correctness of his conclusions. Mr. Shaw was now trying a series of experiments on the sea-trout, which he made no doubt would be interesting to naturalists —the fry were hatched in January, and in May last were one inch and a quarter long.—Mr. LINGWOOD had seen parr longer than six inches, which was about the size that they appeared to migrate.—Sir W. Jardine: Parrs frequently attain the size of eight or nine inches, but they do not exist in any great numbers, and appear to be those that remain longer than usual in the rivers.—Dr. LANKESTER wished to know if any structural difference existed between the salmon at various periods of growth, or whether any difference existed in different individuals of the same species, especially with regard to the number of the rays in their fins. He asked this question, for he had been lately wishing to determine some species of bream, and found the rays of the anal fins varying from eighteen to thirty, and thus destroying the specific distinction between *Abramis brama* and *A. blicca*. This, however, was not the only point of difficulty, as the relative size of the parts varied also very much; and, from these circumstances, he was induced to think that the *A. blicca* was only an early stage of growth of *A. brama*.—Sir W. Jardine was not aware that any difference existed in the number of the rays of the fin at various stages of growth, but he had observed a very decided difference in the form of the pectoral fin at various stages of growth, as might be seen by the specimens on the table. The number of rays in the fin he thought a bad specific distinction, and was not to be depended on among the Salmonidæ. It was so with regard to the bream, as on a late visit to Scotland Mr. Yarrell had found great difficulty in distinguishing the species of bream, on account of the varying number of the fin rays.—Mr. FORBES stated, it was laid down as a rule in zoology, that those parts which characterized a class were those, the differences of which were most to be relied on in specific distinctions. Now, the fins were such an organ in the fish; and it was an exception to the rule if, in any families of fishes, they were not amongst the parts whose difference of structure should point out the most permanent characters.

Mr. ADAIR exhibited some specimens of the *Patella ancyloides*, found on the coast of Arran.

Mr. FORBES stated, that this shell, if picked up in a river, would be called an *Ancylus*: it is not really a *Patella*, but a *Lottia*. It has a shell of one order of animals, and the animal which inhabits it belongs to another order of animals. Patella may be distinguished from Lottia by its habitat, the latter living in the depths of the sea, while the former cannot exist in such a locality.

SECTION E.—MEDICAL SCIENCE.

FRIDAY.

Dr. M'KAY read a paper 'On the Properties, Chemical and Therapeutic, of the Matias Bark.'—The plant from which the bark was obtained, he stated, grew in great abundance in South America; but he was unable to state its botanical characters. From what he had heard he supposed it to belong to the genus Wintersonia. In its native country it was extensively used as a substitute for cinchona bark in intermittents. It was found to contain an intensely bitter extractive matter, to yield on distillation two distinct essential oils, differing in specific gravity, soluble in alcohol and æther, but very sparingly so in water. The principal characteristic substance derived from it was a bitter resinous matter; no alkaloid was discovered to exist in it. Specimens of the bark, its extract, the essential oils, tincture and resinous matter, were exhibited. The principal therapeutic properties were stated to be tonic, aromatic, and astringent. Dr. M'Kay also stated that it had been exhibited with marked success in dyspepsia accompanied by loss of appetite, which it quickly restored,—in phthisis, where tonics were admissible, in which it supported the strength, and prevented rapid sinking; in dropsy it was found to be a valuable adjunct to diuretics; in intermittents it was found to be a valuable substitute for the cinchona. It was also found serviceable in such cases of hemicrania, as permitted the use of quinine.

Dr. NEWBIGGING, from extensive use of the drug, corroborated the statement made of its therapeutic virtues.

Dr. M'KAY then exhibited to the Section drawings of a monocephalous double human fœtus, and read a paper minutely describing its peculiarities of structure. Its principal characteristic, he stated to be, its being so completely monocephalic, with double extremities; the cerebral nervous system was single, the spinal and ganglionic double, the viscera of the thorax and abdomen were of a mixed character.

