (open to all):***1st prize, £1 ; 2nd, 10s.*

2309 John Baptist & Son, "The Gardens," Sydney.

2310 C. Henderson, Newtown.

AWARD :—No. 2310 ; 1st prize.

Class 300.—Four Orchids, distinct, open.—No entry.

Class 301.—Three Orchids, open.—No entry.

Class 302.—Single Specimen, Orchid, open.—No entry.

Class 303.—Six Camellias, open.

1st prize, £1 10s. ; 2nd, 15s.

2311 John Baptist & Son, "The Gardens," Sydney.

AWARD :—1st prize.

Class 304.—Six Azaleas, distinct (Nurserymen.)

1st prize, £1 10s. ; 2nd, 15s.

2312 John Baptist & Son, "The Gardens," Sydney.

AWARD :—1st prize.

Class 305.—Six Azaleas, distinct (exhibitors employing Gardeners.)

1st prize, £1 10s. ; 2nd, 15s.

2313 John Baptist & Son, "The Gardens," Sydney.

Class 306.—Three Azaleas, distinct (Amateurs).—No entry.

Class 307.—Single Specimen, Azalea, open.

1st prize, 10s. ; 2nd, 5s.

2314 John Baptist & Son, "The Gardens," Sydney.

AWARD :—1st prize.

Class 308.—Rhododendrons, distinct (Nurserymen and exhibitors employing Gardeners).—No entry.

Class 309.—Three Rhododendrons, distinct (Amateurs).—No entry.

Class 310.—Single Specimen, open.—No entry.

Class 311.—Three Ericas, distinct, open.—No entry.

Class 312.—Six Roses, distinct, open.—No entry.

Class 313.—Six Show or Spotted Pelargoniums, distinct, open.—No entry.

- Class 314.**—Six Show or Spotted Pelargoniums, distinct, open.—
No entry.
- Class 315.**—Three ditto, ditto, ditto.—No entry.
- Class 316.**—Six Fancy Pelargoniums, open.—No entry.
- Class 317.**—Three ditto, ditto (Amateurs).—No entry.
- Class 318.**—Six Zonale Pelargoniums, distinct, open.—No entry.
- Class 319.**—Four ditto, ditto, ditto, open.—No entry.
- Class 320.**—Three ditto, ditto (Amateurs).—No entry.
- Class 321.**—Six Variegated Foliaged Pelargoniums (Nurserymen
and Ex. P. G.)—No entry.
- Class 322.**—Three Variegated Foliaged Pelargoniums (Amateurs).
—No entry.
- Class 323.**—Three double Pelargoniums, open.—No entry.
- Class 324.**—Best collection of distinct species of Geraniums, open.
—No entry.
- Class 325.**—Eight Fuchsias, distinct (Nurserymen and Ex. P. G.)—
No entry.
- Class 326.**—Four ditto, ditto (Amateurs).—No entry.
- Class 327.**—Six Herbaceous Calceolarias (Nurserymen and
Ex. P. G.)—No entry.
- Class 328.**—Three ditto, ditto (Amateurs).—No entry.
- Class 329.**—Three Shrubby Calceolarias, open.—No entry.

Class 330.—Six Cinerarias, distinct, open.

1st prize, 10s. ; 2nd, 5s.

2315 Henry Moore, Esq., Barncleuth, Elizabeth Bay Road.

AWARD :—2nd prize.

- Class 331.**—Six Mimuli, distinct, open.—No entry.
- Class 332.**—Six Chrysanthemums, Show, open.—No entry.
- Class 333.**—Six ditto, Pompones, open.—No entry.
- Class 334.**—Six ditto, Japanese, open.—No entry.
- Class 335.**—Six Phloxes, Herbaceous, open.—No entry.
- Class 336.**—Six Gladiolus, open.—No entry.

I. P. 17

Class 337.—Six Gloxinias, open.*1st prize, 15s. ; 2nd, 7s. 6d.*

2316 John Baptist & Son, "The Gardens," Sydney. Not exhibited.

Class 338.—Six Achimenes, open.—No entry.**Class 339.—Six Gesneraceous Plants, distinct, open.—No entry.****Class 340.—Six Amaryllis, distinct, open.—No entry.****Class 341.—Six Lilliums, ditto, open.—No entry.****Class 342.—Twelve Miscellaneous Bulbs, open.—No entry.****Class 343.—Twelve Carnations, Picotees, distinct varieties, open.—No entry.****Class 344.—Six ditto, ditto, distinct varieties, open.—No entry.****Class 345.—Six Flowering Begonias, open.—No entry.****Class 346.—Six Balsams, distinct, open.—No entry.****Class 347.—Four Cyclamens, distinct, open.—No entry.****Class 348.—Six Verbenas, distinct, open.—No entry.****Class 349.—Six double Petunias, open.—No entry.****Class 350.—Six Annuals, distinct.—No entry.****Class 351.—Six Primula Sinensis, double or single, open.***1st prize, 10s. ; 2nd, 5s.*

2317 M. Lowe, Esq., Zetland Villa. Produced in simple garden frame without artificial heat.

2318 Henry Moore, Esq., Barncleuth.

2319 Joseph Thompson, Esq., Potts' Point.

AWARDS :—No. 2319 ; 1st prize.

2318 ; 2nd prize.

Class 352.—Six Auriculas, open.—No entry.**Class 353.—Eight Pansies, open.—No entry.**

PART II.—OPTIONAL WHETHER IN FLOWER OR NOT.

Class 354.—Twelve Miscellaneous Variegated or fine Foliaged Plants.

2320 John Baptist & Son, "The Gardens," Sydney.

2321 Charles Henderson, Camellia Grove Nursery, Newtown. Twelve variegated or fine foliated plants:—1. *Iris foetidissima variegata*; 2. *Hoya variegata*; 3. *Ligustrum ovatifolia variegata*; 4. *Maranta zebrina*; 5. *Croton* (sp.) S. S. Island; 6. *Dracæna Cooperii*; 7. *Dracæna* (sp.) Rewa Island; 8. *Arbutilon Tompsonii*; 9. *Aucuba japonica*; 10. *Sanchezia nobilis variegata*; 11. *Hibiscus Cooperii*; 12. *Aspidistra lurida variegata*

AWARDS:—No. 2320; 1st prize.
2321; 2nd prize.

Class 355.—Twelve Miscellaneous Variegated or fine foliated Plants (Ex. P. G).—No entry.

Class 356.—Six ditto ditto ditto (Amateurs).—No entry.

Class 357.—Six Caladiums, open.—No entry.

Class 358.—Six Begonias, open.—No entry.

Class 359.—Ancetochilas, open.—No entry.

Class 360.—Six Dracænas, open.

1st prize, £1; 2nd, 10s.

2322 John Baptist & Son, "The Gardens," Sydney.

2323 Charles Henderson, Nursery, Newtown. Six dracænas:—1. *Dracæna Sustinenecii*, Samoa; 2. ditto (sp.) Rewa Island; 3. ditto Regina; 4. ditto (sp.) Tanna Island; 5. ditto Guilfoyleii; 6. ditto Youngii.

AWARD:—No. 2323; 1st prize.

Class 361.—Six Crotons, open.

1st prize, £1; 2nd, 10s.

2324 John Baptist & Son, "The Gardens," Sydney.

AWARD:—1st prize.

Class 362.—Best new Variegated Foliaged Plant, open.

1st prize, £1; 2nd, 10s.

2325 John Baptist & Son, "The Gardens," Sydney.

2326 Charles Henderson, Nursery, Newtown.

AWARD:—No. 2325; 1st prize.
2326; 2nd prize.

Class 363.—Twelve Palms and Cycads, distinct, open.

1st prize, £1; 2nd, 10s.

2328 John Baptist & Son, "The Gardens," Sydney.

AWARD:—1st prize.

Class 364.—Six Agaves, distinct, open.—No entry.

Class 365.—Best collection of Succulents, open.—No entry.

Class 366.—Six Tree Ferns, distinct, open.

John Baptist & Son ; 1st prize.

Class 367.—Best pair of Tree Ferns, open.—No entry.

Class 368.—Twelve Ferns, distinct, open.

John Baptist & Son ; 1st prize.

Class 369.—Six Ferns, distinct, open.

1st prize, 15s. ; 2nd, 7s. 6d.

2331 Henry Moore, Esq., Barncleuth.

2332 Joseph Thompson, Esq., Potts' Point.

AWARDS :—No. 2331 ; 1st prize.

2332 ; 2nd prize.

Class 370.—Six Lycopods, open.—No entry.

Class 371.—Three Lycopods, open.

1st prize, 7s. 6d. ; 2nd, 5s.

2333 John Baptist & Son, "The Gardens," Sydney.

AWARD :—1st prize.

**Class 372.—Best collection of Twenty Conifers and Taxads
(Nurserymen.)**

2334 Charles Henderson, Nursery, Newtown. Twenty Conifers. 1. Araucaria excelsa ; Araucaria Cunninghamii ; 3. Thuja aurea ; 4. Cryptomeria elegans ; 5. Pinus insignis ; 6. Cupressus Lawsoniana ; 7. Cupressus sempervirens horizontalis ; 8. Cupressus torulosa elegans ; 9. Dacrydium cupressinum ; 10. Dammara Mooreii ; 11. Dammara Australis ; 12. Juniperus macrocarpa ; 13. Juniperus chinensis ; 14. Juniperus Hibernica ; 15. Juniperus oxycedrus ; 16. Juniperus rufescens ; 17. Thuja Lobii ; 18. Taxus japonica ; 19. Podocarpus ferrugineus ; 20. Thujaopsis Borealis.

AWARD :—1st prize.

Class 373.—Best collection of Hardy and Ornamental Trees and Shrubs, not necessarily in flower, and not more than half Coniferæ (Nurserymen).

1st prize, £1 10s.; 2nd, 15s.

- 2335 John Baptist & Son, "The Gardens," Sydney.
- 2337 Guilfoyle & Sons, Double Bay. Hardy ornamental trees and shrubs. Abutilons—Bedfordianum, Berrenger, Duc de Malakoff, insignis, lutea, striatum; Acacias—Arabica, cultriformis; Acmena pendula; Achyranthus fruticosus (drooping myrtle); Acer campestre (sycamore); Acer campestre pseudo-platanus (plane tree); Æsculus hippocastanum (horse chestnut); Ailantus glandulosus (varnish tree); Alectryon excelsum; Aleurites triloba (candle nut); Allamanda nerifolia; Alnus capensis (alder); Alphintonia excelsa; Alyxia daphnoides; Aralias—crassifolia, Japonica, papyrifera (rice paper tree); Arbutus—coccinea unedo, Canariensis; Ardisia crenulata, ditto lutea; Argania sideroxyton (argan tree); Argyrodendron trifoliatum; Aristotelia racemosa; Aucuba Japonica; Balfouria pittosporides; Baloghia lucida; Barkleya syringifolia; Burchellia capensis; Barlesia cœrulea; Barnodesia grandiflora; Bauhinia arborea; Belepore oblonga; Beaufortia decussata; Berberis—Darwini, macrophylla, vulgaris, Wallachiana; Betula Cunninghami (birch); Bœhmeria nivea (grass cloth plant); Botriodendron latifolium; Bouvardias—triphyllo, strigulosa; brachychitons—acerifolium (flame tree), Bidwilli; Brexias—chrysophylla, Madagascariensis; Browallia Jamiesoni; Brugmansias—lonigera (Knighii), suaveolens; Brunfelsia Americana; Calophyllum inophyllum, Montana; Camphora officinarum; Cantua pyrifolia; Capparis spinosa; Carissa carandas; Cassia corymbosa; Castanospermum Australis; Ceanothus floribundus; Citheroxylon quadrangulare; Celtis Australis; Ceratonia siliqua; Cestrum—auranticum, diurnum, vespertinum; Cinnamomum—laurifolium, Zeylanicum; Citriobatus ovalifolius; Clerodendrons—nutans, squamatum; Cooloba cladophyllum; Coletia pictonense; Coprosma—lucida, latifolia; Cotoneaster buxifolia; Cryptocarya glaucescens; Cupanias—Australis, auneadioides, xylocarpa; Deutzias—Crenata flore plena, scabra, gracilis Diplacus glutinosus; Diplopappus fruticosus; Dombeya tricuspidata; Doryphora sassafras; Duranta—Ellisi, Plumeri; Edwardsia microphylla; Elæocarpus serratus; Elæocarpus preciscifolius; Elæagnus—argentea, aurea variegata; Endiandra virens; Erythinas—Bellangeri, caffra, cristagalli (coral trees); Escallonia—macrantha, Montevidensis, organensis, pterocladon; Eugenia—buxifolia, ligustrina, jambos; Eucnium japonicum, ditto variegata, radicans variegata; Euphorbia splendens; Enrya chinensis; Ficus—macrophylla, pendula; Flacourtia pyrifolia; Francisca latifolia; Gardenias—florida, Fortunei, Rothmanni; Geissois racemosa; Grewia occidentalis; Habrothamnus—elegans, facicularis; Hamelia suaveolens; Hibiscus—Liliflorus, splendens, peduncularis, Nortoni; Hypericum—coris, grandiflorum, Noblingifolium; Ilex—aquifolium, cornuta opaca, Tarago, paraguensis; Justicia—adhatoda, carnea, splendens; Kerria Japonica; Ligrustrum—Japonicum, undulatum, spicatum; Libonia floribunda; Lomatia Salaicarpa; Magnolia conspicua; grandiflora, fuscata, purpurea; Mahonia—aquifolium, Leschinaultia; Melia azedarach; Melicope ternata; Melicytus ramifloras; meteosideros tomentosa; Murraya—exotica, paniculata; Myrsine urvillea; Nandina domestica; Nerium—splendens, lacteum; Olea—acuminata, Americana, sativa, Europea fragrans, Wightiana; Osmanthus illicifolia; Owenia Venosa (tulip wood); Panax—arborea, elegans; Polyosma Cunninghami; Paulownia imperialis; Philadel-

phus *Mexicana*; *Phillyrea oleaefolia*; *Pisonia grandis*; *Pittosporum-nigrum*, *revolutum*, *Tobira*, *obtusifolium*, *Engenioides*; *Quercus-Suber* (cork oak); *illicifolia*, *Virginianum*; *Raphiolepis-Indicus*, *spiralis*; *Rhammus Alaternus*; *Bondeletia-speciosa*, *versicolor*; *Royena lucida*; *Russelia-multiflora*, *juncea*; *Schinus molle*; *Schotia latifolia*; *Spirea callosa*, *prunifolia*; *Stenocarpus Cunninghamsi*, *salignus*, *Stillingia libifera* (tallow tree); *Synoum glandulosum*; *Syringa vulgaris*; *Tecoma-fulva*, *velutina*; *Veronica-decussata*, *formosa*, *Turneri*, *Hendersoni*, *variabilis*; *Viburnum-arboreum*, *suspensum*, *Chinensis*, *Japonicum*, *opulus* (Guelder rose), *tinus*, *lucidum*; *Abies-communis*, *Orientalis*, *firma*, *excelsa*, *Menziesii*, *Smithiana*, *rubra*, *alba*; *Araucaria-Bidwilli*, *excelsa*, *Rulei*, *Cunninghamsi*, *imbricata*, *glauca*; *Cedrus-Atlantica*, *deodara*, *Libanon*; *Cephalotaxus fortunei*; *Cunninghamia ginensis*; *Cupressus-funebris*, *goveniana*, *knightsiana*, *Lawsoniana*, *Lambertiana*, *macrocarpa*, *pendula*, *Cashmeriana*, *Whitleyana*, *stricta*; *Dacrydium-cupressinum*, *elatum*; *Dammara Australis*, *ovata*, *obtusa*, *robusta*; *Juniperus-excelsa*, *communis*, *Phœnicea*, *Virginianum*, *prostrata*, *rufescens*; *Libocedrus Chiliensis*; *Octoclinus Macleayana*; *Phyllocladus trichomanoides*; *Picea-amabilis*, *balsamica*, *Nordmanniana*, *Douglasi*, *pectinata*, *amabile*, *Webbiana*; *Pinus-Benthamiana*, *strobis*, *excelsa*, *ponderosa*, *halepensis compacta*, *Hageana*, *Canariensis*, *insignis*, *Laricis*, *longifolia*, *Llaveana*, *Sabiniana*, *tenuifolia*, *contorta*, *Lambertiana*, *prætifera*, *Brutea*; *Podocarpus-macrophylla*, *koriana*, *spinulosus*, *Nerifolius*, *tolara*; *Retinospora-obtusa*, *pisifera*, *squarrosa*, *plumosa*; *Taxus baccata*; *Wellingtonia gigantea*; *Weddingtonia cupressoides*; *Thuja Menziesii*.

AWARD :—No. 2335; 1st prize.

Class 374.—Best Collection of Commercial and Medicinal Plants.

1st prize, £3; 2nd, £2.

- 2339 Guilfoyle & Son, Double Bay. Tropical and semi-tropical fruit trees, commercial plants, &c.—*Achras sapota* (sapodilla plum), species, South Sea Islands; *ægle marmelos* (beal fruit or Bengala quince); *anona cherimolea* (cherimoyer), *lævigata*, *muricata*; *aromadendron elegans*; *artocarpus incisa* (bread fruit), *artocarpus integrivolia* (jack fruit); *bumelia nigra*; *carica papaya* (Papau apple); *chrysophyllum cainito* (star apple); *cookia punctata* (wampee tree); *diospyros kaki* (Chinese date plum), *mabola*, *melanoxydon*; *eryobotria Japonica* (loquat); *eugenia braziliensis* (Brazilian cherry), *cauliflora* (tabuticaba fruit), *alba* (fruit from Java), *malaccensis* (white variety Fiji), *malaccensis* (red variety Fiji), *mitchelli*; *nephelium lichee* (lichee fruit—China), *nephelium longan* (longan fruit—China); *evea dulcis* (*vi* apple—South Sea Islands); *garcenia mangostana* (mangosteen); *hovenia dulcis* (fruit from China); *jambosa vulgaris* (Malay apple); *lucuma obovata* (fruit from Peru); *maclara aurantica* (osage orange); *mangifera indica* (strawberry mango—Bombay); *musa cavendishi* (Chinese banana); *ananassa sativa* (South Sea Isles); *psidium catleyanum* (black guava), *psidium pomiferum* (yellow guava); *vangueria edulis*; *zizyphus jujuba* (jujube fruit—India); *arduina bispinosa* (matingola plum); *pimento vulgaris* (allspice tree); *cinchona officinalis* (quinine), *succi rubra* (red Peruvian bark), *calisayi*; *cinnamomum verum* (cinnamon); *coffea arabica* (coffee); *thea assamica* (assam tea), *bohea* (black tea); *schinus molle* (mastic tree); *vanilla aromatica* (vanilla root); *boehmeria nivea* (grass-cloth plant); *stillingia sibirica* (yellow tree); *symplocos sinica*; *monodora myristica* (Jamaica nutmeg); *draccena* (dragon's blood tree); *guatteria longifolia*.

AWARD :—1st prize.

NON-COMPETITIVE.

2341 Dobroyde Nursery, Ashfield. Thos. W. Morton, Superintendent. Collection of 50 species of the most important and distinct coniferæ:—*Abies excelsa*, *A. menziesii*, *A. douglassii*, etc., etc.; *Araucaria excelsa* (Norfolk Island pine); *A. cookii*, (Cook's pine, from New Caledonia); *A. bidwillii* (*Bunya-bunya*); *A. imbricata* (the Chili pine); *A. ruleii*, *A. glauca*, *Cedrus deodora*, *Cryptomeria elegans*, *C. Japonica*, *C. lobbi*; *Cupressus corneyana*, *C. lawsoniana*, *C. pendula*, *C. stricta*, *C. torulosa elegans*, *C. Thuyoides variegata*; *Callitris* (*Frenela*) sp. from the Richmond River (new); *Frenela cupressiformis*, *Juniperus cracovia*, *J. phœnicea*, *Libocedrus chilensis*, *Pinus Bonthamiana*, *P. canariensis*, *P. halepensis*, *P. insignis*, *P. tenuifolia*, *P. longifolia*, *P. menziesii*, *P. sylvestris*; *Podocarpus spinulosus*, *P. thunbergiana* (new), *P. ferugineus* (New Zealand); *P. totara*; *P. sp.*, from New Zealand; *Retinospora obtusa*, *R. ericoides*; *Thuja knighti*, *T. lobbi*, *T. (Biota) aurea variegata*, *T. (Biota) Aurea*; *Thujopsis dolabrata variegata*, *Dacrydium cupressinum*, *D. elatum*, *D. franklinii*; *Dacrydium* (?) 2 sp. from New Zealand; *Dammara moorei*, *D. australis* (Kauri pine), *D. robusta* (Australian Kauri); specimen plants of *Thuja knighti*, *Libocedrus Chilensis*, *Araucaria excelsa*, *A. cunninghami*, *A. bidwillii*, etc.; a specimen of the Cherokee Rose, used so much for hedges in America, suitable in any climate and soil, and is one of the quickest growing plants we have. A collection of sugar canes, of the most important kinds, used for the manufacture of sugar. A collection of hardy palms, ornamental trees, and shrubs, including palms, *Seaforthia elegans*, *Arica rubra*, *A. sapida*, *A. monostachya*, *Calamus Australis* (the Australian cane), *Coccus plumosus*, *Cordalinea indivisa* (true), *Corypha australis*, *Cycas media*, *Macrozamia tenuifolia*, *M. mackenziei*, *M. macquillii*, *Tychosperma Alexandræ*, *Zamia spiralis*, etc. A collection of hardy ornamental trees and shrubs, general nursery stock. New and rare plants. A collection of new double flowering pelargoniums, new nosegay pelargoniums, new silver-margined and tricolor-zoned pelargoniums; *Daphne hyemalis*, a new dwarf-growing-sp.; the golden-leaved *Euonymus*, from Japan (*E. latifolius aurea variegata*); silver-mounted *Euonymus E. Sieboldii argentea variegata*; *Poa trivialis*, *elegans argentea*, a highly ornamental grass with silver bands; *Panicum plicatum niveo vittatum*, another beautiful grass, margined and striped down the centre of each leaf with silver. New Holland Pitcher Plant—*Cephalotus follicularis*—a peculiar and interesting little plant, with flowers large enough to contain the whole plant; some good roses in pots, forced for the occasion, which will be replaced from time to time, as others come into bloom; fuchsias also, now coming into bloom, will be exhibited in due time, as well as new geraniums and pelargoniums; some fine plants of the variegated New Zealand flax (*Phormium tenax variegata*, and *Phormium colensoi*); variegated leafed pineapple; *Yucca aloëfolia variegata*; *Coleus "Duke of Edinburgh," C. verchaffeltii*, and others from the South Sea Islands, with *Iresene herbstii*, red and yellow varieties; *Alternanthera spathulata*; and other ornamental foliage plants.

Class 375.—Best Collection of Plants suitable for live Fences, not less than two yards each.—No entry.

Class 376.—The most suitable Plant for edging purposes in Australia, to be laid in circles of 3 feet in diameter.—No entry.

NON-COMPETITIVE.

- 2342 C. Moore, Botanical Gardens, Sydney. Miscellaneous Plants:—*Asplenium falcatum*; *Angræcum sesquipedale*; *Anthurium scherzerianum*, *Leuconeurum*, Sp. (new), *Cordifolium*; *Adiantum trapesiforme*, *A. connea*, *Concinnum lætum*, *Formosum*, *A. Tenerum*; *Aspidistra elatior variegata*; *Ananassa porteana*, *Sativa variegata*; *Areca rubra*; *Alocasia metallica*, *A. Albo-violacea*; *Acalypha tricolor*; *Abutilon Thompsonii*; *Bignonia ornata*; *Chamædorea ernesti-augusti*; *Cyperus alternifolius-variegatus*; *D. Crotons*, from South Sea Islands; *Cephaellotus follicularis*; *Dieffenbachia maculata*; *Dracæna ferrea*; *D. Sp. South Sea Islands*, *D. Sp. Samoa*, *D. Gayii*, *D. Umbraculifera*, *D. Draco*; *Davallia hemipitera*; *Dicksonia youngiana*; *Dalechamphia rozliana rosea*; *Elœis guineensis*; *Gymnogramme l'herminieri*; *Guzmannia spectabilis*; *Gymnostachyum pearceii*; *Hibiscus guilfoyii*; *Lycopodium ulicifolium*, *Stoloniferum*, *Umbrosum*, Sp. Fiji Islands; *Latania borbonica*; *Leptopteris superba*; *Maranta pulchella*, *Sanguinea*, *Porteana*, *Bicolor*, *Zebrina*, *Fasciata*, *Regalis*; *Nephrolepis obliterata*; *Peperomia argyrea*, *maculosa*; *Pavetta borbonica*, Sp. Bourbon; *Pandanus latifolius*, *Utilis*, Sp. South Sea Islands; *Palm* from Ceylon, Fiji Islands; *Peristrophe lanceolaria-variegata*; *Strelitzia farinosa*, *Reginæ*; *Sanchezia nobiis-variegata*; *Stangeria paradoxa*; *Yucca aloifolia-variegata*: *Xanthochymus pictorius*.
- 2342A T. S. Mort, Esq., Greenoaks. A miscellaneous collection of ferns, flowering plants, and variegated plants (fifty not specified).
- 2342B Henry Moore, Esq., Barnclouth. Ferns and lycopods in a wardian case. (Not specified.)
- 2342C Hon. S. D. Gordon, Glenyarrah. Miscellaneous collection of plants. This collection has not been grown under glass, but simply protected from the high winds and the direct rays of the sun, in what is generally termed the bush-house. Cultivated for the beauty of their leaves:—*Begonia belli*, B. Count Alfred de la Minze, B. Grandis, B. President Vanden Heke, B. Helena Uhder, B. Smargadina, B. Queen Victoria, B. Sambo, B. Rex, B. Splendens, B. Ricinifolia. Flowering Begonias:—B. Manicata, B. Sanguinea, B. Hendersonii, and B. Fagifolia. *Libonia floribunda*, *Justicia flavescens*, *Diclyptera variegata*, *Eranthemum sanguinulentum*. Geraniums:—*Bicolor splendens*, *Pyrethorum aurea*, *Achyranthus aurea*, *Achyranthus herbstii*, *Sedum carnea variegata*. Ferns:—*Nephrodium molle*, *Nephrodium bulbiferum*, *Pteris Longifolio*, *Pteris cretica albo lineata*, *Pteris serulata cristata*, *Doodia aspera*, *Asplenium marinum*, *A. obtusum*, *Adiantum cuneatum*, *Selaginella wildenowii*, *Nephrodium velutinum*.
- 2342D Dr. F. Von Mueller, C.M.G., Botanic Gardens, Melbourne. Collection of plants:—*Gelsemium nitidum*, Michaux, North America, medicinal; *Chinchona micrantha*, Ruize Pavon, grey Peru bark; *Chinchona Pahuniana*, Wedd, Pahud Peru bark; *Chinchona succirabra*, Weddell, red Peru bark; *Rowenia spectabilis*, Hooker, N. Queensland, in flower; *Cyathea excelsa*, Swartz, Mauritius, tree-fern; *Pittosporum Tobira*, Aiton, China, variegated; *Cordylina*, Australis, J. Hooker, New Zealand, variegated; *Aspidium hispidum*, Swartz, New Zealand; *Grammitis*, Muellieri, Hooker, Queensland; *Billbergia amoena*, Lindt, South America; *Aichrysum punctatum*, Webb, Canary Islands, in flower; *Adiantum trapesiforme*, L. Tropic, America; *Wittsteinia vacciniacea*, Mueller, Victoria, new alpine fruit; *Nidularium purpureum*, Beer, South America; *Prostanthera spinosa*, Mueller, Victoria, new elegant pot-plants; *Hechtia glomerata*, Zuccarini, South America; *Philoden-*

dron cannifolium, Martius, Brazil; *Daemonorops melanochaetes*, Miguel, Java, one of the Rotang palms; *Latania aurea*, —, Rodriguez; *Stedvensonia grandiflora*, Boutt, Mauritius; *Phillyria media*, L. South Europe, variegated; *Ardisia crispa*, A. de Cand, China, in flower; *Cinchona calisaya*, Weddell, yellow Peru bark; *Plycosperma Alexandræ*, Mueller, Queensland, Alexandra palm; *Peristrophe lanceolaria*, Nees, East India, variegated, in flower; *Adiantum reniforme*, L. Madeira; *Coprosma lucida*, Frost, New Zealand, variegated; *Acanthostachys strobilacea*, Link, South America; *Aubrietia deltoidea*, Cand, South Europe, in flower, rockery plant; *Sedum Alfredi*, Hance, China, new rock-plant; *Sideritis macrostachys*, Poir, Canary Islands, in flower; *Pogostemon paniculatus*, Benth, East India, in flower; *Erica arborea*, L., South Europe, in flower; *Colchicum autumnale*, L., Britain, medicinal; *Acorus Calarnuc*, L., Britain, water-plant in flower; *Hartwegia comosa*, Nees, South Africa, vivaporous; *Bilbergia*, in flower, South America; *Aucuba Japonica*, Thumb, Japan, male plant in flower; *Adiantum tetragonum*, Schrader, Brazil; *Adiantum macrophilum*, Swarz, Tropic America; *Thea Chinensis*, Sims, variegated Assamica, Assam tea; *Yucca aloifolia*, L., Central America, variegated; *Cephalotus follicularis*, Dabill, West Australia, pitcherplant; Lahore Bamboo Grass; *Ranunculus Hammula*, L., Britain, water-plant; *Psychosperma calapparia*, Mig, East India; *Podocarpus Drouyniana*, Mueller, West Australia, new coniferous-tree; *Tristina conferta*, Brown, East Australia, variegated; *Pteris serrulata*, L., fil., China; *Ornithogalum thyrsoides*, Jaig, South Africa, in flower; *Asplenium rutifolium*, Kunze, South Africa; *Stanhopea eburnea*, Lindley, Brazil, coming into flower; *Phalaenopsis grandiflora*, Lindley, Java, coming into flower; *Streptocarpus Gardeni*, Hooker, Natal, variegated; *Euphorbia*, — — —, Natal; *Mesembrianthemum felinum*, Haw, South Africa; *Aloe glabra*, Salm Dyck, South Africa; *Aloe coarctata*, Schultes, South Africa; *Aloe spiralis*, Haworth, South Africa; *Aloe rigida*, Candolle, South Africa; *Aloe ensifolia*, Schultes, South Africa; *Aloe Crachyphylla*, Salm Dyck, South Africa; *Aloe pulchra*, Jacquin, South Africa; *Aloe rugosa*, Salm Dyck, South Africa; *Aloe laetipunctata*, Schultes, South Africa; *Aloe tortuosa*, Haworth, South Africa; *Aloe conspurcata*, Salm Dyck, South Africa; *Aloe Bowiesana*, Schultes, South Africa; *Encephalartos lanuginosus*, Schm, Caffraria; *Juniperus Virginiana*, L., Virginian pencil cedar; *Juniperus Bermudiana*, L., West Indian pencil cedar; *Sempervivum*, Haworth, Madeira; *Argania sideroxyylon*, Rimer and Sch. Morocco, Argan-tree (only a fruit-bearing branch placed in earth); *Anacampepos telephiastrum*, Cand, South Africa; *Pinus balsamea*, L., Banada balsam spruce; *Pinus Fraseri*, Purse, Southern balsam spruce; *Pinus rigida*, Miller, pitch fir of the United States; *Pinus Canadensis*, L., Canada pitch spruce; *Anopterus glandulosus*, Labill, Tasmania, in flower; *Quercus bicolor*, Willd., North America, swamp-oak; *Quercus incana*, boxb., Himalaya (*Q. lanata*, Smith); *Quercus alba*, L., North America, white-oak; *Encephalartos Altensteinii*, Schm, Caffraria, an aged plant; *Quercus glabra*, Thunberg, Japan; *Cyathea canaliculata*, Willd., Mauritius, fern-tree; *Caltha palustris*, L., Britain, marsh marigold, water-plant; *Encephalartos cycadifolius*, Lehmann, Caffraria; *Aesculus Californica*, Nutall, Californian horse-chestnut; hardy Chinese sugar-cane; *Euphorbia anti-quorum*, L., East India, medicinal; *Euphorbia tortilis*, Rottler; India *Jubaea spectabilis*, Humboldt, hardy Chilian palm; *Cordylina Banksii*, J. Hooker, New Zealand, long-leaved palm-lily; *Pachypodium tuberosum*, Lindley, Caffraria; *Cinchona officinalis*, L., Peru, Loza bark; *Euphorbia* (2 sp.), South Africa; *Euphorbia clava*, Jacq., South

Africa, in flower; *Anthurium microphyllum*, Endl., Brazil; *Eriophorum polystachyum*, L., Britain, cotton sedge; *Aloe angulata*, Willd., South Africa; *Euphorbia vivesa*, Willd., South Africa; *Vidularium Myendorffii*, Regel, South America; *Euphorbia cereiformis*, L., South Africa; *Eranthemum*, silver-banded; *Blechnum Australe*, L., South Africa.

2342 W. Hill, Esq., Director, Botanic Gardens, Brisbane. Collection from the Botanic Gardens, Brisbane:—Colonial manufactures.—West Indian arrowroot, *Maranta arundinacea*; East Indian arrowroot, *Canna edulis*; Brazilian arrowroot, *Manihot utilisima*; Brazilian tapioca, *Manihot utilisima*; Brazilian cassaripe, *Manihot utilisima*; Cassava flour, *Manihot janifolia*; Cassava bread, *Manihot janifolia*; plantain (under the name conquanty), *Musa paradisiaca*; Tara flour, *Alocasia esculentum*; maizena, *Zea mays*; maizena flour *Zea mays*; Turmeric curry-powder, *Curcuma angustifolia*; cayenne pepper (birdseye), *Capsicum banatum*; cayenne pepper (beet), *Capsicum grossum*; allspice, Jamaica pepper, *Pimenta vulgaris*; West Indian ginger (raw), *Zingiber officinalis*; West Indian ginger (preserved), *Zingiber officinalis*; West Indian ginger (essence), *Zingiber officinalis*; cinnamon-bark, *Laurus cinnamomum*; cinnamon oil, *Laurus cinnamomum*; lime (preserved), *Citrus acida*; lime oil, *Citrus acida*; lemon (preserved), *Citrus lemomum*; lemon oil, *Citrus lemomum*; Sevilla orange (preserved), *Citrus bergadia*; Sevilla orange oil, *Citrus bergadia*; shaddock (preserved), *Citrus decumanus*; comquat (preserved), *Citrus japonica*; Olive (preserved), *Olea europea*; Jack-fruit, *Artocarpus integrifolia*; mango (preserved), *Mangifera indica*; Chermoyla (preserved), *Anona cheremoylia*; sweet sop (preserved), *Anona squamosa*; sour sop (preserved), *Anona maricata*; custard-apple (preserved), *Anona reticulata*; alligator pear (preserved), *Persia grattissima*; grandilla (large, preserved), *Passiflora quadrangularis*; grandilla (small, preserved), *Passiflora edulis*; rose-apple (preserved), *Jambosa vulgaris*; guava, purple (preserved), *Psidium cattleianum*; guava, gooseberry (preserved), *Psidium guinensis*; guava-apple (preserved), *Psidium pomiferum*; lechee (preserved), *Nephelium letchi*; longan (preserved), *Nephelium longan*; Chinese date-plum (preserved), *Diospyros kaki*; Chinese date-plum jam, *Diospyros kaki*; loquat (preserved), *Eriobotrya japonica*; Brazilian cherry, (preserved), *Eugenia braziliensis*; Papaw apple (preserved), *Carica pepaya*; Cape gooseberry (preserved), *Physalis edulis*; jujuba jujuba (preserved), *Zizyphus jujuba*; rosella (preserved), *Hibiscus sorbifolia*; pine-apple (preserved), prickly-leaved cayenne; pine-apple (preserved), smooth-leaved cayenne; banana (preserved), *Musacavendishi*; tamarind (preserved), *Tamarindus indica*; Natal plum (preserved), *Arduina edulis*; oil, castor *Ricinus spectabilis*; oil, croton, *Croton tiglium*; senna, Tinnevely, *Cassia clongata*; senna, Aleppo, *Cassia obovata*; liquorice, European, *Glycirhiza globra*; madder, European, *Rubia tinctora*; indigo, East Indies, *Indigofera tinctora*; Caoutchouc, Para, *Siphonia elastica*; tea, black, *Thea bohea*; tea, Paraguay, *Ilex paraguensis*; coffee, *Coffea arabica*; coffee-leaves, *Coffea arabica*; coffee-berries, *Coffea arabica*.

Useful Timbers.—*Flindersia australis*, Crow's ash; *Oxleya xanthoxylon*, light yellow wood; *Cedrela australis*, red cedar; *Dammara robusta*, Kauri pine; *Araucaria cunninghamii*, Moreton Bay pine; *Vitex macrophylla*, beech; *Grevillea robusta*, silky-oak; *Tristania laurina*, water-gum; *Cucalyptus leucoxulon*, grey ironbark; *Eucalyptus rostrata*, blue-gum; *Eucalyptus maculata*, spotted-gum; *Celtis ingens*.

Fancy Timbers.—*Citrus australasica*, lime; *Harpullia pendula*, tulip-wood; *Araucaria cunninghamii*, Moreton Bay pine; *Castanospermum australe*, bean-tree; *Acacia pendula*, weeping myall; *Acacia coxeni*, bricklow; *Pittosporum phylloroides*; *Exocarpus latifolia*, broad-leaved cherry; *Casuarina tennesima*, forest-oak; *Rhus rhdanthernum*, deep yellow wood; *Callitris endlicheri*, Cypress pine; *Xanthoxylon brachycanthum*, satin-wood.

Fibres.—Queensland hemp, *sida retusa*; Mexican hemp, *furcraea gigantea*; Indian hemp, *hibiscus cannabinus*; sun hemp, *crotonaria juncea*; plantain hemp, *musa paradisiaca*; jute hemp, *corchorus capsularis*; China grass-hemp, *boehmeria nivea*; bowstring hemp, *sanseveria cylindrica*; Ceylon hemp, *sanseveria zelanica*; Guiana hemp, *sanseveria guineensis*; rosella hemp, *hibiscus sorbifolia*; cotton, short staple, New Orleans; cotton, long staple, Sea Island; vine cotton, short staple, Alabama.

Plants, Useful and Ornamental.—Tea, *Thea Bohea*; coffee, *Coffea arabica*; *vacona*, *pandanus utilis*; allspice, *pimenta vulgaris*; cotton, New Orleans; *Yucca alofolia variegata*; *Alocasias*, viz. :—*Metallicum*, *Zebrina*, *Macrorhiza variegata*, and *Macrorhiza albo*; *Caladiums* viz. :—*Magnifica*, *Madame Audrus*, *Argyrites*, *Troubetzhoy*, *Perrieri*, *Mirabilo*, *Houletti*, *Barquini*, *Bicolor major*, *Bicolor splendens*, *Belleymei*, *Chantini*, *Hæmotoelignum*, *Discolor*, *Wightii*, *Amible New manii*; *Gymnostachyum vershaffelti*; *Croton hilli*, *C. Irregularare*, *C. Guilfoylia*, and *Noblis*; *Dieffenbachia marmoratum*; *Aralia veitchii*; *Aralia Sp. New Caledonia*; *Maranta zebrina*; *Dracena marginata*, *Nigrescens*, *Cannæfolia*, *Vershaffelti*, *Ternanali*, and *Guilfoylia*; *Variea speciosa*.

Sugar-canes.—Seventeen varieties, two samples of each, viz. :—*Saccharum officinarum* var., *Socrat*, *Rappoe*, *Rappoe* var., *Meera*, *Poetii*, *Djoengdjoeng*, *Lieliën*, *Chegaca*, *Troeboe*, green and yellow, ribbon (red), *Gingham*, *Diard*, *Diard rose*, *Salangore*, *Bourbon*, *Chinensis*.

Sugar.—Sixteen varieties, from following mentioned canes :—*Socrat*, *Rappoe*, *Rappoe* var., *Meera*, *Poetii*, *Djoengdjoeng*, *Lieliën*, *Chegaca*, *Troeboe*, *Diard rose*, *Salangore*, *Diard*, *Gingham*, *Bourbon*, *Chinensis*, *Ribbon*, and also a sample manufactured from several canes mixed.

Jams and Jellies.—*Rosella*, *Cape gooseberry*, *pine-apple*, *comquat* orange, *shaddock*, &c.

Tobacco.—Three varieties—*Havannah*, *Virginia*, and *Manilla*.

A sugar-bag manufactured from leaves of *pandanus utilis*.

Fruits, Roots, &c.—Ground-nuts, *arachis hypogæa*; sweet potatoes, three varieties, red, white, and yellow, *Convolvulus batata*; yams, four varieties, viz. :—*Dioscorea alata*, *Dioscorea satavia*, *Dioscorea aculata*, and *Dioscorea chinensis*; *caesava*, bitter, *Manihot utilisima*; *caesava*, sweet, *Manihot janipha*; arrowroot, white, *Maranta arundinacea*; arrowroot, purple, *Canna edulis*; taro, *Alocasia esculentum*; turmeric, *Curcuma angustifolia*; pine-apple, five varieties, smooth-leaved *cayenne*, prickly-leaved *cayenne*, *biply queen*, *Moscow queen*, *black Jamaica*; bananas, three varieties—*cavendish*, purple, and sugar; *Queensland nuts*, *macadamia ternifolia*; *bunya bunya cone*, *araucaria bidwillii*.

AWARDS :—No. 2342E; silver medal. [For the variety and value of his large collection of commercial products.]

2342 }
2342D } bronze medals.
2342A; prize, £5.
2342C; prize, £2.

PART III.—CUT FLOWERS.

Class 377.—Thirty-six Roses, open.—No entry.

Class 378.—Twenty-four Roses (Nurserymen and Exhibitors employing professional Gardeners.)—No entry.

Class 379.—Twelve Roses (Amateurs).—No entry.

Class 380.—Eighteen Camellias, open.

1st prize, £1 ; 2nd, 10s.

2343 John Baptist & Son, "The Gardens," Sydney.

2344 Guilfoyle & Sons, Double Bay.

AWARDS :—No. 2343 ; 1st prize.

2344 ; 2nd prize.

Class 381.—Twelve Camellias (Amateurs).

Class 382.—Twenty-four Dahlias, show varieties, open.—No entry.

Class 383.—Twelve Dahlias (Amateurs).—No entry.

Class 384.—Twelve Dahlias Pompones, open.—No entry.

Class 385.—Six Dahlias, Pompones (Amateurs).—No entry.

Class 386.—Twelve assorted Pelargoniums, distinct, open.—
No entry.

Class 387.—Six Show Pelargoniums, open.—No entry.

Class 388.—Twelve Asters, open.—No entry.

Class 389.—Twenty Gladioli, open.—No entry.

Class 390.—Twelve Gladioli (Amateurs).—No entry.

Class 391.—Twelve Herbaceous Phloxes, open.—No entry.

Class 392.—Twelve Zinnias, double, distinct, open.—No entry.

Class 393.—Twelve Verbenas.—No entry.

Class 394.—Best Table Bouquet, showing the tasteful arrangement and grouping of colors.

1st prize, 10s. ; 2nd, 5s.

2345 John Baptist & Son, "The Gardens," Sydney.

AWARD :—No. 2345 ; 2nd prize.

NON-COMPETITIVE.

2346 Silas Sheather, Parramatta. Collection of cut flowers.

Class 395.—Best Bouquet for hand.

1st prize, 7s. 6d. ; 2nd, 5s.

2347 John Baptist & Son, "The Gardens," Sydney.

2348 Charles Henderson, Nursery, Newtown.

AWARD :—No. 2347 } highly commended.
2348 }

Class 396.—Best arrangements of Flowers for table decoration.

1st prize, £1 ; 2nd, 10s.

2349 John Baptist & Son, "The Gardens," Sydney.

PART IV.—FRUITS.

Class 397.—Grapes, White, best collection.—No entry.

Class 398.—Ditto, Black, ditto.—No entry.

Class 399.—Pineapple, any variety.—No entry.

Class 400.—Peaches, best dish, one dozen.—No entry.

Class 401.—Nectarines, ditto, ditto.—No entry.

Class 402.—Figs, ditto, ditto.—No entry.

Class 403.—Cherries, best dish.—No entry.

Class 404.—Plums, ditto.—No entry.

Class 405.—Strawberries, ditto.—No entry.

Class 406.—Melons, two Scarlet and two Green.—No entry.

Class 407.—Dessert Apples, best collection.—No entry.

Class 408.—Baking Apples, best collection.

1st prize, 10s. ; 2nd, 5s.

2350 Andrew Brown, Bowenfels. Winter pearmain apples.

AWARD :—No. 2350.

Class 409.—Dessert Pears, best collection.—No entry.

Class 410.—Baking Pears, ditto.—No entry.

Class 411.—Oranges, best collection.

1st prize, £1 ; 2nd, 10s.

2351 J. K. Chisholm, Narellan.

2352 Shepherd & Co., Darling Nursery.

2353 James Pye, Rocky Hall.

2354 W. H. M'Keown, Lane Cove.

2355 George Oakes, Quiraing.

AWARDS :—No. 2352 ; 1st prize.

2355 ; 2nd prize.

2351 } highly commended.

2353 }

Class 412.—Lemons, best collection.

1st prize, 10s. ; 2nd, 5s.

2356 George Oakes, Quiraing.

2357 C. P. Brookes, Lane Cove. Lisbon and common lemons, grown from slips.

2358 James Pye, Rocky Hall.

AWARDS :—No. 2357 ; 1st prize.

2358 ; 2nd prize.

2356 ; highly commended.

- Class 413.—Walnuts, best dish.—No entry.
 Class 414.—Best collection of Nuts.—No entry.
 Class 415.—Mulberries, best dish.—No entry.
 Class 416.—Raspberries, best dish.—No entry.
 Class 417.—Gooseberries, ditto.—No entry.
 Class 418.—Currants, ditto.—No entry.
 Class 419.—Best collection of Miscellaneous Fruit, Tropical Fruit excluded.—No entry.
 Class 420.—Best collection of Tropical Fruit.—No entry.

NON-COMPETITIVE.

2359 W. C. Windeyer, Tomago. Dates, fruit of *Phoenix dactylifera*.

PART V.—VEGETABLES.

- Class 421.—Broad Beans, single dish.—No entry.
 Class 422.—French ditto, ditto.—No entry.
 Class 423.—Peas, ditto.—No entry.
 Class 424.—Chillies, ditto.—No entry.
 Class 425.—Vegetable Marrows (two).—No entry.
 Class 426.—Rhubarb, 12 stalks.—No entry.
 Class 427.—Carrots, two bunches.—No entry.
 Class 428.—Parsnips, ditto.—No entry.
 Class 429.—Turnips, ditto.—No entry.
 Class 430.—Leeks (six).
1st prize, 5s. ; 2nd, 2s. 6d.
- 2360 J. M. May, Randwick Asylum. Grown on ground of that Institution.
 Not for competition.

AWARD :—Highly commended.

- Class 431.—Asparagus, bundle of fifty.—No entry.
 Class 432.—Cabbage, three heads.—No entry.
 Class 433.—Cauliflower, ditto.—No entry.
 Class 434.—Broccoli, ditto.—No entry.
 Class 435.—Sea Kale, dish.—No entry.
 Class 436.—Yams, dozen.—No entry.
 Class 437.—Onions, ditto.—No entry.
 Class 438.—Celery, three heads.—No entry.
 Class 439.—Beet roots, ditto.—No entry.
 Class 440.—Cucumbers, brace.—No entry.
 Class 441.—Best collection of Salads.—No entry.

Class 442.—Best collection of Vegetables, not less than fifteen sorts.

1st prize, £2; 2nd, £1.

2361 John Baptist & Son, "The Gardens," Sydney.

AWARD :—1st prize.

**Class 443.—Best collection of Vegetables, not less than ten sorts.—
No entry.**

Law, Somner, & Co's. Prizes for Vegetables grown from Seed
procured from them.

*Seeds to the value of the prizes to be selected from Law, Somner, &
Co's. Catalogue.*

G. 1.—*Best Six Cabbages—£1.*

2362 Ah Gow, Botany.

G. 2.—*Six Best Cauliflowers—£1.*

2363 G. Goddard, Botany.

2364 C. Grupe, Cook's River.

C. 3.—*Best Six Carrots (red).—No entry.*

G. 4.—*Best Six Parsnips—£1.*

2365 A. Desbray, Cook's River.

G. 5.—*Best Six Celery—£1.*

2366 G. Goddard, Botany.

G. 6.—*Best Three Pumpkins—No entry.*

G. 7.—*Best Three Mangold Wurzel, £1.—No entry.*

G. 8.—*Best Six Lettuces—10s.*

2367 G. Hooper, Waverley.

2368 C. Cattley, Randwick.

G. 9.—*Best Three Garden Beet—10s.*

2369 G. Goddard, Botany.

SPECIAL PRIZES.*

E.—Hon. Thomas Holt—£10 10s. for the best cultivated vineyard within the
Metropolitan district.—No entry.

F.—J. Joubert, Esq.—£5 for the best managed amateur garden in Sydney and
suburbs.—No entry.

E. P. Ramsay, Esq.—£5 5s. for best collection of new and rare plants,
exhibited.

* Not awarded.

SECTION XIX.—MANURES.

Stewards: J. K. CHISHOLM, | H. BRAY.
 Judges: PROFESSOR A. M. THOMSON, | CHARLES WATT.

Class 443.

£10 10s. to be divided *ratably* into 1st, 2nd, and 3rd Prizes.

No.	Name and Address of Exhibitor.	Price per ton.	Any further Particulars.
1240	Askunas & Co., Geelong	6 10 0	Bone-dust, manufactured at Corio Bone Mills, Geelong. Bone-dust and Superphosphate of Lime. These manures are the natural products of the Colony, and have obtained honorable mention, Dublin Exhibition; Medal and ditto of Melbourne Intercolonial; Medal and ditto, Ballarat; ditto, Port Phillip Society's Show. Dr. Mueller's certificate; W. Ferguson, Inspector State Forests, &c.
1241	Elliott, Bros., 110, Pitt-street.	£4 10 to £6 6	
1242	John Christian Lyons, 164, William- street, Melbourne, Victoria.	6 10 0 in the Colony.	
1243	John C. Lyons & Co.	2.-lb tins 1s. each. Retail, 20s. per cwt.	Patent Chloro Alkaline Deodoriser and Disinfectant and new mineral. This is a new discovery of a mineral containing perchloride of iron and alumina, found in the Polwarth dis- trict, Bass' Strait.
1244	Jas. Macmeiken & Co., Victoria. ....	.....	.....
1245	Manning & Stanger, Ipswich .....	.....	Artificial guano.
1246	J. Macmeiken & Co., Ballarat	7 0 0	Bone-dust.

AWARDS:—No. 1241; 1st prize.
 1244; 2nd prize.
 1245; 3rd prize.
 1242; highly commended.

REPORT.

THE Judges in this section very much regret that so little information has been supplied to them by the various exhibitors; they think that exhibits of this particular character should be always accompanied by certificates of composition, and the price at which the article is sold. The greatest variety is exhibited by Messrs. J. McMeikin & Co., of Ballarat. The Phosphate Polaseo manure of Messrs. Lyons & Co. appears well suited for a variety of crops, and will doubtless command an extensive sale at the price stated, in the Colony where it is prepared; but it is doubtful whether articles of this character will bear the additional charge of conveyance from one Colony to another. The Super Phosphate of Messrs. Elliott Bros., and the finely divided Bone-dust of Messrs. Manning & Staiger, deserve special notice.

SECTION XX.—IMPLEMENTS AND MACHINERY.

Stewards :

R. LLOYD,
W. J. JACKSON,

G. S. YEO,
G. SPRING.

Judges :

R. SCOBIE,
J. N. OXLEY,
J. YEOMANS,

G. A. MORELL,
J. F. THOMAS,
G. ROME.

Class 444.—Reaping and Threshing Machine.

Prize, £5.

- 1247 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £60. Reaping and threshing with patent lever comb.
- 1248 Thos. Henderson, Melbourne. Manufactured by Thos. Henderson, Melbourne. Price, £57 10s.

AWARD :—No. 1247; prize.

Class 445.—Reaping-machine.

Prize, £5.

- 1249 Edward J. Spence, Sydney. Manufactured by Walter Albert, New York. Price, £90. Hames heading machine; the perfection of machinery for harvesting crops with expedition and economy.
- 1250 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Reaping-machine, with patent side delivery into shed, price, £55; reaping-machine, self back delivery in shed, £45; reaping-machine, light tip-up platform, manual delivery, £36; reaping-machine, wood frame, 4 wheels, £40.
- 1251 John Wilding & Co., Melbourne. Manufactured by John Wilding & Co., Melbourne. Price, £35. Back delivery reaping-machine, with strong T iron frame; simple in construction and light draught.
- 1252 Joseph Nicholson, Melbourne. Manufactured by Joseph Nicholson, Melbourne. Price, £52 10s. Patent reaping and mowing machine, with improved self-acting side delivery.
- 1253 Joseph Nicholson, Melbourne. Manufactured by Joseph Nicholson, Melbourne. Price, £33. Improved patent back delivery reaping-machine.

AWARD :—No. 1250; prize.

Class 446.—Mowing-machine.*Prize, £5.*

- 1254 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. With steel finger-bar, £26; with steel folding-bar, price, £26.
- 1255 Joseph Nicholson, Melbourne. Manufactured by Joseph Nicholson, Melbourne. Price, £25. Mowing-machine.

AWARD :—No. 1254; prize.

Class 447.—Light Land Plough.*Prize, £2.*

- 1256 William Ritchie, Parramatta. Manufactured by W. Ritchie, Parramatta. Price, £7. Light land plough, to work with or without wheel; made of wrought iron.
- 1257 John Wright, 341, Sussex-street. Manufactured by John Wright, 341, Sussex-street. Price, £5. Made of wrought iron only.
- 1258 W. Davies, Goulburn. Manufactured by Davies, Alexander, & Co., Goulburn. Price, £7. Two ploughs, one painted and one unpainted, entirely of local manufacture; every part has been made in the Colony of N.S.W.
- 1259 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £7 10s. Light land plough with steel mould-board.
- 1260 R. A. Ritchie, Parramatta. Manufactured by R. A. Ritchie, Parramatta. Price, £4 10s. This light land plough is specially designed for general purposes, simplicity, and durability of parts; constructed of the best wrought iron and steel, combining strength and lightness. Wheels extra ten shillings.
- 1261 Joseph Wilding & Co., Melbourne. Manufactured by Hugh Lemon, Melbourne. Price, £10 10s. This plough is fitted with one wheel, steel mould board, etc., wrought iron share.

AWARDS :—No. 1257; prize.
1260; highly commended.**Class 448.—Heavy Land Plough.***Prize, £2.*

- 1262 John Wright, 341, Sussex-street, Manufactured by John Wright, 341, Sussex-street. Price, £8. Made wrought iron only.
- 1263 Donald Robertson, Windsor. Manufactured by Donald Robertson. Price, £10 10s.
- 1264 William Ritchie, Parramatta. Manufactured by W. Ritchie, Parramatta. Price, £8. To work with or without wheel; made of wrought iron.
- 1265 Edward Walton, Ballarat. Manufactured by E. Walton, Ballarat. Price, £12. This plough works with one or two wheels; attention is directed to the head of the plough, as there are no bolts to come loose.
- 1266 Robert A. Ritchie, Parramatta. Manufactured by Robert A. Ritchie, Parramatta. Price, £7. This plough is intended for ordinary heavy work, simple, strong, light draught, and is suitable for general purposes; will work from five to twelve inches deep. Wheels, 10s. extra.

- 1267 Joseph Wilding & Co., Melbourne. Manufactured by Hugh Lemon, Melbourne. Price, £11 10s. This plough has two wheels, steel mould-board, and wrought iron shares.

AWARDS :—No. 1266 ; prize.
 1262 } highly commended.
 1265 }

Class 449.—Plough for Deep Culture.

Prize, £2.

- 1268 J. Tomkins, Eastern Creek. Howard's imported B.B. Price, £7. Two-wheel, malleable iron.
- 1269 R. A. Ritchie, Parramatta. Manufactured by R. A. Ritchie, Parramatta. Price, £11. Improved one-wheel plough, for deep trenching and subsoiling. Is fitted with movable mould-board, which can be taken off at the end of each furrow by knocking out a cotter. Then it can be run down into the subsoil same depth as top furrow, effectually stirring the subsoil.

AWARD :—No. 1268 ; prize.

Class 450.—Double Furrow Plough.

Prize, £2.

- 1270 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £18. Double furrow plough, four wheels.
- 1271 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., Melbourne. Price, £16. Double furrow plough, with easily adjusted mould-boards.
- 1272 H. B. Mellor, Adelaide. Manufactured by H. B. Mellor, Adelaide. Price, £13. Double furrow, soleless, three-wheeled ; wheels work in oil. It can be drawn by two horses on light land, or three on stiff.
- 1273 D. Edwards, Melbourne. Manufactured by D. Edwards, Melbourne. Price, £16. Edwards' Victorian double furrow plough ; has the wheels made on a new principle, and the sides are steel.
- 1274 D. Edwards, Melbourne. Manufactured by D. Edwards, Melbourne. Price, £16 10s. D. Edwards' furrow patent skin plough. Patented in Sydney.

AWARDS :—No. 1273 ; prize.
 1271 ; highly commended.

Class 451.—Horse Rake.

Prize, £2 10s.

- 1275 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £17. Horse hay-rake, with improved lever.

AWARD :—No. 1275 ; prize.

Class 452.—Two-horse Threshing-machine.

Prize, £2.

- 1276 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £25. Two-horse threshing-machine, with separator.

- 1277 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., Melbourne. Price, £26. Two-horse threshing-machine, with separator and peg drum.

AWARDS :—No. 1276 }
1277 } commended.

Class 453.—Four-horse Threshing-machine.

Prize, £5.

- 1278 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £90. Four-horse threshing and cleansing-machine, mounted on four travelling wheels.
- 1279 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., Melbourne. Price, £65. Four-horse threshing and cleansing machine; to be worked by four horses in circular power, or two horses in a tread power; if by the latter, can be moved about by tread power.

AWARD :—No. 1278; prize.

Class 454.—Steam Threshing and Finishing Machine.—No entry.

Class 455.—Winnowing-machine.

Prize, £2.

- 1280 Samuel Lucas, Ashfield. Manufactured by Samuel Lucas, Ashfield. Price, £10. Winnowing machine, such as is commonly used in the Colony.
- 1281 Ditto ditto. Manufactured by Samuel Lucas, Ashfield. Price, £18. Backheaver cleaning machine; highly approved of for separating all sorts of grain; invented 1843 by S. Lucas, Ashfield.
- 1282 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price—Small, £12; large, £17; with spike roller, £18.
- 1283 Thos. Henderson, Melbourne. Manufactured by Thos. Henderson, Melbourne. Price, £21 10s. Spike roller and revolving separator.

AWARDS :—No. 1283; prize.
1281; highly commended.

Class 456.—Portable Engine, for general purposes.

Prize, £10.

- 1284 Mort's Dry Dock Company. Manufactured by Marshall, Sons, & Co., England. 8 H.-p.
- 1285 G. E. Dalrymple, Brisbane. Manufactured by R. W. Thompson, Scotland. Price, £1,000. Is a patent Thompson's road steamer with india-rubber wheel tires; transports itself (under steam) with any portable machinery from place to place; draws its own fuel and water, and will drive the same as a stationary engine; it is an engine of (nominal) 8-horse power, weighs $6\frac{1}{2}$ tons, and has drawn 21 tons up a gradient of 1 foot in 10.

AWARD :—No. 1284; highly commended.

Class 457.—Traction Engine, adapted for Colonial use.*Prize, £10.*

- 1286 G. E. Dalrymple, Brisbane. Manufactured by R. W. Thompson, Scotland. Price, £1,000. This is a patent Thompson's road steamer, with india-rubber wheel tires, and is admirably adapted for haulage on common roads and farm work, in drawing ploughs, waggons, mowing machines, etc., etc.; for utility, workmanship, mechanical simplicity, and cheapness of price, delivered by the manufacturer, these traction engines are unrivalled; it is an engine of (nominal) 8-horse power, weighs $6\frac{1}{2}$ tons, and has drawn 21 tons up a gradient of 1 foot in 10 feet.

AWARD :—No. 1286; prize.

Class 458.—Corn-cracker.*Prize, £1 10s.*

- 1287 P. N. Russell & Co., Sydney. Manufactured by P. N. Russell & Co., Sydney. Four corn-shellers.
 1288 J. Wilding & Co., Melbourne. Manufactured by Picksley, Sim, & Co., England. Price, £12 10s. Corn-cracker, fluted steel rollers.
 1289 J. Buncle, North Melbourne. Manufactured by J. Buncle, North Melbourne. Price—Double machine, £25; single machine, £14 10s. Corn-cracker and corn-crusher fitted on one frame, but are worked together or separately, as required.

AWARD :—No. 1288; prize.

Class 459.—Corn-crusher.*Prize, £1 10s.*

- 1290 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £13.
 1291 J. Wilding & Co., Melbourne. Manufactured by Picksley, Sim, & Co., England. Price, £10 10s. Equally well adapted for malt; worked by either hand or other power.
 1292 J. Buncle, North Melbourne. Manufactured by J. Buncle, North Melbourne. Price—Double machine, £25; single machine, £14 10s. Corn-cracker and corn-crusher fitted on one frame, but are worked together or separately, as required.

AWARD :—No. 1290; prize.

Class 460.—Hand Chaff-cutter.*Prize, £1 10s.*

- 1293 A. Chisholm, 183 & 185, Pitt-street. Manufactured by Ashby, Jeffery, & Luke, England. No. A—Chaff-cutter, cuts two lengths without changing wheels, has a rising mouth $8\frac{1}{2}$ inches wide, cuts a beautiful sample of $\frac{1}{4}$ inch chaff for horses, and $\frac{1}{8}$ inch for cows; it cuts a large quantity in a short space of time, and it works so easily that a boy can manage it; this machine is not liable to choke or break.

- 1294 A. Chisholm, 183 & 185, Pitt-street. Manufactured by Ashby, Jeffery, & Luke, England. Price, £7 17s. 6d. No. EL—Chaff-cutter, a very strong machine, adapted for hand, horse, or steam power; can be worked by one man, cuts $\frac{1}{4}$ inch and $\frac{1}{2}$ inch chaff; is fitted with safety-lever for instantly stopping feed rollers.
- 1295 A. Chisholm, 183 & 185, Pitt-street. Manufactured by Ashby, Jeffery, & Luke, England. No. 9 chaff-cutter, a useful little machine, adapted for a small stable where only one horse is kept.
- 1296 A. Chisholm, 183 & 185, Pitt-street. Manufactured by Ashby, Jeffery, & Luke, England. Price, £4 10s. No. BL—Chaff-cutter, same as A, cuts the horse-chaff rather coarse ($\frac{3}{4}$) and therefore cuts faster; well adapted for farm horses; those who do not care about the chaff being so extra fine will find an advantage in this machine, as it cuts a large heap of chaff in less time than those which are so fine; well adapted for cutting cultivated furze.
- 1297 R. Towns & Co., Miller's Point. Manufactured by T. D. Burdick & Co. Price, £8. Chaff-cutter No. 4, for farmers and stable-keepers, cutting for 25 to 50 head of stock; made to cut different lengths to suit the Eastern and Western market; this machine has a 10-inch knife, and will cut about 800 lbs. of hay per hour.
- 1298 J. Wilding & Co., Melbourne. Manufactured by Picksley, Sim, & Co., England. Price, £12. Chaff-cutter, worked by either one or two handles, and adapted to cut two lengths of chaff without change of wheels.
- 1299 J. Buncle, North Melbourne. Manufactured by J. Buncle, North Melbourne. Price, £16. It is substantial enough to be driven by horse power, and an extra length of spindles and a pulley is supplied at lowest cost, if intended for horse-power occasionally.

AWARD :—No. 1299; prize.

Class 461.—Horse Chaff-cutter.

Prize, £1 10s.

- 1300 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £12 10s. Horse chaff-cutter, with three knives to cut three lengths.
- 1301 J. Buncle, North Melbourne. Manufactured by J. Buncle, North Melbourne. Price, £24. Complete, with sieve-gear.
- 1302 J. Buncle, North Melbourne. Manufactured by J. Buncle, North Melbourne. Price, £21. Horse chaff-cutter, No. 2 size, complete, with sieve-gear.

AWARDS :—No. 1301; prize.

1302; highly commended.

Class 462.—Horse Works.

Prize, £2.

- 1303 Samuel Lucas, Ashfield. Manufactured by Samuel Lucas, Ashfield. Price, £55. For general purposes; to be worked by four horses.
- 1304 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., Melbourne. Price, £21. Circular horse-power, for two horses; wheel gearing covered in from dust and dirt, with iron dome cover.

AWARD :—No. 1304; prize.

Class 463.—Wool Press.*Prize, £2.*

- 1305 P. N. Russell & Co., Sydney. Manufactured by P. N. Russell & Co., Sydney. One improved rack wool-press, on side, with extra-large top box and double gear; one improved screw wool-press, on end, with gear for working from below, at quick or slow speed; one rack hay-press.
- 1306 Samuel Lucas, Ashfield. Manufactured by Samuel Lucas, Ashfield. Price, £100. Wool or cotton press, of great power, and much approved of; invented by S. Lucas.
- 1307 Bradley & Perry, Sussex-street. Manufactured by Bradley & Perry. Price, £85. Wool or cotton press, worked by wrought iron wheels; pinions and racks for packing bales on the side, excepting the upper box, which is of cedar. The whole of the woodwork is of Colonial hardwood.
- 1308 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., Melbourne. Price, £80. Patent wool-press, with patent travelling top box; movable side to bottom box to allow of bale being got out easily; screw worked by wheel gearing.

AWARD :—No. 1305; prize.

Class 464.—Seed-sowing-machine.*Prize, £2.*

- 1309 R. L. Tooth, Kent Brewery. Manufactured by Garrett & Sons, East Suffolk. Price, £60. For sowing all kinds of grain; it is equally valuable both to the squatter and the farmer. It is specially adapted too for sowing grass-seed without preparing the soil for cultivation, and a similar one has been used with great success for sowing English grasses; one man and three horses can easily sow three acres per day.
- 1310 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £10 10s. and £22 10s. Seed-sowing-machine, broadcast, for sowing English grasses on maiden soil.

AWARD :—No. 1310; prize.

Class 465.—Collection of Farming Implements.*Prize, £5.*

- 1311 W. Ritchie, Parramatta. Manufactured by W. Ritchie, Parramatta. Collection of three ploughs, made wrought iron.
- 1312 T. Robinson, Melbourne. Manufactured by T. Robinson, Melbourne. Valued at £1,000. Collection of farm implements.
- 1313 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., and Hugh Lemon, Melbourne, and Picksley, Sim, & Co., England. Collection of farming implements.

AWARDS :—No. 1312; prize.

1313; highly commended.

Class 466.—Collection of Horticultural Implements.*Prize, £2.*

- 1314 F. Lassetter & Co., Sydney. Collection of horticultural implements.

NON-COMPETITIVE.

1315 R. Reilly, 424, George-street. Collection of horticultural implements.

AWARDS:—No. 1314; prize.
1315; highly commended.

Class 467.—Collection of Dairy Utensils.

Prize, £2.

1316 F. Lassetter & Co., Sydney. Collection of dairy utensils.

1317 Samuel Lucas, Ashfield. Manufactured by Samuel Lucas, Ashfield. Price, £6. Barrel-churn, to work by hand or horse power.

1318 Neil M'Crea, Balmain. Manufactured by Neil M'Crea, Balmain. Price, £5s. These churns are got up so as to be used in the parlor; useful and ornamental.

1319 T. Turnbull, Richmond, Victoria. Manufactured by T. Turnbull, Richmond, Victoria. Price, £2 5s.; wooden cylinder churn. Price, £1; zinc cylinder churn.

1320 J. H. Hutchinson, Sydney.

AWARD:—No. 1316; prize.

Class 468.—Wine-making Utensils.

Prize, £5.

1321 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £18; wine-press. Price, £7 10s.; grape-mill.

AWARD:—Prize.

Class 469.—Water-cart, and Pump attached.

Prize, £3.

1322 F. Lassetter & Co. Water-cart, and pump attached. This pump can be used—first, to fill the tank; second, by placing the hose in the hole of the tank it is converted into an irrigator.

AWARD:—Prize.

Class 470.—Set of Whipple Trees.

Prize, £1 10s.

1323 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £1, for pair horse whipple trees. Price, £2, for three-horse ditto.

AWARD:—Prize.

Class 471.—Post-hole Borer.

Prize, £1 10s.

1324 T. Robinson & Co., Melbourne. Intended for boring holes in posts already fixed, so as to insert wire between the rails.

Class 472.—Post-driver.—No entry.

Class 473.—Apparatus for raising water from Wells, adapted to Wells; depths varying from 20 feet to 120 feet.

Prize, £10.

- 1325 A. A. Marshall & Co., Sydney. Manufactured by Taylor & Sons, London. Price, £38. Deep well pump; the barrels to be fixed in the well at about 25 feet from bottom, and connected with working gear, which rests on top of the well.
- 1326 Mort's Dock and Engineering Company. Manufactured by J. L. Norton, London. 1½ Abyssinian tube well, with driving gear complete.
- 1327 G. Spring, Greville's Rooms. Manufactured by Cullen & Dale, Pitt-street. Price, £13, and upwards. One of the chief peculiarities of this pump is, that the piston-rod is also the pipe through which the water ascends.
- 1328 T. Robinson & Co., Melbourne.

AWARD :—No. 1328; prize.

Class 474.—Apparatus for raising Water for Sheepwashing.

Prize, £10.

- 1329 P. N. Russell & Co., Sydney. Manufactured by Roby & Co., Lincoln. 8-horse power engine (under steam) working a portable Appold Pump; manufactured by P. N. Russell & Co., and arranged with spouts, showing the means of using the water under pressure in place of the ordinary way of gravitation only.
- 1330 Samuel Lucas, Ashfield. Manufactured by Samuel Lucas, Ashfield. Price, £250. A sheepwashing machine, to work by four horses, with washing-tank fitted with 36 brass slides or jets, the water striking the sheep in 36 different places at one time.
- 1331 Wm. Bassett, Sydney. Manufactured by Thomas Mort & Co. For washing sheep.
- 1332 T. Robinson & Co., Melbourne.

AWARDS :—No. 1329; prize.

1330; highly commended.

Class 475.—Apparatus for general Irrigation purposes.

Prize, £10.

- 1333 A. A. Marshall, Bon A. Works. Manufactured by J. Hunt, San Francisco. Price, £35. Windmill pump, for the purpose of raising water for houses, gardens, and stations; well adapted for general purposes.
- 1334 T. Robinson & Co., Melbourne.

Class 476.—Specimens of External Paddock Wire-fencing.

Not less than 50 set up—Prize, £2.

- 1335 F. Lassetter & Co., Sydney. Specimens.

AWARD :—Prize.

Class 477.—Specimen of Internal Paddock Wire-fencing.

Not less than 50 set up—Prize, £2.

- 1336 Messrs. F. Lassetter & Co., Sydney. Specimen.

Class 478.—Specimen of Portable Tramway for Sugar Plantation.
—No entry.

Class 479.—Model of Farm Gate.

- 1337 C. T. Bagot, Armidale. The gates with rollers are taken from the *American Agriculturist*. No. 1 rolls back to No. 2, which is merely a set of slip rails, back half way until it balances and then opens; the large swinging gate is my own invention. I have made several, and they are admirably adapted for roads or gates for the paddocks where cattle have to pass.

Not specified in Prize Schedule.

- 1338 R. L. Tooth. Manufactured by Howard, Redfern. Price, £30. This machine is a scarifier, and effectually cleans the ground. It is invaluable to the farmer.
- 1339 William Ahern, Wollongong. Manufactured by W. Ahern, Wollongong. Horse shoes and farriers' work, made of Fitzroy iron, the best and toughest iron in the world for farriers' work:—1. A new-invented shoe, to fit a horse's hoof without nails. 2. A sandal shoe for a horse with quarter broken. 3. Hoof and ordinary working shoe. 4. Bar shoe, to rest on the frog for heels with corns. 5. Forefoot shoe, to prevent contraction of the heels. 6. Jointed pocket shoe to fit fore or hind hoof. 7. Fore foot interfering shoe. 8. Hind foot interfering shoe. 9. Fore foot training shoe. 10. English hunting horse shoe. 11. Ordinary saddle-horse shoe. 12. Hind foot saddle-horse shoe. 13. A fore foot seated shoe for general use. 14. Hind foot shoe, to prevent horses from forging. 15. Fore foot pommy-sole shoe. 16. Fore foot cocked shoe for general use. 17. Hind foot cocked shoe for general use. 18. A box bar shoe for horses with bad soles—the under plate is fitted on with three screws. 19. Improved shoe, to fit inside the wall of the hoof—prevents contraction of hoof and brushing.
- 1340 A. Chisholm, 183 & 185, Pitt-street. Manufactured by G. Neighbour & Sons, London. Beehives for taking honey without the destruction of bees.
- 1341 Ditto ditto. Manufactured by Ashby, Jeffery, & Luke, England. One cornstock's rotary spader, a new cultivator, adapted to all soils.
- 1342 Thos. Henderson, Melbourne. Manufactured by T. Henderson, Melbourne. Price, £6. Drill-grubber with harrow. Extra strong for vine culture or sugar-cane.
- 1343 J. Wilding & Co., Melbourne. Manufactured by J. Wilding & Co., Melbourne. Price, £45. Railway horse tread-power, for two horses, mounted on four road travelling wheels.
- 1344 Ditto ditto. Manufactured by Picksley, Sims, & Co., England. Price, £11. Treble-action "root" cutter, slicer and pulper, for either hand or horse power.
- 1345 Ditto ditto. Manufactured by Picksley, Sims, & Co., England. Price, £5 10s. Horse hoe.
- 1346 Ditto ditto. Manufactured by J. Wilding & Co., Melbourne. Price, £11. Cultivator (on Coleman's principle) for three horses.
- 1347 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £19. Land roller with wrought iron cylinders.
- 1348 Ditto ditto. Ditto. Price, £20. Four-way motion for driving four machines at same time.

- 1349 T. Robinson & Co., Melbourne. Manufactured by T. Robinson & Co., Melbourne. Price, £3 10s.; canvas water-bucket, self-filling. £5, wood water-bucket, self-filling and discharging.
- 1350 Ditto ditto. Ditto. Price, £7, small earth-scoop. £7 10s., middle size earth-scoop. £8, large earth-scoop.
- 1351 Ditto ditto. Ditto. Price, £12, cultivator, grubber, or scarifier.
- 1352 Ditto ditto. Ditto. Price, £4 10s., vineyard plough. £6 6s., half-size or turn wrist vineyard plough.
- 1353 Ditto ditto. Ditto. Price, £4, small horse hoe. £4 10s., large horse hoe.
- 1354 Ditto ditto. Ditto. Price, £8 10s., malt mill smooth rollers for hand.
- 1355 Ditto ditto. Ditto. Price, £20, corn-screener with blower. £30, corn-screener with blower and stone separator.
- 1356 Ditto ditto. Ditto. Price, £15, straw elevator to attach to thresher.
- 1357 Ditto ditto. Ditto. Price, £33, thistle mower, with wrought iron fingers. This machine is intended to be worked by one horse, and will cut about one acre per hour.
- 1358 D. Edwards, Melbourne. Manufactured by D. Edwards, Melbourne. Price, £16 10s. This patent land cultivator thoroughly pulverizes the ground to any required depth.
- 1359 Wright & Edwards. Manufactured by Wright & Edwards. Price, £35. This machine illustrates the spout washing part of two-jet sheep wash, and the method of washing wool on the sheep's back by means of a thin sheet of water ejected under considerable pressure; also, the manner of cleaning or stopping the jets.
- 1360 J. Wilding & Co., Melbourne. Manufactured by Picksley, Sims, & Co., England. Price, £5 10s. The above harrow is now admitted to be the most efficient and useful implement for covering grass and other seeds, pulverizing the surface, and for dressing in manure; they are made of the best Staffordshire iron.
- 1361 D. Edwards, Melbourne. Manufactured by D. Edwards, Melbourne. Price, £5 10s. These patent harrows are noted for strength and lightness combined.

AWARDS :—No. 1339 }
 1343 }
 1350 } bronze medals.
 1353 }
 1354 }
 1355 }
 1359 }
 1361 }
 1338 }
 1346 }
 1349 } highly commended.
 1351 }
 1356 }
 1358 }
 1352 ; commended.

OFFICIAL REPORT.

THE main general division in classification adopted by the Society for the Exhibition grew naturally out of the character proper to its own operations and the temporary extension of its duties, this division being into agricultural and non-agricultural exhibits. Classification is at all times difficult, and even the distinction above noticed was to a certain extent rough, and open to objection, inasmuch as many things connected with agriculture found their place under the second division, and notably in Section 7, which included food, both fresh and preserved. It is impossible to draw a hard and fast line, and decide exactly where agriculture begins and where it ends, but for the purposes of the catalogue it was interpreted to mean live stock of all kinds, wool, wine, sugar, agricultural implements and machinery, manures, horticultural products, and farm produce generally; but at the same time there were in the non-agricultural department a great many entries that were more or less connected with the land, its cultivation, and its produce; such, for instance, as specimens of indigenous timber, draining-tiles, silk, cotton, flax, hemp, fur, skins, animal and vegetable oils, bones, horns, hides, bark, cork, cabbage-tree straw, osiers, feathers, down, hair, bristles, tobacco, carts, drays, waggons, harness, saddlery, &c., &c. In this report the classification will be adhered to only as far as convenient.

The first general subdivision consisted of the

LIVE STOCK.

The live stock was kept on exhibition only for a week, and during that period seemed to furnish fully half the attraction to the assembled visitors. It was fortunate that their curiosity was thus divided, as it would have been impossible for the number of persons collected to have been accommodated within the walls of the building. As it was, the crowd was broken up into detachments, and room was afforded for tolerably free movement.

HORSES.

In the classification of live stock the post of honor was given to the horse, an animal that has played so great a part in assisting in the civilization of man, and which in war and peace has been so largely used to promote his purposes. Although the steam-engine has, to some extent, invaded what used to be the province of the horse, there seems as much work left for him as ever, and neither in respect of number or quality has the importance of the horse diminished.

The climate of New South Wales is not ill-adapted for the breeding of horses, and very early in its history attention was directed to this department of industry. The Colony was fortunate in its early days in the importation of a few excellent Arab and thoroughbred stallions, some of which were from the Indian studs, and these gave a well-deserved character to much of the stock—a reputation which, owing to circumstances hereafter alluded to, was not sustained as it should have been. Some of the earliest mares were imported from the Cape of Good Hope. They were not of a very superior stamp, being of the Spanish jennett breed, with bad quarters, though showy in action. The fine facilities offered by the abundance of pasture soon led to the multiplication of horse-stock in the Colony, and if attention to quality had kept pace with the increase in quantity there would have been nothing to complain of. Unfortunately the task before us now is to get rid as quickly as possible of a great deal of rubbish, and to replace it by stock worth the grass it eats.

The abundance of pasture in the early days may also be mentioned as one of the causes of the excellence of the horse stock. The native kangaroo grass (*anthisteria*) is, especially when in seed, very nutritious, and the stalk is full of saccharine matter, and young stock reared on it thrive excellently. But of late years the country has been fully stocked, and many horses are bred in cold mountainous districts, where they grow up only half-fed, and never get a fair and full development.

The returns furnished by the *Statistical Register*, though not perfectly reliable, give a tolerably fair estimate of the horse-stock of the Colony, and exhibit the following numbers of the past ten years:—

	Horses.
1861.....	251,497
1862.....	233,220
1863.....	273,389
1864.....	262,554
1865.....	284,567
1866.....	282,587
1867.....	278,437
1868.....	280,201
1869.....	280,818
1870.....	280,304

For the last six years there has been but little variation in numbers. As to the distribution, the detailed returns give 156,913 in the old settled districts or countries, and 123,391 in the unsettled or pastoral districts. Very few horses are bred in the salt-bush country, and it is principally in the upland and intermediate districts that the horse-stock is to be found.

The horse-stock of the Colony may be conveniently divided into three classes, according to the purposes to which they are put; and their numbers and quality have been roughly estimated as follows:—

I. *Draught*—

First-class heavy draught	2,000	
„ farming	4,000	
Middling	7,000	
Inferior	7,000	
·Very inferior	10,000	
	<hr/>	30,000

II. *Light-harness*—

First-class well bred.....	5,000	
Middling	20,000	
Inferior	35,000	
	<hr/>	60,000

III. *Saddle*—

Thoroughbred, including Arabs	1,500
Well-bred	8,000
Middling	50,000
Inferior	60,000
Very inferior	50,000
Add wild	20,500
	————— 190,000
	—————
	280,000

The large amount of inferior stock here displayed shows the degenerating effect of the negligence which has been too general during the last twenty years. Some further particulars as to the different classes of stock will help to display the present condition of Colonial industry in this line.

I. *DRAUGHT*.—These have been chiefly bred in the Counties of St. Vincent, Camden, Cumberland, Northumberland, Durham, Brisbane, Wellington, and Bathurst, and the principal gentlemen who have devoted themselves to their production have been Messrs. Bray, Warn, Wade, Hoskisson, Malone, Clift, G. Rouse, Archibald Bell, and Captain Turner. Among the breeds which have been introduced are the Cleveland, the heavy English dray-horse, the Clydesdale, and the Suffolk Punch. Owing to the unfortunate prevalence of opinion that an intermixture would result in improvement, there has been but little systematic attempt to keep the Home breeds separate, but on the whole the Clydesdale blood is predominant.

Heavy Draught.—These are mostly descended from imported English dray-horses, mixed with the larger class of the modern Clydesdale breed. They are of course chiefly to be seen at dray-work in Sydney, but they are also to be met with in the County of Cumberland, and in the districts of the Hawkesbury and the Hunter. They are most suitable for town-work, as they are too slow and require too good feed to be economical for farmer's use; and indeed it is questionable whether the smaller

Clydesdale and more active Suffolk Punch are not even in town more profitable stock. The prices of first-class heavy draught stock range from £15 to £25 unbroken, and when broken, from £20 to £35.

First-class Farming.—These are mostly the descendants of the early Clydesdale and Suffolk Punches, and are principally to be found in the Counties of St. Vincent, Camden, Cumberland, Bathurst, Northumberland, Durham, Brisbane, and Wellington, although there is a sprinkling of them through the whole of the uplands and intermediate country. Where moderate care has been bestowed in breeding, this class of horse is compact, staunch, and active, and is well adapted (perhaps the most adapted in this Colony) for farming purposes, and even for carrying on the road. This style of horse ranges at present from £12 to £25 unbroken, and when broken, from £20 to £30.

Middling Draught.—The best of this class are the remnant of the old New South Wales draught horse. He was a comparatively high-standing, rather big-headed, light-boned, ragged-hipped, active, hardy, animal, and clearly, from his colour, shape, carriage, and the roundness of his cannon-bone, a scion of the Cleveland stock, with, in many cases, a dash of the thoroughbred. He was pretty staunch, very active, and was good for plenty of work, notwithstanding the scurvy treatment he received, he having in many cases, like the working bullocks, to find his own food. This class is now principally made up of the best of the cross-descendants of the draught horse and light mares. They are, upon the whole, useful stock, and do more work than might have been expected of them, but they are not to be depended on for staunchness like the pure bred draught. Their prices range from £8 to £16 unbroken, and from £10 to £20 broken.

Inferior and very inferior Draught.—These are mongrels, as may be easily seen by studying their points in detail. They are a mixture of the heavy sire and light mare, and all have more or less coarseness about them. As a general description it may be said

that they have large, coarse, fleshy heads and short necks; that they are long in the barrel, weak in the loins, light in the bone, and comparatively small in size. In fact they are little else than an ill-made, cross-bred, light-harness-horse, and considering their origin nothing better was to be expected. When the gold-fields were discovered in 1851, there was an immense demand for draught horses, and they ran up to fabulous prices. Anything that had the smallest resemblance to a draught-horse, if it were only the possession of hairy legs and a big head, brought at that time from £30 to £60, while a really good animal would fetch from £100 to £200. The best market was in Victoria, where draught stock was in great demand to take up stores to the gold-fields, and not only the male but even the female stock was sent across the border, so tempting were the prices. To add to this exodus, breeders in Victoria sent up agents, who scoured the districts of the Hawkesbury and the Hunter, and bought up all the decent brood-mares they could find. Since that date there has also been a further demand on our brood draught mares to stock New Zealand and Queensland. This drain upon our resources would not have been of so much importance if the vacuum had been supplied by the importation of first-class draught stock from the Mother-country, but unfortunately this precaution has been almost wholly omitted. During the last ten years there have not been more than twenty or thirty head of draught sires imported, and not many mares.

The consequence was, that tempted by the prospect of immediate gains, breeders endeavoured to produce stock having some draught characteristics. Those who had good up-standing well-bred mares, put them to draught horses, and some whose studs consisted only of light saddle-mares put them to draught sires. The result was a lot of cross-bred mongrels, and in most of the midland and eastern districts of the Colony there are thousands of this cross-bred stock employed by carriers on the roads; and a team of from six to twelve of them, small, nondescript, and mostly ill-fed beasts, may be seen drawing, at the rate of about half a ton per head, with a driver trudging

alongside, and handling the team as he would so many bullocks. The horses get no grooming, and little or no corn or chaff, unless they happen to be in or near town. In Victoria, whither the best of our horse-stock went, a team generally consists of from four to six fine, well-fed, well-groomed, heavy draught horses, and they draw at the rate of about a ton a horse, with the driver seated on the box. It is partly due to the superiority of their teams that the Victorians supply so much of the south-western portion of this Colony.

The scarcity and dearness of labour during the gold mania was another cause of the deterioration of horse-stock. Station hands left in large numbers, and stations were everywhere undermanned. Very few runs were at that time fenced in, and horses wander more than cattle or sheep, and especially in years of drought. Many owners were too short-handed, or too careless to muster their stock periodically, and much of their male increase was allowed to be too old before they were cut and branded. On open runs wild and inferior horses thus came in contact with the mares, the latter also beginning to breed at too early an age; and we have here the origin of thousands of those worthless animals which have recently been shot down, either to get rid of them, or for the sake of their hair, or which have been sold at prices ranging from five to twenty shillings a piece. The fact of the great inferiority of the draught stock of this Colony is indisputable, and the causes of it are easily traceable; but, to recognize both the fact and the cause is the first step towards improvement, and to this the Agricultural Society has already greatly contributed. The Colony has a great deal of lee-way to fetch up before it can recover the position it once held, or place itself abreast of the neighbouring Colony of Victoria; but a beginning has been made in the march of improvement, and if steadily prosecuted in the right direction a few years will show a change. There are a good many breeders now in the Colony who are devoting themselves to the production of first-class draught stock, and the competition of their exhibits each year will both indicate and stimulate the progress.

II. LIGHT-HARNESS.—This species of stock in the Colony may be divided into three classes:—1st. Those from the pure-bred coaching-sire and dam.—2nd. Those out of a roomy mare by the thorough or well bred horse.—And, 3rd. Those out of a light mare by a draught horse. Of the first of these there are now scarcely any representatives in the Colony; certainly there were none at the Exhibition. Some few pure coaching-horses have indeed been introduced by Messrs. I. K. Cleeve, George Campbell, Capt. Russell, T. W. Smart, and John Eales, but no systematic attempt has been made, or at any rate none is now being made, to maintain a breed of pure, light, harness-horses, and the progeny of the imported coaching-horses is now lost in the general stock.

Belonging to the second division there are a good many horses in different parts of the Colony; in fact, nearly all the best of our coaching and light-harness-horses have been thus bred, as also have many of the better sort of the medium class.

Of the third division there are only too many, for almost all the worst of the middling, and nearly all the inferior and very inferior, light-harness-horses have been bred in this way.

Well-bred Light-harness.—These have been almost all got by the thorough or well bred horse out of roomy, active, clean-legged mares. A few however have been got by a heavy horse, generally a Clydesdale, out of a well-bred mare. This division contains a good many excellent animals, ranging from the showy well-bred carriage to the fast-trotting stylish buggy-horse. Their prices range from £8 to £18, from four to five years old, unbroken, and from £15 to £50, broken.

Middling Light-harness.—The principal portion of the best of these have been got by a horse with some pretensions to breed out of a large mare. The majority by a light-made draught horse out of saddle mares, and the balance by heavy draught horses out of small mares, or out of mares the descendants of that cross. The horses of this class are neither very handsome nor very good, and lack both carriage and style; but they are good slaves, and cost but little money. Their prices range from £1 to £8 at from four to five years old, unbroken, and from £3 to £12 broken.

Inferior Light-harness.—These are almost wholly a cross between the heavy horse and the light mare, or the descendants of that cross. They exhibit the ruinously prejudicial effect of crossing the lighter breeds with the heavy draught, though not exactly in the same way as in the case of the draught breed. In this case the evil that followed was the production of a lot of ill-made nondescripts, quite unfit for draught purposes, while in the case of the light-harness, and also of the saddle-horses, damage was done in two ways: First, by the production of a comparatively worthless animal; and secondly, and most fatally, by destroying the race of large, roomy, well-bred mares, which the Colony possessed before the cross was so generally practised, and supplying their place by a lot of ill-bred mongrels. This accounts for the complaints so frequently heard, that we have now no mares of the right stamp from which to breed good upstanding saddle-horses. It has already been said, in treating of the draught horses, that the effect of putting a draught sire to a well-bred and light mare has been to give us a race of big-headed, short-necked, light-boned, long-backed, badly-coupled nondescripts; and if we add to this that they are also, in virtue of their paternal descent, cloddy and straight in the shoulder, low in the wither, and big in the feet, the inferiority of the large proportion of our light-harness-horses, which are bred from mares of this description, is easily accounted for. The horses in this division of this class are especially deficient in carriage, style, and endurance.

The remarks previously made as to the causes of deterioration in the draught horse, such as the absence of fencing, the too general carelessness and neglect of owners of stock, the losses through drought, the sale to other Colonies of the best brood-mares, and the breeding from inferior sires, and the injudicious intermixture of breeds, apply equally to the case of the light-harness-horse. Here too there have been no importations to make good the defects. Very few coaching-horses have been imported during the last ten years, nor have there been many hunters, though the very best light-harness-horses that we have have been got by them.

III. SADDLE.—Horses of this description constitute more than half of the whole horse-stock of the Colony, and are about equally divided between the counties and the pastoral districts.

Thoroughbreds for racing purposes.—It is estimated that there are about 1,500 horses of this class of all ages in the Colony; and the opinion of those best qualified to judge is, that our thoroughbreds for racing purposes have of late years improved. This solitary exception to the general run of our horse-breeding is due to the enthusiasm for races. Racing is a popular pastime, and never during all the gold mania was the breeding of racers neglected. The stock has not been spoilt in any way by intermixture, nor has the care requisite to keep this style of horse in condition been pretermitted. It is, however, still a much disputed question whether racing-sires have really been of use in the production of good light horses for general purposes, and whether the value of this particular breed is not mainly confined to the amusement of the racecourse. This is thought to have been indicated by the poor show of hackneys. At present it is thought that to breed wholly from Arab sires would give us a race of undersized horses, because the Colony is deficient in good upstanding mares, and it is necessary to go to the thoroughbred for size; but where the mares are satisfactory, it is the opinion of many breeders that the Arab sire is more to be relied upon. This, however, is not a universal opinion, some breeders objecting to the Arab produce as being too heavy in the shoulder, though others deny the liability to this defect.

Well-bred Saddle.—This description is intended to apply to horses that will carry a man comfortably from 50 to 60 miles a day for a week, and it is considered that there are not more than 8,000 such animals in the Colony. They are of course the produce of mares that have none of the draught alloy in their veins, and by sires that are thoroughbred, or nearly so. Although, when the discovery of the gold-fields disarranged the ordinary course of station management, too many owners crossed their mares with draught horses, there were some who did not, and they have reaped the reward of their adherence to the rules of

correct breeding, their stock having continued to fetch fair prices even when middling and inferior horses have been almost unsaleable at any figure. The average size, as well as the number of well-bred saddle-horses, has generally diminished, and an up-standing, good-shaped, well-bred horse is now seldom seen in our sale-yards. The fact is, that this class of animal is not only scarce but is in great demand in the bush as a stock-horse, and when well-bred and properly broken into his work is about the most valuable horse in the Colony. It is difficult to quote prices for this kind of stock, as a really first-class weight-carrying hackney is a comparative rarity in the Sydney market.

Middling Saddle.—These fall under three descriptions:—1st.—Well-made small hacks, under $14\frac{1}{2}$ hands. 2nd.—Stout, straight-shouldered, cobby-made horses. 3rd.—Rather light, leggy, poorly-coupled horses. The remarks made as to the falling off in the breed of saddle-horses do not apply so generally to those that are undersized, as many of these are of fair shape, and possess many of the best qualities of our old saddle-horses. These smaller horses have of course none of the draught-blood in them, and their superiority affords additional proof of the evil of the cross-breed. The middling-class of saddle-horses is distributed pretty generally throughout the Colony; their prices have lately ranged from £2 to £8, unbroken; and from £3 to £9, broken.

Inferior and very inferior Saddle.—These are only too numerous—numbering probably not less than 110,000; they cannot be characterized as anything better than an ill-bred mongrel lot, and the greater part of them are only fit for boiling down; they scarcely pay for breaking-in, as even then they will only fetch at the yards from £1 to £3, while when unbroken they have been sold in numbers at from 2s. 6d. to £1.

Causes of deterioration.—The same reasons that have already been mentioned as causing the falling off in the quality of heavy and light harness-horses, have also operated with respect to saddle-horses, but the result has been more injurious, for the light-harness-horses, though inferior, have been able to do a

certain amount of work, and have been cheap. For vans, spring-carts, cabs, omnibuses, and coaches, they have been used up rapidly, though with but little endurance, and breaking down comparatively soon, their first cost is small, and they are quickly replaced. But with saddle-horses and hacks the inferiority is not so tolerable; these must be of a certain shape and style, and have the indispensable drop of good blood to do the work at all in a bearable manner. Everyone, from the roughest stock-rider up to the fashionable equestrian, appreciates the ease, spirit, and endurance of a well-bred animal contrasted with the roughness, want of paces, and lack of spirit, to be found in the general run of horses; and complaints are frequent and not ill deserved.

In addition to the causes which have tended to the deterioration of other breeds of horses, the class of saddle-horses has suffered from the introduction of light thoroughbreds, and the cessation of the importation of Arabs. This last evil is in a fair way of being remedied. Some new Arabs have been introduced—two by Mr. J. White, and two by Mr. A. A. Dangar—and after the experience of the last twenty years many breeders are convinced that New South Wales can only recover its former prestige for good saddle-horses by returning to a more frequent use of good Arab sires, and that for our climate the Arab blood judiciously intermixed is a far better strain than that of the English racer.

Much damage was also done about thirty years ago by the introduction from South America of a most worthless description of animal, commonly known here as *Valparaisos*, and which got intermixed with our better description, as, owing to the very low value of horse stock during the general depression which existed in 1841-2, many breeders who had up to that time taken much care of their stock, turned them loose in the bush and allowed them to breed indiscriminately, till in the course of time the good mares became extinct, and left in their stead a class of animals quite unfit to breed from. Some deterioration may also be ascribed to the want, especially in dry seasons, of sufficient nourishment after weaning.

Wild Horses.—There have been some of this class in the Colony from very early days, but they have multiplied greatly during the last twenty years. In nearly all the unfenced, mountainous, and upland tracts, and even in some of the merely undulating country, there are to be found mobs of wild horses. So also are there in the unenclosed scrubby country on the great salt-bush plains. They are an unmitigated nuisance; they injure stock-owners by consuming grass and water, disturbing the other stock, and mixing with the mares. And this is not the least evil, for they greatly promote demoralisation. Youths, bred in the bush, are tempted to run in, and brand stock, with their progeny, that do not belong to them, and too easily slide from this practice into the form of horse-stealing, known as duffing. It will be greatly for the interest of the Colony when the wild stock is destroyed, and to this the enclosure of runs will greatly tend.

Prospects of Improvement.—The facts and the causes of the deterioration of the horse-stock in New South Wales have been sufficiently alluded to, and at the same time the prospects of improvement have been indicated. By way of recapitulation, however, these prospects may be said to lie in,—First,—the dearly-bought experience owners have acquired during the last ten years as to the ruinous consequences of mixing different breeds. Second,—the more correct ideas which are beginning to prevail among them as to the true principles of breeding, and the value of pure stock, and consequently, the increased care which is now being given to the culling of brood-mares, and the selection of suitable sires. Third,—the extension of fencing, and the increased value now set on grass. Fourth,—the destruction of wild horses. Fifth,—the demand for the Indian army. Sixth,—the renewed importation of Arabs, and the growing desire to produce a stouter and more generally useful class of well-bred horse.

Export to India.—New South Wales is quite capable of producing the class of horses for which there is a demand in India, but at present the trade is not very extensive. No-Indian officer is stationed in the Colony to make himself acquainted with the

principal breeders, and to furnish such information and encouragement as might lead to a steady supply. The purchasers are speculative shippers, and of these there are only three or four. The speculation is a somewhat hazardous one, as, apart from the risks of the passage, horses rejected by the Government buyers are at once so depreciated as to be scarcely saleable. During the last ten years the shipment to India has been at the rate of about 250 horses per annum. The average length of the voyage is about sixty days, and the cost of transshipment amounts to about £23 10s. per horse, of which about £12 10s. goes to the ship for freight, and the remainder is spent in food, wages, and miscellaneous charges. The fitting-up of a vessel in Sydney for horses generally costs about 20s. or 22s. per stall. It is necessary to take one groom for every ten horses, whose wages are at the rate of £2 per week, with a bounty of 20s. per head for each horse landed safely. The "super" also generally receives the same bounty. The principal breeders, from whose stock horses are selected for the Indian market, are Messrs. George Campbell, of Duntroon, W. Rutledge, of Molonglo, Mr. Bell, of Muswellbrook, Mr. Reynolds, of Tocal, Mr. Dines, of Singleton, Mr. A. Town, of Richmond, Mr. Tindale, of Ramornie, Messrs. Barnes and Smith, of the Clarence, Mr. Graham Mylne, of Etonsville, Mr. W. J. Dangar, of Neotsfield, Mr. Busby, of Cassilis, Messrs. Wyndham, of Bukkulla, and Messrs. White, of Upper Hunter. Messrs. Cheeke, Mylne, and Tait have also furnished racehorses that have achieved distinction in the Peninsula. There are five descriptions of horses that find sale in India,—

1. *Cavalry remount*.—For this purpose is wanted a compact well-bred horse, from 14 hands 3 inches to 15 hands 2 inches. The price in the Calcutta market is about £65, and in Madras about £57.
2. *Artillery*.—For this purpose the horses are required to be of the same height, but rather stronger, and the price is about the same.
3. *Gentlemen's hacks and chargers*.—These are required to stand from 14½ hands to 15 hands, and their prices range from £45 to £75.

4. *Racehorses*.—These fetch a fancy price, which has ranged from £300 to £600.

5. *Carriage-pairs*.—Horses of this class, from 15 to 16 hands high, have realized from £100 to £150 per pair.

Horses at the Exhibition.—There were altogether 130 animals shown, of which no fewer than 46, or more than one-third of the whole, were blood stock. These constituted the real attraction in this section, and, as may be inferred from what has been said above, were the only horses that really justified admiration. Not only in number, but in quality and condition, they were in the highest degree creditable to the Colony, and proved that breeding racers was a sufficiently profitable, or a sufficiently stimulating, pursuit, to maintain the art in a high degree of perfection. There were 19 blood-stallions of three years and upwards, and these did not constitute the whole, perhaps did not even include the best, that the Colony had to exhibit. The close proximity of the Randwick races kept away several. The chief prize was awarded to Tarragon, a Colonial-bred horse, and the second to Yattendon, a younger horse, and also a native. It is worthy of remark, as showing how nearly the two animals are considered equal, that in the previous year they both competed for the same honor at the Agricultural Society's Show, and were differently ranked, Yattendon then being awarded the prize. They won their honours this year in competition with four English thoroughbreds, namely—Velocity, Coræbus, Livingstone, and Stafford; and also against two imported Arabs, namely—Farhan, imported by Mr. A. A. Dangar, and a bay Arab belonging to Mr. White. Out of the fourteen Colonial-bred horses in this class six were by New Warrior, and three by Stafford. Of younger blood stallions, there were exhibited seven of 2 years old, and five yearlings. Among the former the most noticeable was the imported horse, Grandmaster, son of the celebrated Gladiateur. All the others were Colonial-born.

Of female stock there were only fifteen shown, and only one of these was imported. From the earliest days our blood stock has been weakest on the female side. The importation of mares has been very scanty, compared with that of horses, and breeders

have trusted to sires to work out the inferiority on the female side. This is a process, however, that has never been accomplished ; and one great reason for the scarcity of good hackneys has been that the sires have not been properly matched with worthy mares.

In heavy stock there were forty exhibits, the display, both in number and quality, being inferior to that of blood stock. The prize-takers were Mr. A. Town, of Richmond, Mr. Ward, of Bankstown, Mr. Downes, of Brownlow Hill, and Mr. Elliott, of Kiama. Among the farming stallions there were four importations, two of whom took prizes ; but there were no imported mares ; and amongst the heavy draught stock there was only one imported horse, and this took the first prize.

Among the thirteen light-harness-horses there were no imports, and the one that took the prize was of unknown lineage on both sides, although several of his competitors had something to boast of in the way of descent. There was but one pair of carriage-horses exhibited, and they were only adjudged worthy of a second prize.

There were four hunters, and the two that took the prizes were aged, and one of them of unknown descent. Ten gentlemen sent their hackneys, all of them showing the effect of good stabling. The prize-taker was descended from Modesty, by Little John.

There were twenty-two ponies, divided into two classes, of not exceeding 12 and 14 hands high respectively. Of the larger size the prize was given to an aged animal, descended from Saladin. The prize-taker in the smaller class was of unknown descent.

CATTLE.

The cattle-sheds at the Exhibition competed fully with those of the horses in enlisting public attention, and contained really more to admire on the part of those who are acquainted with the productive industries of the Colony ; for not only is the stock of cattle far more numerous and more valuable than that of horses, but taken as a whole it is relatively of superior quality. For though the very best of the thoroughbred horse-stock may be better in comparison than the best of the cattle, yet the great

bulk of the latter are superior to the great bulk of the former. The same causes that have brought about the deterioration of the horse-stock have also operated to keep down the excellence of the cattle ; but their influence has been limited by the constant and profitable demand for bullocks of good quality for food. There has not been any concentration of attention on one pet class to the comparative neglect of all the rest, but the attention has been more generally diffused, and the influence of the imported stock has been more widely spread. Although very much remains to be done to perfect the breeds of our cattle, and bring up the average quality to a standard, which, though high, is quite practicable, there is on the whole less reason for regret and more matter for congratulation with respect to our horned stock than our horses.

According to the *Statistical Register* of 1869, the cattle in the Colony during the past nine years have numbered as follows :—

1861	2,271,923
1862	2,620,383
1863	2,032,522
1864	1,924,119
1865	1,961,905
1866	1,771,809
1867	1,728,427
1868	1,761,411
1869	1,795,904

The decrease observable in the number since 1863 is due partly to the ravages of pleuro-pneumonia, and partly to the fact that about that time the squatters were giving a great preference to sheep over cattle. Wool was then realising a very high price, and sheep stations were paying better than cattle-runs—a process that has since been reversed.

The major part of the cattle, fully two-thirds, is of course to be found in the pastoral districts. Speaking generally, it may be said that the breeding herds occupy the table-land, intermediate, and coast districts. The grasses here are comparatively coarse, and ill adapted for sheep, which in these portions of the country are found to be liable to fluke and foot-rot.

Among the pastoral districts, New England possesses the largest number of cattle, other districts ranking in importance in the following order:—The Clarence, the Gwydir, the Lachlan, Liverpool Plains, and the Murrumbidgee. It is from these districts that our principal supply of store cattle bred in this Colony mainly come. The counties rank in the following order:—Camden, Durham, St. Vincent, Cumberland, Northumberland, and Brisbane. Ranked as to quality, the pastoral districts of Clarence, Wellington, and Bligh take the lead, while among the counties, Argyle, Camden, Durham, and Northumberland occupy a corresponding position.

It cannot be said, however, that any particular district has acquired a special reputation for any particular breed. As a whole our cattle are more Short-horn than anything else, with a sprinkling of somewhere about a tenth or a twelfth of Hereford blood. There is little or no uniformity, either in quality, colour, or shape, and there is plenty of room for improvement in each particular. This want of uniformity, with the too general mediocrity that accompanies it, is due to a large extent to the great variety of breeds from which our cattle are descended. There is in them more or less of the blood of all our principal British and Irish breeds, to which is to be added a dash of the Cape breed; and to make confusion worse confounded, many cattle-owners have proceeded on the principle that an intermixture was a good thing, and have regarded it as good management to keep up a continual round of changes in their bulls. The unenclosed condition of most cattle-runs, and the consequent impossibility of keeping different herds separate, even where there was a desire to do so, has assisted in scattering and intermixing the stock; and this process has been aggravated by the frequent droughts which have afflicted the Colony, and the scarcity and dearness of labour in the pastoral districts during the height of the gold mania.

Under such circumstances it is hardly to be expected that our cattle, as a whole, looking at them from a connoisseur's point of view, would display superior "quality." They do not, and although they have been considerably improved during the last

ten years, they are still comparatively short and rough in the "coat," hard in the touch, and large in the bone, while as to form they lack size, squareness, and fulness in the handling points. The best of the general average of our cattle are compact, short-legged, and fleshy enough, but they are comparatively light at the flank, round in the hind-quarters, and turned more like the "black poley," or Devon, than the Short-horn, from which their horn, colour, and general appearance, shows they are principally descended.

Their *meat* is, as a rule, excellent when killed on, or at a short distance from, the station on which they are fed. It is comparatively fine in the grain, well flavoured, and fairly marbled. It is seldom however that the townspeople see it in prime condition, as the effect of the droving not only depreciates the flavour of the meat but wastes the carcase. The average journey to market is about 250 miles, and the waste in ordinary seasons, and even with careful droving, is hardly less than 75 to 150 lbs., while in seasons of drought and flood, and with careless droving, the waste is greatly more. Ordinarily well-bred bullocks, off a good and not over-stocked run, will leave it at from 3½ to 4 years old weighing from 700 to 800 lbs., and cows 150 to 200 lbs. less.

Upon the whole, though there is still considerable room for improvement in the generality of our herds, the average of the cattle are very far from inferior, and even those that are the least to be admired make passable beef, and turn out when fat a fair quantity of tallow. The disposition to pay increased attention to the improvement of the breed is evident from the demand that now exists for pedigree cattle, and the high prices they bring. None of the yearling Short-horns, with any pretensions to purity of blood, fetch less than £100. Blood is beginning to be appreciated at its true value, and correct views of the principles of breeding are rapidly gaining ground. There is good reason therefore to expect a great and rapid improvement in the quality of our cattle.

Price and demand.—For the average of such cattle as those above described, the return from the Melbourne and Sydney markets may be put all round (bullocks and cows) at an average of £5

per head. For the last eighteen months or two years the demand for fat cattle has been good in both Colonies, and it is likely to improve, not only in consequence of the steady increase of population, but by reason of the large consumption by the different meat-preserving Companies now springing into existence. So far, however, as domestic consumption is concerned, it is to be noted that mutton is a cheaper meat than beef, and that the trade in it is handier and more profitable to the butcher. Beef therefore cannot rise to a very high price.

Breeds and Breeders.—The only breeds in the Colony are Short-horn and Hereford, with a single herd of Devon.

Short-horn.—This, as has been said, is the principal breed. For the last thirty or forty years the greater proportion of imported stock has belonged to it. Nearly every year has seen some importations, and the principal cattle-owners of the Colony have vied with each other in the introduction of superior animals. Many of them have been selected from the best herds in England. The effect of these importations has been most beneficial, as may be seen by contrasting the character of our cattle with those of Mexico.

The Short-horned stock of the Colony may be classified as to its quality as follows:—

Pedigree stock	(say)	4,000
First-class, well-bred	„	126,000
Well-bred to fair	„	450,000
Middling	„	750,000
Inferior	„	160,000
Very inferior	„	40,000
Total		<u>1,530,000</u>

Hereford.—There are about a dozen importers and breeders of pure Herefords, and the introduction of this strain in the general herds may be considered hitherto as having been satisfactory; and if a constant supply of pure bulls of this breed is kept up in those herds where it has hitherto been tried, further good results may be anticipated. The Herefords are hardier, more active, and carry thicker and heavier coats than the Short-horns. They are better

suiting for inferior pasturage and outlying runs, and stand the road and the winter better. They come to maturity as early as the Short-horns, but are not so heavy. A good many stock-owners are now beginning to breed from Herefords, and it seems not improbable that they will to a considerable extent eventually displace the Short-horns in the poorer country and on back runs.

Devons.—In 1832–3 the late Mr. Dickson, of Camden, imported cows and bulls of this breed, and their progeny made excellent crosses with the cattle then in the Colony, both for meat and milk, but they did not gain favour with stock-owners on account of their wildness. The Australian Agricultural Company also introduced some Devon stock, but their influence was lost in the general Short-horn herd. The only importer and breeder of Devons, of any note in the Colony at the present day, is Mr. Reynolds, of Tocal, on the Paterson. As a rule, Devons have found but little favour with our stock-owners, as they do not make up the qualities which our own stock lack, that is, quality, size, squareness, and fulness in the handling points, and are too lively in their movements for any but careful managers. It seems probable, however, that from their hardiness and their ability to travel, and from the excellence of their meat, they will ere long be found on many of the runs in the back salt bush; and as fencing progresses it is probable that in the outlying districts Devon cows will be put to Short-horn and Hereford bulls, the progeny being fattened off and not bred from.

Fat Cattle.—The total number of cattle in the Colony being about 1,800,000, and the annual draft or “cast” of fat stock that is annually saleable from a fair breeding and fattening station in proper working order, being (say) one-eighth of the whole, we have 225,000 as the annual cast of fat stock for the Colony. Taking the average prices of fat stock in the Sydney and Melbourne markets at £5, the annual value of the cast of fat cattle in the Colony would be about £1,125,000.

The Cattle at the Exhibition.—The display was intrinsically good. It would not have been surpassed in any British Colony, neither would it have contrasted badly with many local shows in

the Mother-country. Ten years ago it would not have been possible to make so good a show. The imported stock revealed the care that had been taken by those who selected the animals in England, and the Colonial produce showed that there was nothing in the climate and herbage of the Colony to cause any deterioration. The only reason why we should doubt the ability of the Colony to rival the Mother-country in the production of cattle, is the uncertainty of our seasons. During the long droughts to which the Colony is occasionally subject the stock is half-starved. In these periods many young cattle get stunted for life, and breeding cattle throw inferior stock. The mischief done during these periods is not recoverable during an equal period of good seasons.

The prize animal was Theodore, a bull imported from England and sold by auction in Sydney. He took three prizes,—first, as the best Short-horn; secondly, as the best male animal in the cattle section; and thirdly, as the best animal in the yard in that section. There were larger and fatter beasts shown, but taken altogether none that equalled Theodore in general excellence. Out of 100 points the judges awarded him 84; the nearest competitor obtaining 82. This second position was reached by Garibaldi 4th, also bred in England.

Next to English stock, the Colony has been indebted to Victoria, whence several valuable bulls have been imported. Breeders, however, are now drawing more from English than from Victorian studs, and the large ships from London are continually unloading at the Circular Quay animals selected in England by returned colonists, who are judiciously investing their pastoral gains in the purchase of first-class stock.

In the female list there were three animals of the Short-horn breed, imported from England, and five of the Hereford breed. The imports of late have not been so exclusively on the male side as they were some years ago, and the herds are not so one-sided. The best results may be anticipated in a few years by careful breeding from the excellent stock, both male and female, now continually reaching the Colony. Not long ago it was largely the

fashion for squatters to get a good bull or two, and turn them loose upon their runs; but this plan was not found to answer; the new comer had a fight with old "scrubbers," who were often more than a match for him, and the change in the mode of life very often proved fatal. The imported stock are now more carefully tended; and, with a larger supply of imported heifers and cows, and a more careful selection of the Colonial stock to breed from, the average quality of the young stock is steadily improving. The Colonial-born produce displayed at the Exhibition was of the highest promise, and that though most of the youngsters were out of Colonial dams. The value set upon them was sufficiently indicated by the prices paid at the sales which succeeded the show.

The progress made in fencing runs is tending to the improvement of cattle and the conservation of good stock. Many private estates on the coast side of the range are also having their carrying capacities increased by the process of ring-barking, which kills the worthless timber and leaves all the fertility of the soil and climate available for grass. In some instances four or five times the quantity of stock is being depastured that could be kept ten years ago.

SHEEP.

A stranger visiting the Exhibition, and ignorant of the affairs of this Colony, would never have judged that the production of wool was the foundation of our commercial prosperity, and was still our most valuable export. The animals exhibited were few in number, and none of them represented the excellence to which wool-bearing sheep have attained in this Colony. The reason of this great short-coming is to be found in the stringent operations of the Scab Act. When a few years ago the scab re-appeared in this Colony rigorous measures were adopted to stamp it out. They succeeded, but the utmost vigilance is still required to prevent the re-introduction of the disease, as owing to lamentable neglect in Victoria the disease continues there almost unabated. It is necessary to maintain boundary-riders incessantly to watch the Murray frontier, and prevent the incursion of diseased sheep;

and strict quarantine regulations are enforced at the sea-ports to prevent the disease being surreptitiously introduced by the agency of imported stock. No sheep are allowed to pass from the coast-district into the interior until they have been detained a certain length of time, and dipped and dressed repeatedly. Stock brought down from the interior, and entering the coast-district, would have to submit to this ordeal, and the owners of fine-woolled sheep did not care to run the risk of sending their best animals to be so detained and treated, or to run the risk of possible infection. Even apart from this reason, the frightful state of the roads would have militated against a good sheep-show in Sydney. The long-continued rains had made the country roads almost impassable. Sheep driven down would have brought with them more mud than wool, and to have brought them in carts would have been very expensive and nearly impracticable.

It was to be regretted that at a Metropolitan, Agricultural, and General Exhibition, so little could be done to display the great staple of Colonial industry, for notwithstanding the great and growing variety of articles the Colony is now producing, there is nothing as yet that approaches in importance the production of sheep and wool.

The first sheep imported came from the Cape. Twenty-nine were landed in 1788, and in 1792 the Government flock numbered 105. A few too came in vessels from India; the "Bampton" brought 100 in 1793; but for a long time sheep were few in number, and of great value. Mrs. Macarthur's letters mention as something wonderful, that in the year 1795 her husband had a flock of not less than a thousand sheep, and the books kept in their establishment show that in the year 1805 a fat wether was worth £5. It was from observing the improvement in the character of the wool, effected by a little careful breeding in the mongrel flock he had accumulated, that Mr. Macarthur was led to speculate on the advantages that would accrue from the importation of superior rams; and when he afterwards developed that idea into practice, the beginning was made of the fine wool-

trade of Australia. It took some time to work out the inferior strain of the ewes, but the care bestowed on the breeding of the Camden stud flock soon established a reputation that was never again lost.

The first introduction of fine-woolled sheep to the Colony was due to an accidental circumstance. Some very fine sheep of the Escorial breed (which was considered the best of the three principal descriptions of Spanish sheep) were presented by the King of Spain to the Dutch Government. Some of these passed from the Dutch Government into the possession of Colonel Gordon at the Cape of Good Hope, who was then an officer in the Dutch East India Service. Colonel Gordon shot himself, and his sheep were sold by his widow. It fortunately happened that just at that time two English ships-of-war—the “Reliance” and the “Supply”—had arrived at the Cape from New South Wales for supplies. Twenty-nine were put on board the two vessels bound for Sydney. Some died on the passage. On their arrival, which was in 1797, Captain Macarthur offered £15 a head for the whole; but Captain Waterhouse refused to sell them all to one person, and distributed them, keeping a small flock for himself, which, on his subsequently leaving the Colony, he sold mostly to Mr. Cox. Colonel Gordon’s flock, or part of it, was in this way secured to New South Wales. But though some half-dozen persons had thus equal opportunities of forming stud flocks, Captain Macarthur, whose share consisted of three rams and five ewes, was the only one with the foresight and sagacity to appreciate the importance of maintaining a pure breed. The ewes then in the Colony, especially those from India, though producing only a coarse hairy wool, were very hardy and prolific, and fat wethers ruled at a very high price. The presumption is, that the other owners of Colonel Gordon’s sheep thought only of quantity and of immediate gains, for ten years afterwards, when Governor King made inquiries on the subject, the fine strain had vanished, except in the case of the one flock. In 1802 Captain Macarthur went to England. The woollen manufacture at that time was a close corporation; workmen were jealous of the introduction of

new hands, and only those who had served their apprenticeship could be employed. The master manufacturers rebelled against the restrictions thus placed on their trade, and in memorials to Parliament pointed out how the commerce of the country was limited thereby. The workmen, who considered the interests of their order imperilled by free trade, replied that the allegation of the masters was false; that there was only one country in the world, namely, Spain, from where the fine wool came, and as the quantity was limited the manufacturers could not possibly expand the trade. Just at this juncture Captain Macarthur produced specimens of the Australian wool, thus demonstrating that there was another country, and that one of indefinite capabilities, where fine wool could be grown. The exhibition of these samples greatly facilitated his efforts for pushing the wool-trade in Australia. Before returning to the Colony in 1805 he purchased at Kew, at the annual sale of George the Third's stock, eight or ten rams and ewes. These also were of the Spanish breed, and had been a present from the King of Spain. But they were not quite identical in quality with the sheep from Colonel Gordon's flock, and were considered a shade inferior. It is a curious fact that an effort was made to prevent the transmission of these sheep to Sydney. The day after the sale a paragraph appeared in the *Times*, expressing regret that the colonist who had so invested his capital had not previously made himself acquainted with the laws of the country, as their exportation was illegal. But when it was found that the penalty was cutting off the right hand and branding the forehead, and that the prohibition was to be found in an old unrepealed statute of Edward the First—one of the many measures intended to *protect* the trade of the country—the difficulty ceased to be formidable.

The Camden stud thus founded by Captain Macarthur was kept for more than fifty years, and was not finally dispersed till 1858. The flock at its maximum numbered about 400 ewes of the first class and 500 of the second class. A large part of the flock went over to Victoria, where, under careful management, the weight of the fleece has been considerably increased. In 1823 there

were several private importations of fine-woolled Saxon sheep, and in 1825 the Australian Agricultural Company imported sheep from France and Saxony. Both breeds, however, had been derived originally from the Spanish. It is worthy of remark that catarrh was not known in the Colony till after the arrival of the Saxon sheep.

Mr. Riley was one of the first to follow the lead of Captain Macarthur in bestowing attention on the breed, and at his estate in Raby began the formation of a flock gathered from various quarters. This flock passed into the hands of his neighbour, Mr. Cox, of Mulgoa, who was also devoting his attention to the matter, who had secured some imported French ewes from the Empress's flock, and who ultimately moved his stock to Mudgee. This removal may be considered the second epoch in the fine-wool trade of the Colony, for it placed the sheep in the climate best adapted for the production of wool. In the coast country it is impossible to grow the finest wool. Neither at Camden, Raby, or Mulgoa, could stud flocks ever attain the excellence they have at Mudgee. It is now fully thirty-five years since Mr. Cox's flock was removed to the high lands, and during that time careful persistent breeding has developed the best type yet obtained of the New South Wales merino. The process of acclimatisation has modified the original type of the Spanish merino. There has been a very decided gain in the softness of the wool, and an improvement in its elasticity; but there has been a diminution of the felting quality, which can scarcely be considered a loss. The wool has also increased in length but diminished in density, so that the weight of the fleece remains about the same. The best Mudgee sheep yield about three pounds of clean spout-washed wool, which is equal to six pounds of greasy wool. How far a longer process of acclimatisation will still further vary these results, remains to be proved, but it is already sufficiently demonstrated that the merino is by Australian acclimatisation improved in some important particulars. Nor is there any trace of degeneracy of constitutional vigour, except so far as injury is received by deficiency of food in seasons of drought.

We have no available information as to the exact annual growth of the clip of the Colony, or of its value. But for the year 1821, the second year in which the Colonial wool was sold by *auction*, a broker's catalogue has been accidentally preserved, with the prices attached in MSS., and from this we find that 329 bales were sent Home in the "Shipley" and sold at Garraway's. The Camden wool realized from 2s. 5d. per lb. up to 3s. 10d. Two bales fetched 5s. 6d., and some even went as high as 10s. 4d. Jones, Riley, & Walker's wool ranged from 1s. 1d. to 1s. 9d.; Hannibal Macarthur's, from 2s. 2d. to 2s. 10d.; John Oxley's, from 1s. 8d. to 2s. 2d.; John Wood's, from 1s. 9d. to 2s. 2d.; William Howe's, from 2s. to 2s. 6d.; Berry & Woolstoncraft's, from 1s. 1d. to 1s. 8½d.

The wool trade once established was so natural to the soil and climate that it expanded with great rapidity, and until the last two or three years colonists have been incessantly exploring fresh country, taking up new runs and multiplying flocks, in the full belief that it was impossible to glut the markets of Europe, or bring wool down to an unremunerative price. Against this expansive tendency a re-action has now set in. The great and rapid decline of wool has stopped for the present all extension of this industry. In the northern parts of Queensland hundreds of runs have been abandoned, and in this Colony some of the remoter country, eagerly taken up during the speculative era, has not yet been stocked. Instead of the production of quantity the attention of squatters is now directed to quality. They have been forced by a painful experience to see that in the hurried attempt to overspread the whole available portion of the continent with sheep, the flocks have not been sufficiently culled, and a deterioration has taken place in the general average of the stock, which it will require some years to retrieve.

Capabilities of different parts of the Colony for Wool-growing.—The different degree of success attending sheep-farming in different parts of the country has also compelled attention to the fact that the whole of Australia is not equally fitted for the production of fine wools, and we have now commenced a careful

and discriminating enquiry into the special characteristics of the different parts of the Colony, and are slowly ascertaining what districts are best suited for the different purposes. Roughly speaking, the Colony of New South Wales may be climatically divided into four zones or belts:—First,—the coast-country, extending from the sea-board to the main range, and the breadth of which belt varies at intervals from 20 to 100 miles; secondly,—the table-land or upland districts on the flat or undulating summit of the range; thirdly,—the upper part of the western slopes; and fourthly,—the level arid interior, or as it is called, from the chief characteristic of its vegetation, the salt-bush country.

Along the eastern seaboard, and for some distance inland, the climate is too moist, and the country generally too poor and unsound for merinos. How far the coarser-woolled sheep could thrive in these parts is still an unsettled question, and even were it determined in the affirmative it would still remain to ascertain whether the country could not be put to better account in other ways. Where the soil is good, as on the Hunter and other Northern rivers, and as in the coast districts to the south, it is devoted to dairying purposes and arable culture; and it is probable that the country is thus more profitably used than in producing large-framed, coarse-woolled sheep.

On the higher country, towards the top of the coast range, some sheep are kept, but generally speaking the pasture is too rank and sour, as well as too exposed, for sheep to thrive there. The land around the sources of the Hawkesbury, Hunter, Macleay, and Clarence Rivers, however, must not be thus disparaged, as these rivers rise far inland, where the soil is of a different quality, and where the climate is less influenced by the sea. In the upper watersheds of these rivers there are about 1,360,000 sheep.

After surmounting the coast-range the grazing and wool-growing capabilities of the country improve, although the more upland and mountainous portions are still inferior; and, owing to the comparative wetness of the soil, the sheep depastured there are liable to fluke and foot-rot. Further westward, as the altitude

of the country diminishes, the climate and pasturage for wool-growing purposes improve, and the intermediate country between the table-land and salt-bush plains is first-class. Even here, however, there are better and worse, for those portions, which like the districts of Mudgee and Queanbeyan, overlie limestone strata, are found to be the best for wool-growing. Next in value to these are the southern portions of what is popularly termed *Riverina*, or the plains watered by the westward-flowing rivers, and those portions of the salt-bush country which are nearest to the intermediate. Here the fibre gets coarser, but as the pasturage is plentiful and nutritious, the fleeces are heavy and the staple generally sound. As we go further into the salt-bush country the fleeces become lighter and the wool harsher; but by way of compensation for this defect, the runs there are far more fattening, as well as more healthy and sound, than in the intermediate district. The extreme south-western, western, and north-western portions of the Colony are, from the heat and dryness of the climate, less favourable to the production of fine wool and heavy fleeces, but that even there, with careful management and a periodical introduction of fresh blood, a good wool and fair fleeces can be produced, was demonstrated at the Exhibition in 1869. Some of the disparagement under which wool from this district has suffered, is to be ascribed less to the climate than to the inferiority of the stock. Many of the runs there were taken up at a time when there was a great rage for this country, and when, in order to fulfil the Government conditions of the lease, it was necessary that the country should be stocked to a certain point. Anything was sent that would count as a sheep, and many so sent were not worth breeding from. This inferior stock has the more readily succumbed to the deteriorating influences of the climate, but this early defect may be retrieved in course of time by patient care in culling and breeding.

Number of Sheep in the Colony.—New South Wales is at present only the fragment of its former self—the three prosperous Colonies of Victoria, South Australia, and Queensland, having been carved out of its once ample domain. The last of these

subductions was in 1861, when its northern territory was constituted into the separate Colony of Queensland. Taking that year as a starting point, the official returns give the following as the number of sheep in the several years, though there is good reason for believing that during the earlier years the number was underrated:—

1861.....	6,119,163
1862.....	6,550,896
1863.....	7,169,926
1864.....	9,089,463
1865.....	9,650,106
1866.....	11,644,593
1867.....	15,066,377
1868.....	16,000,000
1869.....	16,848,217
1870.....	16,218,825

An observable increase is specially noticeable in the years 1866 and 1867. During these two years the seasons were good, and the cotton famine helped to make the price of wool high. Fencing was carried on to a great extent, especially on the large runs of Riverina, and the sheep being turned out unshepherded on these enclosed runs, the country was able to carry more to the acre. Many squatters from Victoria, crowded out by the growth of population and the extension of agriculture, migrated with their flocks into the south-western part of this Colony; and many owners of cattle sold them to make way for sheep. In the two following years the seasons were unfavourable. During the last year the numbers show an actual decrease of 629,892, and this is to be explained partly by the losses sustained during the severe drought which took place during the latter part of 1868 and the beginning of 1869, and partly by the very large consumption of sheep by the Meat-preserving Companies. The low price of wool having greatly diminished the profits of sheep-farming the culling of flocks has proceeded much more vigorously than before. There is no disposition to increase numbers, to take up new runs, or to overstock old runs. The tendency is all the other way, and the inferior stock has been sent remorselessly to the pots. The operation is a wholesome one, and though the diminished number

of sheep appears at first sight to indicate a retrograde movement, it is not so in reality. The inspectors of sheep estimated that the losses from drought were a million, but this must be an underestimate, considering that we have to account for the annual increase on a total of 15,000,000 sheep.

Stud Sheep.—Sheep from the best German, French, and American flocks have from time to time been introduced into the Colony and interbred with the Australian merino, and some remarkably fine sheep have been thereby produced; but the conviction is now growing that Australia has little or nothing to gain by encouraging further importations of this kind, for not only is there no natural deterioration due to the climate, which requires to be made good by the perpetual infusion of fresh blood, but, on the contrary, there is an improvement. Nothing that is imported surpasses or even equals in its specialities the best specimens of the Australian merino. By this last term is understood the produce of the imported merino, carefully bred in the most favourable districts of Australia, and guarded from any injurious intermixture with imported blood. The full and special effect of the climate has been thereby obtained at its maximum, so far as the time that has elapsed has allowed. To intermix this special Australian strain with importations is only to undo the good effect of the Australian climate, *i.e.*, better result is to be obtained by careful culling and by close adherence to the best Australian breed. Under this conviction the importations from Europe have of late considerably fallen off. New South Wales, however, has drawn very largely on the stud flocks of Victoria, and would have done so still more but for the unfortunate prevalence of scab in that Colony. The quarantine regulations prohibit sheep from crossing the Murray to the northwards; so that, instead of a short journey from Victoria to the runs of Riverina, sheep have to be sent down to Melbourne, round by sea to Sydney, to perform quarantine and undergo ablutions in our coast districts, and then make a land journey up the country.

Previous to 1864 no record was kept of the importations of stud sheep. Since that time about 3,500 have been introduced from Victoria, about one-half of which were ewes, and 500 from

Tasmania, New Zealand, America, England, France, and Germany. Now, that the importance of developing the Australian merino is distinctly recognized, the formation of stud flocks is becoming more a matter of concern, and from those who have the requisite qualifications the employment is likely to be one of considerable profit, as for many years there must be a large demand for stud sheep before Australian flocks generally are brought up to their proper standard, and full justice is done to the virtues of the climate.

The finest stud-sheep in this Colony are to be obtained at Mudgee—a district where art and nature have combined to produce a favourable result, and where the Messrs. Cox and Mr. N. P. Bayley have especially distinguished themselves. The climate is temperate, the soil moderately fertile, the grasses nutritious without being too rich, and some of the settlers there have had the good sense and the good fortune to pay unremitting attention to quality, and to follow out perseveringly sound rules of breeding. Over how large a portion of the Colony what may be called “Mudgee results” are obtainable is at present undetermined, but there seems good reason to believe that equal skill and attention might produce equal results in the greater part of the belt on the west of the table-land. Breeders favourably situated are now being stirred up to emulate the fame of Mudgee, and from this generous competition the best results may be anticipated.

Repeated attempts have been made of late years to try and combine the two requisites of large carcass and fine wool in the same animal, and for this purpose merino ewes have been crossed with Leicester and Southdown rams; but the result has been uniformly a failure. The stock of the second generation has been comparatively worthless, and the effect of the cross has simply been to spoil the merino breed without any adequately compensating advantages. The practice is now nearly abandoned, and breeding for wool and breeding for carcass are regarded as separate undertakings. If in this Colony the demand for the

meat-preserving establishments should make it pay to produce large-framed sheep, then it would be better exclusively to cultivate the large breeds in those parts of the Colony where the climate and pasture are suitable for them. But at present it seems very doubtful whether (except perhaps for the supply of lambs) there will be any need to bestow special attention on large sheep, as the merinos will probably make up in number what they lack in size. There is still a very large proportion of the Colony unstocked or only half-stocked, and the annual increase from the full number of sheep which the Colony can maintain will yield an immense annual cast for slaughter.

Improvement in Flocks.—Nothing has done so much to stimulate improvement as the apparently disastrous fall in the price of wool. With a high and rising market, wool-growers were greedy of quantity. The effect of the glut has been to show that coarse and inferior wool can be produced in quantity in other parts of the world, and at least as cheaply as in Australia; and that low class wool is the first to feel the falling price, and feels it the heaviest. A very general effort therefore is now being made at the production of superior wool, and though no amount of energy can undo in one season the errors of faulty breeding, or the neglect of a series of years, still such earnest attention is now being given to the careful selection of stud rams, to the classification of ewes, and to the culling of flocks, that every year may be expected to show perceptible improvement.

The fencing of runs is also indirectly tending to the improvement of the stock; and abundant experience has shown that when sheep are turned loose to graze in paddocks of moderate size, they not only get fatter, but throw finer fleeces than when they are driven by shepherds and constantly rounded up by dogs. Now, that the country is pretty well freed from the native dog, it is no longer necessary to shepherd the flocks by day or yard them at night.

Getting up the clip.—During the prevalence of the gold mania, when rural labour was scarce and dear, and when very few stations had been much improved, most of the wool was shorn in

the grease ; but repeated intimations from the London brokers that the get-up of the wool was all important as regarded price, gradually led the more enterprising settlers to fit up apparatus for washing the wool on the sheep's back ; and the use of hot-water has also become pretty general. During the past few years very considerable sums have been expended in tanks, spouts, pumps, and other machinery and appliances. In some instances the hot-water process has been carried to an extreme,—and money has been spent which has not only not been returned but which has even injured the sale of the wool. Dry seasons have sometimes left stations short of water, and so neutralized all mechanical appliances ; and on some thinly-grassed and dusty runs it has been found difficult to keep the wool clean, though the washing process may have been satisfactory. Experience will show what are the profitable limits to the attempt to clean the wool on the sheep ; but the satisfactory point is, that wool-growers generally are keenly alive to the importance of the question, and that as a rule there is now no want of enterprise to carry out what may seem to be the wisest policy.

Combing or clothing.—There has been much discussion as to whether the wool-growers of this Colony should aim at a combing or a clothing wool, and the former has undoubtedly been the ideal towards which the squatters have striven. But the conviction seems now growing, that it is impossible for this Colony to compete successfully with Victoria and Tasmania for the production of a superior combing wool. At the same time, although unable to take the highest prize, New South Wales has a fair proportion of territory within which a good combing wool is producible ; but there is always a large proportion of country, and especially that known as the salt bush plains, within which it is certainly difficult to produce this description. It is fighting against nature ; and the opinion though by no means received is gaining ground that it would be more profitable to strive after a good clothing than to achieve only an inferior combing wool ; on this point further investigations are needed. The climate of each

district requires to be separately studied, in order to determine what description of wool is best adapted to it, and hitherto sufficient attention has not been given to this matter. Squatters have been too content to get good rams and to grow wool, and on no very definite plan, and the consequence has been a good deal of produce of a rather mongrel type, and not exactly either one thing or the other. Increasing attention, however, is now being bestowed to these points, and we are progressing towards a state in which our producers will seek to co-operate more intelligently with the forces of nature, and in which the produce will be of a more definite character and of superior quality.

Coarse-woolled Sheep.—Of these there are not very many in the Colony, and they are principally confined to the coast districts, where they are kept for breeding lambs for the Sydney market. They consist chiefly of Leicesters and Southdowns, with a few Cotswolds and Cheviots; the latter, however, being principally in the New England district. The Leicester appears to be the favourite breed for fattening lambs, the ewes being excellent mothers; but a good many lambs are bred from Southdowns. For lamb-breeding purposes the coarse-woolled sheep would pay better than the merinos in the coast districts, more especially if they are allowed to run at large in paddocks, but they do not thrive if knocked about by shepherds and by dogs. A flock of full-grown, pure-bred, Leicesters will shear from 5 to 7 lbs. of washed wool per head, which will sell at from 10d. to 1s. a lb., and lambs from three to four months old will cut from 3 to 4 lbs. of washed wool. The wethers of this breed, when three years old, have been found to kill at from 160 lbs. to 200 lbs. each. The principal breeders of Leicesters are Messrs. Reynolds, Doyle, Christian, and Green, in the Northern Districts; and Messrs. Massy and Gibson in the Southern. Of Southdowns the principal owners are His Excellency the Governor, and Messrs. Dangar, Loder, and Dight, in the Northern Districts. It is estimated

that there are not more than 60,000 coarse-woolled sheep in the Colony, the number being made up as follows :—

Pure Leicesters and Cotswolds	5,000
Well-bred do. do.	10,000
Middling and inferior do.	25,000
Pure Southdowns.....	2,500
Well-bred do.	5,000
Middling and inferior do.....	12,500
Total	<u>60,000</u>

The supply of fat lambs in Sydney is not super-abundant, and there is plenty of room for better provision. For manuring land easily and cheaply by keeping sheep to eat off green crops, the coarse-woolled stock is better adapted than the merino, and among the small farmers in the coast districts there will probably be a small but steady increase in the number of large-bodied sheep.

Value of annual produce from Sheep.—According to the Customs' returns in the Statistical Register the value of our wool export in 1869 was £3,164,442. But these figures are not to be depended on for minute accuracy. No completely separate account is kept of the relative amount of washed and greasy wool exported, although the returns of the border traffic show that about one-half of the wool from Riverina that crossed the Murray for shipment at Melbourne was greasy. The weights of the wool, as stated in the Customs' entries, are often loosely calculated, nor is there any check upon the valuations. Three different Custom-houses too were concerned in the export of our wool, as a portion goes down the Murray to South Australia, and nearly two-fifths finds its way through Victoria, for shipment at Melbourne. A small portion too from the runs on the northern frontier passes through Queensland to Brisbane. On the other hand a very large quantity of Queensland wool is brought down coastwise for shipment at Sydney.

The Customs' valuation, however, may be roughly checked by another process. According to the sworn returns of owners, the number of sheep in 1869 was about 16,000,000. The weight of

the fleece all round may be considered as averaging about $2\frac{1}{2}$ lbs. per sheep, and the average price of the wool in Sydney may be reckoned at 1s. 2d. per lb. The gross weight of the year's clip, would, on this calculation, be about 40,000,000 lbs.

Divided into five classes according to the estimated quantity of each kind of wool, we get the following result:—

Class.	Proportion of total Clip.	Weight.	Average price per lb.	Value.
		lbs.	d.	£
1	$\frac{1}{2}$ per cent	200,000	30	25,000
2	8 ditto	3,200,000	21	280,000
3	48 ditto	19,200,000	15	1,200,000
4	35 ditto	14,000,000	12	700,000
5	$8\frac{1}{2}$ ditto	3,400,000	9	127,500
Total...	100	40,000,000		2,332,500

This estimate is fully £700,000 below the valuation expressed in the Customs' entries. But neither calculation can pretend to minute accuracy. The prices assumed are those for the year 1869. They would probably be considerably lower for 1870. It is not improbable that the value of the south-western wool has been over-estimated, and the quantity under-estimated, but the double correction would not materially alter the total.

Similarly the annual "cast" of fat sheep can only be approximately calculated. A large proportion of the country is too poor to fatten sheep, but then on the other hand many runs are devoted entirely to fattening, and they prepare for the market the sheep that are bred on the poorer runs. A breeding and fattening station of average quality kept in proper working order may, in an ordinary season, be calculated to send *one-fifth* of its whole stock to the shambles, and the average price of fat sheep, taking into account the prices obtained in Victoria, may be taken at 7s. 6d. each. One-fifth of the whole number of sheep in the Colony would give us annually 3,200,000, which, at 7s. 6d. each, would realize £1,200,000. The value of the carcase, added to that of the wool, will give us a gross total of more than £3,500,000 as the annual return from our sheep.

No precise return is obtainable of the number slaughtered in this Colony for food, but it is estimated at over £1,350,000,—fully 500,000 being consumed in Sydney and its suburbs. The number of sheep sent into Victoria and South Australia to supply the meat markets in those Colonies in 1869 was 866,775.

Value of Pastoral Property.—An approximate estimate of the amount of capital invested in pastoral pursuits in this Colony may be arrived at by capitalising the total annual returns of horses, cattle, and sheep. These may be put down as follows:—

Value of one-tenth of the horse stock in the Colony (280,000), disposed of annually at say 50s. per head	£ 70,000
Value of cast of fat cattle as estimated above, say...	1,325,000
Value of cast of fat sheep	1,200,000
Value of annual clip of wool	2,333,000
Total	£4,928,000

This amount capitalised, at 25 per cent.—the return pastoral property is expected to give to cover risk and pay interest and expenses—would make the amount invested, £19,800,000. This calculation may be checked by another process, namely, by taking the stock and runs at a fair market value on the average price of the last ten years. This may be represented thus:—

280,000 horses, with runs, purchased land, and improvements given in at, say 40s.	£ 560,000
1,800,000 cattle, do. do. at 80s. ...	7,200,000
16,000,000 sheep, do. do. at 15s. ...	12,000,000
Total	£19,760,000

The present depressed market prices would reduce this estimate, but it is generally expected that the depression will not be durable. It must be remembered too that much of the stock is running on purchased land, which is being fenced and cleared of timber, and that large sums of money are annually invested in sinking wells, making dams, erecting wool-sheds, and woolwashing machinery. The epoch of improvement may be said to have only recently commenced. The first investment of capital was in multiplying stock and overspreading the country. The tenure of

Crown Lands has been kept purposely loose, in order that no hindrances might be placed in the way of small purchasers ; but as land comes by degrees under a tenure that justifies fixed investments, and satisfies capitalists, improvements will be multiplied, and the pastoral productiveness of the country will be proportionately increased.

GOATS.

These animals have not been considered of sufficient importance for any attempt to be made to ascertain their numbers. They thrive very well in the Colony ; but they are only kept for the sake of their milk. They are principally owned by small settlers, and in the neighbourhood of towns by those who cannot manage to keep a cow. There is, however, one breed of goats which it is thought may be serviceable in a fleece-producing colony, and that is the Angora. Judging theoretically, it is presumable that there are large tracts of country in New South Wales not very valuable for any other purpose, in which the Angora, which is less dependant on water than any domesticated animal, would thrive ; but at present very little has been done to test this point. But the probability is, that quite as much could be done in the southern Colonies of Australia, as has been done at the Cape of Good Hope and Natal. The animal is said to do well upon rocky sandstone country, of which there is an abundance in the neighbourhood of Sydney, and which at present is turned to but little account. Experiments upon the Angora are being made in Victoria, South Australia, and Queensland, and though only one pair was shown at the late Exhibition it is probable that in future years more attention will be bestowed upon this animal, and Angora hair may in time come to be an important Australian export. Mr. Black, of Muswellbrook, has been for some time guarding a flock, which now numbers about 1,200. He has crossed the pure buck with the common goat, and the fleece produced from the second and third removes is likely to prove valuable. The pure Angora fleece, forwarded by the Acclimatisation Society to England, made half-a-crown a pound, the clip from each goat weighing from four to six pounds. The hair from the present flock

is less valuable, but the conditions under which the experiment has been conducted have hitherto been most unfavourable to success.

PIGS.

In this section only twenty-six animals were exhibited, though the competition was subdivided into large breeds, small breeds, and long-bodied breeds; and these again into boars, sows, sows with litters, and fat pigs. But though the exhibits were not numerous they were good,—no fewer than nine of them having been awarded by the Judges the full number of marks. None of them were reputed to be corn-fed, nor were there any representatives of the simply bush-fed pigs, of which the farmers' stocks principally consist.

The number of pigs in the Colony is estimated at about 176,000, and they are scattered pretty well over the country wherever small farmers are located. Nothing very definite can be said as to the particular breeds. A few gentlemen have kept special breeds in stock, and, with regard to the produce of their own farms, have maintained a pure race, or crossed them for particular reasons. But as a general rule the farmers pay no attention whatever to the breed of pigs, nor has any systematic attempt been made to determine whether particular kinds are specially adapted to different parts of the Colony. Berkshires, Prince Albert's, and short black Suffolks have been imported by those, who, from what they have seen in England, are inclined to give these sorts the preference. The Prince Alberts are said to run too much to fat, and the dealers in bacon give a preference to the meat from the long-bodied breeds. The Berkshires are said by some breeders to be rather delicate during the first year, but a cross between the Berkshire and the Alberts has been found to answer very well though it does not do to breed from the cross. A considerable trade in live pigs is carried on with Melbourne. A good many are driven overland across the Murray from the south-western districts, and the steamers that carry coal from Newcastle often take them round by sea. Many farmers are consequently giving up the attempt to cure bacon, and find it pays better simply to grow corn and feed pigs; but it is quite uncertain how long this demand will continue.

POULTRY.

The climate of this Colony is well adapted for the rearing of poultry. For a large portion of the year they can roost in the open air, and they are not subject to any special disease. Although prizes were offered in more than sixty different classes, and the season being that for moulting was not favourable for exhibition, there were entries in nearly all, showing that the principal varieties have been introduced into the Colony and acclimatised. A few years ago there was a special society for the exhibition of poultry, and many superior birds were imported from England. The enthusiasm then displayed has perhaps somewhat diminished, the number of poultry-fanciers has not increased, and the importation of first-class birds has somewhat fallen off. It cannot be said that there are any regular importers, but the stewards of the large London ships generally bring out a few on speculation, though the local market has not lately been very encouraging. The annual exhibition, however, which it is now intended to continue, will stimulate emulation and competition, and lead to a better estimate of the value of fine birds. The supply of poultry and eggs to Sydney comes principally from the coast districts, although, especially at Christmas, the railways bring down some from the inland farmers. The best poultry that reach the Sydney market come from the Clarence, which is the district most newly occupied by small farmers, and where there is a good strain of the dorking among the fowls. The poorest come from the Windsor district and the Hunter—the oldest farming districts in the Colony, but where, from long indifference to careful breeding, the size of the birds has greatly fallen off. A little fresh stimulus is greatly needed to stir up the farmers in these districts, and to make them see how much better it pays to produce good poultry than to send to market birds that will only fetch half the price readily given for the produce of other districts. There is nothing whatever to indicate that the climate itself tends inevitably to any deterioration in the quality of poultry. The falling off in size that is so marked in the older districts of the Colony is quite accounted for by ignorant neglect, and may easily be retrieved by intelligence and care.

DOGS.

The show of dogs was excellent, and, as a whole, could hardly have been improved on out of England. Though there were over sixty classes there were exhibits in nearly all. The climate is very favourable to the health of dogs, and it may be remarked that no case of hydrophobia has been ever known in Australia. No estimate has been formed of the number of dogs in the Colony; and though there is an abundance of mongrel curs, and here and there a very visible trace of the dingo, or wild dog of the country, there is also a fair proportion of well-bred dogs. Kangaroo-dogs have been especially cultivated in the bush for hunting, while sheep and cattle dogs, when pure, are highly appreciated for station purposes. Bull-dogs have also been much sought after by diggers and others who live in huts, and who value natural protectors to their otherwise slightly defended property. Terriers are in good demand for hunting rats, and fancy-dogs also find patrons. There are but few regular dog-breeders; but fresh animals, and often of excellent quality, are continually arriving by the large ships from England, it being a favourite kind of speculation with the officers of these vessels to bring out a small stock. It is in this way that most of the good dogs recently imported have arrived, and that Sydney was able to turn out so good a show. The majority of those exhibited were either imported, or the first produce of imported stock.

FOOD.

So far as fresh meat is concerned, the remarks on food have been partly anticipated by what has been said under the heading of live-stock; but it will be convenient to include under the above general title all articles of farm produce, fodder, and provisions, in various forms of preparation, including not only solid food but liquors.

Sugar.—The production of sugar is one of the newest, but at the same time one of the most promising, agricultural industries of the Colony. The sugar-cane will grow on the coast even to the south of Sydney; and, as an experiment, sugar has been

made in small quantity at Kiama. But it is only on the northern rivers that the farmers have begun to plant on a commercial scale, and, as a rule, the more northerly the latitude the better the result, so far as this Colony is concerned. The seasons, however, have been singularly trying for the last two years; and on the Macleay in particular the floods have been very injurious. At present it must be admitted that this industry is still in its experimental stage; and the area suitable for the growth of the cane, the best kinds of cane for the different latitudes, the best modes of treatment, and the probable average profits, are points still to be determined. But there are now about 3,000 acres under cane, and 250 cultivators engaged in the task, and every year adds to the body of local experience, and clears the way for a more confident investment of capital. Enough has been at present done to show that cane-growing is not a delusion, but that it is about to take rank among our permanent industries. It should be specially remarked that there is no such thing at present in the Colony as a regular sugar plantation, such as exist in the sugar-growing colonies. The cane is mostly grown by farmers, very few of whom have set up any machinery. The mills have been erected by capitalists, so that cane-growing and sugar-making are kept apart as two separate industries, as much so as wheat-growing and flour-making. How far this plan can be continued successfully, and with as much profit as the plantation system, is a question of as much interest socially as it is economically. There is a disinclination towards the plantation system, on the ground that it will require the introduction of cheap coloured labour, and therefore it is hoped that the problem now being worked out, of sugar-growing by small freehold farmers, will result successfully.

Fryer's concretor has been to some extent employed with useful results, and great hopes are entertained that by this means small growers will be able at slight expense to turn the juice into concrete, in a form that will admit of its being kept without deterioration, and shipped to Sydney for final treatment. But during the present wet season, in which the cane has not sufficiently ripened,

the concrete has proved deliquescent, owing, it is supposed, to the presence of some salts in the unperfected juice. The varieties of cane at present in use are chiefly the Tahitian, Bourbon, ribbon, and violet ribbon, and of these the ribbon and the Bourbon seem to be the most approved.

Beet-sugar has been produced in small quantities, but it still remains to be determined how far the root will be a reliable crop, and how far it will be profitable to grow beet for sugar in a Colony which is capable of growing the sugar-cane.

A variety of imphee has also been much recommended by Mr. Edward Holland, who has given it the name of "The Planter's Friend." This will grow freely on all the coast lands, and several farmers are experimenting with it.

Creditable samples of sugar, both from beet and imphee, were shown; but it is not every operation that is possible that is profitable, and we are still seeking light as to whether in the cooler parts of the Colony beet and imphee will be more profitable crops than others which the climate will allow. There is a wide field open for experiment, and no theoretical conclusions must be allowed to foreclose the practical test.

Wheat.—Although New South Wales has never been specially distinguished for its production of wheat, justice was not done to its capabilities or even to its actual productiveness, by the samples displayed. There were only four exhibits of white wheat from the Colony and only one of red.

The Adelaide white wheat was thrown out of competition through an error in the mode of entry, and the prize went to Victorian produce, to which the Judges awarded two points more than to the Bathurst wheat, which took the second prize. South Australia took the prize for red wheat. No Tasmanian or New Zealand wheat came into competition.

The quantity of wheat produced in New South Wales in 1869 was larger than in any previous year. The Colony has never quite supplied its own wants, but it came nearer to it that year than ever before. The season was favourable, and the average

productiveness was at the rate of nearly 17 bushels to the acre, the most fertile districts yielding from 30 to 45 bushels. In the earlier days of the Colony the wheat was almost exclusively produced in the coast districts, and from Camden the grain was for many years successively of first-class quality. None of the coast wheat, however, will keep free from the weevil for twelve months, and the seasons having lately been unfavourable, cultivators in those districts have largely turned their attention to other crops.

The extension of railways inland has made available a large amount of the best wheat-growing land in the Colony, and some further addition to the present lines would make Sydney independent of imports in ordinary seasons. As it is, the cost of carriage from the remoter parts of the table-land, makes it difficult for the local grower to compete with the importer. The inland country districts produce enough to supply their own wants. What is imported to Sydney by sea is for the consumption of the metropolis and the coast districts.

The wheat most esteemed is that from Adelaide. Nothing produced in this Colony quite comes up to it in quality, but then there is a compensation in quantity, inasmuch as the average yield is greater here than in South Australia. Our best wheat districts are in the neighbourhood of Young, Burrowa, Murrumburrah, Bathurst, Carcoar, Cowra, Wagga Wagga, Orange, New England, and Maneroo. Taking as a standard Adelaide wheat at 5s. a bushel, that grown in these localities will realize in Sydney about 2d. less. Next in excellence is reckoned the grain from the districts of Mudgee, Yass, Queanbeyan, Gunning, Braidwood, and Goulburn, which generally averages about 4d. a bushel below the Adelaide wheat. Victorian is classed as about equal in quality with the best of New South Wales wheat, and Californian a shade below it. Taking the same standard of value, Tasmanian wheat realizes about 4s. 6d., and that from New Zealand, which, however, is very unequal in quality, ranges from about 4s. to 4s. 3d. All these relative values, however, fluctuate

somewhat with the seasons, the quality of the grain produced in the different Colonies varying according to the rainfall, which in all of them is exceedingly uncertain. The preferences here indicated are due to the experience of the millers as to the strength of the flour from the different wheats. No scientific analysis has ever been made of the composition of the grain from different parts of the Colony.

New South Wales has a superabundance of wheat-growing land to meet the wants of its present inhabitants, and could grow breadstuffs for a largely increased population. Its resources in this respect have been scarcely disclosed, inasmuch as the railways have not yet quite tapped the best districts, but while a few years ago flour used to be sent up from Sydney to the remotest sheep-stations, pastoral districts are now supplied from the table-land country. Only the coast towns are dependent on the imported flour, and these will soon be supplied with the home-grown article, for with improved means of inland transit, Sydney will be as cheaply supplied from the interior as by sea, except in unfavourable seasons. How far it will be able to produce for export is a problem still to be solved. Shipment to England from South Australia has been tried to a small extent, but the Colonial grower will generally have to be content with a low price, to leave a margin of profit on this trade. Exceptional circumstances may stimulate this export, but it can scarcely be said that there is at present sufficient encouragement to grow wheat in this Colony to sell to the exporter. We can produce wheat of a quality that can stand the competition of the world, but we cannot do it at the necessary price. The cost of labor is too expensive for rude processes, and we have not yet attained to such proficiency in the use of labor-saving agricultural machinery as would counterbalance the rate of wages. The export to England would also be necessarily limited by the available freight. Homeward-bound ships taking return cargoes consist mainly of those that have arrived bringing imports, and the number of these is, of course, determined by the demand for imported commodities.

Australia is too much in a corner of the world for many ships to come here seeking freight. Flour of excellent quality is produced in all the Colonies, the principal millers having imported all the newest improvements in grinding and dressing machinery. In no part of the world is the loaf finer than in Australia, the only defect being from an occasional failure of the yeast in the very hot weather. The ærated bread is manufactured in Sydney under Dr. Daughlish's patent.

Biscuits.—In this class New South Wales was exposed to a brisk competition with Victoria. There are now only two biscuit factories in Sydney, and the trade has somewhat fallen off. The business with the other Colonies is checked by duties ranging from 1d. to 2d. a lb. The only untaxed outlets are the trade with the Islands and the shipping business. Of the quality of the shipping biscuits a satisfactory test was furnished in the production by the Harbour Master of biscuits purchased by him nine years ago for the depôt at Booby Island, Torres Straits, and of which he had retained some samples. They were as sound as when new. Many captains trading between Sydney and London lay in their store of biscuits at this end. The price is quite as low as in England, and the quality better.

Maize.—The entries for this species of grain were so few that no one would have imagined that it was one of the chief crops of the Colony, and indeed the mainstay of the farmers on the coast. In 1869 there were, according to the Statistical Register, 128,041 acres sown with maize, and the estimated produce was 4,880,805 bushels, or an average of about 30 bushels per acre. A great deal of the crop however is said to have been destroyed by the heavy floods which occurred in that year. The destruction must have been very great, or else the official estimate must have been considerably over the mark, for the trade returns show that there were not 2,000,000 bushels available for the market. About one-half of what came to Sydney was exported to Melbourne, which is the chief intercolonial market, and which will be permanent as the climate of that Colony is not favourable to the production

of maize. Small quantities were also shipped to the other Colonies, some of which may offer permanent markets for a moderate quantity. Maize is chiefly used for horse-food, and its consumption is therefore to some extent dependent on the price of oats. A few shipments have occasionally been made to England, and the little experience thus gained seems to intimate that this outlet for the surplus produce will establish a minimum price of about 1s. 6d. per bushel. This is low compared with what the farmers have been in the habit of getting of late years; but then it must be remembered that before the discovery of the gold-fields they used to be contented with 1s. a bushel. Fully half the maize grown in the Colony comes from the Clarence River, but the best quality comes from the Shoalhaven. There is, however, little or no difference in the price given for the different sorts, and therefore not much inducement to the growers to pay attention to quality, but with glutted markets and a low price this may cease to be the case.

Maize meal, though slightly savouring of unpopularity, because *hominy* has so long been an article of prison diet, is largely consumed for food. There are two varieties, the white and the yellow; the latter is the more generally used. The price is from £9 to £10 per ton.

Maizena.—This article, which is one of considerable domestic consumption, is now produced in the Colony from locally-grown grain. It has had to sustain a sharp competition with the imported article, but has fully made its position. Consumers approve of it, and the Colonial manufacture has been the means of considerably reducing the price.

Oats.—Though there was no entry for this grain, this was not because none is produced. Oats grow well on the table-land though not on the coast, and in 1869 there were 17,301 acres under this crop, yielding 400,000 bushels. This was an increase of 50 per cent. on the returns of the previous year, the extension of the railways having stimulated cultivation in the cooler parts of the Colony. The import of oats in 1869 amounted to 15,000

bushels, which came from New Zealand, Tasmania, and the United States. The demand for oats is kept in check by the extensive use of maize for horse food.

Oatmeal is not made in the Colony, but is largely used for food. Inclusive of groats the amount imported in 1869 was of the value of £5,200, and came from Great Britain, Victoria, and Tasmania.

Barley.—The Colony only furnished one exhibitor of this grain, which perhaps was not an unfair indication of its comparative neglect by our farmers. Barley averages less than 1·5 per cent. of the total cultivation of this Colony. It has been frequently grown on the Hunter River, but is very apt to get the weevil within two or three months; and as maltsters like to have it kept for at least that time it is scarcely available for their use. Some few years ago Messrs. Tooth & Co., the principal brewers of Sydney, offered a special prize for barley the produce of the Colony, in the hope that it would stimulate the local production of an article they largely import; but though the prize was gained by an excellent sample grown at Bega, no stimulus was given to the general cultivation. In 1869 the area under barley cultivation was 9,151 acres, and the produce was under 150,000 bushels. It is only on the south-east corner of the Colony where there is a moist cool sea-breeze, that malting barley can be advantageously grown on the coast, but on the cool table-lands it can be produced of excellent quality, and the probability is that the railways will now lead to a considerable increase in cultivation. At present, the Sydney brewers, unable to get their wants supplied by local growers, import barley and malt from Tasmania and New Zealand. From these Colonies they are drawing a continually increasing supply, and are gradually limiting their orders from England. The import of barley in 1869 was 8,587 bushels.

Rye.—This is a grain of small production and consumption, though rye-bread is made to suit the tastes of those who have elsewhere learned to like it. Only 2,378 acres were devoted to this crop in 1869, and these yielded 37,434 bushels. There is no special difficulty in cultivating this grain in the cool and elevated districts, but there is only a small demand for it.

Potatoes.—The display of potatoes was by no means indicative of the productiveness of the Colony. There were only two exhibitors, and both of them from the high land on the southern line of railway. The month (August) was too early for potatoes from the coast districts, and those that were shown were the produce of the previous season.

The production in the Colony in 1869 is estimated at 54,200 tons, which, at an average value of about £3 10s., would represent about £190,000. The import for the year amounted to 9,775 tons, of which about 1,800 tons were re-exported to Queensland. The import of potatoes is chiefly for the consumption of the city and suburbs, and the northern coast-line. The inland country districts about supply their own wants. Very few potatoes are sent from Sydney up country, and very few are brought down by railway for city consumption, as they will not bear the cost of land carriage in competition with the water-borne article. Those that reach Sydney coastwise come mostly from the south, and principally from Shoalhaven, Moruya, and Twofold Bay. The northern rivers are found to be rather too hot for the successful cultivation of this root. Even to the south the warm spring weather is not very favourable. In a cool season the potatoes produced there are excellent, but when the hot weather sets in rapidly the quality is injured. Though the coast climate is not very favourable for the production of the best article, except in good seasons, it gives the sea-side settlers the advantage of the first of the season. From about November to February they have the Sydney market all to themselves. By that time the Victorian potatoes from Warrnambool come in, and as they are more highly esteemed they take the lead, and the remaining unsold stock of New South Wales potatoes can only be placed at a reduction of 10s. to 20s. per ton. The Victorian potatoes in turn are rivalled by the potatoes from the north coast of Tasmania, which come into the market a few months subsequently. With improved inland transit the resources of the cooler country in the table-land will become more available, and Sydney will be increasingly supplied from the interior.

Hay.—The very few trusses of hay sent in for exhibition altogether failed to represent the productiveness of the Colony in this respect. 15½ per cent. of our total cultivation is devoted to hay. This crop occupies 75,000 acres, and the produce in 1869 was 132,000 tons. Very little is now either imported or exported, as each Colony pretty well supplies its own wants, except in peculiar seasons. Sydney is chiefly supplied from the northern coast districts, although a considerable quantity of lucerne comes in by railway from the neighbourhood of Windsor and Richmond, and of oaten hay from the neighbourhood of Camden and Campbelltown. It is from the Hunter River district however that the lucerne hay is principally derived, where on the river-side alluvial flats six crops in a year can be cut in an ordinary season.

Sorghum.—Though but two specimens were exhibited all the varieties of sorghum thrive in all but the colder parts of the Colony. It is rather an exhausting crop, but it is excellent feed, and will frequently yield three or four cuttings during the season. The large quantity of saccharine matter it contains makes it an excellent food for dairy cows, and for fattening stock.

Tobacco.—This plant grows well in the Colony, though no sample was exhibited. It has been produced for many years for the purpose of sheep-wash, but a great many tons are now being worked up by the manufacturers into negrohead and some into cigars. The Colonial leaf is not at present of equal quality with the American; but there is no necessary presumption against the possibility of its becoming so.

Pumpkins.—There were none exhibited, although they grow luxuriantly and with the very minimum of labour bestowed on them. They are a great resource to bush settlers, but very little care has been bestowed on the quality.

Mangold.—This valuable root has hitherto been singularly neglected, but it is now beginning to receive more attention, especially from farmers who engage in fattening stock. It grows

freely, and in many parts of the Colony will yield two crops in the year. There was only one exhibitor who, however, speaks highly of its utility.

Arrowroot.—This is producible in several parts of this Colony, especially on the northern rivers, but as yet no one here has equalled the preparation of it by Messrs. Grimes, of Brisbane. Their arrowroot is far superior to that from the South Sea Islands, and equal to that from St. Vincent's. There seems no reason but the want of skill why an article of equal excellence should not be produced in New South Wales. The best in this Colony is from the Clarence River.

Butter.—In this class there were exhibited nine samples of fresh and twelve of salt. Although the larger proportion of the fresh butter sold in Sydney comes from the coast districts, there was only one sample of fresh butter from these portions of the Colony, all the others coming from inland localities. The richest dairy-farms are found in the coast districts, yet the butter produced there does not keep so well as that from the inland districts, where the pasture is poorer. The arrangements of many of the dairy-farmers for making butter are exceedingly defective, and much remains to be done in the construction of cool dairies, and in more general habits of cleanliness. Those who have paid attention to these points can readily secure for their butter the highest price in the market. Some years ago, especially during the height of the gold-fever, Irish butter was very largely imported, but since then the Colony has fully overtaken its own wants, and is beginning now to reverse the process. If in quality there is still much to be desired, in quantity the local market is overstocked, and in the present year the wholesale price having fallen as low as 4d. a lb., agents are beginning to ship to England. Some slight margin of profit has seemed possible on carefully-selected shipments, arriving in England during the winter months, and at any rate a withdrawal of a considerable quantity from the local market has tended to prevent an indefinite fall in price. In order to succeed, however, the dairymen have been forced to give additional attention to the way in which their produce is got up, as they cannot compete in the markets of the world unless they do their best. This compulsion will not be without its benefit as respects the production of butter for the local market.

It might be inferred that there was some inferior manipulation on the part of the coast dairymen, from the fact that though eleven out of twelve exhibits of salt butter came from the coast districts not one of them took the first prize, which went to an inland producer. But then some of the most approved coast brands were not exhibited.

Cheese.—A fair show of cheese from different parts of the Colony gave a tolerable representation of this industry, but Colonial producers have not yet succeeded in equalling the quality of the English article; and it is still an uncertain point whether the climate and the character of the pasture do not interpose insuperable obstacles. English cheese sells wholesale at 13½d. per lb. Most of what is imported is Cheshire or North Wilts, and is said to improve on the voyage. The richer cheeses will scarcely bear the passage. The quantity imported does not exceed about 1,500 cwt. English cheese is mostly a table luxury for the wealthier classes, as a Colonial-made product can be obtained at a much cheaper rate. The cheapness in butter has been followed by cheapness in cheese, as the dairymen try to make marketable in one form that for which they can find no sale in the other. Colonial cheese can now be obtained at as low a rate as 4d. a lb., the price rising according to the brand until some of the superior makers approach the English rate. Cheese is largely used as an article of diet by labouring men, especially in the summer time. It is convenient for the mid-day meal for men working away from home, as it requires no cooking and keeps better than meat. At 4d. a lb. it is a cheap diet, and has the nutritive and staying qualities which men habituated to muscular exercise require. In the manufacture of cheese in the Colony there is room for very great improvement. Most of the farmers are but too obviously little skilled in the art. Their cheeses will not keep, and are of inferior quality. There, as in other branches, the low price and reduced profits of late years will probably act as a stimulus to improved methods, and what is now counted as adversity may in future prove to be a great cause of prosperity. No attempt has been made to export cheese to distant markets, for the only qualities which exporters could purchase cheaply would not stand a long voyage; but the time may come when the quality will be so improved as to stand this

test. At present there is no outlet at all for the surplus produce, and the tendency, therefore, is towards an indefinite reduction in price.

Bacon and Hams.—Some very good samples were produced, and New South Wales—which, however, might have made a better show than it did—was distanced in the competition. A Melbourne firm, devoted to the regular business of curing, carried off the prizes. There are no professional curers in Sydney, and considering how many farmers spoil their meat from not knowing how to treat it properly, there seems to be plenty of scope for a curing establishment. The greater portion of the pork, ham, and bacon supplied to Sydney comes from the coast district, but as a rule the richer the pasture on which the pigs are fed the softer is the meat. The flavour of well-cured Colonial bacon is not inferior to that of English, but the bulk of it does not keep longer than from three to six months. A great improvement would be effected if the farmers had better arrangements for smoking the meat, and if they would corn-feed the pigs for at least a month before killing them.

Bacon prepared on the table-lands, as at Maneroo, Goulburn, Bathurst, or Liverpool Plains, is more esteemed in Sydney than the coast-fed article. The climate in these higher regions is colder, and the herbage less succulent. Years ago a good deal of this description of produce reached Sydney from the inland districts, but the price was then high and tempting, occasionally reaching 2s. 6d. a lb. Very little now reaches Sydney from the interior, as notwithstanding the improved railway communication, the wholesale prices only range from 6d. to 10d. a lb., and moreover, the inland local markets of the interior pretty well absorb the local produce. There is no means of ascertaining the quantity of pigs' meat that is cured, but it may be roughly conjectured from the number of pigs. The Colonial produce does not altogether shut off the foreign import, as in 1869, pork was introduced from Great Britain to the extent of 1,311 cwt., and hams to the extent of 1,076 cwt. Of bacon, however, we only drew from the Mother-country 119 cwt., while from Victoria we imported 186 cwt. This intercolonial import however was more than balanced by our export, as we sent away 1,000 cwt. of Colonial-made bacon, of which 138 cwt. went to New Zealand,

357 cwt. to Queensland, and 503 cwt. to Victoria. A brisk inter-colonial trade exists in live pigs, Victorian buyers taking the live animals down by steamer, partly to sell them for fresh meat, and partly to cure them in Melbourne, where the cooler climate is more favourable to the process, and where also that process would seem to be more skilfully conducted. There are in this Colony a few curers, whose brands are considered equal to anything imported, but the greater part of the bacon that comes to market is not got up in first-rate style. The disabilities of climate are aggravated by a carelessness and ignorance, which it is to be hoped will in a few years diminish, if not disappear.

Vegetables.—Partly perhaps owing to the month in which the Exhibition was held, the display of vegetables was in variety anything but fully illustrative of the capabilities of the Colony. Nearly every variety of vegetable, except those which are absolutely tropical productions, can be produced, and by turning to full account the railway communication with the table-lands, and utilizing the two climates at our disposal, we can prolong the season for many vegetables, and have fresh garden produce all the year round. Sydney is surrounded with market gardens, and vegetables are now to be had in great abundance, and at a low price, although there is room for greater attention to quality. In past years there was a good intercolonial trade in garden produce, and the steamers used often to be laden with vegetables, but each Colony now produces enough for its own consumption, and export is rare except in case of a sudden glut or scarcity. In the interior the cultivation of vegetables has greatly increased. There was a time when fresh vegetables were as rare on a station as on board ship, but this is now only the case where the aridity of the climate makes successful gardening almost impossible. The extended purchase of land, the increased disposition towards domestic comfort, the large number of ladies settled in the bush, and the general advance of civilized colonization has made gardens a more familiar sight in the interior than they were some years ago. In this matter we owe very much to the Chinese. They taught us to see that it is possible to grow vegetables successfully where it was the custom to consider it impossible. Their patient attention to minute matters, their skill in watering and manuring surpasses that of the European. Chinese gardeners

are employed by squatters, and it is to Chinese gardeners that many inland towns and scattered gold-fields are indebted for their supply of cheap and wholesome vegetables.

Fruit.—The display of fruit at the Exhibition was a fair representation of the produce of the Colony in this line, though by no means a flattering one. All the fruits of temperate, and some of tropical climates, come to perfection in New South Wales. Not only so, but the different temperature prevailing along the coast, and on the inland table-land, gives us the benefit of two climates. All the English fruits grow on the high land, while the orange, banana, cheremoyer, &c., can be brought to perfection on the coast. Till recently, however, this double advantage has been hardly appreciated, as the cost and delay of carriage from the interior by the ordinary roads would not allow of a trade in so cheap and perishable an article as fruit. The railways are now bringing about a change in this respect. Orchards are being planted in the cooler climates, and there is already an observable increase in the quantity of fruit brought from the interior. It is probable that in a few years the importation of fresh fruit will be considerably reduced. At present that trade is not inconsiderable. In 1869 there were imported 55,696 cases, of the value of £23,372, the greater proportion of which came from Tasmania, and consisted of apples, gooseberries, currants, cherries, plums, &c. From Queensland the Colony receives pineapples and bananas, for though the latter will grow on the coast from Sydney northwards and are full-flavoured, their cultivation has not been largely carried on. In the production of fruit, an improvement in quality is more to be desired than an increase of quantity. Too many growers have been very careless in the selection of their stocks, and a good deal that is produced is of a very inferior description. The price offered is low, and producers complain of bad times. Little or no attempt has been made to turn the surplus fruit into wine, spirit, perry, or cider, but with the annually increasing production it is not improbable that enterprise will take this form. The export of fruit to Victoria has been checked by the large increase of orchards in that Colony. There will, however, always be a trade with Victoria and New Zealand in oranges, lemons, and bananas; and as the climate of Sydney is warmer than that of Melbourne, fruits come earlier to maturity, and the Sydney growers

can make their appearance in the Melbourne market for a month or so before their local rivals can cut them out. The export of fruit in 1869 was of the value of £46,000, of which more than three-fifths went to Victoria, and consisted mainly of oranges. The remainder went chiefly to Queensland and New Zealand. The increasing population of those Colonies will always keep up a demand for such fruits as they cannot produce themselves, and this trade may be looked upon as permanent.

Preserved Fruits.—But few of our orchard-owners have made any attempt to enter on this branch of trade, although the immense quantity of fruit that is wasted furnishes a strong inducement to do so. The few experiments that have been made show that a good article could be produced, but it is still a doubtful point whether it will pay. In dried fruits the Colony has to compete with the cheap labour of the South of Europe. The import of dried fruits in 1869 amounted to 1,290 tons, and was of the value of £38,729. Of bottled fruits there were imported 3,283 cases. Bottling fruits is not at present much practised in the Colony, although the plan of boiling fruit, and hermetically sealing it down in tins, is becoming more general.

Preserved Meats.—A few years ago there was a large sale in the Colony for the preserved meats turned out from English and Scotch establishments, but of late the import has almost entirely ceased, and is confined now mainly to such articles as hare, mock-turtle, grouse, &c., which are simply delicacies. The meat establishment at Ramornie, on the Clarence River, started by English capitalists, first led the way in this Colony to the preservation of fresh meat, but it is now beginning to find several imitators. Liebig's process for making the extract of meat, and Appert's process for preserving cooked meat, are at present the favourite plans, though Messrs. Manning and Staiger have made great progress with their method of preserving uncooked meat by means of chemicals, and Mr. Whitehead manufactures an extract by a plan which retains the albumen.

In accordance with the recommendation of the Jurors the meat furnished by Messrs. Manning and Staiger was submitted to the test of a trip to Galle and back. A special report thereon will be found at page 133.

Expectation is on tip-toe that science will discover some plan better than anything hitherto adopted, and that the surplus meat of Australia will before long find its way to England in a form that will overcome all prejudice. The sample of preserved fresh meat that won the highest approval from the Judges came from England, and had been treated by Mr. Jones' patent vacuum process. More information is required as to the details of this process, and especially as to its cost, and the practicability of carrying it out successfully on a large commercial scale. The method seems to be successful in its results, and may perhaps be adopted if not objectionable for any practical reasons. A large shipping business is done in preserved meats, and vessels bound for London generally lay in a stock for the voyage and back. Some considerable Navy contracts have been taken for Australian meat. The export of preserved meats in 1869 was of the value of £41,000, and this trade will rapidly expand if a remunerative market can be found in Europe for all we can spare. The consumption is at present stimulated by the war; and we still have to find out what is the regular peace demand, and how much of our meat preserved by existing processes and at present prices Europe can absorb.

The Colony did not do justice to itself in this important and growing branch of industry, but it is not so backward as the few samples at the Exhibition would have made it appear. Not only is the Ramornie Company in full work, but a new Company at Goulburn has commenced operations with good prospects of success, and a Company recently formed in Sydney is making careful preparations for going to work effectively. The position of this new industry is disclosed in a report prepared by Mr. Richard Lloyd, the managing Director of the Sydney Company, after a careful inquiry into what is being done at Melbourne and elsewhere. From this report it appears that adequate premises and plant can be provided for about £10,000. That such an establishment could dispose, annually, of 350,000 sheep, producing 5,250,000 lbs. of preserved meat, and an equal quantity of tallow. That the tinned meat could be put free on board for 3½d. per lb., and that, assuming sheep can be bought, as at present, for 7s. 6d. a head, and that tallow will fetch not less than 3½d. per lb., there will be a profit of £8,000 a year for the working capital, after

paying interest on the invested capital, and allowing an ample margin for depreciation. This, of course, assumes that there is a ready sale for the produce, and this is the one point on which we require further European experience. If Europe can and will buy at the price indicated, we can produce, and with larger experience and a steady demand we shall be able to produce at a lower rate. One establishment on the scale mentioned would employ about 120 hands and disburse about £14,000 a year in wages. The general effect on the Colony of an indefinite demand for Australian preserved meat would be that a minimum price would be established for sheep, and that the limit of pastoral depression would be reached.

Of salted and spiced meats there were several very fair samples, and for shipping use the Colony can now furnish supplies, of excellent quality, to any extent.

Fish.—On this subject the reader is referred for information to a special paper by Mr. Oliver. No dried or salted fish were exhibited, and the trade is not carried on, except by the Chinese, who preserve a few for consumption by their own countrymen. The fishery resources of the Colony are at present very much neglected. There are several kinds of fish that might be dried to advantage. The mullet is said to be capable of yielding largely an oil that would have considerable market value, and its roe would make a good second-class caviare. A law has been passed to prevent the utter destruction of some of the oyster-beds, but very little has been done in the way of leasing fisheries, and this department of industry is still open to enterprise. From some statistics obtained by an officer of the City Corporation, it appears that in 1870, 14,000 bushels of net fish were brought into Sydney, the total value of which, at 7s. per bushel, was £4,900; 3,000 dozen of sea-mullet, valued at £300; 9,800 dozen line fish, valued at £2,940; 400 dozen lobsters, valued at £200; 1,500 bushels prawns, valued at £1,200; 30,000 bushels of oysters, valued at £3,000,—making the total value of the fish and oysters brought into Sydney, £12,500. In addition to this, from 25,000 to 30,000 bushels of oysters, valued at about £3,000, were sent to Melbourne.

Salt.—There is but one salt-manufactory at present in the Colony, and that is situated nearly at the head of tidal-water, on the Parramatta River. The article produced, though rough, is

creditable, and finds a ready sale at 60s. a ton in competition with the import. A new establishment is about to be started at Newcastle, where, from the proximity of the mines, small coal is very cheap.

Vinegar.—Although four samples of Colonial-made vinegar were exhibited, its manufacture is only just beginning as a Colonial industry. There is plenty of wine and fruit refuse from which to make it, but malt is neither cheap nor superabundant. Mr. Monk, who produced samples, both of white and red vinegar from white and red wines, as well as malt vinegar, also exhibited pickles of various kinds, and is making a beginning with an industry for which there seems to be plenty of scope, but which hitherto has been neglected. His stock consisted of pickled onions, cabbage, and picallili. The import of vinegar in 1869 amounted to 113,000 gallons, of the declared value of £7,253, of which less than 6,000 gallons was re-exported; and the import of pickles and sauces was of the value of £14,000.

Confectionery.—The manufacture of sweetmeats is somewhat discouraged by the fact that there is a heavier duty on sugar than there is on confectionery; but in spite of that disability there is one firm engaged in the business, and which carries on a considerable trade, using up about 150 tons of sugar per annum. The variety, as well as the quality, of the articles displayed by Messrs. Biddell Brothers, well deserved the medal they received.

Coffee and Tea.—The only samples of the berry exhibited were from New Caledonia, but the tree is to be found in the Botanical Gardens both in Sydney and Brisbane. That there are many places in the coast district where this shrub will bear fruit there can be no doubt, but at present no one has ventured on a plantation. It is an industry that awaits experiment. The same may be said of tea. The plant grows in our Botanical Gardens, but whether it could be cultivated commercially is a problem not yet determined. The import of coffee in 1869 was 225 tons, of the value of £12,500; but that of tea was 6,225,000 lbs., of the value of £430,000, though of this quantity 1,250,000 lbs. were re-exported.

Wines.—The suitability of this Colony for the production of wine has now been demonstrated for many years, and yet only a very small proportion of its area has been tested. Of late years, however, vineyards have greatly multiplied in the district of

Albury, near the River Murray, where the soil and climate give a wine of quite a distinct character from that grown on the coast ; and the success which has attended these experiments in a comparatively new locality is likely to stimulate other experiments in places which promise well. Although the light wines of the country, when carefully made, are wholesome, and better adapted for general use than the strong wines imported from Spain and Portugal, the Colony is still very far from meeting its own requirements. In the year 1869 the import of wine amounted to nearly 190,000 gallons, of the value of £65,000. We re-exported however 65,000 gallons, of the value of £29,000. Of this export only 2,000 gallons were the produce of the Colony, thus showing that at present we do not do much towards supplying the wants of our neighbours. Both South Australia and Victoria produce wines largely, but the absence of a Customs' union keeps inter-colonial trade in check. The Colonies do not much interchange their wines, and are each shut up by their tariffs to the consumption of their own produce. During the past six years the area under vine-cultivation in this Colony has more than doubled, while the production of wine has nearly trebled. In 1869 the area devoted to vines was nearly 4,000 acres, and the production of wine was 460,000 gallons. For further information on this subject the reader is referred to the jurors' reports.

Spirits.—The Colonial Sugar Company, to which belongs the only important distillery in the Colony, exhibited nothing, and the prizes went to exhibitors from neighbouring Colonies. Some years ago rum was largely manufactured in Sydney, and it was then a popular beverage with the working classes, which perhaps was partly due to its comparative cheapness, but the alteration in the tariff by which the duty on all spirits was assimilated, and a change in the popular taste in favour of brandy and gin has almost extinguished the local manufacture of rum. The Sugar Company exports its treacle to England, whence it is again exported to the Baltic, where it goes into consumption as food. The export of molasses and treacle in 1869 was nearly of the value of £17,000. The manufacture of rum is somewhat reviving under the influence of the local sugar cultivation, as a better article is producible when all the refuse is at command, than can be manufactured out of imported sugars.

Malt Liquors.—The large number of exhibits in this class, and the considerable rivalry that there was amongst exhibitors was an indication of the active enterprise that prevails in this industry. The Colony of Victoria too, exhibited largely, and carried off some of the first prizes. In the art of brewing, Sydney is placed at some disadvantage. There are only three or four months in the year in which the weather is cool enough to allow the malting process to be carried out satisfactorily, and from the small quantity of barley produced in the Colony nearly all the grain has to be imported. The hot weather is also a difficulty to be encountered, and the very best XXX is only manufactured during the winter months, though by the aid of artificial refrigerators, to regulate the temperature of the fermenting tuns, sound beer can be produced all the year round. The Sydney water too is very pure and rather too free from lime for brewing purposes. That drawn from Botany is simply rain-water filtered through sand, and that drawn from wells sunk in the sandstone rock on which the City is built is naturally filtered. The popularity in Sydney of the ale brewed at Castlemaine, in Victoria, has induced the manufacturers to open a branch establishment in this Colony, but though the processes are identical they fail in the Sydney climate and with the Sydney water, to produce an article identical with their Victorian beer. Our local brewers, however, contend energetically with the difficulties that surround them. They have, of late years, greatly improved the quality, and produce an article that is sound, palatable, and wholesome, and at only half the price of, at which English ale can be sold. It seems probable that the exigencies of revenue will saddle the latter article with a heavier duty; and the effect of such a tax on the relative consumption of local and imported beer is a matter which is much disputed. Porter, both bottled and draught, is also made, but its consumption is at present limited as compared with that of ale. The import of beer in 1869 was more than 1,000,000 gallons in wood, and more than 500,000 in bottles, and the total value was about £260,000. It is not impossible that our railways may, to some extent, effect the *locale* of the brewing industry. On the cooler table-lands the brewers would operate to greater advantage, and might establish themselves in districts where the neighbouring farmers could grow the barley, that is, of course, supposing that situations close to the railway

could be obtained, and where the water is of suitable quality, and in sufficient quantity.

Aerated Waters.—In this climate, especially in the summer time, there is a very large consumption of soda-water, tonic-water, lemonade, ginger-beer, &c. Very little is imported, the local manufacture being quite equal to the demand, and the quality being unexceptionable. The manufacture is distributed over the Colony, most of the large towns being self-supplied. There was at one time a considerable export trade to the other Colonies and the islands, but this is diminishing as those markets are closing. Some waters from natural springs in Victoria were exhibited. In this Colony no attempt has been made to ascertain the virtue of our medicinal waters, though several remarkable springs are known to exist.

Syrups and Cordials.—Of these nearly every variety is now manufactured in the Colony, and at prices not exceeding and often below the cost of the imported article. But in these things, taste rather than price regulates the preference, and the English-made article finds a sale. In 1869 there were 3,000 gallons of liqueurs imported.

Camden Park Exhibits.—A silver medal was awarded to Sir William Macarthur for the excellence and variety of his agricultural display. It was in the highest degree creditable that so many different articles should have been produced in such excellent condition on one estate. It was in itself an advertisement of what the Colony can do. At the request of the Committee, Sir William Macarthur has kindly furnished the following detailed information as to his several exhibits; and the memoranda are here published, not only for the sake of the useful information they contain, but to serve as a model and stimulus to others. If only a moderate number of cultivators in the different districts of the Colony would experiment with the same intelligent care, and record the results of their labours, a body of information would be gathered together which would greatly stimulate agricultural industry,—which would give a right direction to the good intentions of new beginners,—and which might save much waste of labour, and prevent much disappointment:—

Maize—Large Yellow Flint.—An excellent productive sort, and, upon the whole, probably the best. The sample exhibited weighs 64lbs. to the bushel, and is from a crop of 22 acres, which, although damaged, first by exces-

sively hot, dry weather at the "tasselling," or blossoming, and afterwards by floods, yielded above 80 bushels to the acre. It was sown in drills 5 feet apart, about three plants to the yard, and kept in high tilth with the horse-hoe and other implements. The sowing was in October, and the grain was ripe in March and April.

Maize—Smaller Yellow Flint.—An earlier and smaller sort than the last, and usually less productive. The sample weighs 66lbs. to the bushel, and was taken from a crop of 4 acres, which yielded 90 bushels to the acre. The period of bloom had passed before the intemperate heats above-mentioned, and the crop was secured before great injury was done by the rains and floods. The seed was drilled in about 4 feet between the rows, with four to five plants to the yard, and cultivated like the preceding. It was sown in October, and ripe in February and March.

Maize—Earliest Yellow.—A very early sort, obtained at Paris. I am assured by Vilmorins & Co. that it was the only one which ripened there. It may be sown at Camden as late as the middle of January, perhaps later, and when sown early may be harvested by the middle of January. The sample shown was sown in November, and ripe early in February. The rows were 3 feet apart, with four to five plants to each yard of drill. These three are the best sorts for common purposes.

Sorghum—Black or Chinese Sugar Millet.—This is the best fodder plant I have ever proved, and highly productive in grain; the sample is from a crop of about 4 acres, sown thickly for fodder. It grew from 10 to 11 feet in height, and got laid in various directions. An enormous quantity of fodder was cut from it over a period of nearly six months, and it exceeded all other crops for productiveness. Much of it was cut before the seed had formed or matured, and some through damage from floods was not cut or used in any way; yet, in addition to more than 200 tons of very nutritious food (a good portion was cut for fodder twice), there were saved from the plot above 220 bushels of fine ripe grain. The seed was drilled-in in October, in rows about 14 inches apart. By the middle of December it was being mowed, standing then at from 6 feet to 7 feet high.

Sorghum—A variety called Imphee.—A larger and loftier sort of sugar-millet than the last, but more tender in respect of cold, and coming to maturity later. I have had only the experience of one year with this variety, and only to the extent of about half an acre; this limited quantity was greatly damaged by floods, but so far as my present experience goes I prefer the black sorghum.

Sorghum—The Planter's Friend.—A shorter-growing and stiffer sort than either of the preceding, much less productive in bulk of stuff, but said to be the richest in sugar. It was grown in drills 3 feet apart. The stalk appears to be richest in sugar at the time the seed ripens.

Sorghum—Broom-millet.—A very tall-growing sort, its chief application being for the manufacture of brooms. Of very inferior in value as a fodder-plant to the sweet-sorghum. It is sown in drills 3 feet apart, and cultivated like maize. When the grain is beginning to form, the heads are bent downwards by breaking the stalk.

Sorghum—White Tartarian Millet.—A variety with a twisted neck, and close, compact head, the grain being white and large. I have only grown it for one season, and the experiment has been defective, as the heads have been greatly damaged by the continued rains. The seed was drilled-in about 3 feet apart.

Panicum Italicum—Small Yellow Italian Millet.—A hardy and productive grain, much cultivated in North Italy. The sample is from a plot of one-third of an acre, which produced 12 bushels. It was sown in drills 20 inches apart, in September, and reaped early in December.

White German Millet.—A much less vigorous sort, but producing a larger and finer grain. The sample is from a plot of less than three-quarters of an acre, which yielded about twenty bushels. This sort is very subject to waste by shedding its seed. It was sown in September, in drills 18 inches apart, and reaped in December.

Buckwheat.—A Polygonum.—An excellent grain for a "snatch" crop. The exhibit was from a plot of 4 acres, which had been just previously cleared of a crop of mangolds. It was sown broadcast in September, with a bushel of seed to the acre. A late spring frost did some damage by cutting off many young plants. The crop was mowed in November, and yielded 160 bushels of clean grain.

Haricot Beans.—The exhibit is from a plot of half an acre, and was much damaged by dry weather, having been sown too late. This is an excellent pulse for cottagers to raise for their own use on account of its nutritive flesh-forming qualities.

White Lupin.—A very productive crop, rendering heavy strong soil mellow, and much more easy to work. It is much used in Italy to plough in for manure, and also for fodder.

White Belgian Carrot.—The roots exhibited are from a plot of 7 acres, a most productive crop, yielding not less than 15 tons to the acre. It was sown in drills 14 inches apart, in September and October, 1869, and has been in use since early in June for feeding a number of horses, and more recently for milch cows. Little more than half the crop has been consumed, but the residue can be stored to feed pigs, &c., for several months to come.

Black Bamboo.—Very useful for fishing-rods, walking-canes, handles for umbrellas and parasols. It is a most valuable plant for a low, moist, and rich corner, and is applicable to many useful purposes. It grows slowly for a few years; but when it has obtained full possession of its site, it advances vigorously, and is perfectly hardy in respect of cold.

Olive Oil.—The oil exhibited is of two different seasons' growth—1869 and 1870,—the latter though scarcely so bright, being the best in flavour. The olives were gathered in a less mature condition than the year before; the oil is therefore more pure and nutty in flavour, but hardly old enough to have deposited all the sediment; it seldom does become perfectly clear before the first warm weather after being made. The trees from which it was produced are above thirty years old, large, and of perfectly luxuriant growth, but much too crowded. The soil a deep, well-drained, sandy, alluvium, having never received the least addition of manure; and the former often over-luxuriant, having never been injuriously checked by dry weather. To make oil of superior quality, the olives must be gathered before ripe, when only blotched with purple. At perfect maturity they are of uniform deep brown purple, soon falling to the ground, and in such state, although yielding most oil, it has never the same pure nutty flavour as the produce of unripe fruit.

In olive countries, where little store is placed upon purity of flavour, the crop is allowed to drop from the trees, and in such case is collected with far less trouble than the unripe, which requires to be pulled by hand. From the fallen fruit is made for the most part the common description of oil, much consumed for machinery and manufactures, known in trade as "Gallipoli Oil." A great portion of the produce of the most favoured oil districts is of this, or little better quality, its rancid flavour not being unpalatable to the chief consumers. But in some celebrated oil districts—those of the south of France and Tuscany for example, they strive to make it of the best quality, the increased value compensating for the diminished yield, and the greatly increased cost of gathering and collecting the crop.

It is this costly process of hand-gathering the crop, which seems to me to be the chief obstacle to the successful pursuit of the industry here. Throughout the coast districts sites abound perfectly well adapted for olive grounds. The tree is of the easiest propagation, grows fast, and endures many centuries. "Who would leave a fortune to his descendants," says the Italian proverb, "should plant the olive." If treated liberally, it will flourish in soils naturally arid and sterile; but it loves deep and dry alluvial banks, the sides of moderate slopes, and flourishes amongst rocks and loose stones. In wet situations, especially if the waters be apt to stagnate, or in stubborn compact clays, it will not thrive.

Individual trees are to be found of wide celebrity for their productiveness, this fruitfulness being imparted by the draining or wash from yards used for folding cattle and sheep. Mrs. Grant, I think, mentions one near Rome, reputed to yield annually 240 bottles of oil.

To form an olive orchard, select a well-drained, deep, friable soil, and sub-soil; very sandy, gravelly, or rocky, will do, but if fertile, so much the better, for the tree revels in a rich deep soil if only well drained. It is a good plan to commence getting it into fine tilth and condition, by growing in it some suitable crop with manure, so as to leave the land clean, and in high state of fertility—open holes, 30 to 40 feet apart—closer, if you propose to remove in a few years the alternate trees; into these holes insert (best in early spring) stout, straight branches, taken from a growing tree of productive kind, but taking care that they be stripped of all their spray and leaves, mere bare poles in fact. Let these be *firmly* fixed in the holes at least 20 to 24 inches deep, and the latter filled up, leaving a small basin round each to hold water whenever there is danger of the land becoming too dry. Let the portion of branch out of the ground be 4 to 6 feet long, and as straight as can be got. The stouter, up to 5 or 6 inches diameter, these branches are, the sooner your trees will attain a bearing state, but any stout junks, either of branch or roots, will in suitable soil soon make flourishing trees. If segments of roots be used, I should prefer to first rear them into young trees in a well-manured nursery; and in any case, if roots are taken to plant with, they should be planted wholly beneath the soil, the stouter end of the segment being merely covered. Often where olive-trees have attained to any size in a close plantation, stout straight shoots springing from the base of the trees may be had. These answer best of all, and if severed by axe or adze with a few inches of the root bark to form a heel, they will grow away at once, and probably bear the third year.

In September, 1826, a violent equinoctial storm of rain and wind prevailed for several days. During the gale nearly the half of a fine large olive-tree (the one originally imported in 1805 by the late John Macarthur), was blown down. Previously to this not a plant had ever been raised from it. The prostrate portion was cut up into junks of all kinds and lengths; the stouter pieces split into quarters, and the whole planted in nursery rows.

I *believe* very few failed to grow, although some did not push out until the following spring; but I *know* that a thick grove of flourishing trees was the result.

After an olive-orchard is formed it is requisite to keep the ground free from weeds, and to have it occasionally lightly stirred.

Indeed, if free space be allowed to the young trees, and especially if manure be freely applied, it will be an excellent plan to employ the intervals between the rows in growing green crops for mowing, &c.; but care should be taken that the trees are not starved of the necessary supply of moisture.

If judiciously managed, the freshly-planted poles will soon be covered with young shoots, and yield a crop, at all events, by their fourth year. Any one who has not witnessed it, would be surprised at the progress in a few years which a well-managed young olive plantation will make, in a congenial site.

It will be desirable to form their heads by rubbing off, soon after they appear, all the shoots but a few of the uppermost; and their heads being once formed, the trees will afterwards need little or no pruning.

In the majority of olive-grounds situated in France and Tuscany, the trees undergo an occasional severe pruning; but that process ought not to be required here.

The fruit is produced only upon the young shoots made the preceding season. In the colder olive countries, or in poor arid sites where manure cannot be afforded them, the trees are not vigorous enough to produce at the same time a crop of fruit and young growth sufficient for the next season's crop;—hence has arisen the practice of pruning each alternate year.

After the crop is harvested, and before the rising of the sap in spring, a pruning is given, more or less severe, in proportion to the exhaustion of the trees, and, if possible, the ground is in some way enriched. The young growth having been all cut close back, or thinned out, there is nothing left from which blossoms and fruit can be produced that season, and the trees being thus set to rest in respect to bearing, recruit their strength, producing a plentiful supply of young spray. These young branches the following spring load themselves with blossom, and the season being propitious, in due time with fruit.

In our virgin soils and under our favourable climate, unless the sites be badly chosen or unskillfully managed, there is no need to force our olives into the system of bearing only in the alternate years. They ought to require no such pruning, and should bear every year. Nevertheless, if from any cause an olive tree of considerable stature is reduced to a state of feeble annual growth, it is well to know that by thinning out the spray to a severe extent, and shortening the rest to the length of a joint or two, its vigour of growth may be restored sufficiently to make it bear again the succeeding season. But we ought to have little difficulty in so dealing with the site which it occupies, as to prevent the need of this troublesome process; again, unless in texture of soil, or by want of good drainage, such a site be wholly unfitted, our climate is so propitious that manure and cultivation ought to make the poorest land produce flourishing trees.

Where the olive is extensively grown, mills and presses are constructed for properly grinding the fruit to a paste, and expressing the fluid from the solid parts. They are of simple construction, but are hardly needed as yet.

To obtain the oil exhibited (of which we made this season about five or six gallons) the olives when all gathered (amounting to about twenty bushels) were passed through a common bean or corn crusher, the rollers being kept well apart the first time of being put through, and gradually made to work as close together as possible. We find it expedient to put the pulp through frequently, perhaps eight or ten times, and thus get a better yield of oil. The pulp is afterwards put into gunny-bags and sugar-mats, and subjected for some time to the utmost power of the wine-press, a broad sheet of tin turned up at the edges being placed in the box of the wine-press to receive the oil and convey it out without soiling the box. The liquid thus obtained is placed in large vessels, and the oil as it rises to the top skimmed off and stored in jars or bottles. But it requires some weeks before a complete separation can be effected, and several months before the oil attains perfect transparency. Observe that throughout the process of separating the oil from the watery parts, and afterwards the light should be carefully excluded. Full exposure to it soon makes it rancid.

If our agriculturists generally, our smaller farmers even, did but know what a comfort it is to have in a family a good supply of pure olive oil—how palatable and nourishing it is—how it ought, and in many countries does, supply the place of fat, lard, and butter, in cookery—how much more whole-

some it is, and withal how simple and inexpensive is the cultivation of the tree, and the preparation of sufficient oil for home use,—it would soon become plentiful in the farm-house instead of being looked upon with at best but a momentary curiosity.

The well known legend of Neptune's gift of the horse, but Minerva's of the olive-tree, each as the most valuable gift to man—the repeated reference in our own sacred history to the "olive," "oil olive," as conveying the idea of "fatness" of earthly comfort, and abundance, all attest the high value from the most ancient historical times that was attached to the tree. It stood more high in estimation even than the vine. In neglecting this, and indeed many other products specially adapted to our climate and condition, are we worthily fulfilling our mission? Surely not.

Capers.—Here is another product of considerable value, like the olive, requiring the labour of women and children, rather than of men, to make it available—easy to propagate, growing freely, perfectly adapted to our climate (the hyssop that groweth on the wall of scripture), and yet how many, it would be curious to know, of the many hundreds who noticed the samples exhibited, have the least notion what the plant is like, or what part of it it is that constitutes the capers used as a condiment. The plant then (which is regularly cultivated to some extent in the warm south-east corner of Provence, and grows wild upon old walls and ruins in Italy, Malta, and throughout the warmer shores of the Mediterranean), is a trailing spiny shrub, in favourable sites rambling to considerable extent, losing its leaves and younger branches in winter, and somewhat impatient of cold. In the later spring and summer it produces an immense number of beautiful flowers. The buds of these flowers, when quite small, constitute the "capers" of commerce. Every morning, where they are grown, women and children pick the young buds which are forthwith thrown into jars of strong vinegar cold, and this is all the preparation they require. It is usual to sort them into sizes, and for the smallest sizes to bear a greatly higher price than the larger, but in fact the larger buds are just as good for use as the smallest.

For nearly forty years I tried in vain to obtain this plant. At length, being at Marseilles, late in the spring, and on the point of embarkation, although I knew the caper district lay twenty or thirty miles to the eastward, I inquired in all directions for it. At length, a working gardener heard my inquiry and said, "Sir, I myself have planted out a few this season; they have already begun to grow, but if they will be of service you are welcome to half a dozen." I gratefully accepted the offer, got the plants at once—for which the good man could hardly be induced to receive any payment—and sent them by express train to Messrs. Veitch, London. They succeeded with part, and I got one out here alive. From this one I had a number doing well, but I take shame to add I have only one plant left. They last year were much neglected, and were constantly stripped of their leaves by a species of caterpillar which attacks them in preference to anything else. This accident, followed by the intense heats of January and February, and again by the incessant rains until winter (for the caper is most impatient of wet), killed all but the parent plant, and greatly weakened it. As, however, it will now be better cared for, I hope soon once more to have it multiplied.

Capers should be planted in light, rich, deep, well-drained land, at about 8 to 9 feet intervals. The land should be kept clean, and the capers be fully exposed to the sun. Watering them in very dry weather promotes their growth. Each year the young growth should be pruned short back, and a little heap of loose light earth drawn up over the stool, to be removed after the winter is over. If young plants are needed, the earth, before the frosts come on, may be lightly drawn up over the whole plant without pruning the

young growth back. The greater part will then be preserved through the winter, and, being cut off in spring, will make cuttings, which, with moderate care, will grow freely. This is the usual plan, but segments of the larger roots, an inch or more long, are also used as with the olive. Although the caper is very hardy, enduring heat and drought, it must be remembered that it is only in free rich deep soil, kept sufficiently moist through the summer, that it attains the greatest perfection. If it can be kept growing, as it would be by these favourable conditions, it will continue to produce its crop daily from October to May; and, under such circumstances, is in Provence considered to be by far the most valuable product obtainable from a plot of moderate extent.

Dried Fruits, Plums.—Two kinds of plums are used at Camden Park for making the ordinary “prune” or “French plum.” The largest, called the Fellenberg, a fine large fruit, produced by a vigorous hardy tree, but as yet not a great bearer. This sort seems to make the best, and certainly much the finest-looking, prune. The other, “Prune D’Agen,” is from Agen, on the Garonne, about midway between Bordeaux and Toulouse. In the neighbourhood of this town are made nearly all the prunes which are exported almost all over the world from Bordeaux. I was assured there that only at Agen would the particular sort of plum succeed. Nevertheless, having procured that sort, it proves to be hardy and well-suited to this climate, for only last year the first fruit was produced upon the young trees; and this year (1870) there seemed to be as many plums as leaves. The fruit appears to fall as soon as ripe, that is, early in March. If fine short litter be spread under the tree the fruit may be suffered to lie for some days as it falls; but after a few days it will need to be turned, and, in ten days, if fine weather, will be dry enough to pack away. Moderate rain and showers, if not too often repeated, do not appear to injure the quality, only to delay the process; but continued damp weather, especially if with high temperature, will soon make it mouldy. In such case the use of a hot closet becomes requisite, heated to 100°–120° by hot-water-pipes. If the weather however be generally fine, the plums, especially of the Agen sort, will dry perfectly where they fall. The young trees of this sort are this season again loaded with blossom, evidently for another great crop.

A third sort of dried plum is exhibited, and in the estimation of many persons a very superior product to the former. They are prepared differently. The fruit, just previous to perfect maturity, is boiled in a clear syrup of refined sugar until quite “clear”; it is then dried in the sun, or in a hot closet; for this purpose only the largest and finest sorts of plums are chosen.

Dried Apricots, Peaches, and Nectarines.—The fruit like the last is taken before perfectly ripe, the peaches and nectarines being of the freestone sorts. They are split open, the stones taken out, and, like the preceding, boiled in syrup until “clear”; then dried singly upon trays or dishes. Care must be taken not to boil them a moment too long, or instead of becoming candied they will remain sticky and syrupy.

Muscatel Raisins, Zante Currants.—The former are simply well-ripened bunches of the Muscal of Alexandria grape, dried in the sun on straw hurdles, but they require several weeks. If first dipped in boiling lye of wood-ashes they dry much more rapidly, but lose their bloom and fine appearance with part of their flavour. The currants dry very rapidly in fine weather. This is a very productive crop if in good situation and well managed. The plants should be vigorous with ample room, and be left at the winter pruning with six times the quantity of bearing wood proper for an ordinary vine. They ripen very early, but should be well matured before being gathered. In the Ionian Islands they are dried on the ground, but here the greater uncertainty

of the climate towards the end of summer, in respect to rain and broken weather, renders the use of hurdles expedient, which have long straw woven in between the bars, or otherwise secured to them close enough to prevent the fruit from falling through. It is most convenient to have these hurdles made of light tough sawn pine; the two heads should be 2 or 2½ inches by 3 inches, and the cross-bars with centre-stay be 2½ or 3 inches by ½. 5 feet is a convenient length by 3 feet broad; hurdles are awkward to shift about if made much larger. If placed on hurdles, made as described, with the drying fruit spread thinly on the upper surfaces, it is obvious that as many as twenty or more can with care be piled one upon another without crushing the fruit, and thus with comparative ease be protected from rain or the dews at night; it is desirable that the whole should be made to an uniform gauge.

RAW MATERIALS.

Under this heading will be included such natural productions as have not been already treated of.

Minerals.—The geological collections, although creditable, but incompletely disclosed the mineral riches of the Colony; and it must be admitted that New South Wales is behind Victoria in the work of geological exploration. A geological survey and the construction of geological maps for New South Wales have yet to come. There is not even as yet any collection of specimens that gives a complete exhibition of our mineral resources, so far as yet discovered. Some specimens are to be seen at the Museum—Professor Thomson has a valuable collection at the University—the Rev. W. B. Clarke has a private collection, the result of many years of laborious work—and other individuals who have interested themselves in mineralogy, have also collections more or less valuable; but to make a completely illustrative collection, some combination of these treasures is required. The steady development of mining industry is directing the attention of a larger number of persons to the occurrence of our mineral deposits; and the establishment of a geological Professorship at the University is attracting to the study some of the rising generation, and gives to everybody who appreciates it, the opportunity of listening to lectures on geology, illustrated by references to local formations. The mining industry of the Colony may be looked on as still in its infancy, but as about to pass soon into a more vigorous stage. That the Colony of New South Wales is rich in mineral wealth has already been sufficiently disclosed, but immense areas of country have yet to be closely investigated, and we can only be said at present to have a general knowledge of the superficial

formations. More attention has been paid to the search for gold than to the discovery of any other mineral. New South Wales led the way in the development of auriferous wealth in Australia, but it has been eclipsed by Victoria and New Zealand, and is being hard pressed by Queensland in the production of gold. Great efforts have been made to stimulate the search, and to establish for the Mother-colony a greater attractiveness to the gold-miner. The precious metal has been found widely diffused, and from Armidale on the northern boundary, down to Kiandra on the southern, there are scattered gold-fields at intervals; but as yet no large and steadily productive gold-field has been developed to rival those in Victoria. How far this result may be ascribed to deficient enterprise, to ill-regulated efforts, to the want of intelligent skill, or to defective legislation, is a matter on which there has been much difference of opinion, and which has been specially inquired into by a Royal Commission appointed for the purpose, but whose report and recommendations have not yet been sent in to the Government. Joint-stock enterprise has hitherto failed to develop the auriferous resources of this Colony; but though companies have failed, individual miners and small partnerships have in many cases been very successful. The production of gold has varied very considerably, the most successful year of the last decade having been 1862, when 575,538 ozs. were received by escort at the Mint. The least successful year during the same period was 1867, when the receipts at the Mint were 222,715 ozs.

Superficial indications of copper abound in various parts of the Colony, but in many cases they have proved deceptions, and of the companies formed to work copper-mines scarcely any have been commercially successful. Fresh discoveries, however, are being continually reported, and, warned by the experience of the past, speculators will be more cautious in future in abstaining from heavy outlay until the existence of permanent lodes has been demonstrated.

Indications of lead are found in many places, and some pigs have been produced from ore that has been raised; but some of the lodes have proved treacherous, and a steadily productive and remunerative lead-mine has yet to be opened.

Cinnabar has been found in the neighbourhood of Cudgong; but the deposit is scanty and scattered, and no defined lode has yet been traced.

Antimony has been found on the table-land of the Clarence district, and there seems a fair prospect of its being profitably worked.

Iron is very extensively deposited in the Colony. A fair quality of clay-land-ore is found close to the coast in the Wollongong district, and in immediate proximity to coal; but there is no lime in the neighbourhood. Hematite ore, of excellent quality, is found in extensive pockets in the Mittagong district, near the Southern Railway. Here, too, coal of varying quality, is abundant, but there is no lime nearer than Marulan, from which place, however, it can be brought by railway. A company formed to work the ore at Fitzroy has been commercially unsuccessful, though pigs of excellent quality and some fair castings were produced. Steps are being taken to resume the enterprise, and to secure from Europe the necessary skilled superintendence. Iron has also been found to the north of Sydney, in the districts of Brisbane Water and Port Stephens, where also coal is abundant. The natural facilities for working iron-ore are great, and it would seem as if the development of this industry could not now be long delayed. There is an opening here for the skill and capital of the old country.

For information as to the coal-fields of the Colony, the reader is referred to the special report by Mr. Keene. No fewer than thirty-three mines have been opened, but they are not all at work. The appliances for raising coal are in fact in excess of the demand, and enterprise in this direction has somewhat outrun the call for it. The total quantity raised is now about a million tons a year. It is exported largely, not only to the other Colonies, but to India, China, the Dutch Netherlands, the Pacific Islands, and San Francisco. Its reputation as a steam and gas coal is now well established, and the export is only limited by the available freight.

Kerosene shale, or, as some prefer to call it, cannel coal, has already been discovered in several parts of the Colony, though at

present only worked at Hartley and Wollongong. As it may possibly be found in connection with any of the different coal-seams, and as these seams spread over an enormous area of country, it is impossible to place any limits on the quantity of this peculiar mineral that the Colony may possess, but its value for oil and gas-making purposes is thoroughly appreciated, and it is justly regarded as one of the most valuable of our mineral deposits, though one the full worth of which has yet to be demonstrated.

Timber.—Although much of the native timber of the Colony is worthless for use or ornament, some of it not being even good for firewood, there are in our forests trees of great value. Most of the varieties have now been noted, and polished specimens have been shown in the Colony and sent to European Exhibitions. Many of these woods, however, are still practically unused, and a good many are being destroyed as the rich brush lands of the Colony are being cleared for the use of the farmer. For further information the reader is referred to the special paper by Mr. Moore, in another part of this volume.

Cotton.—No sample of Colonial cotton was displayed, although it is grown in moderate quantity in Queensland; and very fine specimens have been produced in New South Wales. Cultivators have not been induced to take up this branch of industry, and one or two feeble experiments have failed. It would be premature however to despair, and as agriculturists multiply in number, and over-supply the local markets with products consumed in the Colony, there may come an increasing disposition to raise crops for export, and cotton may then receive an attention hitherto denied to it. The best cotton seen in Sydney is undoubtedly that from Fiji, which is fast becoming an Australasian colony, and the industries of which will probably react upon the older settlements. The Fiji cotton will realize 4s. per lb. at Liverpool, and there is every inducement to its extended cultivation.

Silk.—Samples of silk, both from Victoria and this Colony, were shown, and were sufficient to disclose the possibilities of this industry. Some small beginnings have been made, but the general public apathy has not as yet been broken up, though the rearing

of silkworms seems particularly adapted to the circumstances of the Colony. There are one or two enthusiasts who work on amid a good deal of discouragement, amongst whom Mr. Brady deserves particularly honorable mention. He has been indefatigable in collecting eggs and acclimatising the worm, and in making experiments, the results of which are in the highest degree promising. The Agricultural Society is endeavouring to enlist public sympathy towards this infant industry, and has made arrangements for a special exhibition of silk in March next. A very valuable consignment of eggs has been lately received from Japan, through the intervention of the local Acclimatisation Society. These have been distributed to persons undertaking to superintend them carefully and report results, and it is to be hoped that before long sericulture will begin to exhibit some signs of entering on the commercial stage.

Flax.—Only from New Zealand were there any samples of flax, and only in that Colony is this fibre commercially prepared. The New Zealand flax plant grows well in the Botanic Gardens at Sydney, and would probably bear cultivation in several parts of the Colony. How far it would pay is yet to be determined. If New Zealand establishes a remunerative culture and preparation of flax, as it seems likely to do, New South Wales may follow. This is one of the possibilities of the future.

Other Fibres.—The excellent collection by Mr. Hill, the Director of the Botanic Gardens at Brisbane, displayed a variety of fibres, some of which at a future time may be more than curiosities. There is a large field here for intelligent experiment, and it is impossible at present to say how far acclimatisation may succeed, and how many fibres we shall be able profitably to grow.

Commercial and Medicinal Plants.—Of these there were several collections, and of great merit, as showing the industry and intelligence with which the choicest productions of other countries have been collected and acclimatised. This useful work, however, is still in too few hands, and but little has been done as yet to determine the climatic limits within the Colony of the different plants. Very little either has been done in the way of establishing on a commercial basis, the cultivation of medicinal plants. Still less has there been any adequate attempt to ascertain the

medicinal virtues of the native plants. One or two native productions have been discovered, though more by accident than design, to be of medicinal value, but a systematic investigation of Nature's gifts in this respect still awaits the labours of some scientific medical botanist.

Live Fences.—There was no entry for the best collection of plants suited for live fences, nor for the most suitable plants for edging purposes. These are two desiderata. Posts and rails and iron wire constitute the uniform pattern of Australian fences. Several different plants have been suggested as adapted for the purpose, but none have as yet commended themselves for general use. Live fences certainly take up room, take something from the soil, and require trimming, but then they are self-sustaining, they act a little as a breakwind, and they cast some shade. There are very few at present to be found in the Colony, and it seems still uncertain how far any thoroughly unexceptionable plant can be acclimatised that will make a hedge strong and thick enough for Australian use in the warmer parts. Hawthorn will grow to the south of Sydney and on the table-lands, though not quite so vigorously as in England. The sweet-brier and furze have both been tried on the coast, but are objectionable on account of their tendency to spread—the seeds of the latter are blown about, and those of the former are distributed by birds. The native thorn, *bursaria*, has succeeded moderately well in some places, but will not thrive where the soil is saline. The osage orange, the cockspur vine, and the acacia, have also been slightly experimented on. The appearance of gardens would in many cases be greatly improved by a neat edging. Bricks and black bottles may be useful but they are hardly elegant. Box will not do in or to the north of Sydney, nor will the daisy. Grass is generally used, and ivy has been recommended.

Floriculture.—Although for a large number of classes there was no entry, still the display of flowers and pot-plants was very brilliant, and was a chief feature in the ornamentation of the hall. Although gardeners in Sydney are not without their troubles, they are seldom tried by such blighting hot-winds as are experienced in Melbourne and Adelaide. Floriculture has long been popular in Sydney, and is encouraged by a special society which

has its periodical exhibitions, when gentlemen amateurs and their gardeners compete with professional nurserymen, and make a display not to be surpassed in many parts of the world.

MANUFACTURES.

UNDER this head will be classed all articles not being raw material, and not having been previously referred to under the heading of Food.

Agricultural Implements.—The principal manufacturer in Sydney did not compete, and therefore the display made by Victoria completely threw the older Colony into the shade. To whatever cause it is to be ascribed, whether to the stimulus of a better demand, or to greater enterprise, our neighbours to the South have taken an undisputed lead in the department of agricultural machinery. There are more persons engaged there in the business, more competition, and the articles turned out are cheaper than in New South Wales. At the same time the makers in this Colony contend that their work is stronger and more durable. We have several manufacturers of ploughs, who have satisfactorily met a local demand for instruments specially adapted for local tillage, and the ploughing-match was won by the use of a Colonial plough. Mowing, reaping, and threshing machines are, to some extent, imported from Victoria. The facilities for manufacture, however, are equally great in this Colony, and there seems no sufficient reason why in this branch of industry we should be at all distanced. A great many English-made farm-implements are imported, such as ploughs, rakes, hoes, spades, harrows, pumps, and some of the larger machines, on which, however, the freight is very heavy. Our local manufacture at present embraces horse-gears, peg-drum threshers, winnowing-machines, Californian pumps, sheep-washing machinery, and wool-presses, &c.; it is certainly capable of extension. From America we obtain ploughs, threshers, fan-mills, hay-cutters, corn-shellers, &c.

A very large proportion of the agriculturists of the Colony own small holdings, and are too poor to invest much in agricultural implements. It is common for the owner of a threshing-machine

to move it to districts where farmers are sufficiently numerous to give him remunerative employment. The bad state of the country roads is the principal drawback to this convenient arrangement. In the newly-settled parts of the Colony the stumps are not sufficiently cleared away to allow of the use of reaping-machines, and the wheat has mostly to be cut by hand. Stump-extractors have as yet been little used.

It was unfortunate that owing to the time of the year and the season, and the scarcity of cultivated paddocks in the immediate neighbourhood of Sydney, no trial could be given to the various reaping and mowing machines; and even for the ploughs the land selected was not in a state to give a fair trial either of the qualities of the plough or the skill of the ploughman. The wool-presses too were not subjected to any further test than that of bending a spring.

The imports of agricultural implements in 1869 was of nearly the value of £8,000, of which three-fourths was from Great Britain, and nearly one-eighth from Victoria. Articles required more for pástoral than agricultural use, such as wool-presses and apparatus for spout washing the wool on the sheep's backs, are made in the Colony. Iron-wire, which is coming largely into use for fencing, and iron posts and gates have all to be imported.

Manures.—With two exceptions, all the artificial manures exhibited were from the other Colonies. Nothing has as yet been attempted here but the manufacture of bone-dust and super-phosphate of lime. Guano is occasionally imported from the islands of the Pacific. It is only of late that artificial manuring has received any consideration. Some of the older farms in the Colony have been unmercifully cropped, and where not naturally refreshed by the top-dressing left by floods, can only be restored by long fallow, or artificial manure. With a view to promote the proper chemical treatment of the soil, the Agricultural Society has made special arrangements to obtain for its members at a nominal rate chemical analyses, and a more intelligent treatment of the land is beginning to take the place of an incessant production of the same crop. The use of bone-dust is extending in the neighbourhood of Sydney, although by no means to an extent commensurate with the real requirements

of the soil. Too many cultivators are still altogether indifferent to the proper treatment of the land, and a very large portion of the bone-dust and super-phosphate made in Sydney is shipped away, particularly to New Zealand, where it seems to be more appreciated. Some is also exported to Columbo, presumably for the coffee-plantations, and more would be sent, but for the difficulty of getting return freight. Most of the land in the metropolitan county is deficient in lime. No attempt has yet been made to utilise the railways for the purpose of carrying lime as a restorer of the soil, but as both the southern and western lines pass within easy reach of limestone formations, the opportunity will probably be made available as the importance of providing the right ingredients for the land becomes recognized. High farming is at present unknown in the Colony, and only a slight approximation to it is attempted by one or two gentlemen, who are beginning to display a worthy desire of keeping model farms.

Tallow.—The quantity of tallow manufactured in the Colony has varied very much according to the surplus of live-stock. Sometimes sheep and sometimes cattle have been in excess of local wants, and sometimes neither. Thus, while in 1860 only 2,753 sheep were slaughtered for tallow, in 1869 the number was no less than 230,550. So again, while in the year 1864 60,000 head of cattle were boiled down, in 1869 there were only 246. The quantity of tallow produced varies very much therefore from year to year, and within the last decade has ranged between 16,000 cwt. and 67,000 cwt.

Soap.—This is a very natural article to manufacture in a country where tallow is so abundant, and the competitors were numerous, Victoria running the older Colony very hard. What is obtained from England is principally the fancy article. Nearly all the common soap, and an increasing quantity of the toilet soap used, is of Colonial manufacture. Soft soap is made from the black oil, and that is found to be more suitable for the purposes of wool-washing than that made in England from seed-oil.

Candles.—Tallow candles are manufactured to a large extent in the Colony, and indeed in almost all parts of the Colony, and they are made cheaper than they can be imported. In this climate

they are rather soft for summer use. In the manufacture of the harder stearine candles Victoria has taken the lead, and finds a market for its produce in Sydney, where the makers have not yet set up the machinery, or adopted the processes necessary to turn out the best article. If the Kerosene Company should carry out the project of extracting the paraffine from the waste oil, we should then have a Colonial commodity capable of being usefully worked up in the manufacture of hard candles. Sperm candles are to a large extent brought from England, and in addition to the domestic consumption they are much used in the mines of the Colony. The import in 1869 was to the value of £62,000, of which about one-eighth was re-exported.

Tobacco.—The manufacture of tobacco in the Colony is stimulated by a duty of 2s. a lb. on manufactured, and of 1s. on unmanufactured, tobacco. There have been forty establishments at work, but their number is now reduced to thirty-six, of which twenty-three are in the Hunter River District, in the neighbourhood of many of the tobacco-growers. The total quantity of tobacco manufactured is about 9,000 cwt., of which about three-fourths is made from Colonial leaf. The quantity of unmanufactured leaf imported, to be made up in the Colony, was about 1,500 cwt. The amount of manufactured tobacco imported, after deducting the re-export, leaves about 6,000 cwt. for local consumption, so that the greater proportion of what is consumed is of local production. The annual import of cigars, for local use, is about 40,000 lbs. Some are made in the Colony, but it is difficult to ascertain the number, as there are several growers who make on a small scale, and no return is obtained of their work in this line. Imported leaf is used in making up cigars, which are of various quality, and range from 20 per cent. below the price of Manillas, up to 50 per cent. above it. The cigars made from Colonial leaf are held in inferior estimation.

The negrohead manufactured from Colonial leaf is sold at 2s. a pound less than what is manufactured in America. The lower value put upon the imported article is due to the inferior quality of the Colonial leaf. The best seed has been imported, but the standard of American excellence has not yet been attained. The farmers however are steadily improving in the cultivation and

preparation of the leaf, and the limit of excellence has by no means been attained. Tobacco has been hitherto grown upon the alluvial lands on the river-banks, but though larger crops per acre are thus obtained, a superior quality is produced on lands less rich though free from floods. An experiment made a few years ago in tobacco-growing on the Lachlan River resulted very successfully so far as the quality of the leaf is concerned, and there is some ground for anticipating that a large part of the south-western district will not only produce tobacco but will supply the manufacturers with a better raw material than they have hitherto had.

Iron-work.—The quartz-crushing machinery, sugar-machinery, and steam-engines exhibited, gave some idea of the quality of the work produced at our great foundries and machine-shops, but they could not furnish any adequate idea of the extent of this industry, which is one of the most important in Sydney. Although from the temporary stoppage of the Fitzroy Iron Works, iron is not produced in the Colony, there has grown up naturally a large demand for foundry and machine work. The steamers employed in the coasting and intercolonial trade of course require repairs, and the mail-steamers employed in the ocean postal-service are refitted at Sydney. The machinery and tools necessary for all the processes of marine-engineering have been imported, and a large staff of skilled labourers have also been drawn into the Colony. All kinds of repairs can be executed with despatch, and probably at as moderate a price as anywhere out of Europe. Steam-ships have been lengthened, and some few have been built, the latest and largest achievement of the kind being the building of a steamer of 500 tons for the Queensland Government. There are in the port two graving-docks, three patent-slips, and one floating-dock, and both wooden and iron ships can be repaired to any extent. Steam-tugs, punts, and steam-dredges have been constructed substantially, and to advantage. Wooden ship-building on a small scale is carried on at some of the out-ports, where timber is more abundant and labour is cheaper than in Sydney, and several of the coasting craft are of Colonial build.

Apart from the marine engineering, which the port has naturally fostered, there has also been a large demand for mechanical appliances on shore; railways, flour-mills, quartz-mills, sugar-

mills, coal-mines, kerosene-works, sheep-washing apparatus, hydraulic wool-presses, &c., &c., have called for the labour of the local artizan. Where time is not an object, and exact specifications can be remitted to Great Britain, and freight can be obtained on moderate terms, it is cheaper to import than to manufacture on the spot, which is not to be wondered at when it is remembered that the average wages of the iron-workers in the Colony is about double what is payable at Glasgow. There are, however, many articles for which it is inconvenient to wait, or which for other reasons it is preferable to have made upon the spot, and the appliances in the Colony are now equal to any ordinary demand made upon them. Iron-castings can be made in one piece up to 30 tons, and brass-castings up to 10 tons. There are steam-hammers for welding, and large shafts can be wrought out of scrap-iron. There are appliances for turning and boring up to 14 feet, and for planing up to 25 feet by 6. Punching, cutting, bending, and riveting machines, and all the minor appliances, are provided in abundance. At the City Iron Works Mr. Brown has also established a rolling-mill, where scrap-iron is worked up into bar and angle-iron, and where wheel-tires for railway purposes can be manufactured.

Two of the most notable exhibits were two locomotive engines of Colonial-make—one constructed at the Government Railway Works, and the other by Messrs. Mort & Co., who, in conjunction with Messrs. Vale & Lacey, are under contract with the Government to deliver eight engines at a cost of £3,250 each, which is only £50 in excess of the estimated cost of a similar engine from England, after adding all charges for superintendence, agency, freight, and re-fitting. To set against the small extra price is the condition of the contract—that the Colonial engines must run 1,000 miles before they are paid for, and that if during the first year they break down through defective material or workmanship, they are to be repaired at the contractor's expense. The wheels and axles and the frame-work were imported, but all else was of Colonial workmanship. The engines are very creditable specimens of Colonial enterprise, and are now being subjected to the practical test of wear and tear.

Among the minor articles of iron-work displayed was a variety of cooking-stoves. Register-grates for sitting-rooms are all

imported, but for kitchen use Colonial stoves are often preferred, except in large houses, where imported ranges are adopted. A good many American stoves are imported, and they are found to be light and handy, but they are not so durable as those of Colonial make, and are not so economical in fuel. Scotch stoves, made on the American pattern, and with improvements suggested by Colonial experience, are largely imported, and are by many preferred to either American or Colonial stoves. In the country, where wood is burnt, stoves are wanted that do not require the fuel to be cut very small, and the Colonial ovens are adapted to this state of things. In the city, coal and coke are the most economical fuel, breeze being sold at the Gas-works at 6/- a chaldron.

There were several specimens of gas-stoves, and it is somewhat strange that they are not in more general use in this climate, wherever gas is available. In the heat of summer a kitchen fire is a nuisance, especially in a small house, and though often kept up all day is really only wanted for a few hours, to keep water hot, or while the cooking process proceeds. Gas-stoves, to which the heat could be applied exactly when and in the quantity required, would be cool as well as clean, and probably economical, and with the aid of Norwegian ovens, of which several were exhibited, it would be easy to keep hot anything required. This class of apparatus seems to be well adapted for household purposes in our cities, and will probably before long find its way into general use.

In wirework Messrs. Eastway showed a large collection of Colonial-made cages of all sizes and shapes, as well as traps of Colonial design and construction, for rats, mice, birds, flies, opossums, native-cats, fishes; also, sieves, riddles, screens, coops, &c., and many varieties of open wirework. This class of work is all done by hand-labour.

The import of iron and steel in 1869 amounted to 17,520 tons, exclusive of tanks, pipes, bridge-work, and old iron. The import of machinery was valued at £68,589, exclusive of weighing and sewing machines, and the export of machinery at £18,000, of which £10,000 represented work done in the Colony.

Among the large assortment of sewing-machines were two of Colonial manufacture,—one made in Victoria, and one in New

South Wales,—each having some slight alleged improvement, the result of Colonial ingenuity; but these were rather curiosities than indications of a young trade. We are not in a position at present to compete with the older countries in the manufacture of these machines; they are, however, very largely used in the Colony, and here, as elsewhere, the necessity that springs up for repairing imported machinery may in time lead to the manufacture.

Galvanized Iron.—Three different exhibitors showed specimens of Colonial galvanized iron. Mr. Zollner was the first to introduce this industry in 1863, at which time it was not practised anywhere out of England. Now nearly all the buckets and tubs used in the Colony are galvanized in Sydney. Corrugated iron, galvanized, is still imported, as the freight on it is no greater than on the black iron, but tubs and buckets, being more bulky, cost more for freight, and this difference gives the Colonial manufacturer the margin for profit. Mr. Zollner has recently added to his establishment a complete plant, imported from America, for making up tins for kerosene oil.

Woodwork.—There is no timber in the world more durable than the Australian hardwood, though it is rather trying to the tools. The softer woods from Europe and America are imported and used for indoor-work, but where strength and durability is required, and where work is exposed to the weather, Colonial wood is always preferred. Most of the modern steam-driven tools have been imported, and sawing, morticing, tenoning, planing, moulding, tonguing, and grooving, &c., are all done by machinery. This economy of mechanical appliances fixes in Sydney a large proportion of the joinery business of the Colony, as it is cheaper to have ready-made doors, window-sashes, &c., made in Sydney, than by hand-labour in the country.

The making of railway-keys for the permanent way has lately been introduced. Formerly English elm was alone considered suitable, but after a careful experimenting on Colonial timber, it was found that cedar (though cedar alone) would retain the wedge-shape given by the hydraulic presses. Cedar keys are now used, being cheaper than the imported elm, and quite as good.

A considerable amount of cooper's work is done in Sydney, but the casks of Colonial wood are principally used for the export of tallow. They are made of what is known as the silky oak, the beech, the Colonial ash, and Colonial lance-wood. They are not suitable for wine or beer, on account of the sap that exudes from the wood, even when it is well sun-dried; but experiments are about to be made to extract the sap by steaming, and if they are successful, Colonial timber will be more largely used in this branch of industry. At present, wine-casks made in the Colony are mostly of Quebec oak, which is imported direct from New York.

The imported timber in 1869 was of the value of about £50,000. We drew deals mainly from Sweden, spars from New Zealand, battens, shingles, and palings from Tasmania, laths from the United States, pine-wood from Queensland and New Zealand, and planking generally from New Zealand, Queensland, and America, and turnery and small woodware chiefly from the United States and Great Britain. This, however, is exclusive of toys and fancy goods, into the manufacture of which woodwork enters very largely. These were of the value of £50,000, of which £20,000 worth were re-exported. Of our own timber we exported cedar to the value of £11,800, hardwood to the value of £5,700, pine-wood to the value of £3,200, besides a small quantity of spokes, felloes, posts, rails, stocks, naves, shingles, palings, and laths, and turnery and wood-ware. Altogether, the export of our own produce was nearly of the value of £25,000, or about half the value of the import, the wood being nearly all more or less worked up. It is sent away mainly to the other Colonies and to the South Sea Islands, though a small portion of the hardwood finds its way to India and China.

Bellows.—A large assortment of Colonial-made bellows is exhibited by Mr. Zollner. This is a new manufacture, only having been commenced in May, 1870. It was due to the fact of an emigrant to Queensland, who had wandered down to Sydney, and who was unable to find employment, soliciting assistance from Mr. Zollner. Finding that he had been brought up to the manufacture of bellows, Mr. Zollner set him to work, and with satisfactory results. The trade prefer the Colonial article, because in the bellows that are imported the leather is often perished and

the wood worm-eaten. Mr. Zollner makes every size, from the small hand-bellows to the large ones for blacksmith's use, and has already turned out about 200 dozen. The nozzles are galvanized. Colonial pine is used for the small size, and Colonial beech for the large, and the leather is of course Colonial.

Brushware.—Three exhibitors, one of whom was from Victoria, furnished some excellent specimens of Colonial-made brushes in great variety. The substantial character of the Colonial-made recommends them for general use. The bristles all have to be imported, but the Colonial wood is used up to great advantage, the ornamental woods being very favourably displayed in hair and clothes brushes. The brushmakers also turn out matting, but this particular article is largely made in the gaols. The work is found convenient for the employment of prison labour, and some very good samples of prison-made mats and matting were exhibited.

Vehicles.—The very large display in this department was in the highest degree creditable to the manufacturers, and the skill of the Melbourne artisans was also well represented. The manufacture of vehicles is a very important Colonial industry, giving employment to a large amount of labour, and using up a great deal of raw material produced in the Colony. Nearly every variety of vehicle, from a bicycle up to a railway-carriage, is now manufactured. Very superior carriages are still imported, but the demand for them is not great, and they are principally brought out by returned colonists, or to order. The value of carriages imported in 1869 was only £3,385; but the value of carriage materials was £7,500. For these it is absolutely necessary to draw from Great Britain and the United States; from the former come all the trimmings and the steel springs, and from the latter come buggies and buggy materials. The importation of ready-made buggies from the United States has greatly fallen off. The heavy freight is in favour of making them up in the Colony. It is only the lighter and more expensive articles that are now imported; but the coachmakers cannot do without imported ash and hickory. Every effort to find a local substitute, and a fair trial has been given to the Colonial timber, but in vain. For the wheels, shafts, and framing of buggies

American wood must be used, but for the bodies Colonial wood answers well, cedar and beech making excellent panelling. The carriage-leather used is partly Colonial, partly English, and to a small extent American. The Colonial article will come more into use as improved appliances are furnished for splitting the hides; but only one tanner has at present gone into this line; and the Colonial practice of branding cattle is a great inconvenience to the tanner.

For omnibuses, dog-carts, drays, &c., the Colonial iron-bark and blue gum is extensively used, and they answer exceedingly well; but for the shafts of gigs, dog-carts, phaetons, &c., it is necessary, to import lance-wood. The timber of the Colony is not flexible and will not retain its form even when well bent by steam, and a good deal of bent wood is imported from Victoria, where the black-wood, which yields itself to the process, is plentiful, and of which Mr. Perry furnished an excellent exhibit.

Railway-carriages.—One first-class railway-carriage was the only specimen exhibited of the rolling-stock—other than engines—now being manufactured in the Colony. It was constructed under the Messrs. Russell's contract with the Government, which is to supply all the carriages and trucks required for five years, but having been specially got up for exhibition, contained some additions which made its cost exceed the contract price. The Government commenced the experiment of Colonial construction with goods' trucks, and finding it to answer has now extended its orders to all classes of rolling-stock. The wheels and axles of the carriages have to be imported, but the Colonial timber is worked up advantageously in all the wooden frame-work. The panelling of the carriages is mostly of Colonial cedar or beech. The only first-class carriage yet delivered cost £1,232, which is in excess of the standard price. The prices of the other descriptions of rolling-stock are as follows:—Second-class enclosed, £335; second-class open, £300; four-wheeled brake-vans, £315 and £330; cattle-waggons, £148 and £153; goods'-vans, £152; horse-boxes, £245 and £252 10s.; carriage-trucks, £150 and £158; A trucks, £112 and £115; B trucks, £116 and £119; D trucks, £115 and £118. The Superintendent of rolling-stock has

officially reported that the workmanship of what has been already delivered to the Government is good, and that the cost will be less than that of importations when all charges are taken into account.

Furniture.—Some admirable samples were shown of the skill of the Colonial cabinet-makers, and the New South Wales cedar was displayed in many of these works to the greatest advantage. Most of the ordinary furniture used in the Colony is now of local manufacture. We have, however, no such wood as the walnut, and drawing-room suites are mostly imported. To economize freight, many are brought out in the rough and put together in the Colony. Articles so prepared generally receive the preference, as too much of the imported ready-made furniture is slop-work, sent out for sale by auction. The run upon Colonial cedar, which is getting somewhat scarce and difficult of access, has been eased off during the last few years by the introduction of the pine from Maryborough, in Queensland. This wood is completely superseding the use of Baltic and American timber, as it works up well, and takes a good polish. For kitchen and bedroom furniture it is very useful.

There are many other Colonial woods, especially those which grow in the brush country, which would make very handsome furniture, as may be seen from the polished samples displayed in various exhibitions ; but these woods have not as yet come into general use. A large quantity of furniture is made up in Sydney for transmission into the country, but the export to other Colonies, which was at one time considerable, has fallen off. Most of the work is done by hand labour, and the machinery employed in England and America has yet to be introduced. There seems to be an opening in this direction for a skilled capitalist. The Chinese in the Colony have found in cabinet-making an outlet for their patient industry, Their work is not so good as that of the European artizans, but they put a less price upon their labour, work long hours, and can sell a cheaper article.

Colonial horse and cow hair is cleaned and dressed in the Colony, though the longer description of hair is sent to England for weaving into hair cloth.

From America the Colony draws kitchen, rocking, and folding chairs, and a variety of household utensils and "notions," made up with a cheapness and of a wood which the colonists cannot rival. The import of wooden furniture in 1869 was valued at £28,000, of which £19,000 was due to Great Britain, and about £5,700 to the United States.

For household articles made of iron we have to look principally to the Mother-country. There are one or two makers of iron bedsteads, who, considering the difficulties they have to contend with, turn out a very creditable article, but it is absurd to pretend that we can rival effectively the Birmingham wares.

Leatherwork.—Although several of the leading producers did not exhibit, there were some good samples of Colonial leather, that from Melbourne being at least fully equal to anything shown from New South Wales. There are tanneries now in nearly every important township in the Colony, and not only is leather enough for Colonial use produced, but some is exported. Wattlebark is cheap, and it pays to turn hides into leather before sending this surplus commodity away.

The import of leather in 1869 was only of the value of £16,000. The export was valued at £47,000, of which nearly the whole was of Colonial manufacture, and the greater proportion of which went to Great Britain. We do not however work up all the raw hides, as the export of these in 1869 was of the value of £45,000; so that there is still room for the extension of the leather-making business.

The import of boots and shoes in 1869 was of the value of £50,000. The export was valued at £45,000, of which £21,000 represented Colonial work. The local manufacture of boots and shoes has progressed very rapidly of late years. All the stronger kinds of men's boots are now made in the Colony, and at prices which not only make the import unremunerative, but which are as low as the first cost in England. Women's and children's boots are also made of plain leather—from calf and kangaroo skins; but the more expensive sorts and fancy articles are still imported. Most of the local work is done in factories, home-labour being unable to compete with the economy of subdivided

operations that the factory system admits of, and artizans find that they can do better for themselves by working in a factory than by working at home.

Some saddlery, excellent both in style and workmanship, furnished a fair illustration of Colonial skill in this line. The import of saddlery and harness in 1869 was valued at a little over £30,000, and the export at nearly £11,000, of which, however, £6,000 represented Colonial work. In saddle-making, the Colony has made great advances of late years, and the English work is almost entirely superseded. The Colonial saddle is everywhere preferred, as being more suitable in style, though perhaps not better in workmanship. This is an article in which the maker is able to avail himself of all the advantages of local criticism. The buyer of an imported saddle, if he is discontented, grumbles in vain, and his complaints never reach the manufacturer, and if they did the latter would not alter his pattern to suit the caprices of a distant market. But the buyer of a Colonial saddle can insist on having just what he wants, and has his smallest whim attended to. Good riders are very critical about their saddles, and good riders abound in the Colony. Moreover, when horses have to carry a man from 50 to 60 miles in a day, as is constantly the case with stock-riders in the bush, the saddle must fit well, or the horse's back is soon injured. Saddlery therefore is an art which has attained to considerable perfection here, and the English work is almost unsaleable, except in the case of the very commonest article, which finds a small sale at slop-work price. Hogskins, however, have to be imported for the best work, and so have first-class bridles. Somehow or other the Colonial leather, or the Colonial workmanship, will not furnish them equal to the English quality. All the rougher descriptions of cart-harness are made in the Colony, but the best coach-harness is still imported, as also is a large proportion of buggy-harness, but the local manufacture of the latter is increasing rapidly. All harness furniture is of course imported.

Woollen Cloth.—The manufacture of tweed was commenced in the Colony more than twenty years ago, but was stopped by the high price of labour, consequent on the gold discoveries. This industry is now beginning to recover, but is somewhat hampered

by the antiquated character of much of the old machinery. The prize was carried off by Victoria, where the proprietors of a new establishment at Geelong have imported from England the newest and best machinery, and an adequate staff of skilled hands. There are now seven establishments in New South Wales at which woollen cloth is manufactured. The production in 1869 amounted to 234,000 yards. The cloth has not the finish of the English-made article, but being all wool and free from shoddy, is more durable, and finds a pretty ready sale.

Ready-made Clothing.—There was a large display in this class, several of the leading establishments vying with one another. Most of the large drapers and outfitters either keep workshops or put work out, but there is not as yet in Sydney so systematic a development of tailoring as there is in Melbourne. But one establishment has been lately started by Mr. Stevens, detached altogether from any wholesale or retail business, and devoted exclusively to making up woollen garments for the selling houses, and a competent staff of work-people is thus being collected and organized. There seems to be at present too much dispersion in this business to secure the maximum economy of labour, time, and material, and more concentration would probably show an improvement.

In the department of ladies' underclothing and childrens' dresses, J. W. Taylor made an excellent display. In embroidery in silk and wool, and in making up garments, a good many females are employed, the work being mostly given out. The earnings at this labour range from 15/- to £2 a week, and it is principally taken in the city and suburbs, although it is slowly extending among families along the railway-line. Embroidery on cambric is only carried on to a very limited extent.

Oil.—Burning oil was well represented by the Western Kerosene Company. It is only in this Colony that illuminating oil is manufactured, although in Tasmania a substance has been found bearing some resemblance to the kerosene shale, yet not of equal value. There are at present only two manufactories of kerosene oil in the Colony; others that have been started have been closed, the low price of oil, and the difficulties of the manufacture

having proved unexpected embarrassments, and for a time discouraged enterprise. The Western Kerosene Company draws its shale from Hartley, and has its factory near Sydney; and has skilfully overcome the difficulties attendant on extracting from the mineral an oil unobjectionable in quality, equal in illuminating power to the American well-oil, and safer as having its igniting point at 120 degrees. The company, which imported most of its plant from England, has now sixty retorts in full work, and can produce at the rate of fully 5,000 gallons of refined oil per week, which is about half the estimated consumption of the Colony. The residue, which is tolerably rich in paraffine, is shipped to England, though it is in contemplation to erect apparatus for its extraction in the Colony. From the refuse is also manufactured anti-friction grease and wood-preserving oil, or kerosene tar, which is much appreciated as protection against the white ant, for posts, piles, joists, &c. The import of kerosene oil in 1869 amounted to 315,000 gallons, of which about half was re-exported.

There were several exhibits of neatsfoot oil, and six samples of essential oils from Brisbane.

The manufacture of scents from flowers has been frequently suggested as likely to be profitable, but the jealous restrictions of the distillation laws at present stand in the way.

Paper.—Samples of brown, packing, news, and blotting paper, were exhibited from the Paper-works at Liverpool, on the George's River. This is the only establishment of the kind in the Colony. It has been erected at a considerable outlay, and the machinery, which has been all imported, is of the newest and best description. The enterprise has been hampered by want of capital, and also by the want of trade knowledge on the part of the originators. If devoted exclusively to the manufacture of news paper, the establishment is capable of turning out enough to meet the present requirements of the Colony, and the supply of rags, if carefully looked after, would probably be sufficient to keep the mill going. Rags are at present collected for export to England, though only in small quantity. Various fibres of Colonial growth have been suggested as suitable for this manufacture, and the practical experiments at present have been by no means exhaustive. Dr. Müller exhibited a most interesting selection of paper,

hand-made, from various fibres, but there have been no similar experiments on a manufacturing scale, and the cost of preparing most of these fibres would probably be prohibitory. The most promising material hitherto operated upon in this Colony is a sedge known as *cyperus vaginalis*, which grows in considerable abundance in the neighbourhood of Sydney, and is frequently used for thatching. It is said to be as suitable as the Spanish *esparto* grass, and if obtainable in sufficient quantity, and at a moderate price, may be a valuable supplement to the supply of rags. The value of the paper imported in 1869 was £86,000. This of course does not include paper-hangings.

Type.—One type-founder represented this branch of industry, Mr. Wright not only showing the type-casting machine at work, but exhibiting also another machine, made by himself on the model of the imported one, and containing some slight improvement, of his own invention.

Pottery.—There were several exhibitors of Colonial earthenware, and their work was not only creditable in itself, but indicated a rapid advance in this industry. There was a sharp competition in several articles with the exhibitors from Victoria, whose filters especially were deserving of praise. But for finish the highest prize was secured by Mr. Turton, of Waratah, whose jars, water-coolers, and ginger-beer bottles left little to be desired. Clay is almost superabundant in this Colony, and there is nearly every variety there can be wished for, except pure kaolin, which has never yet been discovered. Most of the coarser articles of earthenware can now be advantageously made here, though there is plenty of room for improvement, both in economy and in the style of manufacture. The cost of freight and the risk of breakage furnish a natural protection to the local producer, and this industry is clearly one that has a future before it. Large glazed drain-pipes are made in the neighbourhood of Sydney in considerable quantity, and are extensively used; and machinery has been imported for the manufacture of draining pipes for agricultural purposes, which can now be produced at the low prices mentioned in the catalogue, by Mr. Holroyd. Until lately, draining has been almost neglected by farmers, yet perhaps in no climate is it more necessary. Those who have tried it are

delighted with the results, and the demand for pipes is now rapidly increasing. The use of tiles for paving and for roofing has also recently been introduced. For the former purpose they are cool and clean, and for the latter they are cooler than slates and as cheap as shingles, while they are more sightly. Glazed bricks for foot-paths, hollow bricks for ventilation, long bricks for making hollow walls and chimney-pots, are also turned out from the potteries.

Cutlery.—Two local cutlers exhibited cases, containing excellent samples of their handiwork. It might be thought that this was a department in which it was impossible to compete with Sheffield; yet there are many instruments called for by local circumstances which give scope to the skill and inventive genius of the Colonial manufacturer. Many instruments used on cattle and sheep stations, such as inoculating-needles and spaying-knives, are made to order; and coarse butcher's knives it is found can be turned out at a paying price. Customers requiring instruments of guaranteed quality will also give special orders at a special price for knives, scissors, and razors, and medical men requiring particular instruments or repairs can get their orders executed.

Hats.—Two local manufacturers exhibited different descriptions of Sydney-made hats. In consequence of their bulk, freight is high upon hats in proportion to their value, and it therefore pays to import the material and work it up. The calico, plush, felt, cloth, merino, and shellac are imported at a small cost for freight, and the hats are manufactured in the Colony. The manufacture of felt from fine wool and rabbit here, has lately been commenced by Mr. Ollerenshaw. Cloth caps are not much made, nor indeed much used. Straw hats are only made up to a small extent, with the exception of the cabbage-tree hat, made from the Colonial cabbage-tree, and which is used very extensively in the country districts. Fashion is not so imperious in this climate in the matter of hats as in the old country, and a great variety of head-dress is tolerated. The forms and fashions however are imported, the cabbage-tree hat being the only strictly Colonial production.

Acid.—Samples were shown of the three descriptions of acid, namely, sulphuric, nitric, and muriatic, now manufactured at the works of Messrs. Elliott Brothers, Balmain. This manufacture

is valuable as assisting other Colonial industries. The sulphuric acid is largely consumed at the Kerosene Works for the purification of the oil, and the muriatic acid is used for galvanising iron. It is also employed in the process invented by Mr. Miller, of the Sydney Mint, for extracting silver from gold, and which process is extensively carried on in New Zealand as well as at the Sydney Mint.

Glue.—Two makers of glue contributed specimens of their work, of which three qualities are prepared. It is made from Colonial products, and is a strong useful article, and is coming into use, though for joiner's work it still has to fight its way against the best Russian.

Varnish.—Sydney and Melbourne both competed in the exhibition of Colonial-made varnish, the latter carrying off the prizes. Into the composition of this article, one Australian product, namely, Kauri gum, enters. The Colonial varnish can be sold at a price considerably under that of imported varnish, and is working itself steadily into use.

Glass.—Though two or three attempts have been made to start glass-works in this Colony there is only one establishment at work, and Mr. Ross principally confines himself to the manufacture of glass bottles. The conditions seem favourable to this industry, as the most of the materials are easily obtainable. The freight on glass is high compared with the value, and the damage by breakage is considerable, and this is a natural protection to the local producer. Mr. Wiper, of Melbourne, exhibited some excellent specimens of bent and cut glass, and from both Colonies there were exhibits of stained and painted glass.

Musical Instruments.—Colonial-made pianos were exhibited both from Melbourne and Adelaide, the former being specially worthy of praise, the wood used having laid under contribution the Colonies of New South Wales, Victoria, and New Zealand. In this Colony no attempt has been made to enter upon this business, the instrument dealers seeming to regard it as a hopeless thing to compete with European manufacturers. But skilled workmen have been imported to effect repairs, and have brought with them all the tools and appliances used in the best workshops. The organ in the gallery, though not wholly built in the Colony,

was so reconstructed and enlarged as to be almost a new instrument, and its construction as well as the rapidity with which it was put together reflected great credit on Mr. Jackson, the builder.

Clocks and Watches.—One large turret-clock, of Colonial make, was exhibited from Melbourne, and without any competitor of its kind from any other Colony. Two watches, made in the Colonies from imported material, were also shown; but though there are plenty of skilled workmen here drawn from England, France, and Germany, and who are thoroughly acquainted with all the details of watch-making, their work is principally confined to repairing, as it would be impossible to compete in the manufacture. But there is the skilled labor to effect any kind of repairs to watches, clocks, or chronometers.

Gold and Silver Plate.—Some very handsome specimens of Colonial workmanship were displayed, in which three Colonies competed. There are several skilled workmen who operate on Colonial gold and silver, and who find a fair amount of employment in the manufacture of ornaments to order, for presents or for prizes at races, regattas, &c. Of course the greater proportion of gold and silver plate is imported, labour being so much cheaper in the old world, and the freight on articles of this kind being small compared with the value. Electro-plating is also carried on in Sydney.

Minor Manufactures.—In this list may be included blacking—into the composition of which three Colonial products enter, namely, ivory black, treacle, and sulphuric acid—rope, ink, dentists' work, basket-work, tapestry, ornamental leather-work, wool-work, artificial flowers, inlaid work, watches, wigs, ointments, hair-oils and dyes, walking-sticks, picture-frames, fishing-lines, and curry powder, all of which were represented.

MISCELLANEOUS.

Inventions.—Of these the most important was the apparatus designed by Mr. F. B. Miller, of the Sydney Mint, for extracting silver from gold by the chlorine process, with the advantage of at the same time toughening the gold. The Australian gold is much alloyed with silver, and the separation of the two metals

was expensive, although it is said that the Australian sovereigns used to be melted down in England for the sake of their silver alloy. By Mr. Miller's process the silver is now extracted at the Mint, and the gold-miner gets credit for its value. The process is in full operation at Sydney and also in New Zealand.

Mr. Errington, of Ballarat, was awarded a medal for his model of a dredging-machine to work subaqueous auriferous drift, although the practical utility of the machine has to be tested. But there is not only room but a call for ingenuity to expend itself in this direction. There are several rivers in Australasia, which, intersecting as they do, quartz-reefs and auriferous alluvial, must contain gold in their beds; and there are some places, especially in New Zealand, where near the mouths of rivers the sand and mud must contain gold. It is not to be expected that miners will contentedly leave these places unworked, and where the water cannot be dammed out or averted, the cheapest and most effective method of bringing the subaqueous drift to the surface is a problem which every day becomes of increasing practical importance.

Two inventors exhibited machines intended to facilitate the labors of quartz-miners. Mr. G. M. Stephen showing a hammer battery and a cradle amalgamator, and Dr. Beer a battery in which the rebound from a spring was designed to act in lieu of the force obtained by gravity. Both the batteries claimed lightness and portability as a special merit, and in this Colony, where so much has yet to be done in the way of exploring on new gold-fields, an effective battery, that can be easily moved from place to place, is a desideratum. Ingenuity is profitably directed to the supply of this want.

Mr. H. C. Russell, of the Observatory, furnished models of two Colonial inventions, designed to assist in the study of meteorological science, as well as to be of practical utility. One is an anemometer, which can be held in the hand, and which indicates the force of the wind with a fair approach to accuracy, and the use of which is therefore preferable to the plan of guessing its force. The other is a separate registering pluviometer, for recording on paper the amount of rain fallen in the day.

Mr. Scott entered a model of a new atmospheric ship-lift, the plan adopted being to raise the floating-dock by pumping air underneath. Arrangements are in progress to submit this invention to the test of practical experiment, by constructing one on a small scale, capable of docking yachts.

Models were also shown of a new design for a spiral staircase, of an improved tiller for steering ships, and of an improved beehive. Pumps with alleged improvements, aerated water-fountains, and some other contrivances of minor utility and merit were exhibited. The inventive genius of Australia has not yet developed like that of America, although the necessity for labor-saving machinery is as great here as there; but with the combined advance of scholastic education and industrial training we may naturally expect every year to have more to record in the way of Australian contribution to the history of inventions.

Fine Arts.—In a young Colony it is not to be expected that any great original development of fine arts should be displayed. Intellectual force is more naturally tempted into other directions, and the great advantages of models, training, patronage, and *esprit de corps*, are wanting. Still there are some colonists who have brought with them, not only a love of art but a capacity for it, and there are a few Australian-born who have shown their talent in this department is not denied to us. Drawing is now taught to the more advanced pupils in all the Primary schools, and is much cultivated in schools of a higher grade, and the chances are thereby multiplied that where natural genius exists, it will find its career facilitated. Few colonists who visit Europe, and who can at all afford the luxury, return without some art treasures in the shape of pictures, statues, or bronzes, and private collections are in this way multiplied. The owners of works of art contributed some to the public exhibition. Several were works of great merit; and, from the great amount of attention bestowed by visitors on the exhibits in the gallery, it may be reasonably inferred that this part of the Exhibition did not fail in its object, and that it will be found to have assisted in the cultivation of taste.

Photography is not only assiduously cultivated in Australia, but has attained to great excellence, and the portraits exhibited

would compare favourably with those taken in any part of the world. The lenses and material are imported, but the manipulation is to be praised, and the clean air is favourable to good pictures. Much remains to be done in the way of adding artistic taste to cleverness in mechanical manipulation; and to secure this double result, business competition combines with the love of art.

The development of photo-lithography has been greatly stimulated by its practical utility to the Government in the multiplication of maps, plans, &c. Mr. Osburne's invention in Victoria was adopted by the Government of that Colony, who purchased the right to use it, and some beautiful specimens of that process, as executed by Mr. Noone, were exhibited, who furnished copies not only of maps and plans, but of engravings of pictures by some of the great masters. The need of the same process was felt in the Government Printing Office in Sydney, and Mr. Sharkey, a lithographic printer there, after experimenting for a year or two, succeeded in effecting an important improvement. In Osburne's process the drawing to be copied is first photographed on glass in the usual manner. From the negative a print is then taken on paper specially prepared. This print is then covered with a thin film of greasy ink, after which it is floated for a minute or two on hot water; is then laid on a glass plate, and the superfluous ink washed off with a sponge. This ink adheres permanently to those parts that have been affected by light through the negative, while it comes freely away from the parts not so affected, thus leaving a reproduction of the original drawing. This operation requires great care and delicacy of touch. As soon as the paper is dry it is ready to be transferred to a lithographic-stone and printed off in the usual manner. Mr. Sharkey's improvement consists in this: That no ink is applied to the photo-print, but this print, on being taken from the negative, is laid without further manipulation on a stone, and passed through the press; the paper, being moistened on the back with a sponge and water, is then peeled off, leaving a faint impression of the drawing on the stone. A thin ink of a peculiar kind is then rubbed into the stone, which absorbs it only in those parts corresponding to the lines of the drawing; and the superfluous ink being then washed off, the stone is ready to be inked and printed from as in the ordinary process of lithography. Within a few minutes after the photo-print is taken, a proof can

be drawn from the stone. This new process is more speedy than the old, requires less manipulation of the photo-print, and is apparently capable of reproducing finer work. Mr. Sharkey has been encouraged to continue his experiments, and his process has now attained a high degree of delicacy and beauty. It can copy effectively and reduce any engraving, drawing, or lithograph, where the work consists of distinct lines or dots, but cannot at present produce good results from photographs of natural objects, or from drawings where the shading is continuous and not broken up into lines—a defect it shares equally with the photo-lithographic processes adopted elsewhere. Two specimens of Mr. Sharkey's work were exhibited, which were passed by many under the impression that they were simply steel engravings. A silver medal was awarded to Mr. Sharkey for the merit of his invention.

Concluding Remarks.—This report would not be perfect did it not contain some further notice than will be found in the introduction to it, preceding the catalogue, of the circumstances under which the materials of the Exhibition were collected and the adjudications made.

It has already been stated that the Agricultural Society conceived the idea of inviting all the producers of the Australian Colonies to engage in an Exhibition of Industry before it was known that the Government would afford any assistance to the plan. Although wishing to give the utmost encouragement to the non-agricultural producers the Society found it prudent to be moderate in the prizes offered, and rest contented mainly with affording the opportunity of exhibiting and competing for distinctions that would have a nominal rather than an intrinsic value. One medal only was offered in each class. Had the Society been earlier assured that the Assembly would allow the sum placed on the Estimates for the Exhibition, instead of allotting one medal to each class, the classes would have been subdivided, and more medals offered. As it was, considerable difficulty was experienced by the juries in adjudicating, and in many instances they were obliged to violate the rule laid down concerning the award of one medal in each class. Not that it was impossible to comply with the rule, even had such different exhibits as stained-glass windows and cooking-stoves been classed together, provided principles

were previously agreed upon by the Judges for their guidance. In every class so made, some one object was specially distinguished by merit above all the rest. No insuperable difficulty is found in discovering the "best animal in the show" for a champion prize, although the claims of sheep and cattle have to be compared; and if the feat can be performed in one case it surely can in the other.

When the Council forwarded to London the design made by Mr. Arthur Stopps for the medal, the engraver was directed to strike off a few silver medals to accompany the bronze ones. These silver medals were to distinguish very superior merit; they were to indicate either great results, or great prospects in exhibits of Colonial production.

It has been already stated that, owing to the builder's inability to hand over the building to the Exhibition Committee on the 1st of August, their entire plan with respect to the adjudications was overthrown. According to the original arrangement, the exhibits were to have been placed by the 8th of August, and the juries were to be allowed one clear week without interference for the performance of their duties. This would have allowed of all the awards being made and proclaimed by the day of opening. As it was, the Judges were not called together till the 29th of August, the day before the opening, and were then informed that the Committee would be glad to receive their award papers and reports as early as possible. One day to the majority of the juries was as nothing. They made a reconnoitring visit, determined the points of attack, and left. For the next two weeks, unless they were early, or late, they had to battle in the performance of their duties with crowds of people, whose pressure made a judicial comparison of the objects a matter of impossibility. The work was consequently delayed.

Delay arose, also, from another source. Notwithstanding the instructions given to the juries to *recommend* only silver medals where they deemed them to be deserved, and not to award, and to confine the award of bronze medals to *one* in each class, it was found, when the results of the first day's work

came to the hands of the Secretary, that silver medals were definitely awarded in place of being recommended, the awards made known, and the prize tickets displayed, and also that several bronze medals were awarded in each class.

The Committee at once perceived the necessity of appointing an Award Committee, whose duty it should be to take charge of the award papers from the Stewards, to see that they were properly filled up and signed, to determine the justice of the recommendations and awards where there was a departure from the rules, and also to hear complaints, and take notice of exhibits accidentally passed over.

Before proceeding to investigate the grounds on which the silver medals were recommended, this Committee laid down the grounds upon which they should be granted. They were as follow: This highest distinction which the Agricultural Society could confer was to be bestowed only upon exhibitors whose exhibits combined three requisites—1. Originality; 2. Utility in the highest degree; 3. The representation of some process, manufacture, invention, or discovery likely to be of signal importance to these Colonies. The medals were awarded in conformity with these considerations, excepting two, which were positively given by the Judges, the awards being confirmed by the Stewards. After considering the circumstances, the Committee determined to allow Messrs. Farmer, Painter, Pope, & Co., and Mr. John Taylor, to retain the silver medals bestowed in error, but required them to relinquish the bronze medals, and minor distinctions won in the various classes.

It will be observed that no difference was made in the classification adopted between Colonial and imported products. This course, although contrary to precedent, was well considered. The notice heading the prize schedule for the second department was as follows:—

SPECIAL NOTICE.—There has been no attempt to distinguish between Colonial and imported exhibits in these classes. The Judges will be directed to mark their approval of excellence wherever they may find it. Should the imported article carry off the award of merit, the Colonial producer will have his attention called to the circumstance, and he will, if wise, set to work to

discover wherein the superiority exists to his own workmanship. The distinctions, "Colonially produced," and "imported," have been abandoned in the agricultural department; there is therefore no valid reason for retaining it in the "non-agricultural." The arrangement was thought in some instances to be hard, but the majority of the Judges considered that the producers would learn more by having their articles placed side by side with the results of European skill, than by being classed separately.

It is perhaps necessary to say a word or two about the system of judging by points. Instead of requesting a Judge to say which competing article in a class stands first, second, or third, he is requested to fill up an award paper, which is drawn up on the supposition that excellence in all articles consists of various sensible properties. Each property accordingly is placed in a separate division. A maximum number is allotted to it, and the exhibit is judged of in relation to each quality by numbers ranging from the maximum downwards. The addition of these sums forms an aggregate, the highest aggregates indicating to the Judges where their awards should be given. The system was adopted,—1st. Because it would ensure more care on the part of the jurors in examining the qualities of things brought before them; 2nd. Because its employment would raise the character of the Society's awards; 3rd. Because it would afford a satisfaction to unsuccessful competitors, which is denied under the old method of merely pointing out the best and the second best members of a class; 4th. Because the public would be instructed by having the grounds of the decisions placed before them.

Its adaptation to the varied elements of an Exhibition was much debated, but the results proved so generally satisfactory that a resolution was subsequently passed by the Council of the Agricultural Society affirming the principle for the future. To be of value it requires of course to be intelligently applied. In the present case it would have appeared to more advantage had the Judges met previously, to be instructed in their duties, but owing to the delay already mentioned the assemblage, although provided for, did not occur. For the most part the Stewards instructed the Judges in their sections amid the confusion and crowding of the Exhibition. This at least was true of the state

of things within the building; outside, the Judges were better informed of the system before they commenced, and therefore the award papers of a portion of the live-stock and agricultural implement sections afford a better, although far from an entirely satisfactory proof, of the worth of the point system than those of the non-agricultural department.

In so comparatively small a community it is a difficult matter to find gentlemen able and willing to undertake the duties of Judge. A Judge, to be perfectly unsuspected of bias, should not be an exhibitor in the department in which he exercises judicial functions, nor should he be the relative of exhibitors whose produce he is called upon to judge, neither should he have business relations with them or their relatives; he should, as nearly as possible, enter upon his labours without bias of any sort. It must be clear to every one that the state of society here will not allow of such impartiality. Nearly all competent judges of articles representing the resources of the Colony are themselves in business, and the men of business who have made fortunes and retired, have for the most part "gone Home," and are therefore not available. By dint of persevering inquiry the work of selection and appointment was got through with, and the Society may be deemed fortunate in securing so large a number of good men. It may here be stated that the Victorian Commissioners were invited to furnish one judge to each of the juries formed, but courteously declined to avail themselves of the offer.

A survey of the industries of the Colony cannot but disclose the fact that in most of them, especially in the agricultural and pastoral departments, there is room for very great improvement. That the methods hitherto adopted have been rough and ready, such as have been natural to the early stages of Colonial development, but such as are not adapted to produce the best and fullest results of which the Colony is capable. The soil can produce more, and can produce better, and can produce in greater variety, than it has ever been made to do; and a more intelligent application of scientific knowledge, and a more careful collection and distribution of the information still to be obtained from further experience, will, even with our present resources of labour and capital, add immensely to the productiveness of the soil. The

Exhibitions of the Agricultural Society, which are adapting themselves yearly more exactly to the wants of the community, cannot fail greatly to assist this progress. They reveal all the defects in our present methods, and give prominence to all improvements. They encourage those who take the lead, and they stimulate into activity those who drag in the rear.

With respect to manufactures, we note that there have been some satisfactory successes and some disappointing failures; that the latter have been partly due to the want of capital or to the want of skill—and more the latter than the former. The lesson has now been learnt that favourable local conditions are not sufficient, unless the requisite technical knowledge is also supplied; and in new industries for the future more care will be taken to secure the best available practised skill, so that the local advantages may be utilised to the utmost, and the early difficulties of a new enterprise may not be aggravated, and by blunders that might be avoided.

The Colony would seem at present to be passing through a fresh stage of its industrial career. It has outgrown the purely pastoral stage which was the basis of its prosperity. It has so far advanced in agricultural development as now nearly to provide its vegetable food; it has passed through and nearly recovered from the disorganization caused by the excitement and occasionally high profits of gold-mining, and is now feeling its way towards a more settled condition, and towards a greater variety of industries. It is just the period when a wide-spread general education, combined with the introduction of skilled labor from the older countries of the world, will give it a great forward impulse. Its resources are great, but they are still largely undeveloped, and though many complain of the times as dull and unprosperous, it is mainly because comparison is made with the last twenty years during which the gold fever has been more or less virulent. With steady industry and with success looked for, not as the result of lucky discoveries but as the fruit of patience and intelligent toil, it will be found that there are not many parts of the world where, on the whole, industry is more fairly and uniformly rewarded than in NEW SOUTH WALES.

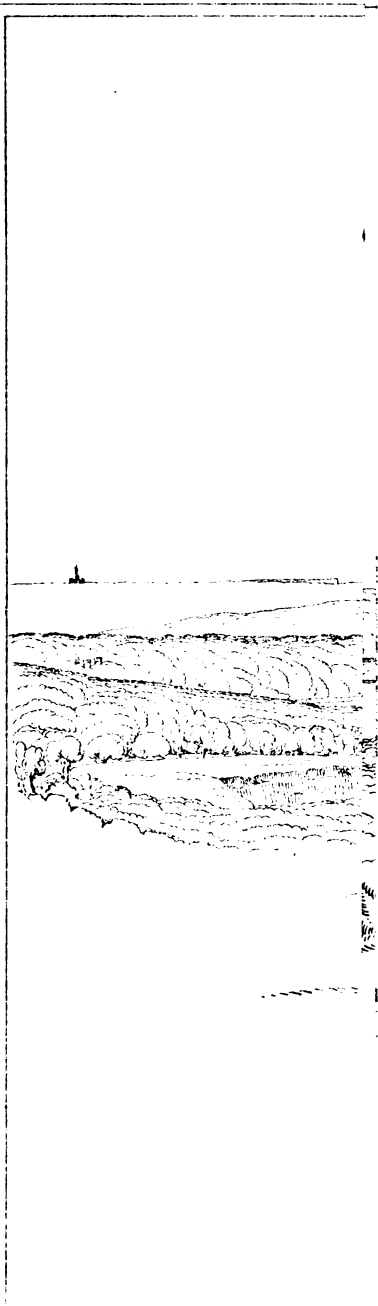


THE INDUSTRIAL PROGRESS OF NEW SOUTH WALES.

PART II.

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New South Wales in 1870.



Engraved by Mr. James A. G. Wells of the S.

Lighthouse
Light on
Head

NEW SOUTH WALES IN 1870.

Geographical Outline.

NEW SOUTH WALES, the Mother-colony of the Australasian group, was so called by the great navigator, Captain Cook, who, when first exploring its rugged coast in 1770—just one hundred years ago—thought that some of its general outlines were not unlike those of South Wales. New South Wales originally included the whole of the eastern portion of Australia, but is now restricted to the southern half of the eastern coast—the northern half being distinguished, since the 1st of December, 1859, as the seaward boundary of the Colony of Queensland. The New South Wales of the present day lies between the 28th and 37th degrees of south latitude, and the 141st and 154th meridians of east longitude. It extends over about nine degrees of latitude, and about twelve and a half degrees of longitude. Its northernmost limit (Point Danger) is in $28^{\circ} 10'$ south, and $153^{\circ} 29'$ east; its easternmost point (Cape Byron) being in $28^{\circ} 27'$ south, and $157^{\circ} 37'$ east; the most southerly limit of the Colony (Cape Howe) being situated in latitude $37^{\circ} 28'$ south, and longitude $150^{\circ} 8'$ east. It has well-defined natural boundaries on every side, except the western border and part of the northern boundary, west of the M'Intyre River, where the 29th parallel of latitude touches that river. On the north it is separated from Queensland by the Macpherson Range, the Dividing Range, the Dumaresq River, the Karaula (or M'Intyre) River, and the 29th parallel of south latitude. On the east it is bounded by the Pacific. On the west it is separated from the territory of South Australia by the 141st meridian of east longitude. On the south, New South Wales is separated from Victoria by a line drawn from Cape Howe to the nearest source of the Murray, and by the westerly course of that river. The position of New South Wales in south latitude corresponds to that respectively occupied by Cape Colony in Africa, and by the lower portion of La Plata, and Chili, in South America—the South of Spain, Italy, and Greece lying in a corresponding zone of north latitude. The boundaries of New South Wales constitute an irregularly-shaped, four-sided figure, the southern frontier deviating most widely from a right line. The extreme length of the country, measured diagonally, is 900 miles;

its greatest breadth, something less than 850; and its mean breadth, about 500 miles. Its superficial area is 323,437 square miles. New South Wales is about three times the size of Great Britain and Ireland, and larger than any State in Europe, except Russia. One of its outlying pastoral districts within the frontier—The Albert—is, alone, larger than England and Wales together. Taken as a whole, the Colony is nearly equal in extent to Canada. The entire length of the coast-line is about 800 miles. The seaboard presents twenty-two remarkable headlands or capes. Its bays and inlets, from Point Danger to Cape Howe, are about eighteen in number. Most of these are still known by names given to them by Captain Cook and other early discoverers. On the coast-line there are eleven inlets, with narrow openings, occasionally closed to navigation after heavy gales from seaward. These salt-water lagoons are generally, but somewhat improperly, known as lakes. In the interior there are several extensive fresh-water lakes. The islands on the coast are very few and unimportant. The principal harbours are the ports of Sydney and Newcastle, but at the mouths of several of the rivers there are numerous roadsteads and inlets, more or less available for maritime purposes. The harbour of Sydney (Port Jackson) is one of the best and most extensive in the world. As regards the physical features of the country, the surface of New South Wales may be divided into three parts—(1) the Coast District; (2) the Table-lands; and (3) the Plains of the Interior. The coast district is a comparatively narrow strip of undulating land, lying along the sea-coast—often not more than 35 miles wide, and sometimes considerably less. A high plateau, or elevated district, furrowed here and there with precipitous valleys, next succeeds, frequently presenting, on the seaward side, nearly perpendicular escarpments. The most important series of these high lands traverses the entire length of the Colony. In width this elevated region extends westward to about the 151st meridian. Its shape is irregular, and its area is not easily estimated. On this table-land, at the distance of from 60 to 70 miles from the coast, are to be found our loftiest mountains, while from the 151st meridian to the westward there is a gradual fall to the great inland plains. These plains are for the most part very thinly timbered, but well watered, covered with luxuriant grass and herbage, and forming admirable cattle and sheep stations. They are the great pasture lands of New South Wales. In the central district or table-land the climate is cold in winter, particularly in the more mountainous tracts. On the Munióng Range, in the Pastoral District of Monaro—a range generally known as the Australian Alps—snow frequently lies from May to October, but is, however, seldom seen in summer, although sometimes known to fall even in December and January. In these

Alpine districts tremendous storms not unfrequently occur, followed by very heavy rains. Although in the table-land the winters are rather severe, as a rule the climate of New South Wales is warm and dry, the difference of mean temperatures not being more than 25 degrees. In the coast region, to the east of the Great Dividing Range, the mean annual temperature stands higher than on the table-lands. The heat of the summer is here, however, moderated by the proximity of the ocean. In the vast plains of the interior the alternations of heat and cold are always more distinctly marked. Hot winds are more or less prevalent throughout the low lands during the summer, and, whilst they last, have been known to raise the temperature to 120° F. Notwithstanding this occasional inconvenience, the climate is universally regarded as both healthy and pleasant, and one of its chief characteristics is a peculiar lightness and purity of atmosphere, seldom experienced elsewhere.

Physical Aspect.

MOUNTAINS.

THE mountain system of New South Wales is sufficiently simple. The mountains extend over an immense area, but their average elevation is probably not more than 3,500 feet, although some peaks are much higher. The highest (Mount Kosciusko—in the Muniung Range) attains an altitude of 7,308 feet—about 700 feet below the line of perpetual snow. The Great Dividing Chain, or Cordillera, separates the eastern and western watersheds, but does not constitute the sole important feature of the system. The mountains of New South Wales may be conveniently distinguished under four different heads:—I. THE INTERIOR RANGES; II. THE GREAT DIVIDING CHAIN; III. THE COAST RANGES; and IV. THE ISOLATED PEAKS AND GROUPS.

I. THE INTERIOR RANGES.—The ranges of the interior, near the western boundary of the Colony, form the western watershed of the Darling River. Of these the principal are—(1) Grey Range, and (2) Stanley, or Barrier Range. In Grey Range the chief elevation is Mount Arrowsmith, 2,000 feet high, and in Stanley Range the chief elevation is Mount Lyell, also about 2,000 feet high.

II. THE GREAT DIVIDING CHAIN has seven main branches, viz. :—(1.) The New England Range (highest point, Ben Lomond, 5,000 feet); (2.) The Liverpool Range (highest point, Oxley's Peak, 4,500 feet); (3.) The Blue Mountain Range (highest point, Mount Beemarang, 4,100 feet); (4.) The Cullarin Range (highest point, Mundoonon, 3,000 feet); (5.) The Gourock Range (highest point, Jindulian, 4,300 feet); (6.) The Monaro Range (highest

point, head of Kybean River, 4,010 feet); and (7.) **The Muniong Range** (highest point, Mount Kosciusko, 7,308 feet). These seven main branches are again subdivided as follows:—(1.) **The New England Range**, into the five lateral branches—1. **MacPherson's Range**; 2. **MacLeay Range**; 3. **Nandewar, or Hardwick, Range**; 4. **Hastings Range**; 5. **Moonbi Range**. (2.) **The Liverpool Range** is subdivided into the three chief lateral branches of—1. **Peel Range**; 2. **Mount Royal Range**; and 3. **Warrumbungle Range**. (3.) **The Blue Mountain Range** is subdivided into the three chief lateral branches of—1. **Hunter Range**; 2. **Mittagong Range**; and 3. **Macquarie Range**. (4.) **The Cullarin Range** is subdivided into—1. **Western Range**; and 2. **Mundoonen Range**. (5.) **The Gourock Range**, of a rugged and broken appearance, cannot be easily subdivided. (6.) **The Monaro Range** is subdivided into—1. **The Western Range**; and 2. **The North-western Range**. (7.) **The Muniong Range**—the northern portion of the **Warragong Mountains** of Victoria—contains on the north side of the frontier—1. **The Murrumbidgee Range**; 2. **The Tumut Range**; and 3. **The Murray Range**. All this series is connected with the Cordillera, dividing the eastern and western watersheds. In one portion of it there is an inland slope, at Lake George, to the south-west of the city of Goulburn, where there is no outlet. Here an area of 300 square miles is drained by the Turallo and Butmaroo Creeks. From the Muniong, Monaro, and the South Coast Ranges, the Margalong or Snowy River—having for affluents the rivers Eucumbene, Crackenback, Mowamba, Tongaro, Moyengul, Ingeegoodbee, Wulwye, Bobundarra, MacLaughlan, and lastly, the Bombala, with its tributaries Cambolong, Columbooka, and Maharatta—flows away across the frontier to the south. With these two exceptions, all the waters of New South Wales either pass away into the ocean on the eastward—or, accumulating on the western side of the Great Cordillera, fall into the river Murray at Wentworth, which itself reaches the ocean near Adelaide.

III. **THE COAST RANGES**.—On the east side of the Great Dividing Chain, and parallel to it for a very considerable distance, lie ranges, which, from their situation, are called the **Coast Ranges**. They generally form the edge of the elevated table-land upon which lies the Great Dividing Chain, and are thus distinguished:—1. **The Northern Coast Range**; 2. **The Illawarra Range**; 3. **The Currockbilly Range**; and 4. **The South Coast Range**. The loftiest peak is **Mount Coolungera** in the South Coast Range, which attains an elevation of 3,712 feet.

IV. **ISOLATED MOUNTAINS AND GROUPS**.—The most remarkable of these are **Mount Doubleduke**, **Whoman**, **Elanie**, **Yarrahappini**, **Kibbora**, **The Three Brothers**, **Mount Talawah**, **Dromedary**, **Mumbulla**, and lastly, **Imlay or Baloon**,—2,900 feet high.

The above is a very brief outline of the mountain system of New South Wales, but it may serve to give some idea of the vast extent of the country, and may also render the description of the river system more intelligible.

RIVERS.

With the comparatively trifling exception of the Snowy River (the Margalong) and its affluents, and the two inconsiderable streams known as Turallo and Butmaroo Creeks, already referred to, it will be correct to say that all the rivers of New South Wales have their sources in the Great Dividing Chain, or Cordillera, and flow thence to the sea, with a curious variety of direction, by the eastern or the western watershed. The great rivers of the western watershed are (I) the Darling, and its numerous affluents; (II) the Lachlan, and its affluents, comparatively few in number; (III) the Murrumbidgee, and its affluents; and (IV) the Murray or Hume, and its affluents. All these great western rivers eventually unite their streams with the Murray, which receives its last tributary, the Darling, at the frontier town of Wentworth, passing which it flows away into Lake Alexandrina, near Adelaide, in South Australia. The drainage of the western watershed may be readily understood by the following analysis:—

I. THE DARLING.—The Karoola, Calewatta, or MacIntyre River, rises at the foot of Ben Lomond, not far from Stonehenge, in the Pastoral District of New England. It first flows in a N.W. direction for about 130 miles, and, having received the Severn, it reaches the northern boundary of New South Wales, and runs for a considerable distance westerly, receiving successively the Dumaresq, Boomi, Whalan, and Gilgil Rivers. Its course, thenceforward, is for the most part southerly and south-westerly. The united stream is here generally called the Barwon, or Upper Darling—almost down to the site of the township of Breewarrina, to the N.E. of Bourke. The river then receives as tributaries the Mooni, the Gwydir or Bundarra, also called the Kindur, the Namoi, or Peel, and its affluents, the Castlereagh, the Macquarie (the Wambool), and its numerous affluents, the Narran, Bokhara, the Culgoa, the Bogan, the Warrego, and several other large streams, or, as they are generally designated, creeks. From Breewarrina down to Wentworth the main stream is known as the Darling. The estimated length of the Barwon is 510 miles; that of the Lower Darling, or Darling, properly so called, is 650 miles; giving a total of 1,160 miles. The Darling falls into the Murray at Wentworth in latitude $34^{\circ} 6'$ south, and longitude $142^{\circ} 2'$ east. The area of basin drained by the Darling and its affluents is 198,000 square miles. The length of the MacIntyre is 350 miles; of the Gwydir, 445 miles; of the Namoi,

600 miles; of the Castlereagh, 365 miles; of the Macquarie, 750 miles; and of the Bogan, 450 miles. It has been supposed that the River Paroo, in the Albert District, falls into the Darling; but this is somewhat doubtful.

II. THE LACHLAN.—The River Lachlan or Calare is the next main stream, but much inferior in length and extent of basin to the Darling. It rises on the western side of the Cullarin Range, in the County of King. It receives first the Jerrawa Creek, and is then called the Narrawa River, and afterwards the Crookwell and Abercrombie, and the river then assumes the name of the Lachlan. The Boorowa and Belubula Rivers are the last of its principal affluents. Sweeping round to the west and south-west the Lachlan falls into the Murrumbidgee, flowing in the latter portion of its course through vast plains. The total length of the Lachlan is 700 miles; area of basin, 27,000 square miles.

III. THE MURRUMBIDGEE.—The Murrumbidgee rises in the Muniung Range, and in the neighbourhood of Cooma trends suddenly to the northward. It receives the Umaralla, the Queanbeyan, the Yass, the Goodradigbee, the Tumut, the Adelong, the Nacka Nacka, and the Tarcutta. After the first 300 miles it pursues a westerly course, and joining the Lachlan west of Maude, falls into the Murray 20 miles to the south-west of Balranald. The estimated length of the Murrumbidgee is 1,350 miles, and it drains a basin having an area of 25,000 square miles. The Murrumbidgee is navigable for 500 miles.

IV. THE MURRAY.—The principal source of the Murray (known also as the Millewa, Hume, or Indi) is in the Muniung Range, near Mount Kosciusko—and not far distant from the head of the Murrumbidgee waters. It flows westerly and north-westerly through the entire breadth of New South Wales, and receives almost all its western waters. The Murray and Murrumbidgee are connected by ana-branches in the lower part of their course. This river has several considerable affluents in the upper portion of its course, and it forms the southern frontier of the Colony from Monaro to the south-western limit. Its length is 1,120 miles, and it drains an area of 270,000 square miles. The width of the stream from Moama to Albury, in the summer-time, is about 240 feet, and it is navigable by small steamers as far as the last-mentioned town.

The rivers of the eastern watershed drain an area of not more than 50,000 square miles. These rivers have often been described. They all flow into the Pacific Ocean. The most considerable are the Hawkesbury, the Hunter, and the Clarence. The length of the Hawkesbury is 330 miles, and it drains an area of about 8,700 miles. The length of the Hunter (Coquon) is 300 miles, and the area drained about 8,000 square miles. The Shoalhaven is 260

miles in length; the Clarence, 240 miles; the Macleay, 190 miles; and the Manning, 100 miles. The Hastings, the Karuah, the Clyde, the Moruya, the Tuross, the Bega, and the Towamba—all more or less navigable—are all less than 100 miles in length. Most of these eastern rivers have sand-bars at their mouths, and their navigation is attended with danger in tempestuous weather. The Hawkesbury (Deerubbun) is remarkable for its singularly tortuous course. Its basin has three distinct slopes in the eastern watershed—a northern, eastern, and western slope. The main stream comes from the northern slope, and is first called the Wollondilly. It receives the Mulwarree, the Cookbundoon, and the Cox Rivers, and is then called the Warragamba. When the Cowpasture River has contributed its waters the river is called the Nepean, which name it bears until its junction with the Grose, flowing from the Blue Mountains, and thenceforth it is known as the Hawkesbury, the name first bestowed, in order of time, upon this stream of many aliases. After receiving the Colo and MacDonald Rivers, and other minor tributaries, the Hawkesbury finally discharges itself into the Pacific Ocean at Broken Bay. Owing to the immense area which it drains, and the flatness of the country in the lower portion of its course, but chiefly perhaps in consequence of the confined and tortuous channel below Windsor, through which the enormous volume of flood-waters is not discharged with sufficient rapidity, this river is liable to sudden floods. The alluvial lands in the valleys of the Hawkesbury and of the Hunter are renowned for their extraordinary fertility.

Topography.

THE Topographical distribution of the vast area of New South Wales has not followed any uniform system. There are old or proclaimed counties with well-defined, and there are new counties with very ill-defined, boundaries; and lastly, there are pastoral districts, provinces in dimensions, lying beyond these old counties.

COUNTIES AND CHIEF TOWNS.

New South Wales has been subdivided into 118 counties, but this mode of subdivision is of but little topographical importance, and is very generally disregarded. Besides the vast extent of country included in the rather vaguely defined areas of some of the more distant inland counties, there are also large unoccupied tracts to be found (as in the Albert District, beyond the River Darling), wherein few counties yet appear even on the map. The old or proclaimed counties near the coast are all more clearly defined, and more densely inhabited, than the new counties of the interior. Towns, villages, homesteads, clearings, cultivated farms, plantations, and other evidences of industry and progress, are of tolerably frequent occurrence, vigorous efforts

having been everywhere made to facilitate inter-communication by railways and roads, by the establishment, at convenient distances, of post-towns and electric telegraph stations. In this direction, although much has already been achieved, yet much still remains to be done. The OLD COUNTIES (with their chief towns, &c.) are:—

Name of County.		Chief Towns.	Number of Post Towns.	Area in Acres.
Coast counties (6)	St. Vincent	Braidwood	21	1,704,884
	Camden	Berrima	30	1,400,320
	Cumberland	Sydney	68	914,800
	Northumberland	Newcastle	27	1,499,880
	Gloucester	Raymond Terrace	10	1,375,200
	Macquarie	Port Macquarie	15	1,408,000
N.W. Inland counties (3)	Durham	Paterson	20	1,354,880
	Brisbane	Scone	9	1,500,160
	Bligh	Cassilis	4	1,077,120
Western counties (7)	Cook	Hartley	16	1,065,600
	Roxburgh	Kelso	18	976,160
	Westmoreland	O'Connell	8	1,018,880
	Wellington	Orange	15	1,059,686
	Bathurst	Bathurst	15	1,190,400
	Hunter	Jerry's Plains	1	1,315,840
Phillip	Mudgee	2	1,035,520	
South-western counties (4)	Georgiana	Tuena	5	1,231,360
	King	Gunning	6	1,159,840
	Argyle	Goulburn	15	1,248,600
	Murray	Yass	10	1,458,080

The NEW COUNTIES (with their chief towns, &c.) are sub-joined in their alphabetical order, without regard to topographical position. These counties appear to be at present little more than vaguely determined areas forming part of the thirteen great pastoral districts of the interior; and they are very often passed over, even by geographers, without much notice; nevertheless it has been thought proper to mention these counties, as they are occasionally referred to.

V. The principal new counties in the interior:—~~ARRAWATTA~~—*Ashford*. ~~ASHBURNHAM~~—*Forbes*, and three other post-towns. ~~AUCKLAND~~—*Eden*, and seven other post-towns. ~~BARADINE~~—*Baradine*. ~~BANABBA~~—*Kunopia*. ~~BERESFORD~~—*Cooma*, and two other post-towns. ~~BUCCLEUCH~~—*Tumut*, and another post-town—*Brungle*. ~~BUCKLAND~~—*Breeza*, and four other post-towns. ~~BULLER~~—*Maryland*, and another post-town—*Tabulam*. ~~BURNETT~~—

Warialda. CADELL—*Moama*, and another post-town—*Mathoura*. CAIRA—*Balranald*. CLARENCE—*Grafton*, and eight other post-towns. CLARENDON—*Gundagai*, and another post-town—*Junee*. CLIVE—*Tenterfield*, and one other post-town—*Deepwater* or *Gladstone*. CLYDE—*Braewarrina*. COOPER—*Narrandera*. COURALLIE—*Maree*. COWLEY—*Kiandra*, and another post-town—*Big Hill*. COWPER—*Bourke*. CUNNINGHAM—*Condobolin*. DAMPIER—*Moruya*, and five other post-towns. DARLING—*Manilla*, and another post-town—*Barraba*. DENHAM—*Walgett*. DENISON—*Beecumwall*, and another post-town—*Mulwala*. DRAKE—*Drake*, and two other post-towns. DUDLEY—*Kempsey*, and four other post-towns. EWENMAR—*Collie*. GORDON—*Newree*—post-town named *Obley*. GOUGH—*Glen Innes*, and three other post-towns. GOULBURN—*Albury*, and three other post-towns. GOWEN—*Mundooran*. GREGOBY—*Merri Merri*. GRESHAM—*Newtonboyd*. HARDEN—*Binalong*, and seven other post-towns. HARDINGE—*Bundarra*. HAWES—*Nowendoc*. HUME—*Crowa*, and another post-town—*Howlong*. INGLIS—*Bendmeers*, and two other post-towns. JAMISON—*Wee Wee*. LEICHHARDT—*Coonabarabran*, and another post-town—*Coonamble*. LINCOLN—*Dubbo*, and two other post-towns. MENINDIE—*Menindie*. MONTEAGLE—*Young*, and three other post-towns. MURCHISON—*Bingera*, and another post-town—*Cobbadah*. NANDEWAR—*Gulligal*, and another post-town—*Narrabri*. NAPIER—*Weetalaba*. NICHOLSON—*Boooligal*. OXLEY—*Cannonbar*, and another post-town—*Warren*. PARRY—*Tamworth*, and five other post-towns. POTTINGER—*Gunnedah*, and another post-town—*Boggabri*. RALEIGH—*Dovedale*, and two other post-towns. RICHMOND—*Casino*, and two other post-towns. ROUS—*Lismore*. SANDON—*Armidale*, and three other post-towns. SELWYN—*Walareegang*. TAILA—*Euston*. TOWNSEND—*Deniliquin*, and two other post-towns. URANA—*Jereelderie*, and another post-town—*Urana*. VERNON—*Walcha*. WAKOOL—*Moulamein*, and another post-town—*Wakool*. WALJEERS—*Apple-tree Flat*. WALLACE—*Nimmitibel*, and four other post-towns. WARADGERY—*Hay*, and another post-town—*Maude*. WELLESLEY—*Bombala*, and two other post-towns. WENTWORTH—*Wentworth*. WYNYARD—*Wagga Wagga*, and six other post-towns.

VI. Additional new counties of minor importance:—Of the following new counties but little is known at present. They are, most of them—perhaps we may say all—situated at a great distance from the metropolis, and are enumerated in the following list:—BLAND, BLACKLAND, BURKE, BOYD, CANBELIGO, CLARKE, DOWLING, FINCH, FITZROY, FLINDERS, FOBBS, FRANKLIN, GIPPS, GUNDERBOOKA, KENNEDY, KILLARA, LANDSBOROUGH, LIVINGSTONE, MITCHELL, NARRAN, NARBOMINE, PERRY, RANKIN, STAPYLTON, STURT, TARA, WERUNDA, WHITE, WINDEYER, YANDA, YOUNG.

The enormous extent of territory represented by these 118 counties contained, in December, 1870, about 550 post-towns, postal-villages, and postal-stations. These are distributed over the country in the manner and proportion shown in the preceding paragraphs. In addition, however, to these post-towns, there are about ninety postal-stations recently established, the exact position of which may be best ascertained by reference to the map. Of these about forty have been placed in districts to the west, about twenty-five in districts to the north, and the remaining twenty-five in districts to the south, of the metropolis. The following analysis may perhaps serve to give some practical idea of the wide extent of the area embraced by these 550 postal-stations. One of them, Mount Gipps, 944 miles; another, Menindie, is 850 miles; another, Wentworth, is 835 miles, from Sydney. Two—Louth and Pooncarie—are over 700 miles and less than 800 miles from the capital; two are over 600 miles, and less than 700; twenty-five are over 500 miles, and less than 600; twenty-six are over 400 miles, and less than 500; fifty-six are over 300 miles, and less than 400; one hundred and four are over 200 miles and less than 300; one hundred and ninety-nine are over 100 miles and less than 200; and only one hundred and thirty-one are less than 100 miles from Sydney. There are seventy-eight telegraph-stations, the most remote being at Wentworth, a distance of about 835 miles from Sydney. There are also one hundred and sixty-eight money-order offices,—one hundred in the twenty counties, and sixty-eight in the pastoral districts. These postal-villages, telegraph-stations, and money-order offices are daily on the increase. According to the latest information on this subject, the number of post-towns in the ten pastoral districts of Monaro, Murrumbidgee, Lachlan, Wellington, Bligh, Liverpool Plains, Gwydir, New England, Macleay, and Clarence, amounts to one hundred and eighty-five; and the number in the three outlying districts of Darling, Albert, and Warrego, to eighteen; the rest are all in the twenty counties. In a 20-miles radius of Sydney there are thirty postal-stations.

The population of Sydney and its suburbs is about 140,000; the population of the second seaport-town, Newcastle, the port of the Hunter, is about 5,000. The total population of the Colony may be estimated approximately at about 500,000 souls.

THE PASTORAL DISTRICTS.

These, in number thirteen, include the whole area of the Colony outside the twenty counties proclaimed under the Orders in Council of 1847, and which have already been described. Grouped around these counties are thirteen pastoral districts, each in extent a province, and each much larger in its area than

some of the most important European States. Though originally taken up by squatters for sheep and cattle stations, they are now gradually becoming occupied by agriculturists and other classes of colonists. They are as follows :—

I. MONARO.—This district lies adjacent to the coast, at the southern extremity of the Colony. It includes the new counties of Auckland, Dampier, Wellesley, Beresford, Wallace, the chief part of Cowley, and part of Buccleuch. It has an area of 8,335 square miles. The principal towns are—Kiandra, Kiora, Moruya, Bergalia, Bodalla, Cobargo, Wagonga, Nerrigundah, Bega, Murrumbula, Panbula, Eden, Bombala, Delegate, Cathcart, Candeloo, Kameruka, Nimmitibel, Bobundarra, Buckley's Crossing, Jindabyne, Jegidzerick, Cooma, Numeralla, Bunyan, Adaminiby, &c. This district is traversed in many directions by lofty mountains and deep gullies.

II. MURRUMBIDGEE.—This district stretches away to the westward of Monaro, and is bounded on the south by the river Murray, and on the north by the Murrumbidgee, from which latter it takes its name. It includes the new counties of Selwyn, the chief part of Buccleuch, part of Cowley, Wynyard, Goulburn, county Hume, Mitchell, Denison, Boyd, Cadell, Townsend, part of Waradgery, Wakool, and part of Caira. It has an area of 26,897 square miles of splendid grazing country. The principal towns are—Walareagang, Tumberumba, Upper Adelong, Tumut, Adelong, Brungle, South Gundagai, Tarcutta, Garryowen, Coppabella, Ten-mile Creek, Bowna, Albury, Dight's Forest, Howlong, Moorwatha, Wallundrie, South Wagga Wagga, Urana, Corowa, Mittiwalla, Tocumwal, Jereelderie, Conargo, Deniliquin, Mathoura, Moama (opposite to which, on the Victorian side of the Murray, is Echuca), Wanganella, Moulamein, Wakool, &c.

III. LACHLAN.—This district lies north of the pastoral district of Murrumbidgee. It is bounded on the south by the Murrumbidgee River, and on the east and north-east by the western boundary of the twenty counties. It includes the new counties of Harden, Monteagle, Clarendon, Bland, Gipps, Bourke, Cooper, Sturt, part of Waradgery, Waljeers, Nicholson, Dowling, Franklin, and Blaxland. It has an area of 22,800 square miles, and is admirably adapted for grazing purposes. The principal towns are—Maude, Booligal, Hilston, Eauabalong, Grenfell, Marengo, Burrowa, Binalong, Bookham, Gundagai, North Wagga Wagga, Narrandera, Hay, Junea, Sebastopol, Jugiong, Cooramundra, Murrumburrah, Harden, Wombat, Young, Morangarell, Marsden, &c. The upper portion of the Lachlan River divides the Lachlan District into two unequal parts, of which the north-western part is but little known.

IV. WELLINGTON.—This district is bounded on the south by the upper portion of the Lachlan River; on the east by the Macquarie River and the western boundary of the twenty counties. It includes the new counties of Ashburnham, Gordon, Cunningham, Kennedy, Narromine, Flinders, Oxley, and part of Gregory, &c. It has an area of 16,695 square miles,—for the most part fine grazing country. The principal towns are—Canowindra, Forbes, Billabong, Moonwonga, Condobolin, Canonbar, Warren, Dandaloo, Heifer Station, Toogong, Murga, Cargo, &c.

V. BLIGH.—This district lies on the north-east bank of the Macquarie River, and to the north-west of the twenty counties. It includes the counties of Lincoln, Napier, Gowen, Ewenmar, Leichhardt, and part of Gregory, &c., and has an area of about 5,000,000 acres of grazing land. It is bounded on the north by the Warrego District; on the east by the Liverpool Plains District; on the west by the Wellington District; and by the Lachlan District and the old counties on the south. Its principal towns are—Dubbo, Mount Harris, Wammerawa, Merri Merri, Coonamble, Coonabarabran, Gilandra, Collie, Munderoo, Cobborah, Coolah, Weetalaba, Talbragar, &c.

VI. LIVERPOOL PLAINS.—This district lies north-east of the pastoral district of Bligh, and nearly north of the old counties, and has an area of 16,901 square miles. It has but few hills, and is supposed to have once been the bed of an immense inland lake. The mean elevation is 921 feet above the sea-level. It includes the new counties of Buckland, part of Parry, part of Inglis, Darling, Nandewar, Pottinger, White, Baradine, Jamison, and Denham. The principal towns are—Walgett, Collarenebri, Pilliga, Wee Waa, Narrabri, Baradine, Boggabri, Barraba, Manilla, Gulligal, Gunnedah, Carroll, Breeza, Pine Ridge, Quirindi, Tamworth, Somerton, Bendemeer, Moonbi, Dungowan, Goonoo Goonoo, Currabubula, Wallabadah, Bowling Alley Point, Nundle, Hanging Rock, &c.

VII. GWYDIR.—This district lies north of the Liverpool Plains District, and contains an area of 11,075 square miles. It consists chiefly of open plains, generally well grassed. It includes the new counties of Murchison, Burnett, Courallie, Benarba, Stapylton, and part of Arrawatta. It is bounded on the north by the MacIntyre River,—here the southern frontier of the Colony of Queensland. The principal towns are—Bingera, Warialda, Moree, Kunopia, Mungindi, Gundiwindi, Yetman, Cobbadah.

VIII. NEW ENGLAND.—This is a long and comparatively narrow district, conterminous with the table-land here lying on each side of the Dividing Range, and reaching from the northern

boundary of the twenty counties to the southern frontier of Queensland. It contains an area of 13,100 square miles, and lies at an elevation of about 3,000 feet above the sea-level. The climate is temperate, but rather cold in the winter months. Much of the soil is well adapted for agriculture. It includes the new counties of Hawes, the chief part of Vernon, Sandon, part of Inglis, Hardinge, Clarke, Gough, part of Gresham, Clive, and part of Arrawatta. The principal towns are—Tenterfield, Timbarra, Bonshaw, Ashford, Wellingrove, Inverell, Dundee, Glen Innes, Oban, Bundarra, Falconer, Armidale, Rocky River, Uralla, Walcha, Nowendoc, &c.

IX. MACLEAY.—This district lies between the southern portion of New England and the coast. It is bounded on the north by the southern limit of the Clarence District, and on the south by the Macleay River, from which it takes its name. It contains an area of 3,180 square miles. Large quantities of cedar are here obtained and shipped to Sydney, Melbourne, and other ports. It includes the new counties of Dudley, Raleigh, part of Vernon, and part of the county of Fitzroy. The principal towns are—Kempsey, Dovedale, Nambucca, Summer Island, Warneton, and Frederickton.

X. CLARENCE.—This district lies between the northern extremity of New England and the Pacific Ocean to the north of the Macleay District, and contains an area of about 5,000 square miles. Much of the land in this district is used for agricultural purposes. It includes parts of the new counties of Fitzroy and Gresham, and the counties of Clarence, Drake, Richmond, Rous, and Buller. It is bounded on the north by the Macpherson Range,—the southern frontier of Queensland. The north-eastern point of Rous is Point Danger. The principal towns are—Maryland, Unumgar, Kynnumboon, Tooloom, Drake, Lismore, Casino, Ballina, Richmond River Heads, Wardell, Woodburn, Codrington, Wyrallah, Lawrence, Clarence River Heads, Palmer Island, Rocky Mouth, Brush Grove, Ulmarra, Grafton, Copmanburri, Ebor, &c.

Returning in the direction of our starting-point, we find the great outlying pastoral districts of Darling, Albert, and Warrego.

XI. DARLING.—This district, lying on the south-west frontier of the Colony, is bounded on the east by the Lachlan Pastoral District, on the south by the river Murray, on the west by the 141st parallel of longitude, and on the north by the southern limit of the great Albert District,—a line running from Menindee to the western frontier, at right angles to it. It contains an area of 50,000 square miles, and has mainly been occupied for pastoral purposes. It includes the counties of Tara, Windeyer, Menindee, Perry, Wentworth, Taila, part of Cairn, part of

Livingstone, &c., and large tracts never distributed into counties at all. The towns are few and unimportant, viz. :—Balranald, of the extreme western boundary of the Murrumbidgee District, Euston, Wentworth, Pooncarie, Mossgiel, Menindee, and Mount Gipps.

XII. ALBERT.—This vast district is as yet but little known. It is bounded on the south by the pastoral districts of the Darling and Lachlan, on the east by the Warrego District, on the north by the frontier of Queensland, and on the west by the frontier of South Australia. On the west of this district are two ranges of mountains,—Grey Range, and Barrier or Stanley Range. Towards the eastern boundary is the course of the river Paroo, running towards the north. The south-east portion of the Albert District is traversed by the Darling. It contains an area of about 60,000 square miles. The larger portion of the district is not yet subdivided into counties, but the counties of Young, Killara, Landsborough, Livingstone, Werunda, Rankin, and Yanda, are all that, up to the present time, have been designated. The towns are very few, small, and unimportant; amongst them are Wilcannia, Tankerooka, Mount, Monaro, Louth, &c.

XIII. WARREGO.—This district is traversed by the rivers Darling, Narran, Bogan, Warrego, and Culgoa, &c. It contains an area of 10,000 square miles. In this district there is much land good for grazing purposes, and much that is barren and useless. It includes the counties of Cowper, part of Clyde, Yanda, Narran, Finch, Gunderbooka, &c. Its towns are few, and for the most part unimportant; amongst them are Bourke, Brenda, Toora, Breewarrina, Yarramba, &c.

Climate.

NEW South Wales, so rich in natural wealth of almost every kind, has the further advantage of a climate which with rare salubrity combines an extraordinary variety of temperature. When in years to come a larger population shall devote themselves to settled occupations, and pastoral and agricultural pursuits are carried on under altered conditions, it may be reasonably assumed that the vital statistics of the Colony will show even more favourable results than those at present exhibited. It is a common error to suppose that the people of New South Wales live in a semi-tropical climate, and that the temperature of Sydney is the prevailing temperature of the Colony. There is as much difference in this respect between Sydney and some parts of the interior, as between the Midland Counties of England and the moors of Scotland, except that in the colder parts of this Colony the

winter is not so long in its duration. Although tropical plants grow in Sydney gardens, a five hours' journey by rail is sufficient to reach a climate where British fruits, flowers, and grasses are cultivated with great success. The vital statistics of the Colony will afford presumptive evidence of some value in regard to the nature of the climate and the expectations of life which may be based thereon, allowance being made for the numerous contingencies incident to life in new countries, with a large moving population. It is nearly ten years since the last general Census was taken, but the population of the Colony has been estimated from time to time, and the most recent official estimate of the number of inhabitants shows that on the 31st December, 1869, there were 271,005 males and 214,351 females, or a total of 485,356. The increase during the last half-year of 1869 was 9,706. The excess of arrivals over departures by sea was 3,043, and the excess of births over deaths 6,713. The population ten years ago was 348,586, so that there has been an average increase of more than 11,000 per annum. This may seem a slow rate of progress for a Colony so rich, and affording so many advantages highly esteemed in old countries; but New South Wales is the parent of several Colonies, all of which are careful to set forth to the world their attractions. In 1851 Victoria was separated from the parent Colony, and the population fell from 265,000 to 197,000, but it soon recovered itself. In 1858 the population was 342,000. Then it fell in 1859 to 336,500, the reduction being caused by the separation of Queensland. Since that time our population has increased, and would have reached a high figure but for the little effort we have made to assert our claims as a field for immigration. Since the year 1862 the number of immigrants from the United Kingdom at their own expense has been considerably less than a thousand a year; and for the last two years there has been no Government immigration. The immigrants introduced from the United Kingdom at the public expense, from 1860 to 1868 inclusive, numbered 21,254. Of these, upwards of 15,000 were from Ireland, 4,500 from England and Wales, and 1,500 from Scotland.

The marriage rate has gradually progressed. In 1860 the registered marriages were 2,945; last year they numbered 8,799. The births last year were 19,243, being 758 more than the births in 1868; while the deaths were only 6,691, or 534 less than the deaths in the previous year. It is also worthy of notice that the death rate of 1868 was considerably in excess of that of 1867, in which last-mentioned year measles were fatal to a large number of children. There is still in the Colony an inequality of the sexes,—females being in the minority by 40,000. Those who pay special attention to vital statistics will be interested to know that of 19,243 births last year, there was an excess of 500 in favour of the males, and that the deaths showed an excess of 1,253 males

the numbers being—males, 3,972 ; females, 2,719. The steps which are now being taken to introduce from the United Kingdom a considerable number of young unmarried women for domestic service, are likely to have a beneficial social effect. Those of the new comers who do not speedily find husbands will be welcome in numerous places throughout the Colony. Statistics relating to the natural increase of population in New South Wales furnish some facts which are somewhat socially abnormal, as well as some which are physiologically interesting. For instance, in the ten years from the 1st January, 1859, to the 31st December, 1868, there were fifteen cases of triplets, and 1,429 instances of twins.

The most prevalent diseases may be gathered from the result of a classified statement, which shows that last year the causes of death were as follows :—Zymotic diseases, 1,506 ; constitutional, 746 ; local, 2,570 ; developmental, 1,220 ; violence, including accidents, homicides, suicides, &c., 565. Total, 6,607. This estimate was made in accordance with the classification of cases, which is uniform throughout the British possessions.

[For further information relating to the Meteorology of New South Wales, the reader is referred to the paper on this subject by the Government Astronomer (Mr. H. C. Russell), which will be found in a subsequent part of this work.]

Governmental Divisions.

THE principal divisions of New South Wales for Political, Executive, and Municipal purposes, are three in number, viz. :—The Electoral Districts, the Police Districts, and the Municipal Districts. These last comprise the City of Sydney, the Suburban Boroughs, the Country Boroughs, and the Municipal Districts, properly so called.

ELECTORAL DISTRICTS.

The Electoral Act of 1858 created sixty electorates, entitled to return seventy-two Members to the Legislative Assembly. Of these electorates two are in the metropolis and return each four Members, and the Gold-fields constitute three several Electoral Districts—South, West, and North. The remaining fifty-five Electoral Districts are Argyle, Balranald, Bathurst, Bogan, Braidwood, Camden, Canterbury, Carcoar, Clarence, Central Cumberland (the Metropolitan County), Eden, Glebe (Sydney), Goulburn, Gwydir, Hartley, Hawkesbury, Hume, Hunter, Hunter Upper, Hunter Lower, Illawarra, Kiama, Lachlan, Liverpool Plains,

Macquarie East, Macquarie West, Maitland East, Maitland West, Monaro, Morpeth, Mudgee, Murray, Murrumbidgee, Narellan, Nepean, Newcastle, New England, Newtown, Northumberland, Orange, Paddington, Parramatta, Paterson, Patrick's Plains, Queanbeyan, St. Leonards, Shoalhaven, Tenterfield, Tumut, Wellington, The Williams, Windsor, Wollombi, and Yass Plains. Of these, Camden, Canterbury, Central Cumberland, The Hawkesbury, East Macquarie, and Parramatta, return each two Members, and the rest one Member, to serve in the Assembly. The three Gold-fields electorates respectively embrace a large number of different localities in which gold-mining pursuits are followed. In these electorates every person possessing a miner's right is qualified to vote. The Sydney University will be entitled to return a Member to the Legislature when the superior graduates number 100.

THE POLICE DISTRICTS.

Seventy-one Police Districts include the whole area of New South Wales (323,437 square miles). The subdivision is one of a purely practical character, and is moreover convenient for statistical and other purposes. These subdivisions have all been taken into consideration in the arrangement of the Electoral Districts. The Police Districts are either grouped round some principal town or towns, or else round some convenient central point; but their limits are so liable to modification, and so little known, that they are not available for geographical purposes.

MUNICIPAL SUBDIVISIONS.

CITY OF SYDNEY.—The City of Sydney was first incorporated in 1842—Corporation dissolved and Commissioners appointed, 1853—Corporation re-established, 1857—Divided into eight Wards, represented by a Mayor and fifteen Aldermen. Present population, about 90,000.

Of the **SUBURBAN BOROUGHS**, as Municipalities, there are twenty-one, namely:—**RANDWICK, WAVERLEY, GLEBE, REDFERN, BALMAIN, PADDINGTON, WOOLLAHRA, WATERLOO, EAST ST. LEONARD'S, MARRICKVILLE, CAMPERDOWN, NEWTOWN, DARLINGTON, NORTH WILLOUGHBY, ST. LEONARD'S, ALEXANDRIA, RYDE, HUNTER'S HILL, VICTORIA, ST. PETER'S, and WEST BOTANY.** They have each a Mayor and a certain number of Aldermen, and the population of the whole is about 50,000.

There are also about twenty **COUNTRY BOROUGHS** governed in a similar manner, and five **MUNICIPAL DISTRICTS**.

[More detailed information respecting our progress in local self-government will be found under Art. "Municipal Institutions"—(*Vide post.*)]

Political Condition.

NEW South Wales furnishes an instance of political growth without parallel. A single century has elapsed since its discovery by Cook, and but eighty-three years since its settlement by Governor Phillip. It is not now intended to give a history of the progress of the Colony from military rule (the original form of administration) to Responsible Government, but rather to convey an idea of the degree of political freedom enjoyed under the present Constitution, and to explain concisely the form of government granted by the Crown, which has for more than fourteen years ceased to exercise a control over the administration of government, except in regard to matters which affect Imperial interests.

The Colony has a Governor, and a Parliament, consisting of two Houses,—the Legislative Council and the Legislative Assembly. The Parliament is invested with plenary legislative powers, subject to the reservation of the Queen's assent by the Governor, to certain classes of measures affecting Imperial and other interests, and specified in the Commission and instructions issued to Her Majesty's representative.

The Governor is appointed by Commission under the Great Seal of the United Kingdom, and is empowered to appoint an Executive Council to advise and assist him in the administration of government. He receives a salary of £7,000 per annum, provided by Schedule A of the Constitution Act, 18 and 19 Vic., c. 54. The Earl of Belmore is the present Governor.

The Members of the Legislative Council hold their seats for life, and are appointed by the Governor.