Dr. NEWBIGGING read a paper 'On the Therapeutic effects of Croton Oil in certain affections of the Nerves.'—He observed that for some time the only action it was supposed to possess on the animal economy, was that of active purgation, until Sir Charles Bell pointed out its effects on neuralgia. Not that it would be found to remove the affection in all cases, which was impossible in those depending on certain organic changes. He then detailed a number of cases to prove that it possessed a specific power over the nervous system, independent of its general action as a purgative. The diseases in which the power was exhibited were severe sciatica, which had baffled every other treatment; convulsions in children, and epilepsy, many cases of which it cured; and even in those depending on organic affections of the brain, it rendered the paroxysms less frequent and more moderate. In a case of severe laryngismus stridulus occurring in a child nine months old, Andral exhibited it in minute doses with complete success.

Dr. ABERCROMBIE said he had long used it extensively in affections of the head, and from his experience of it he thought it might possess specific power over the nervous system. As the disease laryngismus stridulus was alluded to, he would mention a remedy he had found very valuable in its treatment, which was a combination of carbonate of iron and rhubarb with musk.—Sir C. BELL had found several forms of severe neuralgia, particularly occurring in the extremities, as in the finger or toe, over which croton oil had no power. It was in facial neuralgia that it proved most serviceable, or in neuralgia occurring elsewhere, accompanied by some indication of cerebral affection. When he considered the great extent of the intestinal tract, and that those diseases may depend on sympathy with different parts of it, he was prepared to expect the necessity of using different purgatives which were known to act principally on different portions of the intestines.

Dr. LAWRIE read a paper 'On the Results of Amputations,' in which he gave tables stating the results of 276 amputations which took place in the infirmary of Glasgow, during several years. The cases were classed from the sex, the limb operated on, and from the causes rendering the amputation necessary, whether from disease previously existing or from accident. Some of those results were as follows: of the 276 cases, 216 were males, of whom 86 died: 60 were females, of whom 14 died; 153 were for previous disease, of whom 35 died. In operations at the shoulder the deaths were equal to the recoveries; of the arm, the deaths to recoveries were as 3 : 14; in the leg, as 1 : 2; in the wrist, at one period, as 1 : 29; in another period as 8 : 22.

The question of primary or secondary amputation in cases of wounds was discussed, and the preference given to secondary. Immediate dressing was approved of. The impropriety of operating during the shock was insisted on. The cause of death was examined, and found frequently to exist in the viscera, particularly in the lungs.

'On the Anatomical relation of the Blood-vessels of the Mother to those of the Fœtus in the Human Species,' by Dr. John Reid.—In this communication it was proved, by preparations laid on the table, that numerous tufts of the placental vessels pass through the decidua, and enter by the open mouths of many of the uterine venous sinuses of the mother. Some of these tufts only dip into the open mouths of the sinuses; others extend their ramifications half an inch, and even in some rarer cases, more than an inch from the point at which they enter. That these tufts found bathed in the maternal blood of the uterine venous sinuses, are prolongations of the fœtal placental vessels, was proved both by injection and by microscopic examination. Dr. Reid then proceeded to state, that on examining the placental vessels under the microscope, each minute branch of the umbilical arteries is bound up with a single branch of the umbilical vein, and that they go on dividing and subdividing in the same manner—each subdivision consisting of an artery and a vein so closely bound together, as to resemble a single vessel, when seen through the microscope in their uninjected state. All of these branches—each including an artery and a vein—terminate in blunt extremities, and there is no cellular tissue filling up the intervals between them. These blunt extremities, in which the branches of the tufts end, form the termination of the arteries, and the commencement of the veins. The inner coat of the venous system is reflected upon the placental tufts which project into the uterine sinuses, and is prolonged over the surface of all the placental vessels, forming sheaths enveloping each branch of these vessels, and thus constituting a kind of sac with numerous and intricate folds, or fringes projecting into its interior. Into this sac, the blood of the mother is poured by the curling arteries, and returns by the prolongations of the uterine veins. Each of the uterine sinuses into which the placental tufts project, may be considered a minuter representation of the structure of the placenta, for we have there fœtal placental vessels resembling the branchial vessels of aquatic animals, covered by a prolongation of the inner coat of the vascular system of the mother, and hanging in a cavity filled with maternal blood.

The President observed that this communication was of great value. The subject was new, and the information given threw light on one of the darkest points of physiology.—Dr. MARTIN BARRY and Prof. THOMSON also spoke to the importance of this communication—and it was resolved that it should be printed.