The Legislative Assembly consists of seventy-two Members. One of the first acts of the Legislature was to pass a law to amend the Constitution, by repealing those clauses which required a majority of two-thirds to alter the Constitution, and to place that power in the hands of a simple majority. The following are the words of the Electoral Act setting forth the qualification of Members of the Assembly :—“Every male subject of Her Majesty of the full age of twenty-one years, and absolutely free, being natural born, or who, being a naturalized subject, shall have resided in this Colony for five years, shall be qualified to be elected a Member of the Assembly for any electoral district unless disqualified by section 17 or 18 of the Constitution Act, or unless under section 11 or 12 of this Act he would be disqualified or incapacitated as an elector.” The 11th clause of the Electoral Act disqualifies paupers, persons of unsound mind, or attainted or convicted of treason, felony, or other infamous offences.

The following is the qualification of electors: "Every male subject of Her Majesty of the full age of twenty-one years, being natural born, or who, being a naturalized subject, shall have resided in this Colony for three years, shall, if qualified as in this section is provided, and entered on the roll of electors, and not disqualified or incapacitated for some cause hereinafter specified, be entitled to vote at any election for the electoral district in respect of which he shall be so qualified." The requirements are six months' residence, or a freehold or leasehold estate of the annual value of £10. There is a proviso that no elector possessing more than one qualification within the same district shall be thereby entitled to any additional vote at any election for that district. Among the disqualified are classed criminals, paupers, persons in the military service or in the police. The electoral rolls are revised every year, and the duty of collecting the lists is performed by the police.

Parliaments are quinquennial, but only one has expired by effluxion of time.

The mode of voting at elections is by ballot, and the system has worked with excellent effect, having secured the maintenance of good order and not prejudiced freedom of action on the polling-day.

The administration of Government is at present conducted by seven Cabinet Ministers, viz. :—The Colonial Secretary, Treasurer and Secretary for Finance and Trade, Secretary for Lands, Secretary for Works, Postmaster General, and the Law Officers of the Crown—the Attorney and Solicitor General.

There is a good library attached to each House, and a refreshment-room conducted on the principle of a Parliamentary club.

The offices of President of the Legislative Council and Speaker of the Legislative Assembly have always commanded the services of efficient, and sometimes those of highly accomplished, men.

Since the inauguration of Responsible Government changes of Ministry have taken place with a frequency that might have been naturally enough expected by those who are well acquainted with the circumstances of the Colony. In fourteen years we have had six Parliaments. The present Parliament is in its second session. The first Parliament opened on the 22nd May, 1856, and after two sessions was dissolved on the 19th December, 1857. The second Parliament opened on the 23rd March, 1858, and after two sessions was dissolved on the 9th April, 1859. The third Parliament opened on the 30th August, 1859, and after two sessions was dissolved on the 10th November, 1860. The fourth Parliament was opened on the 10th January, 1861, and after five sessions was dissolved on the 10th November, 1864. The fifth Parliament was opened on the 24th January, 1865, and its fifth session was brought to a close on the 1st April, 1869. The sixth Parliament commenced its session on the 27th January, 1869.

The first Ministry was that of the late Sir Stuart Alexander Donaldson, who took office on the 6th June, 1856, and went out on the 25th August of the same year. He was succeeded by Mr. Charles Cowper, who held office till the 2nd October, 1856, when Mr. (now Sir Henry) Watson Parker was sent for, and formed a Government which lasted till the 7th September, 1857. Mr. Cowper then took office a second time, and retained his position till the 26th October, 1859. He was succeeded by Mr. Forster, who, on the 8th March, 1860, made way for Mr. John Robertson, of whose Ministry Mr. Cowper was a member, and whose Government merged into the third Cowper Government, which lasted till October, 1863. Mr. (now Sir James) Martin then accepted office, and held it until the 2nd February, 1865. From the 3rd February, 1865, Mr. Cowper again held office until the 21st January, 1866, when his Ministry was succeeded by that of Sir James Martin, which held office till the 26th October, 1868. Mr. Robertson then came into office, but at the beginning of the present Parliament his Government merged into the Cowper Government, which, in December, 1870, gave place to the existing Ministry, of which Sir James Martin is Premier and Attorney General, and Mr. Robertson Colonial Secretary, with the following gentlemen as colleagues:—Mr. Lord, Colonial Treasurer; Mr. Wilson, Minister for Lands; Mr. Byrnes, Minister for Works; Mr. Windeyer, Solicitor General; Mr. Docker, Postmaster General, and Representative of the Government in the Legislative Council.

Administration of Justice.

THE administration of justice throughout so extensive a territory as that of New South Wales necessarily requires a large and somewhat costly establishment.

The laws of the Colony are substantially identical with those of Great Britain. There are a few variations. The most material is that the punishment of death is still awarded for the crime of wounding with intent to murder, and for rape. Another difference is the absence of a grand jury, and the finding or ignoring of bills of indictment by the Attorney General. A third, that the landed property of a person dying intestate is divided in the same manner as personal estate, instead of passing in its entirety to the heir-at-law. There are other variations which need not be specially noted.

In many matters of practice—as, for instance, in the mode of selecting juries, and in admitting pleas of cross-actions so as to lessen and cheapen litigation—this Colony has been even in advance of the Mother-country. There are still, however, some reforms which are considered to be necessary—particularly a

revision and consolidation of some of the statutes. To that end, and for the purpose of considering the question of a uniform procedure in the Common Law and Equity jurisdictions, a Law Reform Commission has been appointed.

Imprisonment for debt has long been abolished, except as to damages recovered in certain actions for personal wrongs; and in these cases the insolvency of the debtor will not entitle him to be discharged without paying the damages awarded against him. Defendants in Supreme Court actions about to leave the Colony may be arrested and held to bail, and persons against whom judgments have been recovered in any District Court may be imprisoned if it be made to appear to the satisfaction of the Judge that they are of ability to satisfy the same.

LAW OFFICERS OF THE CROWN.

The Crown Law Officers are the Attorney, and Solicitor General, who advise the Government on all matters of a legal character in which the Crown has any interest.

THE SUPREME COURT.

The Supreme Court has, as regards this Colony, all the powers which are vested in the superior Courts of England.

There are four Judges—the Chief Justice and three Puisne Judges. The judicial powers which are vested in the Lord Chancellor in England are here committed to the Judges of the Supreme Court. One of the Judges has, as Primary Judge in Equity, certain special functions. This Judge transacts all such business in the Equitable, Ecclesiastical, and Insolvency jurisdiction of the Court as can be disposed of by a single Judge; but there is an appeal from his decrees to the full Court.

The Supreme Court is the Court of appeal from all Courts of inferior jurisdiction. Any two of the Judges constitute the Court in banc. It is seldom, however, that fewer than three sit for Term business. A single Judge can exercise, in urgent cases, out of term, the powers of the full Court, subject to the confirmation, in term, of his orders. An appeal lies from the Supreme Court to the Judicial Committee of the Privy Council, where property is concerned involving not less than £500. But the Privy Council can allow an appeal in any case on petition.

There are four Terms in the year, during which the Court sits in banc, lasting about a month each, and so arranged as to take up the various special cases, points reserved, motions for new trials, &c., arising out of the several sittings for the trial of causes and of criminal cases. These Terms are not designated as in England, but are styled the First, Second, Third, and Fourth Terms. There are also four sittings in the year, at Sydney, for the trial of causes, and a like number of Gaol Deliveries for the trial of criminals.

Criminal cases are tried by juries of twelve, whose finding must be unanimous. For the trial of civil cases a system has now been in operation many years, which has been found to work admirably. There are three kinds of civil juries—juries of four, common juries of twelve, and special juries of twelve. In every case a verdict of three-fourths of the jury can be returned if after six hours consultation they cannot all agree; and if, after twelve hours consultation, three-fourths do not agree, the jury is discharged without verdict. The majority of the cases are tried by juries of four; but in some cases of importance special juries of twelve are empanelled.

The Master in Equity has similar functions to those formerly exercised by the English Masters in Chancery, now termed Chief Clerks; or, in the District Courts, by a Crown Prosecutor specially appointed for that purpose. The Prothonotary has charge of the Common Law and Ecclesiastical branches, and is also Curator of Intestate Estates. The Sheriff, although specially an officer of the Supreme Court, has other and independent duties to perform, being also Inspector of Prisons. He is a paid officer of the Crown, appointed by the Government in the same manner as other public functionaries, although vested with all the powers held by the honorary Sheriffs of England. He acts for the whole Colony, and is assisted by an under-sheriff and a staff of clerks and bailiffs.

INSOLVENCY COURT.

In this Court the insolvency laws—which here supply the place of the English bankruptcy laws—are administered by a Chief Commissioner, who has original jurisdiction in all matters affecting the management of insolvent estates, the conduct of inquiries, and the granting or refusing of certificates to insolvents. An appeal lies from his decisions to the Judges of the Supreme Court. Such matters as can be dealt with by a single Judge are disposed of by the Primary Judge in Equity, but appeals are heard and decided by the full Court. For the administration of the estates of insolvents there are three Official Assignees.

VICE-ADMIRALTY COURT.

The Vice-Admiralty Court exercises a similar jurisdiction to that of the Court of Admiralty in Great Britain. The Chief Justice is, *ex officio*, President of this Court as Judge Commissary. Two of the Puisne Judges are assistants to him, and sit as Deputy Judges. Cases are heard and disposed of by the Judge alone, and no appeal lies from his decision to the Supreme Court. There is, however, an appeal to the Privy Council.

CIRCUIT COURTS.

The Circuit Courts deal at the Assize towns with all such cases, both criminal and civil, as would in Sydney be disposed of by the Supreme Court. They are presided over by one of the Supreme Court Judges. The Assize towns are Albury, Armidale, Bathurst, Deniliquin, Goulburn, Maitland, Tamworth, and Wagga Wagga. Courts are held at each of these places twice in the year—*i.e.* in the months of April and October. Two of these Assize towns (one of them, Armidale, being to the north, and the other, Wagga Wagga, to the south) are above 300 miles from Sydney; and one (Deniliquin) is distant from it above 480 miles.

DISTRICT COURTS AND COURTS OF GENERAL SESSIONS.

The Colony is divided into five districts for the purposes of this branch of the administration of justice. For the Metropolitan and Coast District there are two Judges. The Southern, South-western, Western, and Northern Districts have also each a Judge. Sittings are held once a month in Sydney, and less frequently at all the principal towns in each district. These Courts have, with certain exceptions, a civil jurisdiction up to £200. Where the amount in dispute is under £10, the case is disposed of by the Judge alone; but where it exceeds that sum, the suitor may require a jury of four. The District Court Judges are, *ex officio*, Chairmen of the Courts of General Sessions in their respective districts, and have jurisdiction in all criminal cases, except capital felonies. All such cases are tried by common juries of twelve. Appeals lie from the District Courts to the Supreme Court.

OTHER COURTS.

CORONERS' COURTS.—These Courts exercise functions analogous to those of the English Coroners' Courts.

MAGISTERIAL COURTS.—The same remark applies to these Courts. There are Stipendiary Magistrates, called Police Magistrates, in most country districts, and two such in Sydney. Each Police District has a separate Bench or Benches of Magistrates; and of these there are altogether in the Colony 107.

COURT OF CLAIMS.—This Court investigates and reports to the Government upon conflicting claims to grants of land.

THE LANDS TITLES OFFICE, although a branch of the Registrar General's Department, may be said to have an important connection with the administration of justice, on account of its great influence in the settlement of titles to real property, and the prevention of litigation thereon. There are three Commissioners

under the Real Property Act, the Registrar General being one of these Commissioners and their Chairman. Of Examiners of Titles there are two, both being professional gentlemen (attorneys) of experience. No title is registered until it has undergone a thorough examination; and if it consist of anything beyond a direct Crown grant to the applicant, or, being such, is or has been affected by any dealing disclosed on the old deed-register, ample opportunity is afforded to any one to come in and object (public notice being given, for that purpose, of each application); but the registration once obtained, objections are barred, and the property may be transferred or otherwise dealt with by a simple act of record, and at a very trifling expense. To compensate for the occasional injustice which this bar to the recovery of land may inflict on those whose rights would have not been excluded by the law in other cases, an indemnity fund is provided, which consists of a contribution of $\frac{1}{3}$ d. in the £ on the value of all property brought under the Act, either by ordinary application, or by Crown grant issued since January, 1863, and which is renewed on each transmission on the decease of a registered proprietor. It is very satisfactory to be able to state, that hitherto, although the Act has been eight years in operation, not one claim has been made on the fund.

The value of the property brought under the Act during the seven years of the period ending 31st December, 1869, was estimated at £3,024,992. The return for the year 1870 is not yet completed, but if the rate of the previous year's addition be adopted as an approximate estimate, the present total may be considered about £3,500,000.

THE LEGAL PROFESSION.

The number of barristers on the roll of the Supreme Court, resident in the Colony, is fifty-six, of whom four are Queen's Counsel. But of these some are not practising. The number of Sydney attorneys in practice is one hundred and sixteen, and of country attorneys ninety-eight. There are twenty-two notaries public, all of whom are attorneys.

Attorneys of the Supreme Court are admitted to practice as Advocates in the District Courts and inferior Courts.

Municipal Institutions.

The inhabitants of New South Wales have shown an intelligent appreciation of the benefits of local self-government. The city of Sydney has been incorporated for many years, and has experienced frequent vicissitudes of municipal existence. The Civic Council derives its powers by statute. The first general Municipalities Act applicable to the entire Colony was passed in

1858, and the amended Act now in force became law at the end of 1867. It was estimated in the year 1869 the City of Sydney had a population of 71,800, occupying 14,500 houses. The estimated value of the house property in the city proper is upwards of £8,000,000. The suburban boroughs have a population of about 50,000, and contain upwards of 9,000 houses and other buildings, the estimated value of which is nearly £3,000,000. In the unincorporated suburbs there are about 12,000 inhabitants, and 2,500 houses and other buildings; and the estimated value of this property is nearly three-quarters of a million sterling. The total population of the city and suburbs, incorporated and unincorporated, within the Metropolitan Police District, is estimated at 127,000; the number of houses and other buildings, at 260,000; and the estimated value of the household property, at £11,637,000. In this district there are nearly 200 miles of streets, and 134 miles of roads. During the past year there have been considerable and valuable additions to the buildings of the city and suburbs, and new streets and roads have been aligned.

The Government offers substantial encouragement to municipal incorporation, with the object of relieving the central Government of much that can be better performed under local supervision. The statute provides for two classes of municipalities—Boroughs and Municipal Districts. A borough may consist of (1) any city or town, without its suburbs or country immediately adjacent thereto; (2) any suburb of the metropolis as at present incorporated; (3) any populous country district. But every such borough must have a population of not less than 1,000 souls, and an area of not more than 9 square miles, of which area no one point shall be more than 6 miles distant from any other point. A municipal district may include any part of the Colony not containing a borough, and may comprise on its first incorporation an area not exceeding 50 square miles, of which no point shall be more than 20 miles distant from any other point. And there is a proviso requiring that every such municipal district shall contain a population of not less than 500 souls. These boroughs and municipal districts are incorporated on petition of persons who, upon the proposed incorporation being effected, would be liable to be assessed for municipal taxes.

There are now about forty municipalities, and it is not too much to say that there are very few Acts on the statute-book whose operation has been attended with results so marked, and at the same time so satisfactory, as that under which they are incorporated. The municipalities vary greatly in regard to size and population. The suburban municipalities are of course the most compact and populous. Balmain contains an area of

but fifteen-sixteenths of a square mile, and has a population of about 4,000. The Glebe has an area of three-quarters of a square mile, and a population of 5,000. The municipality of Cook contains an area of only half a square mile, and has a population of about 1,400. Marrickville contains an area of little more than $2\frac{1}{2}$ square miles, and has a population of 1,500 souls. Newtown contains two-thirds of a square mile, and has a population of about 5,000. Redfern contains an area of little more than half a square mile, and has a population of between 4,000 and 5,000 souls. Some of the country municipalities embrace areas of more than 100 miles. Central Illawarra, for instance, has 116 square miles; Kiama, 120 square miles; and Cudgegong, 191 square miles. The rates are levied on nine-tenths of the fair average annual rental of buildings and cultivated lands, and upon £5 per cent. of the capital value of the fee simple of all unimproved lands. In addition to the general rates, special rates may be levied for sewerage, water, gas, free infant schools, and free libraries. But the rates, general and special, are limited to 2s. in the pound of the assessment, and in very few instances at present do they exceed 1s. in the pound. Several of the suburban municipalities are lighted with gas, the pipes being continued from Sydney, and the Corporation of the inland city of Goulburn light their streets with kerosene. Some of the municipalities have free libraries, but no special rate has been levied for their maintenance. The town-halls, for the most part, are neat and substantial. The Sydney Corporation are erecting a Town Hall which would do credit to any English or Continental city.

Aldermen hold office for three years,—one-third retiring every year. They are elected by ballot, and the electors are the ratepayers. The Municipalities Act of 1867 provides for cumulative votes, thus: the occupier, lessee, or owner of property assessed at an annual value not exceeding £25, has one vote; over £25 and not exceeding £75, two votes; over £75 and not exceeding £150, three votes; over £150, four votes, which last number is the maximum. All municipalities receive endowment in proportion to the rates. For the first five years after incorporation the Government gives a sum per annum equal to the whole of the rates, assessments, and subscriptions; for the second five years, one-half; and in the third succeeding five years, one-fourth, after which the Government endowment ceases.

Hitherto the municipalities have done little to relieve the central Government from the obligation of establishing and maintaining roads, bridges, and other necessary works throughout the country generally, although they have certainly done much to improve the aspect of some of the more populous districts.

Religious Denominations.

Of these the Anglican stands first in point of numbers, and is followed by the Roman Catholic, the Presbyterian, and the Wesleyan. All denominations possess equal rights, and enjoy the most perfect toleration and freedom. None is specially supported by the State. The relative proportions of the different sects, and the extent of their organization, may be understood by the following analysis :—

CHURCH OF ENGLAND.—The Anglican Church in New South Wales is subdivided into five Dioceses :—(I.) *Sydney* (the Metropolitan See).—(II.) *Newcastle*.—(III.) *Grafton and Armidale*.—(IV.) *Goulburn*.—(V.) *Bathurst*. (1.) In the Diocese of *Sydney* (including the City of Sydney and its suburbs) there are ninety-two clergymen, and 118 churches and chapels. Of these churches and chapels thirty-one are in the city and suburbs, and eighty-seven in the country. Church accommodation provided for 28,535; average attendance, 22,480; attendance in buildings used for public worship, 4,504; total average attendance at public worship every Sunday, 26,994. (2.) In the Diocese of *Newcastle*, twenty-five clergymen, and seventy-one churches and chapels. Church accommodation here provided for 9,347; average attendance, 6,272; attendance in buildings, &c., 2,427; total average attendance, &c., 8,699. (3.) In the Diocese of *Grafton and Armidale*, thirteen clergymen, and twenty churches and chapels. Church accommodation provided for 2,750; average attendance, 1,721; attendance in buildings, &c., 1,372; total average attendance, &c., 3,093. (4.) In the Diocese of *Goulburn*, twenty-four clergymen, and fifty-four churches and chapels. Church accommodation for 7,050; average attendance, 4,601; attendance in buildings, &c., 1,935; total average attendance, &c., 6,536. (5.) *Bathurst* Diocese. The details respecting this diocese (recently established) are included under the See of Sydney. Total number of Licensed Anglican Clergymen in New South Wales, 154. Total number of churches and chapels in New South Wales, 263. Total average attendance by this denomination at public worship every Sunday,—46,522 persons.

ROMAN CATHOLIC CHURCH.—The Roman Catholic Church in New South Wales is subdivided into five Dioceses :—(I.) *Sydney* (the Metropolitan See). (II.) *Maitland*.—(III.) *Bathurst*.—(IV.) *Goulburn*.—(V.) *Armidale*. (1.) In the Diocese of *Sydney* (including the City of Sydney and its suburbs) there are sixty-nine clergymen, and eighty-two churches and chapels. Of these churches and chapels twenty-one are in the city and its suburbs, and sixty-one in the country. Church accommodation provided for 25,500; average attendance, 27,151; attendance in buildings used for public worship, 1,665; total average attendance at public worship every Sunday, 28,816 persons. (2.) In the Diocese of *Maitland*, ten clergymen, and twenty-six churches and chapels. Church accommodation provided for 5,772; average attendance, 5,255; attendance in buildings, &c., 450; total average attendance, &c., 5,705. (3.) In the Diocese of *Bathurst*, seventeen clergymen, and fourteen churches and chapels. Church accommodation provided for 3,095; average attendance, 2,350; attendance in buildings, &c., 1,954; total average attendance, &c., 4,304. (4.) In the diocese of *Goulburn*, thirteen clergymen, and twenty-seven churches and chapels. Church accommodation for 6,550; average attendance, 5,500; attendance in buildings, &c., 930; total average attendance, &c., 6,430. In the Diocese of *Armidale*, six clergymen, and nine churches and chapels. Church accommodation for 2,220; average attendance, 1,500; attendance in buildings, &c., 930; total average attendance, &c., 2,430. Total average attendance by this denomination at public worship every Sunday,—47,685 persons.

PRESBYTERIAN CHURCH OF NEW SOUTH WALES.—In the Presbyterian Church of New South Wales there are sixty-eight registered ministers, and ninety-six churches and chapels. Of these churches and chapels seventeen are in the City of Sydney and the suburbs, and seventy-nine in the country. The church accommodation provided is for 18,730; the average attendance, 10,594; the attendance in public buildings or dwellings used for public worship, 4,721. Total average attendance by this denomination at public worship every Sunday,—15,315 persons.

PRESBYTERIAN CHURCH—SYNOD OF EASTERN AUSTRALIA.—In this Presbyterian Church in New South Wales there are seven registered ministers, and five churches and chapels. The church accommodation provided is for 620; the average attendance, 450; the attendance in public buildings or dwellings used for public worship, 730. Total average attendance by this denomination at public worship every Sunday,—1,180 persons.

PRESBYTERIAN CHURCH—OTHER THAN THE ABOVE.—Of this section of the Presbyterian denomination in New South Wales, there are six registered ministers, and three churches and chapels. Church accommodation provided for 280; average attendance, 130; attendance in buildings, &c., 191. Total average attendance of this section of the denomination at public worship every Sunday,—321 persons.

WESLEYAN METHODIST CHURCH.—In the Wesleyan Methodist Church of New South Wales there are sixty-eight registered ministers, and 200 churches and chapels. Of these churches and chapels twenty-six are in the City of Sydney and its suburbs, and 174 in the country. The church accommodation provided is for 36,000, and the average attendance 34,000 persons.

CONGREGATIONAL CHURCH.—In the Congregational Church of New South Wales there are twenty-four registered ministers, and twenty-one churches and chapels. Of these churches and chapels eleven are in the City of Sydney and suburbs, and ten in the country. The church accommodation provided is for 7,030; average attendance, 4,815; attendance in public buildings and dwellings used for public worship, 242. Total average attendance of this denomination every Sunday,—5,057 persons.

PRIMITIVE METHODIST CHURCH.—In the Primitive Methodist Church of New South Wales there are twelve registered ministers, and thirty-nine churches and chapels—four in the City of Sydney, and thirty-five in the country. The church accommodation provided is for 5,260; average attendance, 3,285; attendance in buildings, &c., 260. Total average attendance of this denomination every Sunday,—3,545 persons.

UNITED METHODIST FREE CHURCH.—This denomination has one registered minister, and four churches or chapels. Church accommodation for 580; average attendance, 290; attendance in buildings used for public worship, 210. Total average attendance of this denomination every Sunday,—500 persons.

UNITED FREE GOSPEL CHURCH.—This denomination has one registered minister, and two churches or chapels. Church accommodation for 200; average attendance,—100 persons.

BAPTIST CHURCH.—This church has nine registered ministers, and eighteen churches and chapels. Of these churches and chapels four are in the City of Sydney and suburbs, and fourteen in the country. Out of these fourteen churches three are Welsh churches. Church accommodation is provided for 3,264 persons—1,414 for the city, and 1,850 for the country. The average attendance at the city churches is 710; ditto for the country churches, 1,000: Total, 1,710. Attendance in buildings used for public worship, 479. Total attendance of this denomination every Sunday,—2,189 persons.

FREE CHURCH OF ENGLAND.—This church has two registered ministers, and one church or chapel. Church accommodation for 600; average attendance, 90; attendance in other buildings, 90. Total average attendance every Sunday,—180.

UNITARIAN CHURCH.—This church has two registered ministers, and one church. Church accommodation provided, 300; average attendance every Sunday,—450.

GERMAN LUTHERAN CHURCH.—This church (in the country) has one registered minister, and two churches or chapels. Church accommodation, 150; average attendance every Sunday,—80 persons.

CHRISTIANS.—This church (in the suburbs) has one registered minister, and one church. Church accommodation provided for 400; average attendance every Sunday,—250 persons.

JEWISH DENOMINATION.—This denomination has five registered ministers in the City of Sydney, and two synagogues. Accommodation for 720; average attendance every Sabbath,—410 persons.

CHRISTIAN ISRAELITES.—This denomination has one registered minister, and two churches or synagogues. Accommodation for 160; average attendance,—75 persons.

RECAPITULATION.—Registered ministers of religion, 476; ordinary established places of public worship, 818; church accommodation for 165,118; average attendance of all denominations meeting for public worship weekly,—156,659 persons.

SUNDAY-SCHOOLS OF ALL DENOMINATIONS.—Number of schools, 805; number of teachers, 5,425; number of male scholars, 23,185; number of female scholars, 24,896; total Sunday-school scholars, 48,081. Increase of Sunday-school scholars during the past year,—4,287.

Education.

UNIVERSITY AND HIGH SCHOOLS.

THE principal educational machinery of the Colony is represented by the Primary Schools, Public and Denominational; the Grammar School of Sydney; the King's School of Parramatta; and, lastly, the Sydney University and its Affiliated Colleges—St. Paul's and St. John's. The University of Sydney, situated on a hill to the south of Sydney, presents to the eye a magnificent range of buildings. It was established and endowed in 1851, by an Act of the Legislature, principally through the exertions of Mr. Wentworth, who is justly regarded as its founder. It is empowered to confer degrees in Arts, Law, and Medicine, and its graduates are already winning their way in the Law, in Medicine, and in the Legislature. By a Royal Charter of 1858, its graduates enjoy the same rank, style, and precedence as are enjoyed by graduates of Universities within the United Kingdom. The distinctive character of the University is the absence of any religious test, its aim being to supply the means of a liberal education to all orders and denominations without any distinction whatever. It is not merely an examining but a teaching institution, associating in its lecture-rooms all its students, without respect of religious creeds, in the cultivation of secular knowledge. Its professorial chairs have been filled since its foundation by men whose scholarly and scientific attainments have been proved by success in the Universities of the Mother Country; and to the lamented Dr. Woolley, lost in the ill-fated "London," must

be largely attributed whatever success its influence has achieved. The unsectarian character of the University excluding religious teaching, the Legislature has passed an Act to encourage the erection of Affiliated Colleges, in connection with different religious denominations, where domestic supervision and systematic religious instruction may be given to such students as choose to enter them. The University is liberally endowed with scholarships, and it is possible for the son of the poorest mechanic to proceed from the primary Public Schools to the Grammar School, and thence to the University, free of expense, if he has talent to win the prizes which pay for his education. A system of public examinations, similar to the middle class examinations of England, has also been conducted by the University with some success. The following Colleges are affiliated to the University:—St. Paul's College, of which the Metropolitan Bishop is the Visitor, governed by a Warden and eighteen Fellows. St. John's College, of which the Roman Catholic Archbishop is the Visitor, governed by a Rector and eighteen Fellows. A College for the Wesleyan Body, to be called Wesley College, has been projected; and a Presbyterian College has been incorporated by Act of Parliament. St. Andrew's is to be connected with the Presbyterian Church of New South Wales, whose Moderator is to be the Visitor. The governing body is to consist of a Principal and Council of Twelve.

PRIMARY SCHOOLS.

Great importance is attached to primary education by the people of New South Wales, and ample provision has been made by the Legislature of the Colony for the instruction of the young. From 1848 to 1867 public instruction had been administered under the supervision of two separate Boards, called respectively The Board of National Education, and The Denominational Board. To these separate bodies the Government handed from year to year large sums of money in equal proportions. These Boards performed good service to the community, but many circumstances arose to show that it would be beneficial to supersede them by an undivided authority; and this was done in accordance with the provisions of an Act which, towards the close of 1866, was passed to make better provision for public education.

There are many points of resemblance between the provisions of the Public Schools Act of New South Wales and the Bill recently introduced by Mr. Forster into the House of Commons in relation to the same subject.

The Council of Education consists of five members, who are appointed by the Governor with the advice of the Executive Council. The term of office is four years, but the Act gives the Governor power to remove any member. Two members, however, were at the outset nominated for two years only, so that in the

event of appointment not being again conferred upon the same persons, the changes would not be so abrupt as to interfere with the satisfactory working of the Council. The Act entrusts to the Council the expenditure of all money appropriated by Parliament for elementary instruction. The Council has authority to establish and maintain Public schools; to grant aid to certified Denominational schools; and, subject to certain provisions, to appoint and remove teachers or school inspectors; to frame regulations; to elect its own president; to define the course of secular instruction, the training, examination, and classification of teachers, the examination of scholars, the discipline to be enforced; and to do everything that is necessary to carry out the provisions of the Act. The Council of Education is subject to the control of the Governor and Executive Council in the same way as any other department of the Public Service. Its regulations are laid before Parliament, and have the force of law.

Public schools may be established in any locality where, after due inquiry, it is found that there are at least twenty-five children who will regularly attend such school on its establishment. Denominational schools are certified under conditions set forth in the 9th clause of the Act as follows:—"It shall be lawful for the Council of Education in any locality where a Public school may be established, which has in attendance thereat not less than seventy children, to certify as a Denominational school any school situated not more than 5 miles from such Public school, on such Council being satisfied after due inquiry that there are at least thirty children in regular attendance at such school: Provided that no school shall be so certified in any case where such school shall be within 2 miles by the shortest highway of any Public school, unless there shall be in regular attendance at such school, and at the nearest Public school together, not less 120 children." All certified Denominational schools are subject, generally, to the same course of secular instruction and the same inspection as Public schools, and the certificate may be withdrawn if the required number of pupils be not maintained,—if the building becomes dilapidated or otherwise unsuitable,—if the supply of furniture and apparatus becomes inadequate,—or, if the regulations of the Council be infringed.

Teachers of the same persuasion as that to which any certified school may belong are appointed to certified Denominational schools, but they are subjected to examination and approval in the same way as Public school teachers. In all certified Denominational schools the religious instruction of the children is left under the control of the heads of the denomination to which any such school may belong.

The Act makes further provision for schools to be taught by itinerant teachers who move about among the scattered population

of the interior. By regulation, such schools (termed *Half-time schools*) may be established wherever twenty children of the school-age, residing within a radius of 10 miles from a central point, can be collected in groups of not less than ten children in each. The Act provides for assistance, under certain regulations, to schools in thinly-populated districts. A school-fee generally of a shilling per week is charged, a reduction being made where several children attend belonging to one family; but children whose parents or guardians are unable to pay the fees are not on that account refused. The following are the provisions of the Act in regard to secular and religious teaching:—"In every Public school four hours during each school-day shall be devoted to secular instruction exclusively, and of such four hours two shall be in the morning and two in the afternoon; and a portion of each day—not less than one hour—shall be set apart when the children of any one religious persuasion may be instructed by the clergyman or other religious teacher of such persuasion: Provided that in case of the non-attendance of any clergyman or religious teacher during any portion of the period hereby set apart for religious instruction, such period shall be devoted to the ordinary secular instruction in such school."

The local supervision of these schools is confided to local School Boards. It is the duty of the members of these Boards to visit, inspect, and report upon the schools. Provision is also made for the training of teachers and their classification according to attainments. The assistance given by the Council in aid of the erection and furnishing of Public school-buildings, is as a rule double the private contributions for the same object, and assistance to the other classes of schools is generally limited to the payment of teachers' salaries and the supply of school-books and apparatus. Public school-buildings may not be used as places of public worship, nor for the holding of political and other meetings likely to cause contention; but non-vested schools, built and kept in repair without aid from the public purse, are made available for the work of the Sunday-school and for religious services. It is a special instruction to all Public school teachers that "nothing must be said or done to offend the religious views of any pupil during the period devoted to ordinary instruction." Classified teachers receive salaries varying from £72 to £150 per annum as well as the school fees—which, in large schools where there are several teachers, are divided ratably—and in most cases, residence. Special salaries are given in the model schools.

The Council consists of the following members:—Professor Smith, M.D., of the Sydney University, President of the Council; The Hon. George Allen, M.L.C.; the Hon. the Speaker of the Legislative Assembly (Mr. W. M. Arnold); The Hon. Sir James Martin, Q.C., M.L.A.; and John Fairfax, Esq.

Last year the Council had in operation 846 schools, attended by about 60,000 pupils. The number of teachers, including pupil teachers, was 1,093. The reports which have been issued since the Act came into operation show how well the Public school system is appreciated. The applications for Public schools have been numerous, and the Council has had an arduous task in determining whether they should be granted or refused. During the past year there have been many applications for Provisional schools, but it is not likely that the applications for the establishment of Public schools will be so numerous as formerly; for, with a slowly-increasing population there must of course be a time when the public demand, speaking generally, will be fully met. The average attendance of children in the country districts has, no doubt, been very much reduced by the operation of the floods. The figures published by the Council of Education in its recent report will best show the rate of progress. In 1867 there were established 288 Public schools; in the following year the number increased to 318; and in 1869 to 336. During the same time the Provisional schools had increased from 31 to 146, the Half-time schools from 6 to 61; but the Denominational schools, which in 1867 were 317, fell to 289 in 1868, and last year the number still further decreased to 264. During the same period the number of scholars in the Public schools considerably increased. In 1867 there were in Public schools 20,986 scholars, and in Denominational schools there were 26,416; but in 1869 the pupils in the Public schools had increased to 26,208, and the number in the Denominational schools had decreased to 25,909. The total increase of scholars of all classes has been at the rate of upwards of 4,000 a year. According to the report of the Council, the Provisional schools are supported by all denominations, and tend to supply many destitute and thinly-settled localities with the means of elementary education. There are instances where they have grown into Public schools, and it was anticipated by the framers of the Act that such a result would be brought about with the expansion of the districts in which the schools were established. There can be no doubt about the popularity of Half-time schools, seeing that they are attended by more than a thousand scholars; and in one of the districts the Inspector speaks very favourably of their operations. About 65 per cent. of the children on the roll are continuously at school. The cost of education in 1869 is thus stated:—"The amount of fees paid during the year was, for all schools, £39,618. Of this sum, £22,815 was contributed to the Public, Provisional, and Half-time schools, and £16,803 to the Denominational schools. The local contributions towards the erection and maintenance of Public school buildings amounted to about £6,000. Adding the fees and local contributions to the amount expended by the Council, the total expenditure on all

classes of schools under the Council is seen to be £147,000, besides the amount (unknown to the Council) spent in maintaining Denominational school buildings. Omitting the cost of buildings, and taking 60,000 as the number of children brought under instruction during the year, the cost per head is found to be £2 2s. 6d.; of which £1 9s. 3¼d. is contributed by the State, and 13s. 2¼d. by the parents." There would appear to be a discrepancy between these figures as compared with the number of scholars and the fees paid; but there are many cases where the fees are remitted. It is reported that during the year 1869, "the number of free children educated in Public schools, Sydney, was 220, or nearly 2 per cent. of the total number of pupils on the roll." The number educated in Denominational schools was 1,388, or 9 per cent. of the total number on the roll. In a general summary of the operations of the year, it is stated that "no prominent feature is in a lower position than it occupied last year, and in many respects a marked improvement has been effected."

The Public schools are attended by children of all denominations. The teachers are of various religious creeds—so are the members of the local boards; so also are the members of the Council of Education.

Literary and Scientific Institutions.

UNIVERSITY MUSEUM OF ANTIQUITIES.—This interesting collection is open to visitors one day in the week.

THE FREE PUBLIC LIBRARY, supported by Government, was opened to the public on the 30th of September, 1869. The collection contains about 16,000 volumes, many being of great value as works of reference; and new books in the various branches of literature, of considerable value and interest, have recently been added, besides about 3,000 volumes of the Patent publications. The present building is occupied temporarily pending the erection of the new building. In addition to the Free Library there is a large library at the Mechanics' School of Arts in Pitt-street. Other quasi-public collections are, the Library of the University, that of St. Mary's, Lyndhurst, and the Anglican Clergy's Library, in Phillip-street.

THE ROYAL SOCIETY.—Much has been done for the advancement of general knowledge by the Royal Society. The history of this society was given in the annual address to its members in 1867*, from which a few interesting particulars may be borrowed:—"At first (in the year 1821) it commenced as the 'Philosophical Society of Australia,' a very lofty title for its dozen founders and members. It then (in 1850) after a long interval of silence and inactivity, came out as the 'Australian

* "Inaugural Address, by the Rev. W. B. Clarke, M.A., F.G.S. (Fellow of St. Paul's College, Sydney), Vice-President." Transactions of the year 1867.

Philosophical Society,' till in 1856, still contracting its territorial limits, it became represented by the Philosophical Society of New South Wales, merging itself in that which now represents it, on the 1st May, 1866." One member of the original society still survives to connect it with the present one. In 1825 a volume was published in London, containing Geographical Memoirs by various hands, which had been read before the first Society. Since then a volume of Transactions of the Philosophical Society of New South Wales, consisting of a selection of twenty-six papers, read between 1861 and 1866, was published in the latter year, and separate volumes of Transactions of the Royal Society, for the years 1867, 1868, and 1869, have since appeared, that for 1870 being in course of publication. The object of the Royal Society is slightly different from the former Societies, inasmuch as art and literature, as well as science and philosophy, especially such subjects as tend to develop the resources of Australia, and to illustrate its natural history and productions, take the place of art, science, commerce, and agriculture in Australia. The latter branch of study has now become the main object of the "Agricultural Society," to the advancement of which, in some degree, the present publication is devoted. The Royal Society has had to struggle with difficulties, among which is found the *res angusta domi*, that great hindrance to all voluntary efforts in a new country; but borrowing the words already referred to, of the address of 1870, it may well be said: "We do not know whether any previous session of this or of the previous Philosophical Society has ever exhibited a heartier desire to turn the channel of our thoughts more freely towards practical results; and thanks are due to those members of it who laid before us their able researches in the various branches of science and literature which they have cultivated, for such advancement of the claim which this society has to the respect and support of the community." The Royal Society now numbers 118 members, and has always had for its President Her Majesty's Representative in the Government of the Colony.

THE MECHANICS' SCHOOL OF ARTS is a highly popular institution, under a management similar to that of the Free Library. This library has been for many years under excellent management, and continues to flourish and to increase in the number of its members. The volumes circulated average about 40,000 per annum. The library for circulation consists of not fewer than 16,000 books, embracing standard works in every department of literature. The reading-room is spacious and comfortable, and contains the principal English, Scotch, Irish, Foreign, and Colonial newspapers; together with British, French, German, and American periodicals, and a large and valuable reference library. The following classes meet weekly, viz.:—School of Design, Latin, Mathematical, English Grammar, French, Drawing,

Short-hand, Architectural, Writing and Arithmetic, Singing. The members of the institution enrolled this year number 1,800. The subscription is only 5s. a quarter. This institution is managed by a committee, a secretary, and an assistant. There are above forty Schools of Art and Literary Institutes dispersed about the suburbs of the metropolis and in the various country towns. In many places Mutual Improvement Associations have also been established. In many of the country towns the building occupied as a School of Arts or Literary Institute forms a convenient meeting point for the various Friendly Societies, and occasionally a place for concerts and amateur dramatic entertainments.

THE AUSTRALIAN MUSEUM.—Among the institutions of the Colony dedicated to the advancement of natural history and the instruction of the public, may be mentioned the Australian Museum, situated on the eastern side of Hyde Park, formerly connected with the Botanical Gardens, but since incorporated under a Board of Trustees, consisting of elective and official members, with one representing the Crown. A new building has been added within the last few years to the older one, and the fine rooms of which the former consists are gradually becoming filled with valuable accumulations, illustrative of every department of natural history, and especially of Australian forms, and ably arranged by an accomplished Curator. Among the elective Trustees are found most of those persons to whom the Colony is indebted for researches in the varied fields of scientific inquiry. When the projected new buildings for the reception of the Free Public Library shall have been erected in continuation of the Museum, the whole mass will add much to the architectural ornamentation of the city.

Public Charities.

THE public charities of New South Wales are manifold. There are no poor laws, and there is no regular pauper class, such as is found in older and more thickly populated countries. But there is—as in every populous country there must always be—a good deal of destitution and sickness. It is scarcely necessary to say that intemperance is largely the cause of this distress and sickness. But benevolence has been gradually so systematized that there is scarcely a form of destitution unprovided for, and the whole community subscribes freely and largely to all kinds of charities. The amounts raised by private contributions are very liberally augmented from public funds, and some of the charitable institutions of the Colony are supported wholly by Government grants, whilst others are maintained partly by public money and partly by private subscriptions. There is, however, a class of charities which have no Government aid, and several institutions exist which cannot strictly be called charities, inasmuch as they are intended to be self-supporting, but which require more or less extensive aid for their support.

The amount of Government aid to the various charitable institutions of the country in 1869, was £109,968 18s. 10d. The official returns show receipts from voluntary contributions to the extent of £23,774 18s., but there are many subscription lists of which there are no official records. Besides the amounts expended in the support of various charities unaided by the State, and towards the maintenance of institutions which are partly self-supporting, there are frequently recurring demands upon the purses of the benevolent, in the shape of subscriptions for the relief of sufferers from floods, contributions to British relief funds, &c. The total amount per annum applied in this Colony to charitable purposes is probably about £150,000, exclusive of what is devoted to private and individual charities, and the relief funds of the Freemasons and other brotherhoods.

All hospitals, infirmaries, orphan schools, and charitable institutions which are, wholly or in part, supported by grants from the public revenue, are under the inspection of a Government official, styled the Inspector of Public Charities.

A notice recently appeared in the newspaper press, purporting to give an enumeration of the contributions of the Australian Colonies to the English Relief Funds, in which some of the principal contributions of this Colony were not mentioned. A return, ordered by the House of Commons on the motion of Mr. Torrens, received by a late mail, contains fuller and more accurate information upon this subject. The contributions of the Australian Colonies to the Patriotic Fund, for the relief of Widows and Orphans of Soldiers and Sailors who fell in the Crimean War, were:—

New South Wales	£64,916	6	6
Tasmania	28,375	5	7
Victoria	47,711	10	8
South Australia.....	6,297	0	0

The whole of the sum raised by New South Wales was collected by voluntary contributions, while the amount raised by voluntary contributions in Victoria was only £7,711 10s. 3d.,—the additional £40,000 being voted by the Victorian Legislature.

The contributions to the Indian Mutiny Fund were:—

Victoria	£25,000	0	0
New South Wales.....	5,821	0	6
South Australia.....	2,803	0	0

No mention is made of the contributions of New South Wales in the return, but it will be found, on reference to the *Herald* of the 26th January, 1859, that the above amount was raised in this Colony by public subscription.

The Australian contributions to the Cotton Famine Fund are stated in the return to have been—

New South Wales	£21,311	0	0
Victoria	5,000	0	0
Western Australia	603	11	5
Queensland (amount not named).			

The sum of £15,739 12s. 1d. is also set down to the credit of Australia, the amount being forwarded to the Lord Mayor's Relief Fund.

It is not certain that the sum of £92,048 represents the whole of the voluntary contributions from this Colony to the three funds named; but, admitting that it does, it will be seen that it is £54,337 more than the voluntary contributions of Victoria, the next largest contributor. It is £16,259 more than the voluntary contributions of Victoria, South Australia, Tasmania, and Western Australia put together, and it is a substantial proof of the loyalty and liberality of the people of New South Wales.

A sum of about £23,000 has been subscribed for the erection of a hospital to commemorate the Duke of Edinburgh's visit, and is now in the hands of trustees, awaiting its final disposition; but though various sites for a new hospital have been suggested and discussed, none has yet been decided upon.

GOVERNMENT ASYLUMS FOR THE AGED AND INFIRM POOR.—Four of these asylums are wholly supported by the State. They are managed by Boards, and orders for admission are readily obtainable. In Hyde Park Asylum (Sydney) there were on the 31st December, 1869, 197 females, and the cost of the establishment for the year was £2,731 10s. 3d. In the Parramatta Asylum there were on the same day 232 men, and its cost for the year was £2,736 0s. 10d. In the Liverpool Asylum there were on the same day 521 men, and its cost for the year was £5,393 12s. 6d. The Port Macquarie Asylum contained on the same day 88 men and 38 women, and its cost for the year was £1,579 7s. 3d.

LUNATIC AND INVALID ASYLUMS.—There are three of these: the Hospital for the Insane, at Gladesville; the Asylum for Free Lunatics and Invalids, at Parramatta; and the Asylum for Convict Lunatics and Invalids, at the same place. They are all large, well-organized, and admirably managed, institutions. The Parramatta asylums are devoted almost exclusively to the reception of persons who are considered incurable, and the Gladesville institution to curable patients. These are Government establishments, and most of the patients and invalids are supported free of cost, but the relatives of such patients as are able to contribute towards their maintenance are required to do so. The number of inmates of these establishments on the 31st December, 1869, was—at Gladesville, 429 males and 223 females; at the Parramatta Asylum for free Lunatics and Invalids, 229 males and 211 females; and at the Asylum for Convict Lunatics and Invalids, 53 males and 8 females. The total cost to the Government for 1869 of the three institutions was £39,730 13s. 1d., viz.:—£19,802 9s. 8d. for the establishment at Gladesville, and £19,928 3s. 5d. for those at Parramatta,

BENEVOLENT SOCIETY OF NEW SOUTH WALES.—This was the first charitable institution established in the Colony, having been founded so far back as the 5th June, 1818. It has a most extensive operation, giving relief to any distressed person recommended by a subscriber, or, in extreme cases, by any respectable person. It gives out-door relief during the year to from 4,000 to 6,000 cases (the number of cases relieved in 1869 being 5,740), besides from 100 to 150 accouchement cases; it also affords refuge to a number of persons during the year, and has been especially a boon to destitute children and distressed women with sick children. The number admitted in 1869 was 192 females (adults), and 255 children. There were 3 males and 50 females (adults), and 112 children in the establishment on the 31st December, 1869. 4 adult females and 30 children died there during the year. The amount of voluntary subscriptions in 1869 was £756 6s. 8d., and of Government aid £4,856 19s. 11d.

SYDNEY INFIRMARY AND DISPENSARY.—This is the most costly of all the public charities of the Colony, but its importance can scarcely be overrated. It is supported by voluntary contributions, but these contributions are very largely supplemented by State aid. The total receipts in 1869 were £20,304 8s. 2d., of which sum £4,080 1s. 1d. was raised by voluntary contributions, and £16,224 7s. 1d. obtained from the Government. The total amount disbursed during the same period was £14,750 5s. 1d. The hospital was built many years ago, in the days of Governor Macquarie. The wards are large and airy. It has been added to in various ways, and has now every convenience necessary to such an establishment. It has a large working staff, comprising the honorary consulting physicians and surgeons, district medical officers, a manager, two resident medical officers, two dispensers, and fourteen other officials and attendants. The practical superintendence of the institution is entrusted to a lady superintendent and a staff of nurses trained on Miss Nightingale's system. There are, besides the lady superintendent, five sisters—four English and one home-trained—three probation sisters, and thirteen probationers, besides a housekeeper, six nurses, and twelve female servants. Excellent quarters have been provided, at the public cost, for the sisterhood and female attendants, costing over £7,000, and containing no fewer than 40 rooms. The number of persons in this establishment on the 31st December, 1868, was 123 males and 61 females; total, 184. Admitted in 1869, 1,110 males and 518 females; total, 1,628. Discharged, 977 males and 487 females; total, 1,464. Died, 140 males and 49 females; total, 189. Remaining on the establishment on the 31st December, 1869, 116 males and 43 females; total, 159. Out-door medical and surgical relief given during the same period to 5,439 persons.

ST. VINCENT'S HOSPITAL.—An institution for both in-door and out-door patients, managed by the Sisters of Charity, but open to persons of all religions. The present hospital has been in existence since 1857. The number of in-patients accommodated at one time has been twenty-two; the average number yearly has been about 200; the average number of out-patients has been about 400 yearly. The amount of the annual expenditure has averaged £600, and the fund to meet this has been obtained from subscriptions, donations, and other sources. The increased amount of applications for the admission of patients, which it was impossible to accede to on account of the very limited accommodation in the present building, rendered it necessary to take measures for the erection of a new hospital, now almost complete. The new building, of which but one-half, as originally planned, is now erected, stands in a very healthy situation, overlooking the harbour of Port Jackson, and has been erected on about 3 acres of land. About an acre of this was a Government grant; the remainder has been purchased. The hospital has all the modern requirements which are used in buildings adapted for the use of in-patients. Very particular care has been taken of the ventilation; and gas and water have been laid on through the building wheresoever required. There are two large wards, which will accommodate eighty patients, each of whom will have about 800 cubic feet of air. In addition there are several separate rooms for private patients able to pay for separate accommodation. There is a large operating theatre, a dispensary-room, and the out-offices are all that is required. The cost of the building, when in working order, will be about £9,000,—£1,000 of which has been received from Government; the remainder derived from donations and other charitable sources.

BENEVOLENT INSTITUTIONS AND HOSPITALS IN THE INTERIOR.—There are institutions of this kind at Parramatta, Windsor, Goulburn, Yass, Bathurst, Mudgee, Newcastle, Maitland, Tamworth, Armidale, Albury, Sofala, Gundagai, Wagga Wagga, Murrurundi, Carcoar, Braidwood, Port Stephens, Wellington, Deniliquin, Forbes, Muswellbrook, Grafton, Tenterfield, Young, Wollongong, Warrebri, Queanbeyan, Warialda, Tambaroora, Bourke, Cooma, and Grenfell. These are supported partly by private subscriptions, and partly by aid from the Government. Their total income from the former source during the year 1869 was £7,752 2s. 6d., and from the latter £9,134 14s. 9d. The total disbursements of all these institutions during the same period was £15,678 12s. 8d. There are also institutions at Penrith, Scone, and Singleton, which are classified in official returns as Benevolent Asylums, although one of them at Penrith is stated to be a hospital also, some of the country hospitals being

represented to be asylums as well as hospitals. The income of the Penrith institution in 1869 was £150 19s. 3d. from voluntary contributions, and £70 6s. from Government—total, £221 5s. 3d.; and its total disbursements during the same period, £214 2s. 2d. Scone, voluntary contributions, £63 14s. 6d., Government aid, £135 3s. 4d.,—total, £198 17s. 10d.; disbursements, £61 8s. 5d. Singleton, voluntary contributions, £500 4s. 9d., Government aid, £507 0s. 9d.,—total, £1,007 5s. 6d.; disbursements, £732 12s. 2d.

PROTESTANT ORPHAN SCHOOL, PARRAMATTA.—An institution for the orphan children of Protestant parents of all denominations, and wholly supported by Government. Number of children in the establishment on the 31st December, 1869, 161 boys, 185 girls; total, 346. Cost of the establishment in 1869, £2,781 14s. 10d. This is an admirably managed institution. The children are admitted on Government orders, obtainable on the recommendation of any clergyman or person of known respectability. They are well educated, and when old enough are apprenticed.

ROMAN CATHOLIC ORPHAN SCHOOL, PARRAMATTA.—An institution of the same kind as that last mentioned, but for children of Roman Catholic parents only. It is well managed by the Sisters of The Good Shepherd, and is wholly supported by Government. Number of children on the establishment on the 31st December, 1869, 160 boys and 170 girls—total, 330; cost for the year, £3,470 7s. 9d.

DESTITUTE CHILDREN'S ASYLUM AT RANDWICK.—This, perhaps the most useful of all our public charities, was founded in 1852. It receives and educates destitute and abandoned children, namely:—“(1.) Children found by the police or others without protection, whose parents cannot be discovered, or whose parents have been convicted as vagrants, drunkards, or disorderly characters, unfit to have the care of their children. (2.) Children abandoned by their parents, and left without friends or protection. (3.) Children, either of whose parents is an abandoned or dissolute character, and who may be placed by the other parent in the Asylum, on payment of a fixed sum for their maintenance. To these children this institution affords “a sound and useful education, and trains them in available habits of industry, until they reach an age when they may be disposed of in the manner which may be most conducive to their individual interest and the general good of society.” This description is taken from the original prospectus, which expresses very clearly the objects of the founders, which have been very fully and efficiently carried out. The institution has been so well supported by bequests, voluntary contributions, and Government aids, that although comparatively young it has attained magnificent proportions. The buildings are large and handsome, situated in one of the finest sites near Sydney. A

hospital has been recently added, which is called the Catherine Hayes Hospital, in honor of the lady whose munificent donation, amounting with interest to £1,300, first enabled the managers of the institution to contemplate this addition to its usefulness. The building is in the Romanesque style, and has cost £6,000, besides £250 more for furniture. The number of the children in the asylum on the 31st December, 1868, was,—boys, 364; girls, 320; total, 684,—exclusive of 17 apprentices. There have been received during the year 1869, 142 boys, 121 girls; total, 263. There were discharged during the same period, 100 boys and 84 girls, of whom 60 boys and 47 girls were apprenticed. There remained in the asylum on the 31st December, 1869, 406 boys and 360 girls; total, 766,—exclusive of 25 apprentices employed in the institution. The daily average of the year 1869 was 735, including the 25 apprentices. There were but three deaths during this period. The total amount of subscriptions and donations in aid of this institution in 1869 was £3,827 11s. 6d., and of Government aid, £7,090 0s. 9d. Of the latter sum, however, £3,890 0s. 9d. was for the maintenance of children from the Benevolent Asylum. The total receipts for the year were £11,717 12s. 3d., and the total disbursements during the same period, £11,486 10s. 1d. The Society for the Relief of Destitute Children is incorporated. Its affairs are managed by a directory, and there is a house committee consisting of twelve of the directors.

GOVERNMENT INDUSTRIAL AND REFORMATORY SCHOOLS.—There are three of these,—an Industrial School for Girls and a Reformatory School for Girls, both at Newcastle, and the Nautical School-ship "Vernon," in Sydney harbour. These institutions provide a home and education for all children under sixteen who, although they have not come under the grasp of the law, are being trained up as thieves and prostitutes, by constant association with adults of those classes. They do the same for juvenile offenders. Any boy or girl who is brought before any Court of Justice, and sentenced to any period of confinement not less than fourteen days, can be sent to a Reformatory School instead of to prison. Children found wandering without visible means of support can also be sent to these schools, where they are educated and taught to earn an honest livelihood. These institutions are supported by the Government, but parents who have children in such institutions and are able to contribute towards their support are expected to do so. The number of boys on board the "Vernon" on the 31st December, 1869, was 135; and the cost of the institution during the year was £4,291 12s. 2d. The number of girls in the Industrial School at Newcastle at the same date was 105, and the cost of the school during the year, £6,568 8s. 7d.

SYDNEY FEMALE SCHOOL OF INDUSTRY.—This is a Church of England institution for the maintenance and training of the female children of poor parents. It is supported by voluntary subscription, and by the proceeds of an annual ball. Its receipts for 1869 were £860 Os. 11d., and its expenditure £700 16s. 2d. There were forty-eight children in the institution on the 31st December, 1869. It is managed by a ladies' committee.

DEAF, DUMB, AND BLIND INSTITUTION.—The nature of this institution is sufficiently explained by its title. Premises are rented for its use at Paddington, but it is proposed shortly to erect a suitable building; £1,233 has been subscribed for this purpose, which lies in a bank at interest. A Government grant of £2,000 has been promised, also a suitable piece of land near Newtown, for a site. It is proposed to erect such a building as the means at the disposal of the directory will allow, without incurring any debt. Number of children in the institution,—forty-seven blind, and thirty-three deaf and dumb. Income of 1869 from Government, £450; from voluntary contributions, £728 14s. 3d.; total, £1,178 14s. 3d. Expenditure for the year, £1,029 Os. 5d.

RAGGED AND INDUSTRIAL SCHOOLS.—There are three of these in Sydney, wholly supported by voluntary contributions, containing about 420 children, with an average daily attendance of about 200. The subscriptions amount to about £600.

THE SYDNEY NIGHT REFUGE AND REFORMATORY.—This Institution situated in Francis-street, off Hyde Park, affords temporary relief to male persons who are out of employment and have no fixed places of abode. It is supported by voluntary contributions. The number of nights' lodgings from June, 1869, to the corresponding month of 1870 was 7,644. The number of breakfasts, 6,552.

CITY NIGHT REFUGE AND SOUP KITCHEN.—An admirable charity, supported wholly by voluntary contributions. Tickets are distributed by the subscribers. Sleeping accommodation is provided, and the occupants receive blankets. Three meals a day are served out, and dinner is given by ticket. During the year 1869 upwards of 70,000 meals were given, averaging from 180 to 200 per day, and upwards of 14,000 separate nights' shelter afforded. A free registry-office is connected with this charity. About 300 engagements were made during the year 1869, and employment has been obtained for some persons who could not otherwise get situations. The income for the year 1869 was £404 1s., and the expenditure £326.

SUNDAY MORNING BREAKFASTS.—From 100 to 120 persons of the poorest class receive substantial breakfasts every Sunday morning at the Temperance Hall. The cost is defrayed by voluntary contributions.

SYDNEY FEMALE REFUGE.—A Protestant institution for the reception and reformation of unfortunate women, and managed by a ladies' committee.

HOUSE OF THE GOOD SHEPHERD.—This is a similar institution, open to females of any religion, but managed by the Sisters of "The Good Shepherd," under the inspection of the Roman Catholic priesthood. The Sisters visit and relieve distressed persons outdoors. The expenditure for the year was £1,397 10s. 1d., towards which £832 9s. 1d. was contributed by subscriptions, the remainder being raised by proceeds of work, &c.

HOME VISITING AND RELIEF SOCIETY.—For the relief of educated persons of both sexes by gifts or loans, &c., so as to enable them to earn a livelihood. About 100 persons thus relieved during the year. Subscriptions, about £400 per annum.

SYDNEY HEBREW PHILANTHROPIC INSTITUTION.—For the relief of distressed Jews, by loans or pensions. About £4 10s. a week is distributed. It is supported wholly by voluntary contributions from persons of the Hebrew faith, and managed by a committee.

SYDNEY DORCAS AND STRANGERS' FRIEND SOCIETY.—For the relief of poor married women, without distinction of country or creed, during their accouchement, and for the temporary relief of friendless persons. Wholly supported by voluntary contributions. About twenty or thirty Dorcas cases in the year, and about the same number of poor families relieved. Subscriptions, from £80 to £100 a year. Managed by a committee of ladies.

HEBREW LADIES' DORCAS SOCIETY AND BENEVOLENT INSTITUTION.—Similar to the last-named institution, but confined in its operation as a Dorcas society to poor married Jewesses, but grants assistance under any circumstances, when necessary. Subscriptions, between £80 and £100 per annum.

OTHER INSTITUTIONS.—There are several institutions which, although intended to be self-supporting, require and receive external aid. The principal of these is the Sailors' Home—a very comfortable and cheap abode for seamen. It is a large and handsome building, near the Circular Quay, and affords the means of safe deposit for their money and chests, when absent. The Home in Elizabeth-street, Sydney, is a home for respectable single females of every class when out of employment, but chiefly for nursery governesses and domestic servants. It serves also as a registry-office for procuring them employment, and is open to females of any religion. The Female Home and Registry Office, Darlinghurst Road, is an institution of the same character as that last mentioned, but established under Roman Catholic auspices, and conducted under the inspection of the Sisters of Charity. The Protestant Training School for Young Girls as Domestic Servants at East View House, Darlinghurst, has commenced operations, and the girls number fifteen.

The Volunteer Force.

THE first Volunteer Corps was formed in 1854, shortly after the receipt of the news of the outbreak of the Crimean War; but, although, a considerable number of persons responded to the invitation of the Government to enrol themselves, only partial success attended the effort. Very little was done on this occasion to make the Force attractive. Government aid was limited to the issuing of arms and accoutrements of the inferior pattern of the period, the cost of uniform and other expenses being borne by the members themselves. No organization whatever was attempted, and the drilling and instruction of the Force depended mainly on the efforts of a few intelligent non-commissioned officers. In these circumstances it is not strange that the Force began to dwindle away almost as soon as it was formed. In 1855 the attention of the Legislature was directed to the subject, and in June of that year, on the motion of Mr. (now Sir James) Martin, a Select Committee was appointed to inquire into the working of the Volunteer Act of 1854. This Committee recommended that a building should be provided in a convenient locality for the deposit of arms—that a sufficient number of non-commissioned officers should be appointed—that the Force should be properly organized under one head—and that uniforms should be provided for the Volunteers at the public expense.

The people, however, still regarded the Volunteer movement with great coldness, and the comparatively few enthusiasts who clung to it failed to make any other impression than that they were guilty of the small vanity of "playing at soldiers." It was not till 1860 that the importance of the question forced itself into prominence. About that time a great and successful effort in the same direction had been made in England, and it is doubtless to this fact that the Volunteer Force of this Colony owes its present numerical strength.

Following the example of the Mother-country, a number of the most influential gentlemen in Sydney determined to establish a Rifle Association "with the view of giving permanency and efficiency to the Volunteer Corps, by creating a spirit of emulation amongst the different companies," and accordingly a well attended meeting was held at the Chamber of Commerce on the 5th October, 1860. This Association was founded upon the English model, and has been successful from the outset. The late Sir William Denison (then Governor), and subsequently his successor, Sir John Young, accepted the office of Patron, and both accorded their warmest sympathy and support to the movement. The Committee included the names of the leading men of Sydney; and the public, who were appealed to for funds, responded in the most liberal manner. 250 members at once joined the Association, and over £800 was

contributed in a very short time. The Parliament was equally liberal. At the instance of Mr. Cowper (then Colonial Secretary), a grant of £500, equal to the amount subscribed, was obtained, and the Government cheerfully set apart an excellent site for a rifle range, supplying also the necessary funds for making it immediately available.

The first Prize Meeting, at which no less than 500 Volunteers competed for prizes, was held at Randwick in September, 1861. Since then the practice of the rifle has been pursued with unabated zeal, and our riflemen have attained a degree of excellence, as shots, which is not surpassed in any part of the World. In numerous intercolonial contests they have been almost invariably successful, both with the Government weapon and the small-bore. In the small-bore contest with Victoria for a challenge-shield (value £300) New South Wales won five times out of six, the contest having been conducted annually, "home-and-home," on condition that three matches should be won in succession to secure the prize. The shield is now on its way to us from England. Even in the simultaneous matches of the United Kingdom, in which all the famous Wimbledon cracks competed, our men won the best prizes.

Notwithstanding these encouraging circumstances, there remained however some difficulties to overcome. The high excellence in shooting was perhaps attained at the expense of more important duties in the field. There was a want of regularity in attendance at drill, and of continuity of service, which tended to prevent the Force from progressing in public estimation in regard to discipline and effectiveness, and it had become evident for some time that to remedy this further legislation was necessary.

Accordingly in the year 1866 an Act to regulate the Volunteer Force was assented to. This law, which was passed at the instance of Mr. Parkes (then Colonial Secretary), is still in operation. It is based on the English Act in regard to organization, discipline, and internal management, and it entitles every Volunteer who shall have served efficiently for a period of five years to a free grant of 50 acres of land from the Government. This honorarium has given a great impetus to the service, and the present experienced Commandant has been enabled by means of the more stringent provisions of the Act to enforce a more rigid discipline.

The Volunteer Artillery, considering the nature of the contemplated system of Defence for the Port and City, is certainly not second in importance. There are already 7 Batteries, numbering over 500 efficient, and they have attained a very creditable degree of proficiency, both in organization and gunnery.

The Rifles receive 30s. and the Artillery £2 per annum capita- tion allowance for "efficient." These allowances are for the purpose of providing uniforms.

Cadet Corps have recently been established in several of the schools of the Colony, with the most satisfactory results; Lieut.-Colonel Richardson, the Commandant of the local Forces, has very judiciously given the greatest possible encouragement to these promising Corps; and the steadiness and smartness of the youths on parade indicate that great care is bestowed on their drill and training.

The Naval Brigade has a special organization, being a happy compromise between the Militia and Volunteer systems. It was established in May, 1863, and it has all along been a very favourite Corps. The gunners receive retaining pay at the rate of £1 per month, and the officers proportionally higher rates, according to rank. The principle of its constitution has proved highly successful, as it has been the means of inducing a class of men to join, who from their avocations on the water and alongshore are the best suited for a semi-marine service. It is manifest that there is no difficulty in obtaining any accession of numerical strength, and this fact is conclusive proof that there is no need in this country to resort to any compulsory measure to ensure an adequate auxiliary Defence Force. There are many who think that the whole Volunteer Force might with considerable advantage be organized upon the same principle as the Naval Brigade, as, while the small pay is in itself an attraction, the authorities are at the same time assured of a measure of administrative control which should never be absent in an armed organization. The Government has been fortunate in securing the services of an experienced officer to organize and command this Force, and the proficiency and smart appearance of the men have been the subject of general approval.

The strength of the Volunteer Force of all arms is as follows:—

ARTILLERY—Seven Batteries	535
RIFLES—1st Sydney Battalion—Six Companies	589
Suburban Battalion—Seven Companies.....	629
Country Corps—Fifteen Companies... ..	1,221
Cadet Corps—Four Companies	191
Brigade Band	35
Permanent Staff	24
Honorary Staff	7
NAVAL BRIGADE	235

Total..... 3,466

The total amount voted for the Volunteer Force and Naval Brigade in 1870 is £11,966.

Administration of the Land.

THE last Constitution Act conferred on New South Wales, which came into operation in 1856, gave full power to the Government of the Colony to alienate and administer the public lands. This caused great satisfaction, for it was generally considered that the lands were by no means fairly portioned. A small population thus came into possession of a vast and rich estate, and there was a conflict to determine who should be its administrators. Numerous schemes were proposed to secure the most satisfactory results. In the exercise of its new powers the Legislature passed two Bills, which were assented to on the 18th October, 1861, and which are still in force, and known respectively as the Act to regulate the Alienation of Crown Lands, and the Act for regulating the Occupation of Crown Lands. By the 2nd section of the former Act, the Orders in Council under which the sale and occupation of Crown lands were formerly administered by the Crown were repealed, with certain reservations respecting rights which had accrued in regard to some existing leases.

This Act provides for the granting of Crown lands for public purposes,—for the setting apart of sites for towns and villages,—for the special sale of land to occupiers who have made improvements,—and for a variety of other things of a like nature. The clauses of most universal interest are those which contain provisions for the settlement of population upon the land. The most important of these is the 13th:—“On and from the 1st day of January, 1862, Crown lands other than town lands or suburban lands, and not being within a proclaimed gold-field, nor under lease for mining purposes to any person other than the applicant for purchase, and not being within areas bounded by lines bearing north, east, south, and west, and distant 10 miles from the outside boundary of any city or town containing according to the then last census 10,000 inhabitants, or 5 miles to the outside boundary of any town containing according to the then last census 5,000 inhabitants, or 3 miles from the outside boundary of any town containing according to the then last census 1,000 inhabitants, or 2 miles from the outside boundary of any town or village containing according to the then last census 100 inhabitants, and not reserved for the site of any town or village, or for the supply of water, or from sale for any public purpose, and not containing improvements, and not excepted from sale under section seven of this Act, shall be open for conditional sale by selection in the manner following, that is to say: Any person may, upon any land-office-day, tender to the land agent for the district a written application for the conditional purchase of any such lands not less

than 40 acres nor more than 820 acres, at the price of 20s. per acre, and may pay to such land agent a deposit of 25 per centum of the purchase money thereof; and if no other like application and deposit for the same land be tendered at the same time, such person shall be declared the conditional purchaser thereof, at the price aforesaid: Provided that if more than one such application and deposit for the same land, or any part thereof, shall be tendered at the same time to such land agent, he shall, unless all such applications but one be immediately withdrawn, forthwith proceed to determine by lot, in such manner as may be prescribed by regulations made under this Act, which of the applicants shall become the purchaser."

Crown lands within proclaimed gold-fields, and not within areas excluded by special proclamation, and not occupied for gold-mining purposes, must be selected subject to the foregoing provisions; but if subsequently it be found that the land contains auriferous deposits, the sale may be annulled, in which case the purchaser will be entitled to compensation. At the expiration of three years from the date of any conditional purchase, or within three months thereafter, the balance of the purchase money may be tendered, with a declaration that the law has been satisfied in respect of *bond fide* residence and improvement, and the grant of the fee simple obtained. The following is the clause of the Act:—"At the expiration of three years from the date of conditional purchase of any such land as aforesaid, or within three months thereafter, the balance of the purchase money shall be tendered at the office of the Colonial Treasurer, together with a declaration by the conditional purchaser, or his alienee, or some other person in the opinion of the Minister competent in that behalf under the Act ninth Victoria number nine, to the effect that improvements as hereinbefore defined have been made upon such land, specifying the nature, extent, and value of such improvements, and that such land has been from the date of occupation the *bond fide* residence, either continuously of the original purchaser, or of some alienee or successive alienees of his whole estate and interest therein, and that no such alienation has been by any holder thereof until after the *bond fide* residence thereon of such holder for one whole year at the least. And upon the Minister being satisfied by such declaration, and the certificate of the land agent for the district, or other proper officer, of the facts aforesaid, the Colonial Treasurer shall receive and acknowledge the remaining purchase money, and a grant of the fee simple, but with reservation of any minerals which the land may contain, shall be made to the then rightful owner: Provided that should such lands have been occupied and improved as aforesaid, and should interest at the rate of 5 per centum per

annum on the balance of the purchase money be paid within the said three months to the Colonial Treasurer, the payment of such balance may be deferred to a period within three months after the 1st day of January then next ensuing, and may be so deferred from year to year by payment of such interest during the first quarter of each year. But on default of a compliance with the requirements of this section the land shall revert to Her Majesty, and be liable to be sold at auction, and the deposit shall be forfeited."

Crown lands, alienated without conditions for residence and improvement, are sold by auction, and the following are the upset prices:—Town lands, £8; suburban lands, £2; other land, £1. This is the general plan, but there is a proviso that the upset price may be fixed at any higher amount. 25 per cent. is paid at the fall of the hammer, and the remainder in three months.

The object of the system of "conditional purchase" and deferred payments without interest for three years is to settle people on the land. The effect of its working has no doubt given a large amount of satisfaction, not however unmixed with expressions of disapproval and disappointment. The acquisition of land has been greatly facilitated compared with the system which formerly prevailed, and this is regarded as an advantage of no small importance. Many conditional purchasers have taken up farms of a quality unsurpassed in any part of the world; and those who have had the means and the necessary experience, combined with industry and sobriety, have no doubt, as a rule, established themselves on the soil under very favourable conditions. According to the Crown Lands Alienation Act, Crown lands may be conditionally selected for the purpose of mining, other than gold-mining, on payment of £2 per acre; and on a declaration that £2 per acre had been expended in mining operations other than gold-mining on the land, and further, upon payment of the balance of the purchase money, a grant in fee simple is made without any reservation of minerals other than gold, and this payment may be made although the period of five years required in other cases may not have expired. Auriferous lands are dealt with under an Act which was assented to on the 27th September, 1866, to amend the laws relating to the gold-fields. By this Act the Governor, with the advice of the Executive Council, may, "subject to, and in accordance with, the laws for the time being respecting Crown lands of the Colony, and the provisions of this Act and regulations under it, grant leases for mining of portions of auriferous lands, and fix the amount to be paid by way of rent, whether as a royalty or otherwise." For the right to mine for gold the miner pays 10s. per annum. The gold-fields are a source

of great wealth to the Colony of New South Wales, although the amount appears small when compared with the large sums annually derived from pastoral pursuits. By the Act which regulates the occupation of Crown lands by persons who become lessees under the Government, "Crown lands" are divided into three classes:—The "first-class settled districts" comprise lands declared to be of the "settled class" under the Orders in Council. The "second-class settled districts" comprise lands converted into the "settled class" by a previous Act. All other Crown lands form part of the "unsettled districts." In the first of these classes leases are granted for pastoral purposes for one year—in the settled or unsettled districts for five years; and, for mineral purposes other than gold-mining, fourteen years. The portions leased are of various sizes. There are not many runs, or pastoral leases, less than 10,000 acres; some of them are over 100,000 acres, and many runs are sometimes held by the same lessee. Districts are proclaimed for the formation of "runs." The Act contains the following provision in regard to their area and capabilities:—"Runs shall, in ordinary cases, consist of not more than 25 square miles; but should that area, in the opinion of the proper officer of the Government, be insufficient in average seasons for the pasturage of 4,000 sheep, or 800 head of cattle, a run may be enlarged to whatever area, not exceeding 100 square miles, may be necessary for that purpose." The rent paid for these squattages varies from a fraction of a penny to a penny and a fraction per acre. A short time ago there were between 13,000 and 14,000 leases, the estimated area of which was nearly 209,000 square miles, and the rent and assessment from which amounted to £260,500. The area brought under lease has gradually increased from year to year. The exports of the Colony give some idea of the wealth-producing power of these leased lands, and of their value as a source of revenue.

Those who read this account of the ease with which land can be obtained in New South Wales for all purposes, will naturally compare the state of facts with that which exists in the country they inhabit. It is therefore unnecessary to point out in what respect the Land Acts of the Colony agree with, and in what they differ from, the laws with which various classes of readers are familiar. New South Wales, with her enormous area of land, has room for unlimited capital and enterprise to promote the development of her boundless resources—resources which, be it remembered, are derived or derivable from the most varied catalogue of vegetable and mineral products of any country in the World; and whose exportation is, and will in all probability continue to be, independent of the fluctuations and disasters to which the industries of the old World have ever been subject,

Agricultural and Pastoral Interests.

THE New South Wales of Governor Phillip has been largely shorn of its original proportions—first, by the formation of the Colony of South Australia in 1836; again, by the separation of the district of Port Phillip, under the name of Victoria, in 1851; and lastly, by the separation of the Moreton Bay district, which with all its northern territory was erected into the Colony of Queensland in 1859. In 1835 the population of New South Wales was 71,592, the number of acres under crop, 79,256; the amount of wool in pounds 3,893,927, valued at £299,587; of tallow, 500 cwt. The revenue amounted to £274,591, and the expenditure to £171,044. When Victoria became an independent Colony she carried off 67,845 from the accumulated population of 265,503, and reduced the proportion of New South Wales to 197,658. The area of land under cultivation was reduced from 198,056 to 153,117 acres, the horses were reduced from 132,397 to 126,397, the horned cattle from 1,738,257 to 1,375,257, the sheep from 13,059,324 to 7,396,895, the pigs from 68,631 to 65,510, the wool crop from 32,361,829 lbs. to 15,269,317 lbs. In the year 1861 a considerable increase is observed in the population: notwithstanding the separation of Queensland, it stood at 358,278. There were 297,575 acres of land under crop; the horses had doubled on the return of 1851, the horned stock had increased to 2,271,923, the sheep to 5,615,054, and the wool to nearly 13,000,000 of pounds weight. The same year there were 260,798 acres under culture, which yielded 1,581,597 bushels of wheat, 1,484,467 bushels of Indian corn, 89,801 of barley, 98,814 of oats, 28,127 tons of potatoes, 9,704 cwt. of tobacco, 50,927 tons of hay, 99,791 gallons of wine, besides other produce. The value of the fruit exported, chiefly oranges, was £61,466. At the present time the domain of New South Wales comprises an area of 323,437 square miles,—that is to say, an area equal to that of the United Kingdom and France together. The most recent statistics, compiled for the year ending March, 1870, are highly satisfactory, and significant of a diversion of capital from some branches of labour to others. The number of acres under wheat is 189,452 for grain, and 11,418 for hay; the number under hay, 129,700. Of barley there are 9,151 for grain, 2,208 for green fodder, and 1,251 for hay. Oats for hay, green fodder, and grain, occupies 67,000 acres of land; potatoes occupy 17,132; tobacco, 366; arrow-root, 31; sorghum or imphee, 296; sugar-cane, 8,917; artificial grasses sown for food and hay, 26,309; vines, 3,906; gardens and orchards, 14,516 acres. The horses number 280,304, the horned cattle 1,795,904, the sheep 14,989,923, and the pigs 175,924. These figures, taking into consideration the recent disastrous losses caused by floods of almost unexampled severity, give evidence of the variety and vitality of our productive powers.

OCCUPATION OF LAND.

In 1860, 15,715 persons occupied more than 3,500,000 acres. The number of occupants of land in 1870 (exclusive of occupiers for pastoral purposes) was 27,720; the total extent of holdings was 7,857,469 acres; the extent of land in cultivation was 482,324 acres; the extent of land enclosed but not in cultivation was 3,693,213 acres; and the extent of the land unenclosed was 3,681,931 acres.

AGRICULTURE.

Large tracts of agricultural land are found in almost every district of the Colony. The principal wheat-growing districts are Bathurst, Goulburn, Yass, Orange, Tamworth, New England, Albury, &c. Vast quantities of maize are grown on nearly all the eastern rivers. Sugar is fast spreading from the Manning River to the Richmond River. The fine alluvial valley of the Hunter is devoted to the production of lucerne hay, wheat, barley, and oats. Wine is grown in nearly every district.

CEREAL CROPS.

The cereals of Europe, and maize, have been extensively cultivated in New South Wales,—not because they were the best adapted to the climate, but because the settlers were more familiar with them than with semi-tropical products. Wheat was grown as a necessity when the Colony was first settled; but latterly the farmer has turned his attention to more profitable crops. The same observation holds good of maize, to which the land and climate are admirably adapted. Despite the prolific character of the crop, the profit is small. It is also a fact, in relation to wheat and maize, that, owing to the mode in which they are cultivated, the growers become every year less capable of withstanding foreign competition. The land being cropped year after year, and neither manured nor properly cultivated, its yield naturally diminishes. The remedy of course would be the introduction of better husbandry where the wheat crop is felt to be a safe one, as in the Orange and Bathurst Districts. Still, although the yield per acre is falling off, the acreage continues slowly to increase, but the wheat crop is changing its location, and eventually will be settled on the tablelands. The railways which penetrate fine wheat lands in the west and south will be the means of effecting and establishing this change. The wheat crops occupied 115,928 acres in the year 1860, yielding 1,605,353 bushels, or 13½ bushels per acre. In 1869 there were 189,452 acres of wheat, which yielded 3,200,959 bushels, or 16½ bushels per acre. The price in February, 1871, was about 5s. per bushel. Maize is grown for grain and also for green fodder. In 1860 there were 49,506 acres under maize, the yield being 1,602,630 bushels; in 1870 there were 129,713

acres, yielding 3,880,805 bushels. Barley and oats are chiefly cultivated for hay; the acre produces, of the former from 12 to 14 bushels, of the latter from 12 to 13 bushels. Potatoes were produced to the amount of 54,199 tons in 1869, the average yield per acre being nearly 2 tons. In some districts the hay crop is very valuable. Wheat, barley, oats, are all grown for hay, but lucerne is generally preferred, and on the rich, alluvial, and well-watered lands, near the rivers, so great are the returns that the settlers are said to be able to bear the loss by flood of every third crop. They frequently crop the land five or six times during the year, and gather from one to two tons per acre each time. The labour of cultivation is slight, and the price obtained generally high,—from £5 to £6 per ton being no uncommon figure in the neighbourhood of a good market. Some attention has been given to tobacco, which grows well, but cannot, of course, in the present condition of the labour-market be expected to compete with American.

ORCHARDS.

Many settlers have turned their attention to fruit-growing. Orchards are plentiful, and successful attempts have been made to produce apples and pears on the lowlands, and gooseberries and other hardy European fruits on the uplands. There is a great demand for apples and pears, which, until lately, were exclusively supplied from Tasmania. Peaches, nectarines, apricots, loquats, and almost all the semi-tropical fruits flourish admirably in the open air, and are cheap when in season. These gardens and orchards are mostly found in the counties of Cumberland, Camden, and Durham, and comprise about 15,000 acres.

A considerable portion of this land is devoted to orange culture, particularly in Cumberland, where a fine market and an accommodating railway are to be found. Thousands of cases come down to Sydney annually from the Parramatta orangeries, and are shipped to Melbourne, South Australia, Tasmania, New Zealand, &c. The profits of orange-growing are, when the practical management of the tree is understood, very considerable; but in many cases the trees have been exhausted by being allowed to bear heavily, year after year, without any attempt being made to recruit their jaded powers by the administration of manure. Most of the orangeries are new; but in some of the older ones the trees have attained a height of 35 feet, the diameter, from the extremities of the branches, being 33 feet. From trees of this size, 12,000 oranges are occasionally picked in the year, which, at 6d. per dozen wholesale, would give £25 as the value of the yield of the single tree. The plantations are generally young, and the trade in oranges and lemons is likely to assume large proportions.

VINEYARDS.

The cultivation of the vine has assumed a most important character. The reputation of New South Wales for wine of great excellence is now established, by the awards at Paris and London, in 1851, 1856, 1862, and 1867. In 1860 the vine occupied 1,583 acres—622 acres being devoted to wine. The produce was 99,791 gallons of wine and 709 gallons of brandy, or at the rate of 160 gallons per acre. Since that time the acreage has been annually extending, as will be seen by the following figures:—

Year ending 31st March.	Acres.	Gallons Wine.	Gallons Brandy.
1865	1,849	161,298	3,077
1866	2,126	168,123	1,439
1867	2,281	242,183	3,176
1868	2,531	285,283	3,856
1869	3,115	412,283	1,888
1870	3,906½	460,321	1,687

Besides this, about 1,000 tons of table-fruit have been produced. There is an enormous extent of land suitable for wine-growing, and the occupation of a vigneron is growing gradually more and more attractive. Large numbers of Germans are already settled on productive vineyards (generally their own property) throughout the counties of Cumberland, Northumberland, and Camden, and a considerable amount of capital is being invested in this thriving young industry in many parts of the Colony. It was at one time supposed that our wines would not keep well, but this question has now been satisfactorily settled. Those who have tasted the early vintages of Dalwood, Camden Park, Maryland, Albury, and many other vineyards, will hardly deny to those wines the quality of being well kept. As soon as the acreage has increased, and the price of the better wines been sufficiently reduced to bring them within the reach of the middle and labouring classes, the demand will be much augmented.

THE OLIVE.

Although little or nothing has been yet done with the olive, save by way of experiment, yet in the course of a few years this tree will doubtless be freely cultivated, and olive oil in time appear amongst the exports of New South Wales.

THE SUGAR-CANE.

The cultivation of the sugar-cane has had to overcome much indifference and even prejudice, and it was not until 1867 that a marked change in public opinion began to be manifested. Since

then the settlers on the eastern rivers, from the Manning River upwards, have gone into the venture with considerable enthusiasm.

In 1867 there were about 116 acres of cane crushed, and 17,786 lbs. of sugar made; in 1868, 646 acres, and 134,740 lbs. of sugar made; in 1869, 2,548 acres, and 3,264,824 lbs.; in the year ending March, 1870, the acres under cane were 3,917, and the produce in pounds weight, 3,563,704, and would have been much greater but for the want of machinery. Owing nevertheless to the spirited exertions of the Colonial Sugar Refining Company, the Clarence and Macleay Rivers have been pretty well supplied with machinery,—three powerful mills, each capable of crushing from 4 to 4½ acres of cane per day, having been erected. The mill-owners purchase the cane from the growers at 10s. per ton, sometimes cutting it for them, and in a great many instances advancing money while the cane is growing. It is now placed beyond doubt that the grower may do well with common care and industry in rearing cane at this last-mentioned price. His preparatory expenses in trenching and planting do not exceed £20 an acre, and seldom go beyond £12. The cane comes to maturity in twelve months after being planted, and yields from 30 to 40 tons of cane per acre. If tended with skilful husbandry, the return will be from 50 to 100 tons per acre. The expenses for the second year will be not more than about £5 per acre, while the weight of cane from the ratoon crop will generally be even greater than that from the plant crop. With good management the succeeding crops should increase in force, and indeed as yet the limit is unknown. With regard to the production of sugar, the manufacturer seems to be quite satisfied with his prospects. The average of Queensland appears to be 1½ ton per acre, whilst that of New South Wales is likely to reach 2½ tons per acre. There is a belt of country, 300 miles long and about 50 wide, between Cape Hawke and Point Danger, admirably adapted to sugar production. Nothing is wanted but capital, skill, and labour, and the mode of culture is simple. The crop seems to be proof against floods, for where wheat, maize, hay, and grass have been ruined by flood-waters, the cane has stood in 3 feet of water without much injury.

But the Colony is not restricted for its sugar to the sugar-cane proper. The impee, a variety of sorghum, is a sugar-bearing cane of hardy nature. It stands frost well, and is little affected by floods. It comes to maturity in five months, and therefore may be employed as an interval crop, alternating with sugar-cane, and keeping the sugar-mills going. There are 60 acres planted with impee in various districts. Present experiments lead the growers to expect from 1½ to 2 tons of sugar to the acre. When not grown for sugar the plant yields abundance of valuable food for cattle.

LIVE STOCK—HORSES.

Since 1850 horses have increased in number, but it is generally thought that they have deteriorated in quality, and this too in spite of the unexampled natural advantages presented by the climate and the pastures of New South Wales. Horse-breeding is not found to pay any better in New South Wales than it does in England, but the cause may not be the same. It is however generally acknowledged that it does not pay because the rules of good breeding are neglected so much that the reputation of the Colony has suffered. There are splendid horses and excellent studs in the country, but the general tendency to breed from inferior mares leads to the production of a weedy class of animals. In 1850 there were 116,397 horses—there are now (1870) 250,304. The stud horses imported from England during the year 1869 numbered nine.

CATTLE.

The principal breeds of Great Britain—Short-horned or Durham, Hereford, and Devon—are to be found here in perfection. A walk through the cattle-sheds of the Agricultural Society of New South Wales would have led a lover of stock to believe himself in England. Pedigree stock is much sought for, and realizes high prices. Without particularizing individual importers, it is sufficient to say that so much has been done in this way that at agricultural meetings the colonial-bred animals are allowed to compete without restriction with the imported, although formerly the imported and colonial-bred were classed separately. This was an acknowledgment of inferiority that would not now be tolerated, and perhaps no fact affords better testimony to the high character of the cattle of this Colony. The Devon is not much fancied, but the contest between the merits of Short-horn and Hereford runs high.

Cattle properties are of two kinds—breeding and fattening. The breeding country is pretty much confined to the table-lands—high and comparatively cool—extending from north to south. New England up to Tenterfield, the Liverpool Plains, and the country from Goulburn to Maneroo Plains, afford specimens of breeding land. The fattening stations are mainly found to the west of the mountain range, and fine pastures are also found in the alluvial districts along the seaboard. Breeding are not so much in request as fattening stations. From the former the return may be stated approximately at about 10 per cent., from the latter from 12 to 15 per cent., upon the capital employed. Store cattle are generally sold at from £2 to £3 per head; fat cattle, weighing about 600 lbs., from £7 to £8. The ordinary weight of what are called fat cattle is 600 lbs., but occasionally they average from 800 lbs. to 1,000 lbs. The increase in horned stock since 1850 has

been inconsiderable. In that year the numbers were 1,375,257; they reached a high point in 1860, continued to increase to 1862 (2,620,383), and fell to 1,795,904 in the year 1869. The following figures illustrate the increase of live stock for the past forty years:—

	Horses.	Horned Stock.	Sheep.	Pigs.
1830	12,479	262,868	586,391	.....
1840		No returns.		
1850	132,437	1,738,965	7,366,895	65,510
1860	251,497	2,408,586	6,119,163	180,662
1870	280,304	1,795,904	14,989,933	175,924

Throughout the Australian Colonies there are 636,676 horses, 3,867,678 horned cattle, 46,812,859 sheep, and 598,430 pigs.

WOOL AND MUTTON.

The great staple of New South Wales is wool, which is mainly the produce of the merino sheep. The figures above quoted will show with what marvellous rapidity these animals have increased, and the vast amount of capital invested in sheep-farming. The profits on sheep-farming have been enormous—as much as 25 per cent.—but latterly they have been considerably reduced. This depreciation of value results from the general fall in the price of wool, and the small local demand for mutton. The preservation of mutton for the European market has, however, at last begun to occupy the serious attention of flock-masters, and the result will of course be to raise the price of mutton, and to enhance the value of sheep generally. There are two meat-preserving establishments on the Clarence; but these work only upon beef. A third company is started in Sydney; while a fourth, at Goulburn, is now in active operation. In the export of wool a great improvement is seen since 1850. The number of lbs. was then 32,361,820. The separation of Victoria from New South Wales in 1851 reduced the amount to 15,269,317 lbs.; the separation of Queensland in 1859 further reduced it to 12,809,362 lbs.; in 1866-70 it had risen very nearly to 30,000,000 lbs., and this by no means represents the whole, since the Murrumbidgee district contains nearly 3,000,000 of sheep, whose wool almost wholly goes to swell the exports from Victoria instead of from New South Wales. There are 48 boiling-down establishments in the Colony, where, in 1869, 290,550 sheep and 246 bullocks were turned into merchantable tallow, the quantity of that commodity being 67,175 cwt. Of hoofs and bones, 10,673 cwt. were exported; of horns, 146,851; of horsehair, 3,327 lbs.; of skins, about 67,000 packages; and of preserved meats, 10,059 packages,—valued at £37,072.

In consequence of the low prices obtained in the Home market for inferior sorts of wool, great attention is now being paid to the production of a superior fleece. A sheep, on natural grasses, requires about 3 acres to feed over, but on artificial grasses one sheep to an acre is supposed to be a fair proportion on good land.

WOOL.

The introduction of the merino sheep by Mr. John Macarthur, more than a generation ago, is a matter of history with which all colonists are familiar; it was the original fountain, which, after the lapse of less than half a century, has become a mighty river. From that precious source the cultivation of merino wool has extended to all the neighbouring Colonies; and New South Wales has furnished the flocks from which Tasmania, Victoria, South Australia, Queensland, and New Zealand have become great wool-producing countries.

The chief quality which attracted the notice of English manufacturers, even in the earliest stage of its culture, was the peculiar felting property of colonial-grown merino wools, comprising a desirable medium between the hard milling character of Spanish wool and the softer qualities derived from the German States. It is almost needless to say that the soil, climate, and other characteristics of the Colony, as a wool-growing country, remain unaltered, and are at the present moment as much available for the purpose as they were when the enterprise of the first farmer of Saxon-merino sheep developed this vast source of wealth to the Colony and the Mother-country.

A history of the progress of wool-growing in Australia would occupy a volume; but it will be sufficient for the purposes of the present article to refer to one or two phases in its development, which may be useful to growers in future times.

About thirty years ago a great mistake was made in sheep-breeding. A widely-extended impression prevailed that by cross-breeding with heavy long-woolled rams from the Mother-country, a much heavier and more valuable fleece could be obtained, and larger profits would be the result. This mania, for it can scarcely be otherwise designated, prevailed to an alarming extent—and throughout a large area of the Colony the distinguishing characteristics which had brought our wool into such high repute were in danger of being entirely lost. It is needless to add, that this somewhat pernicious experiment is not likely to be repeated. Recent competitive exhibitions of wool, held in Sydney and Melbourne, have, on the contrary, determined our flock-masters to regain their former ascendancy as producers of the finest clothing wools in the world.

The steady continuous increase in the value of wool (subject only to accidental interruptions), and the consequent increased value of stock, led to the exploration and occupation of new country, especially in Northern Queensland, chiefly through the enterprise of Sydney capitalists, who pushed their business to almost the extreme northern limits of the Australian Continent. Recent experience has, however, proved the total unfitness of a tropical climate for the cultivation of merino wool, and a large number of the far northern and western stations have already been abandoned, and many others are in the process of following suit. Vast numbers of sheep have been converted into tallow, and thousands upon thousands have been disposed of, at an almost nominal price, for transmission to the more congenial climates of Southern Queensland and New South Wales.

New South Wales embraces a vast amount of territory, in which are to be found, to almost an unlimited extent, the different climates, soils, &c., suitable for almost any descriptions of wool, especially those most prized in the Home and Continental markets. The Mudgee district and other highly-favoured localities produce wool which is probably not surpassed by any country in the world. The northern counties, probably best known as the New England district, produce fine, well-grown, sound fleeces, which English manufacturers cannot dispense with. The western and southern counties, which have acquired the designations of the Bathurst and Goulburn districts, can produce in perfection, under proper management, that large and important class known in the trade as middle wools; while further south, any one who has a fancy to compete with English growers in coarse wool can do so to his heart's content. New South Wales is capable of producing every description of wool of value in the final market; but the great evil to be avoided is the attempt to grow such qualities as are not suited to individual localities.

SILK.

Sericulture has recently attracted public attention in a manner which augurs well for the future of an industry which has already been proved by actual experience to be most happily adapted to the soil and climate of a large portion of this Colony.

Mineral Resources.

GOLD.

THE discovery of gold was first made public in 1851, although gold had been found by Strzelecki and the Rev. W. B. Clarke some years previously. At the end of the present year we shall consequently have had twenty years' experience of the consequences of that discovery, and be in a position to appreciate the advantages and disadvantages of the new industry so suddenly introduced. First commenced at Summerhill Creek, in the

western district of the Colony, the gold-workings were gradually pushed on by the enterprise and energy of the diggers, until within a few years the whole of the country bordering upon the Macquarie, the Turon, the Meroo, and many of their tributaries, were found to be auriferous. At the present time we have, or have had, workings on the Cudgegong River, from its head-waters, near Rylstone, down to its junction with the Meroo, below Merrindee. This extent of country includes the Apple-tree Flat, the Pipeclay, the last new rushes at Gulgong and Tullwang, and the Two-mile Flat, with numerous small diggings which have given employment to from twenty to fifty miners, and sometimes to even more, but which have never obtained any special notoriety. The Meroo has been proved along the whole length of the river, from its head-waters to its junction with the Cudgegong, to be almost one continuous gold-field, many of the diggings in connection with it having proved even richer than the river itself. Amongst these may be named the Upper and Lower Pyramul, Hell's Hole, Maitland Bar, and Louisa Creek. In nearly all the places named, gold-washing is being carried on at the present time, though more systematically and with more expenditure of capital than was the case in the palmier days of these fields.

The whole length of the Turon has also been wonderfully rich in auriferous deposits, from its head-waters near the Crown Ridge down to its outflow into the Macquarie. Many of the numerous tributaries of this stream have also proved no less rich than the river itself, whilst others have given yields inferior only to those of the main stream. On the line of the Turon may be enumerated the Gulph, Palmer's Oakey, Spring Creek, Big and Little Oakey, Nuggetty Hill, and Wattle Flat, where work is still going on. Not only have they been already extensively worked, but they now afford profitable employment to hundreds of miners, whilst several reefs have recently been opened. With regard to the immense ranges which border this river, it has been found that whenever a rainy season has offered a supply of water sufficient to supply a race brought on to one of the hill-sides, every one of the hills thus experimented on has paid well for sluicing. This has been so well proved, that during the recent wet season several large sluicing companies have been formed for working different portions of the range. Tambaroora, though a tributary of the Macquarie, demands a special notice to itself, not only by reason of the richness of its alluvial workings, but also because of its extraordinarily rich reefs. The former are being still turned over, though no less than fifteen years have elapsed since the field was first opened, and though the ground has been worked at least a dozen times. As to the latter, the wonderful yields of the quartz-veins which have been worked here during the last eight or ten years, have every now and again astonished the

people of Sydney and the Colony. These veins, found on Hawkins' Hill, though narrow are numerous, and have given returns varying from 10 to 100 ounces to the ton.

On the Macquarie the principal diggings have been those of Ophir, Burrandong, Stony Creek, and the Ironbarks; many of the smaller creeks falling into the river from some 20 miles above its junction with the Turon down to a considerable distance below Burrandong, have proved highly remunerative to the miners. During the last five or six years the Colony has suffered very severely from continuous drought. This had so far reduced the volume of the rivers that the miners were enabled to work the bed of the Macquarie. It required of course some considerable capital and skill to carry on such an enterprise, for even though low there was always a large body of water in the river. Some very splendid yields of remarkably fine and pure gold rewarded the miners for some years; but this last season of floods has carried away all the extensive works, dams and races, and water-wheels, and filled up the immense excavations which had been made at an immense outlay of labour and money; and has driven the miner into the higher grounds, where it has furnished him with the water, the want of which had hitherto made those grounds unworkable.

Southward of the Ophir were found the strange deposits of the Lucknow or Wentworth mines, 7 miles east from Orange. Here the gold was in a regular ironstone lode, and incorporated with the stone as with quartz. The lode, which was exceedingly irregular, occupied a vertical position in a mass of alluvium which had filled up the interstices formed by a deep rent in the bed rock, traced down to a depth of nearly 200 feet. The stone gave from 20 to 60 ounces to the load. These mines are situated on private property, and are now in the hands of a large company. Beyond this last-named spot, round the eastern slopes of the Canoblas Mountains, by Canowindra, and thence to the Lachlan, the country has been proved to be payably auriferous in every spot where the formation of the country has favoured an alluvial deposit. General attention has been directed to this part of the country only within the last three or four years, since which diggings after diggings have been opened; whilst numerous rich reefs are being worked, and others are being discovered almost daily. Only within the last week or two some highly auriferous quartz-reefs have been opened in the Forest district, and the display of the stone taken from the reefs is causing considerable excitement amongst the western miners.

Running up the Lachlan to its junction with the Abercrombie, and then following the latter upwards to its head waters, we have again a large stretch of auriferous country in which may be included the diggings of Cargo, King's Plains, Trunkey Creek, and Tuena, besides workings on some of the smaller tributaries of

the stream. In every spot where there has been no sweeping away of the ancient alluvial deposits, payable gold has been found, whilst the whole tract of country is perfectly seamed by reefs of auriferous quartz, some of the stone, as at Trunkey Creek, being exceedingly rich.

In order to convey some idea of the large continuous area of auriferous country which only requires prospecting to be developed, or rather which only demands a good supply of water to be made richly remunerative, we have passed by the Lachlan Gold-field, which at one time astonished the Colony with its wondrous yields. It still gives employment to some fifty or sixty miners, and the reefs at the Pinnacle would have proved remunerative had permanent water been procurable within easier distance. Crossing the Lachlan, we come to the rich reefing district of Emu Creek, which has certainly sent away from it a larger amount of retorted gold than any other district of the Colony, besides being rich in alluvial workings still far from being worked out. Within a few miles of the Emu Creek Gold-field are the extensive alluvial workings of Lambing Flat, or the Burrangong Gold-field, which for the time they were working furnished perhaps a larger amount of gold than had been done by any gold-field of a similar extent in the Colony, besides bringing together a large number of miners from the neighbouring Colonies. Though worked out, as far as individual mining is concerned, the ground yet offers profitable employment to the capitalists, and two large companies have been formed for working over the ground in a systematic manner by the aid of machinery.

Beyond Lambing Flat, to the south, are the Eurongilly, Junee, and other reefing districts, extending beyond Wagga Wagga. Most of these reefs are in active work, although they are but poorly supplied with crushing power. The latter is very much in demand, not only in these but in other reefing districts. Turning eastwards from these, the reefs of the Adelong and the Tumut have provided settled work for the miners during the last ten or twelve years; and the yields recently reported show that the quartz is by no means falling off in richness. The average of the stone crushed during 1869 gave about an ounce and a quarter to the ton of stone. Then from the Tumut by Tumberumba, where large alluvial deposits were found, and where several reefs have recently been opened, we mount to the head waters of the Snowy River, and reach the rich and extensive gold-field of Kiandra. Here occurred perhaps the largest rush that was ever known in the Colony. The ground was unmistakably rich, but the weather in these lofty ranges proved so inclement in the winter season, and the ice and snow formed so insurmountable a barrier to prospecting, that the place soon got thinned of its population. A number of miners, however, have settled down

here to steady work, and find profitable employment on the margin of the old ground, and occasionally opening out new spots. Several reefs are also being worked in this district, though the stamping batteries are few in number.

From Kiandra eastward to the coast, and thence northward, there are several diggings which have been steadily worked for the last eight or ten years, on the first plateau of the coast-fall of the table-land. The principal of these are in the Nerrigundah and Moruya districts. Thence coming northward we reach Araluen, where the work of the miner is done more systematically and effectually than in any other workings in the Colony. The surface soil is stripped down to the wash-dirt, a depth of about 20 feet, the stripping being carted away, and tipped on to some other spot. When the whole is stripped, the wash-dirt is carefully collected and washed down to the bed rock. The claims are usually worked by companies of ten or a dozen men, and to keep the claim clear of water, pumping-engines are employed by each company. For several years the yield kept up very steadily at 1,200 ozs. per week, but within the last two years it has fallen off to about £3,200 per month. Bell's Creek and Major's Creek, both tributaries to the Araluen Creek, have been long worked out as alluvial diggings; but within the last two years attention has been called to the quartz-reefs in their vicinity. The stone gives promise of considerable richness, and as two or three crushing batteries have been erected at each of the two places, the stone will have an opportunity of being fairly tested. Up to the present time the result of crushings has been highly favourable, 2 and 3 ozs. of gold to the ton being obtained for lots of 50 tons of stone, with reefs varying from 8 to 12 feet in thickness.

The Mongarlow, or Little River, some few miles east of Braidwood, has been a good lasting alluvial field. The number of men working on it has never been large, and there are still many auriferous patches to be turned up, the country at a distance from the river having been but poorly prospected, owing to the scant supply of water. Its reefs lately opened have given some wonderful yields of gold from small quantities of stone, some rich veins struck having returned at the rate of 50 and 60 ozs. to the ton. The body of the reef, however, does not appear to be giving anything but poor stone. Coming next to the Jacqua reefs, between Braidwood and Bungonia, where an average of 1 oz. to the ton has been obtained, we are brought within reach of the southern line of rails, and are only a few hours distant from Sydney.

Turning next to the Northern District, we come first to the Denison Diggings, on one of the head waters of the Hunter River, and within two-and-twenty miles of the town of Scone. This is mainly a reefing district, though some small alluvial patches, not very rich have been worked there. As there is an abundant

supply of water in ordinary seasons, the crushing batteries are here worked by water power. The stone has turned out very fairly, the crushings giving an average of about $1\frac{1}{2}$ oz. to the ton. The Peel River has been found to be auriferous from its headwaters down to within a dozen miles of Tamworth, and on both sides of the river several quartz-reefs have been opened. The great drawback to the development of this field has been found to be the possession by the Peel River Company of a very large portion of the land on the southern side of the stream. The chief reefs are those on Foley's Folly, which are being worked by an association of miners under the amalgamated claims system. The reefs on the river have not been worked for some years past, owing to the absence of water, which had been used as the motive-power of the crushing batteries. Some very extensive sluices had been cut from the morasses on the high table-land, which brought down an abundant supply of water, sufficient for all the purposes of washing and water-wheels; but the last few years of drought stopped the supply. The water-wheels dropped to pieces, and the washing was put an end to. For six years there was no perceptible run in the river, and yet miners managed to procure gold; and, though their number fell off, there were still many who adhered to the old spot in hope of better seasons. The upper part of the river, about Nundle, and the tributaries which here join it, have been very rich, and in the days of water supply were extensively sluiced. There are very many spots which will all pay handsomely for working in this way, and several sluices have been cut at great expense to bring the water to spots fancied by the miner. The Hanging Rock, on the table-land above the river, also gives employment to a few miners.

To the north-west of Tamworth are Wood's Reefs, on which very little is now doing; and further on, in the same direction, are the Upper and the Lower Bingera Diggings, now occupied almost exclusively by the Chinese. In the former of these was discovered one of the most extraordinary auriferous deposits yet met with in the Colony. On an extensive flat the gold was found in large pieces almost on the surface, and barely covered with the soil, with no deposit whatever below it, and with no indication of deposits on any of the adjoining hills. One or two veins of gold were found towards the embouchure of the gully, the gold in this case being fine. There are several fine reefs here, but none of them have been tested. Beyond the Lower Bingera, towards the west, is a large extent of country, which there is every reason to believe will one day be found to be auriferous. A little off the Main Northern Road, and two-and-twenty miles south of Armidale, are the Rocky River Diggings. These were at one time very rich indeed, and they still give employment to some scores of miners. North of Armidale, on the eastern fall of the coast range, the

streams which form the head-waters of the Clarence and Richmond Rivers are all more or less auriferous, and form the extensive gold-field known under the general name of the Timbarra, and extending from Oban on the south up to the borders of Queensland. For years this field has given steady employment to something like 200 miners, and has contributed a steady amount of gold to the escort. Only lately two very fine reefs have been opened on this gold-field, on the road from Tenterfield to Grafton, and reports have reached us of very astonishing yields from the hand-crushing of small quantities of picked stone.

During the year 1869 the Mint returns show that the amount of gold received by escort fell off to some small extent. The Master of the Mint attributes this to the dry state of the country from the long succession of droughts with which it had been visited. It is indeed open to doubt whether the actual yield fell off at all, and the smaller amount received by escort may be accounted for by the fact that the settled state of the country, and the absence of bushrangers on the roads, have allowed more gold to be brought down by private hand. However, taking the Mint returns of the amount of gold actually received by escort into that establishment, and dividing that amount by the number of miners who have taken out miners' rights during the year, the yield per man would be £72 4s. 6d. per annum. This, undoubtedly, would be a fair estimate, as, though there are certainly a number of men working without miners' rights, these could very fairly be set off against the gold which reaches Sydney otherwise than by escort, and of which we have no certain account.

The gold from the various fields, received per escort at the Mint, during the year 1869, was in round numbers as follows:—

Gold Field.	Quantity received.	Value.	Gold Field.	Quantity received.	Value.
Western District.	ozs.	£	Southern District—	ozs.	£
Sofala	15,779	59,698	<i>continued.</i>		
Bathurst	15,816	58,914	Tumut	174	675
Hargraves	4,388	17,166	Tumberumba ...	1,310	5,170
Tambaroora ...	17,567	69,024	Burrangong ...	8,400	32,793
Mudgee	20,177	78,523	Cooma	2,536	9,552
Orange	10,431	38,508	Kiandra	2,420	9,053
Stony Creek ...	3,669	14,401	Gundagai	2,848	9,575
Forbes	1,583	5,871	Total	80,591	310,982
Grenfell	41,543	164,612	Northern District.		
Total	130,953	506,717	Rocky River ...	2,734	10,789
Southern District—			Nundle	5,905	22,342
Goulburn	540	2,072	Tamworth	950	3,547
Braidwood	11,170	43,238	Scone	521	1,752
Araluen	38,825	150,930	Armidale	2,728	10,604
Adelong	12,368	47,924	Total	12,833	49,034

The following table shows the amount of gold received by escort at the Mint during the last ten years :—

Year.	Ozs.	Value.	Year.	Ozs.	Value.
1860 ...	356,572 ...	1,359,123	1865 ...	280,810 ...	1,077,905
1861 ...	402,634 ...	1,554,629	1866 ...	241,489 ...	928,275
1862 ...	575,538 ...	2,212,534	1867 ...	222,715 ...	863,798
1863 ...	423,407 ...	1,629,049	1868 ...	229,739 ...	894,829
1864 ...	316,430 ...	1,211,170	1869 ...	224,382 ...	866,746

A paper on the sedimentary formations of New South Wales, in which he illustrates our gold deposits, written by the Rev. W. B. Clarke, will be found further on in this work.

Actual experience is daily showing the correctness of the views expressed by this eminent geologist. There have not been the same disruption, abrasion, and denudation in New South Wales that have taken place in Victoria; and thus, though the alluvial deposits are more extensive and in many instances richer in the sister Colony, the amount of auriferous wealth contained in the reefs of New South Wales far exceeds that of the reefs of the southern province. Whilst they are richer they are also more numerous, and only require for their perfect development the conjunction of capital with discreet and intelligent management. Unhappily, this branch of mining has, until within the last two years, been too much neglected in the Colony. The management of reefing operations, when they have been undertaken by a company, has fallen too much into the hands of mere speculators; whilst the works have been too often supervised by designing or pretentious men, either wanting in honesty to their employers or without the ability necessary for carrying the venture to a successful issue. We are just now emerging from this state of affairs. Companies are gradually undertaken by men of means and talent, anxious as well for the advancement of the Colony as for their own private gain; and there is now a bright hope before us of something better in the future for what may really be termed mining enterprise.

COPPER, SILVER, LEAD, AND IRON.

New South Wales is unmistakeably rich in copper. In the Orange District outcrops of copper carbonates have been found over an area of 20 miles square. Here the lode has been worked more extensively than in any other district in the Colony. The Cadiangullong Company have very extensive works, both under and above ground, with a complete range of smelting furnaces. The property, however, passed out of the hands of the company, and was purchased by some Victorian capitalists, more for the sake of a quartz-reef running through the property than for the valuable copper-mine and working plant, which had cost its first promoters so large an amount of capital. The mine is now being worked on tribute, and consists of a fine lode of black sulphate of copper, yielding about 60 per cent. of metal. The

Carangara Mine, at the Cornish Settlement, is now idle, but having been proved at various points, shows a very large area of copper country, commencing with an outcrop of carbonates, and running into a regular lode of black sulphate. Within 2 or 3 miles of Carangara, on the track to the Ophir, a copper-mine has been opened on the land of Mr. Icely. The lode has been proved, but it has not been as yet systematically worked.

At Currawang, near Lake George, in the Goulburn District, a fine lode of black sulphate of copper is now being worked on tribute. Here, as at Cadiangullong, a great deal of expense was incurred in making the works as complete as possible, only to encounter failure. The Monmouth Copper-mines at Gulgandra Creek, in the Monaro District, are also being worked by a company of Victorians. Shafts have been put down, and the lode has been thoroughly proved; but as yet the necessary smelting-furnaces have not been erected. Copper-ore has also been found in the vicinity of Bathurst, Carcoar, and Molong; whilst at Tumarumba, in the Albury District, some ore has been brought into market.

The chief silver and lead mines of the Colony are those of Wolgarlo, on the Yass River, near its junction with the Murrumbidgee, and of Hulfe Gottes, on the Isis, one of the upper waters of the Hunter, and some five-and-twenty miles from Scone. The former is being worked by a Sydney company, who were progressing favourably, having erected the necessary furnaces and other works, when the wet season, which had just closed, came upon them, and nearly the whole of the works were swept away by the floods which, one after another, came pouring down upon them at only very brief intervals. This company is now understood to be on the point of winding-up. The Hulfe Gottes is being worked by a company of Newcastle proprietors, and, though well opened and fairly proved, has as yet given no return to its promoters. The Moruya Silver-mining Company at Broulee, after getting together a fine plant at their mine in the Broulee District, was finally wound up a couple of years ago, owing to the manner in which its affairs had been conducted. The mine itself was a promising one, and gave an excellent return on analysis. In fact, as has been before remarked with regard to gold-mining companies, the great fault which has hitherto been committed in the management of mining companies of every kind, has been that the practical working has been left to men altogether ignorant of the important duties entrusted to them.

The Fitzroy Iron-mine at Nattai is the only one which has been worked in the Colony. It has hitherto proved a source of loss to all who have ever been connected with it, and solely from the cause just mentioned. With regard to iron ore it has been found very extensively in the Colony, and in most instances in immediate connection with good seams of coal.

CINNABAR.

Two deposits of cinnabar have been found on the banks of the Cudgegong River, 4 or 5 miles from the township of the same name. The ore was not found in a regular lode, but was traced in small veins of flood debris, highly impregnated with the red sulphuret of mercury, and lying vertically in the ordinary alluvium. It has been worked to some extent, but the quantity procurable was not considered sufficient to justify the company in carrying on an expensive establishment. Attempts are being made to follow up the track of the debris, in the hope of striking the real lode. The writer recently saw unmistakable traces of the red sulphuret of mercury in the workings at a small diggings in the neighbourhood of Trunkey Creek.

The following is the official return of the silver, lead, &c., mines of the Colony, for the year 1869:—

	No. of Mines.	
Bombala—Quidong	5	Silver and lead.
Orange	5	Copper.
Goulburn—Currowang	1	Copper sulphate. ³
Bathurst—Green Swamp	1	do.
Carcoar—Green Swamp	1	do.
Wood's Flat	1	do.
Molong—Near Boree	1	do.
Albury—Tumbarumba	1	do.
Yass—Woolgarlo	2	Copper, silver, and lead.
Scone—Isis River	1	do.
Rylstone—Oakborough	1	Cinnabar.
Broulee—Moruya	1	Silver.
Murrurundi—Timor Creek	1	do.
Berrima—Nattai	1	Iron.

DIAMONDS.

Up to the present time the search for diamonds has not proved a very successful avocation. The diamonds are too sparsely scattered through the wash-dirt; and in spite of the employment of very excellent labour, and saving in machinery (Hunt's Patent Ore-separator), the cost of labour has not been covered by the value of the gems found. The drift in which the diamonds are found, lies immediately above the ordinary wash-dirt taken by the gold-miner, to the height of about 3 feet, the stones being found sometimes in the upper, sometimes in the middle, sometimes in the lower, portion of the drifts; it follows that an immense quantity of wash has to be raised to the surface and passed through the machine. A very excellent paper, furnished by Mr. Hunt, Manager of the Australian Diamond Mining Company, contributed to the *Sydney Morning Herald*, points out the difficulties at present in the way of making diamond-mining a successful mercantile speculation. What is required is a close study of the stones which are found to accompany the diamond in the drift, so as to

save the labour of washing valueless drifts. Here again, occurs a difficulty in the very capricious lodgments of the gems. A very small patch of drift will give a splendid return of diamonds, as was the case with the claim of the Hennessies, at Two-mile Flat, where diamonds worth £1,000 were found within about a dozen cubic feet of drift. The necessity for taking so large a quantity of wash also makes the yield of gold per load very small. Thus there may be only some 6 inches of auriferous drift which, if washed by itself, would give perhaps half an ounce or an ounce to the load; but when to these 6 inches are added 3 feet of the upper drift washed for the diamonds it may contain, the proportion of gold to the load becomes very small.

We are certainly not yet in a position to compete with the diamond-mines of either India or of South America, where labour is procurable for nothing, or next to nothing, or for the mere first cost of the purchase of the labourer. In New South Wales, the miner, who will willingly work for himself so long as he can obtain enough to provide him with food, or "tucker," as it is impressively termed, will not work for a master unless he gets full wages, and the reason is obvious. In the first case he has always before him the chance of obtaining some prize in the digging lottery, and this is the secret which keeps him up when struggling against ill luck; whilst in the latter case he has no hope beyond his wages, for anything he gets must go to his employer. Until diamond-mining has been made a much more complete study than it has yet been, and until it can be said authoritatively that where such and such indications exist there will the gems probably be found, the cost of labour will prevent the search being a successful speculation.

The number of diamonds found up to the present time have been, at a rough estimate, about 5,500; the largest having been one of $5\frac{1}{2}$ carats, and the smallest one-tenth of a grain. The average weights of those found has been about one grain each. They have all been found on the banks of the Cudgegong, at the Two-mile Flat; a great many of them in the old tailings left by the gold-miners from their washings; more from the alluvial drift in regularly-worked shafts; some few accidentally in the bed of the river. They are always accompanied by rubies, topaz, and other gems, but these latter are of a size to give them commercial value.

The Australian Diamond Company was formed in Melbourne, and has been working on the Cudgegong for the last two years, employing two of Hunt's machines driven by steam power, and passing through a quantity of drift. The cost of wages however has been too much for them, and they have recently determined upon bringing the works to a stop. The Mudgee Company, also with a Melbourne proprietary, has been very unlucky, having had their works swept away by floods no less than three times. By last accounts they had not got into working order. The Hennessies'

claim, which was mentioned before as very rich, was situated on one of the old leads. After the rich find alluded to, they were offered £2,000 for a fifth share in their ground, and refused it, and since then they have been getting little of any value. Attempts were made to form two companies in Sydney, but neither was successful,—our Sydney capitalists not being quite so forward in such matters as are the more speculating denizens of the sister Colony. It has been computed by Mr. Hunt, that diamond-mining will not pay a company unless two pennyweights of gold and one diamond of a grain in weight are returned from each load of wash.

Diamonds have also been found on the Meroo, and in the vicinity of Dubbo. At the latter town a local company has been started for the purpose of following this branch of mining.

COAL-MINES.

Next to gold, our most important mineral product is coal. From the first working of our coal-mines, the trade in this important article of commerce has gone on gradually increasing. With the exception of the years 1863 and 1867, when there was a trifling falling off in our exports, easily accounted for, the quantity sent out of the Colony has steadily and surely increased year by year, until now we find our customers in almost every port of the Southern hemisphere.

The most productive, as well as the most extensively worked, of the coal measures of this Colony, is that of the Hunter River, or, as it is more generally called, of Newcastle. The collieries at which the seams are worked have been established on the southern and western sides of the river Hunter. To this there are two exceptions—that of the Tomago Colliery, which is on the Raymond Terrace side of the river, and only a short distance from that township; and the Rix Creek Colliery, which is some 10 miles north of Singleton. Immediately south of Newcastle is the Burwood Colliery, better known as that of the Coal and Copper Company; then immediately to the north of the town, and hemming it in on that side, is the land of the Australian Agricultural Company, on which is the Borehole Colliery. Then come, in the order named, the Waratah, the Lambton, the Co-operative, the Wallsend, the Minmi, the Hexham, the Alnwick, and the Woodford Collieries. At a short distance west of Morpeth are the Four-mile Creek and the Rathluba Collieries. About 5 miles north of the Four-mile Creek, at West Maitland, is the colliery of Mr. Bourn Russell, at Stony Creek, where a seam of cannel as well as a seam of splinty coal is worked. Some 15 miles further north, the Lower Hunter seams again crop out at Anvil and Dalwood Creeks, and are worked near Branxton by Mr. Farthing. 30 miles further north again, at Rix Creek, north of Singleton, there is another outcrop,

which is being worked. In fact, the outcrop of coal-seams has been found throughout nearly the whole of the basin of the Hunter, almost up to the very base of the main range. Even beyond this, outcrops have been discovered; and a valuable seam of kerosene shale has been opened and tested on the property of Mr. A. Loder, at Collie Creek, in the Liverpool Plains District.

About 40 miles south of Sydney commences what may be called the Wollongong coal measure. Outcrops have been traced for a distance of 30 miles to the south, whilst to the west or inland what has been declared to be the same seam has been struck at Nattai, and worked by the Fitzroy Iron Mining Company; and between that locality and Berrima, as here, a splendid seam has been opened by Mr. Young. The Bulli Company are working a fine 14-foot seam by an open adit, with a tramway running thence by an incline to a jetty, built for convenience of shipment,—the only drawback being that vessels have to lie in an open roadstead. The ports of Bellambi and Wollongong afford means of shipment to the other collieries on the southern coast. The mines opened in the Wollongong District are the Osborne Wallsend, or Mount Keira, the Mount Pleasant, the Bulli, the American Creek, and the Bellambi. The seam of the first-named runs from 6 to 8 feet in thickness, and the mine is capable of giving out from 120 to 150 tons of coal per day. All but the last are in full work, shipping their coal at Wollongong and Bellambi, with the exception of the Bulli, previously referred to. In the Berrima District mines have been opened at the Cataract, Black Bob's Creek, Jordan's Crossing, and Nattai. None of these are at present at work, though the mines at Nattai and Black Bob's Creek are in convenient position for connection with the railway. A shaft has also been opened at Stanwell Park, in the Campbelltown District, and coal has also been discovered at no very great distance from Penrith.

To the westward of Sydney we have recently had opened what may be termed the Hartley coal measures. The seam, which has been traced by the outcrop over an area of some 10 square miles, is considered by the Rev. W. B. Clarke to belong to the lower portion of the western section of the upper measures of the great coal-field of New South Wales. This opinion is based on the fact of the presence of fossil plants and the absence of marine fossils. It is a non-caking coal, approaching to splint, and intermediate between the lower Newcastle and the Anvil and Dalwood Creek seams. The seam runs from 9 to 11 feet in thickness, and is being worked by Messrs. Saywell & Garsed, at Bowenfells; by Messrs. Woolley & Anderson, at the Hermitage Colliery, Lithgow Valley; by Mr. Thomas Brown, in the same valley; and by Mr. Andrew Brown, at Coerwale. Besides these, a company is in progress of formation for working the seam on the southern side of the valley. The advantage which this position has is proximity

to the railway-line, whereby, on the completion of the line to Bathurst, supplies of coal may be sent there at a cheap rate, whilst copper-ore may be brought back to the mines to be smelted on the spot. An agitation is now going on in the west to obtain such a reduction of the rate of carriage per railway as will allow of the introduction of this coal into Sydney.

In connection with the coal measures of this district, mention may be made of the splendid seam of cannel coal now working in what has been named *Petrolea Vale*, a long valley running down on the northern side of Mount York. The chief of these mines is at the present time that of the *Western Kerosene Company*, on the northern side of the valley,—the mine of the *Hartley Kerosene Company* being situated on the southern side. Both companies are working on the same seam, which is, on an average, 6 feet wide, 8 inches on the top, and 4 inches at the bottom, being common kerosene shale, whilst the remaining 5 feet consist of fine cannel coal, giving an average of about 150 gallons of crude oil to the ton of coal. The *Hartley Company* are merely raising coal for the supply of the gas companies of Sydney and Melbourne, the cannel giving greatly increased illuminating power to the gas. The *Western Company* are manufacturing oil from their coal at their works on the *Botany Road*. They have forty retorts at work, and are producing near 6,000 gallons of pure oil per week. The oil has been tested by scientific gentlemen, and has been pronounced superior to the best American,—one great advantage being that it will not ignite at a temperature ten degrees higher than the igniting point of the purest American.

The *Pioneer Kerosene Works*, at the *American Creek*, near *Wollongong*, were the first to produce it from the colonial shale. The seam is worked by an adit on the outcrop, and the quantity of oil distilled weekly is about 1,200 gallons.

The quantity of coal raised at the different collieries during the year 1869 was as follows:—*Hartley*: *Blackman's Gap*, 150 tons; *Lithgow Valley*, 1,210 tons. *Maitland*: *Stony Creek*, 900 tons; *Four-mile Creek*, 19,607 tons 15 cwt.; *Rathluba*, 624 tons; *Anvil Creek*, 11,000 tons. *Newcastle*: *Waratah*, 128,869 tons; *Old Lambton*, 166,112 tons; *New Lambton*, 109,850 tons; *Minmi*, 13,808 tons; *Co-operative*, 41,243 tons; *Burwood*, 3,930 tons; *Australian Agricultural Company's*, 164,032 tons; *Wallsend*, 156,490 tons. *Patrick's Plains*: *Rix's Creek*, 1,900 tons. *Wollongong*: *Osborne Wallsend*, or *Mount Keira*, 17,014 tons; *Mount Pleasant*, 17,014 tons; *Bulli*, 65,320 tons; *American Creek*, 700 tons. Total, 919,773 tons 15 cwt.

The following return shows the number of mines which have been working during the last ten years, with the quantity raised and its value:—In 1860—(17), 368,862 tons, £226,493 19s. 6d.;

in 1861—(18), 342,067 tons, £218,820 10s. 6d.; in 1862—(33), 476,522 tons, £305,234 13s. 6d.; in 1863—(20), 433,889 tons, £236,230 10s. 7d.; in 1864—(25), 549,012 tons, £270,171 11s.; in 1865—(24), 585,525 tons, £274,303 13s. 9d.; in 1866—(25), 774,238 tons, £324,049 6s. 7d.; in 1867—(26), 770,012 tons, £342,655 7s. 8d.; in 1868—(28), 954,230 tons, £417,809 6s. 1d.; in 1869—(33), 919,773 tons, £346,145 16s. 5d.

Of kerosene shale the quantity raised during the year 1869 was:—Western Petrolea Vale, 3,000 tons—£9,000; Hartley Petrolea Vale, £2,000 tons—£6,000; Wollongong, American Creek, 2,500 tons—£3,750.

Manufactures.

PRIOR to the discovery of gold in the Colony in 1851, there were but few manufactures established, and these few were confined to Sydney. Boots and shoes were made at a very early period of the Colony's history, and of a very superior description, but they were not then produced at a price to compete with the imported article, and they were consequently not in general use, except by the more wealthy. Articles of furniture, from the cedar and other indigenous woods of the country, had been manufactured long prior to the above date, and there had been for some years a small export of these articles to the neighbouring Colony. The manufacture of woollen fabrics was also commenced some thirty years before the gold discovery, first at Parramatta, from which town the well remembered Parramatta cloth derived its name. Then followed the tweed factory of Sir John Jamison, at Regentville, the produce of which obtained considerable favour in this and the adjacent Colonies. Afterwards, the Stockton factory, near Newcastle, was started, and tweeds and doeskins were there made of a quality quite equal to anything that has since been produced, though certainly not to the same extent, nor at the same cheap rate, that we have them now. Almost up to the time of the gold discovery the iron-trade was only of very small dimensions. Almost the only really engineering firm in Sydney was that of Mr. Struth, afterwards carried on by Mr. Napier, but this was engaged almost exclusively on marine-work. Dawson and P. N. Russell & Co. were little more than iron-founders, doing only the fitting connected with the work they cast. The greatest efforts at production were the manufacture of cooking-stoves and other domestic articles, mill-work and marine-work; and machinery was not then so generally used in every department of trade as now. These, with the manufacture of soap and candles, and the refining of sugar, formed the bulk of our industries.

But such few manufactures as were in existence were gradually establishing themselves; some had grown already into importance, and gave every promise of prominence at no very distant

day ; when the gold discovery in California, in 1848, gave the first blow to them, and by inducing hundreds of our sturdiest mechanics to leave our shores, entirely prostrated for a time every industry. Three years later came the discovery of our own gold-fields, and a large majority of our population deserted the city for them. The clerk deserted his desk, and the professional man his office ; the mechanic and the tradesman threw down the tools to which they were accustomed, to take up others which were foreign to them, and in the use of which they soon found, from sad experience, that they were not adepts. All were too intently engaged in the wild scramble for gold (which it was thought was to be had only for the gathering) to think of their customary regular employments. Closely following up the influx of population came immense consignments of goods ; and with the exorbitant wages demanded by those who had even the slightest claim to be denominated workmen, manufacture in the face of these importations became an impossibility. Soon, however, the tradesman and mechanic found his way back to Sydney, and gradually employers began to take heart, and industries to revive.

The introduction of machinery into large establishments of every kind followed in due course, and gave an impetus to another branch of manufacture,—the iron-trade,—which started into a prominence which bids fair to be strenuously maintained.

IRON TRADES.

The machinists and engineering establishments in the Colony numbered sixty-four at the end of the year 1869 ; of these thirty-four were in the metropolitan district, fourteen at Maitland, four in Parramatta, two each in Carcoar, Goulburn, Newcastle, Port Macquarie, and Yass, and one at the Manning. Of iron, brass, and copper foundries there were thirty-three, of which nineteen were in the metropolis, five at Maitland, two each in Bathurst, Goulburn, and Newcastle, and one each in Berrima, Mudgee, and Orange. A brief description will give some idea of the more important of these establishments. The works of the A. S. N. Company at Pyrmont employ 350 hands, and were originally established for the purpose of effecting the necessary repairs to the machinery, &c., of the large steam fleet of this company. The convenience offered by their fine slip made other shipowners anxious to avail themselves of it, as well as of the services of the workmen of the company, which thus by degrees became engaged in engineering and ship-building on a large scale. Nearly all the work done here is marine work, and there is a magnificent plant of all the best engineering tools. Mort & Co., of the Dry Dock, Waterview Bay, employ about 450 hands. They are engaged in general engineering ; but, having a dry dock and a patent slip in the establishment, do also a large amount of

general marine work. They have recently been manufacturing locomotives for the New South Wales Government railways, and have turned out sugar-machinery, quartz-batteries, and other machinery. This firm has only been started within the last three years, and is provided with a very superior and complete engineering plant. The oldest engineering firm in Sydney is that of P. N. Russell & Co. They have been engaged upon almost every kind of engineering work that has been required in the Colony. They have fitted up flour-mills,—provided sheep-washing machinery with centrifugal pumps,—have built the largest and most effective quartz-batteries in the Colony,—have constructed a turret-ship for New Zealand,—have executed marine work of every description,—have made and erected iron bridges for the Yass River at Yass, and the Murray at Hay,—and are now mainly engaged in executing a large contract for railway trucks and carriages for the Government. They employ at present about 300 hands, and have one of the most complete and extensive engineering plants in the Colony.

Vale & Lacey, of Druiitt-street, employ about 150 hands. This firm has been brought into existence only within the last three years, but during that time it has taken a very high stand in the trade. It has principally been employed in the manufacture of locomotive and other engines, and has now a contract with the New South Wales Government for the manufacture of locomotives. The firm was first brought into notice through the very superior tank-engines it turned out for the use of contractors on our railway-lines. It has also executed a large contract for railway-trucks. Dawson's foundry in George-street is the oldest established foundry in Sydney, and has throughout maintained a reputation for soundness of work; an engineering plant has been added to the foundry within the last few years, and the establishment now employs about seventy hands. About 10 tons of metal are weekly cast here. Bubb's Victoria Foundry, off George-street, employs sixty-five hands, and casts about 12 tons of pig-metal per week. This also is a very old established foundry. No fitting is done here, except what is necessary in connection with the castings, and this principally for contractors' work. Mr. J. Mather, of Bathurst-street, employs about sixty hands. He is employed mainly in boiler and marine work, though other work is executed as it offers. The approaches to the West Maitland bridge were made by this firm. Chapman Brothers, of George-street, employ fifty hands, and execute a very extensive range of work. They originally started in business as agricultural implement and machine makers, but their business very soon took a wider range, and they now construct engines of various kinds, and some of the best engines about Sydney have been made by them. They have turned out several flour-mills, and also many of the labour-saving machines used in the various trades—not

the least noteworthy being the brick-making machine in use at Fowler's pottery. The City Iron Works at Johnston's Bay employ sixty men. There is a very heavy and complete rolling battery at this establishment. Scrap iron is worked up here for the more important kinds of work, and pig-iron is puddled for ordinary work. About 100 tons per month are rolled here, and railway wheels and tires for contractors' locomotives or tank engines have been also turned out at this establishment. At the Government Railway Works at Redfern there is a very fine plant of engineering tools, including three very superior steam-hammers. The work here is exclusively confined to repairs required for the carriages and locomotives on the line; but recently they have turned out a very powerful locomotive, from drawings made by Mr. Whitton, the Engineer-in-Chief for Railways. The number of men employed is forty-one in the engineers', and twenty-six in the carriage, shop. A similar Government establishment is carried on at Newcastle for the engines and carriages on the Northern line. In this, twenty-two men are employed in the engineers', and six in the carriage, shop. Halliday & Co., of Erskine-street, employing about twenty hands, are engaged in general engineering. Besides these, there are the foundries of Mr. Hargraves, at Pymont, employing eighteen hands, and working up 7 tons of iron per week, and that of Taylor and Wearne, of Redfern.

Galvanizing work has now become very general in Sydney, and almost everything of this kind is now done in the Colony. Mr. S. Zollner, of Dixon-street, first commenced this branch of business, and has now an extensive establishment, employing fifty-two hands, and working up from 15 to 18 tons of black sheet-iron per week. Mr. Foy, of Hunter-street, has also entered largely into this branch of the business, and employs a good number of men. In addition to the above, there are twenty iron and tin makers, of whom thirteen carry on business in the metropolis.

LEATHER.

Among the most flourishing branches of trade carried on in the Colony may be ranked the leather-manufacture; and not only the hide from which the leather is made, but also all the articles required in the process of conversion, are produced in the Colony. Ox and horse hides, calf, kangaroo, and sheep skins, are procurable in large quantities, though some of our tanners, who look beyond the present, begin to fear that the trade is extending so rapidly that in a few years we shall have to resort to some foreign source of supply to meet our requirements. The lime, the bark, the oil, and the tallow necessary to convert the hide into leather are all here, though in the matter of bark it has been questioned whether the wattle-trees of the Colony will stand out for many years longer sufficiently to furnish the large amount

of tanning now annually required. It is well known that the districts round Sydney have been for years all but denuded of the wattle; and even within the short space of time that the railway-line has been opened to Picton, the Sutton Forest, Bong Bong, and Berrima Districts have equally been stripped of this beautiful tree. The greater part of the bark now used is brought from the southern coast districts; but these in their turn must soon become exhausted, especially as no attempt is made to perpetuate the tree, and it is left entirely to nature to compensate for the havoc made by man. Several experiments have been tried upon our indigenous barks, but, with the exception of the wattle, they contain only so small a proportion of tannic acid as to make them comparatively valueless.

The Registrar General reports that there were at the end of 1869 twenty-nine boot manufactories in the Colony. Of these, twelve are in the Metropolitan District, four each are in Maitland and Wollongong, three each are in Goulburn and Windsor, and one each in Bathurst, Braidwood, and Yass.

Messrs. Alderson & Sons, of Elizabeth-street, and of Bourke-street, Surry Hills, are engaged in all the branches of the leather trade. They are extensive tanners, employing forty tanners and thirty-seven curriers, and putting through an average of about 1,800 hides per month. In boot and harness making they give employment to 180 hands, and produce about 120,000 pairs of boots of all kinds during the twelve months, besides harness of every description. This firm does a very large export trade with New Zealand and Queensland, and has the Government contract for boots and saddlery here and in Queensland. Mr. J. Vickery, of Barrack-street, has his tannery and factory at Glenrock, Waverley. He was the first to commence the manufacture of boots by machinery; and though he started under the disadvantage of having to compete with the large stocks then on hand, and continuous importations, he has gradually made his way, until now he finds employment for 150 hands in the tannery and the boot and harness shops, and produces on an average 1,500 pairs of boots of all kinds per week, besides saddlery and harness. Both Mr. Vickery and Mr. Alderson have been exhibitors at the different Exhibitions at London, Dublin, and Paris, and have received medals from each. Mr. E. Vickery, of Pitt-street, carries on the oldest establishment in Sydney in this branch of trade, the business having been established by the father of the present proprietor, as far back as 1833. Mr. Vickery came into the business several years prior to the gold discovery, and was then the largest maker of boots in the Colony. When manufactures were thrown out of gear by the gold discovery, Mr. E. Vickery became a large importer of boots and shoes. When machinery began to be employed in Sydney, Mr. E. Vickery was the largest

importer in this branch in the city, but as the manufacture began to make headway, he had to enter into it in order to keep his trade connection. He has by far the finest and most complete set of boot-making machinery in the Colony, but, as he manufactures only for his trade connection, the production is not so large as that of the two firms before mentioned. He employs fifty-three hands, and produces annually 36,000 pairs of boots, principally heavy. Besides this, he takes in from small masters about 1,000 pairs per month. Wright, Davenport, & Co., of Brickfield Hill, have their tannery at Marrickville. The boot-closing firm of Hibbert & Wright was merged into this business about eighteen months since, at which time it was producing about 3,000 pairs of uppers weekly. The present firm has gone very extensively into every branch of the trade, and now gives employment to nearly 300 hands. In their tannery they work in weekly about 150 hides, besides skin; and their production of boots of all kinds is about 3,000 pairs per week. Besides their country trade they do a large export business with Melbourne. Mr. Ellison, of the Botany Road, employs about eighty hands, and produces about 1,500 pairs of all kinds every week. His business is more particularly confined to the supplying of sorts to retail-shops, thus enabling small shopkeepers to carry on business without keeping on hand the large stocks heretofore required. Mr. Dadswell, of King-street, employs seventy hands, and produces about 1,000 pairs of boots per week, principally of the heavier kind, for country use. He does a large trade with the interior, and also with Melbourne. Mr. Tebbatt, of Woolloomooloo, is engaged in boot manufacture only, and employs about forty hands, producing about 800 pairs per week. Mr. Griffiths, of Waterloo, employs some thirty hands, and manufactures on an average 600 pairs per week. Mr. Dryhurst, also of Waterloo, adds some 400 pairs a week to our production, and employs twenty hands. Mr. Forsyth, of Parramatta-street, manufactures weekly some 800 pairs, principally women and children's, and employs twenty hands. Besides these there are some few smaller manufacturers, and several firms engaged in the single business of boot-closing. The latter employ from ten to twenty hands, and turn out from 500 to 1,000 pairs of uppers per week. The weekly production of boots from the Sydney factories is roughly estimated at about 15,000 pairs.

The tannery of Saddington & Sons at South Creek is one of the most extensive establishments of the kind in the Colony. It employs forty-eight hands, and works in on the average about 350 hides per week, exclusive of skins. This firm has imported and disposed of several complete riveting plants, nearly the whole of which have gone into the interior. Mr. Beg, of the Glenmore tannery, South Head Road, works in about 150 hides per week,

principally of the heavier kinds, and employs seventeen hands. The total number of tanneries in the Colony at the end of 1869 is given by the Registrar General at 116. Of these, sixteen are in the metropolitan district; fourteen in the pastoral districts; ten at Windsor; Bathurst and Goulburn have each seven; Berrima, Camden, Liverpool, and Penrith, have five each; Braidwood and Mudgee have four each; Campbelltown, Dungog, Kiama, Parramatta, and Wollongong, have three each; Hartley, Maitland, Port Macquarie, Queanbeyan, Shoalhaven, and Yass, have two each; and Burrowa, Dowling, Manning River, Newcastle, Orange, Patrick's Plains, and Port Stephens, have one each.

WOOLLEN MANUFACTURES.

This particular branch of manufacture has suffered considerably by the death of Mr. O. B. Ebsworth, who with that energy and enterprise which so strongly characterized him, had brought his tweed mills in the course of four or five years to a remarkable degree of excellence and efficiency. The return of the Registrar General of the cloth manufactured during the last five years is:—1865, with four factories working, 145,707 yards; 1866, with four factories, 172,720 yards; 1867, with five factories, 175,348 yards; 1868, with five factories, 227,464 yards; and 1869, with seven factories, 233,904 yards.

Ebsworth's tweed factory, in Sussex-street, possesses probably the finest plant of yarn-making and weaving machinery out of England. This has only been lately brought fully into work, and its producing power has not yet been taken into account. It is estimated, however, that the production of tweed will be, at the very least, 3,000 yards per week, or, in round numbers, 150,000 yards per annum. The number of hands employed is about 104 and the production of this establishment for the last three years has been:—1867, 73,776 yards; 1868, 91,633 yards; 1869, 90,822 yards,—the falling off being attributable to the alteration then going on for the purpose of making available the then newly-imported machinery.

The tweed-mills of the Messrs. Byrnes, at Parramatta, give employment to sixty-two hands, and produce weekly about 1,500 yards. The mills of the Messrs. French, also at Parramatta, have only been started within the last twelve months, and are very complete in every respect, Mr. French, senr., being one of the oldest tweed-makers in the Colony. Mr. Rayner, of Emu Plains, has been long connected with the tweed manufacture of the Colony, and started the Regentville factory about the year 1836, in conjunction with the late Sir John Jamieson. He employs thirty hands, and produces weekly an average of 500 yards of tweed. The tweed factory of Mr. Andrew Brown, at Coerwall, near Bowenfells, conducted by Mr. French, jun., gives employment to nineteen

hands, and produces 300 yards per week. There is a factory in the Hartley district, and the old Regentville factory, on the banks of the Nepean, near Penrith, is still in operation.

TALLOW.

The manufacture of soap and candles has long been carried on in the Colony, but it has not grown with the increase of the population. This has been owing to the facility with which soap can now be made by the use of caustic soda—thus depriving the trade of the greater part of the export it once enjoyed. As regards candles, the general use of kerosene, and the cheap price at which sperm and stearine candles are imported, have reduced the demand for ordinary tallow candles to a minimum, and the trade has consequently fallen off to less than a fourth of what it was ten years ago.

The total number of soap and candle manufactories in the Colony at the end of 1869 is given in the Statistical Register at twenty-seven. Of these, twelve are in the metropolitan, six in the pastoral districts, two at Newcastle, and one each at Bathurst, Goulburn, Maitland, Mudgee, Orange, Parramatta, and Port Macquarie. The produce from these during 1869 was—Soap 73,943 cwt., and candles 15,568 cwt. In 1860, the quantity produced during the year from thirty-six factories was—Soap 57,080 cwt., and candles 35,485 cwt. In 1865, the produce of twenty-seven factories was 71,869 cwt. of soap and 23,909 cwt. of candles.

The factory of Cowan and Israel, at Johnston's Bay, employs twelve hands, and turns out an average of 15 tons of soap weekly. Two of the hands are engaged in the manufacture of scented soap, which is turned out from this establishment in a very superior manner. Caraher's soap and candle works at Camperdown employs six hands upon the soap and four upon the candle-making. The average weekly manufacture of soap is about 12 tons, and of candles 2 tons. Allen Brothers, of Waverley, turn out about 6 tons of soap weekly, and a small quantity of candles, whenever the market is open for them. Mr. S. Dickson, of Waverley, is the representative of the oldest soap-boiling establishment in Sydney, and at present turns out weekly 4 tons of soap and 25 cwt. of candles, by the aid of four men. Mr. Mulcahey, of the Botany Road, employs a similar number of hands, and sends into the market weekly 4 tons of soap and 20 cwt. of candles.

BUILDING, &c.

The Statistical Register for 1869 gives the total number of brickyards in the Colony at 222. Of these, 171 are in the settled, and fifty-one in the pastoral districts. Of the former, fifty-seven are in the metropolitan, and twenty-two in the Bathurst district. Amongst the metropolitan brickyards there are several which

manufacture bricks by machinery, and give them additional solidity by the application of pressure. Very many of them employ pugmills.

The number of potteries is given at seventeen. Of these, seven are in the metropolitan district, three in the pastoral districts, two each at Bathurst, Newcastle, and Parramatta; and one at Orange. Ten years ago the total number in the Colony was only six, and these were situated exclusively in Sydney. The principal pottery and drain-pipe factory in Sydney is that of Mr. Fowler at Camperdown. It employs sixty hands, has seven kilns constantly at work, with three others lately completed, and employs machinery worked by a 12-horse-power engine. The chief articles produced are drain-pipes and fireclay bricks. For the former there is a large demand, not only in the Colony but for exportation. Goodlet and Smith's pottery-works at Surry Hills employ twenty-four hands, and keep three large kilns going, others being in course of construction in connection with a fine plant of drain-pipe-making machinery upon the latest principle adopted in England. The building for the reception of this plant is only just completed, and will be worked by a 20-horse-power engine, recently constructed by Chapman Brothers. These works are solely confined to the production of drain-pipes and articles required in the building trade. Field's pottery in George-street South has been established since 1838, and produces a large assortment of almost every article of pottery-ware, though perhaps the bulk of the business is taken up by drain-pipe-making. It employs thirteen hands, has one kiln, and employs no steam power. Mr. Holroyd's, Sherwood pottery, near Parramatta, is strictly an agricultural pottery establishment; but it produces, besides agricultural drain-pipes, tiles, pan, flat, and flooring. It employs nine hands, and has a demand for its production sufficient to justify an increase in the amount of labour employed.

Of tile-works there were four at the end of 1869, all in the metropolitan district. The chief of these is the Australian Patent Tile Company, at Enmore, where the handsome grooved Italian tiles are manufactured. These have come much into use within the last two or three years. The Company employ about twenty-four hands—twelve in the manufacture and twelve in the roofing.

Encaustic tiles for pavements are manufactured at the factory of Angelo Tornaghi & Co., at Enfield, Liverpool Road, and are said to be equal to, and far cheaper than, those imported. The Government have already recognized this new industry, and have had several orders executed by the manufacturers,—the floor of the entrance-hall at Government House, the floors of the Mortuary-buildings, at Redfern and Haslem's Creek Cemetery, and the entrance-hall of the Government Printing Office, having been laid with them, under the inspection and superintendence of the

Colonial Architect. These tiles exhibit great beauty of design, and an exquisite delicacy and harmony of colour, and obtained the first prizes at the Intercolonial Exhibitions held in Sydney in the years 1869 and 1870.

There are eighty-three saw-mills given in the Statistical Register as working in the Colony in 1869. Of these, twenty-six are in the metropolitan districts; twenty-two in the pastoral districts; five each at Port Stephens; four each at Bathurst and Braidwood; two each at Brisbane Water, Broulee, Newcastle, Orange, and Shoalhaven; and one each at Berrima, Camden, Kiama, Liverpool, Maitland, Manning River, Mudgee, Parramatta, Wellington, and Wollongong. Of the metropolitan saw-mills, that of Mr. Chadwick, in Liverpool-street, employs seventy hands, and cuts about 100,000 feet of timber per week; it has also a splendid plant of machinery for the manufacture of doors, sashes, &c., as well as for fencing, tonguing and grooving, &c. That of Goodlet and Smith, of George and Erskine streets, employs fifty-one hands, and cuts about 50,000 feet per week. This establishment also has a complete plant for making doors and sashes, as well as for performing the other work of the mills. Seamer and Robertson, of Dowling-street and Bathurst-street, cut about 50,000 feet a week, and have also a complete plant for door and sash making, &c. Hudson Brothers, of the Botany Road, employ about sixty hands, and possess all the most recent machinery for the manufacture of house-work of every kind, having recently imported one or two of the latest American patents. Mr. Booth, of Sussex-street and Balmain, employs sixty hands, cuts about 60,000 feet a week, and turns out also a very large amount of turnery for upholstery work. He has also an establishment on the Manning River, where about 30,000 feet are cut per week. The principal timber cut is the cedar, from the Manning, Macleay, and other northern rivers; blue-gum, principally from Brisbane Water; black-butt, from Brisbane Water, Port Stephens, and the northern rivers; grey ironbark, chiefly from Brisbane Water; and pine, from the Clarence, Richmond, and Tweed Rivers, and Wide Bay. The whole of the mills above enumerated are worked by steam-power, which is applied also to the joinery and other machinery. It may be mentioned also that the use of the pine from the northern rivers has now become very general; and that it has almost entirely superseded the American in our market.

COACH AND WAGGON FACTORIES.

The number of coach and waggon manufactories in the Colony at the close of 1869 is given in the Statistical Register at eighty-three. Of these, twenty-seven are in the metropolitan district; twelve in Maitland; seven in the pastoral districts; five in Parramatta; four in Bathurst; three each in Braidwood, Goulburn, Muswellbrook, Orange, and Port Stephens; two each in Kiama,

Penrith, Windsor, and Wollongong; and one each in Carcoar, Liverpool, Mudgee, Newcastle, and Raymond Terrace. The chief coach and carriage factories in Sydney are those of Mr. Robertson, which employs about forty hands; O'Brien, Kerridge, and M'Kay, employing twenty hands; Mr. Vickers, employing eighteen hands; Halley and Clyde, employing sixteen hands; Mr. Vial, employing fifteen hands; Mr. Angus, employing fifteen hands; and Mr. Moore, employing fourteen hands. The principal timber used is cut to order specially for the trade, and consists of mountain-ash, beef-wood, beech, light-wood, spotted-gum, blue-gum, iron-bark, cedar, and pine. All these are Colonial woods; but some American woods, such as hickory, &c., are imported to execute orders for persons who prefer these woods to the Colonial, though this is not often the case, our mountain-ash and beech having all the lightness and toughness of the best American woods.

OTHER MANUFACTURES.

The Registrar General gives the number of tobacco factories in the Colony at the end of 1869 at thirty-six. Of these, nine are at the Paterson, seven each in Maitland and Dungog, six in the metropolis, four at the Manning, and one each at Brisbane Water, Port Macquarie, and Port Stephens. The total quantity manufactured was in the year above-mentioned 8,927 cwt. Of this, 2,752 cwt. were manufactured in Sydney, and this is the only locality in which the imported leaf is taken into manufacture, although even here a large proportion is Colonial leaf. In 1860 the total number of establishments was only eight, whilst the quantity manufactured was 1,697 cwt.

Of wine-presses, there were at the end of 1869 a total of 154, of which ninety-nine were in the settled, and fifty-five in the pastoral districts. Of those in the settled districts, Maitland possesses fifteen; Camden, fourteen; Broulee and Penrith, ten each; Raymond Terrace, seven; Parramatta and Port Macquarie, six each; Windsor, five; Liverpool and Muswellbrook, three each; Bathurst, Campbelltown, the Manning, Mudgee, and Murrurundi, two each; and Berrima and Wellington, one each. In the pastoral districts the largest number, fifty-one, are in the Murrumbidgee District, forty-four of that number being at Albury. In 1864 the number was given at 1 only; in 1865 it was 96; in 1866 it was 116; in 1867 it was 122; and in 1868 it was 149.

The number of sugar factories at the end of 1869 is given in the Statistical Register at twenty-one,—twelve being in the settled, and nine in the pastoral, districts. In the former, five are at Port Macquarie, four at the Manning, two at Brisbane Water, and one at Kiama; in the latter, four are in the Clarence and five in the Macleay district. The first mention of sugar factories is made in 1864, when the number is given at one only.

The number of boiling-down establishments in the Colony was, at the end of 1869, forty-eight,—ten being in the pastoral and thirty-eight in the settled districts. Of the latter, twenty-five were in the Metropolitan and five in the Maitland districts.

Of distilleries there are thirty in the Colony,—twenty-eight being in the settled, and two in the pastoral districts; and of sugar refineries there are two, both working in the metropolis. The total number of mills for grain at the end of 1869 was 183, of which 151 were worked by steam, fourteen by water, ten by wind, and eight by horse power. Of the total number, 140 were in the settled and forty-three in the pastoral districts. There were in the same year twenty-one breweries, fourteen being in the settled and seven being in the pastoral districts; five of the former number being carried on in the metropolis. There were also two glass and eight hat manufactories carried on in the metropolis.

Trade and Commerce.

THE position of New South Wales in the Australasian group of Colonies is one of special importance. Sydney, the metropolis of the Colony, is situated on the waters of Port Jackson—a harbour which, for ease and safety of access, for capacity, for depth of water, for shelter, and for all the conveniences in which shipping rejoices, ranks with the finest harbours in the world. In its commercial advantages it enjoys an undisputed and indisputable pre-eminence in these seas. There are two or three other fine harbours on the coast, but they are as yet unavailable as sites for great cities. Sydney alone combines the double functions of a great metropolis and a great seaport. It therefore draws to itself, as to a centre, most of the coasting-trade of the eastern shore of Australia, and is also the rendezvous of the trade of Southern Polynesia, in addition to possessing a share of the trade of New Zealand. The shipowners of Sydney possess about 600 vessels, and employ about 3,500 men. The extensive coal-fields, which are already opened to a large extent to the north and to the south of Sydney, furnish an article of export to vessels bound to foreign parts, so that few now go away in ballast. Indeed, all the pastoral products of the country—wool, tallow, hides, horns, &c.—go to England as the best market; but Australian coal is everywhere in demand, as its excellent quality, both for gas and steam purposes, is now well recognized. Shipments are made to the Mauritius, Bombay, Ceylon, Calcutta, Singapore, Batavia, Manilla, Chinese ports, California, Panama, and Valparaiso. This export of coal gives to the foreign and intercolonial trade of New South Wales a special character which attaches to that of none of the other Colonies.

One of the first results of the Border Customs treaty between New South Wales and Victoria was the stoppage of the collection of the statistics connected with the intercolonial trade carried on with our southern and south-western districts. The Statistical Register is a very trustworthy publication. Its figures represent facts, as far as official research can obtain them ; but, for the reason stated, the registers for 1867 and 1868 are, as records of the trade and commerce of this Colony, far from reliable. Neither do the official records of Victoria or South Australia enable us to ascertain how much of the wool of this Colony finds its way to Melbourne for shipment to England. The returns compiled by the Registrar General of Victoria present, however, some remarkable figures, for they represent that Colony in 1868 as possessing 9,756,819 sheep, and to have exported 68,010,591 lbs. of wool, valued at £4,254,511, of which £312,671 is said to be the value of all other than Victorian produce. The Statistical Register of New South Wales states that in the same year we possessed 13,909,574 sheep, but only exported 21,708,902 lbs. of wool. What became of at least 20,000,000 lbs., raised in that portion of the Colony contiguous to the rivers Murray and Darling? If it reached Melbourne its value must have been five times the amount at which our neighbours have valued their imports of wool.

Latterly, records have been kept of the imports and exports of the various towns along the Murray, and these documents are now available. By their aid we hope to be able to prove that the trade and commerce of New South Wales is more extensive than is generally supposed, and that our position deserves more favourable recognition from the English Press than it is wont to receive. In taking a retrospective glance at our trade and commerce during two decennial periods, we start from a date well suited for the purpose. 1850 was the year preceding the discovery of gold in Australia, and the separation of Victoria from New South Wales. The wealth of the Colony was then entirely pastoral, and upon it mainly depended the welfare of 265,503 persons, by whom, what now forms three Colonies was then populated. The production of wool increasing with unprecedented rapidity, had trebled itself in about seven years, and in 1850 32,361,829 lbs., representing the clip of 13,059,324 sheep, was shipped to England. 10,893 tons of tallow, and oil, to the value of £29,368, also formed large items in our exports, the total value of which was estimated at £2,399,580, against imports worth £2,078,338. The Government returns for the year following show that, by the establishment of the district of Port Phillip into a separate Colony, the population of New South Wales was reduced to 197,168 ; and as there is a reduction of some 5,000,000 in the number of sheep belonging to this Colony, it is only reasonable to suppose that they were located beyond the Murray,

leaving over 7,000,000 in this Colony, and what is now known as Queensland. After 1851 gold soon appears as an important product, and 144,120 ozs., together with coal, valued at £12,027, help to swell our exports to £1,796,912, or £233,000 in excess of the imports. In 1853 the value of our gold exports alone reached £2,660,946, and resulted in immense quantities of goods being shipped here, so that the imports for the twelve months more than trebled those of the preceding year. It was not a wish for any unhealthy expansion of our imports on the part of our merchants that caused their value to rise from £9 4s. per head in 1852 to £27 10s. per head in 1853. Then, as well as now, shipments were recklessly made to the Australian markets without any regard to actual trade requirements. For a short time nothing was thought of but the gold diggings, to the injury of all other industries. In wool alone there was a decrease of over 4,000,000 lbs., and the aggregate exports fell short of the value of the imports by £1,819,051. The sudden falling-off which took place in the yield of the gold-fields during 1854 tended to divert attention to more permanent sources of wealth. Large purchases of land were made from the Crown, and the production of grain was engaged in on a more extensive scale than at any previous period in the history of the Colony. The coal deposits also attracted more attention, and for the first time over 100,000 tons were raised in the year. During 1855 and 1856 the production of gold steadily decreased, and the agricultural and pastoral interests profited by the reaction. In the latter year the total value of exports was £3,430,880, of which gold represented only £138,007. The improvement which took place in the gold-fields in 1857 and following year again had an unsettling effect; and during that time there was a marked falling off in the export value of other products, and a corresponding increase in our import trade. We received goods to the extent of £6,059,366, against exports representing £4,186,277. The separation of Queensland in 1859 does not seem to have had much effect upon our foreign trade. The interests of the new Colony were as yet too closely allied to New South Wales to be severed at a moment's notice by political changes, and for some years after, the trade of Queensland was entirely in the hands of Sydney merchants. The first decennial period closed with the following results, irrespective of any changes caused by the dismemberment of the Colony:—There was an increase in population of 71,069; in the production of coal, of 226,999 tons; in gold, of 435,995 ozs.; in wool, an apparent decrease of 15,373,813 lbs., owing to the absence of reliable statistics showing how much left the Colony. In the year 1860 the results of our trading with the Mother-country left a debit balance of £2,677,590, as we received goods to the amount of £4,160,307, and returned produce valued at £1,482,717. The imports from

British Colonies were valued at £1,994,947, against exports worth £3,066,021,—an excess of £1,071,074. From foreign countries the imports were to the extent of £1,364,031, and exports thence £523,282. With a population of 348,546, we imported £7,519,285 worth of merchandise, and exported goods valued at £5,072,020. What was then called our foreign export trade, aggregating £523,282, was for the most part a fiction, inasmuch as £331,729 represented gold, &c., shipped to Suez and Aden *en route* for England; about £100,000 more was for exports to New Caledonia, South Sea Islands, and California. China, and other countries largely indebted to the Colonies as opening a new market for the disposal of produce, took nothing in exchange save cash, and Australian coal was as yet unheard of in Eastern ports. In 1862 the production of gold improved very much, and a remarkable increase took place in our imports, the total value being £3,000,000 sterling in excess of those of the preceding year. Up to 1863 the collection of statistics connected with our border trade was not kept up very accurately; but during the three subsequent years great care was displayed in their compilation on account of the collection of border Customs from Victoria and South Australia. It was found that in 1865, the population being 411,388, our imports amounted to £10,635,507, or £26 8s. per head, and our exports to £9,563,818, or a fraction over £23 15s. per head. Then followed the crisis which affected the commerce of the old world during 1866, and extended its influence to Australia, causing a decrease in our import trade to the amount of £1,232,315, while our exports rose to £9,913,839,—an increase of £350,000 on the preceding year. Without taking into account any other produce than that of New South Wales, the export of wool reached 36,980,685 lbs.; tallow, 27,726 cwt.; gold, 2,924,891 ozs.; coal, 540,905 tons. The effects of the crisis were chiefly exhibited by the stoppage of retail houses, and no stronger proof can be adduced of the stability of the larger mercantile firms of this city than that none of them succumbed to the pressure of the time. They made losses, and heavy ones, such as a community trading upon the mere profits of the day could not have withstood. Reference has been already made to the reason why nothing can be adduced from the returns of 1867-8, as they merely exhibit a portion of the statistics of trade. It is, however, satisfactory to be able to state that the lessons taught by the previous crisis were not lost—greater caution was exhibited, speculative transactions carefully avoided, and confidence speedily restored. In reviewing the present position of the trade and commerce, it is assumed that it is now neither better nor worse than at the close of 1869, and to that date the statements given can be verified by official documents. Within the year ending 31st December last there were imported

into New South Wales goods to the value of £8,392,753, of which £3,544,285 was for imports from the United Kingdom, £1,076,014 from Victoria (£581,159 being in overland trade), £523,344 from South Australia, £1,473,008 from Queensland,—and sundry shipments from other British Colonies swelled the amount to £3,919,092. From foreign States the imports were £929,376. In exchange for these, we exported to Great Britain produce, &c., valued at £3,267,019; to Victoria, £2,825,393; South Australia, £286,868; other British possessions, £3,245,290; foreign States, £308,872,—making a total of £9,933,442, or £1,540,689 in excess of the amount of imports. Amongst the exports wool assumes the highest place. 63,000,000 lbs. were exported; but as about 12,000,000 lbs. was the produce of Queensland, credit is only taken for 51,269,672 lbs.; of this, 29,938,837 lbs., valued at £1,762,912, were shipped from this port; and 21,330,835 lbs., worth £1,399,610, left the Colony overland, chiefly for Victoria. The total export of gold consisted of coin to the amount of £2,184,612; bars, £416,570; dust, £161,690: total, £2,762,872;—towards which New South Wales contributed £2,489,145. From the port of Sydney alone there was shipped to London during last year 118,381 bales 84 pockets of wool, 56,829 hides, 19,314 casks tallow, 6,737 casks oil, 3,183 bales of cotton, 39,609 cwt. copper, 2,365 cwt. copper-ore, 2,011 packages unmanufactured leather, 794 tons molasses, 5,600 lbs. pearl shell, 2,856 lbs. tortoise-shell, 9,779 packages preserved meat, 11½ tons preserved beef and sundries. Our coal-mines are being steadily worked, and, as an article of commerce, Australian coal has already established for itself a favourable character in India, China, and along the west coast of North and South America, thereby enabling ships which otherwise would have to leave our ports in ballast to earn remunerative freights. Seventeen years ago the total quantity of coal raised in Australia was only 96,809 tons. In 1869, 919,774 tons were raised, and 535,046 exported. San Francisco alone took 68,653 tons; Shanghai, 55,917; Calcutta, 13,290; Hong Kong, 12,655; while smaller quantities found their way to Mauritius, Bombay, Galle, Singapore, Java, Manilla, Foochow, Petropaulovski, Japan, Mexico, Callao, Valparaiso, &c. In other respects our commercial relations with foreign ports are yearly assuming larger proportions. The total value of exports to Hong Kong during 1869 was £45,543; to Mauritius, £47,499; to Calcutta, £11,894; to the South Sea Islands, £102,053; to New Caledonia, £46,493. The following exports are worthy of mention:—Maize, 1,096,373 bushels; barley and oats, 22,127 bushels; flour and bran, 5,034,800 lbs.; butter and cheese, 1,066,240 lbs., value, £40,844; timber, £23,159; salt meat, £47,002. Irrespective of the numerous steamers and sailing-vessels engaged in the coasting-trade, 2,022 vessels, aggre-

gating 741,369 tons, entered inwards during 1869. Of these, 1,169 brought cargoes; the remainder were in ballast. The entries outwards show that of 2,236 vessels (8,332,848 tons) which cleared outwards, only 98 vessels (30,147 tons) left without cargoes. Though a large portion of the foreign-carrying trade is done by vessels not owned in the Colony, a fair share is done by vessels belonging to New South Wales. Some twenty full-rigged-ships are registered in this port, besides a large number of barques and smaller vessels, many of which are engaged in foreign trade. Since 1860, 280 vessels (22,108 tons) were built, and 785 vessels (120,557 tons) were registered in the Colony. Our steam fleet maintains an unbroken mail service, extending along the coast from King George's Sound, in Western Australia, on the one hand, and to Cardwell, in Northern Queensland, on the other—a distance of some 3,500 miles. Besides this, the trans-pacific mail route has been recently opened,—two-thirds of the service being performed by our own steamers, the remaining portion by American steamers. One result of this line has been the establishment of commercial relations with the Sandwich Islands, the produce, of which, in the shape of sugar, rice, coffee, and pulse, has been forwarded to this market. There are good hopes that the day is not far distant when the large sums of money annually sent to foreign countries for sugar will be retained here, and that the sugar-planters in the northern districts will be handsomely rewarded for the capital they are expending in this new industry. This is not the only direction from which a reduction in the value of our imports may be expected. Local manufacturers are daily becoming more numerous, and will help to bring about a like result.

The heaviest operations carried on at the Sydney Branch of the Royal Mint since its establishment occurred in 1866, when 739,362·930 ozs. gold were received for coinage; in 1867 the receipts were 629,721·990 ozs.; in 1868, 603,866·840 ozs. During the year large quantities of bullion were received from New Zealand, and, after being coined, were exported to England, or returned to New Zealand. These imports having almost entirely ceased will account for the apparent decrease which occurred during 1869. The amount received for coinage in that period was only 346,003·940 ozs., valued at £1,323,487 8s. 3d. The quantity of coin issued, 1,202,000 sovereigns, 154,000 half-sovereigns; total value,—£1,279,000. Of the receipts, 179,549 ozs. were the produce of our own gold-fields, 97,469 ozs. were from Queensland, 64,698 ozs. from New Zealand, and 203 ozs. from Victoria. The balance consisted of foreign coins which were received in the shape of English currency.

With reference to financial affairs, we find by the sworn returns, which by law are required to be made every quarter, that on the

30th June, 1869, ten banking institutions in Sydney held deposits to the amount of over £7,000,000 sterling, and the Savings' Bank returns swell the aggregate to £8,000,000, or more than £16 per head of the population. This in itself is a convincing proof of the wealth of the Colony; but, irrespective of this, there is another fact worthy of mention; the Colonies of Queensland and New Zealand have both recently negotiated loans in this market, thereby withdrawing another half a million from the local banks.

Railways.

THE rapid progress which the Colony has made during the past fifteen years is perhaps nowhere more apparent than in the improvement which has taken place in the means of transit between the interior and the seaboard. It is impossible to travel on any of our principal lines of communication without observing works of great magnitude and importance, significant of our energy, wealth, and civilization. Our railways especially may be regarded as some proof of the enterprise of the colonists, and indicative of the existence of resources capable of furnishing employment and wealth to millions. In order to connect the seaboard with the fertile lands of the interior, wide rivers have been spanned by bridges, while to get to the Western district 50 or 60 miles of the Blue Mountains have been cut down, tunnelled, and zig-zagged for about 3 miles to form the railroad.

The railway to Goulburn was projected as early as January, 1846, and a few years later a company was started with a capital of £100,000 to construct it. The first turf was turned on the 3rd of July, 1850, but the discovery of gold in the following year enhanced the price of labour, and interposed other obstacles which proved insurmountable. In 1855 the company's property passed by purchase to the Government, as also did the property of a second company, which, starting in 1853, had commenced the formation of a railway between Newcastle and West Maitland. The first length of railway opened for traffic in the Colony was that from Sydney to Parramatta (14 miles). It was opened in September, 1855. Its construction cost more than six times as much as the shareholders estimated would be sufficient to complete the whole 134 miles to Goulburn; and it has since had to be relaid at a further cost of from £60,000 to £70,000, the total cost per mile not being less than £50,000.

The line from Sydney to Parramatta is a double line; but on all the other railways, though land has been secured for a double way, a single line only has as yet been constructed. The Great Northern Line for $4\frac{1}{2}$ miles from Newcastle to Wallsend junction is a double line. The gauge is 4 feet $8\frac{1}{2}$ inches, and the double-headed 75-lb. rail is used throughout.

The Great Southern Line to Picton (53 miles from Sydney) passes through country which has long been under cultivation, and in which most of the pursuits of agriculture and horticulture are successfully carried on. At Mittagong (77 miles) rich and extensive deposits of iron and coal exist in close proximity to the railway, and some of the soil of the district is singularly fertile. Indeed, with some exceptions, it may be said that good arable land occurs nearly all the way to Marulan (114 miles); where excellent marble is found. Goulburn, and much of the country through which the line runs, possesses a mild and salubrious climate—in which English fruits, vegetables, wheat, and other cereals thrive luxuriantly. The principal traffic from Goulburn to Sydney consists of wool, grain, and live stock; but when the line is extended to Yass (50 miles further south), the copper, lead, and other ores which are to be found in that district, will be brought by rail to the capital.

The cost of railways has been largely increased by the enormous viaducts which have been constructed over rivers liable to floods. In heavy rains these rivers are swollen to a height of from 40 to 50 feet above the ordinary level, and the torrent carrying with it masses of drift timber, sweeps down to the sea with terrific force. These floods necessitate the construction of bridges of great solidity and strength. Structures of this character are very numerous, and two of them, which take the Southern and Western lines across the Nepean, have cost more than £200,000. That at Menangle is 1,909 feet long, and contains 5,909 cubic yards of masonry, 1,089 cubic yards of brick, and 936 tons of iron. There are some very heavy cuttings on this (the Southern line) through sandstone rock, besides the Gibraltar tunnel, which is 572 yards long. Near Goulburn—Barber's, Boxer's, and Mulwarree Creeks, and the Wollondilly River, are crossed by five railway bridges, having stone or brick piers and abutments and superstructures of wrought iron. Their aggregate length is 2,637 feet. The summit of the line is 2,140 feet above high-water at Sydney, and for 3 continuous miles the gradients are 1 in 30. The total expenditure on the Southern line, from Parramatta junction to Goulburn, exclusive of rolling-stock, up to 30th June, 1870, was £1,691,671, averaging about £13,000 per mile.

The Great Northern was the next line projected. It starts from Newcastle, a commodious harbour about 60 miles north of Sydney, and is for the first $4\frac{1}{2}$ miles a double line. In the first portion of its course it passes over coal-fields of great extent and value, the produce of which is taken by rail to Newcastle. Before the formation of the railway there were only two coal-mines worked, the coal being brought to Newcastle from one mine on a horse-tramway, and from the other by carts and wheelbarrows. Now, however, there are numerous mines at work, and the coal-

trade of the Colony has been developed by means of this railway with extraordinary rapidity. The quantity of coal brought to Newcastle by rail in 1861 was 44,913 tons, and the quantity carried in 1869 was 546,939 tons. In nearly its whole length the Great Northern Railway intersects a fine agricultural and grazing country. Coal, wine, maize, lucerne, and barley are among its chief productions. The pasturage is very luxuriant, and some of our best cattle and horses come from that district. Population is settled chiefly in and around Maitland, Singleton, and Muscleshbrook, which are large towns in the centre of agricultural districts being 20, 50, and 80 miles respectively from the seaboard. The line runs up the valley of the Hunter for the first 80 miles, and the principal engineering work on it is the bridge at Singleton. It has five openings of 80 feet each, and two of 15 feet each. The piers and abutments are built in ashlar masonry, set in Portland cement and the superstructure is of ironbark timber. The length of the bridge is 523 feet, the maximum height from foundations to rail-level is 80 feet, and the width between the parapets is 27 feet 6 inches. It cost £51,300. Another large bridge is now being built over the Hunter at Aberdeen (87 miles). This structure is of iron throughout. The cost of the Northern line to Muscleshbrook (80 miles) was £1,046,534, or £13,081 per mile. The line is completed to Aberdeen, and the construction of 32 additional miles (to Murrurundi) is now in hand.

The Great Western line is finished to Rydal (111 miles from Sydney) and it will probably be completed to within 4 miles of Bathurst by the end of 1871. From Parramatta Junction to Penrith the line passes by orangeries, vineyards, and homesteads; but with the exception of a mile or two westward of Penrith the country is unsuitable for agricultural purposes until the Bathurst Plains are reached. The railway and the Great Western Road are taken over the Nepean at Penrith by a viaduct consisting of three openings, each 186 feet in the clear, and the piers, four in number, are built in ashlar masonry, set in Portland cement, carried down 6 feet below the ordinary bed of the river, where they rest on foundations of hard shale. The bridge is 612 feet long, exclusive of the iron and timber approaches on each side of the river, which also are of considerable length. The height from the foundations to the level of the rails is 65 feet, and the width between the main girders is 25 feet 6 inches. The Blue Mountains, which rise abruptly on the west side of the valley of the Nepean, are ascended by a zigzag, on gradients, the steepest of which is 1 in 30. Knapsack Gully viaduct, which occurs before the first reversing station of the Zigzag is reached, has five spans of 50 feet and two of 20 feet. Its total length is 388 feet, and the greatest height from the foundation to the level of the rails is 126 feet. It contains 6,713 cubic yards of masonry, and cost

£22,724. After the line reaches the summit of Lapstone Hill it follows the winding course of the main range, which divides the tributaries of the Nepean and the Cox from those of the Grose, to Mount Victoria. It then runs over the ranges which divide the watershed of the Lett and the Colo from the sources of the Grose. Thus for 60 miles it pursues its tortuous way along the top of mountain ridges, the rails being laid on gradients which ascend from a level of 87 feet at the base of Lapstone Hill, above the sea level, until an elevation of 3,758 feet is gained near the Clarence Tunnel, the distance between the two points being 50 miles. On either side of the line the traveller may look over a vast expanse of mountain country covered with forest timber. The scenery is indescribably wild and grand. The route which the railway takes is the only passable track over the mountains. The timber consists of varieties of the Eucalyptus, and there is a profusion of flowering shrubs. The land, however, is unsuited for cultivation. The air on these mountains is dry and pure, and they are much resorted to by invalids and tourists. In the neighbourhood of Hartley extensive coal and kerosene shale beds occur, and the opening of the railway has greatly assisted the development of the latter. This industry, however, is yet in its infancy, but in the course of a few years it is likely that it will become a very important one. The coal-mines are also about to be worked; but it is thought that the distance from Sydney will prevent the Hartley coal from entering into competition with the mines which lie within a mile or two of the seaboard. On the completion of the Great Western line to Bathurst the Hartley mines will at once be brought into profitable working for the supply of Bathurst and the mining and agricultural townships of the Western District; and on the extension of the line to Orange, 46 miles from Bathurst, where valuable copper-mines exist, smelting operations will probably be commenced, so that, in addition to the coal-trade, a large return traffic in copper-ore may be looked for. After leaving the Lapstone Hill Zigzag the cuttings are almost exclusively through hard sandstone rock, and when the line arrives at a point $88\frac{1}{2}$ miles from Sydney it passes through the Clarence Tunnel, which penetrates the range between Dargan's Creek and Brown's River. The length of the tunnel, which is through rock, is 539 yards, and it is lined throughout with masonry. The Clarence Tunnel is succeeded by the Lithgow Valley Zigzag, by which the line is taken along the face of a precipitous mountain, and thus descends into Lithgow Valley. This Zigzag is the greatest achievement of railway engineering in Australia, and it challenges admiration for its handsome appearance as well as for the stupendous character of the undertaking. This portion of the line has cost from £20,000 to £25,000 per mile. After an elaborate survey, this point was fixed upon as the least difficult for making the descent; but so rugged

was the place then that those engaged upon the survey had to be lowered down the cliffs with ropes to enable them to measure and peg out the line. The jagged front of the mountain was blasted partly by means of electricity. The contractor had to get the waggons and other plant carried up bit by bit, on the backs of his navvies, and then put together again. Two or three gorges on the Zigzag are spanned by viaducts built of white freestone, and one projecting rock is pierced by a tunnel. The first viaduct is 90 miles 47 chains from Sydney. It consists of five spans of 30 feet each and two of 15 feet. All the arches are semi-circular, and their greatest depth about 46 feet. After leaving the first reversing station, two other viaducts on the middle length are met with, each consisting of eight arches of 30 feet span. The tunnel is situated half-way down the descent, and is 75 yards long. The length of the middle descent is 65 chains, or, with the wings, 88 chains. The Zigzag is constructed on a gradient of 1 in 42, and the fall from the Clarence Tunnel to the bottom of the Zigzag, 5 miles, is 687 feet, the elevation of the former above sea-level being 3,658 feet, and of the latter 2,971 feet. Several viaducts occur on the length between Bowenfells and the Mudgee Road Station; the first is at Farmer's Creek, at 97 miles from Sydney, and consists of seven semi-circular stone arches each of 30 feet span, the height from the bed of the creek to the level of the rails being 40 feet; the second viaduct spans the Middle River, and consists of eight semi-circular arches, each of 30 feet span, the height being 54 feet from the bed of the river to the level of the rails. The Morangaroo Tunnel passes under the Mudgee Road at 100½ miles from Sydney. The length of this tunnel is 264 yards, and about half a mile further on it is followed by another short tunnel of about 44 yards.

The cuttings in this neighbourhood are very heavy, and are for the most part through sandstone rock. The line is laid on a gradient of 1 in 40 for about 2 miles on the Sydney side of the River Cox, which is crossed by a splendid stone viaduct, of fourteen segmental arches of 25 feet span, with a rise of 6 feet 6. The central arch over the river is elliptical, of 54 feet span, with 14 feet rise. The foundations are down to the rock, and the work is massive and well proportioned. At 105 miles from Sydney the Wallerawang Station occurs, and this is the outlet for the traffic from Mudgee and the north-western interior. Sheep-farming is there carried on with great success, and the country is rich in minerals.

The extension now in progress between Rydal and Bathurst is 31 miles, and its first length follows the valley of Solitary Creek. Some heavy works will be here required, for within a distance of 10 miles the line crosses Solitary Creek seventeen times. This creek, in periods of heavy rain, becomes wide and rapid, and it is therefore necessary that the bridges should be very substantial

structures. The piers are to be of brick, and several of the superstructures will be iron. The line then runs north of Solitary Creek and the Fish River, until it reaches the Macquarie River. The serpentine course of Solitary Creek, and the numerous spurs from the range of hills on each side, have necessitated very heavy excavations. On reaching the Fish River, and to avoid crossing it, the line is taken along the side of Mount Tarana, at a considerable height above the river. This mountain is so steep that the cutting is upwards of 90 feet deep on one side, and from 4 to 6 feet deep on the other. In the middle of the mountain a gorge occurs, where a retaining wall is to be built on the side next the river, about 40 feet in height, whereas on the upper side the embankment will be only a few feet high. Considering the nature of the country through which the line passes, the curves and gradients are very easy, the sharpest curve being 12 chains radius, and the steepest gradient 1 in 55; a considerable portion has a gradient of 1 in 600. The cost of constructing the Great Western line to Penrith was £293,979; and the estimated cost of the extension from Penrith to Bathurst is £1,600,000, averaging £14,000 per mile, making the total estimated expense £1,893,979.

The railways already constructed in New South Wales are considerably longer than those of any other Australian Colony; and notwithstanding the great engineering difficulties that had to be overcome, their cost has been less. Indeed, considering the nature of the country through which the lines have been taken, we may congratulate ourselves upon having obtained railways which may be classed among the cheapest as well as the best, in the world. The number of miles of railway now completed in New South Wales is 340, and to these must be added 67 miles which will be completed during the next two years if not before. The Southern line has been surveyed and estimate made for its extension as far as Yass (56 miles beyond Goulburn), and the Western line to Orange (47 miles from Bathurst.)

To the 31st of December, 1869, the total amount expended in the construction of the lines was £5,678,954. In November, 1869, the Engineer-in-Chief estimated that the average cost of the Southern line, from Parramatta Junction to Goulburn (121 miles), will be £13,000 per mile; from Parramatta to Bathurst (132 miles), £14,000; and from Newcastle to Murrurundi (120 miles), £11,884 per mile,—including bridges and stations, but exclusive of rolling-stock. The Victorian and Queensland lines have been constructed in a tolerably flat country, and have not involved very many heavy engineering works. For a double line, Victoria has paid £37,000 per mile, while Queensland has paid £15,000 a mile for a single line (3 feet 6 inches gauge, with a 40-lb. rail) from Ipswich to Toowoomba. It may be proper here to mention that with the exception of the line from Sydney to

Parramatta, the whole of the railway works have been designed and constructed under the supervision of Mr. Whitton, who has held the position of Engineer-in-Chief since 1857.

From the opening of the first portion of the railway there has been a steady increase in the traffic. The number of passengers carried in 1869 was 983,063, and the goods traffic amounted to 714,113 tons, the value of which was £155,548. The earnings were £264,974, and the working expenses amounted to £176,362. The first half of 1870 showed an increase on the railway revenue as compared with the corresponding period of 1869, of £25,372, and this notwithstanding an unprecedented succession of heavy floods in all the districts through which the lines run. These disastrous inundations had a very depressing influence on the trade of the Colony, but such is the expansive character of our resources, that calamities of even such great magnitude have been unable to interpose more than a temporary check to the general prosperity. The receipts for the first half of 1869 were £116,198, and for the corresponding period of 1870 £141,570. Our passenger rates are nearly as low as those commonly charged in England, while the tariff for goods is in some instances even lower. In the foregoing remarks a cursory reference has been made to some industries which have received an impetus from railway extension, but the full benefit which must inevitably result from the stimulus which the railway will give to our resources will probably exceed the most sanguine expectations. No better proof of what the railway has already accomplished for comfort and commerce in this Colony can be cited than the simple fact that the time of *transit* between Sydney and Goulburn (134 miles), in 1857, when the railway was only open to Liverpool, occupied from fourteen to twenty-one days, and the cost of carrying a ton of goods ranged from £8 10s. to £16. The time of transit in 1870 is seven hours, and the cost of carrying a ton of goods is as low as 17s. 11d. It must also be borne in mind that while during fair weather it was possible to travel the road in the time named yet, in the wet season teams were as often three months as three weeks upon the road. The number of men permanently employed upon the railways of the Colony is 1,043. It is computed that the traffic now pays a dividend of from 2 to 3 per cent. on a capital of six millions sterling; but by economical management, and with rates equal to those charged in other Colonies, even the present amount of traffic would yield an interest of from 6 to 10 per cent. The rolling-stock on the 31st December, 1869, consisted of 47 locomotives, 218 passenger and other carriages, and 717 waggons, &c., for the goods traffic. Passengers travel with as much comfort as on British lines, the carriages in respect to accommodation having been constructed on the best English models.

Until about a year ago all the rolling-stock required was imported from England; now, with a few trifling exceptions, almost everything is made, and well made, in the Colony. The establishments connected with the Government railways have from the beginning executed repairs which, in the case of some of the locomotives, have been equivalent to the substitution of entirely new engines. Similar transformations have gradually taken place with regard to the other rolling-stock. Several contractors' engines have been made in this city, but the first locomotive for passenger and goods traffic produced in this Colony was built in connection with the Railway Department. Of the fifty locomotives now in the Colony this is the largest and most powerful, and we believe that its performances have proved it to be equal in all respects to the best imported engines, and even to possess some points of superiority over them. In 1869 the Government accepted tenders for the construction of all the rolling-stock which might be required on an estimate of £60,000 a year for five years. The contractors entered into the business with great spirit, and the results already obtained will, it is thought, effectually prevent any further importations from the Mother-country. Messrs. Russell & Co. in March, 1869, opened a factory (268 feet x 75 feet, having an upper as well as a ground floor), which they built expressly for the manufacture of rolling-stock other than locomotives. The factory is replete with every description of requisite machinery, the whole being worked by steam-power. The factory, &c., cost £10,000, but it is understood that since it was opened there have been subsequent importations of machinery, possessing all the latest improvements specially adapted for the work. Since the opening of their new building they have manufactured the following articles:—150 trucks, 11 cattle-wagons, 10 covered goods-vans, 10 carriage-trucks, 10 break-vans, 10 horse-boxes, 1 first-class carriage, and 2 second-class carriages. 295,000 superficial feet of timber (principally colonial), and about 150 tons of iron, also chiefly manufactured in the Colony, have been used in their construction, and £9,250 have been paid in wages to the workmen since March last. About £2,500 have also been expended in the purchase of other material, a large portion of which is of colonial production. Messrs. Mort & Co. and Messrs. Vale & Lacey were the contractors for the locomotives, and these firms have expended many thousands of pounds in the importation and local manufacture of machinery to enable them to carry out their contract with the Government. The first locomotive was completed by Messrs. Mort & Co., and was started on the 13th of August, 1869. The new engine has been thoroughly well built in every part, and is certainly not inferior to any imported. It is expected that by the end of 1871, at least eight Sydney-made locomotives will be running on the various lines.

Roads.

It would be impossible to give an adequate idea of the great extent of the roads of the Colony. There are three main lines, which, from Albury in the south, Armidale in the north, and Wellington in the west, converge in Sydney. Of these the Western Road presents many instances where the early engineering skill of the country was severely tasked. Although the railways run nearly parallel to these main roads, the traffic upon them is still very considerable, and their maintenance demands the constant attention of a highly skilled engineer and an efficient staff. These main roads represent a length of 900 miles; and the roads other than main roads, or, as they are officially known, the minor roads, extend over thousands of miles. Both classes of roads are under the direct supervision of the Government. Besides the roads under the direct control of the Government, there are other roads and portions of roads under the management of Trustees and other local authorities. Over such a large extent of roads there must necessarily be a considerable number of bridges, and some of those constructed by the Roads Department are very extensive and important structures, and have frequently been erected under great difficulties, owing to heavy floods in the numerous rivers throughout the Colony.

Of the iron bridges constructed by the department, the three lattice foot-bridges were all manufactured in the Colony. The cylinder-piers of the Gundagai Bridge were cast in the Colony, chiefly from Australian iron from the Fitzroy mines. The Bathurst Bridge of three spans of 110 ft. on iron cylinder-piers, and the Yass Bridge, one span of 180 ft., were both made throughout in the Colony. The iron-work of the Nimboi Bridge, of three spans of 150-ft. wrought-iron piers, is being proceeded with at Newcastle; and the Urara Bridge, of two spans of 125 ft. each, at the Waterview Dock Works. A large part of the castings and machinery for the Hay Bridge,—of two swing-spans of 59 ft. each and two side-spans of 60 ft. each, all lattice-girders,—was made at Messrs. P. N. Russell & Co.'s.

The Parliamentary grants for Roads and Bridges amounted in 1869 to £191,678.

Telegraphs.

THE first contract for the construction of a telegraphic line from Liverpool to Albury, to connect with the Victorian line to Melbourne, was entered into in 1857. The line was completed in October of the following year, and communication was thus established between New South Wales and the south-western

Colonies. The value of the telegraph was quickly appreciated, for in the first half year of 1859 there were no less than 17,509 messages transmitted, yielding a revenue of £3,876, or more than 16 per cent. on the capital of £25,000 invested. The through-line to Brisbane was completed in November, 1861, but in the meantime our lines had been extended to Newcastle, Bathurst, and other large towns of the Colony. At the present time telegraphic communication is available throughout the entire territory, and, by connection with the lines of the neighbouring Colonies, with every settlement of any importance on the Australian continent and the island of Tasmania. There are two distinct circuits to Victoria and South Australia, and the aggregate number of miles of wire now opened is nearly 5,500.

The lines have been constructed with a view to ensure durability, but, at the same time, with a due regard to economy. The posts are heavy saplings, 12 inches at the base, tapering to 5 or 6 inches at the top. The conducting wire is that known as No. 6, which weighs 560 lbs. to the mile. The insulators are of the best German porcelain. The height of the poles (28 feet) allows of others being reset in the ground when they decay at the base. Tubular iron poles, of elegant pattern, are erected along the southern and western lines of railway. The cost of construction has averaged, according to the locality, from £29 10s. to £34 per mile, which is cheaper than the cost of similar lines in England, France, and America. The telegraphic instruments employed on the main circuits are the Morse recording instruments of the best construction, made by Messrs. Siemens and Halske, of Berlin; and they possess all the latest improvements patented by Digney Frères, of Paris, for marking the tapes with ink. They are well-finished instruments, and experience has proved that they are capable of being worked more expeditiously than any others, while they are at the same time less liable to get out of order.

The practice of insisting on a guarantee of interest from the inhabitants of the more sparsely populated districts who desire the extension of the telegraph, has worked well, and has been the means of preventing the expenditure of public money on lines which might never be self-supporting. The guarantee of 5 per cent. on the cost of construction and working, tends also to induce business which otherwise would not be obtained from the residents who are individually responsible to the Government.

There are eighty-five telegraph stations in the Colony, 142 Morse instruments, and ninety-seven alphabetical instruments, the latter being in use on the railway and private lines. The officers, clerks, and messengers employed number 138, and the number of messages in August, 1870, showed an average of more than 150,000 per annum. The receipts of the department have every year, excepting the first, shown a surplus over working expenses. In

1859 there were 470 miles of wire ; the cost of construction was £23,816 19s. 9d., the number of messages transmitted 36,867, and the net revenue £3,179. At the end of 1869 there were 5,053 miles of line, and the cost of construction was £189,145 ; the number of messages transmitted was 145,370, and the net revenue £4,646. Latterly a great reduction has been made in the rates, and a telegraphic message, not exceeding ten words, can now be sent to a distance of 700 or 800 miles—in fact to any part of the Colony,—for 2s.

The system of constructing branch lines to connect with the nearest Government telegraph station, at an annual rental, has been taken advantage of by several coal companies in the north and south. All the light-houses along the sea-coast are connected with the metropolis, with the exception of that on Gabo Island. The line, however, has been stretched over the main land, and the whole will very shortly be completed. Stations are also established at Clarence Heads, Port Macquarie, Jervis Bay, Moruya, Twofold Bay, and Broken Bay,—at each of which a complete system of telegraphic storm signals has been provided for, upon a plan arranged by the Superintendent of Telegraphs and the Superintendent of Harbours, Lighthouses, and Pilots.

Shipping intelligence is transmitted by telegraph free of charge, and is posted daily in Sydney and other places of importance in each of the Australian Colonies. Arrangements have also been made to enable steamships, by hoisting their signals as they pass the coast stations, to be reported in Sydney, and their arrival in the port can thus be calculated within an hour.

Meteorological observations are transmitted from all the most important stations throughout the Australian Colonies, and are posted daily at the chief telegraph offices of each Colony. The state of the weather can now be ascertained every morning along the eastern and southern coasts of the continent—from Cardwell in Northern Queensland to Port Augusta in South Australia—a distance in round numbers of nearly 3,000 miles. Most of the telegraph stations in this Colony have been supplied with sets of instruments, including rain-gauges, so that more complete meteorological information will in future be obtained.

When the arrangement which the British Australian Company have entered into with the Government of South Australia is completed, for a cable from Singapore to Batavia, and from East Java to Port Darwin, touching at Coepang, there will be a double line across the Australian continent, connecting us with the Anglo-Indian system. The New South Wales line connects with that of Queensland at Maryland, and the Queensland line is already open to Cardwell—a coast settlement on about the 18th parallel of latitude. The Queensland Government is now extending it to Normantown, Gulf of Carpentaria. From Norman-

town a submarine line of about 300 nautical miles will be taken to the Roper River, on the western side of the Gulf; and 400 miles further westward from that point will perfect the communication with the cable across the East Indian Archipelago. The Queensland line will be completed to the Gulf of Carpentaria in 1871. The line by means of which this Colony has communication with Cardwell is working regularly, is not liable to prolonged interruptions, and is supplied with repairing stations at easy distances, which are self-supporting. Another important advantage which the lines of this Colony and Queensland will have over the proposed South Australian line from Port Darwin to Port Augusta is, that they follow generally the direction of the eastern coast of the continent, along which settlement has chiefly taken place, and connecting with the several northern ports the stations can be easily and cheaply supplied with stores. The Queensland line is self-supporting; it can be worked at a much less expense than the South Australian line, and the public therefore will be able to transmit messages at a far lower rate than by the proposed line *viâ* Port Augusta, which will have no intermediate or way business, but must depend entirely on the revenue derivable from the through cable despatches. It is proposed to establish only four stations between Port Darwin and Port Augusta, and these, on the estimated distance of 1,600 miles, will give 400 miles for each line-repairer to take charge of. It is thus not unlikely that their line may be rendered useless for a considerable period during the prevalence of floods or drought.

The Port and City of Sydney.

SYDNEY—once the capital of the Australian Continent, and of New South Wales, when it included Victoria and Queensland—remains the metropolis of New South Wales. Gifted by nature with all the physical requirements of a great city, the emporium of a country profusely endowed with mineral wealth, and rich in pastoral and agricultural resources, our City, the “Queen of the Pacific,” has increased in importance so largely that at the present time she is entitled to take rank among the principal cities of the world. Within easy sail of, and in constant steam communication with, the neighbouring Colonies, Sydney enjoys a regular intercourse with California, the French settlement of New Caledonia, the Fiji Islands, now rising into commercial importance; she has a trade with many other islands of the Polynesian Groups, with the numerous islands of Malaysia, as well as with Southern India. Her ships also have an established traffic with China and Mauritius; her immense trade in coal extends far north and westward to the American shores of the Pacific, and her European mail service is carried on by lines of steamers that

A plan of a settlement of about 1000 English miles will be laid out in the month of August 1821.

Further westward from that point will be the communication with the other shores the East Indian Archipelago. The Government will be established in the Gulf of Carpentaria in 1821. The first by means of which the Colony has communication with the East of Australia is not laid in the proposed plan. Some time will be spent in the settlement of the proposed plan. The settlement of the proposed plan will be the first step towards the settlement of the proposed plan. The settlement of the proposed plan will be the first step towards the settlement of the proposed plan.



North Head.
mit Point.

jointly make a circuit of the earth. Her maritime enterprise is aided by the vast advantages of a noble harbour, on the southern shore of which Sydney is built. Port Jackson, if equalled, is certainly not surpassed, by any other natural harbour in the world, and not even by the magnificent haven of Rio Janeiro. The bold coast fronting the Pacific is suddenly broken, and the giant cliffs form a portal to an estuary about a mile in width, with an enormous perimeter, capacious enough to shelter the navies of the world. A vessel making the port sails in a few moments out of the long swell of the ocean into calm deep water, protected on every side by high lands. On entering, a splendid vista is presented to the voyager, the elevated shore being broken into innumerable bays and inlets, and the central expanse of water relieved by many a picturesque islet. The rocky shore on each side stretches from heights of above 200 feet down to the water's edge, disclosing at intervals in the distance the white sandy beach of a bay which Stanfield or Copley Fielding would have loved to paint. The well-wooded hills, clothed in the bright garb of spring, or in the russet of summer, and bathed in the glorious light of an Australian atmosphere, form a charming margin to the bright blue waters they enclose. As the city is approached, pretty villas and imposing mansions, surrounded with gardens and orchards, crown the heights or extend along the shore.

About 4 miles from the entrance to the port, and at a point where the southern shore presents several prominent headlands leading to capacious land-locked basins, the city rises into view. It occupies an area of something more than 2,000 acres, and is bounded on the north and west by water. Its greatest length is $3\frac{3}{4}$ miles, north and south; and its greatest breadth $2\frac{7}{8}$ miles, east and west. It has about 115 miles of streets, irrespective of minor thoroughfares, and numbers 14,500 houses. The population (including the suburbs) is about 140,000, and the funds dispensed by the Corporation last year amounted to about £200,000. The original settlement was fixed at the head of the bay called Sydney Cove, and in the neighbourhood there are still traces of the primitive architecture. In a right line, extending from this point to the south, the land is the lowest, rising gently to the south, and more decidedly on each side—to the east by easy acclivities—to the west more abruptly, the highest point in that direction being occupied by the Observatory and Signal Station. Towards the south the variations of level are less strongly marked; but eastward the gradual ascent reaches to the heights of Darlinghurst, and still more elevated suburbs of Paddington, Woollahra, and Waverley. The city is flanked on the west by a large arm of the estuary called Darling Harbour. The streets of the main part of the city have been laid out to the cardinal points of the compass, and therefore

intersect each other at right angles. A breadth consistent with modern ideas of dimensions for city streets, recommended by the authorities during the administration of Sir Richard Bourke, was not adopted in Sydney, though it was in laying out the then provincial town of Melbourne, so that the sixty-six feet of width of Sydney streets must appear somewhat contracted to those who have been accustomed to recently built towns in Europe or America. Architecturally, Sydney has made rapid strides within the last ten or fifteen years, and its fine banking-houses, mercantile establishments, and handsome public edifices give it an aspect bespeaking substantial wealth, advancing cultivation, and enterprise. The portion convenient, though not close, to the quays, which, as usual in other great sea-ports, is the most frequented, contains many of the best buildings for commercial purposes, the banks and most of the warehouses being constructed of freestone, in the modern style of Italian composite, and displaying in their façades much rich ornamentation. The majority of the banks are on the west side of George-street, and, together with the extensive blocks of spacious and handsome warehouses in their neighbourhood, give a distinctive character to that section of the city. The most noticeable for their dimensions and architecture are the London Chartered Bank of Australia, the Bank of New South Wales, the Commercial Bank, the English Scottish and Australian Chartered Bank, the Australian Joint Stock Bank, and the Bank of Australasia. Those in Pitt-street are the new City Bank, the Oriental Bank, and the Union Bank. Here also is the Exchange, a large stone-built edifice, with columned front, of the Corinthian order. All these are substantial structures, externally imposing; and within, displaying much decorative taste. The offices of the Australian Mutual Provident Society, also in Pitt-street, are equally admired for the beauty of their façade. Other large edifices in this locality are the *Sydney Morning Herald* office, a massive building, occupying a prominent site at the junction of three streets; Vickery's buildings,—a splendid pile of warehouses,—besides a great number of insurance offices and mercantile establishments, ornamental in character and of important dimensions. But by far the grandest specimen of architecture which Sydney displays is the University, a noble stone building in the Perpendicular style, extending 410 feet in length. The great hall is at the northern end; and in dimensions, style, and decoration, is favourably compared, by competent judges, with Westminster Hall. Its walls are enriched with paintings, and with exquisite stained-glass windows. It contains a fine marble statue of Wentworth, the founder of the University. The aspect of the eastern front is exceedingly grand. The two affiliated Colleges, St. Paul's (Anglican) and St. John's (Roman Catholic), are also extensive stone structures, Gothic in style, and stand within the

domain of 150 acres that surrounds the University. The new Post Office, in the centre of the city, now on the eve of completion, is a building of exquisite proportions, noble in its general outline, and sumptuous in detail. It occupies a space between George and Pitt streets, with a frontage to each. It will also have a front to a new street on its northern side, the whole frontage extending over 504 feet. The style is Italian, combining the astylar of the Florentine palaces with the arcaded façades of Venice. One of its most remarkable features is the native granite used in the pillars of the arcade and in the columnation of the façades, highly polished, of a grey tint, and, without interfering with the harmony of other details, relieving the otherwise uniform colour of the structure. The building throughout is profusely enriched with carved ornament. Another great public building now in course of erection is the Town Hall, the foundation-stone of which was laid by Prince Alfred. The site is near the present centre of the city; east and west, the length is about 230 feet; north and south, the principal front is 158 feet. The architecture is of the Renaissance period of the Italian, in combination with Venetian details. The clock-tower will stand 161 feet high, and the main body of the building will have an elevation of 57 feet. The Museum, on the eastern side of the city, is a massive structure, with a bold Roman front, whose leading features are strongly marked so as to present deep recesses—a provision well suited to relieve the eye accustomed to the brightness of an Australian day. The principal Courts of Justice are in King-street and at Darlinghurst. The first-mentioned, where the Civil business is transacted, is a large rectangular building of brick-work, with arcaded front, decorated with Doric entablature. The Court-house at Darlinghurst, for criminal trials, is a fine stone building, of the Doric order. In the rear is the gaol, occupying a large area, and built of stone, with spacious wards radiating from the centre. Of the Government offices, the Treasury, at the eastern extremity of Bridge-street, is the only building of any architectural pretensions. The Parliament buildings in Macquarie-street, conspicuous as occupying a large site, present no features in design worthy of attention. The handsomest chamber is the dining-hall, which has fine dimensions, is well finished, and possesses in its mantel-pieces magnificent samples of the beautiful marbles of the country. The private residences in the neighbourhood of Sydney are of a superior character, and are generally in the vicinity of beautiful recreation grounds. The fashionable quarter *par excellence* is the east end of the city, and the suburban localities stretching thence along the shore. Here are most of those splendid mansions of which glimpses are caught from the harbour, which they overlook. Many of them have been erected at great cost, and for extent, tastefulness of internal decoration, and beauty of their grounds

and gardens, are perhaps unequalled by any private residences on this side of the Equator. There are upwards of 120 churches and other places of worship in the city and suburbs. Architecturally, the edifices of the English and Roman Churches are the most prominent, although the chief place of worship of the Congregational body, in Pitt-street, and those of the Wesleyan Methodists in York-street and at Chippendale, are fine spacious buildings, of striking outlines, and with finely-finished interiors. The Anglican Cathedral Church of St. Andrew, in George-street, has occupied many years in erection, and although not thoroughly finished, has been for some time used for public worship. It has a remarkably fine site in the most elevated part of the central district of the city, but is of comparatively small dimensions, being within the walls 160 feet long by 62 feet in breadth. The transept is 110 feet by only 14 feet. It is a Gothic building, in what is usually known as the later decorated style, approaching in some of its exterior details to the Perpendicular. It has stained glass windows in the highest form of modern art, nearly all being the gifts of private individuals. Elaborate marble and encaustic tile-work covers the floor of the choir and the steps leading thereto. The Roman Catholic community are proceeding with the erection of what is to be a highly decorated and very large Gothic Cathedral, near the site of that burnt down a few years ago. This also occupies a splendid site. Government House, the official residence of Her Majesty's representative, is a splendid building, in the Tudor style, on a slight eminence, near to and overlooking the harbour, and surrounded by gardens and ornamental grounds. Its length is 152 feet, width 82 feet.

The public traffic of the city and suburbs is carried on by about 600 omnibuses and hackney-carriages, and the water communication between the city and its transmarine suburbs by steam-ferry boats, which number about thirty. The streets are lighted with gas, at a cost of upwards of £7,000 per annum to the Corporation. Sydney has spacious markets in its main thoroughfares, and they are usually well stocked with fruits and vegetables of every kind. There are two theatres as well as a fine opera-house, which are well supplied with dramatic and operatic companies.

Although Sydney has few reserves analogous to the squares of London, it has excellent parks and gardens within its boundaries, easily accessible to the citizens. Hyde Park is a beautiful plateau of 40 acres, nearly in the centre of the city. It has a fine avenue about half a mile long, and is nearly surrounded by plantations and clumps of trees, affording a grateful shade, and forming an agreeable resort. At the northern end of the avenue is the fine bronze statue, by Theed, erected in memory of Prince Albert, and on the south-eastern side a monument of Captain Cook is being erected, in a position which commands a splendid

view down the harbour. The Domain, a charming expanse of park land of 138 acres, planted for landscape effect, is on the north-eastern side of Sydney, surrounding the pretty inlet called Farm Cove. The grounds present every variety requisite to produce picturesque views, and the artistic disposition of the groups and avenues of trees is fast developing the beauties of this favourite promenade. Near the main entrance is an excellent bronze statue of Sir Richard Bourke, by Baily, in a situation from which is obtained one of the most beautiful views imaginable. The Botanic Gardens embrace 38 acres, and are the finest in the Australian Colonies; for in addition to the immense collection of exotics from every clime, the site strikes every beholder with admiration.

More recently-formed reserves are Prince Alfred Park and Belmore Park, in the south, and a tract of 500 acres on the south-east side, named Moore Park. Adjoining the latter ground is the metropolitan racecourse, where large fields of horses, of the finest breeds, compete at the two half-yearly meetings for stakes which amount to £14,000 or £15,000 in the year.

The Harbour of Port Jackson proper has an area of 9 square miles—Middle Harbour, one of its arms, 3 square miles; and the coast-line of the whole is 54 miles. From the Heads to the city the distance is 4 miles, beyond which the waters extend 8 miles into what is called the Parramatta River, giving 15 miles as the length of navigation. The average breadth of the navigable waters is three-quarters of a mile, though at some points they widen to 2 miles or more. The shallowest part is between Middle Head and George's Head, where the soundings show 23 feet at low-water. Beyond this the depth ranges between 5 and 18 fathoms. There are miles of wharf frontage in use, and about 25 miles of deep-water frontage in sheltered places that may be made available for a like purpose. The chief light-house is 76 feet high, erected on cliffs 268 feet above the sea-level. It is a white revolving light, visible 25 miles to seaward. On a rocky point, 60 feet high, situated immediately within the South Head, stands a second light-house, 30 feet high from the base; it has a bright fixed light visible at 15 miles. Within the entrance there is a light-ship with two fixed white lights; and at Fort Denison, nearer the city, there is a red harbour light, beyond which, ships are forbidden to proceed until they are boarded by the Health Officer and other authorities.

The Circular Quay, at the head of Sydney Cove, has a length of 3,100 feet available for the largest vessels. Cowper Wharf, in Woolloomooloo Bay, is 1,200 feet long.

The eastern shore of Darling Harbour, which skirts the western side of the city, has its frontage entirely occupied with wharfs and quays. Here all the intercolonial steam companies have

their stations, and the Gas Company its extensive manufactory. On the north, from Miller's Point to Dawes' Point, and thence round the largest headland of the port, the waterside is fully taken up by commercial premises, with the exception of the site at Dawes' Point, on which there is a battery. An extensive ship-building establishment was commenced by Mr. Cuthbert some fourteen years ago at Miller's Point, and is capable of building vessels up to 500 tons. It has turned out, besides a large number of sailing-vessels, many screw and paddle steamers, gunboats, and dredges. Mr. Booth's establishment at Johnston's Bay is also a large one, occupying an area of $2\frac{1}{2}$ acres, with water-frontage. It embraces the largest saw-mills in the country, and has capabilities for ship-building up to 200 or 300 tons. The works of Messrs. Hely and Harpur, associated with their floating-dock, are important. The dock offers every facility for the smaller class of vessels up to 250 tons burden, which can be docked in little more than two hours. A considerable number of men have for years been employed at this establishment. Among the works of greater capabilities may be classed the Fitzroy Dry Dock at Cockatoo Island, some few miles to the west of the city. This is a Government establishment, and was originally intended for the repair and overhauling of vessels of the Royal Navy. No vessel has yet entered the port too large for its capacity. H.M.S. "Galatea," of over 3,000 tons burden, was taken in without the slightest difficulty. The Government has taken care to provide this establishment with the largest, most powerful, and most modern machinery. The workshops are contained in an extensive and substantial stone building on the eastern side of the island. In front of these a sea-wall has been built into deep water, giving very spacious wharfage accommodation. The dock is 400 feet long, with 20 feet depth of water over the sill. Situated as it is within easy approach, having an ample depth of water, and well behind any defences that may be erected for the protection of the city, this place is evidently destined to become the naval arsenal of the Colony. Other great dock works are those of Messrs. Mort and Co., at Waterview Bay, westward from the city, but not so far removed as the Fitzroy Dock. Here are very extensive appliances for the repair of the largest ships. The premises occupy the entire head of the bay, the workshops being very spacious, with a length of 500 feet, and a minimum width of 40 feet. Castings up to 12 tons can be undertaken here, and the turning department, which occupies a space of 200 feet by 40 feet, is filled with all the machinery which engineering art has supplied to aid the work of Man's hand. The dock is 365 feet long, with an entrance 70 feet wide, and a depth of water over the sill of 20 feet. It is partly cut out of the rock, and partly built up very compactly with stone masonry. At this establishment are effected

all the repairs required by the large steamers of the Peninsular and Oriental Royal Mail Company. Not only are the largest steamers repaired, but several, of a size suited for intercolonial traffic, have been constructed. The capabilities of the works have recently been augmented by the addition of a large patent slip, and are at present equal to any demand which may be made upon them in shipbuilding and marine engineering. The Australasian Steam Navigation Company have very extensive means for shipbuilding and repairing, their establishment being situated on the western shore of Darling Harbour. It contains vast mechanical appliances, and in its workshops are employed at times some 400 persons. All that is required to equip a first-class engineering establishment is to be found here, and there is a patent slip capable of raising steamers of the largest size. The works are employed not only in repairing the vessels of the Company's powerful fleet, but also in repairing and building for private owners.

Along the seaboard of the Colony there are numerous other establishments for building vessels from 30 to 350 tons, and employing together about 150 hands.

The following is the number and tonnage of Steam-vessels trading to and from the various inland ports and Colonies :—

	Number of Vessels.	Horse-power.	Tonnage.
A.S.N. Company	80	8,517	13,464
Clarence and Richmond River Company.....	15	864	2,786
Illawarra Steam Navigation Company	5	489	1,158
Hunter River New Steam Company.....	4	480	1,829
Parramatta River Company	4	150	532
Bulli Coal Company	2	80	744
Colonial Sugar Company.....	3	134	136
Tug-boats.....	13	745	1,454
Private-owned Steamers	5	249	830
Passenger and Ferry Boats.....	18	336	481

Number of Sailing-vessels of all classes, registered in New South Wales, 518; tonnage, 65,971.

Harbours.

NEWCASTLE.

Newcastle, whose trade is second only to that of Sydney, owes its commercial importance, if not its existence as a large shipping port, in no small measure to the works which have been completed there to facilitate the export of coal.

There are at present two breakwaters in course of construction at Newcastle,—one about 2,000 feet long, connecting the mainland with Nobby's Island, a high rock at the southern entrance to the port and the site of the light-house, called the southern breakwater;—the other, the northern breakwater, extends from the

north head, in the direction of the river Hunter, in an easterly direction, into the ocean. The southern breakwater was constructed in olden times by prison labour, the stone being procured by blasting the rocks on the beach within a short distance. The works were much damaged by the sea in consequence of the stone not being sufficiently hard to resist the action of the waves; the Government, therefore, in the year 1866, commenced to repair the breakwater with stone of a much harder description. In order to procure this stone, a new quarry was opened at Waratah, a few miles from Newcastle, from whence the stone is conveyed in trucks by railway and tipped from the end of the breakwater; the inner side is afterwards hand-packed. Up to the present date 350 yards of the breakwater have been repaired, and it contains 90,000 tons of stone. It will probably be completed as far as Nobby's in the course of a year or so. The work has been tested by heavy gales, but as yet not a single stone has been displaced. A further extension of the breakwater to Big Ben—a reef of rocks some distance off Nobby's—is contemplated. This will be a work occupying some considerable time, owing to the depth of water between Nobby's and the reef, and to the heavy seas which will often prevent the work from being proceeded with.

At the northern entrance to the harbour of Newcastle there was formerly a sandspit, with an extensive bank outside, known as the Oyster-bank.

The ebb-tide taking its course northerly has a great tendency to draw vessels on to the bank when entering or leaving port. Moreover, the force of the current being deadened by running over this shallow, the bar at the entrance to the harbour had a tendency to increase. With the view of improving the entrance, the Engineer-in-Chief for Harbours and Rivers proposed the construction of a breakwater along the spit, and for some distance into the deep water in an easterly direction.

The effect of this work up to the present time has been to deepen the water considerably on the northern side, owing to the increased scour; and furthermore, the bar at the entrance has to a great extent been improved, owing to the current which the breakwater has turned in a more easterly direction.

The breakwater was commenced in 1861, and is formed of ships' ballast, chiefly blue metal brought from Melbourne by colliers, and delivered at a jetty on the northern side of the harbour, whence the stone is conveyed along a tramway and tipped from the end of the breakwater. The stone being spread out by the action of the waves, will form an excellent foundation for the large stone with which it is intended ultimately to construct this work. The breakwater up to the present time is 495 yards long, and contains about 75,200 tons of stone.

The Government coal-wharf at Newcastle is 2,400 feet long, and 22 feet wide. Eight cranes are used for shipping coal. Each crane has a full and empty line of railway, and lifts the coal-waggons, and, slewing round, discharges their contents into the hold of the ship. They lift 10 tons at a time, and the total quantity of coal shipped by them in a week averages 20,000 tons. The cost of the wharf, stone-dyke, and cranes, was about £50,000. The coal-staiths are now completed, and will at once be open for traffic. The existing facilities for shipping coal will be much increased, for it is expected that 12,000 tons a day can be supplied by means of the staiths alone. The coal-trucks will be taken up by locomotives to a sufficient level to allow them to run down by gravitation to shoots projecting over the vessels, and when emptied they will descend by a separate line to the Great Northern Railway. The works are constructed principally of timber, over 2,000 feet of viaduct being used. The shoots, hoppers, regulating gear, and river-piers are of iron, and the cost of the complete lines has been about £27,000.

In addition to the Government cranes and shoots, private companies—the Australian Agricultural and Waratah Coal Company—have shoots of their own, with trains running to them, and can load on an average 5,000 tons a day, in vessels on a draught of 15 feet.

Although this port may be considered second only to Sydney harbour in a commercial point of view, still it cannot as a harbour of refuge, or a port with anchorage area, be compared either to Port Stephens or Jervis Bay. To the north and south of the entrance a very active and efficient pilot staff is kept, and no difficulty will be found in entering the place under their charge. Ships have only to hoist the usual signals at a reasonable distance, when they will be immediately attended by both tug and pilot. The port possesses a patent slip for hauling up vessels up to 1,000 tons—and every description of repair to either engines, hull, or rigging of ships, or stores, can be done as moderately as in Sydney. Two or three tug companies find a good paying business in this port, and assist in moving the ships when in harbour from coal-shoots to their anchorage and back. A depth of 18 feet is found under the Government shoots, and vessels of 2,000 tons have frequently visited this harbour for cargoes. Seldom less than 100 sail of shipping of all classes are to be seen floating on the waters of Port Hunter. Supplies of all kinds are to be obtained at very reasonable rates. Custom-house, post and telegraph office, banks, churches of every denomination, hospital, school-houses, reformatories, &c., are found in Newcastle, which is a very thriving bustling township. There are 22 feet of water over the bar at low-water springs.

Nobby's Head is an isolated knoll of rock standing about a mile from the mainland, and connected with it by the new breakwater

now in construction. A first-class fixed bright light of the dioptric order is placed on this knoll, visible seaward 20 miles.

Screw mooring-buoys are placed at various parts of the harbour, to secure large ships head and stern when loaded and awaiting an opportunity of getting to sea. The tonnage, harbour, and tug charges are moderate, and vessels obtain quick despatch.

There are two life-boats stationed at this port, under the control of a life-boat committee, with an established crew, paid, and exercised twice a month, and they have been frequently the means of saving life and property.

One of the greatest difficulties that had to be contended with in the Hunter River was its tendency to silt up. For the purpose of preventing this in some measure, dykes have been formed of ships' ballast at Wyndur's Island, near Raymond Terrace, and at the flats near Fullerton Cove, so as to keep the river to its natural channel, and to prevent the waters from spreading over the flats. Another dyke is at present in course of construction at the upper end of the harbour, cutting off a large flat, nearly dry at low water; and by thus confining the river to the channel, and directing the current into the so-called coal channel in front of the present wharf, the increased action of the tide causes a greater scour, tending to deepen and equalize the natural channel.

The length of the dyke, when finished, will be 2,830 yards, more than three-quarters of which are already completed.

This dyke forms the commencement of extensive works projected for the enlargement and improvement of the port of Newcastle, which cannot extend in any other direction. It is contemplated to make up the increasing demand for wharfage, by extending the present wharf along the dyke, reclaiming the flat at the back, and subsequently erecting cranes, coal-shoots, and such appliances as may appear most advantageous, and connecting it with the main line of railway, of which there is little doubt it will become the terminus.

Dredging operations have been extensively carried on. There are at present two dredges at work in the harbour, and provision has been made by Parliament for a third. The dredges were designed by the Engineer-in-Chief and were built in Sydney, and each of them is capable of dredging 1,000 tons per day.

Screw-moorings have been laid down in the harbour for vessels of large tonnage.

The navigation of the Hunter as far as Morpeth, 29 miles from Newcastle, is available for ocean steamers drawing 10 feet, the flats having been dredged to that depth.

A coal-shoot has been erected at Morpeth in connection with the railway, and several fine bridges have been built across the Hunter. The Pitnacree Bridge is of iron, cast-iron screw pile

piers, and wrought-iron lattice superstructure. It is 300 feet long, in four spans of 75 feet; the height of girders above low-water-line is 24 feet, and the width, 20 feet between the centres of the piles.

Another of these bridges is that at Dunmore. It is constructed of timber, and has an iron telescope-opening of 45 feet clear for vessels to pass through; the spans are 39 feet, braced with iron tension-bars; the length is 450 feet; the width between the hand-rails 25 feet; and the height above the low-water-line 26 feet. The largest and most handsome viaduct in this district is the Belmore Bridge, at West Maitland. It is an iron structure, 598 feet long, in two spans of 68 feet, three of 105 feet, and three of 49 feet. The height of the underside of the girders above low-water is 37 feet, and the distance between the centres of the cylinders 23 feet. The piers are formed of cast and wrought iron cylinders, and the lattice-girders are laid continuously over the piers.

The following is the export of coal from the port of Newcastle to foreign and intercolonial ports, from 1st August, 1869, to 31st August, 1870:—Coepang, 500; Hongkong, 30,002; Java, 18,021; Manila, 1,608; Saigon, 1,460; San Francisco, 90,856; Singapore, 2,270; Batavia, 4,006; Shanghai, 18,226; Petropaulovski, 3,591; Calcutta, 1,020; Callao, 1,480; Foo Chow, 851; Ningpo, 360; Galle, 866; Bombay, 4,216; Mauritius, 1,090; Yokohama, 926. Total, 181,349. Victoria, 179,766; New Zealand, 76,473; South Australia, 43,241; Tasmania, 12,126; Queensland, 1,525.—Total, 313,131. Grand total, 494,480 tons.

ULLADULLA.

Ulladulla is situated about 25 miles south of the large and safe harbour of refuge, Jervis Bay, which unfortunately contains little available arable land in its immediate neighbourhood. It was an open inlet of the sea until 1864-5, when a pier was constructed at a cost of nearly £11,000. The pier itself is 200 feet in length, formed of massive masonry walls, set in from 9 to 18 feet of water at low-tide, and filled in between with stone ballast, part of which will be taken up again to construct the concrete foundation for the iron light-house which is shortly to be erected on the pier-head. An embankment of rubble stone, 500 feet long, forms the approach to the pier, and carries a tramroad for the more convenient carriage of goods to and from the pier.

The outer angle which is formed by the pier and the approach is directed against the sea, and has therefore been protected by heavy stone pitching. The strength of the pier has been severely tested by heavy easterly gales. The cove is about 1 mile deep east and west, and half a mile wide. The pier is at the head, and within it shelter is afforded for small craft during bad weather. A reef of rocks lies across the entrance, about half a mile seaward; they are passed

on the north side when entering. Cook's Pigeon-house, a very remarkable conical-shaped hill, 2,398 feet high, is seen at the back of this port, and, kept in line with the sand-beach at its head leads, in clear of danger. A steamer visits this place weekly for produce. There are about twenty houses composing the township, and good timber abounds in the neighbourhood.

THE MORUYA.

The Moruya River is about 65 miles south of the Jervis Bay light-house. On the north of the entrance to this river is a sand-spit, and on the south is a rocky point called Toragy. The port is open to the north-east.

There is a rocky foreshore at the south head, which formerly destroyed the force of the current so much that the entrance was in danger of being blocked up with sand. To prevent this, a breakwater or dyke was formed, extending from these rocks at the north-west portion of the point, nearly in an easterly direction, for a distance of over 1,300 feet, and skirting the rocky ledges.

Since this work has been completed, the traffic has only been stopped once. It is in contemplation to build a breakwater on the north side, but for the present, operations will be confined to blasting out a dangerous rock at the entrance which obstructs navigation. There is weekly communication by sea with Sydney.

THE CLARENCE, RICHMOND, AND TWEED.

The Clarence River is the port of outlet for the New England District, and two steam navigation companies carry on an extensive communication between that port and Sydney. The bar of the river has been of an exceedingly shifting nature, owing to reefs of rocks which divert and deaden the tidal currents. To counteract this, a stone dyke was built on the south side, stretching in a gentle curve along the edge of the channel for a distance of 3,000 feet inland, and projecting in the shape of a breakwater to seaward for an additional distance of 570 feet, thus guiding the tidal currents always over the same part of the bar, and preserving the depth and position of the channel, allowing more water to flow in and out at every tide.

There are upwards of 100 sailing-vessels trading to the Clarence River during the grain season. The river is navigable to a draught of 14 feet for 60 miles, or 10 miles above the town of Grafton, the principal emporium of the district. A pilot and crew are stationed at the heads, on which are a small red light and storm signal-staff.

A stone dyke is built on the south shore at the entrance, trending in a gentle curve from 3,000 feet inland to 570 feet towards the bar from the north point of the south headland,—thus deflecting the ebb stream out of the river, always through the same channel and with satisfactory effect, as regards keeping the channel free from filling up. It is in contemplation to supplement this southern breakwater by a similar construction parallel to it, from the north spit, projecting seaward.

The Richmond is now visited by two steamers, which run regularly between it and Sydney, besides numerous sailing-vessels. Its exports are chiefly cedar and other timber, corn, wool, and other marketable commodities. A small light is exhibited from the north head, and a pilot-boat is stationed to assist vessels in entering and leaving the port.

The Tweed, which is the northernmost river of the Colony, is frequented by small sailing-vessels. A pilot and crew are stationed at its entrance. It drains a remarkably large and rich alluvial country, which, for pasturage, grazing, and agricultural purposes, is perhaps unsurpassed in the Colony. Sugar, corn, coffee, and tobacco are found to grow luxuriantly in this district, which only requires population to develop its resources.

[The subjoined information respecting this flourishing district has been furnished by the proprietors of the *Clarence and Richmond Examiner*.]

THE Pastoral and Electoral District of The Clarence occupies the north-eastern portion of the Colony of New South Wales, and lies from 300 to 400 miles N.N.E. from the metropolis—Sydney. It embraces nearly the whole watershed of the Clarence, Richmond, and Tweed Rivers, which constitute its sea-ports,—being bounded on the east by the Pacific Ocean, from the Solitary Islands in south latitude 30 degrees, to Point Danger, at the southern entrance to Moreton Bay, a distance of nearly two degrees of latitude; on the north by Macpherson Range, dividing it from the Colony of Queensland, to the Great Dividing Range; on the west by the tableland of New England; and on the south by the range forming the southern watershed of the Clarence River to the sea. Its area is estimated to contain about 10,000 square miles.

The Clarence River was first discovered about the year 1832, but it was not till the year 1837 that the first white people—cedar-cutters—took up their residence upon it. The Richmond River was discovered somewhat earlier than the Clarence, but it was not until 1840 that the first squatting station was formed upon it by Messrs. Clay & Stapleton; and in the latter part of 1841 and beginning of 1842 several cedar-cutters from the Clarence migrated to that river. From the Richmond these pioneers of our present civilization extended their operations to the Tweed River, about the year 1846. The first steam-vessel that entered the Clarence River was the "King William," in the month of July, 1839, proceeding up the river as far as the First Falls, about 25 miles above Grafton.

The first stock arrived on the Clarence about the middle of the year 1839, the first squatting station formed being that of Mr. J. H. Grose, at what is now Copmanhurst. In the early part of 1840 several other stations were formed, the stock for which arrived in June of that year. Amongst those early settlers were the late Dr. Dobie and Messrs. Mylne, followed shortly

after by Mr. Ogilvie. The country was at first taken up for sheep-farming, but owing to the rankness of the vegetation and the wet season that prevailed for a number of years, sheep-farming was not eminently successful, and, as a pursuit, ceased about the year 1855. The climate having somewhat changed during late years, and the country having become better drained and the vegetation less rank, it is held that sheep-farming might now be carried on with success. For the last twenty years the district has been principally occupied by horned cattle, for which it is well suited. The live stock of the district is now computed to number 10,339 horses, 185,749 cattle, 22,060 sheep, and 6,995 pigs.

The sale and occupation of land for agricultural purposes commenced in the year 1857, previous to which time it had been exclusively devoted to grazing purposes and timber-cutting. There are now 1,308 holdings, comprising 224,000 acres of land purchased, of which 26,094 acres are under cultivation; 90,093 are enclosed, but not cultivated; while 107,823 acres are yet unenclosed. The remainder of the land in the district is held under grazing leases, and is open for purchase at Government auction sales, at a minimum price of £1 per acre, or may be bought by free selection, upon paying 5s. per acre, and the balance of 15s. per acre in three years, which may be paid by instalments, or allowed to remain unpaid after that period, upon payment of 5 per cent. upon the unpaid balance. This latter is the principal method of purchase now adopted. There are two conditions attached, viz.,—the improvement of the land to the [extent of £1 per acre within three years after purchase, and the residence of the original selector or his alienee thereon for that period.

The land under cultivation consists of 23,758 acres maize; sugar-cane, 1,282 acres; sown grasses, 228 acres; potatoes, 204 acres; gardens and orchards, 192 acres; vineyards, 125 acres; wheat, 191 acres; barley, oats, millet, tobacco, arrowroot, &c., occupying the remainder.

The produce of the above is estimated at 1,093,274 bushels of maize, 2,247,280 lbs. of sugar and molasses, 68 tons of hay, exclusive of green crops; potatoes, 543 tons; wine, 28,000 gallons; 640 bushels barley, oats, millet, &c.; 8,844 bushels wheat, 4,200 lbs. tobacco, 5,200 lbs. arrowroot, 11,965 bunches bananas; oranges, pine-apples, &c., are also grown extensively.

There have been exported from the district during the past year (exclusive of those required for home consumption) large quantities of fat and store cattle overland to the southern districts. 6,044 head of fat cattle and 3,951 sheep have been converted into preserved meats, extract of meat, and tallow, for exportation; 389 packages bacon, 832 coops fowls, 1,912 cases eggs, of 70 dozen each, 3,700,000 feet of cedar timber, 648,250 feet of hardwood, 25,000 staves, 18,656 ironbark spokes, boat timbers, &c., &c.; 787 bags antimony, 6,000 ounces of gold. 12,068 cases preserved meat, 239 cases Liebig's extract of meat, 1,053 tierces tallow, 570 casks salted beef, 12,000 hides, and 168 bales wool, have been exported to England and the neighbouring Colonies in 1869. The result of the 6,044 head of cattle and 3,951 sheep slaughtered at the Australian Meat Company's Works, Ramornie, during the year 1870, has given a yield of 1,520,764 lbs. preserved meat; 86,760 lbs. of Liebig's extract of meat, and 2,875 lbs. of essence of meat; besides 6,578,000 lbs. of manufactured tallow, 6,044 hides, and 3,951 pelts. The average number of persons employed at the above establishment is about seventy.

The population of this district is estimated at 13,260 souls. The number of electors is 3,316 (the largest number, with one exception, in any electorate in the Colony) returning one Member only—the present representative being Mr. T. Bawden, of Grafton.

The shipping during the past year have been 152 voyages by steam-ships to and from Sydney; 269 sailing-ships to Sydney and Melbourne—with nine river steamers plying daily.

The district possesses seven steam sugar-mills, one steam flour-mill, four steam saw-mills, one quartz-crushing-mill, two meat-preserving establishments, a local Steam Navigation Company, and one Sydney Company—the former having two steamers plying regularly to and from the Clarence and Sydney, and one to and from the Richmond and Sydney; the latter, two steamers plying regularly to and from Sydney and the Clarence, with occasional trips from two others when necessary. Of the sugar-mills, two belonging to the Colonial Sugar Refining Company of Sydney, are very complete and extensive establishments, capable of making ten tons of sugar each per day. Of the other mills, three are owned by private individuals, the remaining two being the property of local Companies. The district also possesses a tannery, one soap and candle factory, and three newspapers.

Having said thus much of the district generally, the rivers and their productions, exports will be considered more in detail, so as to give a clearer idea of their principal characteristics and capabilities, as well as the progress made in developing their resources.

CLARENCE RIVER.

The Clarence River (from which the district takes its name) is the largest and most important river on the east coast of Australia. From its navigable capacity, the fertility of the soil on its banks, and the salubrious character of the climate, it is better adapted to support a dense population than any other part of the Colony. It is the outlet of all the waters falling from the eastern side of the great dividing range from Armidale in the south to Darling Downs in the north, a distance of rather more than 2 degrees, and falls into the Pacific Ocean in south latitude $29^{\circ}26'$, longitude $153^{\circ}22'$ east. Like all the rivers on this coast it has a bar-entrance, with a depth of water varying from 12 to 18 feet, which can be deepened when required without much difficulty. A breakwater has been commenced with that view at its mouth, the effect of which has been very beneficial. £30,000 have been voted for some time past for further works, but these have not yet been undertaken. When the engineer's plan is fully carried out, it is anticipated that vessels drawing 15 to 20 feet of water will be able to enter. The Clarence River is navigable in a south-western direction for about 50 miles, for vessels drawing from 10 to 12 feet of water, to the city and port of Grafton, maintaining an average width of about half a mile. The river has lately been very carefully surveyed, preparatory to laying down buoys and leading marks, by Lieutenant Gowlland, R.N., from the heads to 15 miles above Grafton; and a steam-dredge is now employed removing the only obstruction between the heads and Grafton. The main river, for 30 miles above Grafton, is navigated by river steamers, as also are the numerous arms and creeks upon its lower portion. The Coldstream, Urara, Mitchell, Timbarra (Rocky River), and Cataract Rivers are its principal tributaries. The Mitchell, at its junction with the Clarence, is almost as large as the main river; its chief tributaries are the Boyd, the Mann, and Nymboida Rivers. The land on the banks of the lower part of the Clarence, as well as the large islands which stud its estuaries, consists principally of rich alluvial soils, with a subsoil generally pervious to water, and is eminently adapted for the growth of maize, sugar-cane, bananas, vines, oranges, figs, pine-apples, cotton, silk, arrowroot, tobacco, and similar semi-tropical productions. Most of these alluvial lands are purchased and occupied by an industrious and thriving agricultural population. The back lands consist principally of undulating sandstone ridges of a carboniferous character, well grassed and thinly timbered; principally occupied under annual leases from the Government for grazing purposes, at the rate of £1 per annum for each section of 640 acres. Coal is found in many places, but has not yet been worked.

The western or upper portion of the district is of a much more elevated character, often rising from 1,000 to 2,000 feet above the sea-level, and consequently has a cooler climate than the low-lying lands near the sea-coast. The principal rocks are granite, trap, serpentine, slate, &c. The whole of the Upper Clarence is auriferous, and large quantities of gold have been obtained by washing the detritus from the mountains. The gold-fields were first opened in the year 1858, since which time they have been steadily worked with considerable success. Rich quartz-reefs have been lately opened near Drake, and shown to yield from 3 ounces to 72 ounces of gold to the ton. Antimony is being largely exported from the same neighbourhood, and strong indications of copper have also been discovered. This part of the district is occupied solely by cattle-stations and miners, and is believed to be rich in minerals.

The population of the Clarence River is estimated at about 9,000. The shipping employed in the Clarence trade in 1869 was 140 voyages by steamships to and from Sydney and Grafton, sixty-three sailing-ships to and from Sydney and Melbourne, with seven river steamers plying daily—one of which made several trips from the Clarence to the Richmond River.

The passengers by sea, inwards, were 2,021; passengers outwards, 1,716. In the Police District of Grafton, comprising the whole of the Lower Clarence and its southern tributaries, there are 4,546 horses, 62,447 cattle, 3,700 sheep, and 4,310 pigs; the number of cattle slaughtered, 13,862. Large numbers of store cattle were also exported overland.

The quantity of land alienated is 67,632 acres, held in 714 holdings; acres in cultivation, 18,827, of which 17,409 acres were planted with maize, and 887 acres with sugar-cane; wheat, barley, oats, vines, tobacco, arrowroot-gardens, &c., occupying the remainder. Most of the agriculturists are freeholders, and a large number free selectors.

The principal exports from the Clarence by sea in 1869 were 762,123 bushels of maize, 3,660 bushels other grain, 682 sacks potatoes, 92 sacks onions, 607 bags bones, 77 bags horns, 153 bags bacon, 12,168 cases preserved meat, 462 cases extract of meat, 1,882 cases eggs, 37 cattle, 38 horses, 1,114 pigs, 1,118 sheep, 814 coops poultry, 13,862 hides, 1,481 hogsheds tallow, 918 tierces salted meat, 8,965 bunches bananas, 113 casks wine, molasses, honey, &c., 787 bags antimony, 149 bags auriferous quartz, 5,771 ounces gold, and sundries, all produced on the Clarence. In addition to the above, over 1,100,000 lbs. of sugar and concrete have been manufactured and shipped within the last few weeks—a quantity more than sufficient to supply the whole district—and a large quantity of cane is still in course of manufacture. It will thus be seen that horned cattle, maize, gold, and sugar, constitute the chief productions of the Clarence. 4,300 bales of wool and 188 bales of sheepskins, exported *via* the Clarence, were for the most part produced in the adjoining districts of New England and Tenterfield.

The principal imports are flour, tea, groceries, clothing, wines, spirits, beer, tools, machinery, and manufactured goods generally, coals, pine, timber, &c.

TOWNS AND VILLAGES.

Grafton, the capital of the Clarence district, was first proclaimed a township in the year 1850. It is a city and an incorporated borough, with a town council consisting of a Mayor and eight Aldermen, elected by the ratepayers. Its population numbers about 2,100, and it ranks as the tenth town in the Colony. It possesses a fine Court-house of stone and brick, in which Quarter Sessions, District Court, Courts of Petty Sessions, and Small Debts Courts are held, a Police Magistrate presiding at the two latter courts,—a commodious gaol, custom-house, and police barracks. Much to the credit of the inhabitants, it may be remarked that there are seldom more than three prisoners in

the gaol, and serious crimes are almost unknown. Grafton boasts of a Church of England, a handsome Roman Catholic Church (recently erected), a Wesleyan Church, and two Presbyterian Churches, three parsonages, and a fourth in course of erection. All the churches are supported by voluntary contributions. There are three public schools, open to children of all denominations, with about 340 pupils on the rolls—one of which is a Roman Catholic Denominational School, with about forty scholars; also several Sunday-schools, a School of Arts or Mechanics' Institute, which has cost £2,000 in building, a Hospital, two Post-offices, Savings' Bank, two Building and Investment Societies, Pastoral, Agricultural, and Horticultural Society, Freemasons' Lodge, Royal Foresters, Ancient Foresters, and Oddfellows' Lodges, Clarence River German Club, Sons of Temperance, two Steam Companies, five wharves, patent slip for taking up vessels of moderate tonnage, steam-ferry, flour-mill, tannery, soap and candle factory, saw-mills, two first-class family-hotels, and fourteen inns, two newspapers, nine general stores, and numerous shops. Two fast passenger-steamers ply daily from Grafton to the lower parts of the river, and four steam-ships per week run between Grafton and Sydney,—the sea-voyage occupying from twenty-seven to forty hours in ordinary weather. Grafton has telegraphic communication with Sydney and all stations in New South Wales and neighbouring Colonies. Grafton is situated upon the banks of the Clarence River, which is there about 900 yards wide. A steam-ferry plies across every half-hour, the rise and fall of tide being from 2 to 3 feet. It is about 50 miles from the heads by water, and 35 miles in a direct line from the sea, in latitude 29° 50' s., longitude 152° 58' e., and but little above the sea-level. The climate is very warm, but healthy, although the thermometer occasionally reaches 100° in the shade. Roads diverge from Grafton to Armidale in the south of New England, 135 miles distant, and thence to Sydney; to Glen Innes and Central New England, 105 miles by the Newton Boyd Road, upon which a large sum of money is being expended—two bridges alone will cost nearly £25,000. When completed it will be one of the most important roads in New South Wales, opening up the far western country on the Gwydir and the borders of Queensland, to the nearest sea-port, to Tenterfield, 110 miles—to Casino, Richmond River, 70 miles—and thence to Queensland.

Copmanhurst is an agricultural and pastoral village, 30 miles by water above Grafton, at the head of the boat navigation. A river-steamer visits the settlement every fortnight. It has a post-office, public school, and a church is in course of erection. About 4 miles south of this village, on the Urara River, are the Australian Meat-preserving Works. This company were the pioneers of the meat-preserving business and the making of Liebig's extract of meat in Australia, although the Melbourne companies, which were not started for two years afterwards, assume that honor. This company does a very large and profitable trade.

Nymboida is also an agricultural and pastoral village on the south river, 30 miles south of Grafton. The road from Grafton to Armidale passes through it. The population is very small.

Ulmarra, although not a village, is a large agricultural settlement, 6 to 12 miles below Grafton. It has two sugar-mills, two inns, three general stores, two public wharves, telegraph and post office, three churches, three public and one Wesleyan school, and exports large quantities of maize, bananas, &c. One of the Colonial Sugar Company's large sugar-mills is opposite Ulmarra, at Southgate; while at Ulmarra there is the Belmore Sugar-mill and the private mill belonging to Mr. E. G. Chowne.

Brushgrove is a recently-established agricultural village, 15 miles below Grafton, at the head of Woodford Island. It possesses one church, two inns, two stores, two wharves, a public school, and post-office. Two other public schools are established on this island.

Lawrence is a township of some importance, 20 miles below Grafton, being the principal port of shipment for the Tenterfield district, the northern portions of the Clarence River, and a portion of the Richmond. It has a Church of England, a public and private school, post-office, two large inns, four general stores, two wharves, &c. It is a police station, and a Court of Petty Sessions and Court of Requests are held monthly. About 6 miles below Lawrence, upon the Broadwater, is Messrs. Whitehead's & Co.'s Clarence River Meat-preserving Establishment, now closed for alterations and additions.

Rocky Mouth or Maclean is a village of much importance, situate at the junction of the north and south arms of the Clarence River, 30 miles below Grafton, and does a considerable trade. It is the depôt of the whole of the agricultural products on both sides of the river and its branches, for which there is ample accommodation in the form of two large and commodious wharves and receiving stores, with deep water-frontage. Maclean, which has an increasing population, boasts of three stores, three hotels, a Presbyterian Church and manse with a resident minister, a Roman Catholic Church, a Wesleyan Church, about to be erected, a public school, and a post and telegraph office.

On Chatsworth Island, 4 miles below Maclean, is a large sugar-mill, belonging to the Colonial Sugar Company, a post-office, and a public school. There is a saw-mill upon the main land, adjacent to Chatsworth Island.

Palmer's Island, which is the centre of a large agricultural population, situate about 9 miles from the heads, is the first place of calling for the steamers after entering the river. It has a post-office, stores, a public school, and hotel.

Yamba, at the Clarence Heads, has a pilot establishment, post and telegraph office, customs' officer, and one hotel, and accommodation house. The population is very small, but it is much frequented during the summer season by persons from Grafton and elsewhere for recreation and sea-bathing.

RICHMOND RIVER.

The Richmond is a much smaller river than the Clarence, but is of considerable importance from the extent of navigable waters, the large area of pastoral and agricultural lands, and as supplying an immense quantity of cedar and pine timber to Sydney and Melbourne. This river has no connection with the table-land, having its sources in the M'Pherson's Range, dividing New South Wales from Queensland, and discharging its waters into the Pacific Ocean at Ballina, in about latitude 29 degrees S.; has a shifting sand-bar at its mouth, with 10 to 14 feet of water, but is frequently obstructed by sand-banks inside the bar. For some 25 miles it pursues a southerly course, nearly parallel with the sea-coast; it then takes a winding course, nearly west to Coraki, about 15 miles, where it divides into two branches, one passing north by Lismore, and the other west by Casino. These arms are very narrow and exceedingly tortuous. The river and branches are navigable for about 65 miles from the sea by the course of the river, and for some 15 miles further by boats. The land upon the immediate banks of the river is of much the same character as that of the Clarence, except that it has a very impervious clay subsoil, backed by large clayey plains, which renders it less suitable for agricultural operations. There is, however, on the northern heads of this river an immense area of cedar brush-land of the richest description, only requiring roads to be opened to ensure its being rapidly settled for the growth of sugar-cane, maize, arrowroot, &c. This is the most magnificently-timbered portion of the Colony, and has for many years supplied most of the cedar and pine timber required for the Sydney and Melbourne markets. The upper portion of this district consists of open plains and well grassed hills, held as

squatting runs, and occupied by large herds of cattle, for which the district is famous. Timber-cutting and grazing have hitherto been almost the only pursuits of the inhabitants, but latterly agriculture has been rapidly extending. The police district of Casino includes the northern head-waters of the Clarence River, the Timbarra, Millera, Drake, and Tooloom Gold-fields. Gold is now being found on the beach, near Ballina, at the mouth of the Richmond River. Coal and meerschaum are also known to exist there. Cape Byron, north of the Richmond Heads, is the most easterly point of New Holland. There is a resident Police Magistrate for the district of the Richmond stationed at Casino.

The population of the valley of the Richmond is about 4,000 souls.

The shipping trade of the Richmond in 1869 comprised twelve voyages by steamships to and from Sydney,—202 sailing-ships, to Sydney and Melbourne,—and two small droghers employed on the river.

The Police District of Casino, including the valley of the Richmond and northern tributaries of the Clarence, possesses 5,927 horses, 122,986 cattle, 18,362 sheep, and 2,521 pigs. Large numbers of cattle are sent overland to the southern markets. The fat cattle are mostly sold to the Clarence butchers and Meat-preserving Companies. The graziers' produce shipped in 1869 was 1,157 hides, thirty-three casks tallow direct from the Richmond, and thirty-two cases cheese.

153,723 acres of land have been alienated to 523 holders, the larger portion being bought for grazing purposes; 5,887 acres are under cultivation, 5,056 acres of which are planted with maize, 370 acres sugar-cane, 110 acres potatoes, and 350 acres of other crops. The agricultural produce exported consisted of 107,740 bushels maize, 186 packages bacon, twenty-nine boxes eggs, and sundries.

The export of timber amounts to 3,639,933 superficial feet of cedar, 5,567,250 feet of pine and ash, 25,364 staves, 10,000 spokes, boat timbers, 100, &c., &c. Two large saw-mills, and a large portion of the population are engaged in this trade. Two small sugar-mills represent the manufacturing interest. No sugar has yet been exported.

TOWNS AND VILLAGES.

Casino, the principal town of the Richmond, is situated at the head of the navigable waters of the south arm, but is only accessible by water in small boats. It has a Court-house, public school, Church of England Church, branch bank, three inns, and three large stores, besides several smaller shops. Estimated population, 300. A District Court and Court of Petty Sessions is held there. Casino is the centre of the pastoral interest of the Richmond, and does a considerable trade with the agricultural population on the south arm.

Lismore, at the head of navigation of the north arm, is the centre of the timber trade. It has a Court-house, a public school, one inn, and temperance lodge. Population, 250 to 300.

Ballina is the shipping port of the Richmond River. A pilot is stationed there, and also a customs' officer; there is a Court-house, public school, Sons of Temperance lodge, School of Arts, five stores, one inn, and from 250 to 300 inhabitants, exclusive of the digging population, now located in the neighbourhood. There is a very complete sugar-manufacturing establishment and plantation, adjacent to Ballina,—Mr. J. Sharpe, J.P., being the proprietor.

Wardell and Woodburn are recently-proclaimed townships, but have not yet attained to much importance. Woodburn is becoming an important postal centre, since it has received the Richmond mails, *via* the Clarence

heads, from which it is not more than 30 miles distant, while it is a centre for a large number of the inhabitants of the Lower Richmond, and almost equi-distant from Casino, Lismore, and Ballina.

Coraki, at the junction of the north and south arms, will most probably be the ultimate centre of an important trade on the Richmond River, the two arms being worked by river steamers from that place.

No telegraph communication has yet been opened up with this river; a line is, however, in course of construction to Casino, and will most likely be continued ere long through the district to the shipping port of Ballina. The pursuits of the people hitherto being principally pastoral and timber-cutting, has caused their dispersion to such an extent as to prevent hitherto the formation of any town of importance, or any large and definite centre of communication or business. The establishment of churches, telegraphs, and social institutions, formation of roads, &c., are retarded by this dispersion, which is in course of correction by the settlement of an agricultural population, and the introduction of steam-ships into the trade. The Richmond bids fair in a few years to become an important agricultural as well as pastoral district.

The Tweed is a small river in the extreme north-east of the Colony of New South Wales, on the border of Queensland, and has only recently attracted the attention of settlers, chiefly from the almost unparalleled richness of the land in the dense cedar brushes which occupy its banks and almost its entire valley. The land upon the Tweed is said to be unsurpassed by any in the Colony. The climate is mild, and plants of every description grow most luxuriantly. It is admirably adapted for the growth of sugar and coffee, and plants requiring similar climatic treatment. There is a pilot stationed at the heads and a Customs' officer. It is navigable for small vessels, and does most of its business with Queensland, being only some 50 miles from Brisbane. It has a post and land offices, also a public school; and periodical Courts of Petty Sessions are held. The country is very mountainous—Mount Warning having an elevation of 3,300 feet. It is an agricultural and timber-cutting district, being too densely-timbered for pastoral pursuits. The live stock consists of sixty-six horses, 316 cattle, and 164 pigs. 11,452 acres of land have been selected by sixty-three holders, and 1,381 acres are under cultivation, 1,296 acres of which are maize—the crop being estimated at 68,873 bushels; the remainder is planted with potatoes, sugar-cane, gardens, &c., for home consumption. No record has been kept of the quantity of timber exported from this river.

The Brunswick is a small river between the Richmond and Tweed, occasionally visited by cedar-cutters. The bar is only practicable for very small crafts.

Evans River is also a small river, between the Clarence and the Richmond, almost connecting the two rivers—but of very little importance.

Rates of labour, &c.—Tradesmen, 9s. to 12s. per day; labourers, 4s. to 7s. per day; farm and station servants, £30 to £50 per annum, with board and lodging; female domestic servants, £15 to £25 per annum, with board and lodging; clerks, shopmen, overseers, &c., £50 to £150 per annum.

Retail prices of provisions, &c.—Tea, 2s. to 2s. 6d. per lb.; sugar, 4d. to 5d. per lb.; flour and bread, 2d. per lb.; meat, 2d. to 3d. per lb.; clothing, tools, and manufactured goods, from 20 to 30 per cent. over English prices.

THE BELLINGER AND NAMBUCKRA.

The Bellinger and Nambuckra—small rivers, some 60 miles south of the Clarence—are now being settled; but there are still large tracts of rich farming land for the enterprising settler to choose from. A pilot is stationed at the Bellinger, and communication is kept up with Sydney by sailing-vessels.

THE MACLEAY.

The Macleay maintains a steam communication with Sydney. Sugar is largely grown on its banks. Two large steam sugar-mills are here actively employed.

THE HASTINGS RIVER.

The Hastings River is about 180 miles north of Sydney, and 50 south of the Macleay. Its entrance is known better as Port Macquarie, and is regularly visited by steamers and sailing-vessels. A pilot and crew are stationed at the heads. There are 9 feet at high-water over the bar.

TRIAL BAY.

Some 5 or 6 miles south of the Macleay, and holding a central position between Port Jackson and Moreton Bay, in Queensland, is Trial Bay, affording excellent shelter for all classes of ships from s. and s.e. gales. It is in contemplation to run out a break-water, in a semicircular form, from the north point of this bay, in a n.w. direction, when it will become an excellent harbour of refuge from easterly and south-easterly gales.

THE MANNING RIVER.

The Manning River, better known on the chart as Harrington Inlet, is 32 miles south of Port Macquarie. A light-house is fixed on its north head, and a pilot and crew stationed at the entrance. Steam communication is kept up with Sydney weekly.

PORT STEPHENS.

Port Stephens is a large sheet of water, about 25 miles north of Newcastle, running due west into country for about 14 miles. Its water-area is greater than even that of Port Jackson, although sand-banks and shoals prevent the anchorage-space from being large or universal. It is, however, one of the principal ports of refuge on the coast. Its entrance is very remarkable from seaward—conspicuous from the clusters of sharp-topped and conical-shaped peaks lying about the heads, ranging from 400 to 800 feet. The entrance is between two of these—steep and rugged-faced—and is about a mile and a half wide. A shoal-patch, with 9 feet on it, is situated a little within the entrance-points, but can in bad weather be always seen breaking, and so avoided. The deep water is to the northward of the shoal. The anchorage usually frequented by vessels in bad weather is Nelson's Bay, some 3 miles within the entrance, on the south shore, and is perfectly landlocked and sheltered.

The lands adjacent to the shores of this magnificent harbour are unfortunately not well adapted to cultivation, the soil being mostly of a sandy nature, covered with trees and scrub.

A light-house of the third order, exhibiting a bright and red light, flashing alternately, is fixed on the easternmost point of Port Stephens, 3 miles south of the entrance.

During heavy s.e. and easterly gales on this coast, which are usually experienced in July and August, as well as during the summer months of November and December, this harbour is to be found usually crowded with shipping seeking shelter. There is a telegraph station in Nelson Bay, and another at the light-house, so that vessels seeking shelter can be reported immediately. A small village—Carrington—was in existence some years ago at the head of Port Stephens, founded by the Australian Agricultural Company, but this small township is now nearly deserted. A few Chinamen and oyster-fishers are located in Nelson Bay, otherwise the shores of this large harbour are all but uninhabited. Good grazing for cattle is found in the n.w. corner of the port, behind the ruined village of Carrington, and it is even now used as a fattening run for the Company's cattle.

BOTANY BAY.

Botany Bay, so famous in connection with the early history of the Colony, is about 10 miles south of Sydney. Between Points Banks and Solander, which form the entrance to the bay, and were so called after two of Captain Cook's officers, the water is deep, the shores bold and rocky; receding westward, the coast features alter to low sandy shores, still covered with the same stunted scrub (tea-tree) noticed by Captain Cook. The water gradually shoals over a sandy bottom to the head, some 5 or 6 miles from the entrance. Two rivers—George's and Cook's Rivers—empty themselves into this bay at its s.w. and n.w. extremities, but are navigable only for small vessels or boats. Botany Bay is frequently used as a harbour of refuge. In s. and s.e. gales good shelter will be found under the south head, about a mile off shore. The whole area of this sheet of water is upwards of 20 square miles.

PORT HACKING.

Port Hacking, 4 or 5 miles south of it, is a small harbour sometimes used by coasting-vessels in bad weather.

TWOFOLD BAY.

Twofold Bay, the southernmost port of the Colony, is some 25 miles north of Cape Howe; it is frequently used as a harbour of refuge by vessels bound to Melbourne and western ports during a prevalence of westerly gales; it is about 5 miles deep east and

west, and 3 miles broad, open to the eastward. The anchorage is under a small peninsula, projecting into the bay from the north shore, above which, on an elevated plain, is the township of Eden. A light-house is situated on Point Look-out, exhibiting a fixed red light, visible 10 miles. There is a whaling establishment situated on the south side of the bay, and in the season, during the winter months, they are very successful. Fresh-water can be had here, but supplies are scarce. There is steam communication with Sydney and Melbourne once a week, and large shipments of cattle are made to intercolonial ports.

BROKEN BAY.

Broken Bay, the name given to the entrance of the Hawkesbury River, is about 16 miles north of Sydney Heads. Two fixed lights are placed on Barranjuoy Head, a steep rugged knoll, about 320 feet high, connected with the south headland of the bay by a narrow sandy neck of land. Within Barranjuoy, to the southward, is a capacious harbour of refuge, known as Pitt Water, available to vessels of 12 feet draught, where shelter and security can be obtained during a prevalence of south and south-east gales on the coast. A telegraph station is established at the Custom House officer's quarters, at the southern foot of Barranjuoy, on the sandy neck already mentioned. Large vessels seeking shelter should pass Pitt Water and continue higher up the bay, enter the mouth of the river, and will find excellent anchorage and shelter in deep water on the south shore, in Flint and Steel Bay. The shores are bold and cliffy, elevated from 4 to 600 feet in this locality, covered with a stunted growth of vegetation. A tide of from 2 to 4 knots is found setting in and out of the Hawkesbury. Brisbane Water, on the northern shore of Broken Bay, is accessible to small vessels and steamers of light draught. Most of the firewood consumed in Sydney is brought from the vicinity of Broken Bay. There is good fishing off almost all the rocky points of this bay, and it is a favourite resort to pleasure-seekers during recess from business.

WOLLONGONG AND KIAMA.

Large works have been constructed in the harbour of Wollongong, 40 miles south of Sydney. It is constructed in a small bay open to the north-east, having a rather high headland on the south, and a long sandy beach on the north.

The Belmore Basin, as the new part of the Wollongong Cove is called, consists of a large rectangular excavation in hard rock. It is 440 feet in length, and 150 feet in breadth, with an average depth at low water of 14 feet; under the coal-staiths, however, it is 18 feet, so that vessels drawing that depth can enter at high-water and load under the staiths without hindrance. Along the

edge of the basin there is a strong wall, built of sandstone from Sydney, filling up the irregularities of the excavated portions of rock. The rock was taken out of the basin in large blocks to suit the breakwater, which was constructed at the same time. The old or outer basin has been deepened to the same depth as the new one. A single-planked coffer-dam of 460 feet long had to be constructed, with a pressure of 20 feet water at the deepest place, the traffic of the port being carried on in the meantime by means of a temporary jetty outside, and the full length of the coffer-dam. The dredge, after the rock was blasted under the water, cleared and completed the channel and entrance to the port. The quantity of stone excavated in both basins is about 80,000 cubic yards. The area of both basins is about equal to 3 acres, and the total wharfage accommodation is 1,700 feet.

The breakwater, which starts from near the north-east corner of the Belmore Basin, and runs in a north-westerly direction for about 450 feet, is composed of very large stones roughly thrown in and packed by the sea; it is near the outer end of this breakwater that the light-house is being built. On the south-east side are three coal-staiths connected to the tramways from the coal-mines; they are built of squared ironbark, and are of sufficient height to discharge the coal direct from the waggons into the vessels' holds, and at the same time to allow uninterrupted passage for the traffic on the roadway underneath, leading all round the wharf. The expenditure on the whole of the work, exclusive of the light-house, was £47,700. The Wollongong light-house is similar in construction to the one in course of erection at Ulladulla. The towers are of wrought iron, circular in section, 13 feet 6 inches at the base, and curving up to 8 feet at top; the height of the focal plane above the base of structure will be about 40 feet, and above low-water 52 feet. The tower will be placed on the outer end of the breakwater; the foundation is now nearly completed; it consists of a mass of concrete, 30 feet square by 12 feet deep, strong holding-down bolts being bedded in it for securing the ironwork.

In bad weather good shelter is found under the breakwater of Wollongong Harbour, and within the basin, for vessels not over 12 feet draught. Mooring-buoys are placed in the corner of the cove for the purpose, and in ordinary fine weather, vessels of a draught of 14 feet can be loaded and got safely out of the basin. The light-house, when complete, will be a great addition to the facilities for entering this cove.

24 miles south of Wollongong is the small inlet, originally open to the east and north-east, known as Kiama Harbour. The excavation of a basin has been commenced, and up to the present time 56,000 cubic yards have been taken out. The large stones have been used in the construction of a substantial breakwater,

and the smaller ones in the forming of inner piers to the basin, and in the general levelling and forming of the approaches to the future wharves. The breakwater now extends 370 feet from low-water mark, and vessels are perfectly safe in approaching the temporary wooden jetty which has been built for their accommodation on the end of the western pier. When the basin is completed, small craft will find shelter in bad weather under its lee, and Kiama will become a harbour of refuge, as Wollongong has already proved to be. The basin will be 440 feet in length by an average width of 280 feet, and will cover an extent of nearly 3 acres, with a depth of 13 feet at low-water, offering a frontage of 1,200 feet of wharf. The expenditure on the works up to the present time amounts to £36,000.

SHOALHAVEN.

A few miles south of Kiama is the Shoalhaven River, the navigation of which is carried on through the Crookhaven River—an arm of the Shoalhaven—opening to the ocean 3 miles south of that river, and having the advantage of being protected from the frequent south-easterly gales by a rocky headland. The country near the mouth is flat, and numerous shallow channels have therefore been formed by the flow of the tides. To improve the main or navigable channel, a dyke of stone, nearly half a mile in length, has been constructed, to guide and confine the action of the current. There is also on this river a dredger, of 16-horse power, lifting on an average 600 tons of silt per day.

There is an active trade to this port by two steamers weekly from Sydney, besides small schooners. It is not a place of refuge in bad weather, but available during ordinary weather to vessels of 9 feet draught.

CROOKHAVEN BIGHT.

Crookhaven Bight, 7 miles south of the Shoalhaven River, is a deep indent on the north side of the rocky peninsular forming the north head of Jervis Bay. It affords shelter from south and south-east gales, with good anchorage on a sandy bottom.

JERVIS BAY.

Jervis Bay, 85 miles south of Port Jackson, is the largest sheet of sheltered waters in the Colony. Its entrance, 2 miles wide, is between Bowen Island on the south and Point Perpendicular on the north. This point is very remarkable, rising abruptly from the sea to a steep rocky cliff, some 200 feet in height, and trending away to the northward for 3 or 4 miles, with a perpendicular wall-like face, to Point Beecroft.

The bay itself is about 7 miles long to the westward, and about 3 or 4 wide—with a perimeter of upwards of 40 miles; and it is without doubt one of the safest, most commodious, and most

accessible harbours of refuge in the world. There is an anchorage area of over 30 square miles, without a shoal, rock, or danger of any kind, the water shoaling gradually from its entrance towards the shores, so that an anchorage may be chosen in any wind with perfect shelter and safety under the weather shore, and everywhere within a quarter or half a mile of the beach. It is much to be regretted that the shores of this magnificent harbour are at present nearly uninhabited. Good timber is found in the vicinity, and a ship-building establishment has been for some years in active operation at Curranbean, a small creek emptying itself into the north-west corner of the bay.

A first-class light is fixed on a projecting rocky headland, 3 miles south of the entrance, exhibiting a flashing green, white, and red light alternately, and distinctly visible about 18 or 20 miles.

There is a telegraph-line from the light-house to Sydney.

OTHER PORTS.

Several thousand pounds have been spent in removing obstructions to the navigation of the Murray, Murrumbidgee, and Darling, and dredging will in all probability soon be commenced on the Clarence and the Macleay.

Wharves and jetties, adapted for coasters, have been erected at Bateman's Bay, Clyde River, Tathra, Twofold Bay, Moruya, Hinton, Shoalhaven River, Gosford, Kempsey, Frederickton, Casino, Port Macquarie, and Kiama.

THE INDUSTRIAL PROGRESS OF NEW SOUTH WALES.

PART III.

Special Papers.

REMARKS ON THE SEDIMENTARY FORMATIONS OF NEW SOUTH WALES,

ILLUSTRATED BY REFERENCES TO OTHER PROVINCES OF AUSTRALASIA.

(By the REV. W. B. CLARKE, M.A., F.G.S., F.R.G.S., Member of the Geological Societies of France and Austria.)

[THE following paper was originally written for and published in the "Catalogue of the Natural and Industrial Products of New South Wales, forwarded to the Paris Universal Exhibition of 1867 by the New South Wales Exhibition Commissioners."

It was afterwards re-printed at Melbourne in the "Official Record of the Intercolonial Exhibition of Australasia" of the same year; and, subsequently, it was honored by being transferred by the editors of that work to the pages of the "American Journal of Science and Art."

It was further so favourably received as to have led a distinguished French geologist to suggest enlargement, in order that it might be translated by him for perusal in France.

The Agricultural Society having suggested its re-appearance in the present publication, the author has acted on his friend's suggestion, and has accordingly, in this edition, noticed the discoveries that have been made since the date of its first appearance.

W.B.C.]

If we inspect the map of Australia we observe that the coasts of Victoria, New South Wales, and Queensland, follow the general directions (with some irregularity) of the Cordillera, or elevated land separating the waters flowing directly to the coast from those which, draining the interior, disembody to the south-west.

The Murray River receives some parts of its tributaries from the high lands of Victoria, and others from New South Wales; whilst the Darling and its tributaries collect the remainder of the supply from as far north as 25° s.

The Cordillera thus sweeps round in an irregular curve from w. to e. to the head of the Murray—and thence, northerly and north-easterly, to the head of the Condamine; trending north-westerly from that point to 21° s., whence it strikes to the north, terminating its course at Cape Melville, in 14° s., about the meridian of 144° 30' E., which is that of Mount Alexander in Victoria.

The more westerly and southerly trend of drainage is represented by the Thomson and Barcoo Rivers, which carry off the waters of the Cordillera at the back of the Barrier Ranges to Spencer's Gulf. The meridian of the head of that gulf is, therefore, the western limit of East Australia.

The Cordillera itself, described in part by Strzelecki in 1845, was traced by him through a considerable part of its diversified course (as understood by him), from the southern point of Tasmania to the parallel of 28° , in longitude 152° ; but not further westward than 146° , on the parallel of Mount Alexander. It is, however, doubtful whether the range between this furthest western point and Wilson's Promontory, where he considers the chain to be cut off by the sea, forms anything more than a spur in that direction.

But the extent of the Cordillera westerly, to its termination on the border of South Australia, is so well defined, that there can be no question that the s.w. and w. extension has as true a character as any part of the northern prolongation. This may be geologically deduced from researches of the Geological Survey of Victoria. That province is limited, at its eastern corner, by a line joining Cape Howe and the head of the Murray, so that the boundary crosses very near the highest point of all Australia, which Strzelecki made 6,500 feet above the sea, but which subsequent observations have shown to be 7,175 feet. This correction rests on observations made by myself in 1852, and on a re-discussion of them, in comparison with results obtained by Professor Neumayer in 1862. On 8th May, 1852, I made the highest point of Kosciusco 4,077 feet above my then base, at 3,098 feet above the sea, which therefore came out 7,175 feet; and in February, 1863, Professor Neumayer wrote me word that he made the highest peak in November, 1862, 7,176 feet. This makes Kosciusco's summit, above the crossing-place of the Indi or Hume River, at Groggan's, 5,425 feet.

To the northwards the 144th meridian limits very nearly all the high land of the East coast to Cape Melville, whilst the 142nd meridian limits to the westward the basin of the Darling, including part of the drainage along the Thomson and Barcoo, from the head of the Flinders, to where it passes into South Australia on the 141st meridian.

Thus, all this enormous drainage of western New South Wales and south-western Queensland is, as it were, bounded by ranges of high geological antiquity, the Grey and Barrier groups being of undoubted similar age to the mass of the Eastern Cordillera.

It has long been known that the strike of the older sedimentary rocks through the Cordillera, in Victoria, as well as in New South Wales, is generally meridional; so that in the former province the beds strike across the Cordillera, whilst in the latter they form various angles from parallelism with it to a transverse direction, as the chain doubles and winds irregularly in its course.

This is the experience of the Victoria survey, and my own traverses across various points of the Cordillera in New South Wales and Victoria establish the fact of a normal meridional

strike of the older strata. So distinct, indeed, is this characteristic, that the settlers in various parts of the country have been accustomed to trace the direction of north and south by the strike of the slates, and are often guided by it.

It sometimes happens that, owing to the high angle of dip, and the effect of denudation on the overlying formations, the Cordillera itself becomes in places almost knife-edged, so that in New South Wales it presents occasionally a *divisa aquarum* not more than nine paces in width; whilst in Maneero to the south, and in New England to the north, it spreads out in a plateau, on which eastern and western waters rise close together and sometimes overlap. These different features have a variable geological aspect as well as value; for, owing to the strike of the older rocks, the breadth of the Silurian formations, which, as in other countries, are repeated by recurring folds, may be more exposed in Victoria than it is in New South Wales; and owing to the curve of the Cordillera probably the same beds are traceable to the north which occur in the south; as, for example, the auriferous rocks of Omeo and Peak Downs, which are on the same meridian; and thus the meridional strike is exhibited along the north-east coast, where there are alternations of old rocks forming precipitous cliffs, with low valleys and beaches separating those alternations.

Independently of this arrangement the whole of the central area inside the Eastern Cordillera has a trend to the south and west, so that the waters collected between 22° and 37° s., on the east of South Australia, find their way to the sea at the eastern corner of that province.

We might naturally assume that one order of deposits is to be expected throughout the Cordillera; but there is a singular exception. Whilst marine deposits of Tertiary age are found along the west coast of Australia, and along the southern coast from Cape Leuwin to Cape Howe, there are no known *marine* Tertiaries in any part of the coast of New South Wales and Queensland up to the Cape York Peninsula; and the reason of this may be, that, as indicated by phenomena before pointed out by me, but which on this occasion cannot be further dwelt upon, the eastern extension of Australia has been probably cut off by a general sinking, in accordance with the Barrier Reef theory of Mr. Darwin. This has some support from the fact that there is a repetition of Australian formations in the Louisiade Archipelago, New Caledonia, and New Zealand, in the latter of which occur abundant Tertiary deposits. The intervening ocean may, therefore, be supposed to cover either a great synclinal depression or a denuded series of folds.

Relatively speaking then, the Cordillera of the eastern coast has not been subject to the changes which introduced the relics

of a Tertiary ocean. At any rate, no evidence is known to me of *marine* Tertiaries on the lands north of Cape Howe.

Another fact worthy of notice, as showing the probable ancient geological vicissitudes of Australia is, that the great Carboniferous series which is so prominent in New South Wales and in parts of Queensland, but which is less distributed in Victoria, and there only partially and irregularly as to the portions still remaining, has been broken up and carried away, so as to have left the various members dislocated, ruined, and separated in such a way as to allow no clear view to be taken of the whole till all the separate portions have been separately examined; and to the want of this personal examination on the part of certain palæontologists and others, who have never yet seen the Carboniferous formation of New South Wales, is to be attributed the perseverance with which they so long disputed facts attested by geologists in New South Wales, who are familiar with the latter and with Victoria also.

In consequence of the absence of marine Tertiary deposits in New South Wales, and the occurrence of a more complete series of the strata in the sections of the Carboniferous formation, there has arisen a difficulty in collating the gold deposits with those of Victoria; and, in this respect, at present the upper deposits in the former province cannot be assigned with any precision to the epochs adapted by Mr. Selwyn for the latter. And it also follows that his view of the distinct ages of Pliocene auriferous and Miocene non-auriferous gravels cannot be tested in New South Wales, if, indeed, it has not already been tested by the actual discovery of gold in the so-called Miocene deposits themselves, as they occur in Victoria.

So far as is at present known, the gold is derived chiefly from the Lower Silurian formation; but researches conducted for me at H.M. Mint in Sydney prove that it exists in almost every distinctive rock in New South Wales. In this province the alluvial deposits are not so extensive as in Victoria; but this probably arises from the fact previously mentioned of the strike being in Victoria transverse to the direction of the Cordillera; by which means the currents which distributed the drift had a wider area of gold-bearing materials to denude than in New South Wales, where, I conclude from numerous examples, the principal currents were to northward, so that in that province they would coincide with the direction of the Cordillera, and not accumulate the deposits in such low-lying extensive regions as those of the Murray Districts. The same objection would obtain on the supposition of gradual waste and accumulation from less powerful agency than that of a general rush of water. It is not, however, to be doubted, that there is an enormous amount of gold

yet untouched in numerous places in New South Wales, not only in the quartz lodes (or reefs), but in gullies and plains where alluvial gold diggings will yet be discovered.

Dr. Duncan, in an elaborate paper on some of the fossil Tertiary corals of Australia (*Proceedings of the Geological Society, August, 1870*), suggests the propriety of discarding the divisions into Pliocene, Miocene, and Eocene, of the Australian Tertiaries, and of substituting the general term Kainozoic, since he considers them merely as successive deposits of one continuous epoch. But, as proved by my own researches nearly twenty years ago, much of the gold in New South Wales is derived from iron pyrites in granite, and in *beds* of sedimentary origin, consisting of silicious matter cemented by iron derived from decomposed pyrites, whilst it has been shown by Aplin, Daintree, Hacket, and others, that much gold in Victoria and Queensland is due to the intrusive agency of felstones, elvanites, and diorite. The dykes or reefs of quartz in the Silurians are therefore not, as once supposed, the exclusive sources of Australian gold. Nay, there is good reason to believe that the Carboniferous rocks are themselves impregnated, as in one remarkable instance on Peak Downs. In New Zealand gold sometimes occurs so mixed with silicious particles as to constitute with them a golden sandstone.

The distinctive differences in material mineral wealth between Victoria and New South Wales are not altogether confined to gold, or tin, which latter metal is well represented in New South Wales; but coal, iron, and copper, and perhaps lead, prove together more than an equivalent of the great amount of gold in Victoria.

At the Universal Exhibition of 1854-5, the present writer exhibited a collection of rocks and fossils, illustrating the whole of the geological formations of Australia, and these were enumerated in their stratigraphical order in the published catalogue. A few remarks on the various geological epochs, as they represent themselves in New South Wales, with a brief statement as to their connection with other portions of Australasia, may be all that is necessary on the present occasion.

AZOIC AND "METAMORPHIC" ROCKS.

There has not been sufficient evidence yet collected to show that these rocks extensively exist in Eastern Australia, although in Tasmania rocks of a doubtful class (and which may, perhaps, be only highly altered Lower Silurian) have been referred to them by Mr. Gould. The existence of gneissoid strata, and of slates of very ancient aspect, has also been well known in New South Wales, with occasional unfossiliferous limestones; but it would be premature to place them, without doubt, under the present head. Mr. Daintree, however, describes them as the source of

some gold in the Cape River and Gilbert Districts, to the north. Some of those mentioned under the first epoch of Strzelecki have, on close inspection, appeared to me to be merely the products of transmutation; nor is such an improbable result, seeing that in Australia some slates have apparently been changed into granitic rocks. It is at least certain that such rocks generally occur in the immediate vicinity of granites, which latter frequently occupy large areas both in Manero and in New England, as well as along the Cordillera, and in independent masses along the coast. In Western Australia, where an enormous region is occupied by granites, and the older formations are represented only by small patches of slates, whilst the granites themselves remain bare, these patches are found on the flanks of the granitic bosses and at extremely wide intervals; nor have I been able to detect among the numerous collections which have passed through my hands, any distinct evidence of any but doubtful examples of those foliated rocks which belong to the so-called primary epoch. In Southern Australia, also, there does not appear to be any considerable amount of strata which could be referred to this epoch.

LOWER PALÆOZOIC ROCKS.

Of these there are undoubted evidences in some limited districts of Tasmania, whilst in Victoria, New South Wales, and Queensland considerable areas are occupied by them.

The greater mass of them in the two latter provinces appears to belong to Upper and Middle Silurian; the mudstones of Yarralumla, with *Encrinurus* and *Calymene*; the Coralline and *Pentamerus* beds of Deleget and Colalamine; the *Tentaculite* and *Halysites* beds of Wellington and Cavan; and the beds with *Calymene*, *Encrinurus*, *Beyrichia*, and others with *Illœnus*, *Harpes*, *Bronteus*; *Brachiopoda* including *Strophodonta*, and *Radiata*, embracing *Star-fishes*, point to the existence of at least the Upper Silurian formation on both flanks of the southern part of the Cordillera. There are also numerous corals included in the list given by me in the Southern Gold Fields (p. 285), which also confirm the same determination; and it may be added that the above, and other fossils of this age mentioned by me elsewhere, have been examined by Palæontologists of eminence in Europe. Such are the genera *Favosites*, *Cœnites*, *Ptychophyllum*, *Calamapora*, *Syringopora*, *Emmonsia*, *Alveolites*, *Cystophyllum*, &c. These, perhaps, might not alone satisfy a doubt, but with them occurs *Receptaculites*; since 1858, when these were determined, I have detected *Halysites*, which may settle the question as to Upper Silurian. Wenlock beds seem to be well developed on the Deleget.

In Victoria numerous species of Graptolites have been found, but during my explorations of New South Wales I have discovered none. It is only recently that they have been found in the most southern part of the province on the M'Loughlan River, and also in other spots in the basin of the Snowy River, near the boundary of Victoria.

In Tasmania I saw fossils similar to those of New South Wales, from beds on the Gordon and Franklin Rivers; Mr. Gould has since placed them partly as Lower Silurian. Lower Silurian beds also occur on the Deleget River, where both the Upper and Lower have a generally meridional strike, but varying dips.

In Queensland Mr. Daintree has confirmed the fact of the existence there of Silurian rocks identical with those of Victoria; and my own examination of the Brisbane slates led me to compare them with the auriferous slates of the Anderson's Creek Gold-field. The quartz-veins of that neighbourhood were found by me in 1851 to hold gold, and some very recent researches have increased the expectation of valuable deposits there, in addition to those which have already been opened on the Burnett, Crocodile Creek, Mount Wyatt, the Burdekin, Talgai, Star Creek, Peak Downs, the Cloncurry, Leichhardt, Cape and Gilbert Rivers, and in other places.

The Gold Fields of Fingal, Dorset, and Black Boy, in Tasmania, are also partly occupied by rocks of Silurian age, the lithological structure of which is identical with that of rocks in New South Wales and Victoria. South Australia is *now* producing her share of gold.

Copper is abundant in strata which may be referred to the same epoch; but a peculiarity which I have observed in most of the copper localities is, that the ores do not occur in lodes of the usual character, but sometimes, as on Peak Downs, in Queensland, they follow the planes of the strata; and generally in New South Wales assume a dome-like form, rising in bosses at intervals without continuous surface connection. The Burra Burra Copper Mine of South Australia has also something of the same character. I have in my possession Pentamerus and corals from Bombala, imbedded in copper ore, and Trilobites in the lead lodes of Yass. The area occupied by the Upper Silurian in New South Wales is of enormous breadth, ranging along the meridian with only slight deviations.

MIDDLE PALÆOZOIC ROCKS.

The late Mr. Jukes desired the term Devonian to be eliminated, referring the so-called beds to the bottom of the Carboniferous formation; but geologists have not generally accepted this view.

It is probable that such would have been the fate of certain strata in Australia, the fossils of which have at once a Silurian

and a Carboniferous aspect, being connected with the former by certain corals, and with the latter by the occurrence of *Lepidodendron*, *Sigillaria*, and other Lower Carboniferous plants.

There is undoubtedly an apparent passage downwards from the marine fossils of the acknowledged Lower Carboniferous beds of New South Wales, to others which very much resemble the so-called Devonian beds of England; and a series of shells, corals, &c., from the Murrumbidgee, which I submitted some years ago to Messrs. Salter & Lonsdale, through Sir R. I. Murchison, Bart.,* excited doubts as to their belonging to any but Silurian and Carboniferous deposits. Among these were *Phanerotinus*, *Loxonema*, *Atrypa reticularis*, *Orthis resupinata*, *Murchisonia*, *Strophomena*, and *Spirifera* of various species, some like Devonian. *Loxonema* is known to me as occurring in the lower marine beds of the Hunter River basin.

There appears to be an intermixture, and such is the case with certain strata to the westward of Wellington, in which some of the fossils have the Carboniferous type, and others the Silurian. In the list before-mentioned these are included in Passage beds.

In Victoria, near Mount Tambo, in Gipps Land, and again near the head of the Murray, there are some limestone beds with fossils, which I visited in 1851, and then believed to be of the same age as the lowest Carboniferous rocks of New South Wales. The Victorian geologists consider them Devonian. *Calceola*, a Devonian genus, has recently been detected by Professor Thomson.

In Queensland, the Burnet Range, the Mount Wyatt District, and tracts about the Bowen Gold Field and Burdekin (on which river limestones with fossils occur), are strewn with spoils of a formation which Mr. Daintree calls Devonian. From the former locality I have had many collections, and among them all I find *Productus* in alliance with *Trilobites*, which appear to be older than Carboniferous. On the western flanks of the Cordillera, near Yass, and on the eastern, along the Shoalhaven River, and again near the Hanging Rock, New South Wales presents numerous bands of limestone full of such fossils; but it is doubtful at present whether these lie on the horizon of the Devonian, or whether they belong to some portion of the Upper Silurian. As these beds appear to range all through the country on a nearly meridional strike, on both sides of the Cordillera, they are traceable in widely different places; and it may eventually be determined that, though in close contact, there is really a distinction of formations, only to be detected by accurate survey. So far as *Lepidodendron* is concerned, that plant occurs in some places in association with beds that are decidedly younger than any called Devonian, near Pallal, on the Horton River, and

* See Murchison's "Siluria," 3rd ed., p. 206.

on the Manilla River, in Liverpool Plains, and in the gold drift of the Turon River, which has been derived from beds of transmuted sandstone belonging to the coal-beds at the head of the river. It occurs thus on Dangera Creek, Yalwal. Near Wellington, also, *Lepidodendron* has been found in hardened rock of similar origin. At Cancoona Gold-field, in Queensland, *Lepidodendron* occurs in hardened shales; and at Goonoo Goonoo, on the Peel River, in New South Wales, it occurs in fine grey sandstone, with *Ferns* and *Sigillaria* in close proximity to beds of marine fossils which are as old as Lower Carboniferous. It has been found also on the Warrego River.

Besides these fossiliferous evidences of supposed Devonian age there are beds of grit, sandstone, and conglomerate, occupying positions of extreme doubtfulness as to age, not only in Victoria but also all along the coast ranges of New South Wales, which, as described by me, and confirmed by Mr. Daintree, are certainly older than some parts of the Carboniferous formation. They make a near approach to the "Old Red" of Europe. In my Report to the Government of New South Wales (6th March, 1852) I have mentioned that I had traced these beds "from the head of the Shoalhaven to the head of the Genoa"; and Mr. Daintree, in his Report to Mr. Selwyn, Director of the Victorian Survey (26th May, 1863), adopts my description, word for word, as applicable to "the Grampian sandstones, the conglomerates south of Mount Macedon, of the Avon River and Tambo, Gipps's Land"; and he adds, "there can be little doubt they are all members of one great formation."

At Mount Tambo, according to Mr. Selwyn (1866), they underlie the limestone of that locality, which he therefore considers as probably carboniferous; and this, as stated above, was my view in 1851.

About Eden (Twofold Bay), and Panbula, and Merimbula, there occurs a series of purple beds, which in 1851 I also ranked as Devonian, but on visiting the district in 1865 I was inclined to think they might be much older. Nevertheless, they are connected with Porphyries with double-headed hexahedral crystals of quartz, which are common in countries assumed to be of the age of "Old Red." After all, there will have to be an adjustment of this and other questions, which may hereafter distribute very differently parts of formations which at present are considered fixed.

At Gympie, on the river Mary, rich gold-bearing quartz reefs occur in transmuted slates and other tilted beds, which are composed of detrited dioritic matter and brecciated deposits, in which are abundance of fossils of doubtful aspect, but which I would refer to some part of the Carboniferous formation. Mr.

Daintree thinks they are likely to prove Upper Devonian. They certainly have much in common with the Devonian beds of North Germany and Belgium, described by Sedgwick and Murchison.

Since these auriferous rocks came into notice I have examined a series of fossiliferous rocks containing fossils apparently Devonian, and which occur about Yass, on Mount Lambie, on the Turon and Moruya Rivers (all in New South Wales), and which are in part identical with the Mount Wyatt shells in Queensland, which are also considered Devonian.

Spirifera and Producta are the almost exclusive Brachiopoda. The latter genus, with a very few exceptions, is considered characteristic of Devonian age; though three examples of Silurian species have been stated; this, however, can scarcely apply to Australia.

In Western Australia Mr. H. Gregory indicated on his map and in his report the existence of Devonian rocks near York, and in other parts of that Colony. Having examined the rocks so indicated, I can only state my belief that they have no pretension to any such antiquity, and are probably mere collections of loose granitic matter and other drift cemented by ferruginous paste, which has since become transmuted into concretionary nodules and hæmatite. There are also pebbles of trap, much decomposed, in the so-called Devonian. They may perhaps be more properly considered as representing the *laterite* of India.

UPPER PALEOZOIC.

That this division of rocks is fairly represented in New South Wales there can be no dispute. It has been long determined by all Palæontologists that the lower Carboniferous marine beds of Europe are represented by the beds immediately below the upper coal measures of the Hunter River, of the Illawarra, Talbragar, &c.; and we know also, that fossils of the same age occur in a part of Western Australia, near the Irwin River; in Queensland; in Tasmania; and in Victoria.

Associated with them, both above and below, in New South Wales, coal-beds of various thicknesses (from 3 to 30 feet) occur. In the Newcastle basin alone there are at least sixteen seams more than 3 feet thick, sections of which have been published by John Mackenzie and W. B. Clarke. Up to a comparatively recent period it was not generally known that under the marine beds below these coal seams, other seams occur bearing the same genera of plants as in the upper beds, of which *Glossopteris* and *Phyllothea* are very abundant. When this fact was first published by me it gave rise to controversy; but the truth of my conclusions has been confirmed since by Mr. Daintree, who, visiting and examining the spot in dispute, found four or five seams in the position to which they had been assigned. Now, below these

lower coal measures there is an enormous thickness of fossiliferous strata, in which the fossils (as before stated) gradually assume what has been called a Devonian aspect. The opposition to this determination arose from a pre-conceived idea that strata bearing *Glossopteris* could not be Palæozoic, and therefore, that the upper coal measures of Newcastle had no right to be considered older than *Oolitic*. But whilst these upper measures produced a fish of undoubted Palæozoic character (*Urosthene australis*), *Cleithrolepis granulatus*, *Myriolepis Clarkei*, and other *Icthyolites*, examined and determined by Sir P. de M. G. Egerton, Bart., to be Palæozoic, have been found by me at least 1,000 feet higher, and of these, photographs were exhibited at the last Paris Exhibition.

This dispute, therefore, ought long ago to have been settled; but it was taken up out of the Colony, and found some support in the writings of De Zigno, author of "*Le Piante Fossili dell' Oolite*." Since then he has modified his views, and, in a subsequent publication, in the "*Rivista Periodica*," Padova, vol. xiii., 1863, admits that the Australian coal-beds are rather *Triassic* than *Oolitic*.

Mr. Tate considers them *Triassic* comparing them with African *Dicynodon* beds, whilst Dr. Oldham holds them to be what I have considered them, Palæozoic, which they must be, if the very uppermost deposits, viz., those of the Wianamatta beds, contain fishes which Sir Philip Egerton considers to be at least as old as Permian, and which Professor M'Coy admits have a partly *Permian* (or *Triassic*) aspect.

If the idea be abandoned (and *there is no real authority for it*) that *Glossopteris* is an oolitic plant, and if it be admitted that a Fauna has more weight than a Flora, and that it is most probable that a floral identity never existed during the same epoch at the antipodes of the European oolitic area, more reasonable will appear the position assigned by me to the New South Wales workable coal-beds.

Nowhere has there been found in association with these beds any marine Fauna but one, which M'Coy and all other Palæontologists admit to be *Palæozoic*. Schimper in his recent powerful work (*Paléontologie végétale*) assumes on the statement of reporters that *Glossopteris* occurs in the Oolitic formation of the Rajmahal hills of India, whereas Dr. Oldham, the skilful Director of the Indian Survey, declares that its officers have not "*been able to trace, among several thousand specimens, a single representative of the genus Glossopteris from any part of these upper or RAJMAHAL beds.*"

If then, that series of beds be considered Mesozoic on other evidence, and if, as is shown, *Glossopteris* belongs to a lower

series, and *that still lower than Triassic*, on the very evidence from India our New South Wales coal-beds are confirmed as Palæozoic.

Alethopteris lonchitica and *Adiantites eximius* may be held of as great weight as *Glossopteris*, which is only known in one obscure place in America, and in India and Africa, where its associates are held to be older than Mesozoic.

Mr. Selwyn has, moreover, admitted that it has never yet been found in Victoria, though sections amounting to 4,000 vertical feet have been passed through under his superintendence; whatever then be the age of the Victoria beds *Glossopteris* cannot be cited from that Colony to assist in proving New South Wales Newcastle coal to be Oolitic.

Admitting that there may be some lithological resemblance between certain beds in the Wianamatta series of New South Wales, and those of the Mesozoic beds of Victoria, yet all this and other like references can have little weight against the testimony produced from Queensland; for there are sections on the Bowen River (full 1,000 miles from Sydney), in which the whole history of the coal-beds may be read off without error.

Mr. Daintree writes thus:—"The Bowen River coal series would afford more conclusive sections in the upper portion than your own; since, besides the seams of coal lying at the base of the Bowen River series, *interstratified with beds containing a marine fauna*, which Professor M'Coy acknowledges to be *Carboniferous*; there are likewise beds containing a nearly similar fauna, resting on beds with abundance of imbedded *Glossopteris*."

I learn also, from the examination of both Fauna and Flora, specimens of which were in my possession before Mr. Daintree had visited Queensland, that the former contains the identical species described by M'Coy (*Annals Nat. Hist.*, vol. XX), such as *Productus brachythærus*, *Pachydomus globosus*, *Allorisma curvatum*, whilst the latter contains *Phyllothea australis* and *Glossopteris Browniana*, and others, which were assumed to be Oolitic at Newcastle, but must be admitted to be Palæozoic on the Bowen River.

The coal seams on the Bowen River are of variable thickness, but a ten-foot seam has been noticed.

Since these facts were first made known, fresh irresistible evidence has been produced. It was known from Leichhardt's explorations that *Glossopteris* existed in the coal-beds of the Comet River. Mr. Daintree, about a year ago, traced these beds up to Peak Downs, and found, at the head of Roper's Creek, the identical marine fossils before referred to, resting upon the *Glossopteris* coal-beds, just as they do on the Bowen River; and since that I have received from Belcombe Creek—a locality within a few miles of Roper's Creek—a fine series of Mesozoic fossils,

identical with those of Wollumbilla and Fitzroy Downs (which Professor M'Coy considered the marine equivalents of the plant-beds of Newcastle), proving as distinctly as possible that the equivalents of those plant-beds are separated in Queensland by Lower Carboniferous fossils from those Mesozoic beds. This ought to be sufficient to show the untenable character of any deductions as to the Oolitic character or Mesozoic age of our Newcastle coal.

Mr. Gould, in his report to the Government of Tasmania, October, 1861, also states that the Mersey River worked coal-seam belongs to the formation with the same marine fossils as in Queensland, and on the Hunter in New South Wales.

Having visited the Tasmanian locality for the purpose of inspection, I can confirm all that has been stated respecting the occurrence of the marine Palæozoic fossils, *Orthonota*, *Spirifera*, *Fenestella*, *Pachydomus*, *Theca*, &c., in association with and immediately above the coal.

So far, then, the question about the age of some of the Australian coal must be considered as settled; and if, as in Illawarra, the coal-beds overlie the marine beds, as they do also in the Fingal district of Tasmania, it would appear that all these separate occurrences belong to one thick series, in which marine beds and fresh-water-beds interpolate each other. But, assuredly, in that case, the arrangement adopted must express the order as follows:—

1. Upper coal measures.
2. Upper marine beds.
3. Lower coal measures.
4. Lower marine beds.

So far as I know, the latter rest frequently on a conglomerate, which in Tasmania I found to contain undoubted Carboniferous fossils.

Since the Exhibition of 1862, on which occasion, in a paper on the Coal Fields, I noticed the occurrence of oil-bearing Cannel Coal at the foot of Mount York, and at Colley Creek in the Liverpool Ranges (not on eastern waters), the former has been in great request for the purpose of producing illuminating oils; and the produce has been brought into the market. In the former locality, and in Burragorang, I have made some recent researches which have satisfied me that these can only belong to the upper coal measures. At Burragorang the blocks of Cannel are found in an intermediate position, between the top of the coal measures and the upper marine beds, which (if the overlying measures themselves do not) certainly bear the very strongest resemblance to the Hunter River series.

In Illawarra, also, there are shales which are above that geological position, and which produce oil for illumination, but

are not of the peculiar character of the Cannel at Mount York, which, in a great degree, resembles the Bog Head mineral of Scotland, only it is more valuable. The character of this substance is such as to justify its being considered a species of Bathvillite or Torbanite, in consequence of its colour and woody condition.

It has unquestionably resulted from the local deposition of some resinous wood, and passes generally into ordinary coal, many portions of the same bed exhibiting the unmistakable features of the latter and the impress of fronds of *Glossopteris* as plainly as they are shown on ordinary coal shale. This hydrocarbon varies somewhat in composition; and (as at Colley Creek) is frequently filled with quartzose particles, showing that it was deposited in a shallow pool, to which sand was drifted perhaps by the wind.

At Reedy Creek, now called Petrolia, there is a band of thin and very elastic substance of this kind, separated from the thicker bed below by a parting of white clay.

Varieties of this mineral occur in the Grose River, on Burragorang, on the Colo, on Mount Victoria, and in one spot in Tasmania behind Table Cape, on the southern shore of Bass's Strait, as well as in other localities in the different Colonies. Presuming that the origin above suggested is correct, viz., the occasional occurrence in the ancient deposits of trees of a peculiar resinous constitution, there is no anomaly in finding in one spot a mere patch amidst a coal seam (as is the case at Anvil Creek, on the Hunter River), or thick-bedded masses of greater area as in the coal-seams of Mount York, or of American Creek in the Illawarra, depending on the original amount of drift timber.

In the section presented by the escarpment on the left bank of Cox's River, below Pulpit Hill, at Megalong, there are two beds in which this hydrocarbon exists.

Sometime since specimens of this, together with others from the Illawarra, were taken to America by Mr. Consul Hall, and were subjected to examination by Professor Silliman. The result was afterwards published in the *American Journal of Science and Art*, under the name of Wollongongite, an accidental misnomer (as I have elsewhere pointed out), inasmuch as I have Mr. Hall's written assurance that the specimens examined by Professor Silliman did not come from the Illawarra, but from the western sections at Megalong and Reedy Creek.

Professor Silliman shows that this material, as tested by him, has an illuminating power very much greater than any other yet known. It would be invaluable if it existed in sufficient quantity to meet all demands upon it. As it is, there are two separate oil-producing works (one on American Creek, the other in

Petrolia), which are now employed in making mineral oils of reasonably good quality, though both inferior to the product described by Professor Silliman.

Having suggested that the name should be changed, some jealousy was exhibited by one of the Companies respecting my remarks; but alteration of the name could assuredly not affect the value of the result of distillation, for the poet tells us, "If we call a rose by any other name it will smell as sweet," and therefore, the desire to "call things by their right names" has no object but to do justice to science.

Specimens of all the products under the present heading were found in the late and in the former Exhibition. It has been an object of inquiry whether Petroleum springs exist in New South Wales. Such have been reported from the Corong in South Australia, and from Taranaki in New Zealand, and from Victoria. The former is, we learn, a mistake, being probably at a point where certain animal substances have decomposed. In New South Wales there are also two localities, known to me for many years, in which Petroleum exudes; and there are two or three in Western Australia, the products from which I have examined. Nothing of value has as yet been found.

Supposing the truth of the conjecture respecting the formation of Torbanite and its allies from chemical decomposition and changes of resinous kinds of drift timber in the masses now transformed to coal, the occurrence of such a mineral is not necessarily confined to coal-beds of one epoch; and thus we find Dr. Hector reporting on the occurrence of a hydrocarbon in New Zealand, from what he deems a secondary formation, intermediate in volatile matter between those of Torbane Hill and New South Wales, the latter having by far the greatest amount, with much less ash than the former.

Over the upper workable coal measures of New South Wales is deposited a series of beds of sandstone, shale, and conglomerate, oftentimes concretionary in structure and very thick-bedded, varying in composition, with occasional false-bedding, deeply excavated, and so forming deep ravines with lofty escarpments, to which series I have given the name of Hawkesbury rocks, owing to their great development along the course of the river of that name. These beds are not less in the coast region than from 800 to 1,000 feet in thickness, and contain occasional patches of shale, with fragments of leaves of ferns, a few pebbles of porphyry, granite, or slates, and assuming in surface outline the appearance of granite, from the materials of which and associated old deposits it must in part have been derived. On the summit of the Blue Mountains, as along the Grose River, the thickness of the series is very much greater. Patches of very small area contain coal,

carbonate of iron, and other representations of miniature coal measures. 30 feet above the sea-level at Sydney; below it at Cockatoo Island and on the Blue Mountains, 3,350 feet above the sea, *Cleithrolepis granulatus* has been found in this formation. The bottom beds are purple, being highly charged with iron; and in various exposed places the remaining upper beds are worn into imitations of ruined castles and singular projections, as on the Grose River; at Hassan's Walls; on Mount Clarence; at Morangaroo, on the western flank of the Blue Mountains, as well as at the north end of Expedition Range, in Queensland, and in various other localities.

This group of the Hawkesbury rocks is surmounted by another series, called by me the Wianamatta beds, consisting of black shales, filled in places with *Cleithrolepis* and other fish of Permian aspect, brown shales, calcareous and other sandstones, with nodules of ironstone with fishes, plants, and shells of *Unio* and *Anadonta*, *Cyclas*, *Entomostraca*, &c. The thickness of this group is not less than 800 to 900 feet. Having been much denuded it forms where the shales are exposed, in smooth rounded outlines. An interval must have elapsed in places between the times of deposition of these groups; but in other localities there is a gradual intermixture of beds.

Along the Nepean, where the escarpment of the Blue Mountains forms the side of a great fault, the Wianamatta beds abut against the Hawkesbury rocks, or recline at a high angle on the slopes, proving there a distinct difference in time of deposit; but whether the two were parts or not of one formation the same species of fishes occur in parts of each, and there is a direct connection of a certain kind between them. But at present no *Glossopteris* has been found in either.

Considerable collections from these groups were exhibited by me at Paris in 1855, and at Melbourne in 1866.

Now, to what epochs do they belong?—to one or to more?—to Palæozoic or to Mesozoic eras?

Whether they be acknowledged as Palæozoic (which the fishes determined by Sir P. M. de G. Egerton, Bart., would justify), or whether, with Mr. Selwyn, we consider them (against that evidence) to be Secondary—or whether we suppose that the beds in Victoria are, or are not, an upper portion of the Wianamatta beds of New South Wales, this appears to be certain, that whilst there is evidence of fish remains of Palæozoic types, extending all through in the Wianamatta, the Hawkesbury, the coal measures and the underlying and interpolating marine beds, there is no Mesozoic Fauna in connection with them; and no *Glossopteris* above the coal.

MESOZOIC OR SECONDARY ROCKS.

Nevertheless, there is in Queensland clear evidence of a supposed Triassic series, in which *Trigonia* and plants allied to *Tæniopteris* are found to exist, though not in the same beds; and there are also shales of a coal series on the Clarence River, in New South Wales, in which a plant of similar kind has been observed by me very recently. But all *these latter* beds are a long way above the *Glossopteris* beds and have little in common with them. They do, in fact, belong to a different series, and if they are Mesozoic they become a satisfactory proof that the Newcastle beds are not so. Should these beds eventually be collocated with the Victoria deposits then there will be established an extension of the latter, but not an extinction of the former.

Some remarks made by de Zigno in a valuable paper before the Academy of Science at Padua, 23rd April, 1863, show that he has been misled on this question, as to the occurrence in the same beds of plants and shells that belong to different Floras and Faunas.

“Altri depositi pure d’ incerta classificazione ci si schierano innanzi prendendo ad esaminare i terreni a combustibile fossile della Nuova Galles meridionale e della Tasmania, che il M’Coy aveva fino dal 1847, collocati nel piano dell’ Oolite, mentre Clarke annunciava di avervi rinvenuto i *Lepidodendri* dell’ epoca carbonifera.

“Successivamente le nuove indagini instituite dal M’Coy lo ponevano in grado di chiarire come i resti trovati dal Clarke appartenessero a depositi collocati ad una grande distanza di quelli le cui piante accennavano ad un’ epoca più recente.

* * * * *

“Egli cita in questi ultimi depositi la presenza di quattro Cicadee e di una *Tæniopteris* molto affine alla *Tæniopteris vittata* dell’ Oolite di Scarborough, e nota come presso Volumbilla abbia trovato *Belemniti*, *Pentacriniti* e varie conchiglie che s’ approssimano alle specie proprie dell’ Oolite inferiore, del *Lias* e del *Trias*.” (p. 148-9.)

Now, in this statement are three things to be re-considered:—

1. It has not been said by me that the *Lepidodendron* was found in the same beds with *Glossopteris* (though evidence has come out recently to the effect that these plants have been found together at Newcastle), but it has been held that the *Glossopteris* coal-beds and the *Lepidodendron* beds are part and parcel of one great formation.
2. In New South Wales no *Cycadites* and no true *Tæniopteris* have been ever found, though they may occur in Victoria in the beds considered by the geologists there to belong to the *Wianamatta* beds.

3. Neither in the Victoria beds, nor in the Wianamatta beds, has ever been found a Belemnite, a Pentacrinite, or any shell, save a fresh-water *Unio* in Victoria and those found in the fish-bearing shales of New South Wales.

The mention of Belemnites, &c., belongs to another discovery I was instrumental in having made.

In 1861 I ascertained that beds existed between the Condamine and Maranoa Rivers, and, as I now know, over an enormous region, which I announced to Sir Henry Barkly as either Cretaceous or Jurassic. Professor M'Coy, who undertook to examine them, came to the conclusion that they were *not* upper Mesozoic but lower, and included them as the marine representatives of the Victoria carbonaceous beds and of the Newcastle coal-beds, which he believed to be of the age of the Scarborough Oolite. As there were shells in the collection which had a much older aspect, and the Professor insisted on the greater age of them all, I consented to adopt the possibility of that view, willing to reconcile the difficulties of the case. I accordingly sent the collection to Europe, to have the stated facts confirmed or refuted by a wider comparison than could be had in Australia.

Mr. Charles Moore, F.G.S., undertook the task conjointly with other Palæontologists, and the result has been embodied in an elaborate paper published in the Quarterly Journal of the Geological Society of May, 1870, illustrated by plates of the fossils. That report consigns the whole to *upper* Oolite, yet admitting one or two to belong to the Cretaceous formation, but denying them to belong to any of the lower Mesozoic formations. It must, however, be borne in mind that Mr. Moore assumes they do not belong to one series of beds, but, as he supposes, have been brought together by accidental circumstances. Whatever be the facts of the case this, at least, is certain—these upper Mesozoic beds are not the representatives of supposed lower Mesozoic plant beds, nor could they by any chance be classed in the way asserted by De Zigno, for they have nothing to do with the "*Tæniopteris*" beds of Victoria, nor with the fish-bearing Wianamatta beds.

I will only add to this, that M'Coy has published several Cretaceous fossils from the Flinders River, and that I have traced the Wollumbilla formation to that river; and therefore, with the knowledge that Mr. Selwyn found two drift Cretaceous fossils in Victoria, my first surmise of a Cretaceous series was not altogether unjustified. The extraordinary extension of these formations may be inferred from the fact, that several of the Wollumbilla species were brought by Mr. Waterhouse from the south-west of Sturt's Stony Desert, and on the route of Stuart across Australia, and were included in my collection described by Mr. Moore.

That Cretaceous or Jurassic rocks formerly occupied and still occupy an enormous range in Queensland I can now assert, having obtained some of the additional information which I proposed to collect in 1861. I have now been able to discover that rocks of the above epochs range from the east of Wollumbilla across the Maranoa and Warrego to the Nive and Barcoo; thence along the head of the Thomson to the Flinders, and so round by Tower Hill and the Belyando back to the Amby and Maranoa Rivers; not of course, in one uninterrupted area, but resting on the Carboniferous and other Palæozoic formations, thus exhibiting a very extensive distribution of Secondary rocks; and it will probably be found that various groups of the Jurassic epoch are represented there.

Mr. Daintree states that he has been enabled not only to confirm this, but that he has traced the same formations 300 miles further, and that the area occupied by them in Queensland covers 52,000 square miles.

Whether they extend across Central to Western Australia is undetermined; but in the latter Colony, as described by Mr. Moore in the paper already cited, there is a lower Oolitic group, which from collections in my own possession I am enabled to identify as coming from a locality north of Champion Bay, rendered classical by the topographical observations of Rear Admirals King and Stokes, viz., Wizard Peak and its neighbourhood.

It is certainly singular that some well-known species of European reputation, or their representatives, are found in the Western Australia Oolites, such as the following of the Great Oolite:—*Trigonia costata*; *Ostrea Marshii*; *Ammonites Moorei*; *Lima pectiniformis*; *Avicula Munsteri*, &c.

None of these have, however, been found in Queensland, New South Wales, in Victoria, or in Tasmania; but in the latter island there are undoubted equivalents of some part of the Wianamatta series, as well as of the Coal measures and lower Carboniferous beds of New South Wales.

Mr. Moore considers that the Lias is represented by some of these formations; but I may suggest that, instead of considering these deposits as a heterogeneous collection, it is not impossible the Mesozoic formations of Australia must be taken as a whole, without the distinctions of European nomenclature.

The facts already arrived at may justify the following arrangement, as representing the disposition of formations over a considerable part of the Australasian region:—

1. CRETACEOUS.—Flinders' River, Queensland; Western Australia. (*Gregory*.)
2. UPPER JURASSIC.—Queensland.

3. LOWER JURASSIC.—Western Australia.

4. TRIAS.—Queensland (?), Clarence River, Victoria.

5. PALEOZOIC.—Queensland, New South Wales, Tasmania, Victoria; in which arrangement I place the Victorian "carbonaceous" above my Wianamatta beds. Of course, subsequent discoveries may modify such a view, and lead to a final settlement of opinion, by enabling geologists to fill up the *gaps* which undoubtedly exist, proving, perhaps, that the Cretaceous fossils picked up in drift by Mr. Selwyn indicate the former existence of Upper Secondary rocks in that province, as the Ammonite brought to me on the Clarence River Coal Fields in 1853 may indicate the former presence there of an Oolitic formation.

In New Zealand the greater part of the coal measures is not Palæozoic, but some of it is said to be Secondary, to which epoch also belong the Jurassic Plesiosaurus and Ammonites; and Triassic Aviculæ and Monotis.

Mr. T. Hood Hood has given a very interesting account of Plesiosaurian and Crocodilian remains in the Waipara gorges of the province of Canterbury, in the Quarterly Journal of the Geological Society for August, 1870.

In New Caledonia there is also a distinct Triassic series, of which some of the fossils are akin to those of New Zealand. But, at present neither has this nor the Belemnites or Trigoniæ of Queensland been found in New South Wales.

So far as the question of coal is concerned, no coal-seams (but only thin patches of very limited layers) have been found in the Wianamatta or the Hawkesbury rocks, or even such as occur in the alleged Secondary deposits of Victoria; and in Queensland, where workable seams do exist, the fossils of New South Wales are also found. In the Secondary marine-beds of Wollumbilla and the Amby, gold in minute visible particles was found by me in some of the quartz pebbles cemented with the shells, and a small quantity was detected by crushing the whole—shells, pebbles, and the calcareous cement, together. Mr. Daintree has also satisfied me that gold occurs at the Springs, on Peak Downs, in Glossopteris beds of the Carboniferous formation.

TERTIARY ROCKS.

Kainozoic of Duncan.

Throughout the whole of Eastern Australia, including New South Wales and Queensland, no Tertiary *marine* deposits have been discovered. There are, however, in various places of New South Wales patches of *plant deposits* which, according to the frequent notices of geologists, may be referred to some period of the Tertiary epoch. A silicified sandstone, or quartzite, of this kind, full of impressions of ferns and leaves of trees, but not known to be now living, occurs at Jerrawa Creek, not far from

Yass. It is probably Miocene. On the summit of the Cordillera, near Nundle, above the Peel River Diggings, occurs a ferruginous bed full of leaves. On the Richmond River occurs a white magnesite, full of yellowish impressions of leaves. At Kewong, in the county of Gowen, there is a bluish deposit of fine aluminous matter with black impressions. From a depth of 60 feet in a shaft near Bungonia, a pale yellowish white deposit with similar impressions was brought up; and on the summit of "a made" hill, above Kiandra Gold Field, at a height of 4,000 feet above the sea, and in a region now partly covered with snow many months in the year, there is a deposit of black clay with such casts of leaves as occur in similar clay near Hyde in New Zealand.

No botanist is willing to declare what is the exact age of such deposits; but some of the leaves are supposed to represent among others the foliage of *Fagus*; yet it was only in 1866 that a beech forest was discovered, by the Director of the Botanical Gardens, growing on the M'Leay River. On comparing the living leaves with the impressions in the various deposits mentioned I can see no specific identity. This indicates a feature in Geology not yet fully dealt with.

The most remarkable instance I have met with is on the coast, about forty-two miles north of Cape Howe, where, at a place called Chouta (between Tura and Boonda), a cliff, about 100 feet high, formed of sand and white silicate of alumina, contains beds of lignite charged with sulphide of iron, and which are full of phytolites much allied to the living vegetation. From the clays, some of which are nearly kaolin, articles of pottery have been formed. It has been proved that, by distillation, a fair proportion of lubricating oil may be produced from the ligniferous clay, and other products are expected to result from these deposits. The cliff is about 60 feet thick from the sea to the top of the clays, and borings below the sea-level have shown a still greater thickness.

These deposits lie between the horns of the little bay at Tura and Boonda, resting at one end on the highly undulating Palæozoic rocks, and at the other on a mass of Porphyry. They were, formerly, no doubt, deposited in a depression among the slopes of the hills, but the wearing away of the coast has left a cliff of clay and sand instead of the original cliff of hard rocks. It is remarkable that at the south end the rocks assume the character of a breccia of quartz, cemented by silicious matter (probably like a deposit mentioned by Mr. Gould as occurring in Tasmania) and in its analysis has detected the presence of gold, though some quartz veins at the north end contained none.

My impression at first was that the lignite is recent, but I place the deposits under the present head because it may be possible

the plants are not recent; and some of the hardened clinker-like sands covering the clays remind me of the sands on the coast of Dorset, at Studland and Bourne Mouth. If this be really a Tertiary locality it does not contradict the general assertion at the commencement of this section, for no shells of any kind have been detected in any part of these beds. Swampy and stunted plants still grow on the sands which are very wet, and probably reproducing the phenomena beneath them, with the exception of the white clays which were in part derived from the decomposed felspathic matter of the Porphyry. In various parts of Maneero there are lignite-like local thin deposits, but on analysis they have proved valueless.

It may be well to mention, that although there are no such positive indications as exist in Victoria, as to the age of the gold drifts which are by Mr. Selwyn referred to Upper and Middle Tertiary, yet there are parallels in New South Wales to certain phenomena that have been observed in that province. Thus, the gold alluvia of the Uralla resting chiefly on granite are covered by a great thickness of basalt, as in various Victorian fields; and at Lucknow, near Orange, as well as at Uralla, under the basalt and with the gold alluvia are found stems and branches of trees, as is the case at Daylesford, in Victoria.

These may be Miocene, or perhaps Pliocene, but the proof must rest on evidence not yet attainable; and Dr. Duncan has already warned us to defer such distinctions.

PLEISTOCENE AND RECENT ACCUMULATIONS.

In many parts of the existing region, all over the surface, wherever the basal rock is not denuded, as near Sydney, there are local deposits which might be called "till," were any Testacea found in them; and in the interior there are widely spread accumulations of drift pebbles, which, as on the Hunter and Wollondilly, are rounded by attrition in their long journey from the mountains whence they have been derived. Sometimes, also, the breaking up of conglomerates has contributed to this drift.

On Peak Downs there are deep accumulations of drift, such as transmuted beds of the Carboniferous formation, igneous rocks, such as porphyry and basalt, and fragments of the older Palæozoic formation. Many of these are encrusted with thin calcareous cement, which forms cups of clear calcspar in hollows of a fine porphyritic grit; the same grit occurring on the Warrego, on the Ballandoon and Narran ridges, with transmuted quartzite, also in wells there and on the Darling near Fort Bourke, in which drift fine gold was detected by me to exist on the Downs, and has been again reported to me from the base of Rankin's Ranges on the Darling River,—the furthest known western auriferous locality in New South Wales.

In 1869 I had the satisfaction of reporting, in the *Geological Magazine*, on the discovery of a femur of *Dinornis* in drift at the depth of 188 feet from a well in that part of Peak Downs (22° 40' s.) which lies between Lord's Table Mountain and the heads of Theresa Creek, near the track from Clermont to Broad Sound. This discovery is interesting in many important ways, but chiefly as showing a probable extension of land between New Zealand and Australia, though now a deep sea rolls between them with only an occasional sounding. It is in accordance with Mr. Hood's discovery of Crocodilian remains in the former country, proving, what other physical evidence confirms, that large tracts have disappeared from the shores of these great islands by long continued geological causes, among which oscillations of the sea-bottom and denudation were most prominent.

Looking to the Colony of New South Wales, we find that in more than one instance the present river channels have deepened since the drift first began to crowd their banks. I have traced one of these drift streams, sometimes at great heights above the valleys, for more than 80 miles. In other places I have found upon the surface, as Strzelecki did in other parts, minerals (especially ores of copper, tin, and lead), which were at a great distance from their sources; and in two instances that rare mineral, Molybdate of lead, of which no habitat has ever been yet found; and not more than a year ago a lump of sulphuret of antimony, weighing three pounds, and exhibiting surface evidence of its being a drifted substance, was disinterred from the superficial ironstone gravel of an unfrequented place in the bush on one of the heights of the north shore of Port Jackson.

In the great plains of the interior bones of various gigantic marsupials, fishes and reptiles, are found bedded in black muddy trappan soil; and on Darling Downs, in Queensland, univalve and bivalve shells are found in some cases attached to the bones, or deposited over them in a regular series of layers, at intervals of several feet; and of these shells some are yet living in the water-holes of the creeks. These facts are generally known, but it was not till recently that the osseous relics have been found in different creeks throughout the whole of the slopes and plains at the base of the Cordillera in Eastern Australia, in Victoria, in South Australia, and in North Australia also. Of similar age are the accumulations of bones in caverns, as at Wellington; at Boree near the head of the Colo River; at Yesseba, on the Macleay River; at the head of the Coodradigbee, and in other places.