Dr. REID communicated a paper by Dr. R. M. Glover, 'On the Medicinal Action of Bromine and its Compounds.'—The principal conclusions from the experiments made to ascertain its physiological action were as follows: whether bromine be taken into the lungs in the form of vapour, or in the fluid form into the stomach, or be injected into the circulation, it acts purely as a corrosive and irritant; the action on the primæ viæ is different from that of hydrobromic acid, into which bromine is converted when absorbed into the circulation. The author extends this observation by analogy to chlorine and iodine, and their hydracids. Bromine exerts an action on the rectum like that of iodine; it is also tonic and diuretic; its remedial virtues are chiefly conspicuous as an external application in the treatment of scrofulous, syphilitic, malignant, and specific ulcers; in these cases, it appears to act as an excitant, and perhaps as a mild caustic; it is also useful in some chronic diseases of the skin. The bromides of potassium, sodium, and mercury resemble much more the chlorides of these bases than the iodides, in their physiological action. The bibromide of mercury has no advantage over the bichloride as a remedy, contrary to what has been asserted by some French writers. The bromide of cyanogen possesses a double action; in a powerful dose it operates like prussic acid, in a moderate one it produces the most violent symptoms of irritant poisoning, and is perhaps the most powerful irritant known. Ammonia is its best antidote. The chlorides and bromides of olefiant gas exert a remarkable action, introduced either into the stomach or circulation: in the former they produce, in a large dose, death by coma, in a smaller dose, loss of power over the voluntary muscles, sensibility being retained, with difficulty of respiration, from effusion into the lungs; in the latter, when injected in a large quantity into the veins, they cause almost instant death, producing great congestion of the lungs, and destroying the irritability of the heart; in smaller doses death is produced in the same manner as by their introduction into the stomach.

SATURDAY.

'On Opacity of the Cornea produced by Sulphuric Acid,' by R. D. Thomson, M.D.

The rapid destruction of vision, when sulphuric acid is brought into contact with the cornea, has long been known to surgeons. But the author is not aware that any accurate investigation of the cause of the opacity has been entered into. The subject came under his consideration from having attended a case along with Dr. Maddock, in which the vision of the right eye was destroyed, in consequence of a woman having thrown a quantity of oil of vitriol at a man in a fit of passion. The corrosive fluid, according to the statement of the sufferer, was only in contact with his eye about two minutes, when he had an

of an acid re-action upon litmus paper. The next question to be examined was, in what manner is the fertilizing influence of the male organs communicated to the ovule? After quoting the opinions of Amici, Brown, Fritzche, Corda, Treviranus, Brongniart, and others, the author came to the conclusion that the *boyaux*, or intestine-like protrusion from the pollen grains, was the result of the action of acids upon the fluid which contained the fovilla in the pollen grain; and he inferred this from the fact of this tube, or *boyau*, never being formed when the pollen grain is placed in water, but being constant when the grain is placed in acid. After describing and explaining the anomalous character of the pollen grains in Orchidaceæ, Fumariaceæ, Asclepias, &c., the author presented the following conclusions as the result of his researches:—1. The stigma is invariably acid; 2. It is in consequence of this acidity that the pollen bursts; 3. That by the same means the fluid contents of the pollen become coagulated, enveloping the fovilla, and assuming, according to the method of dehiscence, different and very remarkable forms. (The memoir was illustrated by an extensive series of drawings.)

Dr. W. Arnott stated, that Prof. Mohl had lately made an extensive series of observations on the forms of the pollen grain. He thought Dr. Aldridge's explanation of the nature of the *boyau* satisfactory, although it increased the difficulty of explaining the mode of impregnation. The triangular pollen grains mentioned would, he believed, in most cases, be found to be square, or four-cornered, their triangular appearance being a deception.—Dr. Balfour said it had been observed, in some cases, that the pollen was alkaline; if this were correct, it was remarkable, taken in connexion with the acidity of the stigma.—Prof. Link, of Berlin, thought Dr. Aldridge correct as to the nature of the *boyau*. He believed it was formed of a glutinous matter, like that of which the spider made its web.

Mr. Babington mentioned, that he had found the *Cuscuta epilinum*, or the Flax-dodder, at Burrishoole, in the county of Mayo, Ireland; and also in a field near to the Crinan Canal in Scotland. He also stated that it had been introduced into this country with the seed of the flax from the north of Europe; and that there was no doubt of its being distinct from the *C. Europæa* of Linnæus.—Dr. W. Arnott thought that it might be got rid of, by using seed from America instead of from the north of Europe. Plants frequently brought with them parasites from other districts,—of this he had seen an instance in France, where a species of Orobanche, which grows abundantly in Barcelona, had been conveyed with the seed of the plant on which it grew. The mode of getting rid of it would be to substitute seed from some other district.