A magnificent collection of the remains in the Wellington Caves has been made, at the instigation of Professor Owen, at the cost of the New South Wales Government, with the superin-

tendance of the Trustees of the Australian Museum, by one of them, Professor Thomson, and by Mr. Krefft, the diligent and skilful Curator of that Institution.

The reports of these gentlemen, together with more than a thousand partly determined specimens, were forwarded to Professor Owen, who has expressed his acknowledgment of the value of this collection, "as regards novelty, instructiveness, and encouragement for the future," and as an "important element in working out the ancient history of the forms of animal life peculiar to Australia."

The Coodradigbee caverns will repay research hereafter. It has already furnished me with bones of birds, in which those of Emeu are prominent.

Within the last two years the drifts of the Cudgegong and Macquarie Rivers have been searched for diamonds, first reported in 1860 by myself as occurring in numbers in the latter river. More than 4,000 examples have been found, but they are chiefly small and of little value; though a few have been found of larger size, and have been cut and polished.

A few others have been brought to me from other localities in New South Wales, and a few also have been found in Victoria.

Those found since 1860 have fully justified the heading of my notice published that year ("Southern Gold Fields," p. 272),—"NEW SOUTH WALES A DIAMOND COUNTRY."

Very recently a paper on the Diamond districts of the Cudgegong River by Mr. Norman Taylor and Professor Thomson, was read before the Royal Society of New South Wales.

This most valuable and able contribution to the Geology and Mineralogy of the Colony will appear in the next volume of the Society's transactions, in which will be found also an attempt by myself to trace the natural history of the diamond.

Some years since I reported on the occurrence of mercury in this Colony; but my expectation of the discovery of a lode of cinnabar has been disappointed. The cinnabar occurs on the Cudgegong in drift lumps and pebbles, and is probably the result of springs as in California. In New Zealand and in the neighbourhood of the Clarke River, North Queensland, the same ore occurs in a similar way. About 1841 I received the first sample of quicksilver from the neighbourhood of the locality of the present finds of cinnabar.

As connected with these drifts may be mentioned the occurrence of gems of all kinds in all the rivers where auriferous deposits occur, and subsequent years have only served to abundantly confirm my statement of 1860 as to the general distribution of them in the gold-bearing districts.

Along the coast are found ranges of Dunes, with a variety of shells, some of them rare, others common, as on Port Hacking and Cronulla Beach; along the shores of Botany Bay; on the great flat between the Hunter and Port Stephens, and along the Macleay River, which now passes for many miles through the shelly accumulations; and about Moreton Bay and in more northern coast openings, shells and marine refuse form deep deposits, from which, as in Illawarra and Broken Bay, a considerable profit is obtained by dredgers and shell-collectors, for the production of lime.

At the mouth of the Richmond River gold is found distributed in the sands and covering pebbles of the sea beach; a similar distribution is found in the sands of Shell Harbour (where the accumulations abovenamed occur) and some gold was extracted. Other spots give similar indications; and one specimen of gold was brought up from the sea bottom by the sounding operations of H.M.S. "Herald," off Port Macquarie.

Numerous instances have also been recorded of gold having been found in the gizzards of wild fowl and of domestic poultry, in various parts of the Colony, confirming, with the above-mentioned facts, the almost universal distribution of the precious metal in river-drifts and superficial deposits. Some of the abovenamed examples of gold collected by birds were exhibited by me at Sydney and in Paris in 1855, and are still in my possession.

All along the coast, from Torres's Strait to Bass's Strait, drift pumice may be found wherever there is a lodgment, generally in the north corner of the little shore bays. That this has gone on for ages is apparent, as in one part of the coast north of Wollongong there is an accumulation of water-worn pumice, some distance from the shore and beyond the reach of the present waves. It is supposed to come in during easterly gales, from the volcanic islands to the north-east. In 1841 this fact, and all the evidence then collected in relation to such drift and "atmospheric deposits of dust and ashes," were published in a paper I forwarded to the *Tasmanian Journal*, of which D'Archiac, *Prog. de la Géol.*, was pleased to say it contained all that was known on the subject.

Subsequently received facts have only confirmed what was then stated.

Raised beaches also occur at various heights on rocky projections of the coast, indicating elevation of the land, of which there is distinct evidence in the recent period, not only in Moreton Bay, near Sydney and thence to Bass's Strait, but on both sides of that Strait, and as far as Adelaide and King George's Sound. Mr. Selwyn gives data for assuming the elevation of the land to have reached occasionally 4,000 feet in Victoria, but he has no evidence of Tertiary marine fossils above 600 feet. Un-

fortunately, on the eastern coast, having no marine Tertiaries, we have to found our deductions, as respects New South Wales, on less secure data. Yet we have here evidence of another kind, and pot-holed surfaces of considerable extent have been found by me at various heights from 300 to nearly 3,000 feet.

In a brief abstract like the present it is impossible to quote authorities, nor has time allowed a more satisfactory digest or a wider range of statements. What has been thus collected is brought together in the design of giving a concise summary of the general geology of the Colony, omitting, on account of its perplexity, all specific reference to the igneous rocks traversing, covering, transmuting, or supporting the sedimentary deposits.

In the former edition of this paper mention was merely made of the Cape York Peninsula, where ferruginous deposits occur on the lower slopes and bases of Porphyry hills. Those deposits were examined at the Mint, and no gold was detected; but on a recent comparison of their lithological character with that of Tertiary beds from Flemington (in Victoria), I believe them to be, if not Tertiary, of similar origin to the *laterite* of India, and of the islands in the intermediate sea.

Dr. Rattray, of H.M.S. "Salamander," who furnished me with a map, and a collection to illustrate it, from the neighbourhood of Cape York, and whose paper was read by me, in his absence, before the Royal Society of New South Wales, has more recently published his views *in extenso* before the Geological Society of London. He therein attributes to me an opinion that the thick sandstones of the Peninsula are of the age of the Hawkesbury rocks of New South Wales.

I do not remember that I have expressed any opinion on this sandstone; what was submitted to me was considered by me far younger. That such sandstone, and even older deposits between Cape York and the Gilbert River, may exist in the interior of the Peninsula, is far from improbable. The data at present are insufficient for further comment. It may belong to the Desert sandstone of Daintree.

But this inference may be permitted, that as Cape York is so short a distance from the gold-bearing deposits of New Guinea, and as is now proved, all the rivers running to the Gulf of Carpentaria, from the Mitchell to the Nicholson inclusive, rise in auriferous ranges, gold will probably be found in some parts of the country, along the back-bone of the Peninsula; and although my past examination of the rocks in the Louisiade Archipelago has not proved gold to exist there, yet I agree with Mr. Daintree, in his last report to the Queensland Government, that the strike of the older formations justifies the belief that that Archipelago, and, I may add, other portions of the lands insulated in

that part of the Pacific, will eventually furnish their quota of the precious metal. This is not the place to discuss the geology of the islands nearer New South Wales and in its jurisdiction. But it may be well to add that, from the account of a recent visit to Lord Howe's Island by a Commission appointed by the Government, and from a collection submitted to me by Mr. Leggatt, of Levuka, in Fiji, the geology of that island is satisfactorily established as offering evidence towards the phenomena which characterize the lands formerly existing to the eastward of Australia.

W.B.C.

St. Leonards, 31st December, 1870.

P.S.—Although not a *geological* discovery, yet, inasmuch as the connection of past geological epochs with the present is a collateral subject, it may be proper to mention the curious fact, that in 1869 a living *Ceratodus* (*C. Forsteri*, *Kreff*) has been detected in the Burnett River, Queensland, the only previously known existence of the genus being the *teeth* found in Triassic European rocks to which that name was given.

This is an interesting addition to the living *Trigonia*, the *Cestracion*, the *Terebratula*, &c., of Australia, which connect the present period with the forms of life once held to be extinct.

W.B.C.

ON THE
PROGRESS OF GOLD DISCOVERY IN AUSTRALASIA,
FROM 1860 TO 1871.

(By the Rev. W. B. CLARKE, M.A., F.G.S.)

IN 1854 and 1861, brief notices, detailing the progress of exploration in the Gold-fields of New South Wales, up to those respective dates, were contributed, by request of the Commissioners, to the Catalogues of the International Exhibition published in the Colony. The present notice carries on the account of progress ten years further; but as the auriferous regions have in this interval been extended considerably beyond the limits of this Colony, it will be needful to take into account several interesting facts connected with the general subject.

Before we proceed, attention may be called to the following abstract, showing the relative proportion in two periods, respectively, of Australian gold to the quantities produced in the other countries named:—

1851 to 1860—	OZS.
America (excluding California)	7,000,000
Russia	7,000,000
California	23,000,000
Australia	25,000,000
1861 to 1867—	
America (excluding California) and Russia	8,900,000
New Zealand.....	3,500,000
California and British Columbia.....	11,200,000
Australia	13,300,000

In the former of these periods nearly all the gold in Australia was the result of diggings in alluvial deposits; the latter period saw the extensive introduction of mining for gold in the matrix.

Since then the produce from alluvial diggings has in many instances decreased, owing to the effects of a natural law that a fund, however large, of limited extent, cannot furnish an unlimited supply. As the first worked deposits become exhausted, and new localities are necessarily more difficult of discovery, owing in part

to the impetus and zeal that led to the earlier investigations having in some degree died out, it is not surprising that later efforts have resulted in a comparatively diminished success.

On the other hand, as the solid reefs of quartz and other sources of imbedded gold have been wrought with greater earnestness and better capacities, the supplies from this branch of industry have rapidly increased. Nor is it surprising, that the present gleaners in the alluvial fields should have a constantly diminishing produce when compared on the large scale with increasing harvests from hitherto untouched and prolific natural resources.

There have been, however, within the last decennial period discoveries that widely extend the field of research and open out expectations, that much auriferous wealth is yet to be earned from the treatment of rocks that had never entered into the calculations of those who founded their theories on the experience of a limited range of observation.

Some of the statements made on former occasions respecting the geological indications of gold in Australia still hold good in New South Wales and Victoria, though in the other Colonies new features have been discovered, and in consequence a wider field for operations has been disclosed.

It may be well to repeat here a few sentences from a former essay* on the subject:—

“The high Alpine regions, from their narrowness and other physical causes, preclude the occurrence of wide areas for profitable alluvial digging; but regions of hornblende granite have been found (as well illustrated by the Adelong, the Uralla, the Timbarra, Araluen, and Burrangong, in New South Wales, and by the Owens River in Victoria) to supply vast resources for the digging and mining population.

“The region of quartz-bearing schists, so abundant in the Western District, constitutes another feature in the history of gold working. It is there that the great masses of rolled gold, and ‘nuggets’ intermixed with quartz, are chiefly found, whilst the granite regions produce chiefly fine dust, or equal-sized granular particles, which the writer formerly denominated ‘gunpowder’ gold.

“Tracts like those of Bingera and Canoonra, and patches as on the Hanging Rock, the Barnard, and the Peel, where serpentine or greenstone carrying quartz-veins is found in the midst of disturbed and transmuted carboniferous beds, will generally supply moderate quantities of gold.

“In the tertiary and post-tertiary accumulations of ferruginous quartz-gravel, commonly called cement, a considerable amount of gold is found entangled.

“Collating the whole of the facts presented by operations in all the Colonies, it appears that the lower Silurian rocks, and certain Tertiary deposits, are very auriferous; the former of gold in the matrix, the latter of separated and re-accumulated particles; that where the latter exist over hornblende granite, the accumulations are very prolific, and that where the coal-bearing rocks prevail (though the proximity to them does not always affect the question), the chance of gold is less.

* Gold-fields.—Communicated to Catalogue of London International Exhibition.—1862.

"It further appears that the dispersion of the gold in alluvia is most abundant in regions where the drainages are northerly and north-westerly; and that the deposits are common to the eastern as well as to the western slopes of the Cordillera. Lastly, it appears that, whatever may be the causes of *deposition* of gold in the matrix, the richest gold is found to the *southward*, and the amount of *silver* alloy greatest towards the northward. It seems, also, as in the case of certain crystals of gold, exhibited in the present collection, that the crystallization of the gold sometimes assumes the character common to native silver."

I see no reason to recall, or to modify, any of these conclusions; on the contrary, all that has been observed since the above was written serves to confirm these statements in every particular; but recent explorations have shown that, in addition to the facts on which these statements were founded, fresh facts, accumulated from beyond the areas therein contemplated, exhibit certain relations with gold, new to many, which the geological data of 1861 had only in part foreshadowed.

Before we go further into detail on that head, a brief summary of the principal gold localities opened out in New South Wales during the last ten years may be usefully introduced.

These localities belong to the head waters, and some of the middle areas, of the Lachlan, the Abercrombie, the Murrumbidgee (with the region between it and the Lachlan), the Darling, the Berudba, and Umaralla (southern sources of the Murrumbidgee), the Macquarie, the Cudgegong, the Shoalhaven, and the Clarence and Richmond Rivers. Amongst these the Gold-fields of Forbes, Young, Junee, Trunkey, Cowra, Grenfell, Emu Creek, Cargo, Drake, Dubbo, Berudba (or Bredbo), have had varied fortunes; some have for several years contributed largely to the revenue, and some have had a less important influence; some have depended on their alluvial riches, some on the produce of reefs, some on both combined, and the latter three have only become noticeable within the past year; and the last of them (although the chief subject of my Report to the Government, No. 5, in Nov., 1851) has only within the present month been found deserving attention.

It is important to mention specially the extension and recently disclosed branches of the older gold workings. The particulars of this information will be found in the Appendix, which gives a full list of late and of previous operations; but there are four localities which are totally independent of each other and of all previous workings, which deserve a passing notice.

On the beach at Ballina, near the mouth of the Richmond River, the sands, shingle, and drift pebbles have been found mixed with gold, the pebbles being occasionally gilded in patches, as well as containing gold. It is natural to conclude that there must be a source of such supply, probably, in the base of the igneous and metamorphic ranges at the head of the river, or

probably the sea has cast up the auriferous wash from a submarine source. The sands of Shell Harbour, on the Illawarra Coast, have also been found auriferous. Both these examples are referred to in the "Remarks on Sedimentary Formations," in conjunction with the specimen of gold brought up by the sounding-line intermediately off Port Macquarie.

A similar occurrence of gold to that near Ballina is met with for some distance on the beach south of the Clarence Peak, mouth of the Clarence River.

In New Zealand abundance of gold at Hokitika is found on the sea-beach, and gilded pebbles, such as occur at the Richmond, are also profusely met with; but in that place the drift, now washed by the ocean, has come down from the lofty moraines of the Alpine glaciers.

Another instance of the occurrence of gold, though in small quantity, in apparent relation with igneous and transmuted beds, occurs at the base of the Mittagong (or rather Merrigang) Range, in this Colony; and at the eastern head of the Nepean River attempts were made to establish "diggings," but unsuccessfully. On visiting the spot at the time (Nov., 1865), I found that the search was being made in sand, and drift formed of transmuted shale and sandstone of the Hawkesbury series of rocks, and in the vicinity of igneous dykes and outbreaks, in which basalt, greenstone, and trachyte are prominent. As in almost every creek running down from the Range a few particles of gold may be obtained, the source is probably in the rocks indicated. Such a locality is not worthy of notice in a commercial way, but geologically it is in accordance with the conditions of other similar ranges running transversely across the country, of which there are several parallel instances in New South Wales. But whatever its value, the Nepean case is a part and parcel of the history of the search for gold during the last ten years; and, as zircon was abundant in some of the patches of ground, the basalt had, probably, some share in the contribution of the auriferous soil.

In addition to the preceding instances may be mentioned the recent fresh occurrence of fine gold in the ranges s.w. of Fort Bourke, on the Darling River, half way between which and the granite of Mount Hopeless west of the Bogan River, copper has been found, indicating the presence, in that little explored region, of outcropping patches of the Palæozoic formations; and as some gold has been found near Coonabarabran, and about the water-parting of the Bogan and the Macquarie basins, it is possible discovery hereafter of other auriferous patches may take place, when the present sources of supply shall have been exhausted.

Whatever the value of such conjectures may or may not be, we may, at least, conclude, that gold is known to exist in less or greater abundance in this Colony, in an area of which the limits

are both, of longitude and latitude, nearly 9 *degrees* asunder, a sufficiently extensive region to offer expectation of many further developments of the precious metal. There is, undoubtedly, a justifiable ground for expectation of future discoveries between the limits assigned and the localities long established.

The future increase in the number of valuable sources of supply will, it is likely, be found to correspond with a closer personal examination of the rocks and deposits already known to be prolific, by prospectors, who at present have but little encouragement and information from the official records of past experience, there being in this Colony no systematic collection and registration of data, such as have been adopted successfully in Victoria. There can be no doubt that had such a system been adopted here, much benefit would have resulted to the community at large, as well as especially to persons employed in the production of gold.

The employment of machinery is, however, on the increase, and much gold, previously undiscovered, or lost from insufficient manipulation, will doubtless be obtained. I feel a personal (though I have no pecuniary) interest in such success, having been the first to point to facts now generally recognized, that quartz frequently contains much invisible gold, and that our granites are also auriferous. The latter statement was not at first adopted, though it was accompanied by the explanation, that the gold in granite is chiefly in outside decomposed portions, more or less charged with sulphide of iron.

The value of pyrites is beginning to be found out as an auriferous gangue; and, as proving the truth of the long-admitted belief, that the gold is *mechanically* held in the pyrites, I learn that from a quantity of that mineral, only a week ago crushed in the mortar at the University, actual plates of gold were found adhering to the pestle.

As bi-sulphuret of iron occurs in rocks of all ages, and is very abundant in Australia, and as it generally contains some gold, even occasionally when it forms in fossil wood, it will hereafter deserve a more important notice than the present. It is no doubt from the decomposition of pyrites that much of the brown ferruginous colouring in some slates and quartz has been derived; and it may be observed that such portions of the rock often exhibit cavities, which, from their appearance, we may conclude have let go gold once held in the crystals of the pyrites.

Lately I have had proofs of the occurrence in some parts of this Colony of *beds* of partly transmuted material, in which quartz occurs bound up with brown ferruginous cement, which simulate lodes and have been mistaken for them by miners, in which the ferruginous matter is most abundant, and from which portion of the rock a considerable amount of gold has been obtained. Examples of such beds may be met with in the neighbourhood of the

Belubula River, and in the Araluen district; in the latter case where a granitic and porphyritic area is predominant. A similar occurrence obtains at Ravenswood, in Queensland. We have also numerous instances, one of which I reported so early as 1851, where gold has been derived from pyrites in greenstone carrying quartz-veins also auriferous. But more recently such occurrences have received the completest illustration from the facts observed at Wood's Point in Victoria, reported on by Mr. Aplin, who describes the slate-rock as traversed by Diorite holding auriferous quartz-veins.

Other writers have started the opinion that the diorite there is merely an altered slate, but it is difficult to conceive how such could be the case unless the slate was derived from dioritic elements. Whatever may be the theoretic explanation, the facts remain. That diorite has contributed under various circumstances to become the holder of an auriferous matrix, is exhibited on the most extensive scale at Gympie, on the River Mary, in Queensland.

Mr. Hacket has shown on his valuable chart that a broad mass of diorite has intruded among slates and limestone, transmuting the schistose beds by interchange of elements over a wide margin, the whole of these altered beds becoming charged with fossils of either Carboniferous or Upper Devonian age, and carrying veins and reefs of quartz wonderfully rich in gold.

In this case the age of the fossils and the origin of their gangue afford in no way an example of the more common exhibition of auriferous reefs in true Silurian rocks, but show what the dykes at Cann's Plains, on the Peel River, and others in the County of Wellington confirm, that our gold-bearing rocks are sometimes very much younger than those which are often considered to be typical. Below* will be found the original notes I made on a collection from Gympie, submitted to me in April, 1870, by the Philosophical Society of Brisbane.

* NOTES ON MR. HACKET'S COLLECTION OF ROCKS AND FOSSILS FROM THE GYMPIE GOLD-FIELD.

1. This collection comprises two series of rocks, the one sedimentary, the other intrusive.

2. The latter consists of varieties of the greenstone group of the Plutonic formations.

3. The former embraces several kinds of rock. Among them are some so completely free from transmutation as to exhibit the characters of ordinary schist, sandstone, and breccia; others appear to have been derived from volcanic ash of the dioritic type, and have been, since their deposit, altered by intrusive agency so as to put on the resemblance of diorite or greenstone, and as such they have by some been classified.

4. The presence of fossils serves, however, to illustrate their condition as ash-beds deposited in an ocean troubled by contemporaneous or subsequent igneous action, which, after the consolidation (in part) of the strata containing

Extending our views still northward, we have indubitable proofs of the influence of diorite and felspathic elvanites, as described by Mr. Daintree, along the Cape and Gilbert Rivers, in Northern Queensland.

And, let it be observed, the fact of the diminished value of gold by the increase of silver alloy, as we proceed northward (before reported on as respects New South Wales) holds good in relation to the Queensland Gold-fields also; and again, as stated by Dr. Hector, in New Zealand.

organic bodies, became changed by the new eruption. A considerable portion of the Gympie Gold-field has thus become a metamorphic area.

5. Such phenomena are by no means rare in Australia. Bedded, as well as intersecting basalt, occurs largely in the Illawarra carboniferous district of New South Wales, whilst, in the western border of that Colony (as about Wellington) greenstone is exhibited in a similar connection with Upper Silurian strata. At Waimalee (Prospect Hill, near Paramatta) an old diorite, precisely like that of Bople, to the eastward of the Mary River, has furnished a matrix for the plant beds of the Wianamatta Rocks the highest in the New South Wales series of sedimentary deposits; and these have been subsequently transmuted by younger igneous rocks that pierce and overflow them.

6. The whole of the sedimentary deposits in Mr. Hacket's collection betray the effects of contemporaneous independent forces. The purple schistose rock contains, besides an occasional fossil, fragments of igneous products, and some segregated quartz; and the grey and greenish fine-grained stone, derived from dioritic detritus, contains frequently much lime, many imperfect squeezed fossils, with a portion of some drifted matter. Patches of the purple schist occur in the green rock; and in the brecciated beds composed of fragmentary materials (the result of violence and subsequent consolidation in a state of repose), chemical action has produced segregations of quartz which simulate true quartz-veins.

7. It is to be presumed that the fissures in the strata which are now filled in with auriferous and cupriferous quartz were formed at a later period. A considerable time must have elapsed, for many of the fossils are themselves changed or partly obliterated, and are traceable only by the glistening cleavage of calcareous sections.

8. Mr. Hacket has marked one variety of rock *Schalstein*, and it certainly agrees with the definition of that species, inasmuch as it is laminated with thin partings or coatings of calc-spar. Now this is a very common occurrence in parts of Germany, where greenstone is also present, and where the age of the rocks is Devonian. *Schalstein* is truly a derivative, and not an independent product, and therefore must be included with the other transmuted deposits. This rock exhibits at Gympie an exact resemblance to its namesake on the Lahn, in Germany, where also are traces of copper ores and jasperised schists, as at Gympie. Mr. Hacket's excellent map of the Gympie Gold-fields should be studied in connection with the valuable memoirs of Sedgwick and Murchison, in the Transactions of the Geological Society of London, 2nd series, vol. 6, on the older deposits of North Germany and Belgium.

9. There is another probable connection between these Gympie beds and those just referred to. At any rate so far as the fossils go they lead to the conclusion that they are not older than Devonian, and may be Upper Palæozoic. The principal fossils capable of indication are *Nucula*, *Fenestella*, *Solarium*, *Spirifera*, *Inoceramus*, *Orthonota*, *Sanguinolites*, *Stenopera*, and *Producta*, which last alone proves the beds to be not above the Upper and not below the Middle Palæozoic periods.

Moreover, that enterprising geologist has shown [Trans. N.Z. Institute, Vol. II, p. 366] by an ingenious "comparative map of New Zealand and the Australian Cordillera," formed by placing the gold-fields of New Zealand over those of Eastern Australia (by a supposed westerly shift of $22^{\circ} 30'$ average longitude), that not only is there a generally equi-distant or relative position between the respective fields in both countries, but that in each country there is a similar increase of silver alloy as we proceed to the northward. Thus Gympie consorts with the Thames Gold-field; Bingera with Collingwood; Rocky River with Wakamarina; Ophir, Tambaroora, &c., with the Buller and Hokitika; the Ovens with Wakatipu and Tuapeka.

The comparison may be fanciful, but it is instructive, and the author of it is, I think, borne out in his idea, that if means of a stricter geological comparison existed, a closer agreement would be established.

The whole view is a strong confirmation of the opinion expressed by myself in another place, relating to the probable former connection of the great fragments of an antient continent, of which the Australian and New Zealand (as well as New Cale-

10. If this view is maintained then we have evidence at Gympie, which is well supported elsewhere in Queensland and in parts of New South Wales, that auriferous quartz-reefs occur in rocks younger than Silurian; and we have there also an additional proof of the influence of greenstone in the production of gold deposits. The fact was many years ago pointed out by myself and by Mr. Oदनheimer in relation to the Peel River Gold-field, and it has since then been extensively confirmed in the Thames River Gold-field, in New Zealand.

11. In Mr. Aplin's report of July 21, 1869, mention is made of the resemblance of fossils in calcareous grits at Canal Creek to those in the "diorite slates" at Gympie. The beds there are said to form "*a narrow band between the greenstone area and the river.*" In these strata, though placed under the head of "Silurian beds," the principal fossils are Spirifera and Producta. It is more than doubtful whether Producta has ever been found in the Silurian formations, and it is held to be the most distinct of all fossiliferous tests of the epoch to which it is confined. So far as is known it belongs to the Upper and Middle Palæozoic, and ranges only from Permian to Devonian formations. Assuming this limit for Canal Creek and Gympie, it becomes certain that beds of the age to which the fossils belong have a wide range in Southern Queensland, and this is the case in Northern Queensland also. Evidence will one day be produced to prove the occurrence of gold in the Upper Palæozoic formations in other localities. Nay, Mr. Daintree has given me his reasons for believing that it so occurs on Peak Downs.

The association of greenstone rocks with beds containing the fossils indicated, will form a guide for prospectors in fresh districts of the Colony.

Too much importance cannot, therefore, be given to the establishment of the fact to which the researches of Messrs. Hacket, Daintree, Aplin, and Ulrich have contributed, that igneous rocks of a certain class are the surest indications of gold in Queensland.

donian) areas represent the summits of the boundary ridges of a vast synclinal depression, filled in now by the Pacific in which occasional soundings between the opposite coasts are found to exist. There must have been on each side of New Zealand a wide sea margin.

Dr. Hector's chart does not, of course, show any comparison with the Northern Queensland Gold-fields; but so far as one may judge by the character of the gold in the latter, compared with the peculiarities of that from some of the reefs on the Thames, there is a great similitude. Nor can the greater part of the Victorian Gold-fields be subjected to such test of correspondence, owing to the form and limits of the New Zealand coasts.

It may be concluded, that gold, when combined with silver in considerable proportions, frequently takes the crystalline forms of the latter metal; and one has only to notice the aggregations of filagree patterns from the Cape River, the wires, threads, pipes, spider-leg shapes, and, in some instances, long drawn, twisted, and bracelet-like forms of which Mr. Daintree will exhibit most interesting specimens in London during the present year, and of which I recognized examples of Boonoo Boonoo gold,—to be convinced that many striking characters of the crystallisation of gold are not generally known. The fact also of that peculiar style of gold in the Thames Gold-field occurring in rocks of an originally igneous class offers a curious agreement of all circumstances of matrix and condition in the produce of both countries, leading us to believe that further search will develop new features in New South Wales, as relates to the occurrence of gold.

In California, gold in wires has been found traversing calc-spar. Such too has been found on the Upper Cape River.

But although these will be considered anomalous instances by European geologists, it is clear that the theory of the quartz-veins of the Lower Silurian rocks, having been charged with gold in a subsequent age, as late as recent tertiary times, can no longer, after our recent inquiries, be supported. There can be no manner of doubt with those who have carefully examined the question, that gold held invisibly, or, as it often is, deeply bedded in solid quartz or lining the cracks in it, only traceable by the gold itself, must have been contemporaneous with the matrix. Having seen examples where quartz-reefs have followed the curves of the slates in all their minor as well as larger deviations from verticality to horizontality, arching at the summit, not only synclinally but spherically (one of which I found at Orundunbee, in New England),* and another of which is figured by Mr. Brough Smyth†, from Sandhurst, in Victoria, I can come to no other

* Report of 28 Dec., 1852. † Gold-fields and Mineral Districts of Victoria, p. 324, fig. 64.

conclusion than that such lodes, with their mineral contents, could by no possibility have received their existence by sudden infilling or injection at a subsequent date.

Whether, however, in *all* cases, *as no doubt in some*, the mineral contents may have been deposited by segregation from the surrounding matrix, or whether they have entered the vein under the influence of mineral waters, as is also in some instances true, or whether, as some perhaps too hastily infer, igneous action alone has prevailed, this appears to be clear enough, that though high pressure steam acting on silica in solution may have produced quartz-veins (as stated in a recent account of certain springs in California) or silica and gold suspended in a menstruum may have been contemporaneously deposited, there is nothing whatever to justify the belief that dry heat or direct igneous forces have, as some persons have surmised, been the chief or solitary agent in the production of gold-bearing reefs.

Nevertheless, as now indubitably shown, hornblendic granite, diorite, porphyry, and felspathic elvans, are so associated with gold in many places that their agency cannot be ignored.

Mr. Hacket, Gold Commissioner in charge of the Ravenswood field (near Porter and Robey's Ranges, of Leichhardt), on the Burdekin River, finds, that in the granite of that region the upper lodes are brown ironstone, and that in the lower, gold only occurs in honeycomb quartz, where it is associated with crystallised sulphurets of iron and lead, and in which the pyrites is decomposed.

On comparing the brown iron lodes of Ravenswood with the brown iron beds of the Belubula, and the pyritous decomposing granite of Araluen, I find very little difference, and Mr. Hacket recognizes the truth of my conclusion on comparing my description of the latter instances with his own observations at Ravenswood.

The remarks above, relating to the occurrence of pyrites in connection with gold, are also applicable to some of the gold-fields about Rockhampton, especially at Morinish. So is it also on the Mary, near Kilkivan.

Queensland has recently extended her operations considerably; and in a region (as I have shown elsewhere) occupying fully 900 linear miles of metalliferous country there are numerous gold-fields, often patchy, but sometimes wonderfully rich. But, however remarkable it may appear, there is in Queensland a very wide distinction as to the relation of gold from the conditions observable in Victoria.

Micaceous diorite, serpentine, pyritous felstone, and compact quartzite (Mount Wheeler), are the gangues in many localities, to the total exclusion of quartz.

Mr. Daintree also very properly suggests that when some of the reefs shall have been cut through in mining "a fresh era will probably result from the evidence produced." Oftentimes, where there is no reef or vein of any kind, the whole mass of the rock is found charged with gold.

Notwithstanding the previously supposed limited value of serpentine, judging from the condition of that rock as it extends from Mount Wheeler to Marlborough, "serpentine may, for the future, be considered a field for the prospector, whether it be associated with quartz or not."

There are other geological conditions in Queensland aberrant from the supposed normal arrangements of an auriferous region. In fact, we have learned very much as to the sources of gold from the researches of Mr. Daintree, Mr. Aplin, and Mr. Hacket; and the exhibition of the photographs and specimens with which the former gentleman is charged for display in London during the present year, will lead geologists at Home to some new views on the subject of gold-mining.

It is quite certain that quartz-lodes are not the sole reservoirs of gold in the rock; nor is it confined to Silurian regions.*

On the Cape River felspathic elvans in the older or Metamorphic rocks, have, as it appears, undoubtedly influenced the occurrence of gold.

The Carboniferous rocks, though generally barren, do unquestionably, in some instances, hold the precious metal.

It was extracted for me at the Mint from the hard ferruginous conglomerate which I brought from the beds overhanging Govett's Leap, on the Grose River. I have found it in some spots in the region of the same Hawkesbury formation elsewhere. Gold in the conglomerate associated with *Glossopteris* shale was procured at my request to Mr. Gregory, by the Clermont Commissioner at the Springs on Peak Downs; this Mr. Daintree took to England.

Mr. Gould describes a lump of gold found in coal at Newtown, near Hobart Town in Tasmania; and in New Zealand one of the gold-fields lies entirely in the Carboniferous formation.

In the so-called "Mesozoic carbonaceous" coal-shale of Victoria, Mr. Selwyn states that "alluvial gold" exists in the "coal group"; and that at the Geological Survey Laboratory as much as $6\frac{1}{2}$ dwts. to the ton was procured from "pyrites" in such shale.

* NOTE.—I wish here to record my opinion, that both Sir Roderick Murchison and Mr. D. Forbes are right in their respect for Diorite; but I dissent from the former, so far as he makes the Silurian rocks to have been charged with gold in a late Tertiary period, because there are cases in which rocks with auriferous lodes have been covered by deposits older than tertiary, into which the lodes do not penetrate; and I think there is sufficient evidence to cause us to withhold assent to the idea of the latter, that the ages of gold are only two,—one when granite and the other when diorite was the agent. Sufficient stress has not been laid upon the presence of the sulphides, which are of all ages.

I have previously reported that gold was detected by Mr. Miller and myself at the Mint, in Sydney, in a portion of the fossiliferous calcareous rock of Fitzroy Downs in Queensland, which rock is now determined to be Upper Jurassic, and I had it also extracted from a calcareous rock of similar age from drift fragments found on Peak Downs; and Mr. Daintree ascertained that it had been found occasionally in the solid masses of his Desert Sandstone, which, so far as is known at present, may be of tertiary age.

So far then as the facts above cited go, we may be satisfied that not only in the Lower but in the Middle and Upper Palæozoic—in the Mesozoic, and in the Tertiary and Post-tertiary beds of Australia, gold does sometimes in the rock occur, independently of external impregnation. In fact it is universally distributed. This has been strenuously denied with respect to Secondary and tertiary deposits. But “seeing is believing.”

We learn, however, that certain igneous rocks have influenced its deposit in available pockets, cavities, and fissures, and that in certain cases it is sealed up in crystalline dykes and masses.

Such being the case, and it being notorious that enormous amounts of pyrites exist that have not yet been handled, and abundance of quartz-reefs that have been scarcely sighted, whilst those that have been worked have scarcely yet been broken into, it is not mere enthusiastic but direct logical inference that gives encouragement to those who are able and willing to pursue scientifically and patiently the laborious seeking for “yet hidden treasure.”

I must remark, however, that this paper (called for at what may be considered public request) is not intended as a treatise on gold working, but as showing the necessity of a more thorough and careful exploration of this Colony than has taken place.

Under the conviction that it is only recently that some of the peculiarities attending the distribution of gold in other provinces of Australasia have been brought to light, it seems but a duty to the community to bring them prominently before those to whom they may be unknown.

The researches that have been made in parts of Peak Downs, on the Mary, Burdekin, Cape, Gilbert, Cloncurry Rivers, &c. [to the undertaking of which my own recommendation has assisted], could not be passed over in relating the events of the period to which this memoir refers. Nor will a few further remarks be considered unsuitable, with which to bring it to a close.

In Tasmania there have been several spots indicated in which some traces of gold are met with at the south part of the island. But the chief progress has been made in quartz-mining about Fingal. At Black Boy, however, a new gold-field, or an extension

of the latter, has been discovered ; and a good deal of expectation has been excited by discoveries still northward, in the county of Dorset. Further to the westward gold also occurs on Piper's River, and towards the Tamar, but not much success at present has resulted. On the rivers west of the Tamar falling to the coast, as the Inglis for instance, gold has been also found ; but the high mountainous district forming the main watershed of Tasmania has not yet produced the moderate supply which from the physical character of the formations might have been expected. There are still tracts in Tasmania of which comparatively little is known.

South Australia, up to a recent period, had only been found to have slight indications of auriferous wealth ; but lately, as at Barossa and some other places, the quantity of gold has increased. In November last 3,100 ounces had been obtained since March, 1870. As gold has been found in various places along the meridian belt dividing the Murray from the Adelaide district, it has been anticipated that in the low country, at the eastern base of the ranges, gold will be hereafter worked.

There can be no reason to doubt, that as M'Kinlay's range, which is apparently an outlier of the South Australian Cordillera in the far north, has gold at its base, so, eventually, it may be the case with the southern extension of the chain.

Mr. Selwyn made a rapid examination in the year 1859 of the country from Cape Jervis to Mount Serle, and laid down on his map several alluvial diggings n. and s. and s.e. of Adelaide ; and in 1866 a reef was announced on the slopes of Mount Bremer, about 40 miles from the capital. About the same time auriferous quartz was detected at Tungkillo, at Highercombe, near Adelaide, and at other places.

It is true that as metals in abundance are solitary, copper or other metals may in South Australia take the place of gold. But both Mr. Selwyn and the Rev. J. E. Wood (in his admirable work, "Geological observations in South Australia, 1862") lean to the idea, that to have gold one must have it in connection with Silurian rocks, whereas no certainty exists as to the age of the metalliferous formations in South Australia. But after the fact previously mentioned, it is likely that other auriferous rocks exist in that colony as well as Silurian, of which, so far as I know, there have been very few fossiliferous indications discovered. Looking at the structure of Australia, it is scarcely possible to doubt that more gold than as yet been discovered exists in and around the South Australian chain and its dependencies. It is at least certain that Barossa has exhibited an evidence of progress.

In Western Australia still smaller indications at present exist of profitable gold working. Up to 1870 the greater part of the data collected by the Government were submitted to my examina-

tion, and I have had reason to believe that gold will yet be found, as specks of it have been seen by me. The exploration of the Colony has been recently committed to Mr. H. G. L. Brown, as Government Geologist, who is the only officer now conducting such a survey in any of the Australian Colonies. As his experience is considerable, as respects Victoria, he will be of great use in Western Australia. But, so far as I can judge, the latter has many anomalies in comparison with the former, and too much reliance must not be placed on *typical* auriferous constants. Mr. Brown's first report bears date 11th October, 1870, and in it he does not speak with much confidence of the prospects of the country on the Irwin River, where, however, gold has been found in small quantities. As he mentions igneous dykes, diorite and others, he may, perhaps, find some application of the experience of such indications as have proved reliable on the eastern side of the Continent. From what I have myself noticed, I think in a territory so largely occupied by granite, it cannot all be barren from the Dan to the Beersheba of our Occidental brethren. I, for one, feel thankful to the Government there, for putting to the test of one who is skilful and accomplished a question that has been too hastily answered in the negative by such as had no proper grounds for deciding one way or the other.

As to Victoria, inquirers must be referred to the official documents collected by Mr. Brough Smyth; and in reference to New Zealand, the voluminous reports of Dr. Hector, Dr. Haast, Captain Hutton, Mr. Crawford, and Dr. Lauder Lindsay,* will be sufficient.

On the whole, there is now reason to anticipate that a golden harvest in Australasia will be gathered in for many years (or centuries) to come; and as it has geological relations with large extents of auriferous islands to the north, we have reason to infer, that when colonization shall have been carried onwards, the gatherings from the Gold-fields yet to be discovered therein will do what they have already done for Australia,—throw open vast new regions to the enterprise of Europeans.

A desire prevails respecting an exploration of New Guinea and Timor, in the latter of which gold is known to occur as well as in the former.

That gold exists in New Guinea there can be no reason to doubt, since it was washed out of the rough pottery made out of the deposits on the river bank visited by H.M.S. "Rattlesnake," under Captain Owen Stanley. As early as 1791 it was known to

* This gentleman formerly explored and described the province of Otago; and since his return to Scotland has been most energetically engaged in developing the auriferous tracts of the County of Sutherland.

Amasa Delano, who says, in the account of his voyage (published at Boston, U.S., 1818), p. 83: "The island abounds with grains of gold as large as shot," and he adds that Malays came from Ceram to buy gold-dust of the natives.

Mr. Wallace (1869), the last writer on the Natural History of the islands north of Australia, does not mention gold in New Guinea, and, so far as I know, no word exists for gold in Papuan.

It would be folly for a band of prospectors, unarmed and unsupported, to go out on any Quixotic expedition without the preliminary arrangements which can only be made and defended by public authority.

Connected with Queensland by the strike of the rocks, it has been surmised that the Louisiade Archipelago and the Solomon Group of Islands also hold out prospects of gold-finding.

A collection of the rocks in the former, in which slates, porphyries, and other felspathic rocks were prominent, was made for me by some officers of H. M. Navy, and the most likely of the specimens to betray the presence of gold were submitted by me to examination at the Mint. No gold was found. I am nevertheless of opinion that it will be found in some part of the Archipelago.

As to the Solomon Islands there is not much doubt.

Lopez Vas, as reported by Forrest in his voyage to New Guinea (p. 6, 1780), says, that gold is found in New Britain, and that the Spaniards "carried back gold from the Solomon Islands to New Spain," (p. 8).

It is further stated that Lopez de Castro, Governor of Peru, sent a fleet about the year 1567, on a voyage of discovery, and that in the island of Guadalcanar they landed, took a town, and found *small grains of gold* (p. 6).

I allude to this, because it has always been my opinion, and because Mr. Daintree has in his last report to the Queensland Government (2nd February, 1870, p. 8), expressed a similar opinion respecting the probable extension of the auriferous slate formations of Northern Queensland through the Louisiade Archipelago into the heart of New Guinea.

As to New Caledonia, which has now to be noticed, many years before any settled plans had been adopted by the French Government, I was enabled to show, by comparisons of physical structure, especially in reference to such districts as that of Bingera, and I may add of Canoona as well, that a great similarity exists between parts of New Caledonia and Australia*. Since

* See "*Plain Statements—1851,*" and "*Recent Discoveries in Australia.—1861.*"

then, a geological survey of the Island was undertaken by M. Garnier, an able and experienced member of the French Corps of Engineers; and from his frequent private correspondence with me, the perusal of his official reports, and the examination of the collections he forwarded to me, I have been rendered better acquainted than before with the geology of New Caledonia.

In 1864 M. Garnier examined the coast as far as Poneuouhouen River, Arama, Balade, Wagap, and the rivers Tihouaka and Balabio. The result was his discovery of gold in various localities, and numerous gems and minerals common with gold in New South Wales. Only ten days ago asbestos and ophiolite, with quartz crystals, were brought to me by a British prospector, who said he had found gold in connection with them up the Yengen River and to the northward, on each side of the Great Coast Range, on the north-east extremity of the island, for full 40 miles. More recently, a sample of red ferruginous clay holding particles of quartz, with rutile oxidulated and pyritous iron, with very bright spangles of a light yellow gold, was also brought to me—the result of late researches by the prospector.

I imagine this came from the neighbourhood of Pouebo, as a bed 3 or 4 feet thick, containing the minerals named with garnets, zircon and titanium, was described to me at that place by M. Garnier.

Abundance of minute fragments of what the latter calls gneiss passing to mica slate, was also embedded in the clay, which is evidently derived from a garnetiferous and mangansiferous gneiss, deeply decomposed on the surface. Quartz-veins were found in it by M. Garnier, who did not then detect gold in *them*; but, as under the microscope I have seen gold in the silicious fragments, it must occur there in minute particles. Porphyritic trap full of garnets and pyrites, also abounds, and in the river-beds Rutile. At Balade similar results were derived from the Baiaou River; thence to Arama the quartzose gneiss becomes talcose and steatitic, with garnets and specular iron. All through the northern part of the country, including some outlying islets, the same kinds of rock occur, accompanied on some of the rivers by granite, syenite, and porphyry, which are always highly impregnated with pyrites. On the river Tihouaka there is an enormous dyke of hard and tenacious trap, forming a magnificent water-fall.

Comparing my reports to the Government of this Colony with his own observations, M. Garnier comes to the conclusion that my statements (referred to in the last note), which he quotes and translates into his own report, are fully justified, and he

concludes in these words: "Cette opinion m'est surtout confirmée par l'analogie existant entre les terrains du Nord de l'île et ceux aurifères de la nouvelle Hollande."*

In the south of New Caledonia there is a large development of serpentine with chrome iron ore, which, as well as the diorites, M. Garnier considers younger than his coal-beds of Mont d'Or. Dr. Hector has made a similar remark respecting the relationship of similar formations in New Zealand.

There is then, it appears, a probability that in the northern part of New Caledonia further explorations for gold will prove successful, especially as a good deal of the known auriferous river-banks are encumbered by vast masses of fallen blocks and boulders obscuring such localities. But I would direct the attention of diggers to the great well-watered plain between the coast range and that on the western side of one island, which has not yet been examined.

As bearing on the general subject, it may be useful to say a word or two respecting California, inasmuch as it has been pretended that gold was sought for in New South Wales on the ground that the geological constituents and structure of the two countries are the same. There is another reason why it should not be passed over unmentioned. We have seen that gold is confined to no particular epoch, and that the Silurian are placed by many at the head of the list of gold-bearing formations.

In New South Wales the Trias is believed to be missing, but it exists in New Caledonia and in New Zealand. It occurs in California, and proves the allegation of its universal distribution. But, unfortunately for people who leap to conclusions, Mr. Whitney, the State Geologist of California, in his preface to the "Paleontology of that State," thus expresses himself:—

"While we are fully justified in saying that a large proportion of the auriferous rocks of California consist of metamorphic, triassic, and jurassic strata, we have not a particle of evidence to sustain the theory which has been so often brought forward, that all or even a portion of the auriferous rocks are older than the carboniferous, *not a trace of a Devonian or Silurian fossil ever having been discovered in California, or indeed anywhere to the west of the 116th meridian.* It appears, on the other hand, that no inconsiderable amount of gold has been obtained from metamorphic rocks, belonging as high up in the series as the *Cretaceous.*"

We might go further and say, that gold is still in the act of being deposited from decomposing rocks of all ages, and is probably being *formed* in deposits by precipitation from mineral waters

* *Rapport adressé par M. L'Ingénieur des Mines à M. le Gouverneur. Port de France, le 26 Aout, 1869.*

He makes further reference in his report of 5th May, 1865, on the traverse from Noumea to Kanala.

He expressly mentions the *breccia* of Artillery Point, Port de France, in comparison with that of the Peel River, New South Wales, and finds great resemblance between Araluen, Uralla, and Poimbey, in the valley of Ti-Ouaka.

holding it in solution,—a supposition not more extraordinary than the fact, that gold is often found alloyed with other metals which, according to the arrangements of certain philosophers, are held to be of *different* ages. Why silver should be associated with gold—and how it could be, as it is, in parts of Australia, in such volume as to overpower the crystallisation usual with gold, and impress its own instead, are questions for future inquiry. It is satisfactory to the colonists of New South Wales to know that the difficulty of separating the two has been overcome by the ingenuity and skill of a member of their own community, an officer of the Sydney Mint, so that those who occupy themselves in gold production can now be sure they can obtain the full value of their enterprise.

W.B.C.

St. Leonards,
31 January, 1871.

APPENDIX.

As there has been found a difficulty in determining the exact dates of the first profitable working of the Gold-fields in New South Wales, the state of progress of discovery can only be traced in such instances as are recorded in official reports. To prevent the effect of imperfect information relating to other cases, it is thought advisable to record in this place, as the most available illustration of progress (alluded to in the text), a list of Gold-fields already proclaimed by the Government in the Southern, Western, and Northern districts, which, in reference to gold, embrace localities of variable importance within the limits of thirty-three counties, of which eighteen are southern, eight western, and seven northern.

SOUTHERN GOLD-FIELDS—(1851-1860)—(both inclusive.)

No.	Name.	County.	Year.	Month.
1	Araluen	St. Vincent	1853	— Feb.
2	Warrambooka	ditto	"	"
3	Mongarlo [Tantalian, &c.]	ditto	"	"
4	Narriga	ditto	"	"
5	Jembaicumbene	ditto	"	— March
6	Adelong	Wynyard	1855	— Feb.
7	Gilmore	ditto	1858	— Nov.
8	Meragle Creek	Selwyn	"	"
9	Multama	Harden	1859	— March
10	Moruya	Dampier and St. Vincent...	"	— Aug.
11	Kiandra	Wallace, Buccleuch, and Cowley.	1860	— June.
	(Curtailed 4 July, 1866.)			

SOUTHERN GOLD-FIELDS—(1861-1870.)

No.	Name.	County.	Year.	Month.
12	Gulf	Dampier	1861	11 June.
13	Crackemback.....	Wallace	"	21 June.
14	Adjunbillee [Tumut]	Buccleuch	"	— July.
15	Gundagai	Clarendon.....	"	— Aug.
16	Corowa	Hume	"	"
17	Black Range..... [Albury and Bungam- brawatha.]	Goulburn	"	3 Dec.
18	Tumbarumba	Selwyn	"	23 Dec.
	(Curtailed 4 July, 1866.)			
19	Delegete..... [Little Plain, Bendoc, and Bombala.] (Curtailed 4 July, 1866.)	Wellesley	"	"
20	Lachlan, south side of river [Mundagery, Pin- nacle, Moura, Widdin, Goobang, and Jemma- long]. See Western Fields, No. 24.	Forbes and Ashburnham...	"	29 Dec.
21	Shoalhaven	Argyle, Murray, and St. Vincent.	"	24 Dec.
22	Back Creek	St. Vincent	"	"
23	Long Flat	ditto	"	"
24	Burrangong	Harden and Monteagle ...	"	"
	[Cunningham Plains, Demondrille, and Cur- rawong.]			
25	Albury and Mungabarina... [Extension of No. 17.]	Goulburn	1863	— June.
26	Emu Creek	Monteagle	1867	1 Jan.
27	Tyagong.....	ditto	"	— March
28	Nerrimunga	Argyle	1869	— Dec.
	[Jerrickanora, Windel- lams, Nadgingoma, En- drick, and Jerralong.]			
29	Mogo	St. Vincent and Dampier...	1870	— Aug.
	[Clyde, Buckenbowers, Goba, Mullenderee, Tomaga, Broulee, and Deep Creek.]			
AURIFEROUS LOCALITIES NOT PROCLAIMED.				
(1)	Bredbo or Berudba	Beresford		
(2)	Brogo	Auckland		
(3)	Wogonga	Dampier		
(4)	Eurongillee	Wynyard		
(5)	Kimo	Clarendon		
(6)	Jingellee	Murray		

WESTERN GOLD-FIELDS—(1851-60.)

No.	Name.	County.	Year.	Month.
1	Macquarie River [from Winburndale Rivulet to Bell River.] Outrilled and defined by subsequent proclamation. (31 Aug., 1865.)	Bathurst, Bligh, Roxburgh, and Wellington.	1853	2 Feb.
2	*King's Plains	Bathurst	1860	— Feb
	1861-70.			
3	†Abercrombie	Bathurst and Georgiana ...	1865	„
4	†Tuena Creek	Georgiana	„	„
5	†Cook's Vale Creek	ditto	„	„
6	†Mulgunnia	ditto	„	„
	[Grove Creek, Trunkey, or Mulgunnia Creek, and Copperhannia Crk.]			
7	†Isabella River	ditto	„	31 Aug.
8	†Rocky Bridge Creek	Bathurst and Georgiana ...	„	„
	[N.B.—Nos. 3 to 8, marked †, were originally parts of one field, No. 3, proclaimed 2nd Feb., 1853, but since separated, and defined on 31st August, 1865, on which occasion the Bolong Gold-field in Georgiana was cancelled.]			
9	*Kirkconnell	Roxburgh	„	„
	[Castleton, Eusdale, Eskdale, Melrose, Yetholme, Winburndale, Diamond Swamp.]			
10	*Bathurst	Bathurst	„	„
	[Queen Charlotte's Vale Creek.]			
11	*Winburndale	Roxburgh	„	„
12	*Cheshire's Creek	ditto	„	„
13	*Turon River	Roxburgh and Wellington.	„	„
	[Pyramul, Wattle Flat, Palmer's Oakey Creek, Boiga, Tableland, Tambaroora.]			
14	*Cudgegong River	Bligh, Roxburgh, and Wellington.	„	„
	[Meroo Ck., Louisa Ck., Clarke's Ck., Long Ck., Campbell's Creek, Burandong, Bocoble, Gourangour, Four-mile Ck.]			

WESTERN GOLD-FIELDS—(1861-70)—*continued.*

No.	Name.	County.	Year.	Month.
15	*Grattai Creek	Wellington	1865	31 Aug.
16	*Muckerawa	ditto	"	"
	[Ironbarks, Stony Ck., Baduldera.]			
17	*Cugaburga	ditto	"	"
	[or Molowran Ck., ex- tension of Ironbarks.]			
18	*Ophir	Bathurst and Wellington...	"	"
	[Frederick's Valley, Lewis's Ponds, Mulyan, Nandilion.]			
19	*Caloola Creek	Bathurst	"	"
	[Queen Charlotte's Vale Ponds, Back Creek.]			
20	*Campbell's River	Bathurst, Georgiana, West- moreland.	"	"
	[Stony Creek, Native Dog Creek, Brisbane Valley.]			
21	*Gilmandyke Creek	Georgiana	"	"
22	*Pipe-clay Creek	Phillip	"	"
	[Cooyal and Lawson's Creek.]			
23	*Mitchell's Creek	Lincoln	"	"
24	*Laoblan [north side of river.]	Forbes and Ashburnham...	"	"
	[Mandagery, Moura, &c. See Southern Gold Fields, No. 20.]			
25	Billabong	Ashburnham	1866	— July.
	[Muginoble and Goo- bang Creeks.]			
26	*Cudgegong, North-east ...	Wellington	1867	— Nov.
	[Birangabil, Wiadere, Rouse, Piambong, Mer- inda.]			
27	*Cudgegong, North	Bligh	1868	— July.
	[Umby and Wialdra Creeks.]			
28	Wood's Flat	Bathurst	"	— Aug.
	[Kenilworth, Wangoola Binni.]			
29	*Macquarie, South	ditto	"	— Sep.
	[Chambers's Creek.]			
30	*Gulgong	Phillip	"	— Oct.
	[Cooyal Creek.]			
31	*Apple-tree Flat	Wellington	1869	— Jan.
	[Brombee & Tunnabutta]			
32	Cargo	Ashburnham	"	— Feb.
	[Bowen Creek, Cargo Creek.]			

WESTERN GOLD-FIELDS—(1861-70)—*continued.*

No.	Name.	County.	Year.	Month.
33	Tallawang [Pugboon, Tallawang, Wialdra, Slapdash Ck. Gold first found there in 1845.]	Bligh	1869	— Feb.
34	Apple-tree Flat, North ... [Derale and Arthur on Cudgegong River, Mul- lamuddy.]	Phillip	1870	— April.
35	*Guntawang and Gulgong North. [Wialdra, Cooyal Cks.]	ditto	„	14 Aug.
36	Belubula, West..... [Marangulla, Lime- stone.]	Bathurst	„	29 „
37	*Turon, South-east [Turon, Coolamigal, Cullen Bullen, Falmash, (?) Jew's Creek.]	Roxburgh	„	15 Nov.
38	Beneree [Beneree, Flyer's Creek, Calvert.]	Bathurst	„	„

N.B.—The Western Gold-fields, marked * (Nos. 2, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 29, 30, 31, 35, and 37), were originally included in the Macquarie River Field, which was proclaimed on 2nd February, 1855. That gold-field comprised all the tributaries to the Bell River inclusive.

On 31st August, 1865, many areas were cancelled, and those which appear in the above list of Western Gold-fields were separately proclaimed. I am indebted for these facts to information on the subject, kindly furnished by the Survey Office.

In addition to this list may be mentioned that in the neighbourhood of Dubbo, County of Lincoln, fresh auriferous localities have recently been disclosed; and that at the watershed of the Bogan and Macquarie Rivers gold has been found, as well as near Coonabarabran to the northward, on the water parting between creeks flowing to the Namoi and Castlereagh Rivers; but if eventually any area of value should be discovered in the latter region it would probably belong to the Northern District.

NORTHERN GOLD-FIELDS—(1851-1860.)

No.	Name.	County.	Year.	Month.
1	*Peel River [Duncan Creek, Nundle Creek, Dungowan Ck.]	Parry	1853	2 Feb.'
2	*Bingera [Bingera and Cowron- gowan Creek, Gwydir River.]	Murchison	„	„
3	*Uralla and Rocky River ... [Kentucky, Booroo- long.]	Sandon	1856	— June.

NORTHERN GOLD-FIELDS—(1851-1860)—*continued.*

No.	Name.	County.	Year.	Month.
4	Timbarra or Fairfield [Tableland, Boonoo Boonoo, Glen Elgin, Tenterfield.]	Drake	1859	— May.
5	* Toooloom and tributaries ...	Buller	"	— Oct.
1861—1870.				
6	* Ironbark or Triabundee ... [Ironbark Creek, Ma- nilla, &c.]	Darling	1861	24 Dec.
7	Upper Hunter [Monam, Omadale, Bell's Creek, Steward's Brook, Page's Creek.]	Durham	"	"

N.B.—Nos. 1, 2, 3, 5, and 6, marked *, were curtailed by a fresh Proclamation on 31st August, 1865.

Auriferous localities not proclaimed—31st December, 1870 :—

1. Tributaries of Clarence River, below Timbarra Creek, and eastward of latter.
2. Coast-sands and beach north of Ballina, Richmond River, and south of Clarence River Heads.

All that can be deduced as to progress from the data supplied by the above lists, is, that in *twenty* years time seventy-four gold-fields have been proclaimed in New South Wales, *i.e.*, averaging more than three per annum; but inasmuch as the original Macquarie River Gold-field included twenty-three, proclaimed in 1865, and the Abercrombie Field included six, also proclaimed in 1865, it appears that the Western District supplied twenty-four in fifteen years and fourteen in the following five years; whilst in the Southern District twenty-five were supplied in the same fifteen years, and four in the remaining five; and in the Northern District none have been proclaimed since 1861, and only five previously to that period.

The greatest amounts of gold have come, therefore, from the Western and Southern Districts.

W.B.C.

NEW SOUTH WALES COAL-FIELDS.

(By **WM. KEENE**, F.G.S., London; M.A.S., Bordeaux; Corresponding Member Geo. Ins., Vienna; and N. S. Wales Government Examiner of Coal-fields.)

PALEOZOIC FOSSILS.

MR. W. KEENE, the Government Examiner of Coal-fields, thus describes a very interesting and valuable collection of rocks, fossils, and minerals, exhibited by him:—

“These specimens show the super and sub-carboniferous rocks, and the coal measures, presenting eleven different seams to working, all of which are more or less worked at various levels—from 450 feet below to 1,500 feet above the sea.

“The first, second, and third seams are worked in the Illawarra District, at Mount Keira, Bellambi, and Bulli; the third, fourth, fifth, sixth, seventh, and eighth seams are worked at Newcastle and Wallsend, and at Minmi, on the Hunter River; the ninth, tenth, and eleventh, at East and West Maitland, and Branxton, near Dalwood.

“The present shipments from the Collieries amount to 20,000 tons weekly.”

Referring to the specimens shown in this collection, I may now enter upon some further particulars:—

The seam of the Australian Agricultural Company, worked at the Colliery known as the Borehole, is 163 feet from the surface, and 150 feet below the sea-level. Its average thickness is about 10 feet, with dip to the south-east of 1 in 20. This coal is highly bituminous, and remarkable, in common with the Borehole and Minmi seams, for its tendency to reniform and orbicular fracture—a peculiarity which appears to belong to the middle seams of the series; the upper and lower seams being more disposed to splinty cleavage, and burning to ash with little cinder. This coal is greatly esteemed in the Melbourne and Californian markets. Ships of large tonnage can load at the staiths of the Company, to which the coal is taken from the pit's mouth by locomotives, a distance of about 2 miles.

Wallsend Colliery.—The coal in this pit is 127 feet from the surface, and 80 feet below the sea-level; 9 feet 10 inches in thickness, including partings, which divide the seam into three bands. The partings are together about 10 inches in thickness. The Wallsend workings are situated about half-way between

Minmi and Newcastle, the strata rising towards the north-west ranges. The works connect with Newcastle by a branch railway to join the Great Northern line at Waratah, about 4 miles from the port, and the locomotives take coals to the ship's side at the rate of 500 tons or more daily.

The Waratah Colliery, near Newcastle, is worked by a Sydney proprietary, and they ship coal by the public cranes at Newcastle Wharf, or at Port Waratah, where they have erected a shipping-staith of their own, and at which vessels drawing 14 feet of water can load. They have on one occasion shipped as much as 900 tons in a day, and their present out-put is about 3,500 tons per week.

Lambton Colliery is near to the Wallsend, and belongs to and is worked by the Scottish Australian Company. The seam crops out towards the river, but they have worked to the dip till they are now under 300 feet of cover, and their present extraction is about 200,000 tons per annum.

The price of good large round coal at all the Newcastle Collieries is 9s. 3d. per ton delivered on board, and the nut coal 5s. per ton. The Panama line of steamers use Australian coal, and the Dutch Steam Navigation Company, working in the Java and China seas, send here for their supplies.

The Minmi Colliery Company work the seam at 90 feet from the surface, and 20 feet above the sea-level. An outcrop of the seam is visible in a creek about 400 yards from the shaft, rising in a northerly direction 1 in 18. It appears to be the second seam below the chert rock which covers the Coal and Copper Company's seam at Burwood, and is bedded on a hard sandstone grit of good building stone. The coal is much liked by the blacksmiths of the district, and the small makes a good coke, as does the small coal of the Collieries of the Newcastle District generally. Messrs. J. and A. Brown, the owners of these mines, raise about 300 tons a day, which is shipped at Hexham, a township on the banks of the Hunter River, 10 miles from Newcastle; or the coal is sent down in barges laden with boxes, which are hoisted by a steam crane so as to load ships of any tonnage whilst at anchor in the stream. The seam averages 6 feet of clean coal.

The Four-mile Creek Company carries on its operations in the East Maitland District, near to the head of the navigation of the Hunter River, 15 miles from Newcastle. There are at least three workable seams recognizable in this district; and that worked is 8 feet 6 inches in thickness, 5 feet 6 inches of which is a splint coal of very superior quality, chiefly used by the steamers navigating daily between Morpeth and Sydney.

The admirable regularity with which these ocean steamers perform their service—their engines of 160 horse-power easily kept to the top of their speed with steam to spare and blowing

at the valve, give sufficient and constant evidence of the excellence of the coal; in fact, I have long considered, and often expressed the opinion, that good clean, hand-picked, New South Wales coal is at least equal if not preferable to the best coals of England, when these latter have been twice transhipped; that is to say, in the state in which English coal can alone be got in Sydney, and at double the price of the best produce of our own mines.

The Four-mile Creek is a hard splint coal, does not clinker, and burns to a fine dry ash—is very comparable to the coals shipped from Goole, in Yorkshire, whilst our bituminous coals may be likened in quality to the “Hartley.”

Descending the strata, and below all the seams of these Collieries, at West Maitland, about 5 miles north from Four-mile Creek, two seams of cannel and splint coal are worked, the property of the Hon. Bourn Russell.

This cannel coal is most useful, and chiefly employed for domestic purposes.

Fifteen miles to the northward these lower seams again crop out in Anvil and Dalwood Creeks, and are worked at Branxton. The coal is in good repute as a steam fuel.

Thirty miles further to the northward, at Rix's Creek, near Singleton, a seam of good coal is worked, and this concludes the collection from the Northern District.

Sixty miles south from Sydney are the ports of Bellambi and Wollongong; and though they cannot be compared for accommodation with the port of Newcastle, the energy of the coal-owners of the district, and the facility with which coals can be worked by “day-levels” from a 7-foot seam, which shows itself in section along many miles of the mountain range, assure to this field a progressive development to prove the inexhaustible resources of New South Wales in mineral fuel; and will be a guarantee to commercial interests that no combination or monopoly can long disturb the regularity of the supply.

By reference to the collection I exhibit, it will be seen that I can recognize eleven distinct seams, which are more or less worked. The same series of seams extends from Newcastle to the Wollongong District, disturbed and broken up only by comparatively modern eruptions of porphyries and basalts.

On the lands of the Australian Agricultural Company, a few miles from Stroud, a seam more than 30 feet in thickness crops out in the length of a creek, and this thickness has been verified by several trial-pits sunk on the dip side. There are many partings of shale and fire-clay, and the coal is of various quality in the thickness of the seam; but there is quite sufficient of good coal for profitable working, if its inland position did not render it wholly unavailable, in face of coal so easily accessible from the sea-board as that of Newcastle and Wollongong.

But late researches have laid open very extensive deposits of rich iron-ore with limestone in their vicinity, and all near to water-carriage. Such combined advantages may probably dispose so wealthy a company to make the necessary outlay for establishing an iron manufacture, of which the Colony stands much in need. Specimens of this iron-ore, limestone, and coal may be seen in the mineral frame of the Company connected with the coal seam exhibits of New South Wales, which I have had the honor to prepare for the Exhibition.

The discovery of our wealth in brown cannel oil coals and oil shales will enable us to manufacture all the oil needful for our own consumption, and even to export the raw article. We know that it exists in many places at wide areas apart, as may be seen by reference to the map; and like to the richness of our coal-seams, which richness is not excelled in an equal vertical section in any part of the world, we may expect that the oil shales will be of as great importance in their development; and if we do not find oil springs, we may possess such beds of the solid material as will justify the expenditure of all the capital needful to keep up a steady and unfailling supply of the valuable and varied products which these shales and coals will yield.

The works already in activity at Hartley and America Creek, and others preparing to operate in different localities, with the general approval of the quality of the oil produced, will justify our most sanguine anticipations on this subject.

As regards the geological age of coal in New South Wales, I may repeat what I have already published—that it would be easy to add pages on this subject, if it were not irrelevant to the question with which I am now occupied, except so far as the geological age of coal is inseparably connected with its commercial value. That is to say—though there may be, and there is, much bad coal in the palæozoic or true carboniferous series, a really good coal in the oolitic lias, or tertiary deposits is a thing unknown. To class the mineral fuel of New South Wales as belonging to either of these latter formations would be at once to discredit and condemn it in the market of the world, until, despite discredit and condemnation, its merits were discovered, when it would be tardily acknowledged that the condemnation had proceeded from an error in science, arising out of a deficient or too superficial investigation, or the too facile application of inapplicable theories.

“A reference to the collection I exhibit will settle this question, which has been so long and ably contested by the Rev. W. B. Clarke; and, for the reasons stated, I may be permitted a few words more on the subject. All the seams of the New South Wales Coal-field, from the lowest which intercalate with silurian fossils (*spirifer*, *radiata*, &c.), devonian flora (*lepidodendron*,

cyclopteris, adiantites), and the bellerophon and crinoidea of the mountain limestone, to the highest and latest deposited seams, in which the flora (equisetacæa, asterophyllites, &c.) approach the oolitic character, all are deposited conformably and almost in parallelism, one on the other; covered also conformably by 1,000 feet of sandstone, upon which again has been quietly deposited the Wyanamatta beds, which I have called the false coal measures; for with all the appearances of being coal-bearing they contain no coal, but a flora probably nearer approaching to that of the oolite.

"The lower beds of the coal series of New South Wales are, then, geologically older than any worked in Europe; whilst the upper beds represent the most recent of the European true carboniferous formation. And as all the coal-seams, from the silurian upwards, are deposited conformably, I must conclude that this portion of the globe was comparatively free from violent eruptions and disturbances from the silurian to the permian epoch, and that the alternate submergences and elevations of the land must have been slow and gradual.

"In stating my opinion here as to the age of the carboniferous deposits of New South Wales, I am in part repeating only what I reported after my first examination in this field in 1853. I then wrote:—'The coal is a true coal, not lignite, or a deposit of the tertiary epoch, but belongs to the true coal formation—is overlaid by regular beds of secondary sandstone, lying in conformable strata upon it.'"

W. KEENE,

Government Examiner of Coal-fields;
F.G.S., London; M.A.S., of Bordeaux;
Cor. Mem. Geo. Ins., of Vienna.

Newcastle, New South Wales,
10th January, 1867.

SINCE the above date, and on the 30th April, 1868, Mr. Keene reported the discovery of a seam of coal 22 feet in thickness, at Greta, near Branxton, in which he found no less than seven varieties of coal, all good, separated only by thin partings of shale. The uppermost coal is like a resinite, glossy and transparent at the edge, lighting readily at a candle-flame; and this is followed by a bed of brown petroleum coal, like to the Bog-head coal; then a considerable thickness of cannelite, and lower down in the seam, divided only by a thin parting of shale, is 5 feet 9 inches and 4 feet 8 inches of excellent bright steam coal, equal to any yet worked in the district.

Mr. Keene concludes his Report thus:—"I cannot refrain from saying that it is more remarkable for variety and quantity of coal

than any coal-seam which has come under my observation in any part of the world. Its geological position is below the spirifer beds; it is the lowest seam but one of our carboniferous deposits, and will be found to extend from Greta over a large area. Its proximity to the Great Northern Railway, and the excellent quality of the coal, will insure its being extensively worked."

At a still later date (28th April, 1870) Mr. Keene addressed the following Report to the Under Secretary for Lands, which gives much interesting information on the working of our Collieries during the past year, the quantity of coal extracted, with the total number of persons employed; and in the case of the Australian Agricultural Company's Colliery, the number of persons immediately dependant on the working of that Company's Colliery.

Coal-fields Office,
Newcastle, 28 April, 1870.

SIR,

I do myself the honor to forward you herewith the Reports of the Inspector of Collieries, Mr. Thos. Lewis, for the year 1869; and in attention to the request in your letter of the 22nd instant, that I would report upon the condition and prospects of the coal-fields in the past year, I beg to state, for the information of the Honorable the Secretary for Lands, that no preceding year has equalled the promise and activity of 1869.

2. The quality of our coal is year by year better appreciated, and I am informed that at Madras it meets English coal at equal prices, and is greatly esteemed for gas manufacture. In the China market the difference in price, which used to be from five to six thalers, has fallen to one-and-a-half thaler. I have always expressed the opinion that time would dissipate the prejudices as to the qualities of our coal, and that when shipped direct from the mines here, it would be found to be more advantageous in use than English coal, generally subjected to two or three transhipments.

3. The error as to the geological position of our coal, and which attributed it to a much later age than the European beds, has entirely disappeared, and in a "Treatise on Coal and Coal Mining," by Warrington Smyth, published only two years ago, during his presidency of the Geological Society, he says that the numerous observations on them, contributed by Mr. Beete Jukes, the Reverend W. B. Clarke, Mr. Selwyn, and Mr. W. Keene, leave no doubt as to the palæozoic character of the lower part of a great conformable series of "strata," and in the table of stratified rocks he places the New South Wales coal as belonging to a period from the Devonian to the Trias.

4. New works are in progress in various directions. New Lambton is an important extension of our colliery workings, and the original Lambton, or Scottish Australian Company, is engaged in an important and interesting sinking for coal, at Stockton, on the North Shore, opposite Newcastle. A cast-iron "tubbing," or shaft, of 7 feet diameter, has, in a few weeks work, been very expertly let down, without pumping out the water, through 82 feet of loose sand, to the clay-bed, by special, ingenious, and well adapted contrivances of the Manager, Mr. Croudace; and I expect that from knowledge acquired by previous borings they will win the same seam as is worked by the Australian Agricultural Company, at a depth of about 240 feet.

5. Messrs. Vindin and Mitchell are commencing operations at Greta; and further to the north, in the direction of the line of railway, coal is found near Muswellbrook, at Wingen, Page's River, and Murrurundi. In the west, researches continue to be made for workable seams near Mount Victoria and Little Hartley. The Western Petroleum Coal Company have greatly increased their facilities of transport to the railway, and a fine seam of coal has been opened at Lithgow Valley, near to the Bowenfells Railway Station. The Reverend W. B. Clarke has reported on this seam for a Company now forming to work it, and from my own examination I can confirm all that Mr. Clarke has reported as to the extent, thickness, quality, and facility of working of this coal. In the south, Wollongong maintains its reputation as producing a good steam coal, and near to the Great Southern Railway seams have been proved to be workable at various points, particularly at the Cataract and Sutton Forest.

6. I have examined seams more than 700 miles to the north of Newcastle, belonging to the same deposits we are working here, covered and underlaid by the same fossil flora and fauna; and we may, without boasting, claim to rank with the most extensive coal-field in the world.

7. A very correct idea may be formed of the number of persons supported by our colliery workings, independent of navigation, by the following statistical table, furnished to me by the courtesy of Mr. Merewether, taken from the books of the Australian Agricultural Company, and which shows the number of persons immediately dependent on the workings of that Company's colliery only:—

	Men.	Women.	Male Children.	Female Children.	Total.
Staff	3	3	4	3	13
Sundry	109	57	91	84	341
Miners and } Whealers... }	264	165	218	250	897
	376	225	313	337	1,251

8. From the same books it appears that of the 376 persons directly employed, as shown in the preceding table, an average of 278 were getters and wheelers of coal, to whom was paid the gross sum of £28,861 1s. 7d.; or at the rate of £103 16s. 4d. per man per annum, equal to 7s. 6d. per day for each day worked. The total quantity of coal raised by this Company was 168,108 tons.

9. I also annex a tabular statement of the numbers of persons employed in each Colliery, and the quantities of coal raised, from which it will be seen that the entire quantity of coal raised in 1869 by the Collieries of Newcastle and its vicinity, including Minmi, amount to 778,263 tons. The Northern pits have raised 35,892, and the Southern, 99,091 tons; and 6,276 tons of oil-coal and shale have been raised in the Southern and Western Districts, making a total of 919,522 tons.

10. On the average it may be estimated that 2,000 tons of shipping enter, and 2,000 tons of shipping per day leave, the port of Newcastle. The new coal-staiths when ready for use will greatly facilitate the work of loading, to the great advantage of the port. From all I can learn from the principal mercantile houses of Newcastle, an equal, and probably a greater, amount of business may be expected in this than in the last year, for the exportation to India, China, and San Francisco, is steadily on the increase. The shipment to the latter port was 21,895 in 1868, increased to 65,589 tons in 1869; and already, in the first quarter of the present year, the shipments amount to 19,774 tons.

11. The complaints of insufficient ventilation in some of the Collieries, as set forth in the reports of Mr. Inspector Lewis for the last six months, have given me much anxiety, for I considered it doubtful that I would obtain any conviction under the Act without some very positive means of proving the fact out of the mine. To effect this object I have made a very simple apparatus for showing the purity of any volume of air in which it may be placed, and which I can exhibit in action to any Bench of Magistrates to support any complaints I may judge necessary to bring before them. I therefore consider that the law will be sufficient as it stands; should it prove otherwise I will report it to you.

12. I have given attention to all accidents as they have arisen, of which particulars will be found in Mr. Lewis's Reports, with a tabular statement annexed.

I have, &c.,

WILLIAM KEENE,

Examiner of Coal-fields.

The Under Secretary for Lands.

TABULAR List of Collieries and Kerosene, Coal, and Shale Mines in New South Wales, with the number of Persons employed, and quantity of Mineral raised in 1869.

No.	Mines.	Names of Proprietors.	Tons of Coal raised.	Tons of Oil-coal and Shale raised.	No. of Persons employed.	Remarks.
1	Borehole	Australian Agricultural Company	Tons. 168,108	Tons.	376	Worked only about 3 months.
2	Burwood	Trustees of Dr. Mitchell	2,930	.....	12
3	Mini	Messrs. J. & A. Brown	13,523	.....	327
4	New Lambton	Messrs. J. & A. Brown	109,850	.....	350
5	Wallaseed	Wallaseed Coal Company	164,000	.....	227
6	Lambton	Scottish and Australian Mining Company	158,368	.....	285
7	Waratah	Waratah Coal Company	127,184	.....	189
8	Co-operative Colliery	Messrs. Laidley, Ireland, & Co.	44,000	.....	1
9	Dark Creek Colliery	Mr. A. Tullip	500	.....	3
10	Sunderland Colliery	Mr. A. Tullip	500	.....	18
11	Not's Ingrance Seam	Mr. Not	8,266	.....	18
12	Mitchell's Ingrance Seam	Mr. John Mitchell	9,426	.....	2
13	Rathluba Pit	Mr. Tunks	500	.....	2
14	Stony Creek	Mr. Frank Russel	900	.....	4
15	Anvil Creek	Mr. Wm. Farthing	14,400	.....	30
16	Rix's Creek	Mr. Jas. Elliott	1,900	6	Good household and steam coal, splinty cannel. For supply of Singleton.
17	Bull's Wollongong	Bull's Coal Company	64,000	.....	90
18	Osborne, Wallaseed	Messrs. Robson & Company	16,677	25	For the oil-shale furnaces. Scarcely in working order yet.
19	Mount Pleasant	The Hon. Jas. Byrnes	17,014	.....	25
20	America Creek	Mr. John Graham	1,300	4	For kerosene oil. For kerosene oil.
21	Sutton Forest	Messrs. M. Larkin & Co.	100	.....	1
22	America Creek	Mr. John Graham .....	.....	2,076	10
23	Western Kerosene Coal Mine	Western Kerosene Oil Company .....	.....	3,000	12
24	Hartley Kerosene Coal Mine	Hartley Kerosene Oil and Petroleum Coal Company .....	.....	1,200	6
			913,246	6,376	2,012	Persons employed.
			6,376	.....	.....
Total of Coal and Oil-shale			919,522	2,012	

ON THE
OCCURRENCE OF THE DIAMOND NEAR MUDGEE.

(BY NORMAN TAYLOR, Esq., of the late Victorian Geological Survey, and
PROFESSOR ALEXANDER M. THOMSON. Read before the Royal Society,
7th December, 1870.)

LAST summer the writers of this paper spent a few weeks in company at the diamond-washings on the Cudgegong, near Mudgee, and were occupied in collecting the leading facts relative to the occurrence of the diamond in that locality. Having agreed to publish their results jointly, they now beg to lay before the Society the following brief remarks.

Though the subject is one which has engaged their attention both in the field and out of it, it is upon Mr. Norman Taylor that the main part of the geological work out of doors has devolved. Such might be gathered from the previous references which have appeared, comprising four articles by Mr. Taylor, in the *Sydney Morning Herald*, also, the remarks by our Vice-President in his inaugural address of this year.

The chief circumstance that led to the discovery was the gold rush of Two-mile Flat, on the Cudgegong River (19 miles n.w. of Mudgee), in June, 1867. The diamonds were at first overlooked, but gems of such unusual brilliancy did not altogether escape the notice of the diggers. Still, little attention was paid to the matter until the Australian Diamond Mines Company of Melbourne commenced active operations in July, 1869. The search was then taken up briskly by several independent parties of diggers.

As far as at present known, the localities on the Cudgegong which produce diamonds lie along the river, extending from its junction with Wialdra Creek (18 miles n. 30° w. of Mudgee), to a point further down, 7 miles s.w., known as Hassall's Hill. Along this line the distribution of the diamond is by no means general, but is confined principally to a few small outliers of an ancient river-drift, which occur at various distances from the present channel, and at elevations of 40 feet or so above it. These outliers of drift are capped by hard, compact, and in many instances, columnar, basalt; they have all the characters of the wide-spread deposits in Victoria, which the Geological survey there has been accustomed to assign to Older Pliocene; they also agree with it in occurring underneath a basaltic rock, which presents, in Mr. Taylor's opinion, the characters of the Older Pliocene basaltic

flows, such as are extremely common in Victoria. At present there is no direct fossil evidence from the diamond-drift itself to assist in the determination of its exact age. Portions of a humerus and a molar tooth,* the latter rather too much shattered to identify with certainty, but sufficiently distinct to show that it belonged to some huge herbivorous marsupial larger than anything living now, have been found in younger drift higher up the river, near the Pipeclay Diggings.

The patches of diamond-bearing-drift (Older Pliocene) with their protective coverings of basalt, though once forming parts of a continuous deposit, have been isolated by extensive denudation. The point of eruption from which the basaltic flow emanated appears to lie to the eastward, but it has not hitherto been detected; its remnants can be followed up for at least 17 miles along the river, in some spots still showing a thickness of 70 feet, which proves the igneous outburst to have been of considerable magnitude, sufficient to materially alter the physical aspects of the river valley; we may also infer, conversely, the enormous extent of the subsequent denudation. There is the clearest local evidence that the course of the river has been much altered since the older drift formed a portion of the channel.

Enumerating in descending order the outliers of this Older Pliocene drift which affords the diamond, the first area occurs at the starting point—the junction of Reedy or Wialdra Creek with the Cudgong. The dimensions of this area cannot be fairly estimated, as much of the basalt has been covered up by various surface accumulations; it lies partly on private ground, and has been insufficiently explored. 100 acres might be taken as an estimate of the extent of the workings as far as yet developed.

2. Jordan's Hill.—Three miles below, on the left bank, a triangular basaltic area of about 40 acres.
3. Two-mile Flat.—Three miles below the last, at some distance on the left bank, comprising five basaltic knolls and ridges at various intervals along a large elliptical curve that the old channel followed, but which the present river has cut off. Computed altogether at about 70 acres.
4. Rocky Ridge.—On the right bank, 1 mile below Two-mile Flat, a scarped basalt hill, extending a short way up a tributary creek. About 40 acres.
5. Horse-shoe Bend.—On the left bank, opposite the Rocky Ridge, a crescent-shaped area of basalt, with its concavity facing the river. About 20 acres.
6. Hassall's Hill.—A similar crescent area, with its convexity towards the river, situated half-a-mile south-west of the Horse-shoe, and covering about 340 acres.

* Received from Mr. Thurston, of Mudgee.

Further down the river, on the east side, about $2\frac{1}{2}$ miles west of Hassall's Hill, there is another small outlier of basalt resting on drift, as well as several uncapped drift or "made" hills; these are as yet untried for diamonds, though formerly worked for gold. Below this there is no trace of basalt for 7 or 8 miles further down the river, when we reach a very small outlier on the right bank; but whether the older drift underlies it we cannot say. "Made hills" of drift, apparently the Newer Pliocene, skirt the banks of the river on both sides to its junction with the Macquarie; but there is no further trace of basalt.

River-drifts at high levels are traceable in many parts of the upper course of the Cudgegong, above Mudgee; but no diamonds have been discovered in them. In one patch a singular deposit of crystalline cinnabar has been found.

In all the above six localities the basalt has been sunk through and tunnelled under, and the drift containing diamonds is invariably found beneath.

The basalt, besides resting upon the drift, frequently comes into direct contact with the metamorphic shales, slates, and sandstone or greenstone rocks, which form the basis of the country.

In spots where the basalt has been denuded away, the drift has either disappeared entirely, or become scattered over the immediate neighbourhood.

The drift rests on vertical indurated strata, or on massive greenstone; it varies extremely in thickness from a few inches to 30 feet, according to the irregularities, in some cases, of its own upper surface, which is not uniformly level, and in other cases, due to the old river-bed. Its composition is various, but it generally includes coarse and heavy material, some of the boulders weighing several hundredweight; thus testifying a strength of current at least as powerful as, if not in excess of, the force of the present stream.

Though the six localities of Older Pliocene drift, just enumerated, are the principal sources of the diamond, they are not the only ones. At Two-mile Flat it has been found in a younger drift, which we shall provisionally term Newer Pliocene, as it occurs at a lower level, and also contains decomposed pebbles of basalt, which appear to have been derived from the protective covering of the Older Pliocene drift. It is probable too that the diamonds in this drift have been washed out of the older deposit. We shall allude to this further on.

Many diamonds have also been extracted from the water-holes in the river, but wherever this occurs the Older Pliocene drift has been previously discharged there by the diggers when gold was the only object sought for. Except in such spots the river-bed of the Cudgegong has not afforded a single diamond.

Before describing the general nature and the contents of the Older and Newer Pliocene drifts, it will be as well to give a brief sketch of the geology of the Cudgong basin, and of the neighbourhood more immediately surrounding the diamond district; this will assist in any inferences regarding the original sources of the various materials which compose the ancient river gravels.

The Cudgong rises in the acute angle, open to the west, which the Dividing range forms in lat. 33° s., and the first part of its course is n.w. 60 miles. In this part it is bounded on the n.e. by the Dividing range, which presents a summit of horizontal sandstone with various coal-seams; the range, in its continuation southwards, completely encircles the head of the Cudgong, and presents a similar formation of Carboniferous rocks. Accordingly, we find outliers of Hawkesbury sandstone and underlying Carboniferous deposits, which include *Glossopteris* shales and coal seams, occurring in great force about the upper sources of the river. Several outcrops and cappings of basalt also occur on summits and spurs of the Dividing range. The main area of the basin, and the ridges which confine it on the s.e., are of tilted slate and quartzite, with a few fossiliferous limestone bands, which are considered to belong to Upper Silurian or Devonian age; these are interspersed with small areas of granite, greenstone, quartz-porphry and felstone. The presence of *Calceola* in the limestone of Mount Frome, 6 miles above Mudgee, may assist in determining the age of a portion of the beds, but it is not improbable that both formations are represented. At Wialdra Creek, where the diamond-drift sets in, the Cudgong makes a remarkable alteration in its course; it suddenly bends to the s.w., and reaches the Macquarie at a point 28 miles distant. This part of its course presents a structure like that of the older portions of its upper basin, except that limestone bands are wanting. No members of the Carboniferous series occur in this portion. The whole course of the river lies through a rugged and mountainous country.

In the neighbourhood of the junction of Wialdra Creek outliers of Carboniferous rocks are frequent. They consist of sandstones, conglomerates, with shales containing *Glossopteris* and other plants. These outliers form links at trifling intervals, connecting the Carboniferous formation of the Dividing range with the coal of the Talbragar. A few miles to the north of the junction the Carboniferous beds form horizontal cappings, on hills of slate or granite, whilst at Guntawang they are met with in the river valley, and near the junction they occur at a similar low level, and have been covered up by the Older Pliocene basalt without the intervention of drift. The great differences in level which the Carboniferous beds occupy deserve consideration. For our present purpose, however, it is enough to show that vast masses

of Carboniferous strata have suffered denudation, and along the main stream we find relics of these rocks not only in the present bed but also in the older drifts.

The rocks immediately surrounding the diamond localities are nearly vertical beds, with a general strike N.N.W., consisting of red and yellow, coarse and fine-grained, indurated sandstones; thin white laminated argillaceous shales; pink and brown fine-grained sandstone, beautifully banded by purple stripes, in concretionary layers; slates and hard metamorphic schists; flinty shales; hard brecciated conglomerate, containing nodules of limestone, flint, and red felspar, in a greenish silicious base. The last is not unlike the trappean ash-beds of Ireland, described by Jukes. With these there also occur dykes and outbursts of intrusive greenstone, which follow the strike of the beds irregularly, and indurate the rocks with which they are in contact. The rocks in general are devoid of mica.

Having thus sketched the geology of the Cudgegong drainage area, and seeing that the diamonds occur in an ancient river-drift, we are led to inquire whether the diamond is of drift origin, like the materials with which it occurs. If so, which of the formations afford the diamond? The Carboniferous, Devonian, or Upper Silurian? Or have the diamonds grown in the drifts in which they are now found? Before dealing with such theoretical questions we will enumerate the materials which compose the drift, and give a more minute description of its structure.

The Older Pliocene diamond-bearing drift is a coarse and heavy deposit, for the most part loose, but portions of it are united into compact conglomerate by a white silicious cement, sometimes coloured light-green by silicate of iron; in other cases the consolidation is the result of infiltrations of manganese and iron oxides, in which case the colour is black or brown.

Diamonds have been picked out of the loose material, and, by a special experiment, which Mr. Taylor conducted, they have been proved to exist in the consolidated portions. Five bags of the conglomerate, weighing seven or eight hundredweight, were burned, crushed, and subsequently washed, and yielded two diamonds and three-quarters of a pennyweight of gold. The diamonds do not appear to be confined to any particular level in the drift deposit, though the lower parts are in preference taken by the miners, probably in consequence of the certainty of finding gold in this portion. The mere fact of the not unfrequent discovery of diamonds on the waste heaps round the old shafts that were sunk for gold, is enough to suggest that the diamond may occur in the higher portions of the deposit, since the bottom layer has been invariably carted to the river for gold washing. One diamond which was observed *in situ* occurred three feet from the bottom, imbedded in a mass of loose quartz pebbles, about the size

of peas. Huge blocks of hard slate, sandstone, quartz, greenstone, and felspathic rock, the two latter often wasted into masses of clay retaining the original shape of the boulders, lie at the base of the drift in many parts. The drift varies much in character, but is chiefly made up of boulders and pebbles of quartz, jasper, inferior agates, quartzite, hard flinty slate, shale, and sandstone, with abundance of coarse sand, and more or less clay. The quartz pebbles are milk-white like vein quartz, but are generally encrusted with a thin film of iron oxide, either brown or pinkish. Manganese is abundant, both cementing the drift in irregular patches, and coating pebbles with a black crust or dendritic markings, or, as if smoked, soiling the fingers when rubbed. Some of the boulders and pebbles are coated all over with a remarkably brilliant siliceous polish, which cannot be the result of friction, as the concave surfaces and irregularities are just as highly polished as the more exposed parts; it is most probably the result of infiltration of silica, and is analogous to the coatings of iron and manganese.

Water-worn boulders of silicified wood frequently occur in the drift; they precisely resemble the fossil wood which is so abundant in the coal formation of New South Wales, and have probably come from the waste of similar Carboniferous rocks to those which now occur in the neighbourhood of Wialdra Creek, or form the escarpments which follow the N.E. side of the river basin, and completely surround its head waters. Silicified wood from these sources is found in the present river-bed. Coal has been seen in the older drift, higher up the river.

Other relics of fossiliferous deposits have been found more sparingly. These comprise several large rolled pebbles of the Silurian coral *Favosites Gothlandica*, beautifully preserved in silica; also one slate boulder full of a small *Orthis*. Fragments of brown ferruginous wood have also been detected in the cement.

It is worthy of remark that the Older Pliocene drift is remarkably free from any detritus of the rocks of the immediate neighbourhood.

In the waste heaps round the mouths of the shafts in the neighbourhood of basalt and greenstone some curious natural changes can be observed going on; botryoidal masses of hydrated mixed carbonate of lime and magnesia gradually form and bind the loose material together. A hard mineral, not unlike opal in appearance, is also produced in a similar manner, encrusting gravel, timber, old tools, or any material with which it comes in contact. It is a pure hydrated carbonate of magnesia, containing,

Magnesia	...	...	...	46.99
Carbonic Acid	...	...	...	49.78
Water	...	...	...	4.08
				<hr/>
				100.85
				<hr/>
Specific gravity	...	...	...	2.94

We have now to add a list of the gem-stones and heavy minerals which exist in the drift, and accumulate in the processes of washing for the diamond :—

1. *Black vesicular pleonast*.—This mineral occurs in small grains from $\frac{1}{8}$ to $\frac{1}{4}$ inch, and is by far the most abundant. It has a dull black surface, but shows a brilliant fracture. Some pieces are coated bluish-grey, or ferruginous brown; but the interior is the same in all, and the differences would seem to be the result of surface decomposition. It never occurs in crystals, nor shows any trace of faces; it has no cleavage; its fracture is conchoidal and jet black, with a strong vitreous lustre. Hardness, 8; streak, grey; composition, found by analysis—

Silica (and undecomposed).....	2·75
Alumina	64·29
Chromic oxide	4·62
Magnesia	21·95
Ferrous oxide	4·49
	98·10
Oxygen ratio	3·2 : 1
Specific gravity	3·77

The mineral is amorphous and vesicular; the latter character is remarkable; the grains do not all show it in the same degree; one variety with a lustrous surface shows it best, the grains resembling a perfect cinder when seen through a lens. Several pounds weight of this mineral are obtained from each cart-load of gravel washed.

2. *Topaz*.—Occurs in water-worn fragments, and sometimes in crystals; transparent, and commonly white; rarely yellow or very light blue. The topaz is the largest of the accompanying minerals, varying in size up to half-an-inch diameter.

3. *Quartz*.—Opaque double hexagonal pyramids, $\frac{1}{8}$ to $\frac{1}{4}$ inch diameter, are very common. Quartz pebbles occur of all sizes. The varieties comprise agate of poor quality, carnelian, jasper, rock crystal, smoky quartz, and a kind which appears bluish opaline when wet. Pebbles of grey quartz, imbedding felspar, derived from a granite very similar to that which occurs at Aaron's Pass, fifty miles higher up the river.

4. *Corundum*.—

(a.) Sapphire, transparent, blue, green, yellowish, or parti-coloured.

(b.) Adamantine spar, hair brown and black.

(c.) The opaque magenta-coloured variety of alumina, which has received the name of Barklyite in Victoria.

All these occur in small fragments in great abundance.

(d.) Another variety, which is characteristic of this locality, has to be mentioned. It is in six-sided prisms, slightly barrel-shaped or tapering, with flat end faces; $\frac{1}{4}$ inch long, not exceeding $\frac{1}{6}$ inch diameter; bluish-white, with a few dark-blue spots; opaque; hardness, 9; specific gravity, 3.59; composition found by analysis—

Alumina	98.57
Ferric oxide	2.25
Lime .....	.45

101.27

(e.) *Ruby*.—A transparent pink variety of corundum; is found sparingly in flat grains up to $\frac{1}{6}$ -inch; its shade often passes into violet and blue; hardness, 9; specific gravity, 3.96; composition found by analysis—

Alumina	97.90
Ferric oxide	1.39
Magnesia .....	.63
Lime .....	.52

100.44

(f.) A few large rolled pebbles of corundum have also been observed, exceeding $\frac{1}{2}$ -inch, of a mottled dirty white and pink colour, perfectly opaque. From their low and variable specific gravity, 3.21, 3.44, and upwards, they appear to be impure massive forms of the mineral; they possess the requisite hardness.

5. *Zircon*.—This occurs in small rolled pieces and as fine heavy sparkling sand in abundance. It is transparent; brown, very pale red, or colourless.

The sapphires and zircons very rarely exceed $\frac{1}{4}$ -inch diameter, and are mostly very much smaller; it is worthy of remark that these gems are found higher up the stream in pieces of considerably larger average size.

6. *Tourmaline*.—Rolled black prisms, $\frac{1}{8}$ -inch long, are common; small nests of schorl in quartz pebbles rare.
7. *Black titaniferous ironsand*.—Common.
8. *Black magnetic ironsand*.—Common.
9. *Titanic acid*.—Probably *brookite*, in flat red transparent or reddish-white translucent plates, with striated surfaces, but too much worn to distinguish the exact crystalline shape. The plates vary in thickness up to $\frac{1}{2}$ -inch, and often measure $\frac{1}{4}$ -inch across; hardness, 6; specific gravity, 4.13; composition found by analysis to be pure titanic acid, excepting a minute trace of iron.

10. *Wood-tin*.—Small, rare.
11. *Garnet*, in minute icositrahedrons.—Rare.
12. *Iron*.—Hackly fragments of the slightly rusted metal, averaging $\frac{1}{3}$ grain, which are evidently derived from the iron tools and apparatus. Analysis failed to detect in them the least trace of nickel.
13. *Gold*.—Fine, scaly, and occasional fragments enclosed by quartz. The quantity is variable, but the average is about 3 dwts. per load of drift washed.
14. The *diamond* itself is distributed through the Older Pliocene river-drift sparingly and irregularly. At Hassall's Hill thirty-three loads from one claim yielded 306; at the same claim they have washed from one to fifteen to the load, but the average has been about five, with 3 dwts. of gold.

At another claim, on Hassall's Hill, a washing of from twelve to fifteen loads yielded at the rate of eight diamonds to the load, and 3 dwts. of gold; the average, however, was about three diamonds to the load. This yield afterwards fell off, and the ground is now worked out. Some of the drift at the junction of Wialdra Creek gave regularly four diamonds per load, but ultimately fell off to one per two loads. In other places the yield has been only one diamond to the load. As regards the weight of the diamonds the following parcels will afford a fair average:—

306 diamonds weighed	74 $\frac{1}{2}$ carats	; largest,	1 $\frac{1}{2}$ carat
81	19	„	largest, 1 $\frac{1}{2}$ carat
110	26 $\frac{1}{2}$	„	„
16	6	„	„
700	151 $\frac{1}{2}$	„	„

giving an average weight of .23 carat each, or close upon a carat grain. The largest diamond hitherto discovered in this locality was a colourless octahedron, weighing 5 $\frac{1}{8}$ carats; it was found in the river, between Two-mile Flat and the Rocky Ridge, at a spot where the Older Pliocene drift had been discharged in gold-washing.

During the first five months of systematic washing over 2,500 diamonds were obtained; several thousand more have been since collected. They are mostly pellucid and colourless; many have a straw-yellow tint, and tints of brown, light or dark green and black are more rarely met with. An opaque black one has been found, and another of a dark green colour, with the external appearance of having been rubbed with black-lead. Black specks within the crystal are not uncommon. The specific gravity taken from a number of crystals is 3.44. They all show a well-defined crystalline form, though irregularities of development are frequent. It is very rare to meet with worn or fractured specimens. They are easily recognized by their characteristic lustre, which is never impaired by a superficial coating of foreign matter. Sometimes

they are dull, but this is not due to water-wearing or incrustation, but to multitudes of minute angles and edges of structural planes, which give a frosted appearance to the crystal. The forms met with are the octahedron, twin octahedron, dodecahedron, tris-octahedron, and hexakis-octahedron; the two latter are frequently hemihedral, with curved faces, and sometimes developed into flat triangular twins. One specimen of the deltoïd dodecahedron or hemihedral icositetrahedron has also been found. The curious flat triangular twin crystals are derivable from the tris-octahedron. If we regard the latter as an octahedron, with a low triangular pyramid on each of its faces, and out of the eight pyramids we imagine that only two, corresponding to opposite and parallel octahedral faces, are developed, on applying these two pyramids together they would not form a closed figure, but by twisting one 180° round, we form the triangular twin crystal. Or, simpler, if we inspect a twin octahedron, there are but two of the original triangular faces entire; these are opposite and parallel, and by replacing these two faces by the corresponding planes of the tris-octahedron, the rest of the faces of the twin octahedron may be obliterated, and thus the triangular crystal will result. The structural laminae are very distinct on some crystals, and many of the octahedrons show these successive layers of growth in a very beautiful manner.

The fluctuating yield, small average size of the gems, great expense in extracting the drift from beneath the basalt, cartage to water, and washing effectually, are the drawbacks which have hitherto stood in the way of the successful investment of capital in this direction.

The Newer Pliocene drift has afforded a few diamonds. Its materials appear to have been partly derived from the older drift. In one spot, where it rests on greenstone, it consists of a pure white clay, in which gemstones are concentrated in the most remarkable abundance. It is studded throughout with black grains of pleonast, and more sparingly with sapphire, ruby, &c. The accumulation looks like the result of some natural washing process upon the materials of the Older Pliocene, so that it is not surprising that a few diamonds have been discovered in it. In the Newer Pliocene we find Carboniferous conglomerates, pebbles of quartzite containing *Spirifer*, others of shale retaining impressions of *Glossopteris*, rolled silicified fragments of *Favosites* and other corals, pebbles of sandstone with crinoidal stems and *Orthis*, silicified wood, abundance of pebbles of flesh-coloured quartz, boulders of basalt and greenstone—all occurring in addition to the ordinary contents of the older deposit. It also affords the same gems and minerals, and, besides these, a few grains of *Osmiridium* have been found.

The recent deposits in the present river channel are of local origin, being derived from the neighbouring rocks, including slates, sandstones, quartz of all kinds, greenstones, characteristic conglomerates from the Carboniferous rocks, and silicified fossil wood. The minerals comprise gold, black titaniferous and magnetic iron sand, sapphire, topaz, zircon, stream tin, and brown garnets crystallised in minute rhombicdodecahedrons with edges either entire or truncated. Similar garnets are found in the bed of Lawson's Creek, a tributary which joins the Cudgegong at Mudgee.

The plan which is adopted in washing for diamonds is—first to screen the drift to separate the larger stones, then to rid it of clay as much as possible in a "tom"; the coarser portions are raked aside, whilst the gold and finer matter is carried by a stream of water through the grating of the "tom," on to the blanket-boxes below, where the gold, and occasionally a diamond is deposited. From the material which passes over the blankets, the heavier fragments are separated from the lighter by various contrivances, among which Hunt's ore-separating machine is the most in use. The heavier stones accumulate in the machine, whilst the specifically lighter materials are washed away. In the heavier portion, thus reduced to a small bulk, the diamonds can be readily distinguished.

In speculating, regarding the original source of the diamonds in this locality, many difficulties arise. Considering that we have not yet discovered the matrix of the pleonast, corundum, zircon, and topaz, which exist in such profusion, it is hopeless to advance any hypothesis on the origin of the diamond, which is so rare in comparison. But there are one or two facts about the diamond which do not equally apply to the other associated minerals. First, the diamonds are never waterworn, and very seldom fractured, while the sapphire and all the other gems are rolled excessively. The superior hardness of the diamond may account for this peculiarity. A few shapeless ones have been found, but if their want of crystalline form is due to abrasion, the lustre has not been in the least impaired by the process. Secondly, they are not so uniformly distributed as the other gems, but generally occur in rich patches, and wherever most abundant they are also largest and purest. The diamonds found at the Two-mile Flat are larger than those found at Wialdra Creek, which is higher up the river. These and other facts have led some to believe that the diamonds actually grew in the drift;—the structural planes in many of the crystals also suggest this belief; but if such is the case, those who hold this view cannot explain why diamonds do not occur in similar drifts which are common throughout Victoria, and in other parts of this Colony.

Until chemistry throws some light upon the possible modes of formation of the diamond in nature, and demonstrates the necessity of its occurrence in metamorphic rocks, it is perhaps as easy to suppose that the gem may originate in a late tertiary drift deposit as in the most ancient strata of a somewhat similar origin. Quartzites and quartzose conglomerates occur in Australian tertiary deposits, having as highly metamorphosed an aspect as those in the Silurian rocks. If the diamonds have been formed in the drift, it will account for their absence in the present river-bed. On the other hand, if the diamond has been drifted from its original matrix, either it might be expected to occur in the river, where it has never yet been detected, or its matrix has been entirely denuded away in Older Pliocene times. Large areas of Carboniferous and older strata, as well as extensive tracts of tertiary basalt, have disappeared from the river basin; others have therefore proposed to assign the original position of the diamond to local and limited deposits in the demolished Palæozoic rocks.

The fact of the association of the diamond with other gems, which are mostly derived from igneous or metamorphic rocks, does not prove that they came from the same rocks. Innumerable creeks and rivers in the Colony contain abundance of fine sapphires, topazes, zircons, &c., but do not yield the diamond. Beechworth in Victoria, the Macquarie, the Turon (Stuchbury), Calula Creek, and the Cudgegong River in New South Wales, and we believe Hahndorf in South Australia, are almost the only Australian localities where the diamond is at present known.

The minerals characteristic of the Cudgegong diamond area are the lustrous black *vesicular* pleonast, brookite, and the variety (*d*) of corundum already mentioned. We are not aware that these minerals have been recognized in any other part of Australia, with the exception of brookite, which has been found in Victoria. The source of these has not been traced, and it will be interesting to notice whether they accompany the diamond in any new localities which may be discovered.

In suggesting that future discoveries of the diamond are very probable, we may state that at Trunkey Creek Gold Field there is a drift in most respects similar to that of the Two-mile Flat; it is found similarly situated beneath basalt, and we have seen one diamond which has been obtained from it.

METEOROLOGY IN NEW SOUTH WALES.

(By H. C. RUSSELL, Esq., Government Astronomer.)

THERE is perhaps no aspect of a new country so interesting as its climate, and none which it is so difficult to learn; nothing but the patient investigation of its phenomena through a long course of years will suffice to reveal its peculiarities.

In the early days of the settlement of a Colony, observations for science are seldom taken, all the energy and time of the pioneers being required to overcome the immediate difficulties which beset them, and the work of observing meteorological phenomena is left to a more convenient season.

In New South Wales, unfortunately, fifty-two years were allowed to pass over before any regular observations of the weather were taken; had a record been kept of the weather, which caused the vicissitudes through which our early settlers passed, it would have been now invaluable for tracing the succession of the seasons. As it is, except the labours of the Rev. W. B. Clarke, who has studied the climate for upwards of 30 years, and published some valuable papers upon it, more particularly on electrical storms, published in the *Sydney Morning Herald* of 1842, some papers by Mr. Tebbutt, Mr. Jevons, Count Strzelecki, and some others, the only information to be found is scattered in books and newspapers of the time, and is so meagre that it is not safe to make deductions from it.

It appears that Sir Thomas Brisbane, having established an Astronomical Observatory in 1821, caused meteorological observations to be taken as well; unfortunately none of the results can now be found, except part of 1822, all 1823, and part of 1824, one year, probably 1827, but it has no date, and some occasional notices in 1838, which show that the rain-gauge was still in use.

In the year 1840 the Government first caused meteorological observations to be taken, but at only two places in New South Wales; both of these were on the coast, and the results from one—Port Macquarie—were so peculiar that they were generally discredited; and the other, South Head, Port Jackson, on a narrow neck of land, with the sea washing both sides of it, can hardly be accepted as a place likely to give a correct idea of the climate of the whole Colony.

The observations were carried on at Port Macquarie until 1849— at South Head until 1855; the Observer then left the Colony, and the instruments were lost, so that it is not possible now to ascertain their quality.

In 1856 Mr. Jevons, in order to keep up the series of meteorological observations, commenced and carried on at his own expense a most valuable series of observations until the arrival of the Rev. W. Scott, the First Astronomer for New South Wales.

Upon the arrival of the Rev. W. Scott in 1856, twelve stations, Rockhampton, Brisbane, Casino, Armidale, Maitland, Bathurst, Parramatta, Sydney, Goulburn, Deniliquin, Albury, and Cooma, were selected and supplied with good instruments as soon as possible. Brisbane and Rockhampton were subsequently passed to the Government of Queensland; and the others, with some alterations and additions, have been retained ever since.

At the request of the Agricultural Society, arrangements were made in 1869 for establishing a number of new stations for collecting observations of rain, evaporation, and temperature; these are now coming into operation, and will it is hoped afford the data for a correct estimate of the rainfall.

In 1863 Mr. Tebbutt, of Windsor, added to his other instruments a complete set of meteorological ones, and has ever since maintained a most valuable series of observations, adding to those usually taken those of max. wet and min. wet, which are not elsewhere recorded in the Colony.

He has published one volume (Reading & Co., Sydney, 1868), including the observations for the years 1863, '4, '5, and '6, and I believe about publishing a second.

He has kindly furnished the Windsor results in the following tables:—

Mr. G. Wyndham, of Dalwood, Hunter River, has recorded the rainfall since 1863, and kindly furnished the results for that place.

Mr. L. S. Donaldson, of Cowga, Bogan River, has kindly furnished the results from that place.

And Mr. J. Comrie, of Northfield, Curragong, has kindly furnished the results for that place.

At the Sydney Observatory meteorological instruments now in use are as follows:—

A photographic barometer from Kew, extremely sensitive to changes of atmospheric pressure. Since its arrival in the Colony it has been altered, so that now only half the time is required to get the photographic record; and even the small oscillations of the mercury in a high wind are recorded. It is confidently expected that this instrument will indicate the connection between the changes of weather and the small changes of barometer, which have before escaped notice.

Two standard barometers, one by Newman, the other by Negretti.

- A standard thermometer (Kew), wet and dry bulbs, max. and min. shade, solar radiation in vacuo; terrestrial radiation; and a sun thermometer in a black box, showing the maximum heating effects of the sun's rays.
- A self-registering anemometer and pluviometer, recording throughout the day the direction and velocity of the wind and the rainfall. This is on the tower, 60 feet from the ground.
- A self-registering pluviometer, recording only the rainfall; this is placed on the ground.
- An evaporator, showing to one-thousandth of an inch the depth of evaporation from the surface of water. The water-basin is 8 inches in diameter, and about 7 inches deep.
- Two rain-gauges of the ordinary 8-inch pattern, placed on the ground.
- Five earth thermometers, showing the temperature to 19 feet below the surface.
- An evaporator, showing the amount evaporated in free air, but protected from the sun.
- An atmospheric exploring wire, and an electrometer.
- Also, a self-registering tide-gauge, recording the rise and fall of the tide to $\frac{1}{2}$ an inch, and the time of high and low water.

It is not to be expected that a few years observation will indicate all that is required to be known of the climate of a large tract of country, even when observers are scattered all over it, much less can the results from ten places of observation in a large Colony like this furnish the information needed in the space of eleven years. Still, much may be learned from what has been done, and enough to prove that in New South Wales generally we have a climate approximately to that of Southern Europe, and so modified by the physical features of different parts that all varieties may be found from the cold of Kiandra, where frost, snow, and hail reign for a considerable portion of the year, to the heat of our inland plains, where the thermometer sometimes reaches 140° in the shade, and is for the greater part of the summer over 100° , and where rain enough to wet the ground is sometimes not seen for eighteen months.

But taking Sydney as representative, because its climate is best known and it is centrally situated, we find that it has a mean temperature of 62.4 (not 66.0 as is sometimes stated), which is almost equal to that of Lisbon, and that the variation in the annual temperature is only 4.5 or from 59.8 to 64.3 , while in London it is 8.0° , and the extreme range of the shade thermometer here is from 106.6° to 36.0° or 70.6° , while in London it is from 97.0° to 5.0° or 92.0° .

But the temperature as shown by the thermometer is not a safe guide as to the sensible temperature of any place; it is necessary also, in order to a correct idea of the climate, that we should know the local physical characteristics and the amount of moisture present in the air; we have therefore collected into tables the results of observations made up to the end of 1869, each table presenting at a view one of the meteorological conditions.

Before, however, proceeding to examine these tables, it may be well to describe generally the physical characteristics of the Colony.

It is comprised within the parallels 28° and 37° south latitude, and 141° and $153\frac{1}{2}^{\circ}$ east longitude, the east side having a general trend to N.N.E., and no very marked inlets; is washed throughout its whole length by the ocean. At the distance of 4 or 5 miles from the coast runs one of the great ocean currents, which, taking its rise to the north of Australia, is necessarily a stream of warm water, and probably has much to do with the remarkably uniform temperature of Sydney; the velocity is from 1 to 2 miles per hour, and the set steadily to s., except after very strong southerly winds, which sometimes stop it for a day or two.

Generally parallel to the coast, but varying in distance from 25 to 120 miles, runs the Dividing Range or Blue Mountains, the altitude of which varies from a few hundred to about 7,000 feet, but is generally between 2 and 3,000 feet. This range divides the watershed of the Colony, the east side to the sea being well watered with small rivers, many of which have very little fall, and are quite insufficient to carry off the tropical rains which at certain seasons fall on the mountains, where the rain clouds get intercepted and discharge their rain in such abundance that in the rivers which skirt the mountains floods are sometimes produced in a few hours.

The whole of this portion of Australia receives its rain from easterly and southerly winds; and the days on which rain falls at different places averages from 100 to 150 in the year, and the amount of rain from 20 inches to 50 inches, decreasing generally as we go inland. (*See table 16.*)

On the western side of the Dividing Range the country gradually slopes to the westward. Rivers are few, and, compared with their length, very small; the rainfall is very uncertain, and varies from 0 in some years up to 30 inches; evaporation, as might be expected, is enormous, sometimes reaching 12 inches a month for several months together; at these times the rivers cease running and the whole country gets burnt up with the heat.

Mr. L. S. Donaldson, who took meteorological observations at Cowga, on the Bogan River, 80 miles above Gongolgan, from 1864 to 1868 inclusive, says—

“In these five years, thirty-seven months have been absolutely without rain, unless perhaps five or ten minutes; eleven months have been distinguished by only one or two good showers, or perhaps a day or two very light rain, leaving only twelve months in which there has been good rain. The river has only run five times in five years through to the Darling, two other slight freshes have only gone part of the way down.”

It has been remarked that floods on the coast districts are simultaneous with droughts inland, but this is not always the case; and during the present year we have had the rain and floods on the coast which have extended to the interior.

The heavy rains coming in both places with winds from eastward, it is not surprising that in some years, when the amount of moisture is not very abundant, it should all be intercepted by the mountains, while in others, with an abundant supply, it should pass the mountains and fall inland as well.

WINDS.

In summer the prevalent winds on the coast are s.e. and n.e. during the day, and light westerly at night.

North of Port Macquarie it is s.e. or part of the s.e. trade-wind; thence south to Eden it is principally the n.e. sea-breeze.

In winter westerly winds prevail, with occasional gales from east and south.

Inland the winds are from n. and w., with heavy rain and storms of wind from eastward, and occasionally southward.

In Sydney, from October to March, with barometer at 30 in. we have fresh n.e. winds during the day; they generally begin between 8 and 10 a.m. in the forenoon, and gradually increase to their maximum about 4 p.m., and die away about sunset; occasionally they last till 10 or 11 p.m., and in some cases all night, continuing day and night for several days, constituting a “black north-easter”; the barometer then falls rapidly for one or more days, and the wind changes to the opposite quarter, s.w. to s. If n.e. wind is very strong, the change to s.w. will be all the more sudden, and it will blow hard from that quarter also; rain in some cases follows after a day or two of the s.w. wind.

These gales occur nearly always in January, but occasionally in December, and the force is greatest late in the afternoon, and early part of the night.

If, during a fine day, with n.e. wind, light clouds be seen rising in s.w., spreading over the sky, and getting thicker as the day goes on, rain is sure to follow within twenty-four hours, and generally before next morning.

When the barometer falls gradually with N.E. wind it will veer to N.N.W. and W., where it will blow for one or more days ; as the barometer rises it will veer to S. and die at S.E. or E., with high barometer ; to begin another circle from N.E.

If in fine hot N.E. weather the barometer falls fast in the forenoon, a southerly wind (burster) may be expected before night ; if the day is very hot the change will come sooner ; and if the barometer is falling very fast, and clouds be seen in W., a thunderstorm may be expected in the afternoon.

Sometimes the thunderstorm bursts first, and the wind sets in from S. afterwards ; if only the storm comes it will probably be hot again next day.

Southerly bursters are generally to be expected from November to the end of February ; they are always attended with strong electrical excitement, a stream of sparks being sometimes produced for an hour at the electrometer.

The approach of the true burster is indicated by a peculiar roll of clouds, which, when once seen, cannot be mistaken ; it is just above the south horizon, and extends on either side of it 15° or 20° , and looks as if a thin sheet of cloud were being rolled up like a scroll by the advancing wind.

Clouds of dust, which penetrate everywhere, announce the wind ; scud flies by overhead with great rapidity, being sometimes less than 2,000 feet high ; rain may follow, but, if so, thunder and lightning come first.

The velocity of the wind is in most cases greatest within the first two hours, and varies from 30 to 70 miles per hour, but is usually from 50 to 60, and the rate of progress along the coast about 40 miles per hour.

The change of wind is sometimes very sudden ; it may be fresh N.E., and in ten minutes a gale from S. ; hence vessels not on the look-out are sometimes caught unprepared, and suffer accordingly.

When a southerly wind commences anywhere south of Sydney it is at once telegraphed to the principal coast towns, and a signal put up, indicating its approach.

When the wind is light they are often carried to sea by the general westerly tendency of the atmosphere, and may sometimes be seen passing by, the peculiar clouds indicating unmistakably their position.

In autumn the wind begins to change to westerly, and brings unsettled weather, the character of which varies in different years. In some the east wind is below and the west above ; then much rain falls on the coast. In others, the east is above and the west below, with much cloudy weather and little rain. In some rare cases this cloudy weather has been known to last three months ; and ships on the coast then find it impossible to get observations. In other years the two winds seem to meet and

form small electrical cyclones, varying from a few hundred feet to a few miles in diameter. These may be seen often for weeks together passing by to eastward, their track being indicated by a cluster of electrical clouds. Some days they may pass every hour, or oftener; on others none can be seen. Rain usually falls from the larger ones, with sometimes lightning and thunder; and in the largest which have been observed, the downpour of rain on both sides, with a lull in the centre, can be distinctly traced. The thunder and lightning manifested by these is terrific, and seems for the time like the change of monsoon in India.

Two of these, rather earlier in the season than usual, were recorded by the anemometer and pluviometer in February, 1869.

The first, with a N.E. wind, on the 10th of February, 1869, lasted two hours, from 8 to 10 p.m.; the lightning was extremely vivid and almost incessant amongst the clouds, with an occasional down-stroke. It rained a perfect torrent,—2·355 inches fell in the two hours; and during part of the time it fell at the rate of ·1 in two minutes, or 3 inches per hour. For about twenty minutes (5 before, and 15 after, 9 o'clock) the rain almost ceased, and then came on again slowly at first, and from 9·25 to 9·35 p.m. (ten minutes) 0·46 inch of rain fell. The storm then cleared away to E., with the scud driving overhead from W.

On the following night (February 11th) another similar storm occurred; it began at 9 p.m., with moderate rain and almost incessant lightning in all parts of the heavens; at 10 p.m. the rain became a perfect torrent,—0·7 inch fell in thirty minutes; it then almost ceased for thirty minutes, and began again with a heavy squall of wind from W.N.W.; the rain was even heavier than before,—0·7 inch fell in eight minutes, or at the rate of 5·25 inches per hour. There could be no mistake about these results for the instrument was watched while it recorded them.

In winter the wind is steadily from the west, with storms of wind and rain from eastward in June, July, or August, and sometimes southerly wind with rain; but the prevalent wind is W.N.W. for all the winter months. The easterly gales come on without warning, instrumental or of any kind. They are by far the most dangerous upon our coast, bringing with them, in nearly all cases, thick weather, torrents of rain, and a very high sea on a lee-shore, from which none but the best found vessels can get away, and others, if unable to make a port, must be wrecked. In one of the worst of these—that known as the "Cawarra Gale,"—no less than fourteen vessels were lost on the coast, and a description of it from Observatory records may convey an idea of their character.

The 10th July, 1866, was fine, with light W. and S.W. winds; cloudy in the morning, but clearing at night; barometer, 30·3 and 30·2, inclined to fall. At 6·45 p.m. lightning was observed

in a bank of clouds low down in s.s.e. Next morning (the 11th) was fine with light w. and w.s.w. winds up to noon, when it veered to n. for about two hours, and then to s.e.; by 2 p.m., very light. The morning was cloudy, but not entirely overcast; barometer 30·2, and at night 30·1. After 2 p.m. the wind very gradually increased; at 3 p.m. it was cloudy and dull, wind only 8 miles per hour; at 5·45 p.m. lightning began in s.s.e., and spread all over the heavens, the force of wind gradually increasing; at 9 p.m. wind 21 miles per hour, very cloudy and raining. The rain continued all night, with increasing wind, which, by 6 a.m., was 40 miles per hour, with gusts from 50 to 60 miles per hour. By 9 a.m. of the 12th 3 inches of rain had fallen; it blew hard and rained in showers all day of the 12th from s.e., and at 8 p.m. the wind began to draw to s. very slowly, and decrease in force; by 9 a.m. of the 13th it was s., and the velocity only 25 miles per hour, cloudy without rain; the wind continued from s. with occasional showers all that day, and at midnight began to veer to w., and was w. at 4 a.m. on the 14th; continued from w. all that day, clouds clearing away; and no return of bad weather.

During the height of this gale four Men-of-war in Farm Cove, Sydney Harbour, dragged their anchors, and were compelled to get up steam to prevent driving on the rocks.

In spring, westerly, southerly, and light easterly winds prevail, with fine weather and moderate rainfall, and occasionally some unsettled weather like the autumn.

REMARKS ON THE TABLES.

Table II gives the average reading of the barometer at the different stations for 9 a.m., corrected to 32° Fahrenheit. As the barometer here has a diurnal range of 0·07, and attains its maxima at 10 a.m. and 10 p.m., it is necessary to subtract from these readings 0·023 to get a true mean result. The extreme variation of the barometer in 11 years has been from 28·884 to 30·585, and the average monthly range 0·786.

Diagram I shows clearly that the barometer does not go through a regular annual curve here, and all that can be said is that it is higher in winter than in summer.

As an indicator of the weather here, it is very apt to mislead those who have been accustomed to its use in England; one or two considerations however ought not to be lost sight of. In the first place, we are in the Southern Hemisphere, and the rules have to be inverted accordingly; for instance, with a high barometer we expect Polar wind not n. but s. Second, we are much nearer the Tropics, and the range is of course much less. And, third, we have a large continent, whose interior is often heated enough to divert the winds entirely from their usual course.

Generally, the barometer is low for northerly, high for southerly wind, lowest for n.w., the true Tropical ; highest with s.e., the true Polar wind.

A low barometer is an indication of westerly wind, either in winter or summer.

A sudden fall in summer indicates, as before stated, a burster or a thunderstorm.

Steady, 30 inches, n.e. winds and fine weather.

High barometer in winter indicates southerly wind.

It should also be borne in mind that since the variation is so small the effect of one wind blowing against another may be to raise the barometer sufficiently to mislead the observer.

Table III shows the mean temperature for each station. It ranges from 45.3 at Kiandra, to 70.9 Cowga.

Taking the whole series for Sydney and South Head, it will be seen that the range at Sydney is from 59.8 in 1854, to 64.3 in 1867 ; that, with some slight exceptions, from 1854 to 1867 the temperature gradually rose at the rate of 1° in three years, and that it has since been falling. A reference to diagram No. 1 shows that the rise of temperature has been principally in the winter months.

The year 1854, that of lowest mean temperature, is also one of those of least rainfall, and 1867 the greatest mean temperature is one of those of greatest rainfall.

Table IV shows the mean temperature in the shade at Sydney of each month, 1859 to 1869 inclusive, with the means for each month.

January and February are our hottest months and nearly equal. March and December, May and September, June and August, are nearly equal in each case, and the temperature of April is the same as the mean of October and November.

Table V shows the mean of all the readings of the max. thermometer for the hottest month in each year. It is curious that the temperature of the three years (1867, '8, and '9) is greater than that of any previous three years, and yet it is a common opinion that our summers are cooler than they used to be. January is in nearly all cases the hottest in the year.

Table VI shows the mean of all the readings of the minimum thermometer in the coldest month in each year. This has always been July, except in the year 1862, when it was in August.

Table VII shows the mean difference between the max. and min. for each year. It is noteworthy that the greatest range is found at Deniliquin 31.8°, at Cowga 31.7°, and Bathurst 29.9°, owing no doubt to the extreme radiation from the inland plains.

Table VIII shows the mean humidity of the air ; saturation is taken at 100. The results are deduced from observations of the wet and dry thermometers at 9 a.m.

Table IX shows the mean amount of sky covered with cloud at 9 a.m.—0 representing clear sky, and 10 overcast.

Table X shows the prevailing direction of wind from observations at 9 a.m.

Table XI shows the amount of rain and number of rainy days for each year at all the stations from which observations could be obtained; also, the average for each place.

Taking the results from South Head and Sydney as from one station (they are only 5 miles apart) they extend over a period of thirty years, and indicate some interesting features in our climate.

The years 1841, '43, '44, '45, '60, '61, '64, and '67 were years of excessive rainfall, and it is remarkable that on each of these years there was a rain storm which had much to do with bringing up the amount of rain—

In 1841	it occurred	in April ;	20 in. fell in one day, the 29th.
1843	"	Aug. ;	5.5 in. " the 13th.
1844	"	Oct. ;	20 in. " the 15th.
1845	"	April ;	9.3 in. in last week.
1860	"	April ;	12.6 in. on 28th and 29th.
1861	"	April ;	12.4 in. on 3rd and 4th.
1867	"	April ;	5.6 in. on 12th.

It will be seen that these storms generally occur in April, and that as much as 20 inches may fall in one day.

A period of nineteen years is distinctly traceable in the rainfall. (See diagram No. 2.) There are of course exceptions to the similarity of the rainfall in the two periods, but, as before remarked, 1862 was exceptional in other respects as well as rainfall; neglecting this exception, of which more presently the coincidence of the curves for the years '40-'59, '41-'60, and from '45-'64 on, is most remarkable, and seems to leave no doubt that we are now in a dry period, with 1870 as another exception. The question naturally arises, what is this period of nineteen years?

Now, it is well-known that on the border of the s.e. trade, as on that of the n.e., is a belt of calms or changeable winds, and that the polar side of this belt is a region of rain precipitation; the position of this region is of course chiefly regulated by the sun. There is, however, every probability that the moon exerts an influence in conjunction with the sun, and there are some observed facts which leave no doubt in the minds of many observers that she exerts a considerable influence on the clouds and the precipitation of rain; hence the similarity of the rainfall at intervals of nineteen years suggests *lunar influence*, for in that period the moon returns to the same *position* in the heavens.

Port Macquarie is usually the limit of the s.e. trade-wind on our coast; thence southward a few degrees we should expect to

find the rainfall excessive ; and such is the case, for the table shows that north of Port Macquarie and south of Cape St. George the rainfall decreases.

It is an observed fact that the monsoon in the Indian Ocean is in part regulated by the sun's heating effect in Central Asia ; hence in all probability the same cause will operate to produce variation in the s.e. trade, and alter its geographical limit, and with it our rainfall ; for, if the effect be to move the border of the trade-wind north, then Sydney will be for the time in the dry w. and s.w. winds which blow steadily in lower latitudes, and will have a small rainfall, a low barometer, and a long winter. Now, this is exactly what we experienced in 1862.

The prevailing direction of the wind in April, 1862, was w.s.w. ; nay more, it is remarkable (see diagram) that every year in which the prevailing wind in April was westerly, the rainfall was below the average. 1866 also had a small rainfall, and there was nearly as much westerly wind in April as easterly. The mean height of barometer was considerably below the average. In winter also the temperature curve shows the lowest temperature in August, when every other year of the eleven it was in July.

Returns recently received show that 1862 was a year of drought in Central Russia ; hence probably the prevalence of westerly winds here and the small rainfall.

Another remarkable fact, which at first it was thought must arise from an accidental misplacement of the results, is exhibited by the table. A careful examination of the records, however, proves the facts to be as stated, viz., that in 1841 the rainfall at Sydney was 76·310 inches ; at Port Macquarie, 48·730 inches. In 1842, Sydney, 48·320 inches ; Port Macquarie, 72·850 inches. Seen in the light of the above views, the explanation is simple,—the rain-belt had changed places.

If then our rainfall does follow a law, which in some years is altered by known causes acting at a distance, and some months before its effects are felt here. It may yet be possible approximately to *predict it*.

Table XII shows the amount of rain and the number of days' rain for each month for thirty years.

It is remarkable that during that period every month in the calendar, except December, has been the maximum for the year, one or more times.

January	2	July	1
February	5	August	1
March	1	September	2
April	6	October	1
May	4	November	2
June	5		

And that 21 months during the same period have had less than half an inch of rain, though there has not been one month entirely without.

There is not much difference in the average amount of rain falling in each of the first seven months, but a marked decrease is manifested in the last five, especially September, November, and December.

Table XIII is convenient for reference for the rainfall of any particular day, and shows that some days are almost always wet, as the 28th March was wet for nine years in succession, 12th August, and others. It is also remarkable that when a rain period, extending over a number of days, occurs in any year, it is almost certain that a rainy period will occur about the same time next year. Sometimes these periods get gradually earlier in the year, as in August, '63, '64, and '65, sometimes later, as in June, 1863-'4-'5. This table also indicates the length of the periods which have been quite without rain, the greatest being twenty days in September, 1866.

It should be borne in mind that the rain is measured every morning at 9 a.m.; and the quantity recorded is therefore the rainfall of the twenty-four hours previous to 9 a.m. of the day on which it is entered.

Table XIV shows the amount of evaporation from a surface of water 8 inches in diameter, kept about 5 or 6 inches deep; it cannot therefore be taken as representing fairly the evaporation from a large surface, but may give some idea of it.

The evaporation in October, November, December, and January is greater than that in the other eight months of the year. December has the greatest, June the least, evaporation. 1862 distinguished here as that of greatest evaporation.

Table XV shows the amount of ozone in each month, 1859 to 1869; the amount is greater at night than during the day; greatest with wet easterly electrical weather, and least with dry westerly winds, and when influenza is prevalent;—the least average being in May, which is usually clear with westerly winds.

Table XVI show the different stations, with their distances from the coast and amount of rainfall, illustrating the decrease of rain from the east coast inland.

Table XVII is an abstract of the anemometer results for three years. The direction is taken at every hour, and the total number of times the wind blew from each point is recorded under that point, and this number indicates the prevalence of the wind.

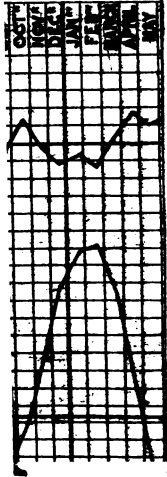
The total number of miles recorded by the instrument is also given with the average per hour during the month; also, the greatest pressure of the wind during the month, with the direction of wind at the time, and the day on which it occurred.

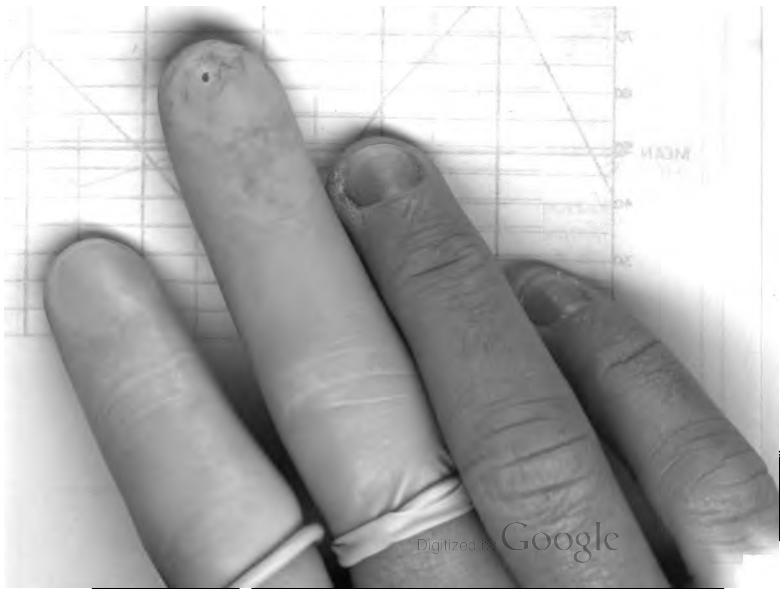
This table indicates at once the character of the winds.

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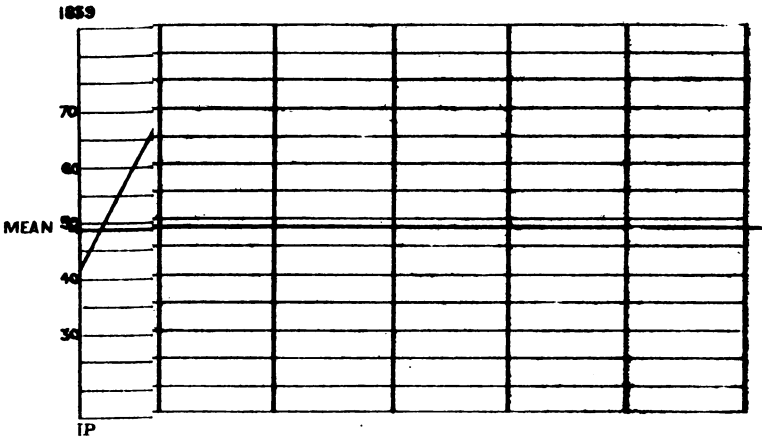
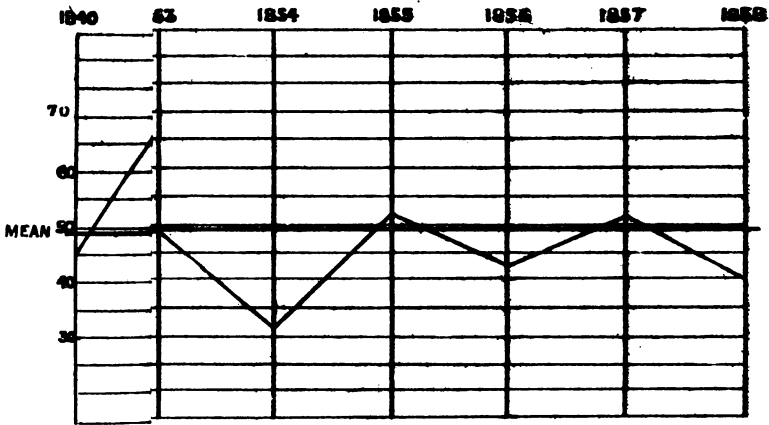
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SYDNEY



In spring the wind is more variable than any other part of the year, but the force is almost equal to summer, and greater than either autumn or winter.

In summer the prevalence of easterly wind is manifest at once by the largest number (97) being under E.N.E. ; the greatest force of wind recorded here (40.5 lbs. on the square foot) is also in summer ; it is also evident that in summer the strongest wind is generally southerly.

In autumn the turn to westerly wind is striking, the average number from W.N.W. being more than double that from any other point of the compass, except W. and N.W., while the strongest winds are also westerly.

In winter the prevailing westerly is still more marked, for more than half the observations show the wind at W., W.N.W., or N.W., while the prevailing wind is W.N.W. ; once during the three years it will be seen that the greatest force was with an easterly gale, but generally the force of wind is greatest between S.W. and S., and it may be said generally of the whole year that our strongest winds come from S.S.W.

DESCRIPTION OF DIAGRAMS.

Diagram I.—The mean height of the barometer for each month was marked on the paper, each space being taken as $\frac{1}{6}$ of an inch ; lines were then drawn through the points to form the curve.

The temperature curve was formed in the same way, the *mean shade* temperature of each month being taken, and the spaces are each 1 degree.

The prevailing direction of wind for each month is indicated by a black dot which is so placed as to indicate the direction of wind as—June, 1860, W.S.W. From January, 1864, the direction is from the anemometer results ; for the same period also the total number of miles of wind for each month is entered, each space being 1,000 miles ; the records for February, May, and July, 1864, are imperfect.

Previous to 1864 the force of wind was estimated three times daily, but the results are not considered of sufficient accuracy to enter here.

The amount of rain for each month is indicated by the portion of black line in it, each division being 2 inches. The amount for each month commences at the top of the previous one, and the top in December therefore indicates the amount of rain for the year.

Diagram II.—Each space is taken to represent 5 inches of rain. The amount for each year, beginning at 1840, was then marked, and lines were drawn through these points.

The data for the nineteen years previous to 1840 is not sufficient to draw the curve for that period; but so far as the results can be found they indicate a similar curve. 1822 appears to have been a wet year; the rainfall for the last three months (all that can be found) is 9.1 inches. 1823 was dry; the total rainfall being only 35.313 inches. 1824 was very dry; the drought is said to have terminated in September. 1825 was very wet. 1826 moderate; but dry at the end. 1827 and 1828 very dry; one of the most severe droughts which has been felt in the Colony, began at the end of 1826 and terminated in the early part of 1829. 1832 was a dry year; only sixty-six days are recorded as days on which rain fell. (The amount is not given.) 1835 was dry. 1838 very wet. 1839 dry.

It will thus be seen that drought of 1827 and '8 coincides with 1846 and '7, 1865 and '6; that 1832 and 1851 agree, being both dry years; and that 1870 is an exception to what might have been expected from previous experience; and it remains to be seen whether the droughts of 1835 and 1854 will have their counterpart in 1873.

It is said that the severe drought of 1813 prompted the attempt to cross the Blue Mounts, and that in 1811 water was sold in Sydney at from 4d. to 6d. the pailful, and that the "tanks" were empty for several weeks.

1800, 1806, 1817, and 1819 were all wet years, and show that the remarkable points in the curves may be traced back four periods.

TABLE I.
METEOROLOGICAL Stations, and their assumed positions in latitude; height above mean sea-level, distance from the Coast in miles, and longitude.

Positions.	Casino, Richmond River.	Gatton.	Armidale.	Port Macquarie.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	St. George.	Eden.	Lake George.	Cowra.
Latitude ...	28°50'	34°40'	34°34'	31°52'	32°24'	32°55'	32°55'	33°24'	33°24'	33°49'	33°50'	33°52'	34°27'	35°22'	35°22'	36°47'	36°13'	35°51'	37°17'	35°17'	31°10'
Height	139	46	378	...	98	169	169	233	38	69	69	151	218	101	407	572	236	170	107	292	19
Distance ...	30	22	26	...	30	16	16	38	30	16	...	5	48	98	60	471	135	...	...	...	...
Longitude...	153°00'	152°53'	151°40'	151°54'	151°35'	151°50'	151°50'	149°37'	150°50'	151°16'	151°16'	151°11'	149°45'	142°11'	141°28'	147°41'	146°59'	150°54'	149°57'	146°54'	147°12'

TABLE II.
BAROMETRE readings corrected to 32° Fahrenheit.

Year.	Casino.	Gatton.	Armidale.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	St. George.	Eden.	Lake George.	Cowra.	
1858	29.688	...	...	29.634	...	...	27.919	...	29.659	...	...	27.845	29.639	...	27.303	...	...	...	...	...
1859	29.690	...	...	29.645	...	...	27.678	...	29.672	...	29.886	29.671	29.671	...	29.463	27.327	...	...	...	...
1860	29.673	...	...	29.641	...	...	27.763	...	29.672	...	29.873	29.686	29.686	...	29.328	27.321	...	...	...	...
1861	29.655	...	...	29.656	...	...	27.810	...	...	...	29.843	29.686	...	...	29.313	27.290	...	...	...	...
1862	29.631	...	...	...	...	...	27.806	29.695	...	...	29.841	27.811	...	...	29.354	27.290	...	...	...	...
1863	...	...	...	...	...	...	27.789	29.688	...	...	29.837	27.818	29.624	...	29.418	27.272	...	...	...	...
1864	...	...	...	...	...	...	27.799	30.006	...	...	29.847	27.828	29.635	...	29.442	27.268	...	...	...	...
1865	...	...	...	...	...	...	27.799	30.006	...	...	29.857	27.855	29.669	...	29.443	...	...	...	...	...
1866	...	...	...	...	...	...	30.024	...	...	...	29.883	...	...	...	...	...	...	...	...	...
1867	...	29.682	...	...	...	...	29.016	...	...	29.758	29.872	...	29.677	25.398	...	...	...	...	...	...
1868	...	...	...	...	...	...	29.086	...	...	29.855	29.833	...	29.669	25.434	...	...	...	...	...	...
1869	...	...	...	...	...	...	29.923	30.000	...	...	29.897	...	29.740	25.463	...	...	...	...	...	...
Mean	29.686	29.982	26.762	29.944	30.020	29.930	27.737	29.995	29.968	29.792	29.866	29.843	29.673	25.432	29.394	27.301	29.632	29.951	27.736	27.736	30.533

* Aneroid.

TABLE III.
MEAN of Temperature in the Shade.

Year.	Casino.	Gratton.	Armidale.	Port Macquarie.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	Cape St. George.	Eden.	Lake George.	Corra.	Northfield.
1842	...	...	...	56	...	...	...	...	...	...	620	...	...	...	...	...	...	...	...	...	...	...
1843	...	...	...	64	...	...	...	...	...	...	620	...	...	...	...	...	...	...	...	...	...	...
1844	...	...	...	64	...	...	...	...	...	...	617	...	...	...	...	...	...	...	...	...	...	...
1845	...	...	...	65	...	...	...	...	...	...	621	...	...	...	...	...	...	...	...	...	...	...
1846	...	...	...	64	...	...	...	...	...	...	620	...	...	...	...	...	...	...	...	...	...	...
1847	...	...	...	63	...	...	...	...	...	...	612	...	...	...	...	...	...	...	...	...	...	...
1848	...	...	...	63	...	...	...	...	...	...	605	...	...	...	...	...	...	...	...	...	...	...
1849	...	...	...	63	...	...	...	...	...	...	615	...	...	...	...	...	...	...	...	...	...	...
1850	...	...	...	64	...	...	...	...	...	...	619	...	...	...	...	...	...	...	...	...	...	...
1851	...	...	...	...	...	...	...	...	...	...	602	...	...	...	...	...	...	...	...	...	...	...
1852	...	...	...	...	...	...	...	...	...	...	598	...	...	...	...	...	...	...	...	...	...	...
1853	...	...	...	...	...	...	...	...	...	...	611	...	...	...	...	...	...	...	...	...	...	...
1854	...	...	...	...	...	...	...	...	...	...	611	...	...	...	...	...	...	...	...	...	...	...
1855	...	...	...	...	...	...	...	...	...	...	603	...	...	...	...	...	...	...	...	...	...	...
1856	...	...	...	...	...	...	...	...	...	...	611	...	...	...	...	...	...	...	...	...	...	...
1857	...	...	...	...	...	...	...	...	...	...	612	...	...	...	...	...	...	...	...	...	...	...
1858	69	...	54	...	...	612	...	...	...	...	612	...	539	...	...	...	...	...	...	...	...	...
1859	69	...	537	...	...	558	...	...	...	612	...	612	537	...	...	...	...	...	...	...	...	...
1860	67	...	...	...	...	549	...	...	...	604	...	612	528	...	...	...	...	...	...	...	...	...
1861	68	...	...	...	...	627	...	...	...	...	...	612	551	...	...	...	...	...	...	...	...	...
1862	67	...	58	...	...	...	...	...	...	...	...	612	553	...	...	...	...	...	...	...	...	...
1863	...	...	56	...	...	635	...	...	...	...	...	612	529	...	...	...	...	...	...	...	...	...
1864	...	...	56	...	...	639	...	...	...	...	...	612	529	...	...	...	...	...	...	...	...	...
1865	...	...	56	...	...	634	...	...	...	...	...	612	529	...	...	...	...	...	...	...	...	...
1866	...	...	56	...	...	632	...	...	...	...	...	612	529	...	...	...	...	...	...	...	...	...
1867	...	...	56	...	...	641	...	...	...	...	...	612	529	...	...	...	...	...	...	...	...	...
1868	...	...	...	...	...	650	...	...	...	...	...	612	529	...	...	...	...	...	...	...	...	...
1869	67	70	56	64	64	64	64	67	67	66	617	624	550	560	453	602	518	649	599	563	709	567

TABLE IV.
MEAN Temperature of each Month in the Year.
SYDNEY.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	Sep- tember.	October.	November.	December.	Totals.
1856	69.0	69.6	68.6	64.7	56.1	49.2	45.9	52.6	55.8	62.2	62.9	65.7	66.3
1857	70.2	71.2	68.0	64.1	54.5	53.0	52.2	51.9	55.1	59.7	64.7	68.6	61.1
1858	73.0	69.6	67.6	62.4	57.1	52.2	48.9	50.7	57.0	60.8	66.3	68.6	61.2
1859	70.6	69.8	68.2	63.8	58.5	52.5	50.6	55.3	57.3	65.3	66.4	69.5	62.3
1860	70.6	68.7	70.6	64.8	57.4	53.4	51.8	54.7	57.5	61.3	63.8	67.2	61.8
1861	69.7	71.6	71.5	64.7	56.6	54.6	51.1	52.4	57.6	64.3	64.5	69.0	62.3
1862	70.6	71.7	70.4	62.4	57.7	54.4	52.5	52.3	59.9	62.0	68.1	69.9	62.7
1863	71.9	72.1	69.4	63.8	59.0	55.0	52.6	53.9	57.0	62.3	66.4	67.8	62.6
1864	72.1	69.3	67.7	64.6	58.2	54.1	53.3	54.9	59.2	60.4	64.9	67.0	62.6
1865	69.5	71.1	69.2	66.4	56.5	52.9	51.0	55.0	61.1	64.1	67.7	70.5	62.9
1866	71.4	71.2	68.2	66.8	60.5	56.8	52.9	54.8	59.5	62.8	66.6	68.1	63.3
1867	71.1	70.8	68.5	66.4	61.0	56.2	54.3	54.7	59.3	68.5	69.4	70.9	64.3
1868	70.7	69.5	69.5	64.4	58.6	55.8	53.0	54.0	59.7	66.5	65.5	72.0	63.3
1869	72.9	70.1	71.6	65.1	58.3	55.2	52.3	55.4	56.7	62.0	66.3	70.1	63.0
Means	70.9	70.5	69.2	64.6	57.9	53.9	51.7	53.8	58.0	63.0	66.0	68.9	62.4

TABLE V.
 MEAN Maximum Temperature in the shade during the hottest month.

Year.	Cadno.	Grafton.	Armidale.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	Cape St. George.	Idem.	Lake George.	Cowga.	Northfield.
1858	93.4	..	87.9	91.9	..	..	92.5	..	91.1	..	..	89.1	85.8	..	..	..	..	..	..	..	..
1859	95.4	..	83.1	87.4	..	..	83.3	..	85.0	..	78.2	80.4	92.4	..	..	77.3	..	..	..	..	..
1860	98.9	..	87.0	89.1	..	..	84.2	..	86.1	..	78.4	81.2	93.7	..	95.4	79.2	..	..	..	..	..
1861	93.6	..	89.3	85.8	..	..	81.8	87.4	..	..	79.3	79.7	91.3	..	90.1	80.1	..	..	..	..	..
1862	..	..	89.4	..	84.8	..	89.8	93.9	..	..	78.7	86.6	..	..	93.9	79.5	..	..	..	..	..
1863	..	..	..	..	84.1	..	88.1	86.3	..	..	78.8	84.9	96.0	..	94.7	86.2	..	..	..	..	..
1864	..	..	..	..	84.7	..	85.8	88.9	..	..	80.3	86.1	94.6	..	..	83.4	..	..	..	..	..
1865	..	..	..	..	86.8	..	88.7	90.7	..	..	79.4	86.5	90.5	..	..	82.2	..	..	..	..	..
1866	..	92.5	..	..	79.5	..	..	89.1	..	..	78.5	..	..	..	..	..	..	..	..	97.0	..
1867	..	95.2	..	..	..	81.9	..	91.6	..	81.8	78.9	..	94.9	81.7	..	..	96.4	..	100.0	..	..
1868	..	..	..	..	..	81.3	..	92.3	..	83.2	79.8	..	95.0	73.6	..	..	79.0	..	101.0	..	..
1869	..	..	..	..	..	80.1	..	92.9	..	..	80.0	..	93.3	74.0	..	..	80.4	76.3	106.0	106.0	78.2
Mean	95.3	93.9	87.3	88.6	84.0	1	86.8	90.3	87.4	82.5	79.1	84.3	92.4	76.4	93.5	81.1	85.3	76.3	72.2	101.0	78.2

TABLE VI.
 Mean Minimum Temperature in the shade during the coldest month.

Year.	Casino.	Grafton.	Armidale.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	Cape St. George.	Eden.	Lake George.	Cowra.	Northfield
1858	37.4	...	29.2	38.4	...	...	28.0	...	33.3	...	...	31.2	22.4	...	...	28.9	...	...	...	...	...
1859	37.1	...	23.9	40.7	...	...	23.9	...	33.8	...	42.8	29.7	29.9	...	...	27.3	...	...	...	...	...
1860	40.0	...	...	42.3	...	...	29.3	...	39.0	...	45.2	32.7	28.3	...	34.1	28.9	...	...	...	...	...
1861	42.8	...	...	...	...	...	31.4	...	...	...	45.2	33.7	...	...	36.8	27.7	...	...	...	...	...
1862	...	...	...	...	44.5	...	29.4	32.8	...	...	43.6	31.2	...	...	...	27.6	...	...	...	...	...
1863	...	...	...	...	45.9	...	27.6	36.7	...	...	45.5	...	...	...	35.6	27.9	...	...	...	...	...
1864	...	...	...	...	43.8	...	30.5	41.1	...	...	46.8	36.2	...	...	36.7	31.2	...	...	...	...	...
1865	...	...	...	...	44.6	...	24.5	34.1	...	...	43.2	31.0	...	...	28.5	...	...	...	...	...	...
1866	...	45.6	...	...	...	...	...	38.6	...	...	45.9	...	...	...	...	...	...	...	...	44.0	...
1867	...	46.3	...	...	...	45.8	...	40.3	...	46.8	46.8	...	41.4	22.9	...	...	...	...	...	40.0	...
1868	...	...	...	...	...	46.8	...	37.8	...	46.4	46.2	...	38.8	20.8	...	...	50.0	...	...	37.0	...
1869	...	...	...	...	...	46.3	...	36.3	...	...	45.3	...	37.6	21.4	...	...	48.6	43.0	29.6	33.0	39.8
Mean	39.3	46.0	26.6	40.5	44.6	46.3	28.1	37.2	35.4	46.6	45.1	32.2	33.1	21.7	34.3	28.5	49.1	43.0	29.6	36.5	39.8

TABLE VII.
 Mean Diurnal Range of Temperature in the Shade.

Year.	Casino.	Grafton.	Armidale.	Midland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windora.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	Cape St. George.	Eden.	Lake George.	Cowra.	Northfield.
1858	270	...	279	249	...	...	596	...	278	...	148	254	336	...	254	264	...	...	...	...	...
1859	323	...	231	244	...	...	324	...	296	...	165	261	326	...	248	256	...	...	...	...	...
1860	282	...	414	217	...	...	262	...	250	...	135	217	348	...	327	243	...	...	...	...	...
1861	267	...	...	198	...	...	276	247	...	...	148	236	...	...	250	262	...	...	...	...	...
1862	...	...	...	...	184	...	312	293	...	...	158	268	436	...	302	281	...	...	...	...	...
1863	...	...	...	...	177	...	261	243	...	...	145	279	...	...	302	252	...	...	...	...	...
1864	...	...	...	...	179	...	269	233	...	...	141	232	...	...	...	237	...	...	...	...	...
1865	...	...	...	...	200	...	359	295	...	...	163	281	...	...	...	...	...	...	...	...	...
1866	...	213	...	...	...	...	...	274	...	...	142	...	...	...	...	...	...	...	...	298	...
1867	...	208	...	...	154	...	...	261	...	154	138	...	259	242	...	...	126	...	...	295	...
1868	...	...	...	...	...	155	...	287	...	175	143	...	266	263	...	...	114	...	...	347	...
1869	...	...	...	...	...	152	...	260	...	...	136	...	252	235	...	...	136	141	271	329	148
Mean	286	211	308	227	179	154	299	266	275	165	147	254	318	247	281	256	125	141	271	317	148

TABLE VIII.
 Mean Humidity of the Air, 9 A.M. Scale of degrees, 0 to 100.

Year.	Casino.	Grafton.	Armidale.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	St. George. Cape.	Eden.	Lake George.
1859	...	...	...	...	...	...	...	...	...	...	70.7	...	...	...	...	...	...	...	...
1860	76	...	...	75	...	...	69	...	78	...	74.2	80	...	...	...	74	...	...	...
1861	78	...	74	...	...	...	...	...	...	...	71.7	76	...	...	...	70	...	...	...
1862	...	...	69	...	74	...	...	67	...	...	71.6	74	...	...	65	71	...	...	...
1863	...	...	77	...	75	...	86	76	...	...	72.4	73	65	...	73	75	...	...	...
1864	...	...	80	...	72	...	77	77	...	...	73.0	73	70	...	75	75	...	...	...
1865	...	...	...	...	68	...	70	72	...	...	69.6	67	65	...	68	...	...	...	...
1866	...	...	...	...	...	...	...	76	...	...	72.1	...	...	...	...	...	...	...	...
1867	...	67.6	...	...	...	72.3	...	74	...	7.61	70.6	...	72	78	...	...	90	...	...
1868	...	...	...	...	...	72.5	...	76	...	71.9	72.9	...	64	74	...	...	91	...	...
1869	...	...	...	...	...	75.1	...	76	...	...	73.3	...	68	72	...	...	87	77	73.9
Mean	77.0	64.9	75.0	75.0	72.2	73.2	75.5	74.3	78.0	74.0	72.0	73.8	67.3	74.7	70.3	73.0	89.3	77.0	73.9

TABLE IX.
 EXTENT OF CLOUDY SKY. Scale, 0 to 10.

Year.	Casino.	Gratton.	Armidale.	Maitland.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	Parramatta.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kandra.	Albury.	Cooma.	Cape St. George.	Eden.	Lake George.
1859	...	...	...	...	...	...	...	...	...	...	4.2	...	...	...	...	...	...	...	...
1860	5.2	...	...	5.4	...	...	4.0	...	6.0	...	5.1	5.8	3.5	...	4.8	5.8	...	...	...
1861	5.4	...	5.4	...	...	...	3.9	...	...	...	4.9	5.8	3.3	...	5.1	5.6	...	...	...
1862	4.7	...	4.3	...	5.2	...	3.7	4.3	...	...	4.2	5.3	2.7	...	4.0	5.3	...	...	...
1863	...	...	6.4	...	5.1	...	5.2	6.1	...	...	5.0	4.6	4.2	...	5.1	5.6	...	...	...
1864	...	...	5.3	...	4.9	...	5.4	6.3	...	...	5.5	5.4	4.2	...	5.5	6.1	...	...	...
1865	...	...	3.7	...	4.6	...	3.6	5.4	...	...	4.4	4.5	2.1	...	4.3	3.6	...	...	...
1866	...	...	...	...	...	...	...	6.0	...	...	4.3	...	...	...	...	...	...	...	...
1867	...	4.4	...	...	...	4.4	...	6.0	...	5.6	5.0	...	3.3	6.6	...	...	5.9	...	...
1868	...	...	...	...	...	4.5	...	5.8	...	5.2	5.0	...	3.0	5.8	...	...	5.6	...	...
1869	...	...	...	...	...	4.2	5.6	6.1	...	...	5.3	...	3.4	6.2	...	...	5.9	4.9	5.5
Means	5.1	4.4	5.0	5.4	4.9	4.4	4.5	5.8	6.0	5.4	4.8	5.2	3.3	6.2	4.8	5.3	5.8	4.9	5.5

TABLE X.
PREVAILING Direction of the Wind.

Year.	Casino.	Grafton.	Armidale.	Newcastle Tel. Station.	Newcastle Sig. Station.	Bathurst.	Windsor.	South Head.	Sydney.	Goulburn.	Deniliquin.	Kiandra.	Albury.	Cooma.	Cape St. George.	Rden.	Lake George.
1859	..	..	..	..	..	..	..	..	W.	..	....	....	....	..	..	..	..
1860	S.E.	..	..	..	..	..	..	..	N.E.	..	....	....	....	..	..	..	..
1861	..	..	..	..	..	..	..	..	N.E.	..	....	....	....	..	..	..	..
1862	N.W.	..	W.	W.	..	W.	E.	..	W. & N.E.	W.	..	..	N.E.	N.W.	..	..	..
1863	..	..	W.	S.W.	..	W.	W.	..	W.N.W.	S.W. N.&N.W.	..	..	S.W. & N.E.	N.W.	..	..	..
1864	..	..	E.	W.	..	W.	S.W.	..	S.S.W.	W.	S.	..	S.W. & N.E.	N.	..	..	..
1865	..	..	W.	N.W.	..	S.W.	S.W.	..	W.N.W.	W.	W.	..	S.W.	..	..	..	..
1866	..	..	..	..	..	..	S.E.	..	W.	..	..	..	..	..	..	..	..
1867	..	S.W.	..	..	N.N.W.	..	..	S.W.	W.N.W.	..	S.	N.W.	..	W.	..	..	..
1868	..	..	..	..	N.W.	..	..	S.W.	W.N.W.	..	S	N.N.W.	..	S.	..	..	..
1869	..	..	..	..	N.W.	W.	..	..	W.N.W.	..	S.	N.W.	..	W.	S.W. N.W.	..	..
Means	S.E. & N.W.	S.W.	W.	W.	N.W.	W.	S.W.	S.W.	W.N.W.	W.	S.	N.W.	S.W. & N.E.	N.W.	W.	S.W. N.W.	S.W. N.W.

TABLE
RAINFALL IN

Year.	South Head.		Port Macquarie		Sydney.		Albury.		Armidale.		Bathurst.		Cooma.		Deniliquin.		Goulburn.		East Maitland	
	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.
1840.....	44-250	106	47-550	77	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1841.....	76-310	142	48-730	91	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1842.....	48-320	137	72-850	98	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1843.....	62-780	168	68-390	135	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1844.....	70-670	157	64-630	145	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1845.....	62-025	132	44-670	137	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1846.....	43-833	139	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1847.....	42-799	142	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1848.....	51-125	137	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
184.....	21-480	140	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1850.....	44-875	157	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1851.....	35-135	142	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1852.....	43-775	145	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1853.....	46-105	130	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1854.....	29-275	138	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1855.....	52-850	138	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1856.....	.....	..	.....	..	43-310	116	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1857.....	.....	..	.....	..	50-950	135	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1858.....	.....	..	.....	..	39-695	139	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..	.....	..
1859.....	.....	..	.....	..	42-044	128	.....	..	32-850	108	24-880	91	18-595	108	13-042	63	24-060	111	34-407	124
1860.....	.....	..	.....	..	82-801	182	35-470	92	.....	..	24-590	87	25-085	123	18-828	64	40-520	131	37-464	143
1861.....	.....	..	.....	..	58-360	157	16-170	75	41-060	143	29-820	91	15-400	118	16-100	72	23-520	104	.....	..
1862.....	.....	..	.....	..	23-960	111	19-500	75	17-170	98	16-870	59	14-410	98	.....	..	16-350	65	.....	..
1863.....	.....	..	.....	..	47-060	152	38-750	96	59-340	162	28-470	81	20-050	115	25-380	66	26-740	78	.....	..
1864.....	.....	..	.....	..	69-120	187	31-270	76	42-850	80	22-960	88	21-450	114	13-020	56	26-420	116	.....	..
1865.....	.....	..	.....	..	36-278	128	27-622	47	44-298	69	12-540	43	.....	..	.....	..	11-708	65	.....	..
1866.....	.....	..	.....	..	36-900	149	30-300	56	39-312	56	.....	..	.....	..	3-500	81	.....	..	.....	..
1867.....	52-370	.....	.....	..	56-680	126	.....	..	.....	..	.....	..	.....	..	6-560	67	.....	..	.....	..
1868.....	41-180	.....	.....	..	43-580	124	.....	..	.....	..	.....	..	.....	..	12-690	47	.....	..	.....	..
1869.....	.....	..	.....	..	48-190	137	.....	..	.....	..	25-650	51	.....	..	11-450	39	.....	..	.....	..
Mean.....	48-286	133	5-796	114	48-697	141	28-440	74	39-560	102	23-222	74	19-165	112	13-255	62	24-168	96	35-936	133

* For 8 months only.

TABLE

TABLE showing the amount of Rain, number of Rainy Days in

Year.	Name of Station.	January.		February.		March.		April.		May.	
		Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.
1840	South Head .....	..	..	..	..	..	..	2.61	13	*16.30	16
1841	„	5.63	17	0.53	6	3.83	18	*25.43	13	6.73	12
1842	„	5.82	12	*11.06	14	3.07	14	7.84	9	5.51	9
1843	„	1.58	14	12.33	17	5.36	20	7.86	13	6.67	17
1844	„	9.88	17	1.88	16	2.28	5	1.31	14	1.95	10
1845	„	4.86	11	4.67	14	3.46	10	*16.40	15	9.64	15
1846	„	1.00	6	5.91	9	2.69	15	1.26	9	1.43	8
1847	„	*10.66	17	6.12	12	2.49	16	7.35	14	6.18	13
1848	„	8.03	18	2.55	14	*13.85	10	2.78	14	0.85	10
1849	„	0.57	11	0.81	15	1.18	4	1.13	10	*5.61	13
1850	„	1.37	12	1.73	17	4.80	12	4.27	12	1.22	11
1851	„	1.74	8	*6.17	12	1.79	12	5.80	17	2.27	14
1852	„	3.39	12	0.87	8	5.17	17	1.25	7	5.41	13
1853	„	4.45	16	+0.16	9	3.09	13	1.85	10	3.90	9
1854	„	3.09	14	+0.11	10	4.67	16	3.40	12	0.89	9
1855	„	2.53	12	4.34	10	7.58	15	*10.24	17	7.10	7
1856	Petersham	3.52	13	2.31	13	3.91	12	4.67	11	3.73	9
1857	Double Bay	3.02	10	*6.69	12	4.39	13	6.04	16	5.74	15
1858	Near Sydney.....	1.16	6	1.31	8	3.74	12	5.02	13	*11.85	12
1859	Sydney	6.99	18	7.22	10	1.02	12	+0.44	4	0.97	6
1860	„	6.57	8	10.87	17	5.23	17	*20.02	14	+0.18	6
1861	„	3.59	15	3.27	16	4.40	19	*24.49	17	1.57	10
1862	„	3.72	13	*4.74	9	1.90	13	1.39	13	1.47	7
1863	„	*6.45	14	6.31	14	5.64	16	6.30	14	+0.40	10
1864	„	1.10	11	7.19	16	11.68	23	7.46	19	4.03	20
1865	„	5.07	14	3.94	9	0.95	11	2.40	11	1.05	14
1866	„	4.10	17	3.95	17	2.70	15	1.02	7	3.26	14
1867	„	1.73	10	3.69	13	12.05	14	*17.50	23	3.83	15
1868	„	4.52	16	*15.30	16	0.85	9	+0.06	4	5.03	11
1869	„	1.03	10	7.21	14	5.18	9	5.99	15	*12.42	10
Sums..	.....	117.19	372	43.24	367	128.95	392	203.38	380	137.19	345
Means	.....	4.041	12.8	4.939	12.7	4.446	13.5	6.779	12.6	4.573	11.5

* Maximum for the year.

XII.

each Month, from 1840 to December 31st, 1869, inclusive.

June.		July.		August.		September.		October.		November.		December.		Total for Year.	Total for Year.
Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain in Inches.	No. of Days.	Rain.	No. of Days.
3-93	15	7-01	13	0-89	6	4-87	14	1-75	13	1-95	7	4-94	11	44-25	108
1-73	7	11-11	14	1-47	7	4-20	10	7-05	10	4-35	14	4-25	14	76-31	142
+0-27	8	6-60	9	3-80	15	1-10	14	+0-07	11	+0-14	8	3-04	15	48-32	137
3-01	18	4-18	13	*12-77	16	3-63	11	1-10	11	0-75	10	3-54	9	62-78	168
10-04	12	2-89	14	2-94	17	3-72	12	*24-69	15	4-51	15	4-57	9	70-66	157
3-42	9	4-91	12	0-60	7	3-62	8	1-89	14	0-80	4	7-74	14	62-01	132
5-61	12	2-31	10	5-48	14	*5-94	18	2-75	16	3-97	10	5-48	12	43-83	139
2-84	9	0-79	10	0-84	11	1-19	13	1-20	10	1-69	11	1-54	6	42-81	142
5-47	8	11-63	15	1-89	15	3-37	7	5-35	17	+0-48	10	2-92	17	59-17	155
1-80	11	3-48	14	1-66	11	1-33	15	1-95	10	1-56	15	+0-41	11	21-49	140
3-52	15	*10-16	22	1-44	10	4-60	14	8-66	17	1-69	9	1-52	6	44-88	157
1-55	12	2-02	15	2-99	10	0-58	6	4-32	11	2-50	15	3-61	10	35-14	142
*10-30	11	0-59	10	5-05	16	3-17	12	2-28	13	4-80	14	1-51	10	43-79	143
*14-25	13	2-33	11	7-00	10	+0-12	7	2-71	9	4-48	14	1-78	9	46-12	130
*8-46	19	1-64	6	1-52	11	2-50	10	1-08	8	1-54	13	+0-39	8	29-29	136
2-17	10	2-96	13	0-59	4	5-35	12	2-38	13	2-35	6	5-27	19	52-86	138
+0-46	6	3-41	9	0-65	5	2-20	8	2-55	9	*11-13	12	4-77	9	43-31	116
5-39	12	5-55	8	4-56	12	1-54	7	5-26	14	1-51	8	1-26	8	50-95	135
5-94	14	+0-06	11	0-79	9	1-42	9	3-72	16	2-48	14	2-10	15	39-59	139
4-33	13	4-69	9	+0-29	6	*10-90	18	+0-30	6	1-31	11	3-62	15	42-06	128
2-81	9	11-95	18	9-48	19	2-54	19	4-08	19	7-29	17	1-75	19	82-81	182
1-84	11	4-77	12	7-72	18	1-77	6	2-71	13	1-62	10	0-61	10	58-36	157
3-32	10	+0-12	4	1-95	9	0-63	7	0-72	10	1-03	9	2-99	7	23-98	111
5-85	19	1-41	8	6-39	14	3-27	10	3-46	16	0-68	6	0-91	11	47-09	152
*15-38	14	8-02	10	3-03	15	1-14	12	5-41	17	1-25	8	3-42	12	69-11	167
5-30	11	1-89	12	2-99	10	1-13	8	0-92	7	*9-88	12	0-77	9	36-29	128
*8-89	17	4-42	14	1-07	11	+0-14	5	1-39	9	3-61	13	2-26	10	36-81	149
12-64	12	2-62	7	0-96	7	3-35	14	+0-21	4	+0-20	2	0-85	7	59-63	119
3-06	9	4-81	15	2-60	9	2-01	11	1-46	6	2-42	14	0-92	7	43-58	127
1-42	10	3-28	9	0-67	3	1-63	9	1-76	17	5-57	15	2-03	13	48-19	134
155-02	356	131-61	347	94-10	327	82-86	326	103-20	361	87-44	326	90-77	331	146-547	4230
5-167	11-8	4-387	11-6	3-137	10-9	2-763	10-9	3-440	12-3	2-915	10-9	2-692	10-03	48-849	141

† Less than half-an-inch.

TABLE XIII.

DAILY RAINFALL.

	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
January.												
1	...	...	...	...	0'038	...	...	...	...	0'001	...	...
2	...	...	...	...	0'013	0'063	...	...	...	0'013	...	0'180
3	0'160	0'005	...	0'020	...	...	...	...	...	...	...	...
4	...	...	1'090	...	...	...	0'037	...	0'008	...	...	...
5	...	0'040	...	0'063	...	...	0'210	0'347	...	...	...	...
6	...	0'339	0'002	0'025	...	0'045	0'128	0'037	...	...	0'010	...
7	...	...	3'130	0'125	0'010	...	0'057	...	...	...	...	...
8	...	0'009	0'256	0'013	0'060	...	...	...	...	...	0'010	...
9	...	1'388	0'380	...	...	...	...	0'829	0'026	...	0'500	...
10	...	0'577	0'001	...	...	...	0'014	0'001	0'160	0'040	0'470	...
11	0'330	0'060	...	...	...	...	0'180	...	...	...	...	0'060
12	0'190	0'275	...	...	0'160	0'010	0'020	0'655	0'077	...	...	...
13	0'040	...	...	0'010	...	0'190	...	0'313	0'037	...	0'020	...
14	...	...	...	...	...	0'953	...	0'645	...	...	...	...
15	...	0'018	...	0'128	...	...	0'175	0'150	...	0'007	...	...
16	...	0'012	...	0'370	...	0'037	...	0'070	...	0'001	...	0'040
17	0'010	...	...	9'017	0'112	...	...	...	...	0'030	...	0'020
18	0'070	...	...	0'087	0'480	...	...	...	...	...	1'280	0'230
19	...	0'285	0'613	0'126	1'090	...	0'004	...	1'025	...	0'120	0'150
20	...	0'020	...	...	0'031	...	0'070	...	0'002	0'160	0'030	...
21	...	0'695	...	0'890	0'032	0'050	...	0'050	0'052	0'970	0'090	0'010
22	...	0'005	...	0'036	0'933	3'750	...	...	0'040	...	0'520	0'220
23	...	...	...	...	0'310	0'253	...	0'001	0'012	...	0'210	...
24	...	...	...	0'287	0'223	...	...	0'028	0'012	0'009	...	...
25	...	...	...	...	0'233	0'055	...	...	...	...	...	...
26	...	...	1'100	...	...	0'553	...	...	...	...	...	...
27	...	0'001	...	...	...	0'159	...	...	0'125	...	0'020	...
28	...	0'022	...	...	...	...	...	0'040	0'233	...	0'790	...
29	...	...	...	...	...	0'326	...	0'044	1'913	0'001	0'280	...
30	...	0'040	...	0'363	...	...	...	1'290	0'360	0'142	0'160	0'010
31	...	3'195	...	1'030	...	0'003	...	0'572	...	0'372	0'010	0'110
Sum ...	1'160	6'986	6'572	3'590	3'725	6'447	0'895	5'072	4'096	1'732	4'520	1'030
February.												
1	...	1'550	...	0'028	...	...	...	0'052	0'004	0'957	...	...
2	0'120	1'365	0'083	...	...	...	...	...	0'054	0'830	3'300	...
3	0'260	0'580	0'100	...	...	...	...	...	0'156	...	0'020	...
4	...	0'002	...	0'250	...	0'212	0'630	...	0'339	0'012	...	...
5	...	...	...	0'014	0'242	0'252	...	...	0'108	...	...	0'530
6	...	...	0'024	...	...	...	0'170	...	0'048	0'015	...	...
7	...	...	0'170	0'270	...	...	1'376	0'110	...	...	0'210	0'080
8	0'040	...	0'052	0'461	1'161	0'140	...	...	0'172	0'001	0'170	0'150
9	...	...	2'976	1'059	1'555	0'145	0'726	...	...	0'045	...	0'600
10	...	...	1'160	0'380	0'590	...	2'118	...	...	...	0'090	0'010
11	...	...	2'389	...	0'008	...	0'342	0'144	0'010	...	0'090	2'720
12	...	...	0'872	0'130	...	...	0'033	0'383	...	...	0'030	2'240
13	...	...	1'661	0'015	0'010	...	...	1'801	...	0'001	...	0'190
14	...	...	0'412	...	0'060	...	0'337	1'205	0'023	...	0'290	0'400
15	...	...	...	...	...	1'043	0'364	0'010	1'039	0'001	0'150	0'120
16	...	0'035	...	0'310	...	0'373	0'009	0'131	1'600	0'001	2'940	0'040
17	0'060	0'785	...	0'004	...	1'314	0'001	0'001	0'210	...	6'180	0'090
18	...	1'545	...	...	...	0'098	...	...	...	...	1'200	0'010
19	...	0'645	0'117	0'006	...	...	...	...	...	...	...	0'030
20	0'100	...	...	...	...	...	...	0'100	0'068	1'580	...	...
21	...	...	...	...	0'848	...	...	...	0'130	0'022	...	...
22	...	...	0'089	...	...	0'550	0'031	...	...	...	0'290	...
23	0'220	0'050	0'242	...	...	0'002	0'030	...	0'115	...	...	...
24	0'170	0'123	0'003	0'320	...	0'062	...	...	0'056	...	0'110	...
25	...	...	0'138	...	...	...	...	...	0'015	...	0'100	...
26	...	...	0'076	0'012	...	1'174	0'224	...	...	0'095	0'130	...
27	...	0'001	0'041	0'060	...	0'439	0'510	...	...	0'130	...	...
28	0'340	0'535	0'430	0'055	...	0'503	0'290	...	...	...	...	...
29	...	...	...	...	...	...	2'398	...	...	...	...	...
Sum ...	1'310	7'216	10'863	3'274	4'744	6'307	9'589	3'937	39'45	3'690	15'300	7'210

TABLE XIII—continued.

	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
March.												
1	0'540	0'240	...	...	0'012	1'378	0'589	...	...	0'462	...	...
2	.....	...	...	...	...	...	0'010	0'381	0'097	0'013	...	0'130
3	1'220	0'393	...	0'838	...	...	0'232	0'043	...	...	...	...
4	0'060	...	0'225	...	...	0'729	...	...	...	...	...	...
5	.....	...	0'541	...	...	...	0'005	...	...	...	...	...
6	.....	...	...	0'025	...	0'190	0'340	0'188	...	...	...	0'010
7	.....	...	...	...	...	0'792	0'061	0'001	1'126	...	...	...
8	.....	...	...	0'022	...	...	...	...	...	...	...	...
9	.....	...	0'273	0'090	...	...	0'529	0'007	0'001	0'046	...	...
10	0'030	...	0'155	...	...	...	0'493	...	0'147	...	...	...
11	0'030	0'010	0'400	...	...	...	...	...	...	0'005	0'190	...
12	0'120	...	...	0'024	0'054	0'250	...	...	...	...	...	...
13	...	0'002	1'385	...	...	0'122	...	...	0'001	...	...	...
14	...	0'058	0'616	...	...	...	...	0'020	...	...	0'020	...
15	0'020	0'142	0'423	...	...	...	0'778	...	0'187	...	0'010	...
16	...	0'103	0'055	...	...	0'095	0'085	...	0'116	0'450	0'030	...
17	...	0'001	0'001	0'001	0'010	0'101	0'044	...	0'110	...	...	0'350
18	...	0'010	...	...	0'004	0'984	0'428	...	...	...	0'020	0'050
19	...	...	0'012	0'116	0'040	...	0'720	...	...	0'342	...	4'450
20	...	0'059	0'023	...	0'210	...	0'273	...	0'008	2'262	...	...
21	...	...	...	...	...	0'328	0'035	0'263	0'067	...	...	0'010
22	0'030	...	...	...	0'133	0'150	0'302	0'001	0'001	...	0'040	0'050
23	0'160	...	...	...	0'410	...	...	...	0'001	...	0'280	...
24	0'370	0'002	0'512	...	0'955	...	...	0'001	...	4'026	...	...
25	0'260	...	...	0'360	0'001	0'001	0'001	...	...	2'650	0'060	...
26	...	...	...	2'347	0'060	0'003	0'502	...	...	0'380	...	0'090
27	0'900	0'001	...	0'083	...	...	0'991	...	...	...	...	...
28	...	...	0'081	0'032	0'004	0'100	2'045	0'040	0'451	0'245	0'200	...
29	...	...	0'040	0'070	0'007	0'304	0'640	...	0'623	0'235	...	0'040
30	...	...	...	0'390	...	0'116	0'184	...	0'037	0'055	...	...
31	...	...	0'483	...	...	...	0'260	...	0'731	0'876	...	...
Sum ...	3'740	1'021	5'225	4'398	1'900	5'643	9'547	0'946	2'703	12'047	0'850	5'180
April.												
1	...	...	0'800	...	...	0'005	0'055	...	0'450	2'095	...	0'270
2	...	...	0'336	...	...	0'015	0'112	...	...	0'830	...	0'580
3	...	...	...	6'616	0'001	...	0'005	...	...	0'080	...	...
4	...	...	...	5'827	0'007	...	...	...	...	...	0'010	0'640
5	0'210	...	...	0'190	0'293	...	...	0'001	0'002	...	...	0'330
6	0'090	0'010	...	...	...	0'073	...	...	0'101	0'652	...	...
7	...	...	...	...	...	0'010	0'700	0'001	0'008	...	...	1'550
8	...	0'046	...	0'245	0'020	...	1'630	...	...	1'430	0'020	0'310
9	...	0'193	...	1'412	...	...	...	0'005	...	0'513	...	0'020
10	0'090	...	...	0'053	...	...	1'650	0'040	...	0'050	...	0'610
11	...	...	0'004	...	...	...	0'230	...	...	0'100	...	0'170
12	...	...	...	...	...	...	...	...	...	5'645	...	...
13	0'060	...	...	0'202	0'295	...	...	0'138	...	0'583	...	0'010
14	0'380	...	...	...	0'295	...	0'119	...	0'001	0'016	...	0'610
15	0'360	...	...	...	...	...	0'310	...	...	0'132	0'020	0'180
16	...	...	0'210	...	...	0'001	0'004	0'220	...	...	...	0'340
17	...	...	...	...	0'110	0'004	0'166	0'002	0'057	...	...	...
18	0'880	...	1'058	...	...	0'176	0'020	0'994	0'208	...	...	...
19	0'030	...	0'694	...	...	1'067	0'134	0'186	0'027	...	...	...
20	0'490	...	0'010	...	...	0'541	0'001	0'739	...	0'200	0'010	...
21	0'590	...	...	0'030	...	0'016	0'004	0'001	...	0'107	...	...
22	...	0'086	...	2'630	0'198	0'009	0'046	...	...	0'500	...	0'060
23	...	...	...	0'023	...	2'025	...	...	0'002	0'040	...	...
24	0'030	...	...	1'109	...	2'218	...	...	0'008	0'435	...	...
25	...	0'008	0'071	0'213	...	0'040	...	...	...	0'820	...	...
26	...	0'009	1'702	1'125	...	...	...	...	0'153	0'780	...	...
27	...	...	2'440	0'461	...	...	0'001	0'116	...	0'065	...	0'310
28	...	0'045	5'151	0'065	...	...	0'933	...	...	0'613	...	...
29	0'030	...	7'522	2'473	0'160	...	1'979	0'089	...	0'700	...	...
30	0'880	0'009	0'025	1'614	...	...	2'280	0'092	0'002	0'195	...	...
Sum ...	5'020	0'439	20'023	24'492	1'395	6'300	9'483	2'404	1'019	17'481	0'060	5'990

TABLE XIII—continued.

	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
						May.						
1	0'080	...	...	0'005	...	0'152	0'093	0'287	0'001	0'670	...	0'110
2	...	...	...	...	...	0'062	0'131	0'035	0'155	0'230	0'540	...
3	...	...	...	...	...	...	0'004	0'289	0'002	0'010	...	0'050
4	1'140	...	...	0'002	...	...	0'003	0'003	0'002	...	0'100	0'160
5	0'060	...	...	...	...	...	0'008	...	...	0'001	...	0'820
6	...	...	...	...	...	...	...	...	...	0'913	...	2'420
7	0'010	...	...	0'053	0'880	...	0'290	...	...	0'395	...	4'370
8	0'870	0'105	...	...	0'490	0'026	0'001	0'001	...	0'045	...	1'890
9	...	0'005	0'010	0'008	...	...	0'001	...	...	...	0'001	0'830
10	2'980	...	0'010	...	...	...	0'008	...	0'050	...	...	...
11	0'030	0'470	...	0'010	...	...	...	...	0'008	0'095	...	...
12	...	0'002	...	0'045	...	...	...	...	0'210	0'070	...	...
13	...	0'067	...	0'377	0'053	...	...	...	0'035	...	0'010	...
14	...	...	...	...	...	...	...	...	0'080	...	0'440	...
15	...	...	...	0'066	...	...	...	0'014	0'513	0'020	0'530	...
16	...	0'030	...	0'704	...	0'002	...	...	2'080	...	...	...
17	...	...	...	0'071	0'006	...	...	...	...	0'090	...	...
18	0'060	...	0'027	...	...	0'010	...	0'057	...	0'020	0'010	1'550
19	...	...	...	0'060	...	0'040	0'280	0'013	...	...	...	0'210
20	...	...	...	...	...	0'010	0'047	...	...	...	0'020	...
21	0'160	0'116	...	0'170	0'043	0'046	0'375	...	...	...	...	...
22	...	...	...	...	...	...	0'193	0'008	...	0'305	...	...
23	...	0'010	0'001	...	...	...	0'215	0'208	...	0'360	...	...
24	0'120	0'034	...	...	0'054	0'013	0'110	...	...	0'001	...	...
25	0'240	...	...	...	...	0'009	0'013	...	...	...	...	...
26	6'100	0'004	0'042	...	...	...	0'010	...	...	...	0'780	...
27	...	0'023	...	...	...	...	0'003	0'053	...	...	...	...
28	...	0'166	0'020	...	...	...	0'030	...	...	...	...	...
29	...	...	...	...	...	0'001	0'040	...	0'047	...	...	...
30	...	0'003	...	...	...	...	0'009	...	...	0'190	1'610	...
31	...	...	...	...	...	...	0'009	...	0'021	0'410	0'980	...
Sum ...	11'850	0'968	0'176	1'572	1'472	0'403	1'750	1'051	3'257	3'815	5'030	12'420
						June.						
1	...	...	1'427	...	...	...	...	...	...	0'030	0'030	0'030
2	...	...	0'050	...	...	...	3'720	...	0'001	0'010	...	0'040
3	...	...	...	...	...	...	1'060	...	...	...	...	...
4	...	1'495	0'006	...	...	1'321	0'030	...	...	0'020	...	...
5	0'080	0'081	0'003	0'388	0'002	0'241	...	...	...	...	...	...
6	0'030	0'343	0'287	0'078	...	0'011	...	...	...	...	1'090	...
7	...	0'525	0'913	...	...	0'473	...	...	...	0'010	...	...
8	...	0'030	0'292	0'137	...	0'749	...	0'614	...	...	...	...
9	...	...	...	0'012	...	0'030	0'400	1'168	...	0'180	...	...
10	...	0'010	...	0'010	...	0'707	2'510	0'777	0'325	...	...	0'180
11	...	...	...	...	...	0'590	3'930	0'070	0'848	...	...	...
12	...	...	...	...	...	0'107	0'405	0'458	0'014	0'240	0'010	...
13	0'380	...	0'010	...	...	0'420	0'080	1'353	0'465	...	...	0'360
14	0'100	...	0'004	...	0'008	...	0'237	0'619	0'427	...	0'040	0'280
15	0'930	...	0'160	...	0'398	0'014	1'170	0'131	3'010	...	0'030	...
16	0'480	...	0'031	...	0'231	...	0'268	0'093	0'005	...	0'900	0'070
17	0'640	0'140	...	0'004	0'785	...	0'273	...	0'183	...	0'560	0'070
18	0'080	0'733	...	...	0'045	0'008	...	0'002	...	0'140	0'370	0'100
19	...	0'466	0'005	0'163	...	0'173	...	0'002	1'338	1'040	0'050	0'070
20	0'080	0'050	...	...	...	0'276	0'590	...	1'000	4'120	...	0'220
21	...	0'014	...	0'105	...	0'250	0'710	...	0'007	0'245	2'180	...
22	0'170	0'140	...	...	...	...	...	...	...	0'120	3'330	...
23	0'220	...	...	...	1'292	...	...	0'005	0'439	1'340	...	...
24	...	...	...	...	0'370	0'002	...	...	...	0'080	...	...
25	...	...	...	0'007	0'075	...	...	...	0'242	...	...	...
26	...	...	...	0'009	...	0'066	...	...	0'152	...	...	...
27	...	0'825	...	...	0'096	...	...	...	...	...	...	...
28	0'240	...	...	...	...	0'210	...	...	...	...	...	...
29	1'250	...	0'005	...	...	0'200	...	...	...	...	...	...
30	1'260	...	...	0'010	0'020	...	0'643	...	...	...	...	...
Sum ...	5'940	4'327	2'805	1'836	3'322	5'848	16'020	5'299	8'894	12'640	3'080	1'420

TABLE XIII—continued.

	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
				July.								
1		...	...	...	...	...	0'752	...	...	...	0'010	...
2		...	0'012	...	...	...	1'260	...	0'070	...	...	...
3		...	0'011	0'017	...	...	0'015	...	0'010	...	...	...
4		0'049	...	...	...	...	0'009	...	...	...	0'020	...
5		...	0'368	...	...	...	...	0'001	...	...	...	...
6		...	...	...	...	...	...	0'199	...	...	0'010	...
7		...	...	...	0'028	...	...	0'080	...	0'020	...	...
8		...	0'025	...	...	0'019	...	0'008	0'080	...	...	0'400
9		...	0'233	0'030	...	...	...	0'009	0'040	...	...	...
10		...	0'003	0'036	0'026	...	0'005	0'158	0'027	...	0'160	...
11		...	...	0'026	...	...	...	0'272	0'232	3'005	0'050	0'140
12		...	0'048	...	...	...	...	1'228	0'015	0'290	...	0'020
13		...	...	...	0'055	...	...	1'921	...	0'258	...	...
14		...	...	...	...	0'146	...	1'910	...	0'025	...	...
15		...	...	...	...	...	...	...	...	0'017	...	...
16		...	...	...	...	...	...	...	...	...	...	0'030
17		...	...	...	...	...	0'068	...	0'045	...	0'160	0'010
18		...	...	...	...	...	0'278	...	0'084	0'553	0'450	1'290
19		...	0'066	0'043	...	...	...	...	...	...	0'410	0'890
20		0'237	0'047	0'054	...	0'135	...	...	...	...	2'390	0'280
21		3'703	0'755	...	...	0'006	...	0'485	...	...	...	0'030
22	0'001	0'629	2'660	...	...	...	...	0'600	...	...	...	...
23	...	...	2'680	...	...	0'717	...	...	...	...	...	...
24	...	...	1'313	0'337	0'010	...	...	...	0'002	0'010	...	...
25	...	...	1'131	1'177	...	0'037	...	...	...	...	0'400	0'100
26	...	...	0'883	2'477	...	...	...	...	...	...	0'200	...
27	0'045	...	1'010	0'102	...	...	...	0'019	...	...	0'030	...
28	...	...	0'446	0'470	...	...	...	0'001	...	0'020	...	...
29	0'006	...	0'188	0'005	...	...	...	...	...	1'770	...	0'160
30	0'009	...	0'015	0'070	...	...	...	...	...	0'670	0'170	...
31	...	0'061	0'003	...	...	...	0'010	...	...	0'080	0'140	...
Sum ...	0'061	4'694	11'952	4'774	0'119	1'406	7'382	1'891	4'423	2'620	4'810	3'280
				August.								
1	...	...	0'888	...	...	0'002	0'022	...	...	...	0'080	...
2	...	0'022	5'325	...	0'110	...	0'022	...	...	...	...	...
3	...	0'009	0'105	...	0'683	...	...	0'001	...	...	...	0'130
4	...	...	0'047	...	0'840	...	...	1'006	...	0'110	...	...
5	0'430	...	0'495	0'052	...	...	0'016	0'140	...	...	...	...
6	0'051	0'010	0'700	0'060	0'011	...	0'265	0'175	0'080	...	0'060	...
7	0'083	0'007	0'300	3'246	0'012	...	0'160	0'036	0'130	...	...	...
8	...	0'027	0'004	1'594	...	...	0'683	0'718	...	0'030	...	...
9	...	...	0'500	1'277	...	...	0'146	0'146	...	0'270	...	...
10	0'064	0'066	0'192	1'001	...	0'290	0'762	0'728	...	...	0'050	...
11	0'093	0'087	0'157	0'004	...	1'339	0'465	0'037	...	...	...	...
12	...	0'004	0'115	0'012	0'015	1'687	0'004	0'001	...	0'010	0'010	...
13	...	...	0'083	...	...	1'396	0'060	...	...	...	...	...
14	...	0'015	...	...	...	0'891	0'156	...	...	...	...	...
15	0'066	...	...	0'507	0'163	0'480	...	...	...	...	...	...
16	...	...	...	0'008	...	0'001	0'060	...	0'056	...	...	...
17	...	...	...	...	0'010	0'280	...	...	...	...	0'310	...
18	...	...	...	...	0'310	0'010	...	...	0'170	0'020	...	...
19	...	...	...	...	0'018	...	...	...	0'394	...	0'810	...
20	...	...	...	...	...	...	0'200	...	0'001	...	0'950	...
21	...	...	...	...	0'082	...	...	...	0'001	0'520	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	0'082	0'040	...	0'007	0'023	...	...	0'020	...	0'350
24	...	0'040	0'160	0'157	0'004	...	...	...	...	...	...	...
25	0'001	...	...	0'080	...	0'001	...	...	...	...	...	...
26	...	...	...	...	...	0'001	...	...	...	...	...	...
27	...	...	...	0'109	...	...	...	...	...	...	0'080	0'190
28	...	...	...	0'072	...	...	...	0'001	0'001	...	...	...
29	...	...	0'320	0'088	...	...	...	...	0'015	...	...	...
30	...	...	0'011	...	...	0'001	...	...	0'048	...	...	...
31	...	...	...	...	...	...	...	...	0'170	...	0'250	...
Sum ...	0'788	0'287	9'484	7'717	1'948	6'386	3'022	2'989	1'066	0'980	2'600	0'670

TABLE XIII—continued.

	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
						September.						
1	...	...	...	...	...	...	0'154	...	0'058	...	...	...
2	...	0'040	0'056	...	...	0'003	0'103	...	0'002	...	...	...
3	...	2'050	0'420	...	...	0'820	...	...	...	0'090	...	...
4	0'968	3'620	0'495	0'009	0'002	0'011	0'002	...	...	0'010	0'020	...
5	...	1'796	0'108	0'032	...	...	...	...	...	0'020	0'010	...
6	0'264	0'532	...	...	0'060	1'440	...	...	...	...	...	0'050
7	0'082	0'030	0'020	...	0'199	0'702	0'001	...	...	...	...	...
8	...	...	...	...	...	0'002	0'083	...	...	0'850	0'090	...
9	...	0'006	0'035	0'001	...	0'030	...	0'109	...	0'050	...	0'180
10	...	...	...	...	...	...	...	0'110	0'022	...	0'060	...
11	0'003	0'200	0'290	0'122	...	...	0'027	0'526	...	0'040	...	0'120
12	...	0'465	0'537	0'036	...	0'089	...	0'001	...	...	...	0'120
13	...	1'957	...	0'012	0'240	...	...	...	...	0'040	0'030	...
14	...	0'045	...	...	...	...	0'195	...	...	...	0'010	0'010
15	...	0'042	...	...	...	...	...	...	...	...	0'310	...
16	...	0'055	...	...	...	...	...	...	...	...	...	0'900
17	...	...	0'045	...	...	...	...	...	...	...	...	...
18	...	...	0'001	...	...	...	0'006	0'020	...	...	0'160	...
19	...	0'001	...	...	...	...	...	0'322	...	...	0'160	...
20	...	...	...	...	0'004	...	...	0'122	...	0'050	0'020	...
21	...	...	0'040	...	...	...	...	...	...	0'250	0'280	...
22	...	0'036	0'070	...	...	...	0'025	...	...	0'100	...	...
23	...	...	0'012	...	...	0'087	...	...	0'020	...	...	...
24	0'103	...	0'107	1'505	...	...	...	0'003	...	1'530	...	0'020
25	...	...	0'030	0'056	...	...	...	...	0'050	0'230	0'010	...
26	...	...	0'242	...	...	...	0'068	...	...	...	0'010	...
27	...	0'011	0'034	...	0'120	0'067	...	...	...	...	...	...
28	...	...	...	...	...	0'017	...	...	...	0'030	...	0'040
29	...	0'010	...	...	...	...	0'006	...	...	...	...	...
30	0'003	...	...	...	...	...	2'020	...	0'010	...	...	...
Sum ...	1'423	12'896	2'548	1'773	0'627	3'266	3'160	1'125	0'140	3'350	2'010	1'630
						October.						
1	...	...	0'030	...	0'057	...	0'330	...	...	...	...	...
2	...	...	0'020	...	0'055	0'034	0'056	0'415	...	...	...	0'080
3	0'325	...	...	...	0'120	0'124	0'014	...	...	...	...	0'020
4	0'665	...	0'300	...	0'225	0'104	...	...	...	...	...	0'200
5	0'734	...	0'447	...	...	0'040	...	...	0'155	...	...	0'010
6	0'514	...	0'140	...	...	...	...	...	0'195	...	...	0'320
7	0'070	0'080	...	0'165	...	...	...	...	0'150	...	...	...
8	0'001	0'017	...	...	...	0'224	...	...	...	...	...	...
9	...	...	0'010	...	...	0'346	...	...	0'007	...	...	...
10	0'070	...	...	...	0'003	...	...	...	...	0'080	...	0'010
11	0'348	...	...	...	...	...	0'004	0'311	...	...	...	0'040
12	0'276	...	...	...	...	0'044	...	0'013	...	...	0'090	0'050
13	0'014	...	...	1'595	...	0'363	...	0'094	...	...	0'160	0'100
14	0'005	...	...	0'090	...	0'002	...	...	0'203	...	...	...
15	0'001	...	...	...	...	...	0'313	...	...	0'020	...	...
16	...	...	0'043	...	...	0'378	0'003	...	...	...	...	...
17	...	0'148	...	...	...	0'002	...	...	...	...	1'060	0'190
18	...	...	...	0'010	0'018	0'983	...	...	...	...	...	0'060
19	...	0'013	1'065	...	0'001	...	...	0'020	...	...	...	0'030
20	0'248	...	0'131	...	0'211	...	0'027	0'020	0'111	...	...	0'020
21	...	...	0'595	...	0'003	...	0'201	...	0'342	...	...	...
22	0'187	0'012	0'001	...	...	...	0'386	...	...	...	...	...
23	...	...	...	0'013	...	0'126	0'284	...	0'094	0'090	...	...
24	...	...	0'070	0'753	...	0'252	0'465	...	...	...	...	0'020
25	...	...	0'084	...	...	...	...	...	...	...	...	...
26	...	...	...	0'001	...	0'050	0'036	...	...	...	0'040	...
27	...	...	0'001	...	...	0'410	0'389	...	0'135	...	0'050	...
28	0'080	0'027	...	...	0'025	...	...	...	...	...	...	0'010
29	0'093	...	0'813	0'078	...	...	0'845	0'042	...	0'020	...	0'220
30	...	...	0'080	...	...	...	0'136	...	...	...	...	...
31	0'090	...	0'245	0'006	...	...	...	...	...	...	0'060	0'200
Sum ...	3'721	0'297	4'075	2'711	0'718	3'482	3'489	0'915	1'390	1'210	1'460	1'760

TABLE XIII—continued.

	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
November.												
1	...	0'052	0'047	...	...	...	...	...	...	...	...	0'240
2	...	0'497	...	...	...	...	...	0'200	...	...	...	0'020
3	...	...	...	0'032	...	...	...	2'010	...	...	0'140	0'140
4	...	...	...	0'540	...	...	0'691	1'643	0'030	...	...	0'140
5	...	...	0'012	...	0'098	0'035	...	...	...	...	0'200	0'050
6	...	0'070	0'210	...	...	0'110	...	0'885	...	...	0'050	0'870
7	0'015	...	0'448	0'001	...	...	...	...	0'016	...	...	...
8	1'177	...	0'123	0'084	...	...	...	...	0'267	...	...	...
9	...	...	...	...	...	0'153	...	...	0'007	...	0'300	...
10	0'072	...	...	...	...	0'263	...	...	...	...	0'040	...
11	0'021	...	0'200	...	0'002	0'052	...	...	1'413	...	...	...
12	...	...	...	0'383	0'162	...	0'002	0'003	0'464	0'010	0'350	...
13	0'060	0'052	0'030	0'090	...	...	...	0'140	...	...	0'060	0'310
14	0'544	0'003	...	...	...	...	...	...	...	...	0'330	0'030
15	0'091	0'050	0'017	...	0'230	...	0'175	...	...	...	0'380	...
16	...	...	0'885	...	0'049	...	...	...	...	...	0'040	...
17	...	0'032	1'613	...	0'008	...	0'090	...	...	0'190	...	...
18	...	...	0'765	0'045	...	...	0'144	...	...	...	0'070	...
19	...	...	1'106	...	...	...	...	0'024	...	...	...	0'100
20	...	...	...	...	0'142	...	...	...	...	...	...	...
21	...	0'002	1'003	...	0'020	...	...	...	...	...	0'430	1'580
22	...	...	...	0'317	...	...	...	...	...	...	0'010	1'140
23	...	...	...	0'070	...	...	0'057	0'002	0'040	...	0'020	0'010
24	...	...	0'030	...	...	...	...	0'003	0'885	...	...	0'410
25	0'018	...	0'650	...	...	...	...	0'541	0'057	...	...	0'140
26	0'012	...	...	...	...	...	0'072	3'950	...	...	...	...
27	...	...	0'040	...	...	0'066	0'023	0'449	0'212	...	...	...
28	0'106	...	...	...	...	...	...	0'001	0'001	...	...	...
29	0'163	0'330	0'110	0'050	...	...	...	...	...	...	...	...
30	0'205	0'225	...	0'007	0'320	...	...	0'163	0'163	...	...	0'190
Sum ...	2'484	1'313	7'289	1'619	1'031	0'679	1'254	3'605	3'605	0'200	2'420	5'570
December.												
1	0'091	0'065	...	...	...	...	...	0'193	0'020	0'100	...	...
2	0'204	...	0'220	0'104	...	...	...	0'048	1'000	...	0'050	0'280
3	...	...	...	0'047	...	...	0'045	...	...	...	...	...
4	...	...	...	0'137	...	...	0'017	0'207	0'073	0'180	...	...
5	0'105	...	0'050	...	...	...	0'047	0'026	...	0'117	0'170	...
6	0'124	0'012	...	...	...	...	...	...	...	0'016	0'010	...
7	0'015	0'001	...	...	...	0'018	...	0'001	...	...	...	...
8	0'010	0'053	...	...	...	...	...	...	...	0'080	...	...
9	0'646	...	...	...	0'126	0'070	0'762	...	...	...	...	0'390
10	0'095	...	0'012	...	...	...	0'363	...	...	...	...	0'280
11	...	0'045	...	...	...	0'330	...	0'094	0'260	...	...	0'100
12	...	...	0'287	...	...	...	...	...	...	0'480	...	...
13	0'433	...	0'050	0'087	...	...	...	...	...	...	...	...
14	0'020	0'001	0'001	...	0'010	0'182	0'370	...	...	0'110	...	...
15	0'002	...	...	0'055	1'902	...	...	...	...	...	...	...
16	...	...	0'067	0'020	0'010	...	...	0'204	...	...	0'090	...
17	...	...	...	...	...	...	...	0'087	0'020	...	0'140	0'070
18	0'001	0'045	0'241	...	...	...	0'130	0'057	0'490	...	...	0'030
19	0'036	0'034	0'001	...	...	0'001	0'377	...	0'146	...	...	...
20	...	...	...	...	...	0'106	0'429	...	...	...	...	0'020
21	...	...	0'170	...	...	0'060	...	...	...	...	...	...
22	...	0'296	0'416	...	0'070	...	...	...	0'012	...	...	0'010
23	...	0'072	...	0'020	...	...	...	...	...	...	...	0'560
24	...	...	...	0'026	...	...	...	...	...	...	...	...
25	...	0'108	...	0'075	...	...	0'521	0'013	...	...	0'020	...
26	...	0'469	0'036	...	0'160	0'079	0'033	...	...	...	0'210	0'060
27	0'010	...	0'060	...	0'715	...	...	...	...	0'010	...	...
28	0'020	2'273	0'007	...	...	...	...	...	...	0'060	...	0'050
29	0'286	0'109	0'093	...	...	...	...	...	...	...	...	0'070
30	...	0'037	0'040	...	...	...	0'160	...	...	...	...	0'110
31	...	...	...	0'035	...	0'003	...	...	...	...	0'241	...
Sum ...	2'099	3'620	1'751	0'606	2'993	0'913	3'323	0'772	2'261	0'850	0'920	2'030

TABLE XIV.
AMOUNT OF EVAPORATION in each Month at Sydney, 1859 to 1869.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
1859	.....*	.....*	.....*	.....*	.....*	2640	1941	2236	3072	7482	7846	7502	32719
1860	7341	4393	3090	2667	1907	1990	1065	1725	2197	4124	4817	5947	41183
1861	8470	4300	3290	1866	2020	1270	1790	1550	3310	6540	8000	9100	49520
1862	8800	6860	6700	5320	1080	3260	4890	4860	7110	7510	9190	7860	76820
1863	6247	5197	3938	3088	2686	1642	1860	3902	4688	6545	9540	9466	58819
1864	6872	5086	3351	1579	2042	1239	2103	4315	3800	6368	5966	7243	50564
1865	5195	5294	5126	3473	2777	1986	1495	2898	4922	6157	5678	7265	52656
1866	6646	4524	4633	2276	1525	1172	1181	1884	4552	5548	5766	6497	46206
1867	7546	4109	4163	1930	1375	0746	2051	1400	3281	6717	7210	7921	48449
1868	5261	3339	4845	2740	1016	0799	1344	1631	3070	5266	4774	6105	40188
1869	5957	4273	4027	2377	1530	1211	1031	1967	3309	4010	5680	5468	40840
Sums	66935	47795	43163	27330	21558	17255	20769	28368	43313	66267	74427	80764	537964
Means	6694	4779	4316	2733	2156	1568	1888	2579	3937	6024	6766	7342	48905

* Observations not taken until June, 1859.

TABLE XV.
AMOUNT OF OZONE in each month at Sydney, 1859 to 1869.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Means.
1859	.....*	.....*	.....*	.....*	.....*	68	60	64	79	64	66	70	672
1860	60	71	82	72	62	65	78	58	64	53	43	37	615
1861	41	66	74	65	53	48	.....†	.....†	.....†	46	43	42	520
1862	47	49	40	37	33	45	29	45	34	38	54	18	423
1863	55	42	55	55	42	63	26	41	29	41	23	23	400
1864	39	42	49	40	40	49	54	44	53	64	64	50	483
1865	17	15	21	27	19	100	52	58	58	67	67	49	458
1866	54	51	54	52	51	50	55	50	49	54	56	41	518
1867	36	35	43	47	50	54	45	46	53	45	47	44	456
1868	52	51	44	39	44	50	52	54	62	65	66	50	524
1869	45	44	39	60	49	53	53	37	41	38	37	39	446
Sums	4406	4654	4933	5683	5055	6511	5044	4877	5222	5711	5433	4977	55707
Mean	446	465	493	517	473	592	504	487	522	520	494	452	500

* Observations were not taken until April, 1859. † Ozone papers exhausted—fresh supply not received.

TABLE XVI.

SHOWING the Decrease of Rain from the Coast—Inland.

Stations.	Distance from Coast in miles.	Rainfall.	Remarks.
South Head ... ..	.....	48'586	
Cape St. George ... ..	.....	53'989	
Eden ... ..	.....	26'570	
Newcastle ... ..	.....	44'662	
Port Macquarie	2	57'786	
Sydney... ..	5	48'697	
Maitland	15	35'935	
Parramatta	16	45'651	
Grafton	22	44'990	
Casino	30	42'996	
Windsor	30	33'991	
Cooma	53	19'165	
Goulburn	58	24'188	} High stations.
Lake George	61	27'190	
Armidale	80	39'560	
Kiandra	90	60'590	Highest station, and snow is included in the rainfall.
Bathurst	98	23'222	
Albury... ..	170	28'440	
Deniliquin	280	13'285	

TABLE XVII—continued.

	E.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	N.	N.N.E.	E.	E.S.E.	E.	E.S.E.	E.	E.S.E.	E.	E.S.E.	E.	Velocity.		Greatest pressure— Direction of wind— Time.
																				Total miles.	Mean perhour.	
March.	1867 ...	73	49	17	19	35	66	59	33	21	45	91	114	32	26	21	30	5702	777	97	W.N.W.	27th.
	1868 ...	57	42	13	20	30	56	70	58	47	31	56	98	53	27	17	35	6773	10'5	186	S.S.W.	13th.
	1869 ...	25	48	24	6	31	37	33	29	112	78	104	61	26	52	33	42	6494	10'1	186	S.S.E.	3rd.
	1867 ...	46	54	23	27	35	66	36	29	37	13	34	31	89	69	39	61	6615	9'9	8'4	W.S.W.	12th.
April.	1868 ...	45	46	22	52	54	158	59	41	43	39	31	31	8	7	21	38	6713	9'7	9'2	W.S.W.	30th.
	1869 ...	22	31	50	27	89	111	99	31	17	35	45	48	27	29	41	18	7466	10'3	9'7	W.	24th.
May.	1867 ...	29	39	33	37	151	149	42	22	21	20	12	12	25	39	57	32	6535	9'2	12'5	W.	25th.
	1868 ...	53	82	21	46	104	157	92	25	45	19	18	13	15	15	11	3	6662	9'3	7'2	S.	6th.
1869 ...	25	31	31	25	68	250	164	56	31	6	8	8	6	7	3	17	16	8135	11'0	23'1	S.S.W.	8th.
Mean ...	42	47	26	29	64	116	73	36	30	32	44	47	31	30	29	31	6673	9'7	...	...	...
June.	1867 ...	15	12	8	24	128	219	42	7	26	36	40	57	58	21	15	12	6470	9'0	33'6	N.E.	20th.
	1868 ...	10	54	21	56	68	230	78	28	64	28	9	14	7	3	10	13	6466	9'0	6'5	N.W.	29th.
	1869 ...	13	27	28	24	87	194	149	39	37	11	10	3	1	37	41	19	7987	11'1	8'8	N.W.	5th.
	1867 ...	16	36	18	37	141	174	126	53	89	17	14	11	5	1	7	4	7394	10'1	10'1	N.W.	2nd.
July.	1868 ...	19	56	25	50	100	238	95	38	25	10	20	15	20	22	2	9	9121	12'3	15'7	S.S.W.	20th.
	1869 ...	36	65	33	25	96	201	133	35	44	10	13	9	11	3	8	2	7089	9'8	19'8	S.S.W.	20th.
August.	1867 ...	56	34	24	42	158	177	89	21	24	18	15	21	14	7	9	13	5142	7'2	6'5	S.S.W.	20th.
	1868 ...	60	41	39	74	110	181	41	9	27	14	26	28	18	23	25	19	7169	9'6	19'8	S.S.W.	19th.
1869 ...	13	8	18	36	78	128	153	72	67	29	26	30	20	19	9	12	6770	9'4	9'2	W.S.W.	31st.	
Mean ...	26	36	24	41	107	196	101	34	45	19	19	19	21	17	15	14	7065	9'7	...	...	...

ON THE
PROGRESS AND PRESENT STATE OF ASTRONOMICAL
SCIENCE IN NEW SOUTH WALES.

(By JOHN TEBBUTT, Esq.)

NEW SOUTH WALES can hardly be expected to have contributed much hitherto to the advancement of astronomy. Eighty-two years only have elapsed since Sydney, its metropolis, formed part of one vast forest, in which the aboriginal, the emu, and the kangaroo roamed in all their native freedom. In that brief period its progress in commercial prosperity has been rapid and astonishing, and the time is now probably at hand when it will take its place creditably among the old countries of Europe as a contributor to the arts and sciences. Now, that we are possessed of an excellent University, opportunities are afforded to young men for the necessary training, in order to distinction in scientific pursuits. And in so far as the science of astronomy is concerned, the Colony can now boast of a national Observatory, comparing favourably with many on the Continents of Europe and America. The object of the present paper is to show, in as brief a compass as possible, that New South Wales is not without her associations in connection with astronomical science, and has in some measure contributed to its advancement. Her astronomical history commences with the establishment in 1822 of the Parramatta Observatory—an institution founded and liberally supported by the private munificence of General Sir Thomas Brisbane, who was Governor of the Colony at the time. He was distinguished for his enthusiastic love of astronomy, with the theory and practice of which he was familiar. Its cultivation was always a matter of interest to him, even in the midst of the turmoil and adventure of a military life. During the warlike operations in the Peninsula he regularly supplied the army with the local time, by means of a pocket sextant, chronometer, and artificial horizon; but it was not till his appointment as Governor of this Colony that he had an opportunity for contributing in any marked degree to the advancement of his favourite science. He at once perceived the ample opportunities which an Observatory in the clear southern skies of Australia would have for extending our knowledge of the heavens. The labours of Lacaille, at the Cape of Good Hope, are well known to astronomers, and formed hitherto the chief contribution to our knowledge of the southern heavens. Under these circumstances the Observatory of Parramatta, in conjunction with

that at the Cape of Good Hope, whose establishment was nearly contemporaneous with it, would have a wide and brilliant field for the development of its efforts. Sir Thomas Brisbane arrived in the Colony in the year 1821, and no time was lost in carrying his scheme into execution. I am informed by an old colonist, that previously to the erection of a fixed Observatory, occasional observations were taken in a temporary building in the town of Parramatta. An excellent site was found for the proposed Observatory on the highest point of what now constitutes the Parramatta Park. The structure being completed, the work of observation was carried on with great assiduity under the able management of Mr. Carl L. Rümker, a German, afterwards the distinguished Director of the Hamburg Observatory, and Mr. James Dunlop, a gentleman of considerable natural talent as a mechanic and astronomer. The principal instruments employed were a transit instrument of 64 inches focal length, and $3\frac{1}{4}$ inches aperture, a 2-foot mural circle (both by Troughton), a 16-inch repeating circle by Reichenbach, and a small equatorial of 42 inches focal length. The two first-named instruments were fully employed in forming a catalogue of southern stars; and in this work Sir Thomas himself, as a relaxation from his governmental duties, took a large share. The first fruits of the labours of the Observatory consisted of observations of the summer solstice of 1821, the results of which were made known to the astronomical world through the *Astronomische Nachrichten* of Schumacher. Determinations of both the solstices of 1822 also appeared in that journal, and those of the solstices of 1823 were communicated to the Astronomical Society, together with an extensive series of observations of the principal stars in both hemispheres. The observations underwent a careful reduction in the hands of Dr. Brinkley, "the details of which," says Sir John F. W. Herschel, in an address delivered by him before the Astronomical Society, in February, 1828, on the occasion of the presentation of the Society's honorary medals to Sir T. Brisbane and Mr. Dunlop, "as well as the original observations, are printed in the first part of the second volume of the Transactions of the Society; and which justify, in the eyes of that experienced observer, as they must in those of every practical astronomer, a decided opinion of the great care and skill with which they have been made." Of occasional observations a great number were furnished by the Observatory. Among these may be mentioned observations of planetary conjunctions and oppositions, of comets, and of eclipses and occultations. One of the most interesting circumstances in connection with the Parramatta Observatory is the fact that we owe to it the verification of one of the most remarkable investigations in physical astronomy. I refer to the elaborate investigation by the late Professor Encké into the

movements of the comet discovered by Pons in 1818, but which now universally bears the name of the distinguished professor. The comet had been seen on several occasions previously. Although the parabolic elements calculated for it at the different apparitions were identical, and showed beyond doubt that they belonged to one and the same body, yet no attempt had been made, previously to 1819, to determine the period in which its revolution was performed round the sun. The investigation of this element, which was a work of profound difficulty in the then comparatively unadvanced state of physical astronomy, was ably conducted by Encké. From the series of observations made during its visibility from the earth in 1818-19, he arrived at the conclusion that the comet was moving in an ellipse, with a period of about $3\frac{1}{2}$ years. This announcement marked the first discovery of a comet of short period (there being only one comet of known periodic character hitherto discovered, namely, Halley's), and formed a very important epoch in the history of physical astronomy. Encké proceeded to investigate the perturbations which the comet would undergo during its next revolution round the sun, from the combined influence of the planets, and fixed May 24th, 1822, as the time of its next perihelion passage. An ephemeris was computed from the resulting elements, showing the apparent track which the comet would pursue among the stars. Encké had the greatest confidence in the result of his investigations; but unfortunately for the gratification of the ardent expectation which every astronomer shared with him, it was found that the comet would traverse the southern hemisphere below the horizon of the European Observatories. It is necessary thus to enter briefly into the early history of this comet, in order to show the interest which the Parramatta Observatory had in the matter. It was, now that the means for the verification of this important investigation was quite out of reach of European astronomers, that the establishment at Parramatta stepped in and supplied the want. On the evening of the 2nd June, 1822, the wanderer was detected by Mr. Rümker. A series of observations, extending to 29th June, was made, which enabled Encké to correct his elements, and predict the next apparition with increased accuracy. The only observations obtained were those made at Parramatta. The investigation was indeed a triumph, and no small credit is due to our Observatory for the part it performed in its verification. Observations of the length of the seconds pendulum were also made at Parramatta, and published in the *Transactions of the Royal Society for 1823*. "The remainder and indeed the great mass of the observations made with the mural circle and the transit instrument," says Sir J. Herschel, in the address before referred to, "have at different periods been communicated to the Royal Society, and are for the present

deposited in its archives. Forming our judgment only upon those of which an account has been publicly read at the meetings of that illustrious body, but which are understood to constitute only a comparatively small part of the whole, they form one of the most interesting and important series which has ever been made, and must ever be regarded as marking a decided era in the history of southern astronomy."

Besides the useful catalogue of 7,385 stars, which has already been published as the result of the labours of the Parramatta Observatory, we have also Mr. Dunlop's catalogue of upwards of 600 southern nebulae and clusters of stars, together with a large and valuable collection of double stars. Independently of the detection and observation of Encké's comet, the Observatory was not behind-hand in cometary discovery. The fourth comet of 1822 was observed by Rümker, for which he calculated elliptic elements with a period of 1,816 years. On the 15th July, 1824, the first comet of the year was discovered by the same astronomer. It was seen only in the southern hemisphere, and its elements were computed by its discoverer. The first and fourth comets of 1825 were also observed by Rümker, the last observation of the first-mentioned body being obtained at Parramatta. Mr. Dunlop also had his share in cometary discovery. The comet of 1833 was detected by him on the 1st October, and observed to the 16th. No other observations, I believe, are recorded. The comet which appeared in the following year, and was first discovered by Gambart at Marseilles on the 7th March, was also found independently by Dunlop at Parramatta. The Observatory was dismantled in 1847. Its roofless brick walls are still to be seen, but nothing remains to testify to the character of the ruins, except the stone piers which once formed the support of the meridian instrument. Before every vestige of this interesting building disappears, I think it would be advisable to determine, by the means now so readily available, its position with reference to the Sydney Observatory. It would also not be inappropriate if an obelisk were erected on the spot, commemorative of the institution and its founder. From the time that operations ceased at Parramatta to the arrival of Sir William Denison, the Colony did not contribute anything worth recording towards the promotion of astronomy. Sir William expressed his regret at the discontinuance of the Parramatta institution, and drew attention to the importance of establishing in the Colony an Observatory wholly supported by the Government. A memorandum was addressed by His Excellency to the Executive Council in March, 1855, on the subject. The Council concurred in the views of His Excellency, and the matter was immediately brought before the Legislature. A liberal sum was voted for the erection of a National Observatory, and the Rev. W. Scott, M.A., of Sidney Sussex College, Cam-

bridge, on the recommendation of the Astronomer Royal of England, was appointed to the important office of first astronomer to the establishment. He graduated as Third Wrangler in 1848, had continued to reside in Cambridge as Fellow, and afterwards as Mathematical Lecturer of his College. Mr. Scott arrived in Sydney on the 1st November, 1856, and proceeded with as little delay as possible to select a site for the proposed Observatory. For purely scientific purposes some site in the country would have been preferable for the building, but it was requisite that it should be within easy access of the public institutions of the metropolis. The hill occupied by Fort Philip was selected for the purpose, as it commanded the best view of the horizon and of the shipping in the harbour, for whose interests it was proposed to erect a time-ball. In June, 1858, the building was so far advanced as to admit of meridian observations. It is a handsome and commodious stone structure. The eastern portion comprises the Astronomer's residence, the library, and the computer's room. From the centre rises a square tower, 58 feet high, which carries the time-ball. Next follows the transit-room, provided with two meridian openings, and an octagonal building covered by a dome, and intended for the reception of an equatorial instrument, completes the western end of the Observatory. The Observatory being completed, the only instruments at the disposal of the Astronomer were those formerly employed at Parramatta. The principal ones were the transit instrument and mural circle, a meridian circle, and a portable equatorial. In the absence of the meridian circle, which had been sent to England for repairs, observations were carried on with the transit instrument, simply for the determination of local time, and of the longitude by the moon and moon-culminating stars. Contemporaneously with the establishment of the Observatory, meteorological stations were formed throughout the Colony. About this period occurred several astronomical phenomena of great public interest, which drew the attention of the Colonists generally to the claims of astronomical science, and, as a consequence, to the high value of the newly-formed Observatory. Among these were the total solar eclipse of March 26th, 1857, and the appearance of the comet of Donati, in October, 1858. Calculations of the former phenomenon were published in the *Sydney Morning Herald* several days previously to its occurrence, by the Government Astronomer, Mr. F. Napier, and the writer of this paper. Unfortunately, however, no part of the total phase was seen at any station where instruments were available for its observation. Nothing could be recorded beyond a few meteorological and terrestrial observations. The Sydney Observatory, not being yet completed, the Astronomer had prepared a temporary observatory at the South Head of Sydney Harbour, in which a portable

equatorial, lent to him by the Governor, formed the principal instrument. In the meteorological department he was assisted by Capt. Ward, R.E. The sun was seen for about fourteen minutes after its appearance above the horizon, during the progress of the partial eclipse. In addition to the meteorological observations at South Head there was a series made at St. Leonard's, in its vicinity, by the Rev. W. B. Clarke, which were published in the *Herald* of April 9th, 1857. The grand comet of Donati was an object of intense interest to the colonists. It was for some time supposed to be the illustrious body which appeared in 1264 and 1556, and whose reappearance was expected about this time. Our national Observatory, then in its infancy, and in an incomplete state, could not furnish any accurate information respecting the interesting stranger. Approximations to the orbit were severally computed, from sextant observations, by the Government Astronomer, Mr. Hawkins, of the King's School, Parramatta, and the writer, which proved the comet to be quite a different body from the expected great comet. Its appearance showed the absolute necessity of furnishing the Observatory with an instrument of a high class for extra-meridian observations. The Astronomer accordingly submitted a report on this subject to the Government, and the Legislature, with their accustomed praiseworthy liberality, granted the sum of £800 for the purchase of a large equatorial telescope. At the close of 1858 the transit circle was received from England, and was mounted with all possible dispatch. Its graduated limb is 42 inches in diameter, and its telescope has an aperture of $3\frac{1}{2}$ inches, and a focal length of 62 inches. Regular observations were commenced with it in June, 1859. These consist of determinations of the right ascension of the moon for longitude, and of the positions of stars, a large proportion of which culminate near the zenith of Sydney. The latter results will hereafter be found useful for the determination of the latitude of other points in the Colony. The attention of the colonists was again strongly drawn to the claims of astronomical science by the appearance in 1861 of one of the most splendid comets of modern times. The newspapers of the day teemed with correspondence respecting the stranger, and the predictions of its movements created much excitement. It was detected by the writer on the evening of the 13th May, and its position determined with great difficulty by means of a telescope of $1\frac{1}{2}$ inches aperture and a sextant. The discovery was communicated to the Sydney Observatory as soon as he was convinced of its cometary character, and a letter announcing it appeared in the *Herald* of 25th May. For some days after its discovery its apparent motion was extremely slow. Mr. Scott's first observation of the comet was obtained on the evening of the 22nd, with the old Parramatta equatorial—the only instrument immediately at

his disposal. A new equatorial, by Merz & Son, of Munich, had just arrived, of 10 feet 4 inches focal length, and $7\frac{1}{4}$ inches clear aperture, but was not yet mounted. Observations were continued with the old equatorial, and it was not till the 9th June that the first observation was obtained with the new instrument. On the 15th June the writer published his first determination of the orbit in the following communication to the *Sydney Morning Herald* :—

“THE COMET’S ORBIT.

“Sir,—The following is a rough approximation to the orbit of the comet now visible. It is based on the observation made at the Sydney Observatory on the 24th May, and sextant observations made here on the mornings of the 3rd and 11th June—

Perihelion passage, June 13, 7253, 1861, Greenwich mean time.	
Perihelion distance	0.82033
Longitude of ascending node.....	280° 0' 44"
Longitude of perihelion on the orbit	252° 13' 39"
Inclination of orbit	86° 18' 42"
Heliocentric motion.....	Direct.

“The above results will doubtless hereafter require considerable correction, as it is difficult to obtain an approximate orbit from a few observations made at the commencement of a comet’s visibility. This fact was exemplified in the case of Donati’s comet, the earlier orbits computed for it being afterwards found to be very incorrect. I have some doubts as to the direction of the present comet’s heliocentric motion, as in the case of an almost perpendicular orbit small errors in the adopted positions of the comet might produce an error of several degrees in the inclination, and thus convert a retrograde into a direct motion. The true numbers will be approximated to as observations accumulate. My calculations show that the comet will soon move rapidly towards the north, and that on the 29th instant the earth will be at no great distance from the extremity of its tail. There is some probability of the comet becoming visible in full daylight about that date.

“Windsor, June 13th.”

This was supplemented by the following more particular statement in the *Empire* of June 22nd :—

“The following particulars, deduced from the rough orbit I have already computed, will perhaps not be uninteresting to your readers. On the night of discovery the comet was distant about 124 millions of miles from the earth, and 96 millions from the sun. It arrived at the perihelion point of its orbit on the 13th instant, its distance from the sun at that time being 78 millions of miles. Although the comet is now increasing its distance from the sun, its distance from the earth is diminishing at the rate of about $2\frac{1}{2}$ millions of miles daily. This diminution will go on till about the time of the comet’s passing its ascending node, namely, on the 29th instant, when the distance of the nucleus from the earth will be about 14 millions of miles. Its distance from us at this date (June 20th) is 35 millions of miles. On the last two or three mornings I have observed the tail to be divided into two branches, which emanate from the main part of the tail at a distance of about six degrees from the head. The upper or western branch was the more distinct, and I could trace it to a distance of 42 degrees from the head. The tail, supposing it to point directly from the sun, will cross the earth’s path about the 29th instant,

at a point which will be occupied by the earth on the 2nd July, so that it appears the earth will have a narrow escape from being enveloped in the more diffused part of that appendage. The comet will be in conjunction with the sun about the beginning of next month, and will shortly afterwards become visible in the evenings in the north-west."

The remarkable announcement of the near approach of the comet's tail to the earth was received with confidence by some, but with extreme distrust, and even ridicule, by others; and it was not till determinations of the orbit were published respectively by the Government Astronomer and Mr. Hawkins, that the public mind was assured of the correctness of the prediction. On the evening of the 30th June this wonderful body made its appearance above the European horizon, and employed the efforts of the most distinguished Observatories. A few days after its sudden appearance in England, Mr. Hind made the following announcement in the newspapers, which was received with the highest interest:—

"It appears not only possible, but even probable, that in the course of June 30th the earth passed through the tail at a distance of perhaps two-thirds of its length from the nucleus. I think the earth would very probably encounter the tail in the early part of that day; or, at any rate, it was certainly in a region which had been swept over by the cometary matter shortly before."

It does not appear to be generally known in Europe that this remarkable circumstance of the comet's movements was *predicted* in New South Wales. In the Rev. W. Webb's account of the physical appearance of this comet, he noticed the gradual closing up of the branches of the tail in the evening immediately succeeding the earth's passage through that appendage. The opposite of this perspective effect was remarked by the writer on the mornings immediately preceding the event. It is worthy of remark, that a display of aurora was witnessed by several persons in the Colony on the evening of the 28th June. The comet was seen in full daylight in England in the afternoon of the 30th, and was re-discovered at Windsor, on the N.N.W. horizon, in the evening of the 2nd August, thus fulfilling completely the predictions of its movements, made some time previously. The observations of the comet in both hemispheres are numerous, and together extend over a period of twelve months. Those made at the Sydney Observatory were published by the Royal Astronomical Society, together with an accurate set of parabolic elements by Mr. Hawkins, of Goulburn. The observations were also published by Professor Peters, the distinguished Director of the Altona Observatory in the *Astronomische Nachrichten*. In the year 1861 the Government Observatory was complete in many respects. The total number of meridian observations made and reduced during the year 1860 was 2820, of which 2507 were published. The number made in 1861 was 2100, being fewer than in 1860, owing to the efforts of the Astronomer and his assistant being partly

devoted to the employment of the new equatorial. Occultations of fixed stars, approximately computed by the writer for the purpose, were observed with this instrument, and also a few of Sir J. Herschel's double stars. The comet observations, made at the Observatory during Mr. Scott's superintendence, consist of those of comet III, 1860, comet II, 1861, and Encké's comet in the beginning of 1862, all of which have been communicated to the astronomical institutions of Europe. Mr. Scott contributed several useful papers to the Colonial Philosophical Society; and, in his official capacity, he endeavoured to form a class of amateur astronomers. It is, however, much to be regretted, that this attempt did not meet with the support it deserved. His labours are, however, chiefly represented by four volumes of observations, published in the Colony, and embracing the period from the middle of 1859 to the middle of 1862. The observations comprise moon-culminations, transit and zenith distance determinations of stars, differential comparisons of comet III, 1860, and comet II, 1861, and the meteorological results at the Observatory, and the stations connected with it. The transit-circle employed in the first two classes of observations is described as only a second-class instrument, but, considering the care and skill employed in the use of it, the volumes referred to will be found to be a very valuable contribution to science. After ably filling the duties of his post, from the establishment of the Observatory till the close of September, 1862, he resigned his appointment. The Observatory remained in charge of the assistant, Mr. H. C. Russell, B.A., till the beginning of 1864, when Mr. George R. Smalley, B.A., formerly assistant at the Observatory of the Cape of Good Hope, was appointed to the office. During the interval the chief work performed consisted of transit observations for local time, and the reduction of the meteorological observations made at the Observatory and the country stations. A careful series of observations of Mars at its opposition in 1862 was also, I believe, made by Mr. Russell. Mr. Smalley's first annual report was presented to the Observatory Board on the 2nd June, 1865. The number of meridian observations during the year 1864 was only 644, the work of the Observatory having been much retarded by a course of repairs to the building, and the unusually rainy season. A series of observations of comet II, 1864, comprising 249 comparisons, and extending from August 15th to September 20th, was made with the 10-foot equatorial; and an abstract of these results appeared in the *Notices* of the Royal Astronomical Society. The usual daily meteorological observations were carried on, and magnetic observations instituted, at various places throughout the Colony. Attention was also drawn in the report to the unstable character of the ground on which the Observatory was erected, the inconvenience of making reflexion observations with the circle being

on that account great. The Astronomer's second annual report was read to the Board on the 16th August, 1866. It gives a detailed account of the work done at the Observatory during the year 1865. The personal establishment remained the same as at the date of the previous report, and consisted of the Astronomer, first assistant, the meteorological assistant, and the messenger.

The meridian results are thus summed up—

Transits	689
Zenith Distances	116
Determinations of Azimuth.....	121
Ditto Collimation	215
Ditto Level	158
Ditto Nadir Point	24

The extra meridian work performed with the 10-foot equatorial consists of fifty comparisons of comet I, 1865, and fifteen of Encké's comet. The observations of Encké's comet were shortly afterwards published in the *Notices* of the Royal Astronomical Society. The usual meteorological observations were carried through the year; and the magnetic survey, which had been commenced in the previous year, was prosecuted as far as time and means would allow. Determinations of the magnetic variation, dip, and intensity, were made at eighteen stations. Some valuable additions were made to the appliances of the Observatory. A shed, twelve feet square, was erected on the south side of the building, for the reception of the thermometers, which was considered to obviate the bad effects due to the ordinary Greenwich stand. A small magnetical observatory was also in course of erection, about 100 feet on the north side of the Observatory. The principal instruments acquired during the year comprised a self-registering pluviometer, a self-recording tide-gauge, and an electrometer. The first-mentioned instrument was constructed by Mr. Russell, whose mechanical talents, so necessary to every practical astronomer, have also provided the Observatory with a self-registering anemometer, employed for some years past with the greatest success. The tide-gauge was erected at Fort Denison, in Sydney Harbour, and was found to work satisfactorily. The library, at the date of the report, consisted of about 1,000 volumes, and was being annually increased by the expenditure of a small grant of money from the Government, and by donations from other scientific institutions. The report just referred to is, I believe, the last published during Mr. Smalley's superintendence. From the close of 1865 to July 12th of the present year, on which latter date the Astronomer's death took place, 2,223 transits were observed and reduced. The greater portion of the interval from the close of 1865 to the beginning of the present year was occupied in the measurement and determination of the base-line intended for the starting point

of the future trigonometrical survey of the Colony. Many difficulties were encountered in the prosecution of this important work, arising from the rugged nature of the country which had to be traversed, and from the inadequacy of the pecuniary grant for the purpose. To this undertaking a large portion of the time of the Observatory staff was devoted, so that little beyond the ordinary routine work could be expected from the establishment. During this period a valuable chronograph was added to the instrumental appliances of the Observatory. Mr. Smalley's last illness commenced about the beginning of the present year, and from that time up to his decease in July last he could rarely attend to the duties of his office; much additional labour, therefore, devolved on Mr. Russell, his assistant. With the exception of the observations of comet II, 1864, and Encké's comet, already referred to, no results of an astronomical character have been published by the Observatory during the late Astronomer's superintendence. It is hoped that the publication of the results will take place at no distant period. Abstracts of the daily meteorological observations have, however, been published monthly and distributed. Shortly after the death of Mr. Smalley the office of Astronomer was conferred on Mr. Russell. Mr. Russell's superintendence has as yet only extended over the short period of four months, and a large portion of this time has been occupied in meeting the difficulties consequent on a change of the directorship. Considerable delay was involved in handing over the baseline to the Surveyor General's department. The meridian observations for time have been carried on as usual. The 10-foot equatorial has been well employed. Frequent examinations of Saturn have been made with this instrument, with a view to detect any peculiarities of the planet's physical structure. Previously to Mr. Russell's appointment some attempts had been made to observe the double stars of Sir J. Herschel's catalogue, but with little success, owing to the imperfect definition of the object-glass. Mr. Russell's mechanical ingenuity has, however, overcome this difficulty, and he now informs me that he has succeeded in greatly improving the definition. This improvement has been effected simply by separating the lenses of the object-glass about one-twentieth of an inch; and so satisfactory is the result that it is now possible to measure bright stars with the full aperture of 7½ inches. On favourable occasions a power of 400 or even 500 can be advantageously employed. The work actually performed with the equatorial, from September 26th to November 28th of the present year, is as follows:—

Measures of position and distance of Sir J. Herschel's double stars	250
Double stars found, but not contained in Sir J. Herschel's catalogue	28
Sweeps for the purpose of finding new stars	15

Some of Sir John's stars indicate considerable change since the epoch of his catalogue, and several stars observed by that illustrious astronomer cannot be found. Owing to an extraordinary continuance of cloudy weather, only 22 out of the 54 working nights since September 26th, had been available for observation. From July 12th to November 28th, 560 observations were made with the transit circle, and reduced; these consist of moon culminations, determinations of positions of double stars observed with the equatorial, and the usual observations for local time. The arrangement by which the time-ball is now dropped automatically, was designed by Mr. Russell, and completed in Sydney, together with the plan for transmitting time-signals along the telegraph lines. A barograph on the photographic principle has recently been added to the stock of meteorological instruments, the results to be obtained from which will be of the highest value to science. It is matter for congratulation to astronomers that such good use is now being made of the fine equatorial of the Sydney Observatory, and the present director is entitled to the cordial sympathy and co-operation of all lovers of the science.

The time has scarcely yet arrived for the establishment in the Colony of private observatories on a large scale. The history of astronomy in New South Wales rests almost entirely on the labours of the Parramatta and Sydney establishments. Occasional observations have proceeded from the private observatory of the writer, at Windsor. The first fruits of this small establishment, which have been published in Europe, were the observations of comet II, 1862, communicated in a paper read before the Royal Astronomical Society, at their monthly meeting, held January 9th, 1863, together with the elements deduced therefrom. Since the resignation of Mr. Scott all the local information respecting the different comets which have appeared in the Colony, has been derived solely from the observatory at Windsor. The principal instruments are a transit instrument, of 2.1 inches aperture and 20 inches focal length, and an excellent refracting telescope, by Jones, of 3½ inches aperture, and 48 inches focal length. The former is provided with two piers, one in the meridian and the other in the prime vertical, so that time and latitude observations can be made with the same instrument. The latter is mounted roughly as an equatorial instrument, and is protected by a revolving roof. A complete set of meteorological instruments may be mentioned among the appliances. With these daily observations have been conducted for the past eight years. These observations, after complete reduction, were forwarded monthly to the Sydney Observatory, during the years 1863, 1864, and 1865, to be incorporated with the returns from the stations under the superintendence of the Government Astronomer. Transit observations of the moon and moon-culminating stars are taken

for the determination of the longitude from Greenwich. The longitude with reference to the Sydney Observatory has been pretty accurately obtained from telegraphic signals, and the latitude has been well determined from prime vertical observations. Occultations of stars by the moon, eclipses of Jupiter's satellites, observations of comets, and other occasional phenomena, form part of the work of the Observatory. The comet observations already made have appeared in the *Notices* of the Royal Astronomical Society, and the *Astronomische Nachrichten*. Comet II, 1864, was well observed in Europe during the earlier part of its apparition; but the latest published observations are those made at Athens, Santiago, Sydney, and Windsor. It was found at Sydney and Windsor early in August, and followed till its disappearance at the close of September. The Windsor observations appeared in due course in the *Astronomische Nachrichten*, and were turned to account in a careful investigation of the orbit by Dr. Kowalzyk, of Warsaw, the results of which appeared in that journal for September 2nd, 1865. It is highly gratifying to find that out of 191 determinations of position at seventeen different Observatories, twenty-five were made at Windsor; and that of 144 employed in the formation of the normal places for the final correction of the orbit, ten are from the same place. The result is satisfactory, considering the inferior character of the instrument with which the Windsor observations were made. The fine southern comet of 1865 was also carefully observed in the Colony. It was for some time thought to be the grand comet of 1843, which Sir J. Herschel had conjectured might reappear about the beginning of 1865. Another interesting event in connection with the writer's small establishment, is the discovery of Encké's comet at its apparition in 1865. The circumstances of its apparent track in the heavens were very similar to those attending it when it was detected by Rümker, at Parramatta, in 1822, it being altogether out of reach of the European Observatories. The usual ephemeris was awaited with impatience. Towards the close of June, 1865, the writer felt assured the comet must be in a part of the sky visible to New South Wales astronomers, and within reach of a moderately-sized telescope. Its rough positions were accordingly computed, on the assumption that it passed its perihelion on the 1st June, and was moving in the orbit assigned to it by Encké in 1862. A few minutes search on the evening of the 24th June revealed the interesting wanderer as a very faint nebulous object, without any indication of a nucleus or a tail. If there could be any doubt as to the identity of the comet with that of Encké, it was wholly removed by an approximate ephemeris, received from the Nautical Almanac Office by the mail on the 30th June. The observations on the evening of the 24th showed the comet to be forty-two

seconds of time east, and thirty-seven minutes of arc north, of the position assigned to it in the ephemeris. The discovery was at once communicated to the Sydney Observatory, and some observations were obtained of it with the large equatorial. The comet was found again at Windsor, after the full moon, with the aid of the ephemeris, but it was so excessively faint in the small refractor that the observations are but mere guesses. The results of the Windsor observations of the 24th and 29th June, were soon afterwards published in the Royal Astronomical Society's *Notices* and the *Astronomische Nachrichten*. Among the occasional observations at Windsor may be mentioned the constant watch kept upon the very remarkable variable star *Eta Argûs*. Its magnitude was determined by careful comparisons in July, 1854. It was then a red star of the first magnitude, and very conspicuous near the constellation known as the Southern Cross. In 1860 it had declined to the $3\frac{1}{2}$ magnitude, and from that time to the present a careful series of comparisons has been made. The star is now of the $6\frac{1}{2}$ magnitude, and therefore invisible without telescopic aid. The Windsor observations have recently been taken up by Professor Loomis, of Yale College. Combining them with the earlier observations of the present century, and those made by Halley in 1677, and by Lacaille in 1751, he makes the period of the star's variations to be 67 years. It had already been pointed out by the writer that Professor Wolf's period of 46 years failed to satisfy the Windsor observations. If Professor Loomis' period be correct, we have now arrived at the epoch of the star's minimum, and we may shortly expect to see it increase in lustre. No decided diminution has taken place in its light during the past two years, except a slight "fluttering" about a mean magnitude. The following communications from Windsor have already appeared in the astronomical journals of Europe:—

	R.A.S. Notices.	Ast. Nach.
Observations and Elements of Comet II, 1862		No. 1402
Ditto ditto ditto ditto Vol. XXIII, page 95		„ 1404
Observations of Comet II, 1864		„ 1497
Observations and Elements of Comet II, 1864 „	XXV, „	43 „ 1503
Observations of Comet II, 1864	XXV, „	194 „ 1517
Observations of Comet I, 1865 (Great Southern Comet).....	XXV, „	195 „ 1526
Ditto ditto ditto ditto „	XXV, „	258 „ 1529
Elements of Comet I, 1865	XXV, „	271 „ 1541
Discovery and Observations of Encke's Comet „	XXVI, „	29 „ 1551
Observations of the Variations of η Argûs, 1854-65	XXVI, „	83
Elements of Comet I, 1865	XXVI, „	84
Apparent Right Ascensions and North Polar Distances of Comet I, 1865		„ 1593
Observations of Total Eclipses of the Moon, Sept. 24, 1866	XXVII, „	84 „ 1621

	R.A.S. Notices.	Ast. Nach.
Observations of Eclipses of Jupiter's Satellites, 1866 and 1867	Vol. XXVIII, page 215, No. 1691	
Observations of the Variations of η Argûs, 1866-68	" XXVIII, " 266	
Observations of Solar Eclipse, of August 18, 1868	" XXIX, " 2 " 1725	
Ring-Micrometer Comparisons of η Argûs and neighbouring stars, May, 1868	" XXIX, " 297	
Observations of Partial Eclipse of the Moon, July 23, 1869 .....	.....	" 1776
Observations of Total Eclipse of the Moon, Jan. 17, 1870 .....	.....	" 1800

Upwards of seventy transits of the moon have been observed, but these being obtained with an object-glass of a diameter only rather more than one-half of that of the Sydney transit circle, cannot be expected to supplement the results determined with the latter instrument. Seventy-six occultations of stars by the moon have, however, been observed, and these are of so precise a character that they may hereafter be employed with advantage in determining the longitude with an accuracy unattainable by the same number of moon-culminations. Beside the publication in Europe of the results mentioned in the table just given, a volume containing the Windsor meteorological observations for 1863, 4, 5, and 6, has been published in the Colony. Copies of this work have been distributed among sixty foreign observatories and scientific institutions. Results for a further period of four years will shortly follow. A fresh impetus has been given by the Agricultural Society to meteorological observation in the Colony. At their recommendation several new stations have been added to those already in existence. Each of the stations is provided with self-registering thermometers and a rain-gauge, and is under the supervision of the Government Astronomer, so that we may expect to have as extended information of the rainfall as that regularly obtained in the Colony of South Australia. The writer has frequently drawn attention to the great importance of establishing systematic observations of gales in New South Wales, with a view to the ultimate adoption of weather signals. The subject was discussed with some interest by the Colonial Philosophical Society, at their meeting held in September, 1864, on the occasion of a paper being read on Australian storms. It was therein shown, from a comparison of the observations made at Adelaide, Deniliquin, Sydney, and Brisbane, that our great atmospheric disturbances move, as a rule, from s.w. to n.e., occupying about two days on the average in their transit from the first to the last mentioned place. It is very gratifying to find that due prominence is given to this important subject in Mr. Smalley's last report. The Astronomer, I believe, receives monthly from the Superintendent of Pilots a register of gales, as

observed at the different ports of the Colony. Attention is also drawn, at the close of Mr. Smalley's report, to the desirability of the measurement of an arc of the meridian in the Colony, of obtaining a first-class meridian circle for the Observatory, and of removing the establishment itself to some more eligible site. The most important work expected from our southern Observatories is doubtless the formation of a catalogue of stars of the southern hemisphere. The published catalogues of Lacaille and Brisbane, though embracing a great number of stars down to the seventh magnitude, are confessedly too inaccurate for the refined purposes of modern astronomy. Their defects are almost wholly due to the imperfections of the instruments employed. The telescope employed by Lacaille had an aperture of only half-an-inch, and a focal length of $26\frac{1}{2}$ inches, while the large transit instrument employed at the Parramatta, and subsequently at the Sydney, Observatory, had defects of construction which it was impossible to correct in observation. These defects have been pointed out, both by Mr. Rümker and Mr. Scott. An extension southward of Argelander's survey of the northern hemisphere was several times proposed in Europe, and has recently been taken up by the Observatories at Madras, the Cape of Good Hope, Santiago, and Melbourne. Sydney, owing doubtless to the want of a good meridian-circle, does not join in this important work. The four volumes of observations by Mr. Scott, however, are a valuable contribution to our knowledge of the southern heavens.

It is much to be regretted that astronomy is not more extensively cultivated in the Colony. The deficiency is probably owing in a great measure to the fact that instruction in the elements of the science is almost wholly neglected in our schools. Due attention to this important branch of education would doubtless beget a taste for, and a better appreciation of, the sublime science. With one exception, I believe no purely Colonial publication has appeared, designed for the instruction of young persons in astronomy. The exception I refer to is, a publication in the form of a Planisphere of the Southern Circumpolar Stars, for the latitude of Sydney, by Mr. George Butterfield, of Homebush. It was introduced to the public at the last Exhibition of the Agricultural Society, and will no doubt prove a useful auxiliary for acquiring a knowledge of the sidereal heavens.

In closing this brief sketch of the progress and present state of astronomy in New South Wales, the writer confidently hopes that before long, private observatories of a high class, equal to those in the Mother-country and on the continent of Europe, will spring up among us, to assist the national establishment in the promotion of the science.

J. T., JUNR.

Windsor, 10th December, 1870.

ON THE
WOODS OF NEW SOUTH WALES.

(By CHARLES MOORE, ESQ., F.L.S., &c., &c., Director of the Botanic Gardens.)

No country has been more favoured by Nature with a greater variety and abundance of trees yielding strong, beautiful, and durable timbers than the Colony of New South Wales. Over the greater part of its vast surface, trees possessing these qualities abound in more or less quantities. With the exception of some parts of the Manero, Murrumbidgee, and Murray Districts, good kinds of timber can be everywhere obtained. Of late years the necessary requirements for building and fencing, and that employed for public works and for exportation, has considerably diminished the supply of several valuable kinds. The trees, however, cut down for these purposes have been small in number compared to those destroyed since the introduction of the system of choosing land by free selection. Persons taking up land under this system almost invariably choose the more richly-wooded places, fine timber-trees being characteristic of good soil. This remark more particularly applies to the forests of Illawarra, and those clothing the banks of nearly all the rivers north of it. It is comparatively but a few years since nearly the whole of the Illawarra basin was covered with magnificent forests, consisting of trees of vast variety, and of other plants of great beauty. This kind of forest vegetation, locally called "brush," but more generally understood by "jungle," is characterized by denseness of growth, the altitude and beautiful dark green foliage of the trees, the presence of lofty climbing plants, which extend their slender pliant branches considerable distances, and by this means often embracing, as it were, into one common bond, many of the loftiest and largest trees. None of these climbers produce wood of marketable value, although some have stems of at least 2 feet in diameter. Another characteristic of forests of this description is a thick undergrowth of numerous kinds of ferns and other plants. Palms and tree-ferns also usually abound, the former reaching a height, in some instances, of at least 130 feet, the latter to from 40 to 50 feet. Some of these, though not so high, have from four to five stems,—a peculiarity somewhat rare

in plants of this class. On the stems and branches of the trees numerous kinds of epiphytal ferns and orchids grow, which, with the other plants referred to, contribute materially to give such forests a very tropical appearance. The soil is usually alluvial, or when otherwise, rich in humus and from the decomposition of rocks pervading the locality. Although such forests as these are confined for the most part to the valleys and banks of rivers eastward of the Great Dividing Range, yet, in some remarkable instances, they are found more inland, as at Mount Tomah, Mount Hay, Mount Wilson, and Mount King George, which shoot out from the midst of the Blue Mountain Range like oases in the desert. On these the soil is of the richest kind, composed principally of disintegrated trap, and clad with noble timber-trees of a brush character, the undergrowth being chiefly tree and other ferns. These four mountains are the more extraordinary, from the fact that they are surrounded in all directions by others of a sandstone formation, covered by a wretched and sterile scrub, and some Eucalypts of miserable growth. Mount Hay, Mount Wilson, and Mount King George, being still unoccupied, the magnificent vegetation with which they are crowned will soon, it is to be feared, meet with the fate that has already befallen so much of a similar kind. The axe of the settler has no discrimination,—every tree disappears under its rude sway when the land is required for a homestead; and such fine land as that on both of these mountains cannot remain long untenanted. The soil of all brush-forest country is invariably rich, and whether on the coast or elsewhere, it is the first seized on for cultivation, and the destruction of the natural vegetation follows. From this and other similar causes nearly the whole of the brush-forests of Illawarra, the Hunter, the Manning, the Hastings, the Bellinger, and the Clarence, have been for the greater part cleared; those on the Richmond and the Tweed—formerly so extensive—are partially so, and all must be inevitably destroyed unless the Government take steps to prevent it. Among the trees which constitute this kind of forest there were many whose timbers were highly appreciated for their excellence; several kinds were suitable for cabinet-makers' work, some for inside building purposes, others for coach-making and for coopers' work, and some for wood-engraving; but, as a whole, comparatively very little was known of their commercial importance. This will be apparent from the fact that at least a hundred kinds of timbers procured from such localities (all of which could then have been obtained in more or less quantities), were exhibited from this Colony at the International Exhibition of 1862, a list of the principal of which, with their names and characteristics, will be hereafter given. Out of the whole number of these not more than one-third of the kinds ever reached the Sydney market. For staves the wood of *Gre-*

villea robusta and *Stenocarpus salignus*, the "silky oaks" of the colonists; *Schizomeria ovata*, the "corkwood" of some localities; *Achras australis*, or "plum-tree"; *Flindersia australis*, or "ash"; and *Alphitonia excelsa*, the "red" or "mountain ash,"—were the most valued. But had the qualities of the other timbers, which have been so ruthlessly cut down, been better understood, the list of stave-timbers would have been in all probability largely increased. For coachmakers the *Ceratopetalum apetalum*, the "coach" or "light wood," and "hickory," obtained under that name from species of *Eugenia*, *Tristania*, and *Acacia*, furnish much of the material used by that body, while the cabinet-maker and carpenter were supplied by the "rosewood," *Dysoxylon Fraserianum*; "tulip-wood," *Harpullia pendula*; "dark yellow wood," *Rhus rhodanthema*; "light yellow wood," *Flindersia Oalejana*; Colonial "beech," *Vitex Leichhardtii*; Colonial "deal," *Podocarpus spinulosus*; Colonial "chestnut," *Castanospermum australe*; the "red cedar," *Cedrela australis*; and the Colonial "pine," *Araucaria Cunninghamii*. These woods are all fine-grained, and some richly-coloured and capable of taking a high polish, but now obtainable only from the northern districts. The Colonial "beech" and "deal" are almost exclusively used for flooring and skirting boards. The "red-cedar" is used for every possible purpose to which wood can be applied; it is one of the most beautiful, durable, and most easily worked timbers in the world. Closely allied, botanically, to the well known mahogany of the West Indies, it possesses the exact colour, appearance, and properties of that famous timber, though not more than one-half its weight. It has an extensive distribution, reaching from the southern parts of this Colony far into Queensland, but mainly confined to districts within the coast range. Formerly it grew in fair quantities in nearly all the brush forests, but it is now only to be procured from the Macleay, the Bellinger, the Richmond, and the Tweed—sparingly from the two former rivers; but a large supply still continues to be sent to Sydney and exported to the other Colonies, principally from the two latter,—the supply from both places being almost wholly dependant on timber already cut and still upon the ground where it was felled. The only good trees now left are in very inaccessible situations, and in such places a few may yet be obtained about the heads of nearly all these rivers. The quality of the timber now sent to the Sydney market is very inferior to that formerly received, the best trees having been the first selected for use. At least 30 years have elapsed since the last cedar was taken from the Illawarra district, yet some of the refuse logs may still be found lying in spots near Mount Keira, thickly covered over with ferns and mosses, the inner wood being as sound as when first cut. According to the best calculations which can be arrived

at, from 90 to 100,000 feet of this timber reach the Sydney market per week, and about as much more is exported to Melbourne and elsewhere. At this rate it must be apparent that the day is not far distant when the supply will cease altogether. It is a magnificent tree, some of the largest furnishing from 30 to 40,000 feet of saleable timber. The Colonial "pine," of which there is even a larger quantity used here and exported than of the cedar, is a northern tree, reaching from the Bellinger (its southern limit) nearly to Cape York in Queensland, and is not wholly confined to brush forests although of very general occurrence amongst them. The wood is sometimes prettily mottled, but, excepting in dry situations, it lacks durability, and is besides very liable to the attacks of the white ant. It can be procured in inexhaustible quantities from Queensland, and at less than half the price of the cedar. Immediately above the cedar and pine brush, on a range which divides the waters of the Macleay and the Clarence, extensive forests have been recently discovered of a true beech, *Fagus Carronii* (Moore), the timber of which promises to become of much commercial value. It has a fine grain, is very tough, apparently durable, and of large size, but the somewhat inaccessible situations of the forests in which this tree is known to abound may render it a difficult matter to bring the timber to market. It has been tried for wood-engraving, for which purpose it is found to be well adapted. If the general properties of our woods were better known, it is possible, nay, it is almost certain, that other kinds now perhaps deemed valueless would prove to be equally suitable for work of this description. A few years ago the only woods of this Colony used for engraving were those of the native "mock orange," *Pittosporum undulatum*, a tree of frequent occurrence, particularly within the coast range, and the "turmeric" of sawyers, *Zieria lanceolata*. In addition to these, the wood-engravers of Sydney have more recently turned to excellent account in their profession the wood of the "white beech," *Gmelina Leichhardtii*, the "rosewood," *Dysoxylon Fraserianum*, a species of *Acacia*; and the "sandal-wood" of Western Australia, and might not the wood of our "quondong," *Fusanus acuminatus*,—a very nearly allied plant to the last—be found equally suitable? Dr. Bennett, in his "*Gatherings of a Naturalist*," says, in a note, page 369, that the wood of *Elæocarpus cyaneus* and *Pomaderris apetala* might be profitably employed for a similar purpose. In the year 1854 small portions of the wood of *Xanthoxylum brachyacanthum*, a tree found in the Clarence and Richmond River districts, was tried for engraving purposes, and found to answer admirably, but the great difficulty and expense of obtaining a supply of this timber seems to have caused it to be abandoned. With the exception of the "sandal-wood," all the trees which have been referred to

as fit for the engraver are usually to be found in our brush forests, but the country generally is now being so rapidly deforested of this kind of vegetation that there is every apparent probability that these and a vast number of equally valuable trees will soon be entirely lost. For commercial, industrial, climatic, and other reasons, the destruction of these forests is greatly to be deplored, but it is unavoidable.

In the "hardwoods"—a term applied to those kinds of trees usually occupying the more open and generally well grassed country—the Colony, under proper restrictions, still possesses a never failing supply of timber, almost unequalled for strength and durability, nearly all of which is furnished by species of the genera *Eucalyptus*, *Angophora*, *Melaleuca*, *Callistemon*, *Tristania*, and *Syncarpia*—all myrtaceous trees. Representatives of the first-named genus are found in all parts of the Colony, and constitute at least three-fourths of all our timber-producing trees. These are distinguished by certain names, such as "ironbark," "blue-gum," "box," "stringy-bark," "mess-mate," "peppermint," "black-butt," "woolly-butt," "mahogany," "ash," "blood-wood," "spotted-gum," "grey-gum," "flooded-gum," "red-gum," "white-gum," and others bearing designations of a similar purport. Under all the names here given, timber is ordinarily sold in the Sydney market. Although it is possible to obtain under any one of these names the same kind of timber, yet this cannot always be relied upon—a fact which is not sufficiently understood by the public. This arises from very different woods being sent to the market under the same name. Without any pretence of giving a full list, it is known that "ironbark" is applied to the wood of *Eucalyptus siderophloia*, *E. leucoxyloides*, *E. melanophloia*, *E. paniculata*, and *E. crebra*; "blue gum" to *E. viminalis*, *E. hæmastoma*, and *E. botryoides*; "box" to *E. hemiphloia*, *E. polyanthemos*, *E. tereticornis*, *E. melliodora*, *E. albens*, *E. bicolor*, and *Tristania conferta*; "stringy-bark" to *Eucalyptus amygdalina*, *E. obliqua*, and *E. capitellata*; "mahogany" to *E. resinifera*, *E. robusta*, *E. pilularis*, *E. botryoides*, *E. acmenioides*, and *Tristania suaveolens*; "blood-wood" to *Eucalyptus corymbosa* and *E. eximia*; "ash" to *E. virgata*, *Alphitonia excelsa*, *Flindersia australis*, and *Elæocarpus longifolia*; "spotted-gum" to *Eucalyptus hæmastoma*, *E. gontocalyx*, and *E. maculata*; "red" and "white gum," each to at least half-a-dozen species of *Eucalyptus*. With the exception of some of the two latter kinds, all the others produce timber of marketable quality. The confusion arising from the same name being applied to the wood of different trees may lead to an inferior kind being substituted for that of a superior character, *e. g.*, the "forest-box," the "bastard-box," and the "swamp mahogany" of the southern districts, are all species of *Eucalyptus*, while those bearing similar designations on the

Clarence, Richmond, and Tweed, are species of *Tristania*, better known here as *Lophostemon*. Many of the local terms used are generic, qualified by such adjectives as "red," "white," "yellow," "bastard," "swamp," &c., &c., which tend in some degree to prevent the confusion arising from the generic term alone being used.

Referring generally to hardwoods, but more particularly to those of the *Eucalyptus* genus, Sir William Macarthur, an excellent authority, makes some very pertinent remarks in the "*Introduction to the southern woods*" in the International Exhibition Catalogues, to the effect that "when the trees are at full maturity they are rarely sound at heart; that even when sound the heart-wood is brittle and of no value, and ought to be rejected; that in several kinds a very serious defect prevails, called "gum-vein," which consists in the extravasation of gum-resin in particular parts among the woody tissue, and where an apparent injury has been sustained, or in the concentric circles between successive layers of wood; the latter, when occurring to any great extent, renders the timber comparatively useless, except for fuel—the interposing gum-veins having the tendency to cause a separation of the woody layers if the timber be exposed to the weather." Of all these kinds the iron-bark is the most preferred, and is the most expensive. It is largely employed in the construction of ships, for cross-beams in house building, for spokes in wheels, bodies and shafts of carriages, for railway-sleepers, and for fencing. Under favourable circumstances it seems to be of an imperishable character, as some of it used for rafters in the earliest days of the Colony has been found as sound as on the day on which it was used. However old and well seasoned, it will palpably shrink if freshly cut. In the ground it is also most enduring; some posts of this, sent to the Paris Exhibition of 1855, and now deposited in the Kew Museum, near London, were perfectly uninjured above the ground-mark, and under it only partially affected. These posts were used for fencing, and were placed in the ground in the year 1815, where they remained, on the authority of Sir William Macarthur, for forty-six years. In the experiments made by Captain Fowkes on the timber sent from various parts of the world to the International Exhibition of 1862, a specimen of the wood of the Illawarra "ironbark" was, next to a Demerara wood, found to be the strongest of any sent to the Exhibition; and the result of similar experiments on the strength and elasticity of Colonial timbers, instituted by Colonel Ward, late Deputy-master of the Mint, at the request of the then Governor Sir William Denison, proved incontestably that the "ironbarks" were the strongest of any of the timbers subjected to the test, and these included nearly all the principal known kinds. The demand for this very excellent timber has always been so great,

that in the more accessible places it has been almost cleared out. Vast quantities of it have been of late years used for railway-sleepers, and so much still continues to be required for this purpose that a sufficient supply cannot now be relied on. The "blue-gums" are next to the preceding, the most valued for their qualities, and are all used for similar purposes. To these follow the different kinds of "box," some of which are remarkably fine timber. There is very little difference in the market value of the other species of *Eucalyptus*, and all are, with few rare exceptions, cut up indiscriminately for scantlings, battens, &c. "Blood-wood" and some of the "red" and "white gums," which are very subject to gum-veins, are only used for timber purposes when no better can be obtained. The average height to which Eucalypts attain in this Colony may be stated at from 100 to 120 feet, with a stem of from $3\frac{1}{2}$ to 5 feet in diameter. All above these dimensions must be regarded as exceptional. In jungle forests they have been known to reach a height of 200 feet or more. In the open forests, in the Wingecarribee district, 150 feet is by no means an uncommon height for more than one species to attain. But these heights sink into insignificance compared to those given of some allied species of the same genus indigenous to Victoria, Tasmania, and Western Australia. The Tasmanian "blue gum," *Eucalyptus globulus*, is said to reach a height of 300 feet, and Dr. Von Mueller states, in the official record of the Melbourne Intercolonial Exhibition, that a "karri-tree," *E. colossea*, of W. Australia, was measured by a Mr. Pemberton Walcott, which reached 400 feet in height; but still more astounding is, that a Mr. Boyle measured a fallen tree of *E. amygdalina*, in the deep recesses of Dandenong, 420 feet in length, with a stem of proportional diameter; and further, the same authority states, that a Mr. Klein took the measurement of a *Eucalyptus*, on the Black Spur, 10 miles from Healesville, 480 feet high, and that a Mr. G. W. Robinson ascertained the circumference of a tree of the *E. amygdalina*, growing in the Berwick back ranges, to be 81 feet.

The *Angophoras*, or "apple-trees" of the Colonists, are closely allied to Eucalypts, and form large trees where the soil is suitable for their growth, characterising certain districts by their abundance. The wood is generally much deteriorated by gum-veins, although occasionally used by wheelwrights for various purposes.

The term "tea-tree" is to be understood as applying to trees of the genera *Melaleuca* and *Callistemon*. These constitute a class of hardwoods usually found in low, moist situations, where their wood is invaluable, and almost imperishable when used under ground, or even in fresh water, but in salt or brackish water liable to be destroyed by the *teredo*. Their timber is

remarkably close-grained, extremely hard when dry, very heavy, and generally sound into the heart-wood; but they are all somewhat difficult to work, and on this account only cut up by the sawyer when no other suitable kind can be obtained.

The *Tristanias*, in which must be now included the trees hitherto known under the name of *Lophostemon*, are remarkable for the close-grained, elastic qualities of their timber. The more southern species of the genus are called "water-gums," and their wood is much used for boat-building; those of the northern districts (the *Lophostemon* of authors), called according to locality, "forest-box," "red-box," "bastard-box," and "swamp-mahogany," principally for the same purpose as the wood of the best kinds of *Eucalypts*.

The *Syncarpa laurifolia*, or Colonial turpentine-tree, is one of the very best of the hardwoods, and the only one, it is said, that will withstand the attacks of that great pest, the *teredo*. It grows to a magnificent tree, and is very generally distributed throughout the eastern parts of the Colony, ranging from the extreme southern districts into Queensland. It is an inhabitant of both the open and brush forest, but in the latter it attains an enormous size. For some purposes it is a most valuable timber, as, in addition to its teredo-resisting qualities, it is most durable under ground, and it is almost impossible to burn it.

Another class of trees, from which woods of a useful description are obtained, but none of which can be classed either with hardwoods or those of the brush forest,—are those of the *Banksias*, the "honeysuckles" of colonists, the *Casuarinas*, or Colonial "oaks," *Frenelas*, or "cypress-pines," and *Acacias*, called by various names, such as "myall," "bastard-myall,"—a term applied to several species—"boree," "wattle," &c. The presence of these kinds of trees, particularly of the three former genera, is, in most cases, indicative of a shallow, sterile, sandy soil. One or other species of all these genera are to be found in all parts of the Colony. The principal purpose to which the woods of *Banksia* is applied in this Colony, and almost exclusively that of *B. integrifolia*, is for "knees" and crooked timbers of ships. The *Casuarinas*, the "forest-oak," "she-oak," "swamp-oak," and "river-oak" of colonists, furnish excellent wood for shingles, and largely employed for this purpose. Occasionally, the wood of the "forest-oak" is used for ornamental cabinet-work. The timber of *Frenela*, or the "cypress-pine," is good for inside house-work, and most valuable for telegraph posts, while *Acacia* timber is used for all kinds of purposes, but can seldom be obtained of sufficient size and quantity to render it of any marketable importance. The root-stock of a northern species, *Frenela columnaris*, is beautifully marked and employed for veneering.

The proper season for felling trees is a point to which little or no attention seems to be paid either in this or the adjoining Colonies, and yet it is one of the very greatest importance. It is a well ascertained fact that the very best of our timbers are cut throughout the whole year to meet the requirements of the market. Nothing can be more injurious than this practice, which, it must be admitted, is more easily condemned than obviated, so long as the demand remains so pressing as at present for railways and other public as well as private purposes.

Any person competent to form an opinion on this subject must admit that the durable quality of the timber is sacrificed if the tree be cut down when in the full vigour of growth. At this time the sap vessels are in full activity, and filled with watery juices destined for the support and increase of the general body. Timber cut when in this condition will have all its sap vessels fully charged with crude fluid matter; fermentation ensues, the tissues are destroyed, and the entire woody substance reduced to a state certain to be acted on by atmospheric and other external agents. If, on the contrary, a tree be felled after having fulfilled its natural functions of leafing, flowering, and maturing its fruit, the wood will not be subject, under ordinary circumstances, to sudden decay. In this case the roots will have ceased to absorb nutriment from the ground, that previously taken up by them has been elaborated by the action of the leaves, and deposited in the formation of new wood; during this process the sap vessels have been relieved of all crude substances, every essential to perfect growth has been secured, and the wood rendered in the best possible condition for use. For these reasons it would appear that the best time to cut down trees, in order to secure the most enduring timber, is either immediately after the fall of the leaf of those that are deciduous, or shortly after the seed has ripened into maturity in those that are of an evergreen character. It must be apparent that this is a subject deserving the best consideration of those interested in the use of timber. But in this Colony, where everything of this kind is too frequently done to meet the urgency of the moment, it is rarely possible to give it that practical attention which it deserves.

Bearing on this point, Tredgold, in his work "*Elementary Principles of Carpentry*," gives an apt quotation from the "*Edinburgh Review*":—"While we give ourselves infinite trouble to pursue investigations relating to the motions and masses of bodies which move at immeasurable distances from our planet, we have never thought of determining the forces necessary to prevent the roofs of our houses from falling on our heads." Might not a similar reproof to this be applied with great force to many large undertakings in this Colony, where much ingenuity and talent is

displayed in the erection of buildings and bridges, and in making railway and other works, without much consideration being given to their permanence so far as regards the nature and character of the timber employed in their construction?

In the following lists of the principal timber trees indigenous to this Colony, the classes are retained under which they have in general terms been referred to in the preceding account, viz. :—

1. Brush, or jungle-forest trees.*
2. Hardwoods, or trees usually occupying the more open country.
3. Trees of a different character from either of the preceding classes, generally growing in company with hardwoods, but denoting soil of a poor description.

* All the trees are named according to the *Flora Australiensis*.

BRUSH OR JUNGLE-FOREST TREES.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
ACHRAS australis...	Sapotaceæ	Black-apple	Illawarra, northward to the Tweed River.	A beautiful tree; the fruit like a very large plum, of a coarse, insipid flavour, the wood close-grained, firm, and prettily veined; good for cabinet work.
ALPHITONIA excelsa.	Elmaceæ	Red-ash	Illawarra, northward to the Tweed River.	A fine tree, often attaining a height of 100 feet; timber hard when old; very useful for a variety of purposes.
ARAUCARIA Cunninghamii.	Coniferae	Moreton Bay Pine	Clarence, northward to the Tweed River.	This noble tree attains a height of 150 feet, and a diameter of 4 to 5 feet; the timber is white, easily worked, and much used for various kinds of in-door work; that from the inland or mountain brushies being much preferred to that of the coast.
BALOGHIA lucida...	Euphorbiaceæ ...	Brush-bloodwood	Illawarra, northward to the Tweed River.	A moderate-sized tree; wood fine and close in the grain; much liked for many purposes.
BACKHOUSIA myrtifolia.	Myrtaceæ .....	.....	Cumberland, Hastings, northward to the Tweed River.	A tree attaining a height of 40 feet; wood close-grained, soft to the touch, and works easily.
BRADLEIA australis.	Euphorbiaceæ ...	.....	Illawarra, northward to the Tweed River.	A tree attaining a height of 50 to 70 feet, and a diameter of 18 inches to 2 feet; wood close-grained, of a reddish colour.
CARGILLIA pentamera.	Ebenaceæ	Black-myrtle ...	Clarence, Richmond, and Tweed Rivers.	A tree of large growth, attaining a height of 100 feet, and 2 to 3 feet in diameter; somewhat rigid in habit; timber soft when fresh, but exceedingly tough; said to be durable.

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BRUSH OR JUNGLE-FOREST TREES—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
<i>CASTANOSPERMUM australe.</i>	<i>Leguminosæ</i>	Colonial or Moreton Bay Chestnut.	Clarence, Richmond, and Tweed Rivers.	A magnificent tree, the principal occupant of many extensive jungle forests, frequently attaining a height of 130 feet, 4 to 5 feet in diameter; the timber is dark, and prettily grained, not unlike walnut; occasionally used for cabinet work, for which purpose it seems to be well suited, and is sometimes split for staves.
<i>CEDRELA australis</i>	<i>Meliaceæ</i>	Red-cedar	Shoalhaven, northward to the Tweed River.	A tall handsome tree, attaining a height of 150 feet, with a diameter of 10 feet; the timber is the best known, and perhaps the most valuable the Colony possesses; it is used very largely for all kinds of purposes, is easily worked, and in dry situations very durable. A good specimen of this wood is equal in quality to the best mahogany, to which it is very similar in appearance. Trees have been cut on the Richmond River which have yielded upwards of 30,000 feet of saleable timber.
<i>CELIS opaca</i>	<i>Ulmaceæ</i> .....	.....	Richmond and Clarence Rivers.	A fair-sized tree, sometimes 2 feet in diameter; timber not used.
<i>CEBATOPE TALUM apetalum.</i>	<i>Saxifragæ</i>	Coschwood	Illawarra, northward to the Hastings River.	A beautiful tree, with long cylindrical stem; wood soft, light, tough, and close-grained, of agreeable fragrance; good for joiners' and cabinet work; much in request for coach-building.
<i>CRYPTOCARYA glaucescens.</i>	<i>Laurinæ</i>	Laurel, or White Sycamore.	Illawarra, northward to the Tweed River.	A magnificent tree in size and appearance, from 80 to 100 feet high, 3 to 4 feet in diameter, timber easily worked, and said to be very durable; when fresh it has a powerful aromatic fragrance.

CRYPTOGAEA обовата.	<i>Laurineæ</i>	Sycamore or Flin- dosa.	Illawarra, northward to the Tweed River.	A fine tree, attaining a height of 80 to 130 feet, 2 to 3 feet in diameter, producing a soft, white, and useful wood.
CUPANIA pseudorhus.	<i>Sapindaceæ</i> .....	.....	Hastings, northward to the Tweed River.	A tree of moderate size; timber close-grained, of a light yellow colour; not much used.
DAPHNANDRA micrantha.	<i>Monimiaceæ</i>	Clarence Light Yellow-wood.	Hastings, Clarence, and Richmond Rivers.	A remarkable and very handsome tree, attaining a height of 80 feet, and from 2 to 3 feet in diameter; timber quite yellow when fresh, takes a fine polish and is easily worked.
DIPLOGLOTTIS Cunninghamii.	<i>Sapindaceæ</i>	Native Tamarind	Illawarra, northward to the Tweed River.	This tree attains a considerable height on the Clarence; from 60 to 80 feet in height, and as much as 3 feet in diameter; timber compact and durable.
DORYPHORA sassafras.	<i>Monimiaceæ</i>	Sassafras	Illawarra, northward to the Clarence River.	A beautiful tree, with dense, bright, green, glossy foliage, emitting an agreeable aromatic fragrance; the bark containing an agreeable bitter principle, held in much repute as a tonic by many colonists; wood soft and weak, of little value, except for packing-cases, but sometimes used for indoor work.
DUBOISIA myoporoides.	<i>Scrophulariaceæ</i> ...	Corkwood	Illawarra, northward to the Tweed River.	A small-sized tree, with rough corklike bark; wood white, very soft, close, and firm; excellent for carving and wood engraving.
DYSOXYLON rufum	<i>Meliaceæ</i> .....	.....	Port Macquarie, north- ward to the Tweed River.	A moderate-sized tree, of very general occurrence in the northern forests; timber not of much importance.
DYSOXYLON Muelleri.	<i>Meliaceæ</i>	Pencil-cedar or Turnip-wood.	Clarence, Richmond, and Tweed Rivers.	A large-sized tree, of frequent occurrence on the Clarence, Richmond, and Tweed Rivers, remark- able for its rough, scaly bark; from 80 to 100 feet high, and 3 to 4 feet in diameter; wood of a red colour; used for cabinet purposes and indoor work; when fresh cut the timber has much the smell of a Swedish turnip.

BRUSH OR JUNGLE-FORREST TREES—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
DYSOXYLON Fraserianum.	<i>Meliaceæ</i>	Rosewood	Illawarra and Hastings, northward to Clarence River.	Of frequent occurrence in many places; wood very fragrant, much used for various purposes, but principally for cabinet-work, for turning, and for wood engraving.
ECHINOCARPUS australis.	<i>Tiliaceæ</i> .....	.....	Hastings, to the Richmond and Tweed Rivers.	A large tree, attaining a height of 150 feet, with a long, straight bole; timber not much used at present.
EURETIA acuminata.	<i>Boraginææ</i> .....	.....	Illawarra, northward to the Tweed River, westward to the Blue Mountains.	One of the few deciduous trees of Australia, attaining a height of 40 to 60 feet; wood of a yellowish colour, soft, and apparently of little use.
ELEOCARPUS holopetalus.	<i>Tiliaceæ</i> .....	.....	Wingecarribee, Upper Hastings, Macleay, Bellinger, and Clarence Rivers, borders of New England.	A beautiful tree; wood close-grained, and good for joiner's work; always growing at a considerable elevation.
ELEOCARPUS grandis.	<i>Tiliaceæ</i>	Blue-fig	Clarence, northward to the Tweed River.	A tree remarkable for its tall, slender, erect stem; wood soft, but not in much repute.
ELEOCARPUS longifolius.	<i>Tiliaceæ</i>	Illawarra Mountain Ash.	Shoalhaven, Wingecarribee, Illawarra.	A tree of considerable size; wood close-grained, elastic, and easily worked; good for oars.
ELEODENDRON australe.	<i>Celastrinææ</i> .....	.....	Illawarra, northward to the Tweed River.	A slender growing tree; wood close-grained, and prettily marked.
EUCRYPHIA Moorci.	<i>Saxifragææ</i>	White-sallow	Wingecarribee & Shoalhaven River.	A moderate-sized tree, with light grey sparse foliage, and a straight trunk; timber tough and durable, but not much used.
EUGENTIA Ventenatii.	<i>Myrtaceææ</i>	Large-leaved Water-gum.	Hastings, Macleay, Clarence, and Richmond Rivers.	This is a large spreading tree, producing a very hard tough timber; used for boat-building, handles of tools, and other purposes.

<p>EUGENIA Jambolana.</p>	<p><i>Myrtaceæ</i></p>	<p>Durobbi</p>	<p>Tweed River</p>	<p>A handsome tree, of moderate size, with large dark green foliage, and brown scaly bark; attaining a height of 80 to 100 feet, and a diameter of 2 to 3 feet; the timber of a reddish colour when fresh, but at present not much used.</p>
<p>EUGENIA myrtifolia.</p>	<p><i>Myrtaceæ</i></p>	<p>Brush-cherry ...</p>	<p>Illawarra, northward to the Tweed River.</p>	<p>A tree of moderate size, sometimes attaining a height of 80 feet, and a diameter of 2 feet; timber not in much repute.</p>
<p>EUGENIA sp.</p>	<p><i>Myrtaceæ</i></p>	<p>Coolmin</p>	<p>Richmond and Tweed Rivers.</p>	<p>A tall tree, with a straight trunk and white bark; attaining a height of 100 to 150 feet, with a diameter of 2 to 3 feet; timber hard, close-grained, of a light colour.</p>
<p>FAGUS Carronii ...</p>	<p><i>Cupulifera</i></p>	<p>Negrohead or Beech.</p>	<p>Borders of New England, head of the Bellinger River, between the head waters of the Macleay and Clarence Rivers.</p>	<p>This is a fine tree, remarkable for its dark green foliage, giving an almost black appearance to the forests composed of it; hence its local name of "Negro-head;" attains a height of 80 to 100 feet, and a diameter of 2 to 3 feet; wood firm, close-grained, of a pink colour when fresh, and likely to prove a valuable timber for many purposes.</p>
<p>FLINDERSIA australis.</p>	<p><i>Meliaceæ</i></p>	<p>Cugerie or Ash ...</p>	<p>Clarence, northward to the Tweed River.</p>	<p>A tree of very general occurrence in the northern districts, greatly resembling the English ash in appearance; from 80 to 100 feet in height, and from 2 to 4 feet in diameter; timber valuable for coopers' staves, for which purpose it is extensively used.</p>
<p>FLINDERSIA Greavesii.</p>	<p><i>Meliaceæ</i></p>	<p>Bulboro or Flint-amendosa.</p>	<p>Clarence, Richmond, and Tweed Rivers.</p>	<p>A magnificent tree, the monarch of the northern jungle forests, attaining a height of 150 feet, 4 to 8 feet in diameter; distinguishable from every other species of the genus by its dark brown and rough scaly bark, as well as by other characters; timber very hard and compact, used for house-building purposes; not a favourite with the sawyers on account of its hardness.</p>

BRUSH OR JUNGLE-FORREST TREES—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
FLINDERSIA Oxleyana.	<i>Meliaceae</i>	Yellow-wood	Clarence, Richmond, and Tweed Rivers.	A moderate-sized tree, from 60 to 80 feet high, not so large in girth as the two preceding species; timber hard and of a clear yellow colour when fresh; occasionally used for fancy work. This tree attains a height of 80 to 100 feet, and a diameter of 2 to 3 feet; timber used for shingles and staves of tallow casks.
FLINDERSIA Schottiana.	.....	.....	Macleay, Bellinger and Richmond Rivers.	A large, smooth-stemmed tree; timber close- grained, and said to be durable.
FLINDERSIA Bennettiana.	.....	Bogum Bogum ...	Richmond and Tweed Rivers.	A tree of 30 to 40 feet in height; wood firm, not much used; bark tasting strongly of the drug from which it receives its local name. Ink of good quality has been made from the bark of this tree.
GEIJERA salicifolia	<i>Rutaceae</i>	Balsam capivi- tree.	Cumberland, north- ward to the Clarence River.	A very beautiful tree, with large trifoliate leaves, a round top, and tall straight trunk; frequently 40 to 50 feet to the first branches, attaining a height altogether of 100 to 120 feet; timber firm, and easily worked.
GEISOIS Benthamii.	<i>Saxifragaceae</i> .....	.....	Manning, northward to the Tweed River.	A noble tree; its wood much prized for the decks of vessels and flooring of verandahs; of fine white silvery grain, and said not to shrink after moderate drying; attains a height of 100 to 150 feet, with a diameter of 3 to 4 feet.
GMELINA Leichhardtii.	<i>Verbenaceae</i>	White-beech	Illawarra, northward to the Tweed.	A good-sized tree, highly prized for the finer kinds of cooper's work; has been extensively used for that purpose, and is in consequence becoming very scarce.
GREVILLEA robusta	<i>Proteaceae</i>	Silky-oak	Clarence, Richmond, and Tweed.	

HARPULLIA pendula.	<i>Sapindaceae</i>	Tulip-wood	Clarence, northward to the Tweed River.	This tree occurs in most of the northern jungle forests, and is well worthy of attention on account of its timber, which is very strong and highly coloured with different shades from black to yellow; it takes a good polish, and is used for cabinet work.
MELIA composita..	<i>Meliaceae</i>	White-cedar	Hastings, northward to the Tweed River.	A moderate-sized tree; timber soft, easily worked, but not durable; occasionally used for shingles.
MELIOPSE australasica.	<i>Bataceae</i> .....	.....	Hastings and Macleay Rivers.	A very handsome, moderate-sized tree, attaining a height of 60 to 80 feet; timber light, not much used.
MENKYON sp. ...	<i>Melastomaceae</i> ...	Brush-cherry ...	Clarence and Rich- mond Rivers.	This is a handsome tree, remarkable for its bright- red guava-like fruit, which it bears in great quantities; timber little known at present.
MYRSINE variabilis	<i>Myrsinaceae</i> .....	.....	Illawarra, northward to the Tweed River;	A tree 20 to 50 feet high, with a prettily-grained wood of a pinkish colour.
MYRTUS Beckleri..	<i>Myrtaceae</i>	Myrtle	westward to the Blue Mountains and N. England.	
MYRTUS acomenioides.	<i>Myrtaceae</i>	White Myrtle, Hickory, or Lig- num Vitae.	Clarence and Rich- mond Rivers.	This tree attains a height of 80 feet, and 2 feet in diameter; umbrageous and graceful in appear- ance; timber of a reddish-colour when fresh, be- coming pale when dry; said to be durable.
NOTELEA longifolia.	<i>Jasminaceae</i> .....	.....	Clarence, Richmond, and Tweed Rivers.	A tree of moderate size, attaining a height of 80 feet, and 2 feet in diameter, with a smooth, reddish bark; timber very hard and tough; said to be durable, and used for coachmakers' work.
OREA paniculata...	<i>Jasminaceae</i>	Marble-wood.....	Illawarra, northward to the Clarence River.	A small tree; wood close-grained, hard, and frequently prettily marked.
			Hunter, northward to the Clarence River.	A tree of moderate size; timber close-grained, hard, and durable.

BRUSH OR JUNGLE-FOREST TREES—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
PITHECOLOBIUM prinosum.	<i>Leguminosæ</i> .....	.....	Illawarra, northward to the Tweed River; westward to New England and Liver- pool Plains.	This is usually a tree of small size, but in some situations it attains a height of 50 to 60 feet; timber hard, close, and of a yellowish colour.
PITTIOSPORUM undulatum.	<i>Pittosporæ</i> .....	.....	Illawarra, northward to the Tweed River.	A tree of moderate size; timber very close-grained, and valuable for turners' work and wood- engraving.
PODOCARPUS spinulosus.	<i>Taxaceæ</i>	White-pine, or Deal.	Illawarra, northward to the Tweed River.	A tree with an upright elongated trunk; wood free from knots, soft, close, easily worked; good for joiners and cabinet work, and for flooring- boards; some trees affording planks of great beauty, often attaining a height of 120 feet, and a diameter of 2 to 3 feet.
RHODOMYRTUS pauidoides.	<i>Myrtaceæ</i> .....	.....	Illawarra, northward to the Tweed River.	A fine tree, attaining a height of 70 to 80 feet, and a diameter of 3 feet; timber hard, close-grained, when fresh quite red in colour; has been used for ship-building purposes.
RHODAMNIA trinervia.	<i>Myrtaceæ</i>	Three-veined Myrtle.	Illawarra, northward to the Tweed River.	A moderate-sized tree; timber close and hard.
EBUS rhodanthemus.	<i>Anacardiaceæ</i> ...	Light-yellow Wood.	Clarence, northward to the Tweed River.	A good-sized tree; timber sound and durable, of a light-yellow colour, close-grained, and beauti- fully marked; will take a fine polish, and is very suitable for cabinet-work.
ROTTLEA tinctoria.	<i>Euphorbiaceæ</i> ...	.....	Clarence, Richmond, and Tweed Rivers.	A moderate-sized tree; timber not used.

SCHIZOMERIA ovata.	Sapifragæ	Light-wood	Illawarra, Blue Moun- tains ; Hastings, northward to the Macleay River. Tweed River	<p>A tree attaining a height of 80 to 100 feet in some situations ; the timber is of a light colour, close-grained, and works easily ; used for coach-building purposes.</p> <p>This is a handsome tree, 80 to 100 feet high, with a clear, straight trunk ; remarkable for its foliage, which is green above, and covered with a short, soft, red down beneath ; the wood is firm, close-grained, and may prove useful for cabinet-work, but not used at present ; confined to small areas on good soil, slightly elevated above the sea, at the Tweed River, where clearing is rapidly going on ; it is likely very soon to disappear altogether.</p> <p>A tree of moderate size, one of the most beautiful of the occupants of the jungle-forests, its fine, large, glossy leaves being densely clustered together at the ends of the long, slender, pendulous branches ; trunk of very irregular form ; wood close, soft, and of a pinkish hue ;—hence its local name.</p>
SERSALINIA sp.....	Sapotacæ .....	.....	.....	<p>A very elegant tree, sometimes attaining a height of 80 to 100 feet, with a diameter of 2 feet ; wood close-grained, hard, durable, and beautifully marked.</p>
SLOANEA australis	Tiliacæ	Maiden's Blush...	Illawarra, northward to the Tweed River.	<p>A moderate-sized tree, attaining a height of 60 or 80 feet ; the wood is red-coloured, beautifully close in the grain, hard, and splits easily ; valuable for the finer kinds of cooper's work.</p>
STENOCARPUS sinuatus.	Proteacæ .....	.....	Richmond and Tweed Rivers.	<p>This tree attains a large size, frequently with a clear straight trunk of 70 feet, and a diameter of 3 to 4 feet ; the timber is not much used at present, except for covering buildings, and some- times for staves.</p>
STENOCARPUS salignus.	Proteacæ	Silky-oak, or beef- wood.	Illawarra, northward to the Tweed River.	.....
TABBERTIA actinodendron.	terciliacæ	Stave-wood	Camden Haven, north- ward to the Rich- mond and Tweed Rivers.	.....

BRUSH OR JUNGLE-Forest TREES—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
TABRETTIA argyrodendron.	<i>Sterculiaceae</i>	Iron - wood or byong.	Macleay, Bellinger, Clarence, and Rich- mond Rivers.	A very fine tree, attaining a height of 100 to 150 feet, remarkable for its rich foliage; timber very hard, as its local name implies, and seldom used on that account.
TABRETTIA Carronii.	<i>Sterculiaceae</i>	Byong	Macleay, Bellinger, Clarence, and Rich- mond Rivers.	A fine tree, attaining a height of 100 to 150 feet; timber, white, hard, and close-grained; but little used at present.
TETRANTHERA ferruginea.	<i>Lawsonia</i> .....	.....	Richmond, Clarence, and Tweed Rivers.	A tree attaining a height of 80 feet, and 2 feet in diameter; timber, although apparently good, is seldom used when other and better kinds can be obtained.
TROCHOCARPA laurina.	<i>Epacridae</i>	Beech, or brush- cherry.	Illawarra, northward to the Tweed River.	A small-sized tree, from 30 to 40 feet high; wood close-grained and tough; useful for turning and other purposes where a fine-grained wood is required.
VILLARBSIA Moorei.	<i>Oleaceae</i> .....	.....	Clarence River	A very beautiful tree in appearance, 60 to 80 feet in height, 3 to 4 feet in diameter; wood of a light colour, very compact in the grain, and supposed to be durable.
WELLMANNIA sp.	<i>Sauriifragae</i>	Marara	Richmond and Tweed Rivers.	A tree reaching a height of 150 feet, and a diameter of 2 to 3 feet, with a tall straight trunk, and light grey bark; timber firm, tough, easily worked, and highly spoken of by those who have used it.

HARDWOODS, OR TREES USUALLY OCCUPYING THE MORE OPEN COUNTRY.

ANGOPHORA intermedia.	<i>Myrtaceæ</i>	Apple-tree, or Red-gum.	Twofold Bay, Illawarra, northward to the Clarence River; westward to Bathurst and N. England.	In some situations this tree attains a height of 80 to 100 feet, and a diameter of 3 feet; timber very variable in quality; when free from gum-veins it is much used for naves of wheels, and cut into boards for various purposes.
ANGOPHORA subvelutina.	<i>Myrtaceæ</i>	Apple-tree	Illawarra, northward to the Tweed River; westward to the Blue Mountains, and throughout the interior.	A large wide-spreading tree, attaining a height of 80 to 100 feet, and a diameter of 3 to 4 feet, on rich flat lands; timber strong and durable; much used by wheelwrights.
CALLISTEMON salignus.	<i>Myrtaceæ</i>	Broad-leaved Tea-tree.	Illawarra, northward to the Tweed River.	A tree attaining a height of 60 to 80 feet, and a diameter of 3 feet; wood very hard, and close-grained; apt to split in drying; it has the reputation of being very durable under ground.
EUCALYPTUS saligna.	<i>Myrtaceæ</i>	Grey-gum or Grey-box.	Cumberland, and Cox River, northward to the Clarence and Richmond Rivers.	A tree usually of a large size, reaching a height of 100 to 150 feet, and a diameter of 3 to 4 feet; it is characterized by a smooth, silvery-grey, shining bark, shedding in thin, longitudinal strips; timber in high repute for various purposes.
EUCALYPTUS stellulata.	<i>Myrtaceæ</i>	White-gum or Grey-gum.	Goulburn Plains, Illawarra, northward to the Clarence River; westward to Bathurst, Mudgee, and N. England.	A tree with rough-furrowed bark at the base, falling off in layers, and smooth above, of a red colour; attaining a height of 80 to 120 feet, and a diameter of 3 to 5 feet, producing an excellent timber, in high repute for ship-building and various other purposes.

HARDWOODS, &c.—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
<i>EUCALYPTUS botryoides</i> .	<i>Myrtaceæ</i>	Blue-gum	Illawarra, and the coast districts generally.	The blue-gum of the coast districts; is a very fine tree, from 100 to 160 feet high; considered to be one of the finest timbers for ship-building.
<i>EUCALYPTUS hæmastoma</i> .	<i>Myrtaceæ</i>	Blue-gum, White-gum, or spotted-gum.	Camden, and a considerable distance inland to the westward.	A very large tree, from 100 to 160 feet in height, and a diameter of 4 to 5 feet, with a smooth deciduous bark, leaving the trunk spotted or variegated when it falls off; considered to be one of the finest timbers for ship-building, and very much used for wheelwrights' work, and other purposes.
<i>EUCALYPTUS rostrata</i> .	<i>Myrtaceæ</i>	Flooded-gum.....	Cumberland, Camden, Hastings, northward to the Clarence River; N. England, and far into the interior.	A tall tree, with a greyish white bark, smooth, and separating in thin layers; produces an excellent timber, famous for ship-building, house-carpentry, and many other purposes.
<i>EUCALYPTUS viminalis</i> .	<i>Myrtaceæ</i>	Flooded or Drooping Gum.	Argyle, Camden, Illawarra, northward to the Hastings River; westward to Bathurst and New England.	A magnificent tree, sometimes attaining a great height and size, with a rough persistent bark on the trunk and main branches; that of the smaller branches smooth and deciduous; timber in high repute for wheelwrights' work and ship-building.
<i>EUCALYPTUS maculata</i> .	<i>Myrtaceæ</i>	Spotted-gum.....	Illawarra, northward to the Clarence; westward to the Leichlan River.	Usually a large-sized tree, remarkable for the spotted character of the bark; timber highly valued for all ordinary purposes.

<p>EUCALYPTUS siderophloia.</p>	<p><i>Myrtaceae</i></p>	<p>Ironbark</p>	<p>Shoalhaven, Illawarra, northward to the Richmond River; westward to the Blue Mountains, and in many parts of the interior.</p>	<p>A large tree, attaining a height of 150 feet, and a diameter of 4 feet, with a straight, even bole, and a hard, persistent, rough, furrowed bark; the timber is of the highest reputation for strength and durability, and is very much used for large beams in building stores for heavy goods, poles for bullock-drays, railway-sleepers, and other purposes where great strength is required.</p>
<p>EUCALYPTUS leucoxydon.</p>	<p><i>Myrtaceae</i></p>	<p>Red Ironbark ...</p>	<p>Twofold Bay, northward to the Hastings River; westward to Mudjee and New England.</p>	<p>A tall tree, 80 to 100 feet high, 3 to 4 feet in diameter, with a rough, persistent, dark grey bark, spongy in the trunk, soft and white on the branches; produces a first-rate durable hardwood timber; used for many purposes.</p>
<p>EUCALYPTUS crebra.</p>	<p><i>Myrtaceae</i></p>	<p>White narrow-leaved Ironbark.</p>	<p>Cumberland, Camden, Hastings, and Clarence Rivers, and New England.</p>	<p>A tree of considerable size, producing an excellent timber, which is hard, tough, and durable.</p>
<p>EUCALYPTUS paniculata.</p>	<p><i>Myrtaceae</i></p>	<p>She-ironbark</p>	<p>Cumberland and Coast Districts.</p>	<p>This is a moderate-sized tree, producing an excellent timber, strong and very durable.</p>
<p>EUCALYPTUS bicolor.</p>	<p><i>Myrtaceae</i></p>	<p>Smooth, or Red Ironbark.</p>	<p>Cumberland, and many parts of the interior.</p>	<p>This is a fair-sized tree; timber redder, closer, softer, and more easily worked than the generality of the ironbarks; highly valued.</p>
<p>EUCALYPTUS tetricornis.</p>	<p><i>Myrtaceae</i></p>	<p>Bastard-box</p>	<p>Snowy River, Illawarra, Hastings, northward to the Richmond River.</p>	<p>A tree attaining a height of 80 to 150 feet, and a diameter of 3 to 4 feet, with a smooth ash-coloured bark, shedding in thin layers; an excellent timber; much used for plough-beams, poles, and shafts of drays and carts, spokes of wheels, as well as in ship-building.</p>

HARDWOODS, &c.—continued.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
EUCALYPTUS hemipholia.	<i>Myrtaceæ</i>	Box	Cumberland, Camden, and other parts of the Colony.	A tall tree, producing an excellent timber, famous for its hardness, toughness, and durability.
EUCALYPTUS melliodora.	<i>Myrtaceæ</i>	Yellow-box	Bathurst, Gwydir, and New England.	A moderate-sized tree, of irregular growth, with a smooth bark of a pale colour, scaling off in flakes in the upper parts of the tree; timber hard, tough, and durable.
EUCALYPTUS polyanthemos.	<i>Myrtaceæ</i>	Bastard-box	Camden, Goulburn Plains, Nepean, Bathurst, and Mudgee.	This is a tree of frequent occurrence and moderate size; timber used by wheelwrights for naves, felloes, and spokes.
EUCALYPTUS corymbosa.	<i>Myrtaceæ</i>	Blood-wood	Illawarra, and the coast districts generally.	A fair-sized tree; timber subject to gum-veins, but durable; principally used for posts and rails.
EUCALYPTUS eximia.	<i>Myrtaceæ</i>	Blood-wood	Cumberland, Camden, and Blue Mountains	A large tree; timber used for posts and rails in fencing.
EUCALYPTUS piperita.	<i>Myrtaceæ</i>	Peppermint, Red-gum, or White-gum.	Twofold Bay, Argyle, Blue Mountains, and Cumberland.	A tree attaining a height of 80 to 150 feet, and a diameter of 4 to 5 feet, and in some parts of the southern districts it is found of much larger dimensions still; bark usually more or less deciduous, falling off in flakes; timber used for various purposes.
EUCALYPTUS capitellata.	<i>Myrtaceæ</i>	Stringy-bark or Peppermint.	Cumberland, northward, westward to the Blue Mountains.	A large tree with a dark grey-furrowed bark; timber much prized for its strength and durability; excellent for house-carpentry.
EUCALYPTUS amygdalina.	<i>Myrtaceæ</i>	Stringy-bark	Twofold Bay, Illawarra northward to the Clarence River.	A large tree attaining a height of 80 to 150 feet, and a diameter of 3 to 5 feet in some situations, with a persistent fibrous bark; one of the best of the hardwood timbers used for house-carpentry.

<p>EUCALYPTUS <i>obliqua.</i></p>	<p><i>Myrtaceae</i></p>	<p>Messmate</p>	<p>Gipps Land, extending south into Victoria.</p>	<p>An immense tree attaining a great height, with a very tenacious, rugged, fibrous bark; produces an excellent timber, used for all purposes.</p>
<p>EUCALYPTUS <i>robusta.</i></p>	<p><i>Myrtaceae</i></p>	<p>Mahogany, Swamp Mahogany, or Bangalay.</p>	<p>Illawarra, Camden, northward to the Clarence River, westward to the Blue Mountains.</p>	<p>A moderate-sized tree with rough persistent bark; wood much used for ship-building and wheelwrights' work.</p>
<p>EUCALYPTUS <i>resinifera.</i></p>	<p><i>Myrtaceae</i></p>	<p>Red Mahogany, Red-gum, or Leather-jacket.</p>	<p>Illawarra, Argyle, northward to the Clarence River, westward to Blue Mountains and New England.</p>	<p>A tree attaining a height of 80 to 150 feet, and a diameter of 3 to 4 feet; producing an excellent timber; much prized for its strength and durability; largely used in house-carpentry and ship-building.</p>
<p>EUCALYPTUS <i>virgata.</i></p>	<p><i>Myrtaceae</i></p>	<p>Mountain-ash or White-top.</p>	<p>Twofold Bay, Berrima, Blue Mountains.</p>	<p>A tree of considerable size, sometimes attaining a height of 150 feet, and a diameter of 3 to 4 feet, with a furrowed, persistent, fibrous bark; timber hard, tough, and durable; much used for many purposes.</p>
<p>EUCALYPTUS <i>longifolia.</i></p>	<p><i>Myrtaceae</i></p>	<p>Woolly-butt</p>	<p>Cumberland and other parts of the Colony.</p>	<p>A good-sized tree; timber subject to gum-veins, and not much in request.</p>
<p>EUCALYPTUS <i>pilularis.</i></p>	<p><i>Myrtaceae</i></p>	<p>Black-butt or Flintwood.</p>	<p>Twofold Bay, Illawarra, Camden, northward to the Hastings River, and a considerable distance inland to the westward and southward.</p>	<p>A tree attaining a height of 150 to 200 feet, with dark-coloured rough bark at the base; smooth and falling off in flakes upwards and on the branches; produces excellent timber for house-carpentry, or any purpose where strength and durability are the chief requisites.</p>

HARDWOODS, &c.—*continued*.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
<i>MELALEUCA</i> <i>stypelioides</i> .	<i>Myrtaceæ</i>	Prickly-leaved-tea-tree.	Illawarra, northward to the Hastings and Clarence Rivers, westward to the Blue Mountains.	A tree from 60 to 80 feet high, and 2 feet in diameter; wood very hard, close-grained; stands well in damp situations; it is said that this timber has never been known to decay.
<i>MELALEUCA</i> <i>pauciflora</i> .	<i>Myrtaceæ</i>	Tea-tree	Illawarra, northward to the Clarence River, westward to the Blue Mountains.	A moderate-sized tree, attaining a height of 60 to 80 feet, and a diameter of 2 feet; wood hard, close-grained, very durable under ground, apt to split in drying.
<i>MELALEUCA</i> <i>squarrosa</i> .	<i>Myrtaceæ</i>	Tea-tree	Cumberland, Illawarra, Blue Mountains.	A small-sized tree; wood close-grained, hard, and durable.
<i>MELALEUCA</i> <i>linariifolia</i> .	<i>Myrtaceæ</i> .....	.....	Cumberland, northward to the Hastings River, westward far into the interior.	A taller tree than the last; wood of a similar quality.
<i>MELALEUCA</i> <i>leucadendron</i> .	<i>Myrtaceæ</i>	White Tea-tree	Cumberland, northward to the Hastings and Clarence Rivers, westward to Blue Mountains.	This tree attains to a considerable size in some situations; timber hard and close-grained, excellent for posts in damp places; said to be almost imperishable under ground.
<i>MELALEUCA</i> <i>armillaris</i> .	<i>Myrtaceæ</i> .....	.....	Twofold Bay, northward to the Richmond River.	A smaller tree than the preceding; timber of similar quality, much prized for its durability under ground.

SYGARFIA laurifolia.	<i>Myrtaceae</i>	Illawarra, northward to the Hastings River, westward to the Blue Mountains.	A magnificent tree, attaining a height of 150 to 200 feet, and a diameter of 5 to 6 feet, with great length of bole; timber valuable for piles and posts for timber fences, very durable under ground and said to resist the <i>teredo navalis</i> in salt water; very liable to rot in drying.
SYGARFIA leptopetala.	<i>Myrtaceae</i>	Brisbane Water and Hastings River.	A tree attaining a height of 60 feet; timber close-grained, exceedingly hard and heavy, useful for turners' work, but not much known at present.
TRISTANTIA conferta.	<i>Myrtaceae</i>	Port Stephens, north- ward to the Tweed River.	A large tree, from 100 to 150 feet in height, and a diameter of 4 to 5 feet; one of the most valuable timbers in the Colony on account of its durability. It is averred on credible authority that instances are known of this timber being perfectly sound as ribs of vessels at the end of 80 years.
TRISTANTIA suaeolens.	<i>Myrtaceae</i>	Clarence and Rich- mond Rivers.	A tree of considerable size producing a timber held in high repute in the Clarence District.
TRISTANTIA nerifolia.	<i>Myrtaceae</i>	Illawarra, northward to the Manning River.	A fine tree, attaining a height, in good situations, of 90 to 120 feet, and a diameter of 2 to 3 feet, with a lofty cylindrical bole; timber close-grained and elastic; valuable for boat-building but requires to be seasoned carefully; also used for cogs of wheels in machinery.

TREES OF A DIFFERENT CHARACTER FROM EITHER OF THE PRECEDING CLASSES.

Botanical Name.	Natural Order.	Local Name where known.	Distribution.	Remarks.
ACACIA pendula...	<i>Leguminosæ</i>	Myall	Liverpool Plains, and open country in the interior.	A small-sized tree, well known for its violet-scented wood, which is hard, close-grained, and beautifully marked; used by cabinet-makers and turners; in high repute for making tobacco pipes.
ACACIA Cunninghamii.	<i>Leguminosæ</i>	Bastard-myall ...	Illawarra, northward to the Hunter, Hastings, Clarence, and Richmond Rivers.	A moderate-sized tree; timber dark, hard, and close-grained.
ACACIA glaucescens.	<i>Leguminosæ</i>	Bastard-myall ...	Illawarra, Wingecarribee, northward to the Richmond, westward to the Blue Mountains.	A tree attaining a height of 80 feet, and 2 feet in diameter; timber dark, hard, and prettily grained.
ACACIA elata	<i>Leguminosæ</i> .....	.....	Illawarra, Grose River, Blue Mountains.	A very fine species, with large leaves; wood hard, close, and tough; often reaching a height of 60 feet.
ACACIA decurrens.	<i>Leguminosæ</i>	Green-wattle ...	Illawarra, northward to the Tweed; westward to the Blue Mountains and New England.	A tree 30 to 40 feet high; bark much prized for tanning; wood strong, light, and tough; much used by coopers for staves.
ACACIA dealbata...	<i>Leguminosæ</i>	Silver-wattle	Illawarra, Cumberland, Blue Mountains, and far westward into the interior.	A handsome, small-sized tree; like that of the preceding species; the bark is much used for tanning; the wood is tough, light, and largely used for staves.
AVICENNIA tomentosa.	<i>Verbenacæ</i>	Mangrove	All along the coast, in salt-water estuaries.	A low branching tree, valued for stonemason's mallets.

ALSTONIA constricta.	<i>Apocynææ</i>	Bitter-bark	Hastings, northward to the Clarence River, westward to the Darling River.	A moderate-sized tree, of 30 to 40 feet in height, with an intensely bitter bark, similar in taste to the quinine, for which it is sometimes substituted; a decoction of the bark is sold by some publicans for bitters.
BANKSIA serrata.	<i>Proteaceæ</i>	Honeysuckle	Illawarra, Cumberland and along the coast to the Tweed River.	A crooked-growing tree, producing a handsome wood much used in boat-building.
BANKSIA integrifolia.	<i>Proteaceæ</i>	Honeysuckle	Twofold Bay northward to the Tweed; westward to New England.	A low-branching tree, with a diameter of 18 inches to 2 feet; wood useful in boat-building.
CASUARINA tenuissima.	<i>Casuarinaceæ</i> ..	Forest-oak or beef-wood.	Illawarra, northward to the Richmond River; westward to Bathurst and New England.	A tree attaining a height of 60 to 80 feet, and a diameter of 2 feet; timber used principally for shingles, and sometimes for cabinet-work.
CASUARINA quadrivalvis.	<i>Casuarinaceæ</i> ..	Swamp-oak	Very general in moist situations all over the Colony.	A tree of moderate-size; timber used for shingles and staves.
FRENELA columnaris.	<i>Coniferae</i>	Cypress-pine	Clarence and Richmond Rivers.	A moderate-sized tree with a straight trunk; the root stock much valued by cabinet-makers for veneering purposes.
FRENELA verrucosa.	<i>Coniferae</i>	Cypress - pine of the interior.	Mudgee and interior generally.	This tree attains a height of 80 feet; timber valuable for cabinet purposes, and very durable for telegraph-posts.
MONOTOCA elliptica.	<i>Epacridææ</i>	Beech	Twofold Bay, northward to the Tweed; westward to the Blue Mountains.	A small tree; wood valuable for handles of carpenters' tools, and turners' work.

The following are the present retail prices at which the principal of our Colonial timbers are sold at Sydney :—

<i>Ironbark</i> ...	@ 20s.	per 100 superficial feet,	1 inch thick.
<i>Stringybark</i> ...	20s.	ditto,	ditto.
<i>Spotted-gum</i> ..	17s.	ditto,	ditto.
<i>Box</i> ...	17s.	ditto,	ditto.
<i>Blue-gum</i> ...	17s.	ditto,	ditto.
<i>Woolly-butt</i> ...	17s.	ditto,	ditto.
<i>Colonial pine</i> ..	16s.	ditto,	ditto.
<i>Red-cedar</i> ...	33s.	ditto,	ditto.

Ironbark, in square logs, 2s. 6d. to 3s. 3d. per cubic foot. This is almost the only timber sold at per cubic foot; all other woods are in measurement, reduced to 1 inch, and sold at per superficial foot.

Stave-wood.—All the woods used for staves are sold in the Sydney market according to length, viz. :—

4 feet long ...	... £7 10s.	per 1,000
2 feet 6 inches long ...	... £4	ditto

Forest-oak shingles.—£1 10s. per 1,000.

It is calculated that the consumption of timber used for building and other purposes is, as nearly as possible, as follows :—

<i>Black-butt</i> ...	... 100,000	feet per week.
<i>Woolly-butt</i> ...	... 30,000	ditto.
<i>Ironbark</i> ...	... 25,000	ditto.
<i>Spotted-gum</i> ...	... 25,000	ditto.
<i>Box</i> ...	... 15,000	ditto.
<i>Stringybark</i> ...	... 10,000	ditto.
<i>Colonial pine</i>...	... 95,000	ditto.
<i>Red-cedar</i> ...	... 90,000	ditto.

The exportation to Melbourne of red-cedar and Colonial pine may be set down at 100,000 feet each per week.

ON THE
INTRODUCTION, CULTIVATION, AND ECONOMIC USES OF THE
ORANGE, AND OTHERS OF THE CITRON-TRIBE, IN
NEW SOUTH WALES.

(By GEORGE BENNETT, M.D., F.L.S., Corr. Member of the Imp. Royal Zool. and Bot. Soc. of Vienna, and Corr. Mem. of the Soc. Imp. des Sciences Naturelles de Cherbourg.)

THERE is no class of men to whom the gratitude of a country is due more than those who have introduced useful animals, luscious fruits, beautiful flowers, and good culinary vegetables, from more favoured countries. In Europe the greater part of our rich fruits, brilliant flowers, and succulent pulses and roots were drawn from the luxuriant climates of Asia, and the profusion which covers the land were introduced by individuals, and reared with anxious care. Acclimatization can no longer be regarded as a phantasy, but as an established fact; many fruits and vegetables and plants are found to improve by the change, and by care taken in the selection of the original stock introduced, the climatic conditions often succeed in modifying and improving their constitution, and by such introductions assist nature in the diffusion of her inestimable gifts for the general benefit of the human race. It has been correctly said that "monuments have been reared, and medals struck to commemorate events and names, which are less deserving our regard than those who have transplanted new fruits, new flowers, and new vegetables of more favoured spots." Although great praise ought to be awarded to those persons whose zeal for the welfare of their country induces them to introduce new products, and by careful selection and great attention endeavour to naturalize them, it is for the most part received with apathy and discouragement, particularly if no immediate return is made, but when by patience and perseverance the new gift is established, and becomes a source of wealth to the community, the calculating political economist is surprised at the result, and avails himself of the advantages obtained.

Among others, the citron-tribe, more particularly the Orange, the subject of this paper, is an instance; from the introduction of a few trees in 1788 they have so increased as to extend over all congenial parts of the Colony, becoming not only an important source of wealth for home consumption, but also forms an im-

portant export to the neighbouring Colonies, whose climate is unsuitable for its production. *Wool* is another instance of wealth obtained from a small origin, now followed by *Cotton* and *Sugar*, for which the climate of North Australia is found so suitable. In a few years we shall probably add *Angora Wool* and *Silk* to our exports. A small quantity of the former, grown in the Colony, was recently sent to England, and realized from 2s. 6d. to 3s. the lb. Silk has not yet met with sufficient encouragement, and it is a curious coincidence, as will be seen from the following extract, that on the first introduction of silk into France, in the reign of Henry IV, precisely the same obstacles existed as are at present observed in New South Wales, but which there is little or no doubt the assistance of the Government, and energy of the people will remove. I may add that the last return of the silk trade of France amounted to £21,300,000.

“Animated by a zeal truly patriotic, De Serres, in France, 1599, composed a work on the art of raising silkworms, and dedicated it to the Municipal body of Paris, to excite the inhabitants to cultivate mulberry-trees. The work at first produced a strong sensation, and many planted mulberry-trees in the vicinity of Paris; but as they were not yet used to raise and manage the silkworm they reaped nothing but the trouble for their pains. They tore up the mulberry-trees they had planted, and, in spite of De Serres, asserted that the northern climate was not adapted for the rearing of that tender insect. The great Sully, from his hatred of all objects of luxury, countenanced the popular clamour, and crushed the rising enterprise of De Serres. The monarch was wiser than the minister. The book had made sufficient noise to reach the ear of Henry IV, who desired the author to draw up a memoir on the subject, from which the King was induced to plant mulberry-trees in all the royal gardens; and having imported the eggs of silkworms from Spain, this patriotic monarch gave up his orangeries, which he considered but as his private gratification, for that leaf, which, converted into silk, became a part of the national wealth.”

The species of the genus *Citrus* (natural order *Aurantiaceæ*) cultivated in New South Wales are the orange (*Citrus aurantium*) and varieties; the lemon (*C. limonum*); the citron (*C. medica*); the lime (*C. lima*); the shaddock (*C. decumaria*); and bergamot (*C. bergamia*).

The distinguishing characteristics of the genus *Citrus* are:—The presence of a cup-like calyx, numerous stamens irregularly united by their filaments into several bundles, a cylindrical style, and a pulpy fruit with a spongy rind. The leaves of these trees are also remarkable, inasmuch as they consist of one leaflet, separated from the leaf-like stalk supporting it, by a distinct joint.

The orange (sweet variety *C. dulcis*) has the petiole sub-alate; leaves, ovato-sublanceolate, slightly acuminate, with a blunt point; spines, axillary; stamens, 20–22; fruit, globose; rind, thin; pulp, sweet. The Seville or Bitter Orange (*C. bigaradia*) differs a little from the preceding variety in having the leaves more acuminate, and partaking more of the lanceolate form; the petioles are

heart-shaped ; fruit, globose ; rind, rougher, and having a deeper red colour ; pulp, acrid. It is a fine tree in New South Wales, and when in full growth, whether in fruit or flower, excites much admiration. I am inclined to consider it a distinct species, as it never changes its peculiar character in growth or fruit in whatever climate it is transported and naturalized. In a plantation of sweet oranges it is immediately distinguished by its more vigorous growth, taller stem, foliage larger, and of a deeper green colour, and the crenatures more distinct, and by its dense masses of fragrant flowers, followed by an abundance of fruit of a deep blood-red hue. It requires dry soil and bears flowers 3 years after grafting, increasing every year. The flowers of the Bitter Orange are preferred by perfumers to all others. The average yield of a full-grown tree is from 50 to 60 lbs. of blossoms. Eau-de-Cologne, so celebrated for its perfume, is extracted principally from the flowers, leaves, and rind of the fruit of the Seville orange, and other trees of the *Citrus* family. The species composing the genus *Citrus* are trees or shrubs furnished for the most part with axillary spines. The orange-tree attains the height of from 12 to 35 feet. The principal varieties growing in the Colony are the Mandarin, Navel, Maltese Blood, Lisbon, China, and St. Michael's, and lately several other varieties have been introduced, but have not yet become naturalized. The Citron has the petioles naked, leaves, oblong, large, rounded at the apex (very rarely acute) ; stamens, 35-40 ; spines, horizontal ; fruit, large, oblong, or ovate ; rind, thick, rugose on the surface. It is an arborescent shrub, seldom attaining a greater height than from 8 to 10 feet. It divides near the root in a very irregular manner. Flowers purple outside and white inside. The rind is the most valuable part, yielding a large quantity of essential oil, and is used in confections.