A Committee was appointed at the last meeting of the Association, to examine various parts of the Coasts of Great Britain by the Dredge. The Report of this Committee was read by Mr. Forbes, and the results were as follows:—Mr. Forbes dredged the east and west coasts of the Isle of Man. The species taken are recorded in the dredging papers, which will be hereafter published. A great bank or bed of scallop and other shells runs from opposite Peel to the point of Ayre, a distance of seventeen miles or more. The dead and living shells were equal. It varies in distance from the shore from half a mile to five miles. From most parts of the coast it is distant four miles. Between it and the shore is a great tract of sand, in which animals are rare. The coast with which this bed runs parallel, is of pleistocene marl and sand, in places exhibiting traces of a similar shell bank to that existing in the sea. The characteristic shells of the fossil bed are, however, altogether wanting in the recent. Echinodermata abound in the recent bed. The east coast presented a different character. Off Laxey there is an oyster bank apparently of small extent. The rest of the sea bottom is milleporinæ. The most abundant shell is the *Pectunculus pilosus*. Scallops are very scarce, and shells of the Venus tribe not abundant. Sponges are plentiful, but Echinodermata scarce. A sub-committee dredged the west coast of Ireland. The testacea usually regarded as characteristic of the southern districts of Britain, were found on this coast, and extended as far as Donegal Bay. The province of Connemara must be excepted: the marine lough there presenting a northern Fauna similar to that found in the Highlands of Scotland and the Hebrides. In Clew Bay a deep-water Fauna was observed on a shallow bottom, accompanied by the geological phenomenon of a raised coast and islands presenting beds of shells *in situ*, at some elevation above high-water mark. The species of testacea were very generally distributed. Ascidian mollusca were abundant, but radiata were much more scarce than on the east coast. No instance of a true shell bank was observed. Dead shells were generally more abundant than living. Mr. Patterson dredged a portion of the east coast of Ireland, in the neighbourhood of Belfast. In the course of his researches he found dead shells usually more abundant than living; and with the exception of one or two species, the number of individuals of each form but limited. *Nucula margaritacea* was found in great abundance,—in many places much more abundant than the other species, which fact illustrates the circumstance of the nucula being characteristic of the newest tertiary formation. Papers filled up with the species taken, as well as the list of queries drawn up for the use of the dredgers, were laid before the Section.

Mr. Smith, of Jordan Hill, had been in the habit of dredging for years, and believed there were not so many new species to be found as was generally supposed, and therefore the labour would not be so great as might have been expected. Labours of this kind, although they might not be important to the conchologist, were very much so to the geologist.—Mr. Forbes had been much surprised at the result—not a single new testaceous mollusk was found on the west coast, and only a few new species of the naked mollusca. This was opposed to the prevailing opinion that our seas contained many new species.—Dr. Fleming thought it desirable that, in order to prosecute dredging with success, more should be known of the nature of the coast. Government coast surveys had now been going on for years, and it was most desirable that what had been done should be accessible to the naturalist. He was not surprised at the few new species found. Frequently rare species were widely scattered; whilst those that were abundant might be local. He once found the *Ciderella cristata* in great abundance, in one locality, and although he had often sought it again there, he had never found it; and the few he brought away the first day, he believed were the only British specimens that existed. He mentioned other instances in which he had found shells only once in abundance in the same place, although repeatedly visited again for the same purpose.

Mr. Patterson then read the Report of the Committee on Radiate Animals, which concluded as follows:—"Respecting the state of our knowledge of two divisions of the radiate animals, the Committee feel it unnecessary to furnish any report, these departments being undertaken by individual members of the Committee, whose researches are either published, or are now in course of publication (Johnstone's 'Zoophytes' and Forbes's 'Echinodermata'). With regard to the remaining portion, the Acalepha, they are persuaded it cannot be effectually investigated and illustrated, except when the artist and the naturalist are combined in the person of one individual. The Committee therefore beg leave to discontinue the further prosecution of their subject."

SATURDAY.

Sir William Jardine in the chair.