The Lemon.—Petioles, sub-alate, oblong, narrowed towards the apex, remotely crenato-serrate ; stamens, 30-35 ; fruit, oval or ovate, terminated by a small nipple-like point ; rind, thin ; pulp, very acid ; spines, long, axillary, patent. The tree attains the height of from 8 to 16 feet. The flowers of the lemon are larger than those of the orange, and have the outside of the petals of a purplish pink tinge of colour.

The Lime is a tree of shrubby growth, with the petioles having the alæ narrow ; leaves, oval, obtuse, obscurely crenulated ; stamens, 25 ; fruit, roundish or ovate ; pulp, acid ; spines, axillary, in a direction between patent and horizontal.

The Shaddock.—Leaves, large and oval, rounded at the apex, sub-emarginate, crenated, beneath pubescent ; petioles, alate ; stamens, 30 ; fruit, very large, roundish, with a pale yellow skin ; rind, thick. It is a tree with divaricating branches, attaining the height of from 12 to 20 feet ; spines, for the most part, wanting.

Botanists are not agreed about the numerous species and varieties of the *Citron* genus, and consider it doubtful whether all of them have not originated from *Citrus medica*. On this point Dr. Lindley observes, "The varieties known are very numerous and difficult to reduce according to their species, on the limits of which botanists are much divided in opinion. Those who have bestowed the most pains in the investigation of Indian botany, and in whose judgment we should place the most confidence, have come to the conclusion that the citron, the orange, the lemon, the lime, and their numerous varieties now in circulation, are all derived from one botanical species, *C. medica*, indigenous to, and still found wild in the mountains of East India. Others, it is true, tell us that the citron, the orange, and the lime, are to be found as distinct types in different valleys, even in the wild state; but these observations do not appear to have been made with that accuracy and critical caution which would be necessary in the case of trees so long and so generally cultivated." Galesio, who has almost devoted his lifetime to the subject, considers there are four species, namely—sweet and bitter oranges, lemons, and citrons, each of which has given rise to whole groups of varieties, monsters, and supposed hybrids. Much very interesting information on this subject, with reference to the citron tribe and other fruits, may be obtained by consulting Darwin's "Animals and Plants under Domestication," vol. 1, pp. 33-4, 36.

I will now proceed to give an account of the introduction and cultivation of the orange (and other species of the citron-tribe) in New South Wales, from my own observation, and the practical experience of some of the extensive orange-growers in the Colony, comparing it with methods adopted in other countries where the orange is cultivated to perfection:—

The orange is a native of China and India, and is supposed to have been introduced into Italy in the fourteenth century. Galesio states "that oranges were brought by the Arabs from India by two routes: the sweet ones through Persia to Syria, and thence to the shores of Italy and the south of France; and the bitter, called in commerce, Seville oranges, by Arabia, Egypt, and the north of Africa, to Spain." Thus all the old orange-groves at Seville, planted by the Moors, were the bitter-fruited variety, and the first sweet orange is stated to have been reared at Lisbon, and became commonly known as the Portugal or Lisbon orange, probably procured by the Portuguese from India or China, the route to India by the Cape of Good Hope having been then discovered. Alluding to orange-trees in Spain, Mr. T. C. Archer ("Gardener's Chronicle," August 13, 1870) says: "At Cordova, in the Court of Oranges of the old Moorish Mosque, now the Cathedral, the splendid avenues of orange-trees, all of them centuries old, were a most interesting sight. The lines of

orange-trees in the court corresponded with the lines of pillars, 1,096 in number, in the interior. He also mentions having visited the Alcazua, the most beautiful of Moorish palaces. Its garden is a marvel of beauty. The most striking thing, however, was the celebrated orange-tree of vast dimensions, and said to be 600 years old. Its stem is split into several trunks, and covers the ground-space of a good-sized oak." Great attention is now directed by the colonists to the cultivation of the orange, lemon, and others of the citron tribe; orange plantations are numerous, and rapidly increasing over the whole of the suitable parts of the Colony. The climate of Tasmania and New Zealand is not congenial to the ripening of this fruit in the open air, nor has it yet succeeded to any extent about Victoria; consequently, a large and remunerative trade is carried on by the exportation of oranges to these Colonies. The whole of the citron-tribe being evergreens, embellishes the gardens about Sydney during the winter season, and are then laden with blossoms and fruit in every stage of maturity. This fact of the orange-tree bearing flowers and fruit at the same time has been very beautifully alluded to by Moore:—

"Just then beneath some *orange-trees*,
Whose *fruit and blossoms* in the breeze,
Were wantoning together, free,
Like age at play with infancy,—"

One thing remarkable in the citron-family is, that although a tropical genus it ripens its fruit in all countries in which it becomes naturalized, only in the winter months, and from this peculiarity it has probably been enabled to travel from India to the southern shores of Europe, and to find a congenial locality in the equable and temperate climate of the Azores, Cape of Good Hope, and New South Wales. The citron-tribe thrive in great luxuriance in the open air in the districts around Sydney, Hunter's River, and other suitable portions of the Colony of New South Wales; more especially in sheltered situations in the vicinity of the inland creeks or salt-water rivers (as they are termed by the colonists), such as the Parramatta, the Hunter, and others; these, for several miles from their entrance, are mere arms of the sea, with fresh water flowing into them. In localities of this description, fine, healthy, umbrageous orange-trees are planted in groves, their dark green glossy foliage contrasting beautifully with the clusters of delicate white, waxy-looking flowers, which diffuse a rich fragrance in the surrounding atmosphere, and attract by their perfume innumerable swarms of bees, butterflies, and other insects, while at the same time the fruit may be seen in every stage of maturity. It has always been found that lemon and orange trees thrive luxuriously on a sloping ground in sheltered situations near the salt water, or under the influence of the sea-air, but must not be exposed to

the strong sea-breeze; the trees also enjoy situations exposed to the morning sun. The varieties of the orange are very numerous. In Ceylon, oranges are plentiful, and of fine flavour, and are either of a deep green or russet colour when perfectly ripe; when they have an occasional tinge of yellow they are not considered so good. The trees bear twice every year. I have given a list (from the "Gardener's Chronicle") of those grown in Mr. G. Brown's nursery, at St. Michael's, Azores, as a guide to the cultivators in this Colony, as follows:—

CITRUS AURANTIUM—SWEET ORANGES.

1. Achilles, flat at the eye, round and full at calyx, very good.
2. Acis, a seedling.
3. Bettencourt, very good, from seed.
4. Botelha, said to be very good.
5. Brazilian, rugged, quartered, said to be a superior sort.
6. Brownii, an excellent seedling.
7. Circassian.
8. Crispa, quartered fruit and curly leaves.
9. Don Luiz.
10. Dulcis.
11. Dulcissima, said to be a very fine flavoured fruit.
12. Egg, egg-shaped, or oval, one of the best flavoured fruits of St. Michael.
13. Excel.
14. Exquisite.
15. Long, very long fruit, of excellent flavour.
16. Villa Franca, a seedling of No. 13; has not yet fruited.
17. Maltese, blood-red fleshed orange.
18. Navel, a Brazilian orange, with a navel-like eye; fine flavour.
19. Nonpareil.
20. Partridge-eye, very good.
21. Pernambucana, said to be the best for flavour and appearance; tree very spiny.
22. Queen.
23. Bride.
24. Savoy.
25. Selecta, a Brazilian, large light coloured fruit, keeps long; very good.
26. Silver, oval-shaped, thin skin, very light coloured, excellent flavour.
27. Star, oval-shaped, with a large star eye; very good.
28. Star, large star-shaped calyx; very good.
29. Strawberry, said to partake of the flavour of the strawberry.
30. Superior, thin skin and fine flavour.
31. Transit.
32. White, flesh white as in Persian Lime.
33. Citrus nobilis, Mandarin Orange.
34. " " var. minor, Tangeirine.
35. " " (?), said to be Mandarin; leaves shorter and rounder.
36. " japonica.

CITRUS ACRIS—ACID AND BITTER ORANGES.

37. Corniculata, horned Orange.
38. Acida, Seville.
39. Acuminata.
40. Agrea, very bitter.
41. Bigarade Royal.

42. *Buxifolia*.
 43. *Orispa*.
 44. Navel-eye, very acid.
 45. *Myrtifolia*.
 46. *Citrus Limetta*, Lime Bergamot.
 47. " " small and bitter.
 48. " " acris, small, rugged, very acid.
 49. " " Persian, beautiful appearance, insipid.
 50. " " Island, insipid, sub-acid flavour.
 51. Acid, very acid.
 52. *Citrus decumana*, Shaddock, spheroidal, lemon-coloured.
 53. " " *Gadii*, very spiny.
 54. " " *grandis*.
 55. " " *Toranga*, very large.
 56. " " *veris*.
 57. " " Pear, pear-shaped.
 58. *Citrus dulcis*, sweet Lemons.
 59. " " Brazilian.

CITRUS LIMONUM—ACID LEMONS.

60. Common Lemon.
 61. Silver-striped, very ornamental; with striped fruit.
 62. Major, very large.
 63. *Angularis*, long-angled fruit.
 64. *Bignetta major*, very large thick spongy rind.
 65. *Braziensis*, very small fruit, thin skin; best fruit.
 66. *Galego*, fruit medium size, oval, skin thin, good, very spongy.
 67. *Galego*, long, seedling of No. 66.
 68. *Imperialis*, spineless, large fruit.

CITRUS MEDICA—CITRUS.

69. Acid.
 70. Sweet.
 71. *Citrus australis*, fruit obovate, rugged, very likely a Lemon.
 72. " *californica*, small Box-like leaves.
 73. " *mexicana*.
 74. " *Paradisi*, Forbidden fruit.

The orange-tree was first introduced into Sydney, New South Wales, from Brazil, in 1788. Captain Hunter says, in his "Journal of Transactions at Port Jackson and Norfolk Island," that they took on board at Rio de Janeiro, among other seeds and plants, "*orange, lime, and lemon trees*," and further states, that at Sydney "*vines, orange, and lemon trees are in a very thriving state*." These were introduced from Sydney into Norfolk Island, when Lieut. King observes in his Journal of 1788, at that island, "*Two orange-trees, which I brought with me (from Sydney) were kept in tubs until I should find a sheltered situation to plant them in*." He afterwards says they were planted in the vale; and in March, 1790, observes, "*Vines, orange, and lemon trees are in a very thriving state*." Thus we find that they appeared to be well established in Norfolk Island; and at this time they were also thriving at Sydney, as we learn from "*Phillips's New South Wales in 1790*," from which date we may consider the cultivation of the orange-tree as permanent in this Colony.

Respecting the orange-tree in Norfolk Island, in a communication made by Capt. Sir E. Home, Bart., R.N., to Sir William Hooker, in 1847, he says: "Norfolk Island was formerly covered with orange-trees. The Commandant in 1827 (Colonel Morissett), believing that the fruit furnished means of sustenance to the runaway convicts, caused them to be destroyed with a very few exceptions, which trees have since gone off; and although every means have been taken to re-establish them they will not succeed. In 1844 there was but one tree upon the island, and that was in an unhealthy state." (Curtis's Botanical Magazine, 3rd Series.)

All the species of the citron-family may be propagated by seeds, grafting, budding, or layers. The plants raised from seed are generally used for grafting and budding, as they are considered to possess greater durability and productiveness; the fruit is sweeter, but they take a longer time to come into bearing. The best month for pruning orange-trees in New South Wales is February, and by keeping the branches thin, so as to admit sun and air, improves the quality of the fruit, for in unpruned or in trees too much sheltered it has been found that the rind of the fruit has become thicker and softer, which is prejudicial to the keeping of the fruit. By judicious pruning, the health and graceful appearance of the tree is much improved; and when we bear in mind that the blossoms of the citron-tribe are produced in the form of terminating peduncles on the wood of the current year, the object of pruning ought to be to encourage the production of young wood in every part of the tree. The wood of the citron-tribe is hard, compact, and durable. This family is remarkable for the dotted appearance of all parts of the plants, in consequence of their abounding in little cells filled with a volatile and frequently highly fragrant oil. For instance, on holding up the foliage of the orange-tree to the light it is observed to be covered with innumerable minute glands, which secrete an essential oil in large quantities, and this, together with water distilled from the flowers, might form valuable articles of commerce in the Colony, as in France and the southern parts of Europe, for the flowers have somewhat of a warm and bitter aromatic taste, and are not only held in high esteem as a perfume, but are used for making orange-flower-water, as they give out their flavour by infusion; this preparation is extensively used, more particularly among the French, for nervous and hysterical complaints. The seeds of all the species afford a pleasant bitter, and an infusion of them makes a good stomachic when the digestive organs cannot bear more powerful tonics. In some parts of the West Indies the expressed oil of the rind of the orange is used as an excellent remedy, as a warm aromatic bitter, to strengthen the stomach, create appetite, and aid digestion.

The products of the orange are the fruit, distilled water of the flowers, and neroli or essential oil of the flowers. The Seville orange yields a very delicious water and essential oil from the flowers, which is much in demand amongst the Egyptian ladies for its odour, and also for mixing with the water they drink, and the tree is much cultivated in that country for the flowers they produce. The lime and lemon trees are also cultivated for and make excellent fences, kept properly clipped down.

I will now make some observations upon the value of the orange-tree, and others of the citron-family, not for cultivation only for its fruit but for its commercial value in the art of perfumery, in which it certainly acts an important part. Piesse says: "Some plants yield more than one odour, which are quite distinct and characteristic; the orange-tree, for instance, gives three—from the leaves, one called *petit grain*; from the flowers we procure *neroli*; and from the rind of the fruit, essential oil of orange, *essence of Portugal*. On this account, perhaps, this tree is the most valuable of all to the operative perfumer." A question then arises, why we should not have as extensive flower-farms in the Colony of New South Wales, where flowers of the kind required grow in great profusion, as in a similar climate at Nice, Grasse, and Cannes, in France? Some idea of its commercial importance may be formed when it is said, "that one of the large perfumers of Grasse and Paris employs annually 80,000 lbs. of orange-flowers, 60,000 lbs. of cassia-flowers, 54,000 lbs. of rose-leaves, 32,000 lbs. of jasmine-blossoms, 32,000 lbs. of violets, 20,000 lbs. of tuberose, 16,000 lbs. of lilac, besides rosemary, mint, thyme, lemon, citron, and other odorous plants in larger proportion."

I am indebted to Mr. Piesse's work on the Art of Perfumery for some of the following information, showing how large a trade might be carried on from this Colony in the citron-family, if only as an article of perfume. He says two distinct odours are procurable from the orange-blossom, varying according to the methods adopted for procuring them. This difference of perfume from the same flower is a great advantage to the manufacturer. When orange-flowers are treated by the maceration process, that is, by infusion in a fatty body, we procure orange-flower pomatum, its strength and quality being regulated by the number of infusions of the flower made in the same grease. The maceration process is thus conducted: The fat should be placed in a clean metal or porcelain pan, and melted by a steam heat or water-bath; the flowers are then to be placed in the liquid fat, and allowed to remain from twelve to forty-eight hours; the fat is strained from the spent flowers, and fresh ones are added several times, until the pomade is of the required strength. To preserve the fat from decomposition, a teaspoonful of the bi-sulphite of lime

to each pound may be added. By digesting this orange-flower pomatum in rectified spirits, in the proportions of from six pounds to eight pounds of pomade to a gallon of spirit, for about a fortnight at a summer heat, we obtain the *extrait de fleur d'orange*, or extract of orange-flowers—a handkerchief perfume surpassed by none. When orange-flowers are distilled with water we procure the otto of the blossom, which is known commercially as oil of neroli. The neroli procured from the flowers of the *Citrus aurantium* is considered to be the finest quality, and is called “neroli petale.” The next quality, “neroli bigarade,” is derived from the blossoms of the *Citrus bigaradia*, or Seville orange. Another quality, which is considered inferior to the preceding, is the neroli petit grain, obtained by distilling the leaves and the young unripe fruit of the different species of the citrus. The “petale” and “bigarade” neroli are used to an enormous extent in the manufacture of Eau-de-Cologne, and other handkerchief perfumes. The “petit grain” is mainly consumed for scenting soap. To form the esprit de neroli, dissolve $1\frac{1}{2}$ oz. of neroli petale in one gallon of rectified spirits. Although very agreeable, and extensively used in the manufacture of bouquets, it has no relation to the flowery odour of the *extrait de fleur d'orange*, as derived from the same flowers by maceration; in fact, it has as different an odour as though obtained from another plant, yet in theory both these extracts are but alcoholic solutions of the otto of the same flower. The water used for distillation in procuring the neroli, when well freed from the oil, is imported under the name Eau de fleur d'Orange, and may be used, like elder-flower and rose-water, as a lotion. It is remarkable for its fine fragrance. Orange-flowers were analyzed by Boullay, and found to contain volatile oil, bitter extractive, gum, acetic acid, and acetate of lime. Orange-juice consists of citric acid, malic acid, mucilage, albumen, sugar, citrate of lime, and water. Of essence of orange, or more frequently termed Essence of Portugal, he says:—The otto of orange-peel, or odoriferous principle of the orange-fruit, is procured by expression and by distillation. The oils of citron and lemon-peel are identical in composition with that of the orange. The peel is rasped, in order to crush the little vessels or sacs that imprison the otto. It has many uses in perfumery, and from its refreshing fragrance, finds many admirers. Its abundance in the peel is shown by pinching a piece near the flame of a candle; the otto that spurts out ignites with a brilliant illumination. It is the leading ingredient in what is sold as “Lisbon Water” and “Eau-de-Portugal.” The citron yields a perfume called Cedrat, from the rind of the fruit, both by distillation and expression, and the flowers when distilled yield a very fragrant oil, used principally by the manufacturers of Eau-de-Cologne.

That delightful perfume, Bergamot, is procured by expression from the peel of the fruit. The volatile oil of Bergamot differs from the other volatile oils of this genus in containing oxygen. It is believed to contain a mixture of oils, having the composition of citrene with a hydrate of such an oil, and an oxygenated oil formed by the action of the atmosphere (Liebig). Mr. Piesse, a few years ago wrote, in a letter to a gentleman of this city, the following directions, with, I believe, the view of inducing him to enter into flower-farming, and I was permitted to make the following extracts:—"Let the fat you employ be beef-suet, and when rendered purified; let it be done always as soon as possible after the animal is killed. There is a regular killing day in every market, and it is then the suet should be collected. Beef-suet and lard melted together in equal proportions forms a good body-grease for enfleury. In every case the flowers are to be used entire, and plucked fresh from the tree, to produce the best quality. Second quality only to be had by collecting the fallen leaf and petal. I can sell," he continues, "in the open market any quantity of flower-grease of fine quality. I advise you to begin your flower-business by distilling for the ottos, and put up a 30 or 50 gallon still. 1st, distil orange-leaves; 2nd, orange-flowers; 3rd, orange-peel; the same with lemons. Procure and plant as soon as you can some few hundred *Bergamot lemon*. The demand for Bergamot essence is constantly increasing—the Italian produce decreasing." Mr. Rimmel mentions a new system of enfleury, lately devised by Mr. D. Séméria, of Nice: "Instead of laying the flowers on the grease he spreads them on a fine net, mounted on a separate frame. This net is introduced between two glass frames, covered on both sides with grease. The whole series of frames is enclosed in an air-tight recess, and all that is required is to draw out the nets every morning, and fill them with fresh flowers, which give their aroma to the two surfaces with which they are in contact. This system saves the waste and labour resulting from having to pick the old flowers from the surface of the grease, and produces also a finer fragrance." In the south of France, in the principal towns close to each other, where the maceration and absorption processes are carried on, among other flowers, the quantities of orange-flowers are 2,000,000 lbs., worth about £40,000. The flowers are procured from growers by private contract, or sold in the market. The average quantities of the following articles are manufactured yearly:—1,200,000 lbs. of orange-flower-water, first quality (that is, distilled twice over the flowers); 2,400,000 lbs. of orange-flower-water, second quality; 1,000 lbs. of Neroli, an essential oil obtained from orange-flowers. The proximity of the sea is favourable to the growth of the orange, and the fruit is seldom found in great perfection further than 30 or 40 miles from the sea-coast. Royle

says: "Orange-trees live, but do not thrive, in the Neelgherries." In New South Wales the most luxuriant crops are produced on a slightly sloping land, with an eastern aspect, by which a good drainage is secured; and great care and attention being bestowed upon the plantations, a superior quality of fruit is ensured. The first large orangery I visited was in 1859, at Lane Cove, the property of Richard Hill, Esq., but now the property of Mr. M'Keown. After an agreeable drive of nine miles I arrived at the orangery. On entering the grounds the scene was beautiful. It is impossible to describe the effect produced by the mass of bright green foliage, studded in all directions with golden, luscious fruits, and redolent with the perfume of the flowers, realizing what Thomson, in his "Summer," says—

Bear me, Pomona, to thy citron groves;
To where the lemon and the piercing lime,
With the deep orange, glowing through the green,
Their lighter glories blend.

The situation of the grounds is good, having a north-east aspect, well sheltered from injurious winds. The land is well drained, and gradually slopes down to a well-watered creek, and on the opposite side of this gradually rises again. On the brows of these sheltered hills the rows of orange-trees are planted. At the entrance of the garden I remarked some fine lemon-trees, forming an agreeable contrast by the lighter green of their leaves and delicate hue of the pendulous clusters of fruit, with the darker tints of the orange-trees in their vicinity. The fragrance of the blossoms attracted multitudes of insects, butterflies of various bright tints, and innumerable bees, the latter imbibing the nectar from the flowers to convey to their hives, kept upon the grounds of this plantation. What a combination of beauty this scene displayed! What gratification it afforded to the senses! The air we breathed was filled with delicious odour, and the trees around were loaded with ripe and ripening fruit. The mandarin orange-trees are readily distinguished by the smaller leaf; and I observed that the fruit on the upper branches had obtained a large size, whilst those on the lower branches were much smaller. This orange, in Egypt and other countries, when budded on the Seville orange stock, form quick growing and fine trees, but when budded on the Shaddock, as recommended by others, bear a fruit of very superior flavour. The mandarin orange-tree, several of which in this plantation were 20 feet high and 40 feet in the circumference of their leafy branches, have yielded annually 350 dozen each tree, and the more common varieties have produced 280 dozen. The trees in this plantation, numbering nearly 900, surprised me by their healthy, luxuriant growth; and the absence of weeds evinced the great care bestowed upon them. Every two years the earth was dug around the trees, which, by

admitting air to the roots, and by occasionally manuring with bone dust and other fertilising agents, materially benefited their growth and productiveness. The trenching was carried from 20 inches to 2 feet in depth, which was always found amply sufficient. Bone manure is considered effective on clayey and sandy soils, and the benefit is felt for many years. It has been mentioned to me that some of the finest and most productive orange-trees have been grown near the Salt-water Creek, the subsoil consisting for the most part of shells, and among swamp oaks (*Casuarina*). The aborigines name the *Casuarina* "She-look," which has probably been corrupted by the early settlers into "She-oak." Another valuable variety in this orangery was the navel orange (a fine, large, and luscious fruit), originally from the Brazils; it is devoid of seeds, or has, at most, a solitary one, which is always abortive. This is a highly valued variety, but is usually regarded as a precarious and shy-bearing tree; and each tree usually bears only about 100 dozen. The crop of navel oranges is also very uncertain, the blossoms not being able to endure the hot winds so well as other varieties, and a large proportion is often destroyed. Nevertheless, from their extended cultivation, a great number of these delicious oranges are sold during the season; and, as they obtain a higher price in the market than others, it compensates the growers for their more limited production. The extent of ground planted with oranges at this place was 22 acres, the trees being about 23 feet apart; many of them were from 18 feet to 25 feet high; the latter when measured had a circumference of branches of 54 feet. It was a bright sunny day when this orangery was visited, with an exquisite clear Australian sky, and the light was playing over the plantation with a brilliancy and beauty that must have aroused the most apathetic to admiration of the luxuriant scene. Since Mr. M'Keown has been in possession of this orange plantation he has maintained its reputation, by great care and attention to its general cultivation, and by avoiding everything which could interrupt the luxuriant healthy growth of the trees. He has also grown the Bergamot lemon (*C. bergamia*), finds it hardy, and bears fruit very well; both flowers and fruit possess a powerful fragrance, and from both an essence of a delightful odour is extracted. It is said that $2\frac{1}{2}$ ounces of the oil, by expression, is produced from 100 fruits. The orange-tree generally begins to bear about the third or fourth year; but growers seldom or never permit the fruit to come to maturity until the fifth, or even the seventh or eighth year, by which time the tree has attained a considerable size, has more vigour, and will then probably, with care and attention, bear fruit to the age of 60 and 70 years, and even more. The soil at this plantation was ironstone and clay, with an upper surface of loam; the trees were 18 years old, and all

in full bearing. Generally the trees are planted too close together, which is an important error, as there is not a tree that exhausts the soil more rapidly than the orange, and *destroy one another*; it has been remarked to me, "that the greatest enemy to the orange-tree is its own kind," that is, when they are planted too close together. At the time of my visit the mandarin and navel oranges, being early varieties, were not of such excellent quality as the later ones. The manure used to the trees, as described to me, was bones and the refuse from the boiling-down establishments, and this was found to be a good fertilizing agent for orange-trees. It was applied in the following manner: A layer of bones was placed in the trenched ground, then a layer of earth, and lastly, the liquid from the boiling-down establishment was poured over the whole. This manure was applied every 5 years, and the bones left unbroken to decay and nourish the trees. Care should be taken by the grower not to over-stimulate (or what may be called *dram-horticulture*) by rich manure, as it is sure to be followed by exhaustion of the trees; many orangeries, very productive and remunerative at first, have been destroyed by the adoption of this plan of over-manuring. Bush-sweepings and burnt vegetable refuse, the ashes of which have been found very good manure for orange-trees, and lupins might be employed for the same purpose as obtains in the Azores. Some persons prefer grafting the orange on the stock of the lemon-tree, as it is thought to give a pleasant acid flavour to the fruit; but others fancy the orange stock, more especially the seedling Seville orange-tree, as the trees so treated attain a much greater age, with an increased bearing of fruit. Lindley observes, that "the lemon is considered to be a better stock for the orange than its own varieties"; but in New South Wales it is found neither to survive so long, nor stand the frost so well, as those grafted on varieties of the orange, more especially the Seville, which is the best. Mr. James Pye, of Rocky Hall, near Parramatta, one of our first practical growers of oranges for nearly fifty years in New South Wales, says on this subject:—

"I will first mention the mode I adopt in cultivating seedlings. I choose the finest oranges I can find from the healthiest trees which have never had any connection with the common lemon. I admit they are some time before they begin to bear, but they make finer trees, and as a proof of the quality of the fruit, the oranges I have sent to market for some time have realized more money than those grafted on the lemon.

"It is about five years ago since I commenced grafting upon the bitter orange stocks. I find them free from all insects, and looking healthier than any other kind of the orange tribe, and also find that the stocks have more small roots than any other kind. The mode of working them:—'I take the scions from the most healthy trees that bear the best fruit, which has had no connection with the common lemon.' Mr. Charles Moore, of the Botanical Gardens, in his report, after his visit to the orange countries, says: 'The mode of cultivation hitherto practised in Spain seemed to me to be similar

throughout. All growers appeared to follow one well-beaten track. It is only since the disease has proved so disastrous that there has been the slightest improvement, either in the culture or in the propagation of the plants. Greater attention appears now to be paid to both. Formerly, young trees from buds on stocks of citron or lemon were preferred. These, at two years old, are now scarcely saleable, even at the low price of two reals, or about 6d. each; while those of the same age on stocks of the bitter orange are readily purchased at twelve reals, or about 2s. 6d. each. Although the Spaniard is averse to change any old custom, yet the fact that the trees on stocks of the bitter orange were seldom or ever touched by the disease could not fail to fix his attention, and the result has been to bring plants propagated in this manner into great demand. One of the many remarkable instances of trees of this description resisting the disease was pointed out to me in what had been a very fine plantation, near Alcira. Here every tree was almost either dead or dying, with the exception of a group of about a dozen—all on the bitter orange—which were entirely unaffected, and in a fine healthy condition, while some of those surrounding them, which had suffered so severely from the disease, were raised from seed, others budded both upon the citron and lemon.

"All seeds used by me for raising trees or stocks, I select the large, round, and plump seed; the lean and thin ones I throw away. I plant them a distance from each other, to enable the roots to take their natural course, so that when I require to remove them I can do so without injury.

"First, what I object to is, the usual way adopted to sow the seed in drills, without any selection, and that from the refuse oranges which I disapprove of; consequently the roots get twisted and entangled together, that when they come to remove them the process of separating the roots injures the small fibres, which are the life of the tree. Secondly, grafting upon stocks four or five times the size of the scion, which takes a long time to heal over, and therefore it is difficult for the centre part to unite. Thirdly, I disapprove of the plan generally used in rearing trees upon ground which has been richly manured, as it causes the leaves to be nearly three times the size of an ordinary common orange-leaf, and is therefore unnatural, as every one must be aware that when removed to a poorer soil it is not likely to thrive.

"I may state that I have no objection to one cross with the common lemon; but if you go on crossing year after year I am sure it deteriorates the quality of the fruit (more particularly the keeping quality, which I have had proof of), as well as increases the red scale; and the reason I refer to it so often is that it is now difficult to obtain scions from trees which have had no connection with the common lemon; there is no tree so subject to the red scale, and there is none of the orange-tribe so free from it as the bitter orange. My nursery also consists (in addition to the above) of Lisbon lemons and mandarins, &c., which are both from grafts and seedlings, prepared as above.

"As Parramatta district is noted as being the finest district in the Colony for the culture of the orange—and I may state that were it not for that, both town and district would suffer materially—as the export of oranges from the district realizes many thousands of pounds, which is circulated in the town and district—thus, my object is to improve the growth of the orange, and not allow it to deteriorate."

Deviations from the usual construction of the fruit is occasionally met with in the citron-tribe in New South Wales. According to Mr. Masters ("Vegetable Teratology," p. 389) the orange is one of the plants most frequently subject "to an augmentation in the number of capillary whorls; sometimes this is due to the stamens assuming the guise of carpels, but at other times the increase occurs without any alteration in the stamens or other organs. If

the adventitious carpels be exposed, they are covered with yellow rind, while those portions that are covered by the primary carpels are destitute of rind." Lindley says: "The genus citrus is very subject to a monstrous separation of the carpels, which produces what are called horned oranges and fingered citrons, or to a multiplication of the normal number of carpels, in which case orange is formed within orange." A ripe seed usually contains a single embryo; in the seeds of the orange there are frequently two or more additional embryos. The orange is also placed in the list of plants producing double flowers. Mr. Masters says: "In some variety of the orange, called by the French 'Bigarades cornues,' the thalamus of the flower, which is usually short and terminated by a glandular ring-like disc, is prolonged into a little stalk or gynophore, bearing a ring of supernumerary carpels. These carpels are isolated, one from another, and are formed by the transformation of the filaments of the stamens."

In the Hunter River District there are several fine orangeries. One is particularly mentioned (Mr. Waddell's) in a daily paper as follows:—

"It is well-known that oranges form a large item of our exports to other Colonies, and that the demand for them has given a great impetus to the formation and improvement of orchards. The *Singleton Times* thus speaks of Mr. Waddell's orangery, at Townhead, Singleton. It covers upwards of four acres of land, and numbers 400 trees, the oldest of which were planted ten years ago. The trees were selected with the greatest care, Mr. Waddell having more regard to the quality of his fruit than to mere quantity. The Seville and St. Michael, so justly celebrated, grow here in perfection. Mr. Waddell pointed out a St. Michael tree, which, he told us, had averaged a yearly yield of 100 dozen oranges during the last four years. The tree was actually loaded; indeed, the owner states that at no former season has it exhibited so great a 'yield.' But every tree seems equally prolific, and Mr. Waddell thinks that they will average 100 dozen each, so that from his 400 trees he expects to gather 480,000 oranges. The orchard is kept in the highest order, and is laid out in great taste. The long avenues of trees, with the deep green leaves when the fruit is ripe, must have a very fine appearance. So umbrageous are these trees that it is deliciously cool in the orangery in the hot days of summer."

I should recommend those persons, whether visitors or residents, who may feel any interest in the naturalization of choice fruit-trees in New South Wales to visit the extensive gardens of orange and other fruit trees near Parramatta, and in other districts of the Colony. Oranges, lemons, apple, pear, loquat, apricot, peach, and other excellent fruits, together with extensive vineyards, stocked with superior kinds of grapes, may be seen growing in the greatest luxuriance.

My attention was directed to this subject by a visit made in December, 1866, to the extensive and fertile orangery of Mr. James Pye, Rocky Hall, near Parramatta. It is situated on a point of land known as the "Governor's Arms," on the south side of a

creek running from Castle Hill into the head of the Parramatta River. The orangery is planted on land more or less elevated, near a creek, the fruit-trees growing on the slopes as well as on level ground. I observed that the orange, lemon, and apple trees of various kinds (of which the greatest number of trees consisted) were in a very healthy state, and growing with the greatest luxuriance, *in a very poor sandy loam, from which large sandstone rocks cropped out over the whole of the land*, the trees being planted around and between them. The situation was sheltered, and the whole extent of the fruit-gardens was twelve acres, divided into three paddocks or enclosures; and the neatness and order of the ground, and the perfection of the trees in growth and bearing, excited our admiration. I remarked in the Azores or Western Islands that the soil is volcanic, and generally a friable loam, and many of the orange-gardens are formed in places where there is often not a greater depth of soil than eighteen to twenty inches above the shattered mass of rubble and rock which has been thrown together by volcanic action. The orange-trees at Mr. Pye's were still bearing ripe fruit; and a quantity of a second crop, as yet but small and unripe, were on many of the trees; for there are often three crops of oranges during the year, the fruit of each crop differing in form and size, but all of excellent flavour. I remarked that the oranges are of a dark-reddish orange-colour, of a deeper hue than I had usually seen them. Whether this was occasioned by the advanced state of the season, or other causes, I could not determine.

A quantity of oranges from the garden were lying in heaps in the out-house, ready for packing, as well as a number of well-filled boxes, prepared for transmission to Sydney. A large quantity of oranges are exported to Tasmania, Melbourne, and other of the southern ports of Australia, and also to New Zealand. There is a dark-skinned orange often seen on the trees, which colour is occasioned by a kind of fungus being deposited on the rind. It is called the "Black" or "Maori" orange by the growers. At first sight the dark colour occasions it to be rejected as unsound; but when tasted it is found to be of as luscious flavour as any of the oranges of the normal colour on the tree, and are excellent for keeping. In this garden there were a few very young orange-trees, easily distinguished at a short distance by their stiff clumpy form. Most of the trees had attained a height when the full beauty of their rich green foliage had been developed, and were laden with drooping clusters of golden fruit, some of the clusters consisting of from sixteen to twenty oranges. The *Herald* of June 10, 1865, mentions that a bunch of oranges, grown by Mr. Holroyd, was exhibited, containing forty-two oranges on a single stem the thickness of a finger, and was grown on a yearly-worked tree, planted out in September, 1860. The fruit was very fine,

and formed only a small portion of the produce of the tree from which it was taken. Some of the oranges, Mr. Pye informed us, had remained fifteen months on the tree, and when gathered were found to be sound, juicy, and sweet. On tasting some of them the result confirmed this opinion. The apple-trees, growing intermingled with the orange and lemon trees in this inferior soil, consisted of russet, winter pearmain, quarrenden, red-streak, and other excellent varieties. They were all healthy, and in full bearing, but the fruit was not yet ripe. It was certainly more than might have been expected, to see the apple and orange flourishing side by side. The Lisbon lemon-trees were bending under the weight of fruit of large size. Among some we gathered we weighed three. The first weighed 19 ounces; the second, 17½ ounces; and the third, 14 ounces. When cut, they were firm, very juicy, and in excellent condition. The varieties of the orange in the garden were the navel, mandarin, common, and a few Seville oranges, citrons, and limes. Although the whole of the excellent fruit-trees before-mentioned grew with the greatest luxuriance in this poor soil, yet I was informed that peach, nectarine, and other stone-fruit, would seldom last longer than three years after having commenced bearing. Many of the orange-trees were from 20 to 25 feet in height, and the wide-spreading branches and dense foliage afforded a cool and agreeable shelter from the heat of the sun. These trees were 20 years old. The trunk of one of them we measured was 4 feet 1 inch in circumference, 1 foot from the ground, and 3 feet 10 inches at 4 feet from the ground. Near them were some seedlings of large growth, 9 years old, the fruit of which had not yet been gathered. Seedling trees are considered by orange-growers in Europe to be far less liable to be attacked by insects than those raised by layers. The trees, Mr. Pye informed us, were occasionally refreshed by fresh soil, to replace that which had been washed away by heavy rains; and at certain intervals of time bone-dust was applied as a manure. From the situation of the gardens, the roots of the orange and other fruit trees appeared to be well drained; for, from the locality, and the nature of the soil, it was not likely that water would accumulate at the roots, which often causes the destruction of the orange-trees, more especially when the soil is clay, and the drainage is not attended to.

On arriving at another part of the orangery, the magnificent orange-trees, celebrated for their size, and one of the objects of our visit, were now before us in all their beauty of fresh luxuriant foliage, and profuse bearers of luscious fruit. The previous accounts I had received of them were not over-rated, but it is only by actual inspection and attentive examination that a correct idea of them can be formed. It is seldom that in orange-growing

countries trees are seen of this magnitude. One has been mentioned growing at St. Michael's (Azores) which, when measured, was found to be 30 feet in height, and the stem 7 feet in circumference at the base. The photograph of these beautiful trees, taken by Degotardi for the Paris Exhibition, although executed with great accuracy, does not represent the graceful drooping of the dense foliage, the delicate tints of colour—from a dark to the lightest hue of green—the light and shade of the leaves being contrasted by the rich colour of the ripe and ripening fruit; this is all lost in a photograph. The elegant appearance of these beautiful vegetable productions can only be truly and accurately obtained by a drawing in water-colours, and if executed by an artist accustomed to sketch from nature, would, no doubt, succeed in delineating their natural beauties. The lofty sandstone rocks on the opposite side of the creek, forming a back ground, would afford a good relief to the picture. This rocky portion of the landscape comes out very well in the photograph. These noble trees are now 40 years old, and, although of full growth and mature age, were covered with a bright and luxuriant foliage, the bark smooth and healthy, young and slender stems branching in all directions, indicative of a vigorous and robust state of health, and bearing large crops of fruit every year. An agreeable shade was obtained under the extensive branches, where several persons could find a cool and agreeable resort from the heat of the sun. The loftier of the two trees was 35 feet in height; and the other was 30 feet high, but surpassed the former in the circumference of its branches, which by actual measurement was 33 feet in diameter from the extremities of the branches, making a circumference of 99 feet. The first tree bifurcates a few feet from the ground; and below the bifurcation, at a foot from the ground, the trunk measured 5 feet in circumference. The circumference of the lower portion of the bifurcated stems was,—the first, 3 feet 3 inches; and the other, 2 feet 10 inches. The fresh, vivid green of the foliage, and general healthy appearance of these as well as all the orange and other fruit trees in these extensive grounds, could not but excite our admiration. It has been stated that in 1859 Mr. J. Pye gathered from two large trees in his orangery 2,000 dozen (24,000) oranges. The gardens are situated on the banks of the creek, at an elevation varying from 25 to 30 feet. Pomegranate, loquat, quince, and other fruit-trees were planted in the gardens; but orange, lemon, and apple trees of luxurious growth formed the largest proportion of fruit-trees, and was a sight rarely if ever seen in any other climate in the world.

In August last I visited the orangery of Mr. A. T. Holroyd, at Sherwood Scrubs, near Parramatta. It was a very young orchard, compared with that of Mr. Pye, but it was in an excellent and flourishing state. The orangery consists of 13 acres, on which

there are 850 trees planted, having about seventy trees to the acre. Ten of the trees, he informed me yielded this year upwards of 550 dozen of oranges.

There appears to me to be a great desire, on the part of the orange-growers in this Colony, to import the St. Michael's orange, regarding it as a variety of very superior quality. On ordering plants of it from Europe, many have supposed they had obtained it, but were not satisfied with the result; for, on coming into bearing, the trees did not produce the expected thin-skinned variety, free from seed. The disappointment arises, in my opinion, from this cause:—From observations made at the Azores or Western Islands I do not consider, except as a variety, it differs from the common orange generally cultivated in the Colony; the improvement in the quality of the fruit, constituting a variety, resulting from the genial climate, soil, or careful cultivation. There are some trees at the Azores which are very old, and these bore the thin-skinned orange, very juicy, and free from pips. The thinness of the rind, and freedom from seeds, will be found to depend on the age and careful cultivation of the tree. The younger trees, in all the gardens I examined, and the fruit which was at the same time in process of packing for England, were for the most part similar in quality to the common orange produced in New South Wales (which was originally introduced from the Brazils in 1788, and is no doubt the Lisbon orange, brought from Portugal to that part of South America), and generally with abundance of seeds. At the Azores the orange-trees are planted at a distance of from 25 to 30 feet apart, and the ground sown with lupins, which are considered by the Portuguese to be a favourite food of the orange-trees, being subsequently used as a manure for the trees. Beans (various kinds of *dolichos*) are also I believe largely grown in Japan expressly as a manure (treated with the lees of the spirit distilled from rice) for mulberry-trees. To fortify our mulberry-trees beans is just such nourishment as beans are calculated to supply, and lupins may be equally advantageous for orange-trees. Seven years elapse from the time of planting before the orange-trees come into full bearing, during which space of time, more especially among the poorer class of proprietors, the garden is sown with melons, water-melons, and other vegetables. The orange-trees are pruned every year, so that by thinning out their superfluous branches a free circulation of air is allowed, which is required for the proper ripening of the fruit. The orange-grounds at the Azores vary in size from 1 to 60 acres, and they are rarely occupied only by orange-trees; for, besides the vegetables before-mentioned, among the more opulent owners, limes, citrons, sweet lemons, guavas, loquats, and other trees, are scattered about. A recent writer (Mr. P. Wallace) observes, "that there are two kinds

of oranges cultivated in the Island of St. Michael's (Azores), namely, the Portugal and the mandarin. Many varieties of the former exist, and they are greatly improved by the genial climate of St. Michael's. The mandarin orange has not been many years in the island, nevertheless there are some trees of it 14 feet high. This capital little orange has lately been exported to England, where it realizes a higher price than the common St. Michael's."

Mr. George Oakes has also been very successful in the cultivation of the orange, near Parramatta, and well bears out what the soil and climate are capable of producing. Some navel oranges, taken from trees that will be 5 years old next spring, and were grafted on seedlings, were exhibited very recently in the Sydney Market, and were found to weigh, respectively, 22, 22½, and 25½ ounces. Two common oranges on a single stalk weighed together 32 ounces. Some large specimens of the Emperor mandarin orange, exhibited at the same time, also confirmed the excellence of the cultivation.

It is usual among the fruit-dealers of Australia to purchase the whole of the produce of an orangery, and gather the fruit as required for exportation, or for sale in the Colony. From £50 to £1,800 are realized by the proprietors as annual incomes (varying of course when bad crops, disease, or other causes affect them) from the produce of their orange plantations, according to the extent of fruit-bearing-trees and choice varieties,—some of the dealers paying for the whole of the produce, whilst others purchase from the growers by the dozen, according as they consist of the rarer or more common varieties. Mr. Hill, during the year 1858, gathered, and sold for exportation and home consumption, 40,000 dozen oranges, leaving about 20,000 dozen unculled.

As the orange-tree increases in age, so the fruit improves in quality, that is, if it is originally a healthy tree and grafted on a good stock,—the younger trees bearing fruit with a thicker rind and abundance of seeds; as the tree becomes older, the skin becomes thinner, the fruit much more juicy, and the seeds diminish in number. Mr. Hill said that some of the old trees in his garden bore fruit of the thinnest skin and most luscious flavour. Mr. Buller states, "that some of the trees at the Azores bear at a very great age; some in one garden were 100 years old, still bearing plentifully a highly-prized thin-skinned orange, full of juice and free from pips. The thinness of the rind of a St. Michael's orange, and its freedom from pips, depend on the age of the tree." The orange-trees in New South Wales commence bearing ripe fruit about the month of June; they are at that time of an acid flavour, but are sweeter in July; and from September to January they are in perfection. The season seldom terminates until February, and even as late as the 13th of March oranges are occasionally exposed for sale. We find in New South Wales

that if the fruit is allowed to remain upon the trees, and only plucked as required, they last all the year round, or, at all events, until the next crop begins to ripen. The late blossoms form a second crop, which ripening later in the season, keep up a supply for the table; but oranges left too long upon the tree in any quantity are liable to injure the fruit of the next season. Oranges of the second crop are small, with the pulp peculiarly crisp and sweet, containing (if any) very small abortive seeds; sometimes the rind remains green, or of a pale greenish yellow colour. Although it has been considered that these and other fruit trees have no season of rest in Australia, yet, when there have been two productive seasons, the third (which I regard as the season of rest) will generally be a failure. It is an admitted fact that resting is necessary for the production of the finest fruits and flowers. The orange-tree is stated to be found in perfection when the temperature of the soil rises to 80° or 85° , and never falls below 58° . The average natural ground-temperature at Port Jackson, according to Lindley, is — season of growth, 67° ; ripening, 75° ; rest, 58° . Lindley also observes that the abstraction of fruits and flowers augments the vigour of the branches, or of the parts connected with them, and that the removal of any part which takes up a portion of the food employed in the support of the flowers, increases their luxuriance. This is not sufficiently attended to in New South Wales, where, although the fruit is abundant and good, growers are too much in the habit of regarding quantity more than quality; and this remark applies to other fruits beside oranges, whereas, by attention to pruning, thinning the fruit and flowers, and care in general cultivation, the fruit would be superior both in size and flavour; indeed, it would be advantageous when orange or other fruit trees produce a superabundance of blossoms, to thin them, leaving those having the stoutest stalks and nearest the centre; this would have the effect of diverting the sap to the flowers which remain, and as regards the orange-flowers they could be utilized for perfume; the laundresses in the orange-growing countries know well how to employ the flowers, for, from the gratefulness of their odour, they are in the habit of sprinkling them over their clean linen, thus imparting to it an agreeable fragrance. The Chinese scent their teas with orange-flowers, which is described by Fortune as follows: "In a corner of the building there lay a large heap of orange-flowers, which filled the air with the most delicious perfume. A man was engaged in sifting them to get out the stamens and other smaller portions of the flower. This process was necessary, in order that the flowers might be readily sifted out of the tea after the scenting had been accomplished. The orange-flowers, being fully expanded, the large petals were easily separated from the stamens and smaller ones. In 100 parts, 70 per cent. were used and 30 thrown away.

When the orange is used its flowers must be fully expanded, in order to bring out the scent. When the flowers had been sifted over in the manner described they were ready for use. In the meantime the tea to be scented had been carefully manipulated, and appeared perfectly dried and finished. At this stage of the process it is worthy of observing that, while the *tea was perfectly dry, the orange-flowers were just as they had been gathered from the trees*. Large quantities of the tea were now mixed up with the flowers, in the proportion of 40 lbs. of flowers to 100 lbs. of tea. This *dry tea* and the *undried flowers* were allowed to lie mixed together for the space of twenty-four hours. At the end of this time the flowers were sifted out of the tea, and, by the repeated sifting and winnowing processes, which the tea had afterwards to undergo, they were nearly all got rid of." The foliage of the orange-trees affords food to the caterpillars of several lepidopterous insects, among which are *Papilio erectheus*, *anactus*, and *sthenelus*. In the month of November the caterpillar of that large handsome butterfly, *P. erectheus*, may be seen in various stages of growth upon the orange-tree, munching the trees and injuring the trees. They should be collected and destroyed, or otherwise the quality of the crop of fruit will be injured by them. There is also an insect which feeds upon the orange-tree in its larva state, resembling the locust of the Colonists, but differing from it in generic characters; it is the *Cystosoma saundersii*, and is known in the Colony by the name of the "Orange Locust." They have been found very numerous at the orangery at Ash Island, Hunter River. Orange-trees are often found covered with a minute black fungoid plant, resembling the appearance of soot, for destroying which lime-water proved very efficacious. Another disease, the scale (*coccus*), is prejudicial to orange-trees—retards their growth, and renders them sickly. According to some writers it may be successfully treated by rubbing it off with a sponge dipped in soap and water, in the proportion of two ounces of soap to a gallon of water. A good dressing for this purpose, suggested by Mr. Grey, is—Soft soap, $\frac{1}{2}$ lb.; flour of sulphur, $\frac{1}{2}$ lb.; nux vomica, $\frac{1}{2}$ oz.; hot water, 6 qts.; when cold, take a sponge and wash the parts infested, and three days after the insects are destroyed. The washing may be repeated three times every year. The application may also be used for Aphides. M. Robineau-Desvoidy says "that the *coccus adonidum*, a native of Senegal, attacks especially the citron and lemon trees; the *coccus hesperidum*, a native of America and Africa, prefers the orange, rose bay, and peach trees. The *coccus adonidum*, a native of the Indian Archipelago, attacks the lauraceous trees; the *coccus olex* commits the greatest ravages upon the olive-trees, but also attacks the orange and other trees, and is the most destructive of all." (*Comptes Rendus*, 1852. *Annals*

of Nat. Hist., vol. 11, 2nd series, 1853.) Some attribute the fungus to over-manuring; but it may result from a directly opposite cause. In 1843 so complete was the ravages of the coccus of the orange-trees, that at the Island of Fayal (one of the Azores) the entire produce was lost from this cause alone. It has been recently stated (Gardener's Chronicle, Sept. 10, 1870), that previously to the year 1842 from 20,000 to 30,000 boxes of oranges were annually exported from Fayal, but owing to the attacks of the insect (*Coccus Hesperidum*), which destroyed the trees, for several years no oranges were produced. For the last fifteen years the insects have been gradually disappearing, and the exportation of oranges is augmenting. It is calculated that the crop of 1868 yielded 6,430,000 oranges.

A question may arise whether it would not benefit the trees, and improve the quality of the fruit, when abundant, to thin them, and use the young fruit, as in France, for making conserves? Whatever may be considered the origin of disease in trees, judging from the laws of physiology we cannot be wrong in attributing it to many causes, among others, over-stimulation and the reverse, neglect of proper drainage of the roots, over-production, and being grafted on an inferior stock. By any of these the constitution of the tree will be weakened, and rendered more liable to the attacks of the coccus and other diseases. To some such cause may be attributed the disease which attacked the orange-trees at the Azores in 1834, when it was observed for the first time that the orange-trees cracked at the base of the trunk, and allowed a viscid liquid to escape—hence the term "lagrima," given to the disease. Soon afterwards the bark separated from the wood, which latter with the roots decayed, and the tree soon died.

The treatment adopted for this malady consisted in removing the diseased limbs, in making large incisions to favour the escape of the liquid, and in exposing to the air the roots, which were considered the principal seat of the disease. A second disaster was caused by the appearance of an insect nearly allied to coccus, a native apparently of Brazil, first observed in 1842 in the gardens of Fayal. This insect soon spread and multiplied in the other islands, and covered the orange-trees with its galls. The vegetation of the trees became enfeebled, their foliage became yellow and dry, and many trees died in consequence. Nevertheless, this plague was not so disastrous as the preceding.

This is probably the disease mentioned by Mr. C. Moore in his "Report on the Orange Plantations in Spain and Portugal," as observed by him at Valencia, as follows: "Its presence is first indicated either by a black gummy substance exuding from one side of the stem, a little above the ground, or in the bark at the

very base of the stem becoming soft and discolored. In either case, when these symptoms appear, certain portions of the bark, wood, and roots are already in a decomposed state, and emit a most offensive smell."

The following account, which refers to this disease, with the chemical analysis by Professor Bunsen, published in the *Chemical Society*, December, 1868, will be interesting:—

"Professor Bunsen, of Heidelberg, one of the founders of that mode of chemical research known as spectrum analysis, by which the existence of terrestrial substances in the sun and fixed stars has been proved, has had his attention drawn lately to a more homely topic, in which our orange-growers may find themselves interested. The orange plantations along the south-eastern coast of Spain, and in the adjacent Balearic Isles, have recently been visited with a severe epidemic, the rapid progress of which was naturally viewed with no little anxiety by the people, since the culture and exportation of oranges constitute one of their principal industries. This disease is said to have made its appearance at Valencia, and to have spread to the islands during the summer of 1867. The first symptoms of the sickening manifest themselves in the leaves, which turn yellow, and in time drop from the branches. During the progress of the disease the roots exhale a most disgusting odour, and within a very few days after the attack the tree succumbs. But the true nature of this remarkable disease, hitherto unknown in these parts, is very imperfectly understood; its origin is involved in complete obscurity, and as yet it has baffled all attempts at remedial measures. Happily, however, its violence, which at one time threatened destruction to the entire plantations in the islands, has, of late, considerably abated, and the disease seems to be gradually dying out. These particulars were collected by Professor Bunsen, who visited the Balearic Isles in the summer of 1867; and as it appeared interesting to ascertain the nature of the inorganic constituents of the diseased trees, and to compare it with the ashes left by the combustion of perfectly healthy specimens, he procured all the necessary materials for analysis. Accordingly analyses of the ashes of the roots, stem, branches, and fruit were made in the laboratory of the University of Heidelberg, under Professor Bunsen's direction and superintendence.

The following are the results compared with those obtained from perfectly healthy trees grown in the Island of St. Michael:—

Root.		
	Diseased.	Healthy.
Amount of ash left by 100 parts	1·37	4·48
Potash	6·75	15·43
Soda	5·72	4·52
Lime	61·98	49·89
Magnesia	7·72	6·96
Peroxide of Iron	1·24	1·02
Chloride of Sodium	1·50	1·18
Phosphoric Acid	1·57	13·47
Sulphuric Acid	4·76	5·78
Silica	8·76	1·75
	100·00	100·00

STEM.		
Amount of ash left by 100 parts	Diseased.	Healthy.
	3.29	2.74
Potash	10.87	11.69
Soda .....	.18	3.07
Lime	71.22	55.13
Magnesia	5.96	6.34
Peroxide of Iron	0.00	0.57
Chloride of Sodium	5.78	0.25
Phosphoric Acid	2.69	17.09
Sulphuric Acid	3.30	4.64
Silica	0.00	1.22
	100.00	100.00

DISEASED BRANCHES.

Potash	3.49
Soda	0.67
Lime	82.51
Magnesia	4.31
Peroxide of Iron	0.51
Chloride of Sodium.....	0.15
Phosphoric Acid	4.83
Sulphuric Acid.....	0.40
Silica	3.13
	100.00

FRUIT.

Amount of ash left by 100 parts	Diseased.	Healthy.
	0.00	3.94
Potash	51.64	36.42
Soda	1.45	11.42
Lime	23.80	24.52
Magnesia	4.41	8.06
Peroxide of Iron	0.14	0.46
Chloride of Sodium	2.19	3.87
Phosphoric Acid	12.07	11.07
Sulphuric Acid	3.78	3.74
Silica	0.52	0.44
	100.00	100.00

It will be noticed on instituting the comparison, that the composition of the ashes of the healthy tree differs widely from that of the diseased specimens. The want of analogy is more particularly seen in the undue proportion of lime and the comparative lack of phosphoric acid in all parts of the unhealthy tree, with the exception of the fruit; but the concentration of potash in the latter is remarkable. Whether, however, these deviations may in any way be connected with the *source* of the disease, or are themselves its *results*, remains to be proved.

Hitherto the culture of the orange has nowhere been carried to a greater degree of perfection than in the Balearic Isles; but the yield of fruit seems to have been forced by excessive manuring to a most unnatural extent, and probably in this injudicious over-working of the trees may be found the cause of their sickening.

Sir R. Schomburgk, in his history of Barbadoes, says: "The orange and lime trees are subjected to great ravages from the insect tribe. The female of a gall insect covers itself with a white cotton-like stuff, in which it deposits its eggs to the number of from 150 to 400. The young brood feed on the tender parts of the tree, and multiply so rapidly that they have been known to destroy whole groves of orange-trees. It is a species of *Dorthezia*, resembling *D. Citris*, which in Italy is called *Morfea*. *Coccus Adonidum* Linn. is likewise highly injurious. The leaves of the orange-tree are at times marked below by a yellowish somewhat concave spot. This is a certain sign that another small insect has established itself, which belongs to the coccus tribe. It is of a reddish colour like *C. Adonidum*. The female deposits its eggs to the number of ten or fifteen in the leaf, and as they multiply very rapidly they are equally injurious as the other insects. The best remedy is to pluck off the yellow leaves and burn them; smoking with sulphur appears to have no effect." I will now direct attention to an extract from Mr. C. Moore's "Report on the orange plantations in Spain and Portugal," as bearing upon the practical working of the orange plantations in this Colony:—

"Hitherto, in the Murcia and Valencia plantations, 90 per cent. of the worked orange-trees were upon citron stocks; about 8 per cent. upon lemons, which were the first attacked by the disease, as were the lemon-trees themselves, and with such fatal effects that this fruit has almost ceased to be exported from these districts—at one time the most productive. Only about 2 per cent. are upon the bitter orange, arising from a deeply-rooted belief, which long prevailed, that this kind of stock would give a degree of bitterness to the fruit of any other variety which might be worked upon it. As time however has proved this idea to be fallacious, and as, moreover, trees on stocks of this description were scarcely affected by the prevailing disease, they are now, as I have previously observed, preferred (at least in Spain) to any other kind. I could not learn that any regular system of pruning was adopted; all that seemed to be done in this respect was to keep the trees clear of dead or decaying branches. The usual distance between the trees in the majority of plantations was about 18 feet each way, and all were planted in straight lines. In many places the trees must be of very considerable age; but on this point I could not obtain any reliable information. The largest which came under my observation in any country were not more than about 26 feet high, with well-proportioned breadth. Trees of this size are calculated to bear annually about 2,000 oranges. Towards the latter end of November the fruit is sufficiently ripe to gather for exportation. If a second crop is produced, which is seldom the case, the fruit rarely arrives at perfection, as it is almost invariably blown off by the high winds in early spring, which not unfrequently cause serious damage to the young and bearing wood. To guard against this, protection is given in exposed situations, either by high walls or by plantations of trees of a more robust character than the orange. Both in Portugal and in Spain the orange is more or less infested with the same kinds of coccus or scale, which are or have been so frequent upon trees in the Colony, and are regarded by some Colonial orange-growers as the cause or origin of the disease from which so many orchards have been destroyed. In Europe the presence of these insects is not so considered, as they were known to attack the orange long

before the present fatal disease appeared. Two kinds of coccus were sent to me by Mr. Pye, from his orchards, near Parramatta. I had them brought under the notice of Professor Westwood, of London, who pronounced them to be allied, if not identical. The small white kind, the *coccus vitis*, and the larger one, commonly called the black scale, to the common mussel coccus of naturalists, both very common in Europe.

"In addition to these pests, the Spanish trees are subject to the white or mealy bug, which greatly injure both foliage and fruit, and from which, I believe, the trees in the Colony are yet quite exempt. In Europe, that peculiar form of disease, by which the fruit in the Colony is sometimes attacked, called 'Maori,' is entirely unknown. Some fruit so affected, kindly sent to me by Mr. Pye, I submitted to the inspection of the Fellows present at a meeting of the Linnean Society; and although some excellent cryptogamists were there, and examined the fruit very carefully, no distinct form of fungus could be discovered, although it was the general opinion that some fungus, in an incipient state, was the cause of the cuticle of the fruit becoming discolored."

The opinions I formed and published some years ago have been fully borne out by Mr. C. Moore's observations in Spain, and the experience of other practical growers, that bad drainage, soils unsuitable for the orange, exposed situations, exhaustion, and trees of weak constitution, and over-manuring, all these physiology teaches us, is incompatible to make an orangery productive for any length of time; whilst by planting good healthy seedlings from naturally productive trees, or by grafts, more especially on the Seville orange, would render them free from disease, bearers of fruit of superior quality, and capable of attaining a good age. An article, published in the journal of the Agricultural Society of New South Wales on orange culture, also bears out many of my remarks, as follows: "There is a circumstance which deserves to be borne in mind by orange-growers, and this is the absolute amount of material annually carried away from the land in the produce of the tree, and never returned again, except by those who manure. Let anyone compute what this is. Mr. Watt has obliged us with the result of a practical analysis just made. The average weight of an orange he determines to be 4 ounces, so that one dozen of them may be said to weigh 3 lbs., and 250 dozen (no unusual product for a good-sized tree) 6½ cwt. Directing his attention only to the peel, he discovered that the peel of an orange weighing 4 ounces weighed 960 grains. When the peel was burned the ash weighed 7 grains. Computing this abstraction on the supposition of the crop named above, it will be seen that each tree will remove of absolute soil, or soil elements, which must in some way be restored, 2½ lbs., and taking seventy trees to the acre, of nearly 2 cwt. per acre. Now, be it observed, that of this bulk abstracted from the soil, *fully one-half is potash* in one of its compound forms. The other half consists of silica, lime, and phosphate of lime, &c. If we follow up this subject a little further we may probably arrive at a point

where our non-manuring friends will perceive their folly. Potass is not supplied to the soil either by the water or the atmosphere, like some other elements essential to the growth of a plant. It exists in the soil in various quantities. The granatic and the volcanic soils contain it in most abundance; soils formed by degradation of sandstone rocks are poorest in it. Some soils contain absolutely no potass. It does not, however, follow that these soils will not produce plants requiring potass, because it may be artificially supplied." In Jamaica some of the most delicious oranges in the world are produced, and this is what Mr. Macfadyen says: "It may be remarked of all fruits, into whose composition the saccharine principle enters largely, that these acquire the sweetness and flavour for which they are esteemed most readily in a *limestone* district. Thus, the finest in Jamaica are raised on the white limestone of the parish of St. John, and in no part of the world are *sweet oranges* produced in such abundance as in Manchester. The rocks which compose the south-west boundary of Blue Mountain Valley are of the same formation, and it is remarked of an estate in that district, that the seeds of oranges, sown by the negroes there, turn out uniformly sweet. On the contrary, in the neighbourhood of Bath, where rocks of the trap and secondary formation prevail, all the oranges have more or less of acidity." On inquiry I found it impossible to ascertain with accuracy the exact amount of oranges exported from Sydney; but on reference to the Custom House, as near as could be procured, the export to Victoria, &c., was as follows:—

Year.	Packages.	Value.
		£
1866	76,758	46,708
1867	74,726	34,026
1868	52,163	25,730
1869	107,619	45,919

This does not include the export of oranges from other ports of the Colony.

The following letter was written by Don José da Canto to Mr. Charles Moore, with reference to the disease of the orange-tree, from his own observation at the Azores, and will no doubt be interesting, confirming many of the extracts and remarks previously made. It is dated from Paris, May 27, 1868. The orange-trees alluded to arrived at the Botanical Gardens, Sydney, in a very flourishing condition, and after remaining some time in the Gardens under cover they were sent to Mr. Pye's Orangery, at Rocky Hall, near Parramatta, where, with but one exception,

they were thriving well planted out; from these it is intended to distribute the scions among the orange-growers when they have attained sufficient size:—

“With regard to the disease of the orange in the Azores, I am enabled, from personal observation, to give you some information. The disease was first observed in our gardens about the year 1836, but it is probable that for a year or two previous it must have been not inactive, inasmuch as the consequences we then observed were very general and disastrous. At first we noticed that our orange-trees were dying one after another, and were wholly unable to divine the cause; ere long, we found it was our best and oldest trees that were thus disappearing. At that time we had trees producing from 6,000 to 20,000 oranges a year—trees that were as much as 200 or 300 years old. By degrees we began to observe that all the trees affected with the disease produced a very large crop exactly on the year the disease manifested itself; that the leaves became yellowish, and fell off in great quantities; and that on the trunks or stems, near the ground (and sometimes beneath the ground), the bark opened, and drops of a kind of yellow gum exuded. As this last-named fact was in all cases observable where the trees were so diseased, and as the drops of gum took the shape of *tears* (*lagrimas* in Portuguese) the disease was called by us the ‘*Lagrima*,’ the name by which it is still known amongst the Portuguese orange-growers. At first many orangeries were quite destroyed, and had to be replanted, so that a remedy for so great a misfortune was most earnestly sought for. Opinion as to the cause of this disease was very much divided. Many thought it must be that the orange-tree had but a limited period for its existence, and that, this limit being reached, the tree must thus naturally decay. As the only way which we then had for propagating orange-trees was by layers, we thought that the proposed explanation was not an unreasonable one; but later it was found that new *seedlings* were attacked in the same way, although not with so much violence. Then, again, others thought that it must be something in the atmosphere which prevented the free circulation of the sap and other fluids, and supposed that this must be the origin of the disease. The great point, of course, was to find an easy and practical mode for remedying the evil. Gradually, after repeated trials, we found that superabundance of moisture in the soil was one of the worst conditions for the disease, and every kind of drainage was the best way for improving the health of the trees. Soon afterwards we found that the destruction of all the diseased bark and wood in the stem of the tree affected was the best method for us to adopt in trying to save the tree. Now the disease still exists in our gardens, but it has ceased to cause us uneasiness. From the month of February till August a skilled horticulturist visits, month by month, every tree in an orange plantation, inspecting the stem near the ground, and—at the slightest sign of any exudation of gum—he cuts the bark across, so as to allow the gum to run freely out. If he finds the disease in a more advanced state, both the bark and the wood must immediately be cut out, until that which is sound shall have been reached;—the earth being, at the same time, withdrawn from contact with the stem, and the largest roots left quite exposed to the air, free from any of the soil, to the distance of from 1 foot to 2 feet from the stem. The small roots on the side where the gum has appeared are carefully examined, and every decayed portion of them cut off. Great care is, moreover, taken to prevent the accumulation of rain-water near the stem where the roots are exposed. If the attack of the disease be discovered at an early stage the tree, by this treatment, is soon restored, and even when the disease is more advanced, the tree, by following out this treatment, generally recovers. When they are long in recovering we find it more profitable to plant a new orange-tree, and to provide for such contingencies we have always numerous supplementary orange-trees in our plantations. Although the

disease continues to exist, our gardens now look very prosperous, for the remedy is known, and the disease causes no such ravages as it did for the first seven or eight years after it made its first appearance. Orange-trees take very easily by transplantation, and we always keep our plantations fully supplied. The only and great difference which our orange-gardens present is this, that we have no longer old and large trees in our plantations; you can no longer count upon handing your orange-trees over to your children.

"A great revolution has taken place in consequence of this disease in the culture of our orange-trees. In old times the orange-trees wanted no culture at all. The old trees produced abundant crops of the most beautiful thin-skinned fruit, well ripened by exposure to the sun and a free circulation of the air. Since the appearance of this disease, however, we shelter our orange-trees very much against the winds, and this shelter (procured by the plantation of rows of large trees) prevents, as a matter of course, the free circulation of the air, the free passage of the light, and the direct action of the sun. We manure our gardens with common court manure [stable dung?], seaweeds, and lime; and we trench underground a green crop of white lupins, which promotes a considerable amount of vegetation. We also dig the ground under the trees once every season, and so on. The consequences are a great development of the productive power of the tree—abundant crops, but of a very inferior kind. The oranges are no longer thin-skinned, and no more of that deep golden colour and inviting aspect which formerly distinguished them. They have also lost much of their reputation in the English markets, and the durability of the fruit has been lessened. Forty years ago we could send our fruit to Norway and to Russia, and now our fruit will scarcely arrive in England in good condition after a fortnightly passage.

"So we are returning once more to some of the old traditional culture. We are clearing the shelters, pruning the interior of the trees for the admittance of air and light, are less liberal with supplies of manure, and do our utmost to get the ground under the trees free of all weeds, except when we want to excite vegetation. We have abandoned the propagating by layers, and graft good chosen kinds upon seedling stocks. For shelters we give preference to trees that have not a thick foliage, and take care not to let them grow too high.

"I shall be very happy to find that any of these hints have proved to be of any use to you.

"As to the varieties now prepared for culture, we give our preference to some of the Brazilian varieties, and to some good ones obtained from seedlings. The good qualities of our old oranges were, I think, more due to the old age of the trees and complete exposure to the air, heat, and light, than to any peculiarity of the usual variety. Some of the Brazilian varieties are truly good, and keep their qualities through any culture.

"I have had the pleasure to forward to you, through Mr. Veitch, five boxes with a dozen of each of the most approved kinds. Mr. Veitch has detained them for some time in London, under the supposition that their roots were not good enough for a long voyage, but I hope they will now have arrived, and will soon produce such fruit as may serve to confirm the good name which they have gained amongst us."

In a leading article, published in the *Sydney Morning Herald*, of November 13th, 1868, alluding to the foregoing letter, there are some very excellent remarks upon the errors in the mode of treatment adopted for so many years in this Colony of the

orange-trees ; and all those practically acquainted with the subject will readily agree with the truthfulness of the statement. The observations I allude to are as follows :—

“ The orangeries, of which Mr. Moore’s correspondent writes, are at the Azores, in about the same isothermal relations to the Equator as the southern part of New South Wales. Oranges it seems have been cultivated there for the last three or four hundred years, and there are, or were, trees from two to three hundred years old bearing heavily every year.

“ Until the year 1836 the gardens never gave their owners an instant’s uneasiness. They budded, and blossomed, and fruited, with unvarying regularity. The growers would have as soon suspected the sun of variation from his diurnal course as the orangeries from their yearly round of duty. They were bequeathed from father to son with as much confidence as the soil which bore them, and lasting, as they did, from generation to generation, it is not surprising that they came to be symbolical of permanence. Not only were they possessed of the quality of permanence, which is a very agreeable quality, in a world characterized by incessant mutation, but these trees cost the growers no care, no attention, no labour, save the labour of picking and packing, so far as we can understand. The people might dance and drink, and drink and dance the year round, and the orange would blossom and fruit without trenching, without manuring, without draining, it may be without pruning. The plant was neither fickle nor fastidious, and the islanders rejoiced in their orange-trees which provided them with bread, and demanded no labour of them in return.

“ Suddenly, however, there came a change. This bright picture of the growing, green-leaved, self-contained tree, surrounded by a joyful, sun-loving, dancing people, dissolves away, and gives place to a pale-leaved and sickly tree, surrounded by a care-faced and inquiring population, who are as much dismayed at the blighting of the orange as the Egyptians of old were when their Divine Nile ran blood. This was in 1836, and since that period the old feelings of confidence and assurance have never returned.

“ The first proceedings of these orange-growers were those of the panic-stricken—they were carried to extremes. From absolute indolence they rushed into alarming activity, but it was the blundering activity of ignorance. Having had little need to inquire into the physiology of the plant, or the relations subsisting between the soil and the plant, while they basked and sported beneath it, they adopted measures to set things right which outraged both, and only made things worse ; but gradually, by the aid of the suggestions of science, and a teachable disposition, a middle course was hit upon, and restorative processes were prescribed with an intelligent knowledge of the patients’ requirements. In the first instance, the orange-trees were overloaded with manure and stifled with shelter, and a great deal more was done to them than they could well bear. Now, although the restoration is by no means complete, and the growers still sigh for the golden age—the fruit having then more of a golden hue than it now has—they see their way clearer, and have corrected many errors into which they first fell. They perceive that thorough drainage is at the foundation of successful orange-culture ; that, next to this, the trenching of the ground to a great depth is essential ; and thirdly, that manure must be applied, but applied with discretion. It is true that the trees are more fickle than they were, and die more frequently, and that the fruit will not keep so long. But at the same time the growers are now able again to calculate with tolerable certainty upon their crop.”

The orange-tree at the Society Group of Islands in the Southern Pacific forms a conspicuous feature in the *wild* vegetation of those islands, its spontaneous increase being so great, more particularly

at Tahiti and Raiatea, the number is almost incredible. It has been said that "the yellow colour of the fruit is an indication of its being ripe and eatable, but this is not precisely the fact; for when of mature growth, and in every way fit for the table, it is only the pulp that is yellow, while the rind retains its deep green colour, unless it should be hanging on the bough 'dead ripe,' or have been gathered for but a few days, when it assumes its true yellow or orange colour." The natives of Raiatea show an aged example of this tree, which they say was planted by Captain Cook. The natives name the tree and fruit Anani. The lime-tree is also very abundant at the same group of Islands, and the Tahitian name is Taporo. At Matavai, Island of Tahiti, some years ago some large orange and lemon, as well as a tamarind tree, was shown me, which were planted by the first Missionaries that visited the island.

Some notes, from the practical experience and observations of Mr. Edwin A. McIntosh, of Lane Cove, was sent to me very recently (December 16th, 1870), and are as follows:—

"The orange-tree, when grown from the seed will live longer, and is much harder than the tree worked on the lemon stock, but takes longer to bear, and seldom bears such heavy crops as the worked tree. The orange-tree grows best in well-sheltered parts on the sides of the hills sloping towards the east and morning sun. I have seen good trees in sheltered parts, near the salt water, growing in deep sandy shelly soil. It seldom flourishes if exposed to the west and north-west winds; it should be protected as much as possible from every wind, and this can be done by carefully selecting the ground, and by leaving a margin of bush trees so as to break off the wind but not to shade the orchard. Any orchard should be well drained, especially if planted in soil with a clay bottom; the drains among the tree should be well covered so as to allow the roots to spread. No soil is sufficiently rich to support an orangery for any length of time where trees are grown close together (say 21 feet); therefore, to have good crops and keep the trees healthy, the ground must be manured, and this can be done by carting to the orchard fresh bush-soil, bush-leaves, &c.; in fact, any kind of rubbish that may accumulate about a farm, or that may be collected in the bush, is good manure for the orange-tree; this should be spread over the orangery, and turned in with a fork, so as not to cut the roots of the trees; the orchard should be kept free from weeds, especially in dry summers. An orange orchard should not be planted on ground previously cropped, and no kind of crops should be grown among the orange-trees, especially oats or pumpkins; one crop of oats is sufficient to destroy an orangery. The young orchard should be planted in new ground or virgin soil; the trees should not be planted deep, and the holes should not be dug more than one foot deep; the hole should be filled nearly to the surface before the tree is planted; the ground should be trenched about sixteen inches deep. The trees should not be transplanted in very wet or in cold frosty weather; I prefer the summer months for transplanting, provided there is no young wood on the tree; I have transplanted trees in January with success; evening or night is the best time for removing them; the sun should not shine on the roots, consequently they should be kept covered with soil and moist. If the season should prove very dry, the foliage and tree should be watered with clean water about sunset, by which the tree will be much refreshed. Young trees reared in a

nursery without manure, are far superior to those reared with it, and I have seen it proved in many instances; care should be taken to select hardy healthy trees; the butt or stock should be carefully examined, and if any red bugs are found upon them those trees should be rejected."

The Bahama Islands in the West Indies are celebrated for their producing very fine luscious oranges, limes, and others of the citron tribe; these islands are formed of calcareous rock, which, by retaining moisture, is well adapted for their growth, and attain the greatest perfection in sheltered situations, but under the influence of the sea-air. Oranges, &c., are exported from these islands to Charleston, South Carolina, and other North American ports. Indeed, so abundantly are they produced, that it is said in the Bahamas and other West Indian islands, immense quantities of oranges, limes, and lemons, more especially the two last, are annually wasted and allowed to rot.

About eight years ago Mr. Robert M'Intosh, of Lane Cove, near Sydney, selected from a case of decayed oranges which had arrived from China, some seeds, which he planted, and succeeded in raising several trees, some of which are now 8 or 10 feet in height, and bear a large smooth-skinned orange of a light yellow colour; the leaves are large, broad lanceolate, and of a dark shining green colour; bark greyish. This appears to be the true China Orange, our original stock having been from the Lisbon variety. The China Orange will probably be considerably improved by grafting. In conclusion, I may observe that we may estimate the production of the orange and others of the citron-tribe as at present very large and likely to increase; and even should the price obtained by the grower be diminished, yet with proper care and attention an orangery will always yield a good income to the proprietor, more especially if he enters into utilising the flowers and fruit of some portion of the orangery to that profitable process of *enfleuray*, for distilled essence will always command a ready sale in the European market. The return of the quantity and value of fruit exported from Sydney to the neighbouring Colonies, it will be perceived from the Custom House returns given in a previous part of this paper, is subject to great fluctuations; and as the packages are all entered as fruit, it is difficult to ascertain with accuracy the exact amount of oranges only, but as we know the principal export of fruit from Sydney consists of oranges, with occasionally bananas, the approximation of value would be in favour of the former fruit. This, however, does not include the export of oranges, &c., from other ports of the Colony, or the very large number taken for sea stock by the different ships, and the still larger quantity used for home consumption. We may therefore safely consider, from our experience, that orangeries in New South Wales, with proper care and attention, will prove to be the most profitable of all fruits grown in New South Wales.

NOTE.

IN "Loudon's Gardener's Magazine" (vol. 5th, 1829, pp. 280-284) is a paper entitled "Catalogue of Fruits cultivated in the Government Botanic Gardens at Sydney, in New South Wales, by Mr. Charles Fraser, dated 1st April, 1828." Among the fruits he mentions as in cultivation in 1827, those of the Family Aurantiacæ are as follows:—

Systematic Name.	Vulgar Name.	Varieties.	Bearing state.
<i>Aurantiacæ.</i>			
<i>Citrus Aurantium</i>	Sweet orange.....	Common Chinese. Malta red Seedling, Brazil ... Selletta Navel, Bahia..... Pernambuco Maranham. St. Jago's. Tangareen, Brazil... Small-leaved China. Nankin oval Chinese downy Long-leaved China. Long-leaved dwarf. Chinese seedling ... Common Do. Fang-Kau, Lioan ... Tuan-Kat. Chu-Cha-Kud.	Abundant. Not yet borne. Shy bearer. Not yet borne. Shy bearer. Not yet borne. Shy bearer. Not yet borne. Now in bearing. Not yet borne. Bears freely. Not yet borne.
<i>vulgâris</i>	Seville orange ...	Common Do.	Bears freely.
<i>nobilis</i>	Mandarin	Fang-Kau, Lioan ... Tuan-Kat. Chu-Cha-Kud.	Not yet borne.
<i>Limétta</i>	Common lime.		
<i>margarita Sw.</i>	Sweet lemon	Persian	Bears freely.
<i>Limònum</i> ...	Common lemon.		
<i>decumàna</i> ...	Shaddock	Whaley's seedling... Puniclo of Java. of Brazil. Green-fruited Sama- baya.	Not yet borne.
<i>Médica</i>	Citron	Brazilian oval Dwarf large-fruited Brazil.	Bears freely.

AUSTRALIAN VERTEBRATA—FOSSIL AND RECENT.

(By GERARD KREFFT, Esq., F.L.S., Curator and Secretary,
Australian Museum.)

MAMMALS.

(Recent species.)

THE fauna of Australia is distinguished by a large number of Marsupial animals, which are now extinct in almost every other part of the world, and considered to be the oldest Mammals known. A few living species allied to our *Dasyures* still exist in America, and fossil remains were found in France and England which indicate the presence of Marsupials at a very early period when mammalian life was in its infancy; in fact the general belief is that the first Mammals belonged to the Marsupial or Pouched tribe. The isolated position of Australia may have caused these animals to retain their stronghold here much longer than in other countries; and it is almost certain that many of their predecessors were also Marsupials, equal in size to the Rhinoceros and the Hippopotamus.

The living species are of moderate growth, and the largest do not exceed two hundred pounds in weight.

They are divided in carnivorous or flesh-eating, and herbivorous or grass-eating sections, with a few genera of mixed feeders.

At a rough estimate we know 110 Marsupials in Australia, to which must be added—

24 Bats,
1 Dog,
30 Rats and mice,

and a number of Seals and Whales, which, inhabiting the ocean, are not restricted in their habitat.

The most curious Australian animals are the duck-billed Platypus and the spiny Ant-eater; both are peculiar to this country. Marsupials are found in New Guinea, on some of the islands of the Pacific, and in America.

Of the Placental series the curious Water-rats or Beaver-rats must be mentioned, as being purely Australian. The dog was no doubt a very early introduction, because fossil remains were discovered contemporaneous with the great extinct Marsupials of post-pleiocene times. Of Man, we have but scanty evidence regarding the length of his existence here; in not one instance were weapons or implements obtained with the remains of fossil animals. Stone weapons are still used by many tribes, and the primitive art of splitting, grinding, and shaping various rocks into hatchets and spear-heads, is not yet lost.

The measurements of a series of Australian skulls is given at the head of the list, and some of these greatly resemble the ancient skulls found at the Neanderthal cave, and near Engis.

The Mammals are arranged as follows:—

CLASS MAMMALIA.

a. Placentalia.

Order.	Example.
Bimana	Man.
Cheiroptera	Bats.
Carnivora	Dog and Seals.
Rodentia	Rats and Mice.
Sirenia	Dugong.
Cetacea.....	Whales and Porpoises.

b. Marsupialia.

Rhizophaga	Wombat.
Carpophaga	Phalangers.
Poëphaga	Kangaroos.
Entomophaga	Bandicoots.
Sarcophaga	Dasyures—Native Cat tribe.

c. Manotremata.

Echidna	Ant-eaters.
Ornithorhynchus	Duck-bill.

A. Placentalia.

BIMANA. HUMAN RACE.

HOMO.

Homo sapiens. Australian or Melanian Variety.

The following are the measurements of some of the skulls of Australian Aborigines in the collection of the Museum at Sydney.

Greatest Length.	Breadth.	Depth from the anterior margin of the occipital foramen to the middle of the coronal suture.	Locality.
6 $\frac{1}{8}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$	Brisbane.
7 $\frac{1}{8}$	5 $\frac{1}{8}$	—	Hobarton.
7 $\frac{1}{8}$	5 $\frac{6}{8}$	5 $\frac{0}{8}$?
7 $\frac{1}{8}$	4 $\frac{1}{8}$	5 $\frac{2}{8}$?
6 $\frac{1}{8}$	4 $\frac{1}{8}$	5	?
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{6}{8}$	Mudgee.
7 $\frac{1}{8}$	5 $\frac{3}{8}$	5 $\frac{1}{8}$?
6 $\frac{3}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	5 $\frac{1}{8}$	4 $\frac{1}{8}$?
7	4 $\frac{1}{8}$	5 $\frac{1}{8}$?
7 $\frac{2}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	4 $\frac{1}{8}$	5 $\frac{1}{8}$	Brisbane.
7 $\frac{1}{8}$	5 $\frac{3}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	5 $\frac{3}{8}$	5 $\frac{1}{8}$?
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	4 $\frac{1}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
7 $\frac{1}{8}$	4 $\frac{1}{8}$	5 $\frac{1}{8}$?
7 $\frac{1}{8}$	5 $\frac{3}{8}$	4 $\frac{1}{8}$?
7 $\frac{1}{8}$	5 $\frac{6}{8}$	5 $\frac{6}{8}$?
7 $\frac{1}{8}$	4 $\frac{1}{8}$	5 $\frac{1}{8}$	Mudgee.
7 $\frac{1}{8}$	5 $\frac{6}{8}$	5 $\frac{3}{8}$?
6 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$?
7	5 $\frac{1}{8}$	5 $\frac{2}{8}$?
7	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Pine Mountain.
6 $\frac{1}{8}$	5 $\frac{6}{8}$	5 $\frac{1}{8}$?
6 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Murrumbidgee.
6 $\frac{1}{8}$	5 $\frac{3}{8}$	5 $\frac{1}{8}$	Cape York.
6 $\frac{1}{8}$	4 $\frac{1}{8}$	5	Bondi.
8 $\frac{2}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Port Fairy.
7 $\frac{1}{8}$	5 $\frac{6}{8}$	5 $\frac{1}{8}$	Hunter's Bay.
7 $\frac{1}{8}$	5 $\frac{6}{8}$	5 $\frac{1}{8}$	Rockhampton.
7 $\frac{1}{8}$	5 $\frac{7}{8}$	5 $\frac{1}{8}$	Do.
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Kiama.
6 $\frac{1}{8}$	5 $\frac{1}{8}$	4 $\frac{1}{8}$	Do.
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Mudgee?
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Brisbane.
7 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	Cape York.

CHEIROPTERA—BAT-TRIBE.

a. Frugivorous Bats.

PTEROPUS.

- P. poliocephalus.*
 „ *conspicillatus.*
 „ *funereus.*
 „ *scapulatus.*

These large Bats are best known by the name of Flying-foxes ; they inhabit the east and north coast ; in South Australia and on the west coast they have not been observed yet.

b. Insectivorous Bats.

HARPYIA.

- Harpyia australis.* A new species of Bat, recorded from Cape York.

MOLOSSUS.

- Molossus australis.* Victoria.
 „ *Wilcoxii.* New South Wales and Queensland.

TAPHOZOUS.

- Taphozous australis.* North-east coast.

RHINOLOPHUS.

- R. megaphyllus.* New South Wales.
 „ *cervinus.* North-east and north coast.
 „ *aurantius.* Port Essington.

NYCTOPHILUS.

- N. Geoffroyi.* West Australia.
 „ *Gouldi.* New South Wales.
 „ *unicolor.* Tasmania.
 „ *timoriensis.* West Australia.
 „ *australis.* New South Wales.

SCOTOPHILUS.

- S. Gouldi.* Southern parts of Australia.
 „ *merio.* Southern parts of Australia.
 „ *microdon.* Tasmania.
 „ *picatus.* South Australia.
 „ *Greyi.* Port Essington.
 „ *pumilus.* New South Wales.

VESPERTILIO.

- V. macropus.* South Australia.
 „ *tasmaniensis.* Tasmania.

NYCTICEJUS.

N. australis. East coast of Australia.

Our knowledge of the smaller Bats is not very extensive, and in most descriptions of species the chief characteristics, the number, shape, and arrangement of their teeth, is omitted. Australia has not one genus peculiar to the country.

CANIDÆ.—DOG-TRIBE.

CANIS.

C. Dingo.

The Australian Native Dog or Dingo inhabits almost every part of Australia, and interbreeds freely with the domestic dog. In the more settled districts this destructive animal has been nearly exterminated. Dingos occur of almost any color,—black and tan, tan spotted with white or pure tan, and yellowish. In Tasmania no Dingos have been observed by the first settlers, nor have fossil remains of dogs been found there.

PHOCIDÆ.—SEAL-TRIBE.

STENORHYNCHUS.

S. leptonyx. Tasmania and southern portions of Australia.

ARCTOCEPHALUS.

A. lobatus. Southern and eastern coasts of New South Wales and Tasmania.

„ *cinereus.* South and West coasts.

The seals of the Australian coast frequently ascend rivers to a great distance, and during the time of floods may be carried into some lake or lagoon, whence, after the subsidence of the water, retreat is impossible. Through animals of this kind being left in an extensive lake the fable of the Bunyip may have arisen. A large Seal, now in the Australian Museum, captured in fresh water, had devoured a full-grown Platypus (*Ornithorhynchus anatinus*.) Three species are common on the Australian coast-line, though many others inhabit the Antarctic Ocean.

RODENTIA, OR RAT-TRIBE.

a. Long-eared Rats.

HAPALOTIS.

H. albipes. } New South Wales, Victoria, and South Aus-
 „ *apicalis.* } tralia.
 „ *hemileucura.* Queensland.
 „ *hirsutus.* North Australia.
 „ *penicillata.* North Australia.
 „ *conditor.* New South Wales.
 „ *longicaudata.* Western Australia.
 „ *Mitchellii.* New South Wales, Victoria, and South Australia.
 „ *arboricola.* New South Wales.

b. Short-eared Rats.

MUS.

- M. fuscipes. Southern Australia.
 „ vellerosus. South Australia.
 „ longipilis. Victoria River.
 „ cervinipes. New South Wales
 „ assimilis. New South Wales.
 „ manicatus. Port Essington.
 „ sordidus. New South Wales.
 „ lineolatus. New South Wales.
 „ Gouldi. From East to West coast.
 „ nanus. New South Wales and Western Australia.
 „ albocinereus. Western Australia.
 „ novæ-hollandiæ. New South Wales.
 „ delicatulus. }
 „ macropus. } North Australia.
 „ personatus. }

c. Water Rats.

HYDROMYS.

- H. chrysogaster. }
 „ fulvolavatus. } Various parts of Australia.
 „ leucogaster. }
 „ fuliginosus. }
 „ lutrilla. }

Numerous Rats have been described according to the colour of their fur; but few authors have examined the dentition of their new creations, so that in course of time their number will probably suffer a reduction. We consider the five Water-rats to be varieties of a single species.

SIRENIA.—DUGONG-TRIBE.

HALICORE.

H. Dugong.

The Dugong is not found on the coast of New South Wales, but inhabits the more northern seas; it is still plentiful near Brisbane, and chased on account of its valuable oil, said to be superior to cod-liver-oil.

CETACEA.—WHALE-TRIBE.

BALÆNA.

B. australis (?).

The "Right Whale" is still observed in Australian waters. A fine skeleton, 96 feet long, is in the Melbourne Museum.

PHYSETER.

P. macrocephalus.

Sperm Whales are also caught occasionally. A skeleton, 35 feet long, is in the Australian Museum, at Sydney.

KOGIA.

K. Graii.

Of this curious and rare species of Whale, specimens are now and then obtained. A skin and two skeletons are in the Australian Museum, at Sydney.

DIOPLODON.

D. seychellensis.

A rare Whale,—a skeleton of which was lately purchased of some of the inhabitants of Lord Howe Island, is now in the Australian Museum, at Sydney. Many other cetaceans inhabit the Australian seas, but we cannot enumerate all the species in this paper.

MESOPLODON?

A fine skeleton, allied to the above genus, has just been secured for the Museum, which contains also several skeletons and many skulls of the so-called "Killers" and Porpoises.

B. Marsupialia.

RHIZOPHAGA.—WOMBAT-TRIBE.

PHASCOLOMYS.

- P. Wombat.* Tasmania, and islands of Bass' Straits.
- „ *latifrons.* Eastern parts of South Australia.
- „ *platyrhinus.* New South Wales.
- „ *niger.* Port Lincoln, South Australia.

There are four distinct species of Wombats now living, all of an average size, and seldom exceeding 100 lbs. in weight. The western species existed in New South Wales during the post-pleiocene period. Wombats are nocturnal in their habits, and live in burrows. Their flesh is very palatable.

CARPOPHAGA.—PHALANGER-TRIBE.

PHASCOLARCTOS.

P. cinereus. Koala, or Native Bear.

Only one species of this singular form is known, which inhabits the southern and eastern portions of Australia, and extends to the tropics.

PHALANGISTA.

- P. canina.*
 „ *fuliginosa.*
 „ *vulpina.*

These three animals are varieties of the common Opossum. The first inhabits the Clarence River District, the second is found only in Tasmania, and the third is distributed generally over Australia. All have a brushy tail.

- P. Cookii.*
 „ *viverrina.*
 „ *laniginosa.*

The Ring-tailed Phalangers or Opossums are varieties of each other, and found in almost every part of Australia; the first occurs on the east coast; the second in the interior, on the south coast, and also in Tasmania; the third is a local variety of the Clarence River District. All these animals (Phalangers) are about the size of a half-grown cat; and they resemble in their dentition the great Flying Phalanger of the genus *Petaurista*.

DROMICIA.

- D. gliriformis.*
 „ *concinna.*
 „ *unicolor.*

The *Dromicias* inhabit the southern portion of Australia and Tasmania. They are small Ring-tail Phalangers, and never grow larger than about the size of a common mouse. Little is known of these creatures, which are seldom captured; they live principally on honey and soft insects.

CUSCUS.

- C. brevicaudatus.*
 „ *maculatus.*

Inhabitants of North Australia, which are allied to the Phalangers proper; they appear to be rather more carnivorous than the rest, and both have been added only lately to the Australian fauna.

DACTYLOPSILA.

- D. trivirgata.*

The habitat of this animal is also North Australia; it is a curious form connecting the Flying Phalangers with the genus *Phalangista*; the membrane between arms and legs is absent, but the tail has a feathery appearance, and resembles that of the little *Acrobata*; skull and dentition are like *Belideus flaviventer*; the size of the animal is about that of a common rat.

PETAURISTA.

P. taguanoides. Great Flying Phalanger.

A species closely allied to the Ring-tail Phalangers; the skulls of these two genera are much alike, their teeth also resemble each other. Habitat, East Australia; not found on the Plains of the interior, or on the West coast.

BELIDEUS.

B. flaviventer.

„ *sciureus*.

„ *breviceps*.

Of these Flying Phalangers the first is the largest, and about the size of a cat, but less bulky; the other two are much smaller; they inhabit South and East Australia, and have not yet been recorded from the West coast. They are restricted to mountain districts, and not found on the Plains of the interior.

B. notatus and

„ *ariel* are varieties of the *B. breviceps*.

ACROBATA.

A. pygmæa.

The smallest of the tribe, less than a common mouse in size, and distinguished by a feathery tail. Habitat, the southern and eastern portions of Australia.

TARSIPES.

T. rostratus.

This little creature, with its almost toothless jaws, belongs certainly to the Phalanger family, and connects it with the *Monotremata*. The teeth are very diminutive and soon lost, except the canines, a few of the back teeth, and the lower incisors, which are very fine, straight, and almost horizontally inserted in the ramus. The tongue is rather long, covered with hair near the tip, enabling the animal to insert it into flowers and obtain their honey.

POEPHAGA.—KANGAROO-TRIBE.

The Kangaroos vary considerably in size and in the form of their teeth; and the smaller species are generally furnished with strong canines. Some of them have prehensile tails, and they can ascend small trees; others have long pliable tails and very short tarsi; these are known as Rock - Wallabies or Rock - Kangaroos, and frequent mountain districts. Others again possess short stiff tails and long heads; they resemble in appearance the Bandicoots, and where on the one hand the prehensile-tailed group of Bettongs approaches the Phalangers we observe on the other side, in the Rat Kangaroos, an inclination to the Bandicoot family in their elongated skulls and stiff and short tails.

Space will not permit to go into detail, and we divide the family as follows:—

A.—*Large Kangaroos with small premolar teeth, which are soon lost.*

MACROPUS.

a. *Male and female, uniform in colour.*

- M. major. Southern and Eastern Australia.
- „ ocydromus. West coast.
- „ fuliginosus. South Australia.
- „ antilopinus. North Australia.
- „ Isabellinus. North-west Australia.
- „ Parryi. Eastern Australia.

b. *Female, different in colour from the male.*

- M. rufus. Plains of the interior.
 - „ robustus. Rocky districts of the East coast.
- In both these animals the female is of a much lighter colour, sometimes almost white.

The large Kangaroos attain a weight of 200 lbs. and more.

B.—*Kangaroos of smaller size, with permanent premolar teeth; weight of adult up to 50 lbs.*

HALMATURUS.

- H. dorsalis. New South Wales and Queensland.
 - „ ruficollis. New South Wales.
 - „ Bennettii. Tasmania.
 - „ Ualabatus. New South Wales.
 - „ Mastersii. New South Wales and Queensland.
- Ruficollis and Bennettii are stated to be varieties of each other; so are Ualabatus and Mastersii, though very different in colour.
- H. agilis is also a large species from the north-east coast.

Animals up to 30 lbs. weight.

- H. Greyi. South Australia.
- „ manicatus. West Australia.
- „ Derbianus. South Australia.
- „ Hautmanni. Hautmann's Abrolhos, W.A.
- „ Billardieri. South coast districts and Tasmania.

“*Pademelons,*” or *small Kangaroos, and from 10 to 15 lbs. in weight.*

- H. parma. East coast of N. S. Wales.
- „ dama. West Australia.
- „ Thetidis. Coast districts of New South Wales.
- „ stigmaticus. North-east coast.
- „ brachyurus. West Australia.
- „ Wilcoxi. Clarence District and Southern Queensland.

These animals inhabit the mountain districts near the coast, and are seldom, if ever, found on the plains of the interior.

Rock-Wallabies or Rock-Kangaroos, with long pliable tail not incrassated at the base, inhabiting mountain districts on the southern, eastern, and western coast-line. Weight of animal up to 30 lbs. :—

Petrogale penicillata.	}	Eastern parts of New South Wales.
„ inornata.		
„ xanthopus.	}	South Australia.
„ brachyotis.		
„ lateralis.	}	West and north-west coast.
„ concinna.		

Strong-armed Kangaroos or Tree-Kangaroos.

DENDBOLAGUS.

D. ursinus.	}	New Guinea.
„ inustus.		

These animals ascend trees, and are distinguished by their powerful fore-limbs and long pliable tail, which resembles that of the Rock-Wallabies. A third species, *Dorcopsis Bruni*, also inhabits New Guinea, but is terrestrial, though the fore-legs are more strongly developed than is usual in Kangaroos. The weight of these animals we should judge to be about 30 lbs. The *D. Bruni* was the first Kangaroo ever discovered, many years before Cook's voyages.

Silky-haired or Nail-tail Kangaroos.

ONYCHOGALEA.

O. unguifer.	North-eastern parts of Australia.
„ frænata.	Plains of the interior of New South Wales and Victoria.
„ lunata.	Plains of the interior of South and West Australia.

This group comprises the small silky-haired Wallabies or Kangaroos of the interior; they weigh seldom more than 8 or 10 lbs., and are about the size of a common hare. Their light-grey fur is of a peculiar softness; the tail has a bare nail-like tip. This and the following genera possess more or less developed canine teeth.

Hare Kangaroos.

LAGORCHESTES.

L. fasciatus.	}	West Australia.
„ hirsutus.		
„ conspicillatus.		
„ leporoides.	Plains of New South Wales, South Australia, and Victoria.	
„ Leichhardti.	North-east coast and Victoria.	

The Hare-kangaroos, so called from their resemblance to that well-known rodent, are the fleetest of the whole tribe, and though they do not exceed a common hare in bulk, they will make clear jumps of 8 and 10 feet high; their arms are exceedingly short, and when progressing cannot be noticed, as they are pressed close to the body and are hidden by the long fur; the hind legs are very long and slender, and the tail rather short and stiff and not incrassated at the base; the canines are well developed.

Bettongs or Jerboa Kangaroos.

BETTONGLA.

- B. cuniculus. Tasmania.
 „ Graii. New South Wales, South and West Australia.
 „ campestris. South Australia.

These three species of Bettongs resemble each other very much, and are probably nothing but local varieties. The western and southern animal, that is, B. Graii and B. campestris, form extensive burrows which the Tasmanian species does not; their tails are more or less prehensile; weight, 8 to 10 lbs.

- B. penicillata. Interior of New South Wales.
 „ Ogilbyi. West Australia.

These two animals also resemble each other; they are very small, probably not more than 4 or 5 lbs. in weight; their tail is prehensile, and they can climb well. We have seen them get over a close palisade-fence 8 feet high. This group connects the Kangaroo-tribe with the Phalangers.

Rat Kangaroos.

HYPSSIPRYMNUS.

- H. murinus. New South Wales.
 „ apicalis. Tasmania.
 „ Gilberti. } West Australia.
 „ platyops. }

The true Rat-Kangaroos approach the Bandicoot-tribe, and some of the best naturalists have classed them as Bandicoots when the skull could not be examined; their limbs are of more equal length; and the tail is like that of the Bandicoots,—short and rather stiff; the head of the Rat-Kangaroo is elongate (that of H. platyops excepted), and the canine teeth are strongly developed.

ENTOMOPHAGA.—BANDICOOT-TRIBE.

PERAMELES.

- P. nasuta.* New South Wales.
 „ *Gunnii.* Tasmania.
 „ *myosurus.* West Australia.
 „ *fasciata.* South Australia.
 „ *obesula.* Southern Australia and Tasmania.

The Bandicoots are distributed over every part of Australia, but never in great numbers; the first species is of the size of a rabbit, and the next three are as large as a common Norway rat. The last is heavier, but stands very low on its legs, and has a harsh and coarse fur. The tribe did not receive sufficient attention from naturalists, who generally fail to give a description of the teeth; it is highly probable that another species or two exist in the north and in New Guinea, and that some of our continental animals, such as *P. myosurus* and *P. fasciata*, are varieties only.

PERAGALEA.

- P. lagotis.* Rabbit-eared Peragalea or Rabbit-rat of the Colonists.

An aberrant form of the Peramelidæ, with rather long compressed and crested tail, inhabiting the interior of South Australia, New South Wales, and West Australia. The head is very elongate, the ears long, and the fur soft and silky; the canine teeth are strong and recurved, very powerful, and the grinders conical, without fangs, except a few tubercles. The Peragalea burrows, and is not gregarious, a pair only occupying one of the warrens.

CHÆROPUS.

- C. castanotis.* The interior of New South Wales, South, and West Australia.

The Chæropus is known as the pig-footed Bandicoot, having only two functional toes to the fore-feet; the hind legs are like those of the Kangaroo and Bandicoot. The teeth of this animal are feeble, in particular the canines; the tail resembles that of the Peragalea, with a crest of hair on the upper edge.

The dentition of the Bandicoots resembles the carnivorous section, the Dasyures.

SARCOPHAGA.—NATIVE-CAT TRIBE.

The largest species of this group are few in number, and only one of them, an inhabitant of Tasmania, is formidable, and may become dangerous to man. The smaller kinds represent the

shrews and hedgehogs of the Placental series, and they do not exceed a rat in size; some are not larger than a common shrew-mouse. We divide the Dasyures in the following sections:—

Tasmanian "Tigers."

THYLACINUS.

- T. cynocephalus. Greyhound tiger.
 „ breviceps. Bull-head tiger.

Both inhabiting Tasmania, the bull-head species having a more powerful dentition than the T. cynocephalus, and in particular the premolar teeth closer together; the palatal opening is also much smaller in the T. breviceps, and the head shorter.

Tasmanian "Devil."

SARCOPHILUS.

This section contains but one example, the Sarcophilus ursinus, a very ferocious but small animal, the habitat of which is restricted to Tasmania. This species should be classed with the Dasyures proper, on account of its dentition, which is the same as in the next group; premolars, $\frac{2-2}{2-2}$; the Thylacine having $\frac{3-3}{3-3}$ of these teeth.

Native-Cats.

DASYURUS.

- D. maculatus. Eastern and Southern coast districts, Tasmania, and islands of Bass's Straits. The largest of the tribe, with spotted tail.
 „ viverrinus. The common Native-cat has a wide distribution over the southern and eastern parts of Australia; it is also found in Tasmania.
 „ Geoffroyi and D. hallucatus are varieties from Western Australia, the interior of South Australia, New South Wales, and Queensland. These animals are furnished with a rudimentary nailless thumb to the hind foot.

Spiny-tails.

CHÆTOCERCUS.

- C. cristicauda.

A small animal of the size of a half-grown rat, with premolars $\frac{3-3}{2-2}$, a rather thick tail, and a black hairy crest on the upper edge. Habitat, South Australia.

Tapoa-tapas, or Brush-tails.

PHASCOGALE.

P. penicillata inhabits almost every part of Australia; it is a small animal the size of a rat, with black brushy tail, and of a uniform grey colour. The premolars number $\frac{3-3}{3-3}$, as in the genus *Thylacinus*.

P. calura is a smaller species, found in the interior of New South Wales, South and West Australia; both are arboreal.

Broad-footed "Pouched-Mice."

ANTECHINUS.

- A. Swainsoni.* Tasmania.
- „ *apicalis.* West and South Australia.
- „ *flavipes.* Australia generally.
- „ *Stuarti.* Sydney.
- „ *maculatus.* Queensland.
- „ *miniutissimus.* Queensland.

The first four are about the size of a half-grown rat. The last not larger than a small mouse; they frequent shrubs and trees, except *A. Swainsonii*, which is terrestrial in its habits.

Slender-footed "Pouched-Mice."

PODABRUS.

- P. macrourus.* Queensland.
 - „ *crassicaudatus.* Interior of New South Wales.
 - „ *albipes.*
 - „ *murinus.*
 - „ *fuliginosus.*
 - „ *feruginifrons.*
 - „ *apicalis.*
- } Australia generally.

Several other small slender-footed Marsupials have been described, but merely on account of a slight difference in coloration; nothing being said about their teeth. We consider the above five species varieties only. The slender-footed animals which have been arranged under the genus *Podabrus* are principally terrestrial in their habits. A larger kind, *P. Mitchellii*, from the interior of New South Wales, should be added to this list. The original is in the Australian Museum, but much mutilated; it was discovered by the late Surveyor-General of New South Wales, Sir Thomas L. Mitchell, K.C.B.

Jumping "Pouched-Mice."

ANTECHINOMYS.

The above genus was established for the reception of the little animal described as "*Phascogale lanigera*." The Phascogales are arboreal in their habits, and have short legs and broad feet, with a thumb behind. The *A. lanigera* has long slender legs, a fine long tail with small brush at the tip, and no thumb; it moves by a succession of jumps, and is strictly terrestrial.

Brush-tailed Ant-eaters.

MYRMECOBIUS.

M. fasciatus.

The Western Districts of New South Wales, South Australia, and Western Australia, are inhabited by this curious animal, which approaches the Monotremous section of the Marsupials. The teeth number 52, but they are small, and stand far apart. The long and slender tongue is used to capture ants and their eggs, upon which the animal principally preys.

C. Monotremata.

Spiny Ant-eaters.

ECHIDNA.

E. hystrix. New South Wales, Victoria, South and West Australia, and Queensland.
 „ *setosa.* Tasmania.

The Spiny Ant-eaters have a wide distribution all over the Australian Continent; they abound, however, more on the east coast, and reach north as far as Cape York.

The Hairy Ant-eater is a variety inhabiting Tasmania.

Professor Owen has written some interesting papers on the Monotremes, and proved the existence of two cavities or pouches, without the usual nipple, in which the young are confined, the milk draining into these cavities from the mammary glands. It has been stated by a close observer that these animals are plentiful in winter and spring in certain districts, but that they disappear in summer. Our informant thinks they live underground. Ant-eaters experience little inconvenience with 4 or 5 feet of earth above them, and it takes fully half-an-hour to drown one. The young of these creatures are exceedingly rare. They feed on ants, ant-eggs, and probably on grass also, as some of it was found in their stomachs on several occasions.

Duck-bills.

ORNITHORHYNCHUS.

O. anatinus.

Australia generally, is the habitat of this curious creature, which, though plentiful, is still very little known as regards its economy, propagation, &c. Dr. Bennett discovered the young of a *Platypus* 30 years ago, but very few, if any, specimens have since been obtained, and no further progress has been made towards the solution of the still pending and highly interesting physiological question—Does the *Platypus* lay eggs?

FOSSIL MAMMALS.

The fossil-bones of Australian Mammals in the Australian Museum collection are arranged as follows :—

PLACENTALIA.

CANIDÆ.—DOG-TRIBE.

CANIS.

Remains of the dog are scarce in every part of Australia where fossil-bones occur; there can be no doubt, however, of the presence in this country of a dog during the post-pleiocene period; a few teeth were obtained at Wellington; they resemble the teeth of the common Dingo of the present day.

RODENTIA, OR RAT-TRIBE.

HAPALOTIS AND MUS.

All the fossil-bones and teeth are from Wellington, where they occur in large quantities. As far as we have been able to ascertain, some six or more species existed, nearly all of which have very peculiar grinders, and differ from most of the living Rodents.

EDENTATA.—SLOTH-TRIBE.

MYLONDON.

Mylodon? australis.

The presence of some animal, allied to the above extinct American genus, is indicated by a single terminal phalanx, or nail-bone, with its peculiar protecting hood, partly broken.

IMPLACENTALIA.

Marsupialia.

RHIZOPHAGA.—WOMBAT-TRIBE.

PHASCOLOMYS.

Wombats are well represented in a fossil state, and existed to the number of twenty species at least during post-pleiocene times. A modern Wombat of 90lbs. weight is considered heavy, but some of the ancient fossil animals, judging from the size of their teeth and bones, must have been more than twice as bulky. The Wombats are closely allied to the Phalangers (the "Opossums and Flying Squirrels"), and are distinguished from all other Marsupials by their incisor teeth, which, like those of the rodents, number two above and two below.

CARPOPHAGA.—PHALANGER-TRIBE.

PHALANGISTA.

Bones of animals of this group, to which the well-known "Opossums" and "Flying Squirrels" belong, are rare; the only specimens observed, two fragments of a lower jaw, indicate species allied to, or identical with, the living Vulpine Phalanger (*P. vulpina*), and the "Sugar Squirrel" (*Belideus breviceps*). The curious "Native Bear" is also a Phalanger, and forms the connecting link between the Wombats and the "Phalangers proper" (the "Opossums" and "Flying Squirrels"). All these creatures have a nailless thumb to the hind foot; they also possess, like the Kangaroo family, the two small inner toes joined by a membrane. Wombats, Phalangers, and Kangaroos (including Wallabies and Kangaroo-rats), seldom produce more than *two* young at a time; *one* at a birth is, however, the general rule. The Phalanger family comprises some of our very largest creatures, namely, the gigantic Diprotodons, Zygomatari, and Nototheri, about the position of which there has been much discussion. Looking at the dentition, and comparing the incisors only, the observer is struck at once with their close resemblance to the teeth of an ordinary native bear. The short tail of both the "Native Bear" and "Wombat" appears to have been peculiar to the large extinct species also; though this supposition is only based on negative evidence—the absence of any caudal vertebræ of a size in proportion to the other large bones which have been found.

DIPROTODON.

The collection consists of many fragments of jaws and teeth of great size, indicating ten or more species.

ZYGOMATURUS.

This large animal is represented in our collection by two or three species,—the original *Zygomaturus trilobus*, the *Z. Macleayi*, and a still undescribed one, lately discovered by Dr. Mildred Creed, near Scone.

NOTOTHERIUM.

Of the *Zygomaturus* we know the skull and teeth of the upper series, and of the *Notothere* only the lower jaw. But many of these mandibles may yet prove to be those of *Zygomaturus*. It will be necessary, however, to obtain clearer evidence on the subject, as, for instance, palate and jaw of the same animal found close together and properly fitting; specimens of this kind are still missing.

THYLACOLEO.

This animal was first described by Professor Owen; it is evidently a Phalanger and comes close to the "Flying Squirrel" (*Belideus flaviventer*). The great premolar of *Thylacoleo* is not found in *Belideus*, and the grinders differ much in the two species, but the incisors above and below are of the same shape, and skull and jaw, when compared with the much larger *Thylacoleo*, appear to be formed on a similar model. That it was erroneous to consider the *Thylacoleo* a formidable carnivore, and a match for the ponderous *Diprotodons*, is plainly discernible from the remains (nearly perfect jaws) in our collections; many of the "trenchant" teeth are worn quite flat, the incisors are weak, and the upper ones often rounded off to conical points, unfit to hold or tear tough substances such as flesh.

Besides these remains, others indicating a smaller allied species have come to hand.

PLECTODON.

This genus is distinguished by lower incisors of a peculiar form, much shorter and more round than those of *Thylacoleo*; a portion of the enamel laps over, and covers the inner side of the tooth like a fold;—hence the generic term.

POEPHAGA.—KANGAROO-TRIBE.

MACROPODIDÆ.

Numerous species of all sizes, some several times larger than any modern Kangaroo, existed in Australia in former ages, but their remains are much scattered about, and upper and lower jaws are seldom found together; to distinguish the bones as those of particular species is out of the question, and we must content

ourselves at present to class them as Kangaroo, or Kangaroo-rat bones. The fossils which resemble, or are identical with, modern species, may of course be more correctly classified.

As a general rule, most of the fossil Kangaroos have shorter and stouter tarsi than living species possess, and the greater number, including the largest of the tribe, must be arranged with the *Halmaturi* or Wallabies, a group of Kangaroos with permanent and often large premolar teeth.

The Kangaroos proper, of which our common Great Kangaroo is the type, soon shed their premolars, and continue to lose the grinders also in such a manner that sometimes only a pair of teeth are left in each ramus. The Wallabies, on the other hand, wear the teeth down. Looking at a Kangaroo's incisors, we find the first of the upper series comparatively small, and the third very broad; whilst the Wallabies have the third tooth large in a vertical direction, and in most species this tooth is deeply indented by a fold.

In all recent Kangaroos, Wallabies, and Kangaroo-rats, the rami of the lower jaw are movable; in many fossil Kangaroos this peculiar characteristic is wanting, and the two mandibles are firmly ankylosed, as may be observed in the two fossil species *Halmaturus Scottii* and *Halmaturus Thomsonii*.

The premolars of the fossil species are often very bulky, with a deep hollow in the middle of the tooth—another characteristic peculiar to extinct animals of this tribe.

The following genera belong to the family *Macropodidæ*:—

BETTONGIA.

Comprising the Kangaroo-rats, or more correctly speaking, the "Bettongs," with long hind legs, and more or less prehensile tail. Of these animals many remains were found at Wellington, all of which appear to be identical with the common Bettong *Bettongia rufescens*, now living in New South Wales.

HYPSIPRYMNUM.

This genus had very few representatives, and comprises the smaller Kangaroo-rats, with short stiff tails and short hind-legs; all *Hypsiprymni* progress in the same manner as the Bandicoots.

MACRUPUS.

The typical species is our *Macropus major* or Great Kangaroo. Fossil remains of closely allied species, and of others, resembling *M. ocydromus*, *M. rufus*, and *M. robustus*, are in our collection.

HALMATURUS.

This genus, distinguished by permanent and often very large premolar teeth, is numerously represented in a fossil state, and cannot be estimated at less than thirty or more species; the Wombat-like Kangaroos, with short anchylosed jaws, are here included.

ENTOMOPHAGA.—BANDICOOT-TRIBE.

PERAMELIDÆ.

Fossil Bandicoots are not rare, but their bones are generally much broken; those observed were collected at Wellington, and represent, with slight differences, the two living species, *Perameles obesula*, the short-nosed Bandicoot, and *Perameles nasuta*, the long-nosed Bandicoot. A few remains of the *Peragalea* were also obtained; the teeth are larger and slightly different from the *Peragalea lagotis* of the present day. The discovery of this animal was made during our last visit to the caves, in company with Professor Thomson, when nearly all the most important specimens were found. The *Peragalea* is known by the English term of "Rabbit-rat," probably on account of the long slender ears; the native name on the Lower Murray is "Wuirrapur"; and "Jacko," on the Darling. The number of young produced in a litter by Bandicoots does not exceed four.

SARCOPHAGA.—NATIVE-CAT-TRIBE.

DASYURIDÆ.

The rich deposits in the Caves of Wellington have supplied us with evidence of the existence of two species of "Native-cats," that is, a common *Dasyurus viverrinus*, and a "Tiger-cat," *Dasyurus maculatus*; besides these small carnivores we have to record the presence in post-tertiary Australia of the formidable *Sarcophilus ursinus*, the "Tasmanian Devil," and the still more ferocious *Thylacinus cynocephalus*, Thylacine or "Tasmanian Tiger." The number of teeth belonging to these creatures, collected at the Wellington Caves, amount to several hundred; other remains (skulls and jaws) are as plentiful, and many of their owners must have died at a ripe old age, because their canine teeth are often worn level with the rest of the series.

PHASCOGALE, ANTECHINUS, AND PODABRUS.

These small animals represent the Shrews and Hedge-hogs of the Placental division. The difficulty of discovering their remains is very great, a tiny jaw, less than $\frac{1}{8}$ of an inch in length, proves the existence in post-pleiocene Australia of mammals not larger than a small mouse.

SECTION MONOTREMATA.

Genus—ECHIDNA.

A fractured femur is referred to the above genus, and was discovered at Wellington; another specimen, part of a humerus, was obtained at the Darling Downs, and described as *E. Owenii*; both are exhibited in the Museum collection.

This closes the list of our Mammals, in which nearly all still living genera are represented, with the following exceptions, namely:—Bats (*Cheiroptera*), and "Water-rats," of the peculiar Australian genus *Hydromys*. Of the Marsupial Order the missing genera are the *Myrmecobius* and the *Ornithorhynchus*.

BIRDS.

The Avi fauna of Australia is considerable, though perhaps not so rich as that of other countries under the same latitude. Australia is famous for the beauty of her many parrots, over sixty species of which are found here; the honey-eaters are also numerous and varied in plumage, while bower-building satin birds, mound-raising Megapodes, and stately Emus, are peculiar to this favoured region. Game species abound; there are many pigeons, ducks, geese, plovers, and quail, and every bay or island along the coast-line is swarming with noisy seabirds. Some large groups are however altogether absent; we have no woodpeckers, no humming-birds, no Trogons, and few good songsters. Other handsome forms compensate in some measure for this loss. Numerous game and singing birds have been imported from other parts, and all thrive well, and thanks to laws for the protection of game during a few months of the year, there will always be good sport in the shooting season.

We cannot go into detail with our birds, but would refer students to Gould's Handbook, which contains a list of all the genera and species.

The total number of species is about 690, which are distributed as follows :—

New South Wales	403
Queensland	442
Victoria	351
South Australia	313
West Australia	240
North Australia	236
Tasmania	162

Many of these species are however mere varieties of each other, but as new discoveries are constantly made, the number given as 690 will be tolerably correct.

FOSSIL BIRDS.

Ornithic remains are by no means plentiful in Australia, and such bones as have been found do not differ much from those of living genera. The Emu (*Dromaius*) existed, and also a species of Moa, about the size of the *Dinornis robustus*. The specimen proving the presence of the gigantic bird, a large femur, was found on the Leichhardt Downs in Queensland, 86 feet below the surface, and is now in the Australian Museum.

REPTILES.

CHELONIA.—TORTOISE-TRIBE.

a. HYDRASPIDIDÆ. FRESH-WATER TURTLES.

The Australian Tortoises are few in number, and all belong to one family. They inhabit almost every pool, creek, or river, but the genera are not equally distributed. In New South Wales three or four species occur, which are probably also found in Victoria and South Australia. From West Australia we have to record only two kinds, the remainder inhabiting Queensland and the North Coast. Like our snakes and frogs, some of the Australian Tortoises are closely allied to South American genera.

CHELODINA.

- C. Collei. West Australia.
 „ oblonga West Australia.

Few specimens are known of the first species; the second is common near King George's Sound and the Southern Districts of the Swan River Colony. The shell is not produced, and affords no shelter to the very long neck of the animal. According to Dr. Gray it is found in North Australia also. Mr. George Masters has frequently taken specimens in the brakish lakes on the West coast.

- C. expansa.

This is rather a large species, 11 inches long by 8 broad; it does not occur near Sydney, and inhabits the larger rivers. Coloration, uniform greenish above and yellowish below, without marble spots.

- C. longicollis. Long-necked Tortoise.

This animal occurs in large numbers near Sydney; it is the most common and best known of the tribe; the lower shell is generally marbled.

- C. sulcata.

Dr. Gray figures a shell of this Tortoise in his catalogue of shield reptiles; it occurs near Sydney, but is seldom captured.

CHELYMYS.

- C. macquaria. The Macquarie Tortoise.

A large species, 11 x 8 inches, inhabiting the river after which it is named. This tortoise, has a deep narrow interrupted groove along the vertebral line.

ELSEYA.

- E. dentata.

The late Dr. Elsey, who accompanied Gregory's expedition, discovered this species in the Northern rivers. The Australian Museum has specimens from the Burnett and some from the Port Curtis District.

- E. latisternum.

Closely allied to the last; both may be distinguished from other Australian Tortoises by a pair of tubercles or beards on the chin. This closes the fresh-water species as far as they are known to us at present; there is no doubt, however, that more exist in Australia. A few undescribed forms are even now in the Australian Museum collection.

b. CHELONIDÆ—MARINE-TURTLES.

Marine-turtles have long compressed fin-shaped non-retractile feet, the toes being enclosed in a common skin, with one or two projecting claws. The following species occur on the Australian coast:—

CAOUANA.

C. olivacea. Loggerhead Turtle. This species is carnivorous, and eats fishes, mollusca, and crustacea.

CHELONIA.

C. virgata. Green Turtle. This is the edible species which feeds on Algæ.

CARETTA.

C. squamata. Hawk-bill Turtle.

This reptile produces the Tortoise-shell, and is carnivorous.

DERMATOCHELYS.

D. coriacea. The Luth.

The Leathery Turtle or Luth is the largest of the tribe; it is herbivorous, and yields a large quantity of oil. A fine specimen in the Australian Museum, perhaps the most gigantic ever taken, was caught off Wollongong, on the coast of Illawarra, and measures 9 feet in length.

FOSSIL CHELONIA.

The carapace of a fresh water species was found at the Caves of Wellington. It was broken in removing it, and measured about 8 inches in length.

SAURIA.—LIZARD-TRIBE.

The Lizards of Australia are very numerous, and are distributed over every part of the country; a few species also inhabit Tasmania, and two kinds Lord Howe Island. We are indebted to Dr. John Edward Grey, F.R.S., for the first systematic catalogue of our reptiles; and his list of Lizards is still the standard guide for students. Dr. Gray enumerates 129 species, which number must have greatly increased since the list was published. To give even short descriptions of each kind is impossible in the present paper; but some characteristics will be pointed out, so that an idea may be formed of this numerous tribe of animals.

Lizards live chiefly in tropical and semi-tropical climates, and prefer dry sandy or rocky open scrub country to luxurious forests; none are venomous.

The largest grow to 30 feet; others do not exceed a few inches in length; their diet is varied, and supplied by both the animal or vegetable kingdom; in fact, we remember a fine large New Guinea species which subsists principally on leaves. Our Sleeping-lizard, "*Cyclodus gigas*," is very fond of certain berries called "jee-bungs," and during the season is often filled with them. Lizards do not reject dead animals like the Ophidians, and are therefore excellent scavengers.

The greater number lay eggs generally with a soft skin or shell, and of irregular form, which they deposit under stones, exposed to the sun, among the decaying leaves of the stag-horn fern, under bark or sand, in crevices of rocks, and in other places where heat is generated, and the embryo brought to maturity. No Saurian has ever been noticed to incubate her eggs like the Rock-snakes or Pythons. Nearly all the Lizards found in Australia are peculiar to the country.

CROCODILIDÆ.—CROCODILES.

CROCODILUS.

C. porosus.

The Australian Crocodile is a distinguished production of Queensland, where it reaches the enormous length of 30 feet, and becomes occasionally troublesome to settlers. It is vigorously hunted down, and wherever the country is opened up the Crocodiles soon retire.

TOMISTOMA.

T. Krefftii.

Another much smaller species of Crocodile, which inhabits the shallow lagoons of the interior of Queensland. It seldom exceeds 6 feet in length. Dr. J. E. Gray, F.R.S., has lately described the head of the animal, which is all we know of it at present. The form is narrow and Gavial-like. A few fine young specimens of the rare *Crocodylus pondicereanus* have lately been purchased for the Australian Museum; these were obtained near New Guinea, and are probably found in our northern waters also.

Forked-tongued Lizards.

MONITORIDÆ—MONITORS.

These Lizards are best known as Lace-lizards and "Iguanas," and are distinguished by a forked-tongue. They inhabit almost every part of Australia, but are not found in Tasmania. They burrow in the ground, and are excellent climbers and good swimmers; some grow to 8 or 9 feet in length, though the largest have but a small head in comparison with a Crocodile.

ODATRIA.

O. punctata.

Spotted Odatria, a small spotted species, about 15 inches long when full grown; inhabits North Australia.

O. ocellata.

Eyed Odatria, with larger spots and whitish margin around them. From the same district.

HYDROSAURUS.

H. Gouldii. West Australia.

„ *varius.* Australia generally.

„ *giganteus.* North Australia.

„ *Bellii.* North-east coast.

These are the largest of the tribe; four species are recorded, which vary much in colour, but are probably only varieties.

Flat-tongued Lizards.

CRYPTOBLEPHARUS.

C. Burtonii.

„ *lineo-ocellatus.* } Western Australia.

MOBETHIA.

M. anomala. Western Australia.

MENETIA.

M. Greyii. Western Australia.

LERISTA.

L. lineata. East coast.

All of small size, with short or rudimentary limbs, and but little known.

PYGOPIDÆ.—SLOW-WORMS.

(With paddle-like extremities near the vent.)

PYGOPUS.

P. lepidopus.

This *Pygopus* has a wide distribution, and is found all over the mainland, but not in Tasmania. It is common near Sydney, and often mistaken for a snake; the tail is very brittle and the tongue flat. Snakes have a forked tongue, and cannot reproduce their tail when lost or injured.

P. squamiceps.

A *Pygopus* from the west coast. There are several undescribed species in the Museum collection.

DELMA.

D. Fraseri.

A much smaller *Pygopus* from West Australia with rudimentary fore-limbs.

D. Grayii.

Another small species. The exact habitat is not known.

APRASIA.

A. pulchella. West Australia.

„ *octolineata*. Adelaide.

Small worm-like species, not found in New South Wales.

LIALIS.

L. Burtonii. Burton's *Lialis*.

„ *punctulata*. Spotted *Lialis*.

Two snake-like Lizards, with a pair of slight rudimentary flapper-like hind limbs; head square behind, with long and pointed snout; tail rather thick; sometimes a stripe on each side from the head down the body; scales with fine black dots. These Lizards occur of all colors, from almost white or creamy yellow to reddish brown.

They have a wide distribution, but are not found in the southern part of the mainland or in Tasmania. The eye is pale yellow, with vertical pupil, and a slight noise is heard when the animal is handled or is in pain. We remark this because very few Saurian reptiles possess a voice.

SCINCIDÆ.—SKINK-TRIBE.

The greater number of our Lizards belong to this family; they inhabit sandy or stony districts; are very quick in their movements in summer, and hibernate during the cold season under rocks or bark; seldom in holes below ground.

The first group, the genus *Hinulia*, contains species of 6 or 8 inches in length; the members of the genus *Mocoa* are smaller; all are ground Lizards.

HINULIA.

H. Gerrardii. Clarence River and Queensland.

„ *elegans*. Near Sydney and East coast generally.

„ *Greyii*. West Australia.

„ *tenuis*. West Australia.

„ *Labillardieri*. West Australia.

„ *australis*. Australia generally, except Victoria.

„ *essingtonii*. North Australia and West coast.

„ *inornata*. West Australia.

„ *tæniolata*. Near Sydney, and on the East coast generally.

A variety or perhaps a distinct species inhabits Tasmania.

- H. *Whitii*. Sydney, Tasmania, and the East coast far to the north.
 „ *Richardsonii*. West Australia, South Australia, and Queensland.
 „ *fasciolata*. Queensland, Rockhampton.
 „ *branchialis*. North-west Australia, Champion Bay.

MOCOA.

- M. *Guichenoti*. Southern Australia, from east to west.
 „ *trilineata*. West Australia.
 „ *ocellata*. Australia.
 „ *Entrecasteauxii*. Australia.
 „ *microtis*. Swan River.
 „ *Owenii*. East coast.

CARLIA.

- C. *melanopogon*. North Australia.

LYGOSOMA.

- L. *australe*. Swan River.
 „ *Bougainvillii*. Australia.
 „ *laterale*. South Australia.
 „ *Schomburgkii*. South and West Australia.

These four species have an elongate body, with short limbs ; they average about 5 or 6 inches in length.

TETRADACTYLUS.

- T. *decesiensis*. Kangaroo Island, Swan River.

HEMERGIS.

- H. *polylepis*. South Australia.
 „ *decesiensis*. Kangaroo Island.

CHELOMELES.

- C. *quadrilineatus*. West Australia.

SIAPHOS.

- S. *æqualis*. Near Sydney, and on the East coast.

Five small species, 3 or 4 inches long, with very short limbs the last is bronze above, bright yellow below.

OMOLEPIDA.

- O. *casuarinæ*. Near Sydney, South-east coast, and Tasmania.

A very elongate form, with short legs and long toes ; tail very long. Large specimens measure up to 14 inches and more ; common near Botany.

RHODONA.

- R. punctata.* West Australia.
 „ *Gerrardii.* West Australia.
 „ *punctato-vittata.* Queensland.

Small Blind-worm, like Lizards, with tubercular fore limbs, and short legs with developed toes behind.

SORIDIA.

- S. lineata.* West Australia.
 „ *miopus.* West Australia.

Very small snake-like Lizards, with a pair of tubercles near the vent, which represents the hind limbs.

ANOMALOPUS.

- A. Verreauxii.* Queensland.

MABOUIA.

- M. macrura.* North Australia.

TRACHYDOSAURUS.

- T. rugosus.*
 „ *asper.*

Stump-tail Lizards, with formidable rugose scales. These well-known species inhabit the plains of the interior; their legs are short, and their movements slow. The body-scales are very large and rough, resembling the scales of fir cones; the colour varies considerably, from brown to almost brick red. The tail is short and flat. The female produces a pair of young ones of considerable size about the end of January. Many persons consider these Lizards highly venomous; it must be borne in mind, however, that vertebrated animals, with limbs ever so rudimentary, possess no poison fangs.

CYCLODUS.

- C. gigas.* Australia generally.
 „ *occipitalis.* South Australia.
 „ *adelaidensis.* South Australia.
 „ *nigroluteus.* Tasmania.

The above four species are best known under the name of "Sleeping-lizards." They resemble the "Stump-tails," but their scales are smooth, the tail is round, and of moderate length, and the body generally banded with broad stripes. One species is peculiar to Tasmania; the other three inhabit the mainland. These animals have a broad bluish tongue, which is frequently thrust out; they feed on the berry called "jee-bung," and also on other berries and leaves, besides insects.

SILOBUSAURUS.

S. Stokesii. Named in honor of Capt. Stokes, R.N., one of our Australian discoverers.

This Lizard has a short rather flat tail, armed with powerful spines ; it does not exceed 6 or 8 inches in length, and inhabits West Australia.

EGERNIA.

E. Cunninghami. Named in honor of Allan Cunningham, F.L.S., the Botanist and Australian Explorer.

This species is common near Sydney, but can only be captured during the cold season when hibernating under stones. The Egernia has rather a flat body, covered with prickly scales, and an armed tail, which is not so spiny as that of Stokes's Lizard. The geographical distribution of this reptile must be extensive, as specimens have been obtained near Adelaide and in Queensland. The general colour is brown above, and red below.

TROPIDOLEPISMA.

T. Kingii. Admiral P. P. King, R.N., whose services to Australia are well known, discovered this reptile on the West coast.

It is nearly as large as the Cyclodus or Sleeping-lizard, and rare in collections.

T. nitidum. Wide Bay, Queensland.

„ **majus.** Clarence River, New South Wales.

These two species are found on the East coast. **C. majus** exceeds the Sleeping-lizard in size ; it is jet-black.

Thick-tongued or Night-lizards.

GECKOTIDÆ. GECKOS.

Of the twenty or more Night-lizards, recorded as inhabitants of Australia, only a few are well known ; and these are looked upon with dread by the less informed settlers. The Geckos are distinguished by their nocturnal eyes, thick tails, and granular skin, which is without the usual imbricate scales observed in other Lizards. They pass the day under stones, in crevices of rocks, or under bark ; and their feet, bearing movable disks, enable them to run up straight walls, or adhere on the roof of caves.

GEDURA.

G. marmorata. "Turnip-tail;" rather a large species, found on the North-east coast.

„ **rhombifera** is recorded from West Australia.

STROPHURA.

S. spinigera. A Gecko, with very granular body, inhabits West Australia and New South Wales.

DIPLODACTYLUS.

D. vittatus.

„ *ornatus*.

These two species are stated to inhabit West Australia, and they are also observed near Sydney, and on the east coast generally; we consider both to be one and the same species.

D. ocellatus. West Australia.

„ *bilineatus*. West Australia.

„ *polyophthalmus*. West Australia.

„ *furcosus*. South Australia.

These four species are rather rare in collections.

HEMIDACTYLUS.

H. vittatus. North Australia.

PERIPIA.

P. variegata. West Australia.

GEHYRA.

G. australis. North Australia and West Australia.

GONIODACTYLUS.

G. australis. West Australia.

HETERONOTA.

H. Binoe. West and North Australia.

PHYLLURUS.

P. platurus. }
 „ *inermis*. } New South Wales, Queensland, South Australia,
 „ *Myliusii*. } and probably Victoria.

These species occur near Sydney, where they are much dreaded by some persons, who apply the name of "Rock-scorpion" to them. They possess a distinct shrill voice, and like most Geckos change colour from light to dark; their broad flat tails are often lost and soon reproduced; adults measure about 6 inches in length; seldom more.

AGAMIDÆ.—THE AGAMAS.

The last family of Lizards comprises animals which have a thick tongue, adhering to the gullet, the head covered with numerous small shields, and generally a long tapering not fragile tail. The eye and eyelids are well developed and the pupil is round.

CHELONASIA.

C. brunnea. West Australia.

GINDALIA.

G. Bennettii. North-west coast.

Both are rare and little known species.

PHYSIGNATHUS.

P. Lesueurii. Water-lizard.

A common species, in almost every part of Australia, of large size, 3 or 4 feet in length, with bright yellow throat and copper-red breast; the colouration is more or less bright during certain seasons, and in young animals indistinct. This species may be seen basking on trees or logs near the water, from which it plunges in as soon as disturbed; it keeps a long time under the surface, and moves along the bottom without difficulty.

The larger species of beetles form the principal food of this Lizard.

CHLAMYDOSAURUS.

C. Kingii.

Another and most important discovery of the late Admiral P. P. King is the "Frisled-lizard," which is restricted to Queensland and the north coast. It is a well-known reptile, which has the power of erecting the loose frill-like skin round its neck in such a way that it resembles a collar, not unlike the gigantic lace collars of Queen Elizabeth's time. This Lizard stands remarkably high on her legs; and when, not long ago, Professor Huxley discussed the question of "the most reptile-like birds and bird-like reptiles," we experimented on one of these Frilled-lizards, and observed her, when startled, to rise with the fore legs off the ground, squat like a kangaroo, and hop once or twice to get out of our reach. There is certainly no other Lizard known which could take up such a position, and this observation may prove of interest to comparative anatomists.

LOPHOGNATHUS.

L. Gilbertii. From North and West Australia.

Named in honor of another gallant Australian explorer.

DIPOROPHORA.

D. bilineata. From North Australia.*

* Many of these specimens we have never seen, and the books in which they are described are not at our disposal; hence these brief notices.

GRAMMATOPHORA.

- G. cristata.* West Australia.
 „ *muricata.* Australia generally (not Tasmania).
 „ *reticulata.* West Australia.
 „ *barbata.* Australia generally.
 „ *angulifera.* South and West Australia.
 „ *maculata.* Australia. Bay of Sea Dogs.
 „ *ornata.* New South Wales. South and West Australia.
 „ *Decresii.* West Australia.
 „ *lævis.* West Australia, Champion Bay.
 „ *temporalis.* North Australia.
 „ *calotella.* North Australia.

The members of the genus *Grammatophora* are not of large size.

The Bearded-lizard (*G. barbata*) is perhaps the largest and best known of this tribe; some species are arboreal, and a few prefer open plains or scrub-country. *G. ornata* inhabits the flats on both sides of the Murray, and is remarkable for its bright colors of blue and yellow about back and neck. The lively long-tailed grey or sometimes black Lizard, which is frequently seen basking on fences or old stumps, is *G. muricata*. This species changes colour as well as the rest of the *Agamas*, and can scarcely be distinguished from the object on which it may be resting.

TYMPANOCRYPTIS.

- T. lineata.* South Australia.
 „ *cephalus.* West Australia, Nicol Bay.

MOLOCH.

- M. horridus.* Australian Moloch.

This reptile is one of the most singular species on record; it is covered with large and small spine-bearing tubercles in the most extraordinary manner; has a very small head and mouth, and is sluggish in its movements. The Moloch has the power to change colour, not only from light to dark but some parts also from yellow to grey or red. South Australia and Western Australia is the habitat of this strange creature.*

* Dr. J. E. Gray, of the British Museum, has figured about fifty species of Australian Lizards, which may be purchased at the low price of 7s. 6d. We refer those interested, to this valuable work.

FOSSIL SAURIAN REPTILES.

Many remains of fossil reptiles have been discovered in Australia during the last ten or fifteen years. Teeth of great Crocodiles were first obtained by the late Mr. Stutchbury, on the Darling Downs. The almost complete skeleton of another large Saurian (a Plesiosaurus, if we remember correctly), was found farther north, and the caves of Wellington yielded bones of the smaller species of the genus *Hydrosaurus*, *Cyclodus*, *Trachydosaurus*, *Tropidolepisma*, and *Grammatophora*. All these remains were however fragmentary, and have not yet been fully described.

OPHIDIAN REPTILES.

OPHIDIA—SNAKES.

The geographical distribution of snakes is very extensive. They inhabit almost every country from the south of Sweden and Siberia to Tasmania. None have as yet been recorded from New Zealand. India, America, and tropical Africa, appear to be the strongholds of the highly venomous species; and in these countries the dangerous Rattlesnakes, Copper-heads, Puff Adders, and Lance-heads, are met with—all of which have very long movable fangs, and belong to genera which are not found in Australia. Only five species are dangerous to man when full grown—the Black Snake (*Pseudechis porphyriacus*), the Brown Snake (*Diemenia superciliosa*), the Brown-banded snake (*Hoplocephalus curtus*), the Broadscaled Snake (*Hoplocephalus superbis*), and the Death Adder (*Acanthopsis antarctica*); all these retire under ground during the cold season, only a few young specimens being found under stones.

Our Death Adder is the nearest approach to the Viper, but its fangs are permanently erect, and its bite is not nearly so dangerous as that of the above-mentioned species. It is only found in the warmer parts of Australia, and not in Tasmania, South Victoria, or South-west Australia.

Only three species of snakes inhabit Tasmania, though foreign naturalists enumerate many more. Tasmanians distinguish the "Diamond Snake" (*Hoplocephalus superbis*), the "Carpet Snake," and "Black Snake," (*Hoplocephalus curtus*), and the "Whip Snake" (*Hoplocephalus coronoides*). The first is identical with the Continental *Hoplocephalus superbis*. The second two are varieties of each other; the young brought forth differing greatly in colour even in the same litter. The dark variety has been described as *Hoplocephalus fuscus* by M. Steindachner; but Mr. George Masters captured a large number of both kinds of snakes in Tasmania, and took from a gravid female, thirty-five young, seventeen of which were banded, and of a light colour, and the rest black.

The third Tasmanian snake is very small, only about 16 or 20 inches long, and, though venomous, not dangerous. This reptile is known as the Whip Snake (*Hoplocephalus coronoides*), and is allied to the New South Wales Black-bellied Snake (*Hoplocephalus signatus*), and to Masters' snake (*Hoplocephalus mastersii*) of South Australia.

We do not know exactly how many snakes Victoria produces. In the South, the Tiger Snake (*Hoplocephalus curtus*) and the Tasmanian Diamond Snake (*Hoplocephalus superbis*) are met with; also the little Black-bellied Snake (*Hoplocephalus signatus*) and the Black Snake (*Pseudechis porphyriacus*). Near the New South Wales boundary, on the Murray, we find, in addition, the Death Adder (*Acanthophis antarctica*), the Green-bellied or Grey Snake (*Diemenia reticulata*), the Brown Snake (*Diemenia superciliosa*), and probably also the innocuous Green Tree Snake (*Dendrophis punctulata*), and the Carpet Snake (*Morelia variegata*).

There occur in South Australia, in addition to the above, several small venomous Ophidians; the Death Adder is, however, very scarce, and, further west, altogether absent. Near King George's Sound are found many snakes of the brown-banded species, of a very marked colour, and with the bands much more distinct than in eastern specimens; small *Hoplocephali*, and particularly *Hoplocephalus coronoides*, abound on the barren hills near the Sound, but of the Ophidio-fauna further to the north-west our knowledge is limited.

Returning to New South Wales, we observe, in addition to the specimens enumerated from Victoria, the Diamond Snake (*Morelia spilotes*), and the Brown Tree Snake (*Dipsas fusca*), but miss the Tasmanian Diamond Snake (*Hoplocephalus superbis*). There is also a goodly number of small Ophidian reptiles, which will be fully described hereafter. Near the Queensland boundary, in the Clarence and Richmond River District, a new form has been discovered which differs from other Australian venomous species in having scales strongly keeled; this species has been described as *Tropidechis carinata*. A small ringed snake, with a very short head and tail, belonging to the South American genus *Brachyurophis*, is met with on the Clarence, as also are many other diminutive Ophidians which do not inhabit the southern districts. There the Diamond Snake disappears, and the sombre-coloured Carpet Snake takes its place, but no other Rock Snake is observed until the tropics are fairly entered.

Northern Queensland is rich in harmless Pythons; *Nardoa gilbertii* and *Aspidiotes melanocephalus* occur near Port Denison, and at the Gulf of Carpentaria two species of the genus *Liasis* have been observed. The harmless Fresh-water Snakes (*Cerberus australis* and *Myron richardsonii*) appear to be restricted in their habitat to the northern rivers.

A second harmless Tree Snake (*Dendrophis calligastra*) has lately been discovered near Cape York, and a variety of the Australian Brown Tree Snake (*Dipsas fusca*) extends even to New Ireland. This large island produces a second Tree Snake belonging to the genus *Dendrophis*, probably a new species, and a Python (*Liasis amethystinus*) which grows to a considerable size. The islands to the south-east of the Solomon Group are inhabited by harmless Pythons only. *Enygrus bibronii* is the most common of them, and found on the Solomon, New Hebrides, and Fiji Group, and the rearer *Bolyeria multicaudata*, which is generally but erroneously recorded by Foreign naturalists as inhabiting the shores of Port Jackson, must also be referred to the islands east of New Guinea.

A small venomous snake, allied to the Australian genus *Diemenia*, is peculiar to Viti Levu, the principal island of the Fijis; two other venomous species have been discovered at the Solomon Islands, but no large or dangerous venomous snake is on record from any other locality in the South Pacific. At New Caledonia, snakes have not been noticed; they are also absent from New Zealand, where a few lizards and frogs represent the reptilio fauna.

Twenty-one innocuous and forty-two venomous Australian snakes have been described, but of the latter not more than five species are dangerous to man or the larger animals, and these retire under ground for nearly five months in the year. It is, of course, most desirable to distinguish the dangerous from the harmless species by external characters; and, by a little attention to the subject, this may be easily done.*

An Australian snake that is not thicker than a man's little finger, whatever may be its length, cannot by its bite endanger the life of an adult human being.

Günther states that "poisonous snakes are armed with a long canaliculated tooth in front of the upper jaw, with a duct which carries the poisonous fluid from a large gland to the tooth. This venom-gland corresponds with the parotid salivary gland of the mammals, and is situated on the side of the head, above the angle of the mouth; it is invested by a dense fibrous sheath, which is covered by a layer of muscular fibres. At the moment the snake opens its mouth to bite, these muscles compress the gland, and force its contents through the excretory duct into the channel of the venom-tooth, whence it is injected into the wound. The structure of the venom-tooth is not the same in all poisonous snakes; in some it is fixed to the maxillary-bone, which is as long, or nearly as long, as in the non-venomous snakes, and generally bears one or more ordinary teeth on its hinder portion. The

* See Krefft's Snakes of Australia, page 10.

venom-tooth is fixed more or less erect, is not very long, and its channel is generally visible as an external groove. The poisonous snakes with this dentition have externally a more or less striking resemblance to the non-venomous ones; and on this account they are designated as venomous Colubrine Snakes, and form the second sub-order of snakes." All our Australian venomous serpents belong to this sub-order (except the "Death Adder," *Acanthophis antarctica*, which occupies an intermediate position between the venomous Colubrine Snakes and the venomous snakes properly so called).

Australia has few Ophidian genera, when compared with other countries in the same latitude. The four Blind Snakes, two Colubrides, two Fresh-water Snakes, and three Tree Snakes, are not peculiarly Australian; while the six species of Rock Snakes are not found beyond this region—that is, not in India or the Islands of the Archipelago;—Timor, New Ireland, and the Fiji Group, being the extreme northern limits of the geographical distribution. Twenty-three species constitute the whole of the Australian non-venomous snakes; and, not counting the Blind Snakes, we have but five harmless Ophidians in New South Wales. The second sub-order, comprising the venomous Colubrine Snakes, is, however, very large; and forty-two well-defined Australian species are known at present. Nearly all the larger kinds have the power of dilating the skin of the neck, and resemble in this respect the Hooded Snakes or "Najas" of India. The Brown-banded Snake (*Hoplocephalus curtus*), the large-scaled Snake (*Hoplocephalus superbus*), the Black Snake (*Pseudechis porphyriacus*), and the Orange-bellied Snake (*Pseudechis australis*), belong to this group, and are perhaps our most dangerous Ophidians. Two other large snakes—the Brown Snake (*Diemenia superciliosa*) and the Northern Banded Snake (*Pseudonaja nuchalis*)—and all the small venomous but not dangerous species, do not distend their necks when angry, and probably bear a close resemblance to the *Elapidae* of South America. The whole are peculiar to the Australian region, except the Short-tailed Snake (*Brachyurophis australis*), which, according to Günther, belongs to an American genus. The real position of the Death Adder (*Acanthophis antarctica*) has not yet been pointed out; in form a true viper, this snake has its poison fangs permanently erect, and will therefore be classified according to its dentition with the *Elapidae*. From late experiments it also appears that the venom of this reptile is less dangerous than that of the first-mentioned four species; thus, a Frog (*Hyla aurea*) and a young Sleeping-lizard (*Cyclodus gigas*), severely bitten by a Death Adder, lived for more than twelve hours after the bite. The snake was fresh, and very vigorous, and the fangs were left in the wound for two minutes.

It will be necessary also to say a few words about the Sea Serpents which visit our coast, as they belong to the second sub-order, and are frequently overlooked in adding up the Australian fauna.

Two well-known forms—the Ringed Sea Snake (*Platurus laticaudatus*) and the Yellow-bellied Sea Snake (*Pelamis bicolor*)—are occasionally thrown ashore on the coast of New South Wales; but eight other species have been noticed further north. Sea Snakes are rare in collections; and, in arranging the riches of the Australian Museum, one of these aquatic reptiles has been found that cannot be classed with other known forms, and will constitute the type of the new genus *Emydocephalus*.

We arrange the Ophidian order as follows:—

FIRST SUB-ORDER.—INNOCUOUS SNAKES.

TYPHLOPIDÆ.—BLIND SNAKES.

TYPHLOPS.

1. polygrammicus. Schlegel's Blind Snake, Queensland.
2. bituberculatus. Peter's Blind Snake, South Australia.
3. Güntheri. Günther's Blind Snake, Queensland.
4. nigrescens. Gray's Blind Snake, New South Wales.
5. Rüppelli. Rüppell's Blind Snake, New South Wales.
6. Preissi. Preiss' Blind Snake, New South Wales.
7. bicolor. Schmidt's Blind Snake, New South Wales.
8. australis. Australian Blind Snake, West Australia.
9. Wiedii. Wied's Blind Snake, Queensland.
10. unguirostris. Queensland Blind Snake, Queensland.

COLUBRIDÆ.—COLUBERS.

CORONELLA.

1. australis. Australian Coronella, North coast.

NATRICIDÆ.—WATER COLUBERS.

TROPIDONOTUS.

1. picturatus. Fresh-water Snake, East and North coast.

HOMALOPSIDÆ.—TRUE FRESH-WATER SNAKES.

CERBERUS.

1. australis. Australian Bockadam, North coast.

MYRON.

1. Richardsonii. Richardson's Water-snake, North coast.

DENDROPHIDÆ.—TREE SNAKES.

DENDROPHIS.

1. *punctulata*. Green Tree Snake, East and North coast.
2. *calligastra*. Northern Tree Snake, East and North coast.

DIPSADIDÆ.—NIGHT TREE SNAKES.

DIPSAS.

1. *fusca*. Brown Tree Snake, East and North coast.

PYTHONIDÆ.—ROCK SNAKES.

MORELIA.

1. *spilotes*. Diamond Snake, South-east coast.
2. *variegata*. Carpet Snake, Australia generally, except South Victoria.

ASPIDIOTES.

1. *melanocephalus*. Black-headed Snake, North-east and North coast.

LIASIS.

1. *Childrenii*. Children's Rock Snake, North-east and North coast.
2. *olivacea*. Olive-green Rock Snake, North coast.

NARDOA.

1. *Gilbertii*. Gilbert's Rock Snake, North-east coast.

SECOND SUB-ORDER.—VENOMOUS COLUBRINE SNAKES.

ELAPIDÆ.—ELAPIDES.

DIEMENIA.

1. *psammophis*. Schlegel's Snake, North-east coast.
2. *olivacea*. Spotted-headed Snake, North-east coast.
3. *reticulata*. Grey Snake, Australia generally, the south excepted.
4. *Mülleri*. Müller's Snake var., Australia generally, the South excepted.
5. *superciliosa*. Brown Snake, Australia generally.
6. *torquata*. Percy Island Snake, Percy Island, East coast.

PSEUDONAJA.

1. *nuchalis*. North Australian Brown Snake, North-west and North coast.

PSEUDECHIS.

1. porphyriacus. Black Snake.
2. australis. Orange-bellied Brown Snake, North-east coast.
3. scutellatus. Variety of orange-bellied Brown Snake, Rockhampton.

BRACHYSOMA.

1. diadema. Scarlet-spotted Snake, Australia generally, except South coast.
2. triste. MacGillivray's Snake, North coast.

FURINA.

1. calonotos. Doubtful species.
2. bimaculata. West Australia (?)

BRACHYUROPHIS.

1. australis. Short-tailed Snake, East coast.

HOPLOCEPHALUS.

1. curtus. Brown-banded Snake, Australia generally.
2. superbus. Large-scaled Snake, Western districts.
3. ater. Flinder's Snake, South Australia.
4. variegatus. Broad-headed Snake, South-east coast.
5. Stephensii. Stephen's Snake, Port Macquarie.
6. pallidiceps. Pale-headed Snake, Queensland and N. S. Wales.
7. Gouldii. Gould's Snake, South-west Australia.
8. spectabilis. Port Lincoln Snake, South Australia.
9. coronatus. Crowned Snake, West Australia.
10. coronoides. Tasmanian Snake, Tasmania.
11. Mastersii. Masters' Snake, South Australia.
12. signatus. Black-bellied Snake, Queensland
13. temporalis. Temporal-desert Snake, South and West Australia.
14. Ramsayi. Ramsay's Snake, New South Wales.
15. minor. Desert Snake, South-west Australia.
16. nigriceps. Black-naped Snake, New South Wales.
17. nigrescens. Black-backed Snake, East coast.
18. nigrostriatus. Black-striped Snake, North-east coast.

TROPIDECHIS.

1. carinata. Clarence River Snake.

PETRODYMON.

1. cucullatum. Red-bellied Snake.

CACOPHIS.

1. *Krefftii*. Krefft's Dwarf Snake, East coast.
2. *Fordei*. Forde's Dwarf Snake, Queensland.
3. *Harriettæ*. Harriett's Dwarf Snake, Queensland.
4. *Blackmanii*. Blackman's Dwarf Snake, Queensland.

VERMICELLA.

1. *annulata*. Ringed Snake, Australia generally.
2. *lunulata*. Half-ringed Snake, North-east coast.

ACANTHOPHIS.

1. *antarctica*. Death Adder, Australia, Eastern and Northern portion.

DENISONIA.

1. *ornata*. Ornamented Snake, Queensland.

HYDROPHIDÆ.—SEA SNAKES.

PLATURUS.

1. *scutatus*. Ringed Sea Snake, Australian seas.
2. *Fischeri*. Fischer's Sea Snake, Australian seas.

AIPYSURUS.

1. *anguilliformis*. Eeel-like Sea Snake, Australian seas.
2. *fuscus*. Brown Sea Snake, Australian seas.
3. *lævis*. Juke's Sea Snake, Australian seas.

EMYDOCEPHALUS.

1. *annulatus*. Ringed Sea Snake, Australian seas.
2. *tuberculatus*. Tortoise-headed brown Sea Snake, Australian seas.

DISTERA.

1. *doliata*. Dumeril's Sea Snake, Australian seas.

ACALYPTUS.

1. *superciliosus*. Bibron's Sea Snake, Australian seas.

HYDOPHIS.

1. *Stokesii*. Stoke's Sea Snake, Australian seas.
2. *Belcheri*. Belcher's Sea Snake, Australian seas.
3. *elegans*. Elegant Sea Snake, Australian seas.
4. *ocellata*. Eyed Sea Snake, Australian seas.

ENHYDRINA.

1. *bengalensis*. Bengal Sea Snake, Australian seas.

PELAMIS.

1. *bicolor*. Yellow-bellied Sea Snake, Australian seas.

BATRACHIAN REPTILES.

BATRACHIA.—FROGS.

This sub-order of the class Reptilia is well represented in Australia, and about forty or more species are described. Nearly the whole of these have been observed on the East coast, so that many novelties may be expected when the interior of the country and its western parts have become better known.

Frogs are found almost everywhere, in particular near water, though at times they are seen far away from it. They are all more or less nocturnal, and may be collected by the aid of a light after dark, or during the day-time by removing the loose bark of certain trees, turning over logs or stones, or examining any crevices in the soil which are likely to be damp. The paper-like bark of a species of *Melaleuca* (the tea-tree of the settlers) harbors many *Hylæ* or tree-frogs; they are also found on Grass-trees (*Xanthorrhœ*), on the dwarf-palms or *Zamias*, and on other plants which retain moisture, or are frequented by a variety of insects. When basking in the rays of the sun they generally assume a pale colour, the pupil is contracted and scarcely visible, and the frog is supposed to be asleep. How far this is correct may be judged from bringing an insect within reach of him—he will soon wake up and swallow it. Night is however the proper time to observe them; then they are most active, and generally of a darker colour. The variable hues which pass over some of the tree-frogs in particular are truly wonderful; they will change from white to dark-grey, from bright-green to almost black, from slate-colour to a rich green, and so on, till one is bewildered how to describe them.

Frogs are voracious feeders; they devour each other at every chance, as long as the victim is but a trifle smaller than the aggressor; and the elastic bag known as a frog's stomach often contains such a varied collection of things that it will almost appear incredible to non-observers. Nothing dead is accepted by frogs—all must be living food; and they generally watch till the intended prey moves before they make a spring. If the victim is a small insect, the tongue is thrown out as quick as thought, and the fly or beetle devoured, but when too large a sound grip is retained, and the arms are freely used to work the creature down into the stomach. Large beetles, spiders, centipedes, worms, butterflies, caterpillars, snails, crabs, prawns, small snakes, and lizards have been removed from the digesting apparatus of various frogs, and, it may sound incredible, the remains of young birds were found, and on one occasion a large mouse or

perhaps a young rat.* Tree-frogs are safe weather-prophets, and whenever they begin to chirp or croak rain is not far off. We have not yet heard of the remains of fossil frogs being found in Australia, and with regard to the frequent discoveries of "toads in solid rock" those statements must be received with caution. All the frogs presented to the Museum, and said to be so obtained, proved to be common Sydney species.

No tailed frogs, such as Newts, Salamanders, or Olms, inhabit this country.

The *Batrachia salientia*,† the tailless section, is arranged as follows:—

A. AGLOSSA.

Frogs without a tongue.

MYOBATRACHUS.

M. paradoxus. Swan River.

Above brownish-grey, beneath greyish; no teeth, except two large horizontal fangs, tympanum hidden; toes, 5, free.

B. OPHISTIOGLOSSA.

Frogs with a tongue, adherent in front and more or less free behind.

α OPHISTIOGLOSSA OXYDACTYLA.

Frogs with tapering cylindrical fingers and toes.

RANIDÆ.

Frogs with webbed toes, cylindrical processes of the sacral vertebra and without paratoids.

MYXOPHIES.

M. fasciolatus. Queensland, Clarence River, and Illawarra Districts.

Dr. Albert Günther, F.R.S., informs us that the present species is the most *Rana*-like form hitherto discovered in Australia. This frog has rather a large head, and exceeds the common golden frog in size. Its legs are striped, the general colour grey, lighter below.

* We have just tried the experiment and put a common house-mouse into a glass jar with a large green frog (*Pelodryas*), secured by a glass stopper. We intended to watch but were called away, and on our return ten minutes afterwards the mouse had vanished and the frog increased in size.

† The list of frogs has been compiled from Dr. Günther's excellent "Catalogue of the *Batrachia salientia*, in the collection of the British Museum," the best work published on the subject.

CRINIA.

- C. verrucosa.* Australia.
 „ *georgiana.* King George's Sound.
 „ *affinis.* West coast.
 „ *tasmaniensis.* Tasmania.
 „ *lævis.* Tasmania.
 „ *fasciata.* East and West coast.

These are small species, about an inch in length; they inhabit swamps and shallow pools, have all their toes free, and are destitute of large glands. Nearly all have a series of tubercles on the back, and are spotted with bright pink or orange on the inner side of the hind legs. A fly often deposits her eggs behind the tympanum, or on the back of these little frogs, and we have several times noticed single individuals infested with four such larvæ. When the larva has reached maturity it drops out and the frog dies. The result of the usual transformation of the insect is a small yellow fly, to which the late W. S. Macleay has given the name of *Batrachyomia*.

We have subsequently ascertained that the same parasite infests other Australian frogs.

CYSTIGNATHIDÆ.

Frogs with free toes, cylindrical processes of sacral vertebra, and without paratoids.

LYMNODYNASTES.

- L. dorsalis.* Australia generally.

On each calf a large gland; head broad; snout of moderate length and rounded; back with a distinct vertebral line. It would be useless to try and give the true color of any frog, because the changes are numerous, and cannot be defined.

- L. Dumerilii.* Adelaide.

This is an allied species, perhaps identical with *L. dorsalis*.

- L. platycephalus.* Adelaide.

Probably another variety of *L. dorsalis*.

- L. Salminii.* From the Clarence River to the far north.

This new species resembles *L. Krefftii*, and differs from it chiefly in its two or three elongate red stripes on the back.

- L. Krefftii.* South-east coast.

One of the most common frogs near Sydney; not so short as the previous three species, and without a distinct dorsal stripe. General colour, dark greenish-brown; lighter below.

L. tasmaniensis. Tasmania and South-east coast.

This frog is smaller than the other members of the genus, much spotted, of a lighter colour, and the male with a yellow vocal sack; some specimens have a distinct red vertebral line. Gland on the calf absent.

L. affinis. From the Clarence River.

Closely allied to *L. tasmaniensis*.

L. ornatus.

A northern frog, with slightly webbed toes, a marbled back, and without a gland on the leg.

PLATYPLECTRUM.

P. marmoratum. From Port Stephens to the far north.

This is one of the rarer species, discovered through the exertions of Mr. Wilcox, at the Clarence River. It is a rather stout species, with marbled back and whitish belly. The total length is eighteen lines. It resembles *Cryptotis brevis* at first sight.

DISCOGLOSSIDÆ.

Frogs with webbed toes, dilated sacral vertebra, and without paratoids.

CHIROLEPTES.

C. australis. From the Clarence River to the far north.

We find the *Chiroleptes* widely distributed, and sometimes of a considerable size. The head is very large, perhaps the largest of any Australian frog; the fingers are free, the toes partly webbed, the back covered with some flat warts. General colour, greenish grey, slightly marbled. The tympanum or ear-disk is distinct; the tongue elliptic, and slightly notched behind. We have taken many valuable insects, and once a half-grown rat from the stomach of one of them. Some very large specimens are in the Australian Museum collection.

C. alboguttatus. Cape York.

This is a northern species, which we have not yet obtained.

ASTEROPHRYDIDÆ.

Frogs with free toes, with the processes of the sacral vertebra dilated, and without paratoids.

CRYPTOTIS.

C. brevis.

Head, large; body, rather stout, covered with numerous rather smooth tubercles; grey or brownish marbled above and below; fingers and toes tapering, free to the base; a pair of tooth-like processes at the symphysis of the lower jaw; total length, about 20 lines; inner side of legs pink-spotted.

ALYTIDÆ.

Frogs with webbed toes, dilated processes of the sacral vertebra, and with paratoids.

HELEIOPORUS.

H. albopunctatus. West and North Australia.

A short and stout form, with a broad and swollen head, large eyes, short extremities, four fingers quite free, and five toes which are half-webbed. Skin of the back, granular; of the belly, smooth. Vomerine teeth in a straight, in the middle interrupted line, between the inner nostrils. Above brownish with round white spots, or more or less marbled.

UPEROLIIDÆ.

Toes and fingers free, sacral vertebra dilated, and with paratoids.

UPEROLEIA.

U. marmorata. New South Wales and West Australia.

This frog has, no doubt, a wide distribution, but nearly all our specimens came from the east coast and a few from the west. The back is more or less mottled or marbled, and there is always a bright orange spot on the inner side of the leg; general size to $1\frac{1}{2}$ inch long.

BRACHYCEPHALIDÆ.

Small frogs with free toes, dilated sacral vertebra, and without paratoids.

PSEUDOPHYRNE.

P. australis. East coast.

One of the smallest frogs known, with bright scarlet markings on the head and back; black and white marbled below. The scarlet spots turn white in spirits. Found in moist localities under logs and stones; never in swamps or lagoons. A much larger variety occurs near Lake Macquarie of a bright red colour above, black and white marbled below.

P. Bibronii. East coast.

Coloration more uniform than in the previous species, with no broad marks but only a few yellow spots on the back.

ENGYSTOMATIDÆ.

Toad-like frogs with free toes, dilated sacral vertebra, and without paratoids.

CHELYDOBATRACHUS.

C. Gouldii. West Australia.

Head protruding globular, ear-disk distinct, extremities very short, no teeth, and rather elongate tongue; skin smooth with a few flat warts; fingers and toes free.

b. OPHISTHOGLOSSA PLATYDACTYLA.

Tips of fingers and toes dilated into a disk, ear perfectly developed.

POLYPEDATIDÆ.

Frogs with webbed toes, processes of the sacral vertebra cylindrical, and without paratoids.

HYPEROLIUS.

H. bicolor. New South Wales and Queensland.

The *Hyperolius* is a very small frog, not exceeding an inch in length; the vomerine teeth are wanting; the colour above is a very pale green, inner side of legs bright orange, and white below.

HYLODIDÆ.

Toes free, sacral vertebra cylindrical, and without paratoids.

PLATYMANTIS.

P. vitianus. Fiji Islands, Solomon Group, perhaps North Australia.

We mention this species, because it is one of the few representatives of the Batrachian order found on the islands of the Pacific. A second species has been described by Dr Günther as *P. platyductyla*; the habitat is however not given. The first grows to a considerable size.

HYLIDÆ.

Toes webbed, processes of sacral vertebra dilated, and without paratoids.

LITORIA.

First finger opposite to the other three. Fingers slightly webbed, toes half-webbed, ear-disk distinct.

L. Freycineti. Port Essington.

„ *nasuta.* North and East coast.

„ *Wilcoxi.* Clarence River.

These three allied species are distinguished by their elongate form and exceedingly long hind legs, which enable them to jump great distances. The colouration differs but slightly, generally brownish or red, more or less mottled or striped.

L. aurea.

This is the most common of all our frogs and the one which has the widest distribution. The popular name is "Blue-frog" or "Golden-frog," from the blue inner skin of the legs and the bronze or golden marks on the back. The ground tint is green and whitish below. A variety occurs in West Australia with marbled belly. The voice of the males is very loud, and when pinched they scream almost like a child.

L. latopalmata. Port Denison.

We believe this to be a well distributed species, which occurs at Adelaide, near Sydney, and probably in intermediate districts. The general colour is grey or reddish grey, with some black spots on the inner side of the legs.

PELODRYAS.

P. cæruleus.

The largest of Australian frogs; bright green above, with a few white spots on the side; inhabits the whole of Australia and New Guinea. It is not found in Tasmania. This is the frog whose deep voice is always heard before rain. It lives about dwelling-houses, secreted under rafters or in post holes;—devours mice.

HYLA.

No finger opposite to the three others; toes completely webbed. *H. Ewingii.* Australia and Tasmania.

A small frog, $1\frac{1}{4}$ or $1\frac{1}{2}$ inch in length. Above greyish or reddish, more or less spotted with a darker band in the middle of the back. The Museum is in possession of specimens from almost every part of Australia, the west coast excepted.

H. Krefftii. East coast.

Rather rare in collections; colour when dark of a rich chestnut with fine black spots, and a vertebral band from between the eyes to the vent; inner sides of legs bright pink. When asleep or exposed to the sun this frog changes almost to dead white. We procure our specimens from a district covered with *Zamias*, and find them between the fronds of this dwarf palm; in winter under stones in moist rocky places, or under the bark of the tea-tree. The male has a loud shrill voice.

H. Verreauxii. East coast.

This tree-frog is very common almost everywhere on the eastern border; the colour is uniform greyish-brown, with a darker band from between the eyes to the vent. Males with a yellowish vocal sack. The shrill almost bird-like voice of this little frog is very remarkable after or during rain, and as deafening as the noise of the locusts. Verreaux's frog has been tamed on several occasions, and we remember one which lived for years in a shell on the mantel-piece of a hospitable homestead in the Hawkesbury District. He was in the habit of coming out at night—hopping about for a short distance, but generally preferred to wait for the flies which the children gathered for him. This specimen had grown to more than double its usual size. Another frog of the same kind, kept in a fern-case, always cried lustily when one of the larger species tried to swallow it, and being released would keep on its deliverer's shoulder for hours together.

H. jervisiensis.

Probably a variety of the former species.

H. rubella. North-east and North coast.

This is the smallest tree-frog known to us, and distinguished by a black throat.

H. phyllochroa. Australia, East and North-east coast.

A handsome green species, of small size. Common among ferns and in hot-houses.

H. infrafrenata. Cape York.

„ *ingrofrenata*. Cape York.

Both species have been lately described by Dr. Günther, F.R.S. The ground colour is probably green.

H. citropus. East coast.

This rare frog inhabits high trees and lays up in moist localities under stones during the cold season. It attains a considerable size, nearly as large as the golden frog. The colour varies; sometimes it is purple-grey with a wash of green on the back; at other times slate-grey or almost green; and young specimens taken during winter from under stones appear quite white. The inner side of the legs is pink. Very few examples are in collections; they occur near Sydney, at Kissing Point, Ryde, at Hunter's Hill, and other localities.

H. Peronii. Australia.

Péron's tree-frog is found principally on the east and north coast; it changes colour from light-grey with pale green spots to almost brown, the green spots still being distinct. The inner skin of the legs and the flanks are bright yellow and black.

This closes the list of Australian frogs.

FISHES.*

(Inhabiting the Australian Seas and Rivers.)

SUBCLASS I.—TELEOSTEI.

Fishes with ossified skeleton and completely separated vertebræ; the posterior extremity of the vertebral column either bony, or covered with bony plates. Bulb of the aorta simple, with two opposite valves at the origin; branchiæ free.

* Compiled from Dr. Günther's "Catalogue of the Fishes in the British Museum," 8 Vols., 8vo., 1859 to 1870. The latest work published. This descriptive catalogue should be in every Australian's library; it contains the characteristics of 4,219 species, and took (as the learned author says) the best ten years of his life to complete it. The price is moderate; about £4 or £5.

ORDER I.—ACANTHOPTERYGII.

Part of the rays of the dorsal, anal, and ventral fins not articulated, forming spines. The inferior pharyngeal bones separated. Air-bladder, if present, without pneumatic duct.

BERYCIDÆ.

Form of body oblong or rather elevated, compressed; eyes lateral, large; cleft of mouth extending on the sides of the muzzle, more or less oblique; villiform teeth in both the jaws, and generally on the palate. Eight or four branchiostegals. Opercular bones more or less armed. Scales ctenoid, seldom bony, or wanting. Ventral fins thoracic, with more than five soft rays, in one genus with less. Cæca pylorica in increased number.

Tropical and temperate seas.

Monocentris japonicus. Port Jackson. (Mr. Fitzhardinge.)

Trachychthys australis. Coast line. Port Jackson.

——— *elongatus*. Australia and New Zealand.

Beryx affinis ("Nannygey"). Port Jackson.

Holocentrum operculare. North coast.

PERCIDÆ.

Body generally oblong, and covered with ctenoid scales; lateral line continuous.* Mouth in front of the snout, with lateral cleft, rarely at the lower side. Eye lateral. All or some of the opercles serrated or armed.† Seven or six branchiostegals.‡ Dentition complete; teeth pointed, in villiform bands, with or without canines; teeth either on the vomer, or on the vomer and palatine bones. No barbels.§ Cheek not cuirassed. Dorsal fin formed by a spinous portion and by a soft; ventrals thoracic, with one spine and five soft rays. Stomach cæcal; pyloric appendages generally in small number. Swim-bladder present, simple.|| Intestines little folded.

Carnivorous fishes, inhabiting the fresh waters and seas of all parts of the globe.

Lates colonorum. Rivers of New South Wales. "Perch" of settlers.

Psammoperca waigiensis. North coast.

Enoplosus armatus. Port Jackson.

Serranus guttatus. Port Jackson. "Blue-fish"?

——— *ouatalibi*. Lord Howe Island.

——— *crapao*. Port Essington.

——— *variolosus*. Coast line.

——— *hexagonatus*. North coast.

* Some species of *Ambassis* excepted.

† Cfr. *Percilia*.

|| In *Pileoma* and *Boleosoma* absent.

‡ Except *Apsilus*.

§ Except *Pogonoperca*.

- Plectropoma semicinctum*. West coast, Port Jackson.
P. dentex. King George's Sound.
 ——— *cyanostigma*. Port Jackson.
 ——— *cinctum*. Norfolk Island.
 ——— *serratum*. King George's Sound.
Trachypoma macracanthus. Norfolk Island.
Grammistes punctatus. Australian coast.
Myriodon waigiensis. Port Essington.
Mesoprion carponotatus. Ditto.
 ——— *waigiensis*. Ditto.
 ——— *Johnii*. North-west coast.
 ——— *annularis*. Coast line.
Glaucosoma Bürgeri. West coast.
Ambassis Commersonii. North coast.
Mionorus lunatus. Cox's River, N.S.W.
Pogon Rüppelli. Australian seas.
 ——— *quadrifasciatus*. North coast.
 ——— *fasciatus*. Port Jackson. "Red mullet."
 ——— *Victoriæ*. South coast.
Pogonichthys aprion. Port Essington.
Oligorus macquariensis. Australian rivers. "Murray cod,"
 "Cod perch," grows to 80 lbs. weight.
Arripis georgianus. Port Jackson.
 ——— *salar*. Tasmanian coast.
 ——— *truttaceus*. Port Western.
Dules ambiguus. West coast.
 ——— *riverrina*. Fresh waters of New South Wales.

PRISTIPOMATIDÆ.

Body compressed and oblong, covered with scales, the serrature of which is sometimes exceedingly fine and sometimes wanting. Lateral line continuous, not continued on the caudal fin. Mouth in front of the snout, with lateral cleft. Eye lateral, of moderate size. Five, six, or seven branchiostegals. Teeth in villiform bands, with pointed and conical canines in some of the genera; no molars or trenchant teeth in the jaws, generally no teeth on the palate; jaws toothless in two of the genera. No barbels. Cheek not cuirassed. One dorsal fin, formed by a spinous and soft portion of nearly equal development, the former of which either contains strong spines or is continuous with the latter; anal similarly developed as the soft dorsal; the lower rays of the pectorals branched; ventrals thoracic, with one spine and five soft rays. The bones of the head with a rudimentary or moderately developed muciferous system. Stomach cæcal; pyloric appendages in small or moderate number. Air-bladder present, more or less simple. Pseudobranchiæ well developed.

Carnivorous fishes, without molar or trenchant teeth, inhabiting the seas of the temperate and tropical regions ; a few entering fresh waters.

Therapon ellipticus. Macquarie River.

—— *unicolor*. Gwydir River.

—— *servus*. Cape York.

—— *Cuvieri*. Port Jackson.

—— *caudovittatus*. Harvey River, West coast.

Helotes sexlineatus. Port Jackson. "Yellow-tail."

—— *octolineatus*. South-west coast.

Macquaria australasica. Bell River.

Pristipoma hasta. Cape York.

Diagramma affine. North-west coast.

—— *polytænia*. North coast.

—— *nitidum*. Australian coast.

Hyperoglyphe porosa. Port Jackson.

Gerres subfasciatus. Ditto.

—— *ovatus*. Ditto. (?)

—— *filamentosus*. Cape York.

—— *argyreus*. Port Jackson.

Scolopsis longulus. Torres Straits.

Synagris furcosus. North coast.

—— *tæniopterus*. North-east coast.

Pentapus vitta. West coast.

—— *paradiseus*. North coast.

Erythrichthys nitidus. New Zealand, West coast of Australia.

MULLIDÆ.

Body elongate, slightly compressed, covered with large scales without or with an extremely fine serrature. Profile of the head more or less parabolic; hyal apparatus with two long barbels. Lateral line continuous. Mouth in front of the snout, with the cleft lateral and rather small. Eye lateral, of moderate size. Four branchiostegals; pseudobranchiæ. Dentition feeble, more or less complete. Two dorsal fins, remote from each other; anal similar to the second dorsal; ventrals with one spine and five rays. Air-bladder, if present, simple and of variable size; stomach siphonal.

Inhabitants of nearly all the tropical seas, extending in Europe on to the coasts of the temperate region. Some species entering rivers.

Upeneichthys porosus. Port Jackson.

Upeneus signatus. Ditto.

SPARIDÆ.

Body compressed and oblong, covered with scales, the serrature of which is exceedingly minute, and sometimes wanting. Tail not armed. Lateral line continuous, not continued on the caudal fin. Mouth in front of the snout, with lateral cleft. Eye lateral, of moderate size. Five, six, or seven branchiostegals. Either trenchant teeth in front of the jaws, or lateral series of molar teeth;* generally no teeth on the palate. One dorsal fin, formed by a spinous and soft portion of nearly equal development; anal with three spines; the lower rays of the pectorals generally branched, in one group simple; ventrals thoracic, with one spine and five rays. The bones of the head with a rudimentary muciferous system. Air-bladder present, often bifid posteriorly. Pseudo-branchiæ well developed.

Herbi- and carnivorous fishes, inhabiting the seas of the temperate and tropical regions; a few entering rivers.

Girella tricuspidata. Port Jackson.

—— simplex. Ditto.

—— zonata. Ditto.

Tephraëops Richardsonii. West coast.

Haplodactylus punctatus. Tasmanian coast.

—— arctidens.

—— lophodon. Port Jackson.

Lethrinus chrysostomus. Australian seas.

Pagrus unicolor. Port Jackson. "Schnapper," "Bream."

Chrysophrys hasta. West coast.

—— australis. Port Jackson. Fresh-water.

SQUAMIPINNES.

Body compressed and elevated, covered with scales, which are sometimes exceedingly finely ciliated, and sometimes smooth. Lateral line continuous, not continued on the caudal fin. Mouth in front of the snout generally small, with lateral cleft. Eye lateral, of moderate size. Six or seven branchiostegals. Dentition formed by villiform or setiform bands, without canines or incisors; some of the genera with teeth on the palate. Dorsal fin formed by a spinous and soft portion of nearly equal development; anal with three or four spines, similarly developed as the soft dorsal, and both many-rayed. The vertical fins more or less densely covered with small scales; the spinous portions sometimes not scaly. The lower rays of the pectorals branched; ventrals

* Some species of *Lethrinus* appear to make an exception, but their teeth are thick, and approach to molars; they are, moreover, readily distinguished by their naked cheek.

thoracic, with one spine and five soft rays. Stomach cæcal; pyloric appendages in moderate number; intestines generally with many convolutions. Air-bladder present, more or less simple. Pseudobranchiæ well developed.

Mostly carnivorous fishes, inhabiting the seas between the Tropics, especially of the Indian region; a few entering rivers or spreading beyond the Tropics.

Chætodon sexfasciatus. Port Jackson. West coast.

Chelmo rostaratus. West coast.

——— *marginalis*. Ditto.

Heniochus macrolepidotus. North coast.

Holacanthus semicirculatus. Ditto.

Scatophagus multifasciatus. Port Jackson.

CIRRHITIDÆ.

Body compressed and oblong, covered with cycloid scales; lateral line continuous. Mouth in front of the snout, with lateral cleft. Eye lateral, of moderate size. Cheeks not cuirassed. Generally six, sometimes five, in one genus three branchiostegals. Dentition more or less complete, composed of small pointed teeth, sometimes with the addition of canines. One dorsal fin, formed by a spinous and soft portion of nearly equal development. Anal with three spines, generally less developed than the soft dorsal*. The lower rays of the pectoral fins simple and generally stout; ventrals thoracic, but remote from the root of the pectorals, with one spine and five rays.

Carnivorous fishes, inhabiting the seas of the tropical regions and the southern temperate parts of the Pacific.

Chironemus georgianus. King George's Sound.

——— *marmoratus*. West coast.

——— *maculosus*. King George's Sound.

Chilodactylus carponemus. South coast.

——— *macropterus*. North coast of Tasmania.

——— *aspersus*. Tasmanian coast.

——— *nigricans*. King George's Sound.

——— *gibbosus*. West Australian coast.

Nemadactylus concinnus. Tasmanian coast.

Latris hecateia. Tasmanian coast.

——— *ciliaris*. New Zealand coast.

TRIGLIDÆ.

Form of the body oblong, compressed or subcylindrical; eyes generally lateral, the cleft of the mouth extending on the sides of the muzzle; sometimes of hideous aspect—eyes directed upwards and the cleft of the mouth subvertical. Dentition feeble; teeth

* Cfr. the genus *Latris*.

in villiform bands; generally without canines. Some bones of the head armed; suborbital ring articulated with the præoperculum. Epidermoid productions very variable. Two separate dorsal fins, or two distinct portions of the dorsal fin*. Anal fin similarly developed as the soft dorsal. Ventrals thoracic, often with less than five soft rays. Five to seven branchiostegals; pseudo-branchiæ; air-bladder often absent.

Carnivorous fishes, found in all seas,—a few only entering fresh waters. Some inhabit exclusively the fresh waters of both the Arctic regions. All live at the bottom of the water, being bad swimmers; a few are able to raise themselves into the air.

Scorpena cruenta. Tasmanian coast.

—— *bynoensis.* North-west coast.

—— *cardinalis.* Australian seas.

—— *panda.* West coast.

Glyptauchen panduratus. South-west coast.

Pterois volitans. Port Jackson.

—— *Kodipungi.* Coast of Australia.

Centropogon australis. Fresh water and Australian coast.

—— *robustus.* Ditto.

Pentaroge marmorata. Tasmanian coast.

Prosopodasys cottoides. Coast of New Zealand.

Aploactis Milesii. South-west coast.

Synancidium horridum. North coast.

Platycephalus insidiator. North coast. "Flathead."

—— *tasmanius.* Port Jackson.

—— *lævigatus.* Western part Port Jackson.

—— *inops.* King George's Sound.

—— *nematophthalmus.* Victoria. (Port Essington Settlement.)

—— *cirronasus.* Botany Bay and Port Jackson.

Trigla kumu. Australian coast.

—— *polyommata.* Tasmanian coast.

TRACHINIDÆ.

Body elongate, low, naked, or covered with scales. Teeth in villiform bands, with pointed and conical canines in some of the genera; no molars or trenchant teeth. The infraorbital ring does not articulate with the præoperculum. One or two dorsal fins, the spinous portion being always much less developed and shorter than the soft; the anal similarly developed as the soft dorsal; ventrals with one spine and five rays.† Gill-opening more or less wide; five, six, or seven branchiostegals; pseudobranchiæ. No prominent papilla near the anus. Air-bladder generally absent; pyloric appendages in moderate number, or wanting.

* Except in *Aspidophoroides*.

† In *Epicopus* with one spine and six rays.

Carnivorous fishes, living at the bottom of the shores of nearly all the seas.

Anema monopterygium. New Zealand coast.

Kathetostoma læve. Port Arthur.

Leptoscopus macropygus. Port Jackson.

Percis nebulosa. West coast.

—— *nycthemera*. New Zealand coast.

—— *colias*. Ditto.

Aphritis Urvilli. Tasmanian and South Australian Rivers.

Sillago maculata. Port Jackson. "Whiting."

—— *punctata*. South coast.

—— *ciliata*. Cape York. "Koopooroa."—Native name.

Notothenia cornuola. New Zealand coast.

POLYNEMIDÆ.

Body compressed and oblong, covered with scales, feebly ciliated or without serrature. Lateral line continuous, continued on the tail. Mouth at the lower side of the snout, with lateral cleft. Eye lateral, large. Seven branchiostegals; pseudobranchiæ. Villiform teeth in the jaws and on the palate. Two separate dorsals,—the second, the caudal, and the anal fin more or less covered with minute scales. Several filiform appendages below the pectoral fin, entirely free and articulated. Ventrals thoracic, with one spine and five rays. The bones of the head with the muciferous system well developed. Air-bladder varying in form and structure, and sometimes wanting.

Tropical regions of the Atlantic; East Indian seas to the Pacific. Entering rivers.

Polynemus indicus. Port Jackson.

—— *macrochir*. Ditto.

SPHYRÆNIDÆ.

Body elongate, subcylindrical, covered with small cycloid scales; lateral line continuous. Cleft of the mouth wide, armed with strong teeth. Eye lateral, of moderate size. Seven branchiostegals; pseudobranchiæ and air-bladder present. Two dorsal fins, remote from each other; anal similar to the second dorsal; ventrals abdominal, composed of one spine and five rays.

Carnivorous fishes inhabiting the seas of the temperate and tropical regions. One genus only.

Sphyræna novæ-hollandiæ. Port Phillip, south coast.

—— *obtusata*. Port Jackson.

SCOMBRIDÆ.

Body generally elongate, compressed, naked, or covered with scales of small or moderate (*Nomeina*) size; eye lateral. Dentition variable. The infraorbital bones do not articulate with the præoperculum. The spinous dorsal less developed than the soft or than the anal, either continuous with, or separate from, the soft portion, sometimes entirely absent. The soft dorsal and the anal sometimes divided posteriorly into finlets. Ventrals thoracic,* sometimes rudimentary or entirely absent. No prominent papilla near the vent. Gill-opening wide; generally seven branchiostegals, pseudobranchiæ†, and an air-bladder‡; pyloric appendages generally in great number.

Inhabitants of the high seas of nearly all the regions, many of the species having a very wide range.

Scomber australasicus. Port Jackson. "Mackerel."

Naucrates ductor. Ditto. "Pilot Fish."

Elacate nigra. Ditto. "King-fish."

Echeneis remora. Ditto. "Sucking-fish."

—— *naucrates*. Ditto. Ditto.

Gasterochisma melampus. New Zealand coast.

Platystethus cultratum. Norfolk Island.

Zeus faber. Port Jackson. "Sun-fish."

Cyttus australis. South coast.

CARANGIDÆ.

Body generally compressed, oblong or elevated, covered with small scales or naked; eye lateral. Dentition variable. The infraorbital bones do not articulate with the præoperculum. The spinous dorsal less developed than the soft or than the anal, either continuous with, or separated from, the soft portion, sometimes rudimentary.§ The posterior rays of the dorsal and anal fins sometimes semi-detached. Ventrals thoracic, sometimes rudimentary or entirely absent. No prominent papilla near the vent. Gill-opening wide; generally seven branchiostegals and pseudobranchiæ;|| air-bladder present; pyloric appendages generally in great number.¶

* Jugular in *Pteraclis* and *Hypsiptera*.

† Absent in *Coryphæna*.

‡ Absent in *Elacate*, *Echeneis*, *Stromateus*, and *Coryphæna*.

§ A single short dorsal in the second group.

|| Absent in *Lichia* and *Trachymotus*.

¶ In small number in *Equula* and *Lactarius*.

Inhabitants of the seas of the temperate and tropical regions, many of the species having a very wide range.

Trachurus trachurus. Port Jackson. "Horse-Mackerel."

Caranx georgianus. South-west coast.

—— *leptolepis*. East coast.

—— *hippos*. North coast.

Seriola gigas. Port Jackson.

Chorinemus lysan. West coast.

Temnodon saltator. Port Jackson.

Platax vespertilio. North coast.

—— *orbicularis*. North-west coast.

Psenes leucurus. Port Jackson.

Equula edentula. Australian coast.

—— *interrupta*. North-west coast.

Pempheris compressus. Port Jackson.

XIPHIIDÆ.

Body elongate, compressed, naked, or covered with rudimentary dermal productions. Teeth none, or rudimentary. The upper jaw (ethmoid, vomer, and intermaxillaries) much produced, sword-shaped. One or two dorsal fins, without a distinctly spinous portion. Ventrals absent, or rudimentary and thoracic. Seven branchiostegals; pseudobranchiæ and air-bladder present. Pyloric appendages in great number.

Mediterranean; open seas between or near the tropics.

Histiophorus gladius. Port Jackson. "Sword-fish."

GOBIIDÆ.

Body elongate, low, naked, or scaly. Teeth generally small, sometimes with canines. The infraorbital ring does not articulate with the præoperculum. The two dorsal fins separated, or more or less united,* the spinous portion being always the less developed, and composed of flexible spines; the anal similarly developed as the soft dorsal; ventrals with one spine and five rays;† sometimes both ventrals united into a disk. Gill-opening more or less narrow, the gill-membranes being attached to the isthmus; four gills; pseudobranchiæ. A prominent papilla near the vent.‡ Air-bladder generally absent. Pyloric appendages, none.

* No spinous portion can be distinguished in *Luciogobius*, a genus but imperfectly known.

† Four in *Trypauchen*, *Microcephalus*, and *Trypauchenichthys*.

‡ No anal papilla in *Asterropteryx*.

Carnivorous fishes, living at the bottom of the shores and of the fresh waters of the temperate and tropical regions. This family offers numerous instances of the fact that a part of the individuals of one and the same species are entirely confined to fresh waters, whilst others live in the sea.

Gobius lentiginosus. Coast of New Zealand.

—— *amiciensis*. Ditto.

—— *ornatus*. North-west coast.

—— *criniger*. Ditto.

—— *bynoensis*. West coast.

—— *papuensis*. North coast.

Eleotris mogurnda. Clarence and northern rivers.

—— *gobioides*. New Zealand rivers.

—— *Coxii*. New South Wales rivers.

—— *compressus*. Ditto.

—— *australis*. Ditto.

—— *grandiceps*. Ditto.

—— *brevirostris*. Cape York.

—— *lineoatus*. Queensland rivers.

BATRACHIDÆ.

Habitus cottoid; skin naked or with small scales; the system of muciferous channels well developed. Teeth conical, small, or of moderate size. The spinous dorsal very short, the soft and the anal long. Ventrals jugular, with two soft rays; pectorals not pediculated. Gill-opening a more or less vertical slit before the pectoral, rather narrow. Gills, three; pseudobranchiæ absent; an air-bladder.

Carnivorous fishes, living on the bottom of the coasts of the tropical regions, several species advancing into the temperate seas.

Batrachus diemensis. Coasts of Australia.

—— *dubius*. Ditto.

PEDICULATI.

Head and anterior part of the body very large, without scales. Teeth in cardiform or villiform bands. The spinous dorsal either composed of a few more or less isolated spines, or entirely absent. Ventrals jugular, with four or five soft rays, absent in *Ceratias*; the carpal bones prolonged, forming a sort of arm for the pectorals. Gill-opening reduced to a small foramen, situated in or near the axil. Gills two and a half, three, or three and a half; pseudobranchiæ absent.

Carnivorous fishes, inhabiting the seas of the temperate and tropical regions.

Brachionichthys hirsutus. Tasmanian coast.

Saccarius lineatus. New Zealand coast.

Antennarius marmoratus. Australian coast.

—— *urophthalmus*. Ditto.

BLENNIIDÆ.

Body elongate, low, more or less cylindrical, naked, or covered with scales, which are generally small. The infraorbital ring does not articulate with the præoperculum. One, two, or three dorsal fins, occupying nearly the whole of the back,—the spinous portion, if distinct, being as much developed as the soft, or more; sometimes the whole fin composed of spines; anal fin long; ventrals jugular,* composed of a few rays, and sometimes rudimentary or entirely absent. Air-bladder generally absent; pyloric appendages none. Pseudobranchiæ present.†

Carnivorous fishes, living at the bottom of the shores of all regions; several inhabiting fresh waters.

Blennius tasmanianus. Coasts of Tasmania.

Petroscirtes filamentosus. North coast.

—— *punctatus*. Ditto.

—— *variabilis*. Port Jackson.

Salarias Dussumieri. North coast.

—— *fasciatus*. Ditto.

—— *meleagris*. Coast of Australia.

Pataëcus fronto. Ditto.

—— *maculatus*. Port Jackson.

Clinus anguillaris. Coast of Australia.

—— *despicillatus*. Coast of Tasmania.

Cristiceps argentatus. Port Jackson.

—— *nasutus*. Port Jackson.

—— *roseus*. West coast.

—— *australis*. Ditto.

Tripterygium varium. Coast of New Zealand.

—— *nigripinne*. Ditto.

—— *Forsteri*. Ditto.

—— *medium*. Ditto.

—— *fenestratum*. Ditto.

ACANTHOCLINIDÆ.

Body elongate, low, compressed, covered with small scales. One dorsal fin, occupying nearly the whole of the back, by far the greater part being composed of spines; anal fin long, with the number of the spines exceeding that of the rays; ventrals jugular, composed of a few rays. Dentition complete. Four gills, pseudo-branchiæ. Air-bladder, none; pyloric appendages, none.

Coasts of New Zealand. Carnivorous fishes.

Acanthoclinus littoreus. Coast of New Zealand.

* Thoracic in *Pseudoblennius*.

† Except in *Dactyloscopus* and *Pataëcus*.

TEUTHIDIDÆ.

Body compressed and oblong, covered with very small scales. Lateral line continuous; tail not armed. Eye lateral, of moderate size. A single series of trenchant incisors in the jaws; palate smooth. One dorsal fin, the spinous portion being the more developed; anal with seven spines. Ventral fins thoracic. Pseudobranchiæ well developed.

Herbivorous fishes, inhabiting the tropical seas of the East Indian region and the western parts of the Pacific.

Teuthis javus. Hobson's Bay.

——— *tumifrons*. West coast.

——— *nebulosa*. Australian coast, Port Jackson.

ACRONURIDÆ.

Body compressed, oblong or elevated, covered with minute scales. Lateral line continuous; tail generally armed with one or more bony plates or spines, which are more developed with age, and frequently absent in very young individuals. Eye lateral, of moderate size. Mouth small; a single series of more or less compressed, sometimes denticulated, sometimes tapering incisors in each jaw; palate smooth. One dorsal fin, the spinous portion being the less developed; anal with two or three spines; ventral fins thoracic. Pseudobranchiæ well developed; air-bladder present, forked posteriorly. Intestines with more or less numerous circumvolutions.

Seas between the tropics. Herbivorous fishes.

Acanthurus triostegus. West coast.

——— *grammoptilus*. North coast.

——— *triostegus*. West coast.

NANDIDÆ.

Body oblong, compressed, covered with scales. Lateral line interrupted. Dorsal fin formed by a spinous portion and by a soft, the latter being the less developed; anal fin with three spines, and with its soft portion similar to the soft dorsal. Ventral fins thoracic, with one spine and five or four soft rays. Dentition more or less complete, generally feeble. Five or six branchiostegals; gills, four, or three and a half; pseudobranchiæ present in the marine, absent or hidden in the fresh-water genera. An air-bladder. No superbranchial organ.

Carnivorous fishes.

Plesiops cæruleo-lineatus. Australian coast.

Trachinops tæniatus. Port Jackson.

ATHERINIDÆ.

Body more or less elongate, subcylindrical, covered with scales of moderate size; lateral line indistinct. Cleft of the mouth of moderate width, with the dentition feeble. Eye lateral, well developed. Gill-opening wide; four gills; pseudobranchiæ; five or six branchiostegals. Two dorsal fins; the spines of the first feeble; the second of moderate length; anal like the soft dorsal, or rather longer. Ventral fins abdominal, with one spine and five rays. Vertebrae very numerous in the caudal and abdominal portions.

Carnivorous fishes inhabiting the seas of the temperate and tropical regions; several species entering or living in fresh water.

Atherina hepsetoides. Tasmanian coast.

—— *microstoma*. Ditto.

—— *presbyteroides*. Ditto.

—— *pinguis*. Port Jackson.

—— *endrachtensis*. South-west coast.

—— *pauciradiata*. North-west coast.

Atherinichthys jacksoniana. Port Jackson.

—— *nigrans*. Northern rivers.

MUGILIDÆ.

Body more or less oblong and compressed, covered with cycloid scales of moderate size; lateral line, none. Cleft of the mouth narrow or of moderate width, without or with feeble teeth. Eye lateral, well developed. Gill-opening wide; four gills; pseudobranchiæ; five or six branchiostegals. Two short dorsal fins, the anterior with four stiff spines; anal a little longer than the dorsal opposite. Ventral fins with one spine and five rays, abdominal, suspended from the elongate caracoid bone. Number of vertebrae twenty-four.

Fresh waters and coasts of all the temperate and tropical regions. Feeding on soft organic substances or very small animals.

Mugil dobula. Australian rivers and coast.

—— *waiensis*. North-west coast.

—— *compressus*. Rivers and coast of New South Wales.

—— *Peronii*. North-west coast.

Agonostoma Forsteri. Australian coast.

Myxus elongatus. Port Jackson.

TRICHONOTIDÆ.

Body elongate, subcylindrical, covered with cycloid scales of moderate size. Eyes directed upwards. Teeth in villiform bands. The infraorbital ring does not articulate with the præoperculum. One long dorsal fin, with articulated, not branched rays, and

without a distinct spinous portion; anal long; ventrals jugular, with one spine and five rays. Gill-opening very wide, seven branchiostegals; pseudobranchiæ. No prominent papilla near the anus. Air-bladder and pyloric appendages absent. Caudal vertebræ much more numerous than those of the abdominal portion.

Carnivorous fishes, living near the shores of the East Indian Archipelago and of New Zealand.

Hemerocoetes acanthorhynchus. Coast of New Zealand.

GOBIESOCIDÆ.

Body rather elongate, anteriorly depressed, naked. Teeth conical or compressed. A single dorsal fin on the tail, without spinous portion; anal short; ventrals widely apart from each other, with one spine hidden in the skin and four (five) rays. A large adhesive apparatus between them, the posterior portion of which is suspended on the caracoid bones, which are partly free, in the axil of the pectoral fins. Three gills or three and a half. Air-bladder absent. Intestinal tract short, wide, without pyloric appendages.

Carnivorous fishes. Most of the species live in the seas of the temperate regions of both hemispheres; two are known to inhabit seas between the tropics.

Diplocrepis puniceus. Coast of New Zealand.

Crepidogaster tasmaniensis. Coast of Tasmania.

—— spatula. Swan River.

Trachelochismus pinnulatus. Coast of New Zealand.

CENTRISCIDÆ.

Form of the body compressed, oblong or elevated; the anterior bones of the skull are much produced, and form a long tube terminating in a narrow mouth. Teeth, none. Body either covered with a cuirass or with non-confluent ossifications; scales, none, or small. Two dorsal fins; the spinous short, and with one of the spines strong; the soft and the anal of moderate extent; ventral fins small, without spine, or rudimentary, abdominal. Branchiostegals three or four; air-bladder large, four gills and pseudobranchiæ. Pyloric appendages, none; intestinal tract rather short.

Mediterranean and north-eastern shores of the Atlantic. Eastern coasts of Africa. Coasts of China, Japan, and Australia

Centriscus humerosus. Australian coast.

FISTULARIDÆ.

Fishes of greatly elongated form; the anterior bones of the skull are much produced, and form a long tube terminating in a narrow mouth. Teeth small. Parts of the skeleton and dermal productions form external mails; scales none, or small. The spinous dorsal fin is either formed by feeble isolated spines or entirely absent; the soft dorsal and anal of moderate length; ventral fins abdominal, composed of six rays, without spine; they are separate from the pubic bones, which remain attached to the humeral arch. Branchiostegals, five; air-bladder large; four gills; pseudobranchiæ. Pyloric appendages in small number; intestinal tract short.

Tropical parts of the Atlantic and of the Indian Oceans.

Fistularia serrata. Port Jackson.

ORDER II.—ACANTHOPTERYGII PHARYNGOGNATHI.

The inferior pharyngeal bones are coalesced, with or without a medium longitudinal suture. Part of the rays of the dorsal, anal and ventral fins not articulated, forming spines. Air-bladder without pneumatic duct.

POMACENTRIDÆ.

Body compressed, more or less short, covered with ctenoid scales. Dentition feeble, palate smooth. The lateral line does not extend to the caudal fin or it is interrupted. One dorsal fin, with the spinous portion as well developed as the soft, or more. Two, sometimes three, anal spines; the soft anal similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Branchiostegals five, six, or seven; gills three and a half; pseudobranchiæ and air-bladder present. Pyloric appendages in small number; intestinal tract of moderate length. Tropical seas.

Pomacentrus unifasciatus. Port Jackson.

Dascyllus aruanus. Coast of New Zealand.

Parma microlepis. Port Jackson.

—— *squamipinnis*. Ditto.

—— *polylepis*. Norfolk Island.

Heliastes hypsilepis. Port Jackson.

LABRIDÆ.

Body oblong or elongate, covered with cycloid scales. The lateral line extends to the caudal or is interrupted. One dorsal fin, with the spinous portion as well developed as, or more than the soft; the soft anal similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Palate without teeth; only one lower pharyngeal bone without median suture. Bran-

chiostegals, five or six; gills, three and a half; pseudobranchiæ and air-bladder present. Pyloric appendages, none; stomach without cæcal sac. Marine fishes inhabiting the seas of the temperal and tropical regions.

Xiphochilus fasciatus. Cape York.

Chærops macrodon. North-east coast.

—— *cyanodon*. North coast and Harvey River (Fresh-water).

Labrichthys celidota. Australian coast.

—— *bothryocosmus*. Ditto.

—— *psittacula*. Tasmanian coast.

—— *inscripta*. Norfolk Island.

—— *laticlavus*. Tasmanian coast and South-west coast.

—— *luculenta*. Port Jackson.

—— *tetrica*. South and West coast.

—— *parila*. Coasts of Australia.

—— *punctulata*. Swan River.

Cheilinus radiatus. North-east coast.

Hemigymnus melanopterus. Ditto.

Stethojulis strigiventer. North coast.

Platiglossus miniatus. North-east coast.

Julis aneitensis. Ditto.

Coris auricularis. South and West coast.

—— *lineolata*. West coast.

Odax balteatus. Tasmanian coast and Port Jackson "Kelp-fish."

—— *frenatus*. Ditto.

—— *Richardsonii*. Ditto.

—— *radiatus*. West coast.

—— *vittatus*. New Zealand.

Olistherops cyanomelas. King George's Sound.

Siphonognathus argyrophanes.

GERRIDÆ.

Body compressed, elevated or oblong, covered with sparoid scales. Lateral line continuous. Dorsal fin with the spinous and soft portions equally developed, and with a scaly sheath along the base, which is separated by a groove from the other scales. Anal with three (two) spines and with the soft portion similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Teeth small, palate toothless. The lower pharyngeal bones are firmly united by a suture. Branchiostegals, six; gills, four; pseudobranchiæ present; glandular; air-bladder present. Stomach without cæcal sac; pyloric appendages, rudimentary. Oviparous.

Tropical seas.

Gerres subfasciatus. Port Jackson.

—— *ovatus*. Australian coast.

—— *filamentosus*. North coast.

ORDER III.—ANACANTHINI.

Vertical and ventral fins without spinous rays*. The ventral fins, if present, are jugular or thoracic. Air-bladder, if present, without pneumatic duct.

GADOPSIDÆ.

A small portion of the dorsal and anal fins is formed into true spines.

Gadopsis marmoratus. Fresh waters of Australia and Tasmania.
"Black-fish."

GADIDÆ.

Body more or less elongate, covered with small smooth scales. One, two, or three dorsal fins, occupying nearly the whole of the back; rays of the posterior dorsal well developed; one or two anal fins. Caudal free from dorsal to anal, or, if they are united, the dorsal with a separate anterior portion. Ventrals jugular, composed of several rays, or, if they are reduced to a filament, the dorsal is divided into two. Gill-opening wide; the gill membranes generally not attached to the isthmus. Pseudo-branchiæ none or glandular, rudimentary. An air-bladder and pyloric appendages generally present.

Mostly inhabitants of the sea. Arctic and temperate regions.

Lotella rhacinus. Coast of New Zealand.

—— *bacchus*. Ditto.

—— *callarias*. Port Jackson.

OPHIDIIDÆ.

Body more or less elongate, naked or scaly. Vertical fins generally united into one; no separate anterior dorsal or anal; dorsal occupying the greater portion of the back. Ventral fins rudimentary (reduced to a filament) or absent, jugular (except in *Brotulopsis*). Gill-openings wide, the gill-membranes not attached to the isthmus. Pyloric appendages none, or in small number.

Inhabitants of the seas of nearly all regions.

Fierasfer Homei. Australian coast.

Congrogadus subducens. North and West coast.

MACRURIDÆ.

Body terminating in a long compressed, tapering tail, covered with spiny keeled or striated scales. One short anterior dorsal, the second very long, continued to the end of the tail, and composed of very feeble rays; anal of an extent similar to that of

* With the exception of *Gadopsis*.

the second dorsal; no caudal. Ventral fins thoracic or jugular, composed of several rays. Pseudo branchiæ none; six or seven branchiostegals. Air-bladder present. Pyloric appendages numerous.

Temperate parts of North Atlantic, Mediterranean, Japanese, and Australian seas.

Macrurus australis. Tasmanian coast.

Coryphænoides denticulatus. South coast.

PLEURONECTIDÆ.

Body strongly compressed, flat, with one of the two sides, which is always turned upwards, coloured, whilst the other is colourless and only sometimes spotted. Both eyes are placed on the coloured side; and although the bones are present on both sides of the skull they are not equally developed or symmetrical.* Dorsal and anal fins exceedingly long, without divisions. Gills four; pseudobranchiæ well developed; air-bladder none.

Carnivorous fishes, living on the sandy bottom of the coasts of all the regions; many ascend rivers.

Brachypleura novæ-zeelandiæ. New Zealand coast.

Pseudorhombus Russellii. North coast.

Ammotretis rostratus. Tasmanian coast.

Rhombosolea monopus. Australian coast.

——— *tapirina*. Ditto.

——— *leporina*. Ditto.

Peltorhamphus novæ-zeelandiæ. Norfolk Island.

Solea microcephala. Port Jackson.

ORDER IV.—PHYSOSTOMI.

All the fin-rays articulated; only the first of the dorsal and pectoral fins is sometimes more or less ossified. The ventral fins, if present, are abdominal, without spine. Air-bladder, if present, with a pneumatic duct.

SILURIDÆ.

Skin naked or with osseous scutes, but without scales. Barbels always present; maxillary bone rudimentary, almost always forming the base of a maxillary barbel. Margin of the upper jaw formed by the intermaxillaries only. Suboperculum absent. Air-bladder generally present, communicating with the organ of hearing by means of the auditory ossicles. Adipose fin present or absent.

† This is unique in the division of vertebrate animals.

Inhabitants of the fresh waters of all the temperate and tropical regions, some entering the salt water, but keeping near the coast.

Plotosus anguillaris. Moreton Bay. "Cat-fish."

Neosilurus Hyrtlii. Queensland Rivers.

Copidoglanis tandanus. Port Jackson.

——— *obscurus*. Ditto.

——— *brevadorsalis*. North-west coast.

Cnidoglanis megastoma. Port Jackson.

——— *lepturus*. Ditto.

——— *microcephalus*. North-west coast.

Arius australis. Clarence River.

Arius venaticus. North-west coast.

Arius vertagus. Ditto.

HAPLOCHITONIDÆ.

Body naked or scaly. Margin of the upper jaw formed by the intermaxillary; opercular apparatus complete. Barbels, none. Gill-opening wide; pseudobranchiæ well developed. Air-bladder simple. Adipose fin present. Ovaries laminated; the eggs fall into the cavity of the abdomen, there being no oviduct. Pyloric appendages, none.

Fresh-water fish from the temperate parts of South America and South Australia, representing the Salmonoids of the northern hemisphere.

Prototroctes maræna. Rivers of Southern Australia. "Herring."
"Grayling."

SCOPELIDÆ.

Body naked or scaly. Margin of the upper jaw formed by the intermaxillary only; opercular apparatus sometimes incompletely developed. Barbels, none. Gill-opening, very wide; pseudobranchiæ well developed. Air-bladder, none. Adipose fin present. The eggs are enclosed in the sacs of the ovarium, and excluded by oviducts. Pyloric appendages few in number or absent. Intestinal tract very short.

Pelagic or deep-sea fishes. Splendid food fishes.

Saurus myops. Port Jackson.

Saurida undosquamis. North-west coast.

Aulopus purpurissatus. Port Jackson. "Sergeant Baker."

Alepidosaurus ferox. Port Jackson.

SALMONIDÆ.

Body covered with scales, head naked; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Belly rounded. A small adipose fin

behind the dorsal. Pyloric appendages generally numerous, rarely absent. Air-bladder large, simple; pseudobranchiæ present. The ova fall into the cavity of the abdomen before exclusion.

Fresh waters of the temperate and arctic regions of the northern hemisphere, many species periodically descending to the sea. One genus from New Zealand; two genera pelagic.

Retropinna Richardsonii. Rivers of New Zealand.

Retropinna (?). Rivers of New South Wales.

GALAXIDÆ.

Body naked; barbels none. Margin of the upper jaw chiefly formed by the intermaxillaries, which are short and continued by a thick lip, behind which are the maxillaries. Belly rounded. Adipose fin none; dorsal opposite to anal. Pyloric appendages in small number. Air-bladder large, simple; pseudobranchiæ none. The ova fall into the cavity of the abdomen before exclusion.

Fresh waters of the temperate zone of the southern hemisphere.

Galaxias alepidotus. Rivers of New Zealand.

—— *truttaceus*. Rivers of Tasmania.

—— *olidus*. Rivers of New South Wales.

—— *fasciatus*. Rivers of New Zealand.

—— *attenuatus*. Rivers of Tasmania.

—— *Krefftii*. Rivers of New South Wales.

—— *punctatus*. Rivers of ditto.

—— *brevipinnis*. Rivers of New Zealand.

—— *Scottii*. Rivers of New South Wales.

—— *Waterhousii*. Rivers of South Australia.

Neochanna apoda. Rivers of New Zealand.

SCOMBRESOCIDÆ.

Body covered with scales; a series of keeled scales along each side of the belly. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Lower pharyngeals united into a single bone. Dorsal fin opposite the anal, belonging to the caudal portion of the vertebral column. Adipose fin none. Air-bladder generally present, simple, sometimes cellular, without pneumatic duct. Pseudobranchiæ hidden, glandular. Stomach not distinct from the intestine, which is quite straight, without appendages.

Marine fishes of the temperate and tropical zones, many species entering or inhabiting fresh waters.

Belone depressa. North-west coast.

— *ferox*. Port Jackson.

— *Krefftii*. Hunter River.

Scombrosox Forsterii. New Zealand.

Hemirhamphus regularis. Australian coast. "Gar-fish."

— *robustus*. Tasmania.

— *intermedius*. Ditto.

Arrhamphus sclerolepis. Fitzroy River, Queensland.

Exocetus robustus. Australian coast.

— *nigripinnis*. West coast.

GONORHYNCHIDÆ.

Head and body entirely covered with spiny scales; mouth with barbels. Margin of the upper jaw formed by the intermaxillary, which, although short, is continued downwards as a thick lip, situated in front of the maxillary. Adipose fin none; the dorsal fin is opposite to the ventrals, and short, like the anal. Stomach simple, without blind sac; pyloric appendages in small number. Pseudobranchiæ; air-bladder absent. Gill-openings narrow.

Southern temperate parts of the Atlantic and Pacific; Japan. *Gonorhynchus Greyi*. Australian coast.

OSTEOGLOSSIDÆ.

Body covered with large hard scales, composed of pieces like mosaic; head scaleless, its integuments nearly entirely replaced by bone; lateral line composed of wide openings of the mucus-duct. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. The dorsal fin belongs to the caudal portion of the vertebral column, is opposite and very similar to the anal fin; both approximate to the rounded caudal (with which they are abnormally confluent). Gill-openings wide; pseudobranchiæ none; air-bladder simple or cellular. Stomach without cæcal sac; pyloric appendages two.

Large fresh-water fishes of the tropics.

Osteoglossum Leichhardti. Queensland, Rivers Dawson and Burdekin. The true "Barramundi" (Masters).

CLUPEIDÆ.

Body covered with scales; head naked; barbels none. Abdomen frequently compressed into a serrated edge. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally; maxillaries composed of three, sometimes movable, pieces. Opercular apparatus complete. Adipose fin none. Dorsal

not elongate; anal sometimes very long. Stomach with a blind sac; pyloric appendages numerous. Gill-apparatus much developed, the gill-openings being generally very wide. Pseudo-branchiæ large, except in *Megalops*. Air-bladder more or less simple.

Inhabitants of all seas, many species entering fresh waters.

Engraulis encrasicolus. Tasmania and New Zealand.

Chatoëssus Erebi. Northern Australian Rivers Murray, Clarence, Burnett, Fitzroy, &c. "Bony-bream," Burnett settlers (Masters).

Clupea novæ-hollandiæ. Northern Rivers of New South Wales. "Sprat."

Clupea sagax. Australian coast.

Spratelloides delicatulus. Ditto.

Megalops cyprinoides. Fresh waters of North coast.

Chanos salmoneus. North coast.

SYMBRANCHIDÆ.

Body elongate, naked or covered with minute scales; barbels none. Margin of the upper jaw formed by the intermaxillaries only, the well-developed maxillaries lying behind and parallel to them. Paired fins none. Vertical fins rudimentary, reduced to more or less distinct cutaneous folds. Vent situated at a great distance behind the head. Ribs present. Gill-openings confluent into one slit situated on the ventral surface. Air-bladder none. Stomach without cæcal sac or pyloric appendages. Ovaries with oviducts.

Fresh waters and coasts of Tropical America and Asia. Coasts of Western Australia and Tasmania.

Chilobranchnus dorsalis. Tasmanian fresh waters, and North coast of Australia.

MURENIDÆ.

Body elongate, cylindrical or band-shaped, naked or with rudimentary scales. Vent situated at a great distance from the head. Ventral fin none. Vertical fins, if present, confluent, or separated by the projecting tip of the tail. Sides of the upper jaw formed by the tooth-bearing maxillaries, the fore part by the intermaxillary, which is more or less coalescent with the vomer and ethmoid. Humeral arch not attached to the skull. Stomach with a blind sac; no pyloric appendages. Organs of reproduction without efferent ducts.

Inhabitants of the fresh waters and seas of the temperate and tropical regions.

Anguilla Reinhardtii. Australian fresh waters. "Eel."

—— *latirostris*. New Zealand.

—— *australis*. New Zealand and Tasmania.

Conger vulgaris. Tasmania. "Conger eel."

- Congromuræna habenata*. New Zealand.
Murænesox cinereus. Hunter River.
Ophichthys cephalozona. North coast.
 ——— *calamus*. West coast.
 ——— *cancrivorus*. North coast.
Muræna Helena. Australian coast.
 ——— *macassariensis*. North coast.
 ——— *Nubila*. Norfolk Island.
 ——— *Richardsoni*. West coast.
 ——— *flavomarginata*. Norfolk Island.
 ——— *callorhyncha*. West coast.
 ——— *afra*. Port Jackson.
 ——— *nebulosa*. East coast.
Leptocephalus Morrisi. East coast.

PEGASIDÆ.

Body entirely covered with bony plates, anchylosed on the trunk and movable on the tail. Barbels none. The margin of the upper jaw is formed by the intermaxillaries and their cutaneous prolongation, which extends downwards to the extremity of the maxillaries. Gill-cover formed by a large plate, homologous to the operculum, præoperculum, and suboperculum; interoperculum a long fine bone, hidden below the gill-plate. One rudimentary branchiostegal. The gill-plate is united with the isthmus by a narrow membrane; gill-opening narrow in front of the base of the pectoral fin. Gills four, lamellated. Pseudo-branchiæ and air-bladder absent. One short dorsal and anal fin, opposite to each other. Ventral fins present. Ovarian sacs closed.

Indian Ocean and Australian seas.

- Pegasus natans*. Moreton Bay.
 ——— *lancifer*. Tasmanian coast.

ORDER V.—LOPHOBRANCHII.

The gills are not laminated, but composed of small rounded lobes, attached to the branchial arches. Gill-cover reduced to a large simple plate. Air-bladder simple, without pneumatic duct. A dermal skeleton, composed of numerous pieces arranged in segments, replaces more or less soft integuments. Muscular system not much developed. Snout produced. Mouth terminal, small, toothless, formed as in *Acanthopterygians*.

SYNGNATHIDÆ.

Gill-openings reduced to a very small opening near the upper posterior angle of the gill-cover. One soft dorsal fin; no ventrals, and sometimes one or more of the other fins also absent.

Chiefly marine fishes, occurring in all parts of the tropical and temperate regions ; many species entering fresh waters.

- Syngnathus semifasciatus*. Tasmania.
 ——— *pelagicus*. South coast.
 ——— *Grayi*. North coast.
 ——— *margaritifer*. Port Jackson.
 ——— *pœcilolæmus*. South coast.
Ichthyocampus scalaris. West coast.
 ——— *filum*. New Zealand.
Nannocampus subosseus. West coast.
Stigmatophora argus. Port Jackson.
 ——— *nigra*. Australian coast.
Gastrotokeus biaculeatus. Cape York.
Solenognathus Hardwickii. West coast.
Phyllopteryx foliatus. Port Jackson.
 ——— *eques*. Port Lincoln.
Hippocampus abdominalis. Tasmanian coast.
 ——— *antiquorum*. North coast.
 ——— *breviceps*. South coast.
 ——— *angustus*. Ditto.
 ——— *novæ-hollandiæ*. Port Jackson.

ORDER VI.—PLECTOGNATHI.

Teleosteous fishes with rough scales, or with ossifications of the cutis in the form of scutes or spines ; skin sometimes entirely naked. Skeleton incompletely ossified, with the vertebræ in small number. Gills pectinate ; a narrow gill-opening in front of the pectoral fins. Mouth narrow ; the bones of the upper jaw generally firmly united. A soft dorsal fin, belonging to the caudal portion of the vertebral column, opposite to the anal ; sometimes elements of a spinous dorsal besides. Ventral fins none, or reduced to spines. Air-bladder without pneumatic duct. Nearly all are marine fishes.

SCLERODEEMI.

Snout somewhat produced ; jaws armed with distinct teeth in small number ; skin with scutes or rough. The elements of a spinous dorsal and ventral fins generally present. Marine fishes of the temperate or tropical regions.

(“ LEATHER-JACKETS.”)

- Tricanthus biaculeatus*. North coast.
Balistes stellatus. North-east coast.
 ——— *niger*. North coast.

- Balistes aculeatus*. North coast.
 ——— *verrucosus*. Ditto.
Monacanthus pardalis. North coast.
 ——— *logirostris*. Ditto.
 ——— *prionurus*. Ditto.
 ——— *trossulus*. West coast.
 ——— *oculatus*. South coast.
 ——— *megalurus*. Port Jackson.
 ——— *tomentosus*. Ditto.
 ——— *sulcatus*. East coast.
 ——— *granulosus*. Port Jackson.
 ——— *rudis*. Tasmania.
 ——— *Ayraudi*. Port Jackson.
 ——— *penicilligrus*. Ditto.
 ——— *hippocrepis*. Ditto.
 ——— *Gunnii*. Tasmania.
 ——— *convexirostris*. New Zealand.
 ——— *multiradiatus*. South Australia.
 ——— *trachylepis*. East coast.
 ——— *Peronii*. South coast.
 ——— *Brownii*. Ditto.
 ——— *spilomelanurus*. Port Jackson.

Group of OSTRACIONTINA—("COFFIN FISHES.")

- Ostracion concatenatus*. Port Jackson.
 ——— *cubicus*. South Australia.
 ——— *cornutus*. North coast.
 ——— *rhinorhynchus*. North-west coast.
 ——— *diaphanus*. Port Jackson.
Aracana aurita. South coast.
 ——— *ornata*. Ditto.
 ——— *lenticularis*. Port Jackson.

GYMNODONTES.

Body more or less shortened. The bones of the upper and lower jaw are confluent, forming a beak with a trenchant edge, without teeth, with or without median suture. A soft dorsal, caudal, and anal are developed,—approximate. No spinous dorsal. Pectoral fins, no ventrals.

Marine fishes of the temperate and tropical regions. Some species confined to fresh-water.

PORCUPINE-FISHES, or TOAD-FISHES.—(Flesh poisonous.)

- Tetrodon hypselogenion*. Port Jackson.
 ——— *Hamiltonii*. Ditto.
 ——— *Richei*. South Australia.

- Tetrodon immaculatus*. Port Jackson.
 ——— *hispidus*. East coast.
Diodon hystrix. Port Jackson.
 ——— *maculatus*. Ditto.
Chilomycterus jaculiferus. New Zealand.
Dicotylichthys punctulatus. Port Jackson.
Atopomycterus nychthemerus. South coast.

SUB-CLASS II.—DIPNOI.

Fishes with the skeleton partly cartilaginous, partly osseous ; no occipital condyle. Bulbus arteriosus with two longitudinal valves ; air-bladder double, lung-like, communicating by a duct and glottis with the hæmal side of the œsophagus, with a pulmonary vein. A narrow gill-opening on each side, with a rudimentary gill-cover ; some of the branchial arches without gills ; gills free, membranaceous. Nostrils double on each side. Intestine with a spiral valve. Optic nerves not decussating. Oviducts distinct. Ventral fins abdominal.

SIRENOIDEI.

Body eel-shaped, covered with cycloid scales. Vertical fins a continuous border to the compressed tapering tail. Pectoral and ventral fins subulate. A single maxillary dental plate is opposed to a single mandibular one. Scapular arch attached to the occiput. Vent not in the median line. No pseudobranchiæ.

Fresh-water fishes of tropical Africa, America, and Australia.

- Ceratodus Forsteri*. Burnett River, Queensland.
 ——— *miolepis*. Mary River, Queensland.

This is not the true "Barramundi"; the native name is "Teevine" or "Redfish" (*Masters*).

SUB-CLASS III.—GANOIDEI.

Not yet discovered in Australia.

SUB-CLASS IV.—CHONDROPTERYGII.

Skeleton cartilaginous ; skull without sutures. Body with medial and paired fins, the hinder pair abdominal ; caudal fin with produced upper lobe. Gills attached to the skin by the outer margin, with several intervening gill-openings ; rarely one gill-opening only. No air-bladder. Three series of valves in the bulbus arteriosus. Intestine with a spiral valve. Optic nerves commissurally united, not decussating. Ovaries with few and large ova, which are impregnated and, in some developed internally. Embryo with deciduous external gills. Males with prehensile organs attached to the ventral fins.

ORDER I.—HOLOCEPHALA.

(SHARK TRIBE.)

One external gill-opening only, covered by a fold of the skin, which encloses a rudimentary cartilaginous gill-cover; four branchial clefts within the gill-cavity. The maxillary and palatal apparatus coalescent with the skull.

CHIMÆRIDÆ.

Form of the body elongate; pectoral fins free; anterior dorsal fin above the pectorals. Mouth inferior. Dental organs confluent into two pairs of laminæ in the upper jaw, and into one pair in the lower. No spiracles. Males with a peculiar prehensile organ on the upper part of the snout. Skin naked in the adult. *Callorhynchus antarcticus*. Australian seas.

ORDER II.—PLAGIOSTOMATA.

From five to seven gill-openings. Jaws distinct from skull.

SUB-ORDER I.—SELACHOIDEI.

Gill openings lateral. Body more or less cylindrical.

(Sharks.)

CARCHARIIDÆ.

The first dorsal fin opposite to the space between pectoral and ventral fins, without spine; an anal fin. Eye with a nictitating membrane. Mouth crescent-shaped, inferior.

Carcharias gangeticus. North coast.

—— *brachyurus*. East coast.

Galeocerdo Rayneri. Ditto.

Galeus canis. Ditto.

Zygæna malleus. Ditto.

Mustelus antarcticus. Ditto.

LAMNIDÆ.

The first dorsal opposite to the space between the pectoral and ventral fins, without spine; an anal fin. No nictitating membrane. Mouth crescent-shaped, inferior; nostrils not confluent with the mouth. Gill-openings generally wide. Spiracles none, or minute.

Odontaspis americanus. South coast.

SCYLLIIDÆ.

The first dorsal fin above or behind the ventrals, without spine; an anal fin. No membrana nictitans. Spiracle always distinct. Mouth inferior. Teeth small, several series being generally in function.

Scyllium maculatum. East coast.

Parascyllium variolatum. South coast.

Chiloscyllium ocellatum. North-west coast.

——— *trispeculare*. Ditto.

Crossorhinus barbatus. South coast.

——— *tentaculatus*. East coast.

CESTRACIONTIDÆ.

Two dorsal fins, with spines, the first opposite to the space between the pectorals and ventrals; the second in advance of the anal. Nostrils and buccal cavity confluent. Mouth rather narrow, the upper lip divided into seven lobes, the lower with a fold. Spiracles small, below the posterior part of the eye. Gill-openings rather narrow. Dentition similar in both jaws, viz., small obtuse teeth in front, which in young individuals are pointed and provided with from three to five cusps. The lateral teeth large, pad-like, twice as broad as long, arranged in oblique series, one series being formed by much larger teeth than those on the other series.

Pacific and East Indian Archipelago.

Cestracion Phillipi. South and East coast.

——— *galeatus*. Port Jackson.

SPINACIDÆ.

Two dorsal fins; no anal. Mouth but slightly arched; a long, deep, straight oblique groove on each side of the mouth. Spiracles present; gill-openings narrow. Pectoral fins not notched at their origin.

Acanthias vulgaris. Australian coast.

——— *Blainvillii*. Ditto.

RHINIDÆ.

Spiracles wide behind the eyes. Nostrils with skinny flaps on the margin of the snout. Teeth conical, pointed, distant. Dorsal fins without spines on the tail; no anal. Temporal and tropical seas.

Rhina squatina. Port Jackson. "Angel Shark."

Body depressed, flat. Mouth anterior. Pectoral fins large, expanded, in the plane of the body, with the basal portion prolonged forwards, but not grown to the head. Gill openings rather wide, lateral partly covered by the base of the pectoral spiracles.

PRISTIOPHORIDÆ.

The rostral cartilage is produced into an exceedingly long flat lamina, armed along each edge with a series of teeth (saw).

Pristiophorus cirratus. Port Jackson.

— *nudipinnis*. Ditto.

SUB-ORDER II.—BATOIDEI.

Gill-openings ventral. In a few of the genera, which we place first, the habit is still that of the Sharks; but the body is depressed; and in the typical genera the trunk, which is surrounded by the immensely developed pectoral fins, forms a broad flat disk, with a thin and slender tail. Spiracles always present. Five pairs of gill-openings. No anal fin; dorsal fins, if present, on the tail. Temperate and tropical seas; some species pelagic; some entering fresh waters, or entirely limited to rivers within the tropics. *Rays*.

PRISTIDÆ.

The snout is produced into an exceedingly long, flat lamina, armed with a series of strong teeth along each edge (saw).*

Pristis pectinatus. North coast.

RHINOBATIDÆ.

Tail strong and long, with two well-developed dorsal fins; a caudal and a longitudinal fold on each side. Disk not excessively dilated, the rayed portion of the pectoral fins not being continued to the snout. No electric organ.

Rhinobatus granulatus. North coast.

Trigonorhina fasciata. Port Jackson.

TORPEDINIDÆ.

The trunk is a broad, smooth disk; tail with rayed dorsal (absent in *Temera*) and caudal fins, and a longitudinal fold along

* The endoskeleton of the saw consists of three, sometimes five, rarely four, hollow subcylindrical tubes, tapering towards the end, incrustated with osseous deposit, which has a granular appearance, and is perforated by small foramina. These tubes are the rostral processes of the cranial cartilage as they are observed in nearly all Rays, though shorter and much less developed. It is very difficult to remove them out of the saw in their integrity. However, one of these bodies, which is in the British Museum, became detached in an at present unexplained manner, and is perfectly intact. It was described by Dr. Gray under the name of "*Myriosteon*" (Proc. Zool. Soc. 1864, April 12), and remained a puzzle to zoologists until Prof. Kölliker, during a recent visit to London, examined it microscopically, and arrived at the conclusion that it must be "part of the endoskeleton of a Plagiostome." After the nature of this specimen had been thus determined we discovered that it is one of the lateral tubes of the saw of *Pristis*. (*Günther*.)

each side. Anterior nasal valves confluent into a quadrangular lobe. An electric organ composed of vertical hexagonal tubes between the pectoral fins and the head. .

Narcine tasmaniensis. Tasmanian coast.
Hynops subnigrum. West coast.

RAJIDÆ.

Disk broad, rhombic, generally with asperities or spines; tail with a longitudinal fold on each side. The pectorals extend to the snout. No electric organ. No serrated caudal spine.

Raja Lemprieri. Tasmanian coast.

TRYGONIDÆ.

The pectoral fins are uninterruptedly continued to, and confluent at, the extremity of the snout. Tail long and slender, without lateral longitudinal folds; vertical fins none, or imperfectly developed; often replaced by a strongly serrated spine.

Trygon tuberculata. Port Jackson.

MYLIOBATIDÆ.

The disk is very broad in consequence of the great development of the pectoral fins, which, however, leave the sides of the head free, and reappear at the extremity of the snout as a pair of detached (cephalic) fins.

Rhinoptera polyodon (?). Australian coast.
Ceratoptera Alfredi. Port Jackson. "Sea Devil."

The original specimen, 15 feet wide, is in the Australian Museum.

SUB-CLASS V.—CYCLOSTOMATA.

Skeleton cartilaginous and notochordal, without ribs, and without real jaws. Skull not separate from the vertebral column. No limbs. Gills in the form of fixed sacs, without branchial arches, six or seven in number on each side. One nasal aperture only. Heart without *bulbus arteriosus*. Mouth anterior, surrounded by a circular or subcircular lip, suctorial. Alimentary canal straight, simple, without cæcal appendages, pancreas, or spleen. Generative outlet peritoneal. Vertical fins rayed.

PETROMYZONTIDÆ.

Body eel-shaped, naked. Subject to a metamorphosis. In the perfect stage with a suctorial mouth armed with teeth simple or multicuspid, horny, sitting on a soft papilla. Maxillary, mandibular, lingual, and suctorial teeth may be distinguished. Eyes present (in mature animals). External nasal aperture in the middle of the upperside of the head. The nasal duct terminates

without perforating the palate. Seven branchial sacs and apertures on each side behind the head. The inner branchial ducts terminate in a separate common tube. Intestine with a spiral valve. Eggs small.

The larvæ without teeth and with a single continuous vertical fin.

Mordacia mordax.	Tasmanian rivers	} "Lampreys."
Geotria australis.	Ditto	

Inhabitants of the fresh waters and coasts of the temperate regions of both hemispheres. Suck themselves fast to other fish, and live by scraping off their flesh. (*Günther.*)

MYXINIDÆ.

Body eel-shaped, naked. The single nasal aperture is above the mouth, quite at the extremity of the head, which is provided with four pairs of barbels. Mouth without lips. Nasal duct with cartilaginous rings, penetrating the palate. One median tooth on the palate and two comb-like series of teeth on the tongue. Branchial apertures at a great distance from the head. The inner branchial ducts lead into the œsophagus. A series of mucous sacs along each side of the abdomen. Intestine without spiral valve. Eggs large, with a horny case provided with threads for adhesion. Inhabitants of the seas of the temperate regions of both hemispheres; burrow into other fishes, and feed on their flesh. (*Günther.*)

Bdellostoma cirrhatum. New Zealand and Australian rivers.

SUB-CLASS VI.—LEPTOCARDII.

Skeleton membrano-cartilaginous and notochordal, ribless, no brain. Pulsating sinuses in place of heart. Blood colourless. Respiratory cavity confluent with the abdominal cavity; branchial clefts in great number, the water being expelled by an opening in front of the vent. Jaws none.

CIRRSTOMI.

Body elongate, compressed, scaleless, limbless. Mouth a longitudinal fissure, with subrigid cirri on each side, inferior. Vent at a short distance from the extremity of the tail. A low rayless fin-like fold runs along the back, round the tail, past the vent, to the respiratory aperture. Eye rudimentary. Liver reduced to a blind sack of the simple intestine. One genus only occupying the lowest scale in the class of vertebrata. Found imbedded in sand on many coasts of the temperate regions of both hemispheres.

Branchiostoma lanceolatum.

Dredged in Bass's Straits by H.M.S. "Herald," at a depth of from 10 to 12 fathoms.

This brings the list of recent Australian fishes to a close:

The new species which have been described during the last few years are not included in it because the literature is not at my command, but all fresh discoveries will be added should the present work reach a second edition.

It is very important to know the animals of a country, and in particular the useful ones, because some men starve in the midst of plenty, property is sacrificed, and great enterprises are brought to a disastrous termination through the pioneer's ignorance of the natural products. The fresh-water fishes, always valuable in aboriginal economy, are constantly overlooked, and little is known of them beyond the coast districts. Leichhardt discovered fine eating fishes in the Burdekin more than twenty years ago; since then thousands of pounds have been expended for the importation of trout, tench, and carp, whilst the superior fishes of our own rivers are forgotten. The famous "devonian" fish, *Ceratodus Forsteri*, was made known to the outer world in May last, though both settlers and aborigines feasted on it years before. A second species* was found by Mr. Buchanan, of Maryborough, shortly afterwards; and Mr. George Masters obtained no less than nineteen fine specimens during his last expedition to the Burnett.

It is indeed wonderful how every pool and creek teems with animal life; numerous muscles, various kinds of cray-fish, turtles, frogs, lizards, fresh-water snakes, and other creatures, can be caught without much trouble, and all these are more nourishing to a starving human being than the wretched nardoo, on which the lamented Burke and Wills tried to subsist.

More attention should be paid to the study of natural history in our schools, the establishment of district museums encouraged, and the children taught to observe the habits and economy of different animals, in particular those which are useful, by which means the wealth of the country would be much increased.

I regret that this paper is not more attractive to the general reader, but time and space are precious; it is only the outline of a complete natural history of Australian Vertebrata, the first ever published, and to be fully wrought out at no very distant period.

* Probably *Ceratodus miolepis*. (*Günther*.)

THE FISHERIES OF NEW SOUTH WALES.

By ALEXANDER OLIVER, Esq., M.A.

It is perhaps, in the nature of things, that the fisheries of new countries should belong to the class of "postponed industries." The maritime nations of Europe have for ages been constrained to lay their seas and sea-coasts under contribution, for the support of teeming populations, which had no outlet but emigration. For them the products of the ocean and the river became an important factor in the supply of food, and the fisherman's occupation took the form of a recognized industry, encouraged and regulated by the State. Thus the fisheries of Great Britain, Holland, and France have grown with the growth of each of these nations, and for centuries have formed an integral part of its productive power. The Channel fisheries alone maintain a fleet of several thousand vessels, and a vast amount of capital is embarked in their outfit.

Compared with the enormous development of this industry in the countries just referred to, it may, for any Australian Colony, be well termed "a postponed industry," for in none has it ever seriously asserted a claim to rank with other forms of remunerative labour. Twice or thrice perhaps, within the past twenty years, a few individuals have combined to start some ill-considered scheme, once in the form of a Sydney Billingsgate, at another time in that of a Fishery Company;—always with the same result—a speedy and utter collapse. Neither skilled experience nor the stimulus of capital has come to the rescue; and the result is, that a most lucrative field of employment is abandoned to a handful of poor and unenterprising men, to whom continuous exertion is distasteful, and the principle of co-operation altogether unknown.

In the meantime, enormous sums of money have been squandered in almost every other conceivable direction, in attempts to realize the promises of some visionary, or to launch the schemes of some nefarious company-mongers. The community has in consequence been, to an appreciable degree, both impoverished and demoralized.

In the last few years, however, during which the Colony may be said to have been suffering a recovery, some wholesome symptoms of a better state of things have shown themselves. The preservation for export of our superabundant food-materials has at length, overcoming much prejudice and more apathy, acquired the status of an established industry; and the cultivation of sugar—perhaps the most hopeful sign in our industrial horizon—

has become at last an accomplished fact. Side by side with these, other genuine enterprises have begun to establish themselves, and the writer may be excused for venturing to express a hope that the time is not far distant when Sydney and other sea-port towns of New South Wales may be in the possession, each of its little fleet of fishing-smacks,—propelled by steam or sails, and manned by an industrious and intrepid body of men, associated together on a system of regulated co-operation, or employed by companies or individuals in the possession of adequate resources.

The entertainment of such a hope may by some be viewed as excusable, who would nevertheless feel many misgivings as to its chance of realization.

To endeavour to convince those of my readers who may look either with distrust or indifference at the project of establishing our fisheries upon the basis, and with the prospects of a fairly remunerative industry, will be mainly the scope and object of this paper, while at the same time it is hoped that its perusal may not be unattended with interest to the general reader.

With this view it will be convenient to consider in the first place:—

The nature and extent of the demand for fish (fresh or preserved) which may reasonably be calculated upon; and whether for home consumption or for exportation.

Secondly:—The nature and extent of the supply to meet such demand.

Thirdly:—The most effective mode of procuring such supply.

With the exception of the produce of a few fishing stations to the northward, such as Lake Macquarie and Port Stephens (where a few Chinamen catch and cure fish for the Melbourne market), nearly all the fish, both line and net fish, caught on the various grounds lying within half a degree of latitude north and south of Port Jackson, find their way to Sydney, and pass into consumption amongst the inhabitants of the city and suburbs, and the towns quickly accessible by rail; and during the winter months, fish are sent to Sydney from stations even a hundred miles distant. The consuming power of the metropolitan district might be put down approximately at 200,000 mouths. Last year (1870) it has been estimated that about 15,000 bushels of net fish, and about 5,000 dozen of line fish (averaging about 72 lbs. to the dozen) were brought into Sydney. These quantities may be represented in round numbers as equivalent to a supply of about a ton and a half weight of fish per week to be distributed among 200,000 mouths, which last figures might probably be reduced to 50,000 actual consumers. The result would thus seem to show that only a little more than one ounce of fish diet per week is taken by each individual consumer.

The estimated cost to the dealers of these quantities of fish would be about £6,000. Their real value, as represented by the cost to the consumers, would stand at certainly not less than £10,000. It will be seen that in this statement neither lobsters, oysters, nor prawns are taken into account; these last would have brought the figures up to £15,000, but they have been purposely omitted from the present estimate.

It appears then that Sydney, with the adjacent suburbs and neighbouring towns, consumes, even under the present system of distribution, about £10,000 worth of fish. What that system is, and how far it is capable of improvement, requires to be considered, for it is mainly owing to the barbarous system of selling fish which has for years prevailed in Sydney, that a city which ought to be able to boast of the finest and most bountifully supplied fish-market in the southern hemisphere, exhibits, it is to be feared, the very worst.

It is a fact, that in Sydney, a metropolis containing considerably over 100,000 inhabitants, there has never been such a building of any kind devoted to the purpose of displaying fish for sale; in other words, a fish-market. Fish are now, and have for years, been bought from the catchers at two wharves—the Queen's and the Market Wharves—by two or three wholesale dealers, who subdivide their purchases amongst a horde of brawling barrow and basket men, and these last distribute to the consumers. The market, as it is called, is held shortly after daybreak, and only for a few hours at most. No fish, therefore, are ever brought to the wharves by the fishermen after 7 or 8 o'clock.

In order to secure a market and dispose of his fish, a fisherman is obliged to secure his freight the day before he sells. Oftentimes he has to make good his passage from Broken Bay, a distance of some 20 miles from port; his fish remain in the boat all night and are taken to the wharf for sale to the dealers on the following morning. These offer him whatever price they choose—for the trade is a pure monopoly. If there should happen to be several boats at the wharf with fair freights of fish, these worthies declare that there is a "glut," and reduce the price per dozen, or per bushel, by from 15 to 50 per cent. But if the supply is short, or it is the season of Lent, or some Jewish festival, the fisherman may be lucky enough to get 12s. per dozen, or 10s. per bushel, or on rare occasions, when the commodity is at an extreme premium, even twice these sums, for his fish. The purchased fish, if not condemned by the Inspector (an officer of the Sydney Corporation), which, as might be conjectured by the reader, is an extremely common occurrence during the hot season,—are thrown on the wharf and resold at a very considerable advance to the

hawkers. These last hurry the fish away, by this time beginning to look much the worse for the rough handling they have suffered, and retail them to the unfortunate consumer, who, besides paying from 50 to 200 per cent. advance on the cost price, is not uncommonly obliged to discharge his purchase into the dust-bin. Thus a well-grown schnapper, of about 8 or 9 lbs. weight, nets the catcher, if the market is favourable, about *tenpence*, but the customer has generally to pay from *two to three shillings* for the same fish, and afterwards must not be surprised to find that owing to bad usage and long exposure to the sun the fish is unfit for food.

But perhaps the most annoying feature of the existing system is, that these hawkers of fish are never to be depended upon. Nearly all of them are engaged in hawking other commodities besides fish. Their practice, therefore, is to rattle the fish through the streets and dispose of them as quickly as possible, in order that they may be free to vend other cargoes of multifarious wares over the largest traversable area. Accordingly, after about 9 o'clock in the morning, the consumer has but a very poor chance of purchasing fish, and as there are no fishmonger's shops, and no fish-market, where fresh fish can be obtained, he is compelled to keep a sharp look-out for his only medium of supply—the itinerant vendor—failing whom, he is simply without remedy, and for that day, at least, he may as well expunge "fish" from his bill of fare. This state of things may be best appreciated by supposing the existence of a similar state of things in the supply of meat, poultry, or bread. Of course the bare idea in connection with the distribution of the necessaries of life is intolerable to a civilized mind. And yet for years the citizens of Sydney have patiently endured this abomination, and, with the exception of one or two sensible civic reformers, scarcely a single voice has been raised to discountenance and get rid of it.

The influence of this system upon the consumption of fish can hardly be overrated.

Competent judges have estimated that if two well-arranged fish-markets were established in suitable positions in Sydney, at least *four times* the quantity of fish now taken into consumption would find a ready sale. The price to the consumer would be very greatly reduced; the commodity would be nearly always at hand, and at any hour of the day; its quality and wholesomeness as food would be enhanced to a degree difficult indeed to exaggerate; the fisherman would get better prices for his catch; and the expansion of the trade, generally, would inevitably attract either the impulse of capital, or of its equivalent, co-operation.

It appears then, that Sydney, which under the present mode of supply takes fish to the value of only £6,000 per annum, would, under a better system of distribution, absorb annually, at least £24,000 worth. These figures of course represent the

wholesale values; the retail might be increased by from 50 to 75 per cent. It is necessary also to remember that the above estimate only deals with fresh fish. No account has been taken of the capabilities of the home and intercolonial market for the sale of preserved, salt, or dried fish. These, it would be exceedingly difficult to estimate, for everything would depend upon the success of the processes employed. Fish have hitherto been salted chiefly by Chinamen for exportation to Victoria, and consumption in that Colony by the Chinese gold-diggers. They are shipped in a dry state in bags, and in the piping times of gold-digging, frequently realized over £50 per ton;—at present, the export trade is very limited, and the price paid to the catchers is not more than £16 to £18 per ton.

The mode of curing adopted by the Chinese, however relished by their countrymen in Victoria, is sufficiently revolting to European tastes to exclude the article from general consumption,—the backbone of the fish being left by the splitter, the flesh in the dried state is always more or less “cheesy.”

The capabilities of the market for dried or preserved fish, whether for home consumption or for exportation, cannot be said to have been ever fairly tested; for the experience of the Chinese and other curers has been too much derived from the production of a commodity in exceptional demand, to be of any value in considering how far the market might be calculated upon, or to what extent trade in this direction might be expanded.

There are many varieties, however, of fish, common to our coast, which, when properly smoked or corned, are far superior to any imported codfish or ling. A Lake Macquarie smoked mullet will not suffer in comparison with a Finnon haddock,—and nothing can surpass a corned “moorra nennigai.” Corned king-fish is far better food than half of the salt fish which is brought to us from a distance of some 14,000 miles, as though our seas were destitute of fish fit for curing. Barracouta, schnappers, whiting, and many other descriptions of fish which take the salt well, could be named; indeed it would be difficult to enumerate all the varieties upon which curative processes might be successfully tried.

On the whole it may be confidently predicted that enterprise in this direction will hardly fail to bring about satisfactory results; and it is safe to say, that a large home demand for cured fish would reward any well conducted experiments upon such fish as our lake mullet, herrings, tarwine, whiting, schnapper, king-fish, Jew-fish, taraglin, and sea-tailors.

It may be gathered from this necessarily brief description of the present state of the Metropolitan market, in reference to the important question of demand, that this, at all events, is capable of almost indefinite expansion; and that the probable annual

consumption of fresh fish may be fairly put down at £24,000, when the mode of keeping, displaying for sale, and distributing fish shall be conducted upon a different scale. These figures are, as has already been shown, independently of the returns which might reasonably be expected from the sale of cured fish.

Intimately connected with the question of demand is the consideration of the nature and extent of the supply of fish which our seaboard is capable of furnishing.

New South Wales presents to the eye a coast-line of some 600 miles in length, situated in a zone of temperature, and endowed with marine and topographical conditions, admirably adapted as a habitat for the many families of edible fishes with which nature has endowed us.

From north to south the coast abounds both with spawning as well as feeding grounds. A score of rivers with wide and well protected embouchures, and a thousand inlets and indentations of every size and form, from the vast expanse of Jervis or Broken Bay, to the miniature boat harbour of Terrigal, or the spacious crescent of Curranulla, or Providence Bight, offer all the requirements of sea bottom for food and protection for the young fry, necessary to our southern fish in their various stages of growth.

Within a range of 30 miles of Port Jackson (that is to say, an easy passage for a small open craft of about two tons burthen, such as is commonly used by the Sydney and Botany fishermen) there are considerably more than forty well-known grounds, generally rocky patches, in from 8 to 25 or 30 fathoms of water, where in anything like ordinarily fair weather, schnappers of all dimensions, from the gorgeously tinted "native" of near a score pounds in weight, to his great grandson of less than three, the silver Jew-fish, taraglin, king-fish, "moorra nennigai," black and red rock-cod, morwong, travally, salmon, the beautiful "aulopus" (serjeant baker), flat-head, samson-fish, and a variety of other less familiar forms, may be taken by the line in almost unlimited quantities. Forty dozen schnappers have been caught in a few hours by a crew of three, even at so short a distance from Sydney as Coogee; and during the present year, even at the Heads of Port Jackson, two fishermen caught as many as thirteen dozen taraglin in as short a time, and might have loaded their boat but that they feared by so doing they would but help to bring about one of those gluts described in a former page of this paper.

The beaches of Broken and Botany Bays and Port Hacking (all within 16 miles of Port Jackson) are even perhaps more productive to the net fishermen than the outer grounds to the schnapper-men. These, as well as the schnapper-grounds in their neighbourhood, have now for more than forty years withstood the

regularly increasing and most wasteful drain on their resources, generated by the Sydney market. During the last ten years this demand has been yearly both more exacting and more exhausting. The net of the fishermen gradually increased in length, and the meshes decreased in width, so that nothing escaped, and bushels upon bushels of small fry—the young of the very best fishes—were left on the beaches after every haul of the seine; and to so alarming an extent was this process of extermination carried on that the Legislature at length, in 1865, interfered and prohibited the use of nets of a mesh less than 2 inches in the bunt and 2½ inches in the wings, except during the months when the gar-fish was supposed to be in season, viz., from April to August, when a smaller mesh might be used. The intention of the promoters of this measure may have been worthy of all admiration, but its provisions and general structure are ill-adapted to promote the objects sought to be attained. The close months are openly and derisively ignored by the fishermen, who use the gar-fish, or “ballahoo” bunts, as they are locally termed, whenever the fish come within their reach. In January of this year (1871) gar-fish were hawked in large quantities through the streets of Sydney, by men who of course had nothing to fear from an Act which absolutely contained no penalty for the *sale* of fish caught in contempt of its prohibitions.

It is not therefore to be wondered at that the Act is merely a dead letter so far at least as it pretends to be a remedial or protective measure directed to the preservation of small fish. But apart from the impotence of protective enactments, the fisheries are now, and have long been, suffering from a grievance which must in the long run completely ruin the resources of all our grounds within thirty miles of Sydney.

Oftentimes there may be seen, especially during the cool months, as many as a dozen fishing-boats, working both net and line in and about Broken Bay (the mouth of the River Hawkesbury). These boats, their freights of fish secured, frequently come down the stream to Baranjo, the southern headland at the entrance to the river, to find a hard southerly or south-easterly wind blowing in the offing. Unable to cope with the sea which a very few hours' continuance of either of these winds invariably sets along the coast, the poor fellows who have perhaps been toiling all the night before at net and oar, are compelled to throw away their fish, and to recommence work, often with the same result. The writer has frequently witnessed the sacrifice, in one day, of the entire cargoes of half-a-dozen boats, amounting perhaps to a hundred bushels of whiting, bream, black-fish, tailors, flathead, mullet, and gar-fish—the most esteemed and most marketable of our fishes. And all this destruction because fishermen are unable to dispose of their

catch, after seven o'clock in the morning! It is worse than useless for them to commence catching up the rivers until evening, unless the weather should happen to be very cool and favourable to the preservation of their fish; for the Sydney monopolist dealers have determined, it appears, that fish must lie at least one whole night on the not too fragrant floor and bilge of a boat, before they arrive at that degree of incipient putrefaction which the consumer must be taught to appreciate. A constant stream of fish could be poured throughout the day, a few hours after being caught, almost indeed alive, into the cool tanks of a fish market; but, alas, the fish market as yet is not. Now it is said by those who have the best opportunities of forming a trustworthy opinion, that in summer considerably more fish are thrown away from stress of weather, and the effect upon fish of a hot, muggy night in a slimy boat, than are consumed by the entire metropolis. Nor is the destruction of line fish, from the same cause, especially of that finest of all the Sparidæ, the schnapper, less to be deplored. In the old times of schnapper-fishing, the fisherman caught his freight as early in the morning as possible—during the hot season often within an hour after dawn—and disposed of them in the course of the forenoon. Those fish were accomplishing their alimentary mission under the waistcoats of our fathers, at an hour of the day when in these times the fisherman is but thinking of dropping his “kellick.”

So that—to repeat what has been already said in equivalent terms—the great enemy of all our generations of fish is not so much the stomach of their consumers as the ignorant greed of monopolists. Not many years ago the bays of our harbour sufficed for the wants of the inhabitants of Sydney; in course of time, Botany and Broken Bays, and Port Hacking were called upon as contributories. All these grounds are now unquestionably exhibiting signs of exhaustion, and it is time that Parliament should seriously consider how much longer they can be expected to hold out against the combined effects of random legislation and the oft times mis-directed and destructive energies of the fishermen themselves.

In the meantime it ought to be a source of sincere congratulation to all who take an interest in these matters, that beyond Port Hacking to the south, and Broken Bay to the north, there are, and will continue to be found, prolific fishing grounds without number, many already known to the schnapper and net fishermen, who, at various times, and often in most unexpected places, have plied their trade for the supply of Chinese curers. From the North Head of Broken Bay, as far as Newcastle, some 35 miles or more, the coast is really one continuous schnapper-ground. From the beautiful little boat harbour of Terrigal, as a fishing station, there are sent to Sydney, with tolerable regularity in the

winter months, very fine freights of schnapper, taraglin, whiting, and other fish. Northward of Point Upright, locally known as "Terrigal Highland," there is a magnificent series of schnapper-grounds, reaching all the way to Bird Island and Lake Macquarie, and thence by Redhead to Nobby's (Newcastle). Some are on sunken rocks in about 8 fathoms water, "Bumblers," as they are generally termed, from 1 to 3 miles distant from the shore others on rocky patches in deeper water.

The fish in this locality are very plentiful, but a little apt to keep on the move,—coming in "rallies" of from four to five dozen, and then leaving for some one or other of the countless feeding grounds, with which this part of the coast abounds.

A little north of Point Upright, the noble series of saltwater (sometimes brackish) lakes, known as Tuggarah, Budgewi, Manburra, and Lake Macquarie commences, and extends with but one break to within 10 miles of the Hunter River. At the entrances of these lakes (Tuggarah and Lake Macquarie) there are, unfortunately, very shallow bars; one only is navigable for vessels of light draught, but about their outlying reefs and sunken rocks there are many excellent fishing grounds. Those near Lake Macquarie only a few years ago gave occupation to several gangs of Chinese curers, and would do so now, but that this industry, as has already been mentioned, is in a very depressed state in consequence of the falling off of the Victorian demand for cured fish. The lakes themselves are literally crowded with fish of the same species as are found in the southern bays and rivers, but perhaps superior both in size and flavour.

In these lakes black-bream, tarwine, flat-head, whiting, river gar-fish, and several varieties of mullet, are the chief net fish, while in the deeper parts, especially of Lake Macquarie, schnappers and Jew-fish are very plentiful, and the former of exquisite flavour, though small compared with his oceanic congener. These grounds once supported more than 200 Chinese curers, and could easily do so now; but it is to be hoped that we have seen the last of their system of curing fish, and that any future labourers in that field will adopt a process more congenial to civilized palates. A few settlers on the shores of Lake Macquarie were employed (during a recent visit which the writer made to that most interesting district) in curing mullet for the Newcastle market, but on a very small scale, and furnished with very primitive nets and appliances. Coasting northward past Newcastle, we reach another famous area of fishing grounds—Port Stephens and the Broughton Islands. The expanse of Port Stephens is about double that of Port Jackson, and every bay and inlet has an excellent beach for working nets. The islands and rocks lying to the north of Yaccaaba—the stately sentinel of porphyry which nature has posted at the entrance of this fine harbour—abound in the finest

feeding grounds for schnappers and other line fish, which, as might therefore be expected, are here found in great abundance. The same may be said in respect of the coast in the neighbourhood of the Seal Rocks, Cape Hawke, and the Manning River. Beyond this point the writer's personal experience does not extend, but it is an undoubted fact that the whole northern seaboard of the Colony as far as the Tweed River, abounds in the finest description of fish.

To return to the point of departure, Port Jackson. It remains to mention some of the fishing grounds lying to the south. There are some dozen of these along the coast, situated at distances of from half-a-mile to three miles off shore; before reaching Botany, all however suitable only for deep sea line fishing. In Botany Bay and the Estuaries of the two rivers, George's and Cook's, which fall into the bay, the beaches, where nets can be successfully worked, are all but innumerable. These fringe in almost all cases enormous reaches of shallow water or flats more or less denuded at low tide. Vast freights of net fish have for years been taken on them, and their productive power would no doubt be indefinitely prolonged, if some effective method of arresting the slaughter of the young fry by the nets could be enforced. But in every direction the same destructive influences are at work, and always with the same result,—gradual but certain extermination.

Botany Bay abounds with the best of our Australian fishes, and here are caught large quantities of flathead, and a good many soles and flounders; and many more would be caught if trawls were used, to which description of net the bottom is excellently adapted. At and off the entrance of Botany and Curranulla Head there are several well known schnapper grounds, and about two miles within the bight formed by Marly Head and Curranulla is a famous ground known to fishermen as the *Mary, Merry, or Shamrock rock*, for it goes under all these names. It is a sunken flat rock, or series of rocks, with about 8 to 11 fathoms of water, situated at the point of a reef which runs from a little boat-harbour here, called "Doughboy," about half-a-mile to the southward. Tons upon tons of schnappers have been taken off this ground, which however is difficult for a stranger to find, as the crossbearing marks are not easily described. The whole of this Port Hacking or Curranulla Bight is one vast nursery and feeding-ground for fish, and the harbour and river of Port Hacking at its southern extremity is second only to Broken Bay as a net ground. Here are caught generally the first gar-fish and mullet of the season, both which fish come to us from the southward, generally seeking the smooth harbour waters, after heavy south and south-easterly weather, and, after a few days, continuing their progress northward, and putting in at every inlet or river-mouth lying in their course. A cable-length or so

distant from "Jibben Head," the southern point of the entrance to Port Hacking, lies Jibben "bumborer," a fishing-mark of great repute, but not now much resorted to for school-fish, *i.e.*, the schnapper of about 4 to 6 or 7 years old, and found on the off-shore grounds in large schools, as distinguished from the native, which is the same fish, at a later stage of growth, but frequenting different haunts (the shoals off headlands, sunken rocks, and river-points.) Passing south, the inshore grounds off Marly Head and Wattamolle are next reached, and this latter point forms the Sydney and Botany fishermen's *Ultima Thule*. Indeed, these southern fishing grounds are rarely troubled, except in the winter months, when the wind generally blows off the shore, and is fair for both the down and the up trip.

Beyond Wattamolle the coast continues as fruitful as ever of good inshore grounds, but there are few wide grounds, in consequence of the increased depth of water within a mile or two of the shore. The hundred-fathom-line trends in towards the coast in this neighbourhood with a sudden bend, showing that the high lands of the Wollongong district are more strikingly marked as an upheaval from the Ocean-bed than the general line of coast to the northward.

The Shoalhaven and Crookhaven Rivers, with their numerous lagoons and bays, teem with fish which, however, rarely find their way to the Sydney market; and the same may be said, though in a lesser degree, of Tom Thumb Lagoon and Lake Illawarra, near Wollongong. Then comes the splendid expanse of Jervis' Bay, with its fishing waters of at least 50 square miles in area, and Sir John Young's Banks, lying a few miles to the north-east of Point Perpendicular, lately discovered by Navigating Lieutenant Gowland, R.N., of the Coast Survey, both offering an area of workable grounds, capable of supplying Sydney with schnappers for years to come. Passing to the south, the bight of Wreck Bay, the lagoon called St. George's Basin, and, in short, the whole sea-board as far south as Twofold Bay, presents a range of grounds both for line and net fishing, unsurpassed by any on the eastern coast, and, owing to their distance from the Sydney mart, almost a virgin country to the fisherman.

The reader, who has commanded patience enough to wade through this somewhat diffuse, but still very incomplete, enumeration of fishing grounds, whence the Sydney market actually does procure, or will eventually have to look for, its supply of fish, can scarcely arrive at any other conclusion than that our eastern seaboard has received from nature a rich endowment of resources. He will, however, scarcely fail to draw his own conclusions from the preceding statement of facts, as to the little profit the community has hitherto derived from those resources.

A few concluding observations and suggestions may perhaps now be offered towards the consideration of the question, how to secure for the consumers of fish the cheapest, most punctual, and most wholesome supply.

It is in the first place quite obvious that the sources through which our present supply of fish are procured will not only be insufficient to meet the demands of the metropolitan market in the course of a few years, when we have fish markets, but are even at the present moment insufficient, when we have no such facilities for distribution.

The boats employed in catching and bringing fish to port number about twenty-five, on an average of the year, and are rarely of more than two tons burthen. They are open clinker-built boats, generally fitted with sliding centre-keels, or centre-boards, after the American plan, and manned by from two to five men, according to their size. They rarely fish further to the north than Terrigal, or to the south than Wattamolle, that is to say, within 25 miles of Port Jackson. Their carrying capacity may be put down as equal to sixty bushels of net-fish, or forty dozen of line-fish; and neither cargo could be brought to market against a head wind or moderately heavy sea. But the proper sort of freight-boat required to secure a regular supply of fish (and some such-craft must sooner or later be called into requisition) is, in the writer's opinion, a small fore-and-aft centre-board vessel of from 45 to 70 tons, furnished with an engine (auxiliary screw), capable of driving her, say six miles an hour, and of being lifted up through the screw aperture, as in Her Majesty's ships of war, when the sails are to be used. Such a vessel would be able to work all the grounds between Jervis Bay and Port Stephens, in connection with her schnapper and net boats at the various fishing stations. She could find accommodation for two net or schnapper boats on deck, and these might be dropped at convenient places and picked up on her return trip. A craft 70 feet overall by 18 feet beam, and 7 feet depth of hold, would give a tonnage of about 70 tons. Five men, including an engineer, would be a sufficient complement; and as she could take cargo and passengers to and from the various ports of call on her route, there would be little doubt of her being a success in a pecuniary point of view. Sydney, with two Fish Markets, would give constant employment to two such fishing vessels as that above described; and it is to be hoped that in anticipation of the erection of, at all events, one market, some enterprising Capitalist or Co-operative Association may view the present suggestion as deserving of consideration. And it is also hoped that this slight and imperfect survey of the resources of our seas and rivers may attract the attention, or come to the knowledge of some of those hardy and industrious fishermen of the old Country, who would be willing enough to emigrate, did they but know with how much certainty of success they could ply their calling in New South Wales.

SYDNEY :
THOMAS RICHARDS, GOVERNMENT PRINTER.

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(ESTABLISHED 1849.)

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(ESTABLISHED 1849.)

FOR MUTUAL LIFE ASSURANCE, &c.

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The average rate per cent. of interest realized on the assets during the last five years has been £5 14s. 1d.,—fully £1 10s. per cent more than that obtained by the largest and most successful English offices.

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THE following are Examples of Bonuses added to Policies issued by this Society.

No. of Policy.	Date of Policy.	Annual Premium.			Sum Assured.	Amount, with Bonus additions.		
		£	s.	d.		£	s.	d.
2	1849	9	7	10	800	82	4	11
89	1850	13	8	8	500	1,021	7	8
82	1851	7	12	0	200	411	4	11
154	1852	21	6	8	1,000	1,525	13	11
217	1853	10	19	0	500	743	16	6
284	1854	12	7	0	500	743	19	6
400	1855	14	14	2	500	731	18	10
655	1856	9	12	8	400	543	19	4
884	1857	11	15	6	500	649	9	11

The Annual Revenue was increased by £32,236 from the new Assurances effected in the past year, a rate of progress which entitles the Society to rank among the first-class Assurance Offices of the United Kingdom.

AUSTRALIAN MUTUAL PROVIDENT SOCIETY,

(ESTABLISHED 1849.)

FOR MUTUAL LIFE ASSURANCE, &c.

THE following extract from the Money Article of the *Times* newspaper of 2nd November, 1870, exhibits the relative progress of the Society as compared with other offices, viz. :—

“STATEMENT of New Life Assurances effected during twelve months by seventy Life Offices carrying on business in Great Britain and the Colonies, according to the last Annual Report :—

Date of Establishment.	No.	Name of Office.	Amount of New Assurances effected in last 12 months.	Date of Establishment.	No.	Name of Office.	Amount of New Assurances effected in last 12 months.
1825	1	Standard.....	£1,110,347	1845	36	London & Provincial Law	£289,970
1809	2	North British and Mercantile.	933,301	1824	37	Clerical, Medical, and General.	270,025
1849	3	Australian Mutual Provident.	767,712	1825	38	Scottish Provincial ...	263,710
1815	4	Scottish Widows' Fund	732,378	1854	39	Law Union.....	263,490
1838	5	Life Association of Scotland.	701,197	1840	40	Reliance	260,573
1836	6	Liverpool, London, and Globe.	661,066	1841	41	Scottish National	235,895
1854	7	Briton.....	630,768	1840	42	Provident Clerks	223,550
1837	8	Scottish Provident	581,036	1840	43	Church of England ...	213,986
1845	9	Royal	564,249	1825	44	Alliance	212,358
1854	10	British Equitable ...	536,136	1807	45	West of England	212,330
1824	11	Scottish Union	523,243	1836	46	Hand-in-Hand	209,645
1807	12	Eagle	491,435	1844	47	Great Britain.....	206,450
1839	13	English & Scottish Law	477,360	1812	48	Union	204,710
1806	14	Provident	474,273	1862	49	London and Lancashire	204,710
1835	15	National Provident ...	444,900	1847	50	British Empire	192,211
1840	16	Temperance & General	435,210	1832	51	Friends' Provident ...	187,505
1825	17	Crown	426,620	1836	52	National	181,730
1843	18	Star	418,455	1762	53	Equitable	175,690
1823	19	Economic	400,353	1835	54	Metropolitan	175,100
1826	20	Scottish Amicable	393,433	1857	55	Queen	164,446
1836	21	Northern.....	392,462	1834	56	Mutual	160,444
1834	22	Universal	389,702	1867	57	British Imperial.....	138,325
1844	23	Equity and Law	370,495	1855	58	Whittington	132,563
1838	24	City of Glasgow	368,983	1850	59	Law Property & General	132,200
1823	25	Edinburgh	344,213	1864	60	Sceptre	130,400
1862	26	Commercial Union ..	348,900	1852	61	Provincial	123,378
1831	27	Scottish Equitable.....	338,905	1825	62	University	116,375
1808	28	Norwich Union	334,862	1836	63	Westminster & General	115,860
1806	29	Rock	318,510	1866	64	Planet	115,375
1823	30	Law Life.....	313,168	1866	65	Imperial Union	113,300
1845	31	Sovereign	311,260	1861	66	Western Counties and London.	110,050
1806	32	London Life Association	302,050	1805	67	Caledonia	109,940
1829	33	Clergy Mutual	301,940	1853	68	Emperor	95,348
1836	34	Legal and General.....	298,257	1865	69	Scottish Imperial	71,230
1837	35	General	296,995	1865	70	Birmingham Alliance...	37,094
				Total Assurances....			£22,807,950 ⁿ

AUSTRALIAN MUTUAL PROVIDENT SOCIETY,

(ESTABLISHED 1849.)

FOR MUTUAL LIFE ASSURANCE, &c.

THE Society is a purely Mutual Life Office, local to Australia, Tasmania, and New Zealand; not restricted to one Colony, but extending its privileges alike to all, and, operating over so ample a field, is safer than an Office whose business is circumscribed.

The Revenue derived from every respective Colony is proportionately represented in the Statement of Assets by investments in the local securities of each.

Over and above the accumulations of the Assurance Fund, the Society has a

GUARANTEE FUND OF FIFTY THOUSAND POUNDS,

which bears a favourable comparison with the Guarantee Funds formed by the leading Mutual Assurance Societies in Europe.

The exposition contained in the last Quinquennial Report is believed to be more full and complete than was ever presented to the Members of any Assurance Society. It fully and clearly makes known to Actuaries and persons skilled in the finance of Life Assurance, what is the condition of the AUSTRALIAN MUTUAL PROVIDENT SOCIETY, and what are the prospects of advantage to Members in joining it. Only by the publication of such information can the real position of a Life Assurance Institution be made known; and the form in which it has been communicated to the Members of this Society is in complete accordance with the forms and schedules prepared by a Committee of Actuaries, and passed by the Imperial Parliament.

The Quinquennial Report, showing the Society's state and progress, Prospectuses, and Forms of Proposal, may be had, or will be sent, post free, on application at the Office, or to any of the Society's Agents.

By order of the Board,

ALEXANDER J. RALSTON,

General Secretary.

THE EUROPEAN ASSURANCE SOCIETY

FOR

LIFE ASSURANCE AND FIDELITY GUARANTEE.

The only Guarantee Society empowered by Special Act—27 Victoria—of the New South Wales Parliament to sue and be sued in this Colony.

HEAD OFFICE, 17, WATERLOO-PLACE, PALL MALL, LONDON.

Annual Revenue, upwards of £300,000.

Capital subscribed by more than 1,600 Shareholders, nearly £800,000.

Directors :—General Sir Frederic Smith, K.H., F.R.S., Chairman; Edward Hamilton Anson, Esq., late H.M. Bengal Civil Service; Reverend A. Alston, D.D., London; Alfred R. Bristow, Esq., Admiralty; R. M. Carter, Esq., M.P. for Leeds; Edmund Heeley, Esq., Birmingham; Reginald Read, Esq., M.D., London.

NEW SOUTH WALES BRANCH.

OFFICES, 34, HUNTER-STREET, SYDNEY.

Directors :—Hon. John Hay, M.L.C., C. Rolleston, Esq., G. O. Allan, Esq., G. Thornton, Esq., J.P.

LIFE ASSURANCE.

This Society, from its peculiar constitution and the large amount of its income, from Premiums, &c., is in a position to transact Life Assurance business upon terms favourable to Assurers.

FIDELITY GUARANTEE.

The European Assurance Society is specially constituted to grant bonds or policies of indemnity to bankers, merchants, public companies, municipal corporations, and others, against losses occasioned by the dishonesty of their employes.

The European is specially authorized by Imperial Parliament to guarantee the fidelity of Government officials.

Government and Bank officials are charged the lowest rates of premium.

FREDK. J. JACKSON,

Resident Secretary.

THE LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY.

SYDNEY BRANCH.

Income	£1,347,000.
Invested Funds	3,680,000.
Life Reserve	2,183,000.

.....

Directors :—Joseph S. Willis, Esq., Chairman ; Edward Knox, Esq. ;
George K. Holden, Esq. ; J. B. Watt, Esq. ; Hon. E. Deas Thomson,
Esq., C.B. ; Benjamin Buchanan, Esq.

Medical Referees :—J. Macfarlane, M.D. ; Alfred Roberts, Esq.

Surveyor :—Francis H. Grundy, Esq., C.E.

Resident Secretary :—Alfred Stanger Leathes.

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WYNYARD-SQUARE, SYDNEY.

AUSTRALIAN GENERAL ASSURANCE COMPANY, SYDNEY.

HEAD OFFICE, 129, PITT-STREET.

Directors :—Alexander Stuart, Esq., Chairman ; John Frazer, Esq. ;
W. O. Gilchrist, Esq. ; J. Grafton Ross, Esq. ; Charles Smith, Esq.

Agents :—London : Messrs. Jas. Barber, Son, & Co., 136, Leadenhall-street,
Melbourne : Messrs. J. Strachan & Co.
Brisbane : Messrs. Geo. Raff & Co.
Maryborough : Messrs. R. Travis & Co.
Rockhampton : Messrs. John Palmer & Co.
Fiji Islands : Messrs. Jas. Levick & Co.

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MARINE INSURANCES

effected at lowest current rates of Premium, particulars of which can be
obtained at the Head Office, or at any of the Agencies.

HENRY T. FOX,
Manager.

NEW SOUTH WALES

MARINE ASSURANCE COMPANY.

Capital—£150,000, Unlimited Liability.

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 INCORPORATED BY ACT OF COUNCIL, 1851.

OFFICE : GEORGE-STREET, SYDNEY.

Directors :—

Edward Knox, Esq., Chairman; John Fairfax, Esq.; Hon. S. D. Gordon, Esq., M.L.C.; Charles T. Gedye, Esq.; Thomas Littlejohn, Esq.

Auditors :—

John Brewster, Esq.; Edward Chisholm, M.L.C.

Marine Surveyor :—

Secretary :—Robert Garrett, Esq.

Agents in LONDON..... Messrs. Atkins & Co.
 ADELAIDE Messrs. Josh. Stilling & Co.
 BRISBANE Mr. Edward B. Forrest.
 MELBOURNE Mr. W. H. Jarrett.

Risks on Goods taken to all parts at the current Rates of Premium.

Policies on Wool, Goods, Gold, &c., to Great Britain, granted in Triplicate payable in London in case of Loss, by Messrs. Atkins & Co., who also issue Policies on behalf of the Company on risks from Great Britain, &c., to the Australian Colonies, payable in case of Loss, either in Sydney or London.

Time Policies granted on Vessels at rates according to the nature of the trade in which they are employed.

.....
 Goods stowed on Deck not covered by the Company's Policies unless specially named.

THE AUSTRALIAN JOINT STOCK BANK.

(Incorporated by Act of Council, 1858.)

PAID-UP CAPITAL, £484,656, with power to increase to £1,000,000.

Directors :—J. S. Mitchell, Esq., Chairman; William Moffitt, Esq.; Edward Lord, Esq.; Edwin T. Beilby, Esq.; J. B. Rundle, Esq.; Robert Saddington, Esq.

Auditors :—George Ferguson, Esq.,

Solicitors :—Messrs. M'Carthy, Son, and Donovan.

HEAD OFFICE, SYDNEY.

Vincent Wanostrocht Giblin, General Manager; Edward Griffith, Accountant.

LONDON OFFICE.

Directors :—James Henderson, Esq.; James Macgregor Mackay, Esq.; Paul Frederick Morgan, Esq.; John Christie, Manager.

BRANCHES.

Branches in New South Wales :—Francis Adams, Branch Inspector. Araluen, Armidale, Bathurst, Braidwood, Deniliquin, Forbes, Gulgong, Goulburn, Grafton, Grenfell, Hay, Mudgee, Murrurundi, Muswellbrook, Newcastle, Singleton, Tambaroora, Taree, Tenterfield, Wagga Wagga, West Maitland, Yass.

Branches in Queensland :—H. P. Abbott, Branch Inspector. Brisbane, Bowen, Clermont, Gladstone, Gympie, Ipswich, Mackay, Maryborough, Ravenswood, Rockhampton, Toowoomba, Townsville, Warwick.

The Agents of the Bank in the Colonies are for :—Melbourne and Victoria generally—The Bank of Victoria. The English, Scottish, and Australian Chartered Bank.

Hobart Town and Launceston, Tasmania—The Bank of Van Diemen's Land. Adelaide—The Bank of South Australia.

New Zealand—The Bank of New Zealand. The Bank of Otago, Limited—Dunedin.

For Great Britain and Ireland :—London—The Australian Joint Stock Bank, 18, King William-street, E.C. London Bankers, and Agents for England generally—The National Provincial Bank of England.

Edinburgh and Scotland generally—The Royal Bank of Scotland.

Dublin and Ireland generally—The Provincial Bank of Ireland.

For New York and the United States of America :—Messrs. Brown, Brothers, & Co.

The Bank grants drafts and credits on all its Agents and Branches at current rates; negotiates produce bills with documents; discounts commercial paper; collects dividends on local stock for its customers, free of commission; and is open to transact every kind of banking business and agency.

ORIENTAL BANK CORPORATION.

(Incorporated by Royal Charter, 30th August, 1851.)

PAID-UP CAPITAL, £1,500,000. RESERVE FUND, \$444,000.

Court of Directors :—

James Blyth, Esq., Chairman; James Walker, Esq., Deputy-Chairman; George Arbuthnot, Esq.; Duncan James Kay, Esq.; John Binney Key, Esq.; Alexander M'Kenzie, Esq.; Lestock Robert Reid, Esq.; William Walkinshaw, Esq.; Charles J. F. Stuart, Esq., Chief-Manager; Patrick Campbell, Esq., Sub-Manager.

Bankers :—The Bank of England; Union Bank of London; Bank of Scotland, London.

Agents in Scotland :—R. Dundas Cay, Esq., 23, St. Andrew Square, Edinburgh; National Bank of Scotland; Commercial Bank of Scotland; British Linen Company Bank.

Agents in Ireland :—Provincial Bank of Ireland; National Bank.

HEAD OFFICE, THREADNEEDLE-STREET, LONDON, E.C.

Branches and Agencies :—Bombay, Calcutta, Colombo, Badulla, Galle, Haldamulla, Jaffna, Kandy, Newera Ellia, Hong Kong, Foochow, Shanghai, Madras, Negapatam, Pondicherry, Mauritius, Melbourne, Singapore, Sydney, Yokohama, Hiogo.

AUSTRALIAN ESTABLISHMENT.

SYDNEY BRANCH.

Stewart Murray, Manager; Fred. Wm. Crozier, Sub-Manager;
A. G. Smyth, Accountant.

With Agencies at—Braidwood, Araluen, Burrangong, Grenfell, and Gulgong.

MELBOURNE BRANCH.

George Hamilton Traill, Manager; Alex. Wm. Anderson, Sub-Manager;
Chas. J. Hepburn, Accountant.

With Agencies at—Beechworth, Bright, Stanley, Eldorado, Castlemaine, Chewton, Pleasant Creek, Sandhurst, Eaglehawk.

Agents in—NEW ZEALAND..... The Bank of New Zealand.
TASMANIA..... The Bank of Australasia.
SOUTH AUSTRALIA ... The Bank of South Australia.

S. MURRAY, Manager,

SYDNEY.

UNION BANK OF AUSTRALIA.

LONDON OFFICE: No. 1, BANK-BUILDINGS, LOTHBURY.

Directors :—Richard James Ashton, Esq.; Robert Brooks, Esq.; Robert Campbell, Esq.; Robert Carter, Esq.; Frederick G. Dalgety, Esq.; William Fanning, Esq.; Archibald M'Lachlan, Esq.; Edward P. W. Miles, Esq.; Charles Henry Mills, Esq., M.P.; Sir Charles Nicholson, Bart.; Sir Henry Watson Parker; James Bogle Smith, Esq.

Trustees :—The Right Hon. Lord Wolverton; Robert Brooks, Esq.; Edward P. W. Miles, Esq.

Bankers :—Bank of England; Messrs. Glyn, Mills, Currie, & Co.

Solicitor :—Charles Frederick Murray, Esq.

Manager :—John Bramwell, Esq.

Secretary :—W. R. Mewburn, Esq.

Inspector and General Manager :—John M'Mullen, Esq., Melbourne.

Assistant Inspectors :—George Cowie, Esq.; Alexander Sutherland, Esq.

COLONIAL ESTABLISHMENTS.

VICTORIA.

MELBOURNE.

Local Directors :—Richard Grice, Esq.; James Blackwood, Esq.; T. J. Nankivell, Esq.

Manager :—John Curtayne, Esq. (on leave.)

Acting Manager :—E. B. Holt, Esq.

[Agencies at Sandhurst (Bendigo), Daylesford, Tarnagulla, Alexandra, Wood's Point, and Godfrey's Creek.]

GEELONG.

Local Director :—Charles Ibbotson, Esq.

Manager :—John Simpson, Esq.

BALLARAT.

Local Director :—R. H. Bland, Esq.

Manager :—James Williamson, Esq.

[Agencies at Smythesdale, Clunes, and Pleasant Creek.]

PORTLAND.

Manager :—William A. Stokes, Esq.

NEW SOUTH WALES.

SYDNEY.

Local Directors :—Alex. M'Donald, Esq.; J. B. Watt, Esq.;
F. C. Griffiths, Esq.

Manager :—John C. Raymond, Esq.

UNION BANK OF AUSTRALIA.

COLONIAL ESTABLISHMENTS—continued.

QUEENSLAND.

BRISBANE.

Local Director :—George Raff, Esq.

Manager :—John S. Turner, Esq.

ROCKHAMPTON.

Manager :—Alex. Thomson, Esq.

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SOUTH AUSTRALIA.

ADELAIDE.

Local Director :—John Hart, Esq.

Manager :—William J. Crawford, Esq.

PORT ADELAIDE.

Acting Agent :—Henry H. Thomas, Esq.

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TASMANIA.

HOBART TOWN.

Local Director :—Askin Morrison, Esq.

Manager :—Nigel Gresley, Esq.

LAUNCESTON.

Local Directors :—John Crookes, Esq. ; James Robertson, Esq.

Manager :—John T. Sale, Esq.

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NEW ZEALAND.

AUCKLAND.

Manager :—James B. Brathwaite, Esq.

[Agencies at Shortland and Grahamstown, the Thames Gold-fields.]

WELLINGTON.

Local Director :—Isaac E. Featherston, Esq., C.M.G.

Acting Manager :—Wm. Jamieson, Esq.

NAPIER (HAWKE'S BAY).

Manager :—David S. Melville, Esq.

NELSON.

Manager :—Donald McDonald, Esq.

UNION BANK OF AUSTRALIA.

COLONIAL ESTABLISHMENTS—continued.

HOKITIKA (WEST COAST).

Manager:—John Foster, Esq.

[Agencies at Greymouth, Ross, Waimea, Westport, and Charleston.]

CHRISTCHURCH (CANTERBURY).

Manager:—Joseph Palmer, Esq.

LYTTELTON (CANTERBURY).

Agent:—H. H. Knowles, Esq.

TIMARU (CANTERBURY).

Manager:—W. W. Cobb, Esq.

DUNEDIN (OTAGO).

Manager:—Alfred Jackson, Esq.

INVERCARGILL (SOUTHLAND).

Acting Manager:—John H. Kent, Esq.

Agents:—The National Provincial Bank of England; The London and County Bank; The Bank of Liverpool; The Gloucestershire Banking Company; The County of Gloucester Bank; The Devon and Cornwall Banking Company; The West of England and South Wales District Bank; Messrs. Cave, Baillie, and Co., Bristol; Messrs. Sir William Miles, Bart., and Co., Bristol; Messrs. Grant, Gillman, and Long, Portsmouth; Messrs. Bolithos, Sons, and Co., Penzance, &c.; Messrs. Tweedy, Williams, and Co., Truro, &c.; Messrs. J. M. Williams and Co., Redruth, &c.; Messrs. Dingley and Co., Launceston, &c.; Messrs. G. E. Foster and Sons, Cambridge, &c.; Messrs. Round, Green, and Co., Colchester; Lloyds' Banking Company, Birmingham; The Town and District Bank, Birmingham; The Birmingham Banking Company, Birmingham; Messrs. Beckett and Co., Leeds, &c.; Messrs. William Williams, Brown, and Co., Leeds, &c.; Messrs. Garfit, Claypon, and Co., Boston, &c.; The Northamptonshire Union Bank; The Lancaster Banking Company; The Halifax and Huddersfield Union Bank; Moore and Robinson's Nottinghamshire Banking Company; the Bank of Ireland; The Royal Bank of Ireland, Dublin; The Northern Banking Company; The National Bank of Scotland; The Commercial Bank of Scotland; The Union Bank of Scotland; The City of Glasgow Bank; The Aberdeen Town and County Bank; The Bank of British North America; The Chartered Mercantile Bank of India, London, and China; The Chartered Bank of India, Australia, and China; The Mauritius Commercial Bank; The Hong Kong and Shanghai Banking Company; The Bank of Rotterdam, Rotterdam, Batavia, &c.; The Standard Bank of British South Africa; The London and Brazilian Bank; The London and River Plate Bank; The London and San Francisco Bank, San Francisco; Messrs. Hellmann, Brothers, and Co., San Francisco; Messrs. Frederick Huth, Gruning, and Co., Valparaiso; Messrs. Russell and Sturgis, Manilla.

**THE
COMMERCIAL BANKING COMPANY OF SYDNEY.**

(ESTABLISHED, 1834.)

(Incorporated by Act of Council, 1848.)

CAPITAL, £400,000. RESERVE FUND, £120,000.

Directors :—Richard Jones, Esq., Chairman; Walter Lamb, Esq., Deputy Chairman; Edward Knox, Esq.; John Brewster, Esq.; F. H. Dangar, Esq.; T. A. Dibbs, Esq., Manager.

Auditor :—J. R. Street, Esq.

Solicitors :—Messrs. Want, Son, & Johnson.

HEAD OFFICE: GEORGE-STREET, SYDNEY.

Manager :—T. A. Dibbs.

Secretary :—William Neill.

Accountant :—F. N. Burt.

Branch Inspector :—T. B. Gaden.

CITY AND SUBURBAN BRANCHES.

Haymarket, George-street South, and South Head Road.

London Office: 39, Lombard-street, E.C.

Directors :—J. A. Youl, Esq.; H. G. Smith, Esq.; and F. H. Hogg, Esq.

Manager :—Nathaniel Cook.

BRANCHES:—

NEW SOUTH WALES.

Albury.	Carcoar.	Maitland.	Shoalhaven.
Armidale.	Cooma.	Morpeth.	Singleton.
Bathurst.	Casino.	Muswellbrook.	Tamworth.
Bega.	Dubbo.	Narrabri.	Wentworth.
Berrima.	Goulburn.	Newcastle.	Wollongong.
Bombala.	Inverell.	Orange.	Yass.
Bourke.	Kempsey.	Parramatta.	
Burrangong.	Kiama.	Queanbeyan.	

QUEENSLAND.

Brisbane.	Dalby.	Gayndah.	Maryborough.
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THE
COMMERCIAL BANKING COMPANY OF SYDNEY.

AGENCIES IN THE COLONIES.

Victoria :—The Bank of Victoria ; National Bank of Australasia ; Colonial Bank of Australasia.

South Australia :—Bank of South Australia ; National Bank of Australasia ; Bank of Adelaide.

Tasmania :—Bank of Van Diemen's Land.

New Zealand :—Bank of New Zealand.

Western Australia :—National Bank of Australasia.

IN GREAT BRITAIN AND ELSEWHERE.

London :—London and Westminster Bank ; London and County Bank.

Liverpool :—Liverpool Union Bank.

Manchester :—Manchester and Salford Bank.

Ireland :—Belfast Banking Company and Branches ; National Bank and Branches.

Scotland :—Commercial Bank of Scotland.

San Francisco :—Messrs. Macondray & Co., and Bank of British Columbia.

Valparaiso :—Banco Nacional de Chile.

New York :—Messrs. Dabney, Morgan, & Co.

India, China, Ceylon, and Singapore :—The Chartered Mercantile Bank of India, London, and China.

BANK OF NEW SOUTH WALES.

(ESTABLISHED, 1817.)

(Incorporated by Act of Council, 1850.)

CAPITAL, £1,000,000. RESERVE FUND, £300,000.

HEAD OFFICE, SYDNEY.

Directors:—Thomas Walker, Esq., President; Thomas Buckland, Esq.; Francis Mitchell, Esq.; Alexander Stuart, Esq.; The Hon. George Allen, Esq., M.L.C.; The Hon. E. C. Weekes, Esq., M.L.C.

Auditors:—George Thorne, Esq.; James Milson, jun., Esq. Shepherd Smith, General Manager.

LONDON OFFICE, OLD BROAD-STREET.

Directors:—Donald Larnach, Esq., Managing Director; T. S. Atkins, Esq.; Sir Daniel Cooper, Bart.; William Walker, Esq.

London Bankers:—The Bank of England; The London Joint Stock Bank.

BRANCHES IN NEW SOUTH WALES.

Parramatta-street.	Richmond.	Gundagai.	Orange
William-street.	Penrith.	Wagga Wagga.	Dubbo.
Maitland.	Camden.	Burrowa.	Glen Innes.
Newcastle.	Goulburn.	Deniliquin.	Sofala.
Tamworth.	Adelong.	Albury.	Armidale.
Grafton.	Grenfell.	Bathurst.	Trunkey.
Windsor.	Araluen.	Mudgee.	Gulgong.

BRANCHES IN QUEENSLAND.

Brisbane.	Warwick.	Rockhampton.	Roma.
Ipswich.	Gympie.	Bowen.	Maryborough.
Toowoomba.	Ravenswood.	Townsville.	

BRANCHES IN VICTORIA.

Melbourne.	Castlemaine.	Wangaratta.	Linton.
Geelong.	Maldon.	Chiltern.	Inglewood.
Kyneton.	Beechworth.	Ararat.	Echuca.
Ballarat.	Sandhurst.	Creswick.	Mansfield.

BANK OF NEW SOUTH WALES,

BRANCHES AND AGENCIES IN NEW ZEALAND.

Auckland.	Dunedin.	Ross.	Charleston.
Nelson.	Invercargill.	Cromwell.	Waipori.
Wellington.	Hokitika.	Dunstan.	Lawrence.
Wanganui.	Greymouth.	Dunstan Creek.	Black's.
Christchurch.	West Port.	Mount Ida.	Grahamston.

AGENCIES WITHIN THE COLONIES.

SOUTH AUSTRALIA—The Bank of South Australia.

WESTERN AUSTRALIA—The Western Australian Bank.

VAN DIEMEN'S LAND—The Commercial Bank of Van Diemen's Land.

AGENCIES BEYOND THE COLONIES.

SCOTLAND—The Royal Bank of Scotland.

IRELAND—The National Bank of Ireland.

MANCHESTER—The Manchester and Liverpool District Bank.

BIRMINGHAM—The Birmingham Joint Stock Bank.

LIVERPOOL—The North and South Wales Bank.

BRISTOL AND WEST OF ENGLAND—Stuckey's Banking Company.

HAMBURGH—Messrs. Merk & Co.

NEW YORK—Messrs. Duncan, Sherman, & Co.

SAN FRANCISCO—The London and San Francisco Bank.

INDIA AND CHINA—The Chartered Mercantile Bank of India, London, and China.

MANILLA—Messrs. Russell & Sturgis.

The Bank allows Interests on Deposits if lodged for fixed periods, at rates which may be ascertained at its various offices.

Collects for its customers Dividends on Shares in Public Companies, and interest on debentures.

Invests money on their behalf in Colonial Securities or those of Great Britain.

Issues Drafts and Letters of Credit, and negotiates approved Bills, payable at any of the above-named places, and undertakes the Agency of other Banks on such terms as may be agreed upon.

BULLI COAL-MINING COMPANY.

OFFICES: EXCHANGE, SYDNEY.

Capital, £37,000 ; Amount paid up, £36,465.

Directors:—George Wigram Allen, Esq., M.L.A., Chairman ; Honorable George Allen, Esq., M.L.C. ; A. H. C. Macafee, Esq. ; Edwin Thomas Beilby, Esq. ; James R. Fairfax, Esq.

Manager:—James Shoobert, Esq.

APART from their extensive local and intercolonial trade, this Company executes orders for delivery of Coal at San Francisco, Chili, Mauritius, or any of the ports of India and China ; and having a line of their own screw steam Colliers running from their mines at Bulli (forty miles south of the Port of Sydney), can ensure the loading of ships with great despatch.

[Copy.]

Australasian Steam Navigation Company,
Sydney, 9th March, 1871.

James Shoobert, Esq.,
Manager, Bulli Coal-mining Company,—

Dear Sir,

In reply to your letter of even date, asking me to express my opinion on the quality of your Coal supplied to this Company for the past three years, and informing me that "it had been stated in Adelaide that the certificates obtained from this Company were obtained under pressure," I beg to state that the statistics in this office on the subject of Coal, and the official reports from the Company's engineers afloat, leave me no alternative but to pronounce your produce to be an article of *first class quality*, and particularly suited to vessels undertaking long voyages, owing to the fact of its lasting or economical qualities, and to the fact of its depositing but a small quantity of soot in the boiler tubes, in comparison with the majority of *Colonial* coal.

The assertion of pressure being brought to bear on this Company to induce them to take your coal is too contemptible to induce me to occupy my time in confuting.

I may add that the reason this Company removed their custom last January to another Coal Company was entirely owing to the tender of the latter being materially under yours.

I am, dear Sir,

Yours faithfully,

FRED. H. TROUTON,
Manager.

BULLI COAL-MINING COMPANY.

[Copy.]

Sydney, 10th March, 1871.

To the Manager, Bulli Coal Company,—

Sir,

In answer to your letter of this date, I beg to state that after a three years' trial of your Coal, I have found that there is a general saving of from 15 to 25 per cent. in most of the vessels belonging to this Company, varying according to the construction of the boilers, whilst the steaming qualities are nearly equal to the Northern or Newcastle Coal—the fires seldom require cleaning—the tubes keep clean—and they give but a moderate quantity of ashes. I may also state they take from 10 to 12 per cent. less room than Northern coal, which for a long voyage is of importance.

I am, Sir,

Yours truly,

JAMES MUNRO,
Marine Superintendent.

Our average consumption would be about 3,000 tons per month.—J.M.

[Copy.]

Australasian Steam Navigation Company,
Sydney, 11th March, 1871.

James Shoobert, Esq.,

Manager, Bulli Coal-mining Company,—

Dear Sir,

In reply to your letter of the 9th instant, I beg to inform you that my opinion regarding the superiority of the Bulli Coal compared with the Newcastle Coal is still unchanged, and more strongly thoroughly confirmed since writing the letters referred to by you.

There was no pressure used with me to give the letters referred to.

My opinion was formed from actual facts of the superiority of the Coal, compared with the Newcastle Coal, and long before the Company used them for their steamers.

I strongly recommended them for the Californian mail steamers, in which they have been used, and given great satisfaction.

I have much pleasure in certifying that the tear and wear upon the boilers, especially the uptakes and furnaces, is very much less with the Bulli Coal than with the Newcastle Coal, at least 10 per cent.; the former being altogether free from flaming, which always proves destructive to boilers where it exists.

I may also state for your information that, in order to get the best results from the Bulli Coal, it is necessary to have furnace-bars fitted not less than 1½ to 1¼ inch apart; if so fitted, they will steam equally as well as the Newcastle Coal, and will save at least 15 or 20 per cent. in the quantity consumed for the work performed.

I may also state that I had an interview with Mr. Wigram, of London, this week, at which the quality of the Coal of Australia was considered, and I strongly advised him to use the Bulli Coal for his steamer, the "Somersetshire," trading between London and Melbourne.

I remain, dear Sir,

Yours most truly,

THOMAS JAFFREY,
Superintendent Engineer.

BULLI COAL-MINING COMPANY.

[Copy.]

United States' Consulate, Grafton Wharf,
Sydney, 27th October, 1870.

James Shoobert, Esq., Secretary and Agent,
Bulli Coal-mining Company, Sydney,—

Dear Sir,

I am in receipt of your letter of the 27th instant, asking me for my opinion as to the value of the Bulli Coal-mining Company's Coals for steam purposes, and whether my engineers' reports are favourable or unfavourable. In reply, I have much pleasure in informing you that I find a saving of over 15 per cent. in favour of your Coals, as well as 15 per cent. in the space occupied, and this is confirmed in the reports from my engineers during the past six months.

I remain, dear Sir,
Yours truly,

H. H. HALL, U.S. Consul,
Manager, Californian, New Zealand, and Australian
Mail Line of Steam Packets.

[Copy.]

Australasian Steam Navigation Company,
Sydney, August 24th, 1870.

James Shoobert, Esq.,
Exchange,—

Dear Sir,

I have just received your note, enclosing copy of opinions of several of the best qualified gentlemen on the merits of Bulli Coal, and I may say that I fully endorse what has been said by them. I prefer them for many reasons—Firstly,—because there is less occasion to clean fires, and consequently more equal pressure of steam. Secondly,—they are not so heavy to work, especially in long furnaces. Thirdly,—not nearly so liable to flame, and not so much smoke; and lastly,—with the same bunker space a vessel is enabled to go a longer distance without coaling, as the difference in favour of Bulli Coals is at least 15 per cent.

With respect to the action of Bulli Coal-mining Company's Coals upon iron, as compared with Newcastle, I find that the Bulli Coals are not so severe on either furnaces, boiler backs, or the uptake, as they burn more steadily and gradually, with much less blaze and flame; and when once the firemen are acquainted with them, and the mode of treating them, they prefer them, and can raise as much steam on an average, during the four hours watch, as with Newcastle. They require more opening between the bars than Newcastle.

Yours truly,

FREDK. FERNLEY,
S.S. "Boomerang."

BULLI COAL-MINING COMPANY.

[Copy.]

A.S.N. Co.'s Steamship "Auckland,"
Sydney, 29th August, 1870.

Mr. Shoobert,—

Sir,

I received your note, asking my opinion on the Bulli Coal-mining Company's Coal. I used them first mixed with Newcastle Coal in the "Boomerang," and did not like them, but found by using the Bulli alone they were better than Newcastle.

The tubes in this ship's boilers are carried very high above the furnaces; on that account I would prefer Newcastle Coal, as they carry heat further beyond the fires than Bulli. I am aware that I would have to use 15 per cent. more Newcastle than Bulli; also that Bulli takes up less room in the bunkers. It is my opinion that if Bulli Coal was better known it would be more used.

Your humble servant,
DAVID GEDDES,
Chief Engineer of S.S. "Auckland."

[Copy.]

Australasian Steam Navigation Company,
Sydney, September 1st, 1870.

Mr. Shoobert,—

Dear Sir,

In answer to your note, in reference to the quality of Bulli Coal, I have much pleasure in stating that I still retain my former opinion as regards their good steaming properties, and also as to their being less destructive to the fires and furnace.

I am, Sir,
Yours truly,
JOHN DUNBAR,
Chief Engineer, S.S. "Balclutha."

[Copy.]

S.S. "Black Swan,"
Sydney, 13th September, 1870.

To James Shoobert, Esq.,
Secretary Bulli Coal-mining Company,—

Sir,

In answer to your note, in reference to the steaming quality of the Bulli Coal-mining Company's Coal, as compared with Newcastle Coal, I find by experience there is a considerable saving by the use of the former, with less wear upon those parts of the boiler exposed to the action of the fire.

I am, Sir,
Yours, &c.,
ROBERT H. GLEN,
Engineer.

BULLI COAL-MINING COMPANY.

[Copy.]

S.S. "Wonga Wonga,"
26th September, 1870.

To the Secretary of Bulli Coal-mining Company,—

Dear Sir,

At your request I have much pleasure in stating my opinion as to the quality of your Coal. Having had considerable experience of various mines I can, without hesitation, say they are the best I have seen in the Colonies, no clinker arising from them; furnaces easily cleaned; tubes not so easily blocked; larger quantity stowed in smaller space than any Colonial Coal; with 10 per cent. less consumption, and quite as such steam.

I am, yours respectfully,

WM. GRAY,
Chief Engineer.

[Copy.]

S.S. "City of Melbourne,"
27th October, 1870.

To James Shoobert, Esq.,
Agent, Bulli Coal-mining Company,—

Dear Sir,

I have much pleasure in certifying that during the two years I have been using the Bulli Company's Coal there is not their equal for a long run. There is a saving at the very least of 25 per cent.

JAMES BLACKWOOD,
Chief Engineer, "City of Melbourne."

[Copy.]

Steamship "City of Melbourne,"
Sydney, N.S.W., 26th October, 1870.

To James Shoobert, Esq.,—

Sir,

In answer to your letter of the 24th instant, I beg to state that Bulli Coal-mining Company's Coal gives, I am sure, for a long passage, a saving of at least thirty (30) per cent. over any Coal we have had, and from what Mr. Blackwood (who is a first-class man) tells me, they can be worked with greater ease and give us all confidence, as we feel sure it will not fail us, which the Newcastle Coal often does; nor do I think, from what I have seen, that the necessary exposure to weather, &c., in out Ports, has the bad effect upon Bulli Coal that it has on Newcastle. To say all in a few words, for a long passage give me Bulli Coal-mining Company's Coal before anything produced in Australia.

I am, Sir, your obedient servant,

H. GRAINGER,
Master S.S. "City of Melbourne."

BULLI COAL-MINING COMPANY.

[Copy.]

A.S.N. Co.'s Steamship "City of Adelaide,"
19th August, 1870.

James Shoobert, Esq.,
Secretary and Agent, Bulli Coal-mining Company,—

Dear Sir,

In answer to your letter of the 18th instant, requesting me to furnish you with my opinion of the value for steam purposes of the Bulli Coal-mining Company's Coal, as compared with the Newcastle, and if I have observed the effect produced by it on the parts of the boilers exposed to intense heat, also as compared with Newcastle.

I find the saving, after my two years experience in burning Bulli Coal, to be 17 per cent. less than Newcastle. The amount of steam produced, while consuming round lumpy coal, is equal to that obtained from Newcastle. When, however, the Bulli Coal is of too small a description we are not able to obtain so large a supply as from small Newcastle, but this does not increase the consumption per hour.

It is known generally among engineers that the Bulli Coal-mining Company's Coal generates steam more by radiation than flaming, the latter being a feature peculiar to Newcastle Coal and all such bituminous coal, which is very injurious to the plates of the boilers exposed to the flame, especially the uptakes. Still, on the other hand, it is proper to state that by an admission of air at the right place and in proper quantities, the flaming may be almost entirely removed.

In reply to your request to suggest some improvements on your "Memo," I would observe that it is absolutely necessary, in order to consume your Coal efficiently and economically, to bear in mind,—

- (1.) That the fire-bars should not be closer than one inch.
- (2.) That on no account should any air be admitted beyond the fire-bridge, as it is very injurious to the rapid production of steam.
- (3.) That half a square inch of opening at the furnace-doors—this opening to be permanent—for admission of air for each square foot of fire-grate surface is highly beneficial.

I remain, yours obediently,

JOHN WALKER,
Chief Engineer.

NEWCASTLE WALLSEND COAL COMPANY.

Capital, £100,000, in 10,000 Shares of £10 each.

.....
HEAD OFFICE:—SYDNEY, NEW SOUTH WALES.

Directors:—Robert Rome, Esq., Chairman; H. C. Dangar, Esq.; Michael Metcalfe, Esq.; Saul Lyons, Esq.; Alfred Lamb, Esq.

Shipping Manager, Newcastle:—H. R. Cross.

Colliery Manager, Wallsend:—J. Y. Neilson.

Secretary, Sydney:—F. W. Binney.

The Company's Mines, with appliances for raising over 1,000 tons of Coal per day, are situated at Wallsend, eight miles from Newcastle. The estate comprises over 8,000 acres of coal land, and is connected by the Company's and the Government Railways with the shipping Port of Newcastle, where the largest ships can load at the Government Staiths and Cranes.

This Company's Coal was tried at Woolwich, in May, 1862, and the report was "Very good in every respect."

The Coal of this Company obtained the 1st prize at the Intercolonial Exhibition, held at Sydney in 1870; the sales in that year amounted to over 168,000 tons.

Sydney, March, 1871.

WARATAH COAL COMPANY.

(Incorporated by Act of Parliament.)

.....
 Capital, £60,000, in 10,000 Shares of £6 each.

Directors:—Charles Smith, Esq., Chairman; Joseph S. Willis, Esq.; W. O. Gilchrist, Esq.; The Hon. Thomas W. Smart, Esq., M.L.C.; Alex. Stuart, Esq.

Auditors:—Henry T. Fox, Esq.; Atkinson A. P. Tighe, Esq.

Solicitors:—Messrs. Norton and Barker.

Secretary:—D. N. Joubert.

HEAD OFFICES:

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For Purity, Brilliancy, and Cheapness—unsurpassed by any other Oils.
For Safety—unequaled.
Igniting point—120° Fahrenheit.

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Secretary.

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Capital, £100,000 in £1 Shares.

Directors:—The Hon. Thomas W. Smart, Esq., Chairman; Benjamin Buchanan, Esq.; John Alger, Esq.; James S. Mitchell, Esq.; John Brewster, Esq.

Auditors:—Robert Garrett, Esq.; W. Wolfen, Esq.

Solicitors:—Messrs. Want, Son, & Johnson.

Secretary:—D. N. Joubert.

HEAD OFFICES:

EXCHANGE CORNER, BRIDGE-STREET, SYDNEY.

London Agents:—Messrs. Wm. Mort & Co., 155, Fenchurch-street, E.C.

DANIELL, KING, & CO.,
 MERCHANTS AND GENERAL AGENTS,
 10, O'CONNELL-STREET, SYDNEY, N.S.W.

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 FIRE ASSURANCE COMPANY,**

Bartholomew-lane, London.

(ESTABLISHED BY ACT OF PARLIAMENT, 1824.)

Capital, £5,000,000 Sterling.

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 Jardine, Skinner, & Co. ... Calcutta.
 Remington & Co. Bombay
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 B. A. Barretto & Co. Manilla.
 Jas. Henty & Co. Melbourne.
 J. E. Crockett, Esq..... Singapore.

DANIELL, KING, & Co.,
 Agents in Sydney.

AUSTRALIAN MEAT COMPANY,

RAMORNIE, NEAR GRAFTON, NEW SOUTH WALES,

(ESTABLISHED IN 1866.)

Supply PRESERVED BEEF, in 2, 4, and 6-lb. Tins,

AND

EXTRACT OF BEEF (Liebig's Process), in 4, 8, and 16-oz. Tins.

Sole Agents for Australia,—

RABONE, FEEZ, & Co.,
 Wynyard-street, Sydney.

AUSTRALIAN BREADSTUFFS.

THE undersigned are desirous of notifying to Grain Merchants and Flour Factors in the United Kingdom and elsewhere, that they devote special attention to, and have the largest Commission business in this Colony in the sale and purchase of Wheat and Flour.

Sydney is the chief depôt in the Australasian Colonies for the surplus productions of Wheat and Flour in the surrounding Colonies of South Australia, Victoria, Tasmania, and New Zealand; and the undersigned are Agents for most of the leading Millers and Shippers engaged in this trade at the principal ports, and are in receipt of continuous supplies by the numerous inter-colonial traders. They have the experience of many years in executing Foreign Commissions, and, in their capacity of Agents, charter and load vessels direct from any of the grain-producing Colonies, or forward any quantities desired by the regular lines of ships trading to London and elsewhere.

No charge is made for chartering vessels or engaging freight. The usual Mercantile Commission of $2\frac{1}{2}$ per cent. covers execution of orders accompanied by Letters of Credit. Drafts under which at sixty days sight against shipping documents can be negotiated at from par to 1 per cent. premium. Insurances (free of particular average) range from 25s. to 30s. per cent., according to ports of loading and discharge.

Wheat is shipped in new hempen sacks, costing about 1s. each, and containing about $4\frac{1}{4}$ bushels.

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There are no Cartage, Labour, or Wharfage Charges attendant upon export of Breadstuffs, the vendors delivering to vessel's side.

Freights to London range from 30s. per ton minimum in Sydney, up to 60s. maximum in other Colonial ports.

Wheat and Flour are usually lower in price in other Colonies than Sydney, but to export buyers the difference is more than made up by the lower rate of freight, the Produce being brought to this port to a great extent by coasting vessels returning for cargoes.

The superior quality of Australian Grain and Flour is now so universally known and understood in the United Kingdom, India, China, the Cape, Mauritius, Port de France, and many other parts of the world, that any representation on the subject is uncalled for.

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Our Agents in London are Messrs. Johnson and Archer, No. 2, Lawrence Pountney Hill, Cannon-street.

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 Exporters of Crude Minerals and Chemicals.
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 Agents for the Principal Patent Medicines and Medicinal Manufacturers
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THE undersigned have the following First-class Vessels sailing Monthly and Semi-monthly, making an average passage of eighty days. Each vessel carries an experienced Surgeon. Passengers proceeding by this Line can make equitable terms for return passage; and the Dietary arrangements are superior. Shippers of Wool are informed that all shipments are covered by Fire Insurance whilst in the Stevedore's Stores in preparation for shipment.

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" Strathdon"	1,011 do.
" Kosciusko"	1,192 do.
" Christiana Thompson"	1,079 do.
" Thyatira"	962 do.
" Damascus"	964 do.
" Nineveh"	1,174 do.
" Maid of Judah"	665 do.
" Queen of Nations"	846 do.
" Centurion"	965 do.

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Dry Dock—Capable of receiving the largest Merchant Vessels or Steamers visiting Port Jackson.

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Iron and Brass Foundry—Castings up to 12 tons each.

Engineering Shop—Replete with all modern Tools and Appliances, including heavy Steam Hammer, Wheel-turning and other Lathes, and capable of fulfilling the requirements of the largest Engineering Works.

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.....

 Stores capable of storing 5,000 Bales of Wool.

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Secretary :—J. E. Ebsworth.

THE
AUSTRALASIAN STEAM NAVIGATION COMPANY.

CAPITAL, £320,000, in 16,000 Shares of £20 each.

- Chairman** :—John Brewster, Esq.
Deputy Chairman :—Thomas Walker, Esq.
Directors :—James Milson, jun., Esq. ; James Henry Neale, Esq., M.L.A. ;
 W. B. Piddington, Esq., M.L.A. ; Michael Metcalfe, Esq.
Manager :—Frederick H. Trouton, Esq.
Secretary :—Frederick Phillips, Esq.
Traffic Manager :—William Westgarth, Esq.
Accountant :—Dawson A. Davis, Esq.
Marine Superintendent :—James Monro, Esq.
Superintending Engineer :—Thomas Jaffrey, Esq.

THIS Company was first formed in the year 1839, under the name and style of "The Hunter River Steam Navigation Company," but in 1851 it was re-incorporated as the "Australasian Steam Navigation Company."

The Company's first operations were confined to the Hunter River District, but it has gradually increased its trade so, that at the present time its lines extend from Sydney, southward and westward, to Melbourne, Adelaide, and King George's Sound, a distance of 4,220 miles ; northward, as far as Rockingham Bay direct, but it also has several trades between all the important intermediate ports of Queensland, with subsidiary lines to and from Brisbane and other ports of that Colony. The aggregate distance of these northern trades is 9,292 miles. It has also branch lines to Fijis and Auckland (5,062 miles) ; and two of the largest steamers, the "City of Melbourne" and "Wonga Wonga," are engaged in connection with the Mail Service to England, *vid America*, in the conveyance of the Australian and New Zealand Mails as far as Honolulu in the Hawaiian Islands, distant from Sydney 5,261 miles.

At head quarters, in Sydney, the Company have a large Engineering Establishment, where every description of iron-work can be executed, as they are in the possession of the most costly machinery, embracing the latest improvements ; here too, is a Patent Slip, capable of taking up ships of 1,500 tons burthen. Several steamers of large tonnage have been built at these works.

The Company has very commodious Stores, together with large and extensive Wharves at the Port of Sydney. At several of the Agencies too, these accommodations of Stores, Wharves, &c., are plentifully provided.

The number of men daily employed by the Company averages 1,492.

The fleet of the Company consists of the following vessels, viz. :—

Alexandra (screw).	City of Melbourne (screw).	Lady Young (paddle).
Auckland "	Clarence (paddle).	Leichhardt "
Ant "	Collaroy "	Queensland "
Balclutha "	Coonanbara "	Rangatira (screw).
Bolwarra (stern-wheel).	Egmont (screw).	Tinonee (twin screw).
Bee (screw).	Emu (paddle).	Williams (paddle).
Black Swan (screw).	Florence Irving (paddle).	Wonga Wonga (screw).
Boomerang "	Havilah (screw).	Yaamba (stern wheel).
Brisbane (paddle).	Ipswich (paddle).	Yarra Yarra (paddle).
City of Adelaide (screw).	James Paterson (screw).	
City of Brisbane (paddle).	Lady Bowen (paddle).	

FREDK. H. TROUTON,
Manager.

THE SYDNEY MORNING HERALD, AND THE SYDNEY MAIL,

Published Daily and Weekly respectively in
SYDNEY, NEW SOUTH WALES.

THE SYDNEY MORNING HERALD

is the oldest established newspaper in the Australian Colonies, and in New South Wales has maintained the highest position for many years past. Its interests are principally Mercantile, Political, and for General Information; and circulates widely throughout New South Wales, Queensland, and other parts of Australia.

THE SYDNEY MAIL

AND

NEW SOUTH WALES ADVERTISER

is compiled for the purpose of suiting, as far as practicable, all classes of readers.

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Horticulture and the Garden	Commercial
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