The Chairman exhibited the roots of a beech-tree, which had been sent to the Section by Sir Thomas Phillips. They were remarkable from having been produced in a tank of water, through the crevices of which they had penetrated, and they had thus become divided in an extraordinary manner.

Dr. Neill remarked, that the spongioles here were acicular, and that he had observed this to be the case in a plant of *Leuecio Jacobæa*, whose roots had been produced in water.—Dr. Walker Arnott said, all plants growing in the water have pointed extremities at their roots, and in many cases they possessed a distinct case or calyptra at the end; and he believed it would be found that roots in water terminated by aciculæ, and those in the earth by knobs.

The Secretary read a communication 'On an anomalous form of the Plum, observed in the gardens of New Brunswick,' by Prof. Robb.

After some general remarks on the character of the fruit-bearing trees of New Brunswick, which is not favourably situated for the developement of Rosaceous fruits, the author stated—In the summer of 1839 I had an opportunity of observing the progress of destruction among the plums. Before, or soon after the pieces of the corolla had fallen, the ovarium had become greenish yellow, soft, and flabby; as the fruit continued to grow, its colour became darker and of a more muddy yellow, and, at the end of a fortnight or three weeks, the size of the abortive fruit was fully greater than that of a ripe walnut, and resembled, in appearance, apricots. When examined, they were hollow, containing air, and consisting of a distended skin, insipid and tasteless. By and bye, a greenish mucor or mould is developed on the surface of the blighted fruits, which becomes black and shrivelled, and, at the expiration of a month from the time of blowing, the whole are rotten and decomposed. The flower appears about the beginning of June, and before August there is hardly a plum to be seen. The changes producing these anomalous forms of the fruit, were explained on the admitted principles of morphology. The differences from a normal form of the fruit would be found as follows:—The exocarp is yellow and wrinkled, not smooth and red or black; while the mesocarp is as little developed as if the protophyllum had become a leaf. Its cells are loose and dry, while the vessels, large, and very prominent, are discerned passing through it. The two largest sets of vessels run up along the inner surface of the groove or suture, corresponding to the line along which the edges of the protophyllum are united, and those which correspond with the radicle in the protophyllum. They all anastomose and converge towards the apex, where all contribute to form portions of the style and stigma. The endocarp was small; it was attached by vascular fibres, but sometimes adhesions existed between it and the mesocarp, on which it lay. Sometimes it was attached near to where the style was given off, in other instances it was midway between that point and the peduncle. In some cases it was empty; mostly one or two ovules might be seen; and one was generally smaller than the other, indicating its deficient nutriment. Each ovule was made up of three transparent shut sacs, the innermost of which (the tercine) contained a transparent fluid, and nothing more. The author supposed this anomalous form of fruit to be influenced in its production by cold winds and long-continued rains at that season at which the flower is open, and the reproductive organs the most exposed to atmospherical vicissitudes. It was popularly attributed to insects; but, from not having observed any, he did not think this could be the cause.

Dr. Walker Arnott thought the author wrong when he stated that the endocarp of the fruit represented the epidermis or epiphyllum of the normal leaf. The real fact was, that the shining membrane on the interior of the endocarp was the true representative of the epiphyl. He believed that these plums were produced by the attacks of insects, as he had frequently seen anomalous forms of fruit produced in that way. An early examination of the flower would probably have detected them. Moist weather produced a contrary effect on vegetation, and was favourable to the developement of leaves rather than fruit.—Dr. Lankester related some instances of abnormal developement of leaves and other parts from the attacks of insects, especially from the deposition of ova in the tissues.

Mr. James Wilson exhibited a series of specimens illustrating Mr. Shaw's (of Drumlanrig) views on the developement and growth of Salmon-fry. Mr. Wilson read a portion of an article on this subject by Mr. Shaw, which appeared in the 14th volume of the Transactions of the Royal Society of Edinburgh. The series of experiments last performed by Mr. Shaw seem to have satisfactorily settled the question, that the fish called the parr is but one form of the fry of the salmon, and that the differences of opinion on this point have resulted, 1st, from the varying time which the young fish remain in the rivers—from fifteen months to two years; and, 2ndly, the different dress or colour which they assume during their growth.

Sir W. Jardine thought the question of the nature of parr was set at rest by Mr. Shaw for ever. He had witnessed the places in which the experiments had been performed, and, from the care which had been taken to make the ponds as much like their natural haunts as possible, he had no doubt of the