This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

https://books.google.com

17. f. 3

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

RESEARCHES

INTO THE

PHYSICAL HISTORY

OF

MANKIND.

Digitized by Google

LONDON:
R. CLAY, PRINTER, BREAD STREET HILL.

Digitized by Google

RESEARCHES

INTO THE

PHYSICAL HISTORY

OF

MANKIND.

BY

JAMES COWLES PRICHARD, M.D. F.R.S. M.R.I.A.

CORRESPONDING MEMBER OF THE NATIONAL INSTITUTE OF FRANCE,
HONORARY FELLOW OF KING'S AND QUEEN'S COLLEGE OF PHYSICIANS IN IRELAND,
MEMBER OF THE ROYAL ACADEMY OF MEDICINE OF PARIS.

FOURTH EDITION.

VOL. I.

LONDON:
HOULSTON AND STONEMAN,
65, PATERNOSTER ROW.
1851.

Digitized by Google

LONDON:
PRINTED BY RICHARD CLAY,
BREAD STREET HILL.

Digitized by Google

TO

THE VENERABLE AND UNIVERSALLY CELEBRATED

PROFESSOR BLUMENBACH,

OF THE

UNIVERSITY OF GOETTINGEN,

BY WHOM THE DEPARTMENT OF KNOWLEDGE TO THE CULTIVATION

OF WHICH IT IS DEVOTED WAS FIRST EXPLORED,

This Work is Dedicated,

BY HIS OBLIGED FRIEND AND FAITHFUL SERVANT,

THE AUTHOR.

Digitized by Google

Digitized by Google

PREFACE.

"MIRANTUR homines altitudines montium, ingentes fluctus maris, altissimos lapsus fluminum et oceani ambitum et gyros siderum—et relinquunt seipsos, nec mirantur." This exclamation of St. Augustin refers to the low degree of interest with which men have contemplated the phenomena of their moral nature; but a similar remark might with almost equal propriety be applied to the want of curiosity displayed by them in respect to the physical history of their species. It is surprising, as one of the most distinguished of modern physiologists has well observed,* that the natural history of mankind should be a department of knowledge of most recent acquisition—of so recent, indeed, that it may be considered to have been for the first time explored by an author now living—the celebrated Blumenbach. In reality, before Blumenbach entered

* Dr. W. F. Edwards. "Des Caractères Physiologiques des Races Humaines."

Digitized by Google

upon the inquiry, no work of extensive and accurate research had been written on the comparative anatomy of human races; * nor until he had formed his admirable collection of skulls, did there exist any adequate means of investigating the most important of those diversities in structure, which distinguish one tribe of the human family from another.

The origin and mutual relation of human races is a subject which had strongly excited my curiosity at an early period; and I had made it the theme of careful study and research, even before Blumenbach's treatise came into my hands. His work was the only one of great value that existed at that time on the natural history of mankind, and it was not then so generally known as it has since become. From it I obtained however the most important aids, and I was encouraged to pursue the investigation with greater interest on remarking, that while some conclusions to which I had been led differed considerably from the opinions of Blumenbach, the main inference deduced by him was exactly that, the soundness of which, as it had been strongly impressed upon my own mind, I was most desirous to establish and to display to the

* The comparative physiology and psychology of different races of men had never been made expressly the subject of inquiry, until the publication of my work.

Digitized by Google

conviction of others. I accordingly chose this subject for the argument of an inaugural essay which was printed at Edinburgh in 1808. In 1813, the same treatise was enlarged, and in a new form it became the first edition of the work, of which I am now about to bring the third before the public. Each edition has been almost entirely written anew; every topic comprised in it has been reconsidered, with the advantage of such additional information as I have been in the interval enabled to acquire.

Since the first edition of this work made its appearance many treatises have been published on the same subject. In all of these, as far as they are known to me—with the exception of Mr. Lawrence's well known Lectures, in which the able author has maintained, with great extent of research, the unity of species in all human races—an opposite doctrine has been upheld. MM. Rudolphi, Virey, Desmoulins, Colonel Bory de St.-Vincent and others have asserted, in the most positive manner, an original diversity of races in mankind. Even Cuvier has admitted this conclusion, although he had adopted a definition or criterion of species which would have led to a different inference; and the most celebrated scientific travellers have been impressed with a similar persuasion, which may be traced, if I am not mistaken, in the works of M. de Humboldt, and in

Digitized by Google

those of M. de Spix and Martius on the American nations, as well as in the writings of several distinguished French navigators and naturalists, who have described the tribes of people visited by them in the late expeditions to the oceanic regions. If the elucidation of doubts on subjects of physical inquiry were to be sought for in the preponderance of authorities or the opinions of celebrated men, I am afraid that the problem which I have endeavoured to investigate would receive a different solution from that which I have obtained; but as the case is quite otherwise, I shall venture to put forth the present edition of my work, without much doubt that it will find readers disposed to admit the inferences which a long reflection on the facts therein developed and on their relations have led me to entertain.

August 8, 1836.

Digitized by Google

ANALYSIS OF THE CONTENTS.

INTRODUCTION.

		PAGE
SECTION 1.	General statement of the inquiries which form the subject of the following work	1
SECTION 2.	Probable considerations on one side of the question	3
SECTION 3.	Of arguments which are urged on the opposite side of the question—Relation of these inquiries to the scriptural history of mankind .	6
SECTION 4.	Inadequacy of historical sources of information .	8
SECTION 5.	Method to be followed in the investigation—Statement of two distinct problems which are to be discussed in the following books . . .	9

BOOK I.

ON THE ORIGIN AND DISPERSION OF ORGANIZED BEINGS: COMPRISING CONSIDERATIONS RELATIVE TO THE QUESTION—WHETHER EACH SPECIES IN THE ANIMAL AND VEGETABLE WORLD EXISTS ONLY AS THE PROGENY OF ONE RACE, OR HAS SPRUNG ORIGINALLY FROM SEVERAL DIFFERENT SOURCES.

CHAPTER I.

Introductory Remarks—Opinion and argument of Linnæus —Mode of investigating the Subject 13

Digitized by Google

CHAPTER II.

PAGE

Of the Dispersion of Plants, and of the primary Habitations of individual Species.

SECTION 1. Three hypotheses which have been maintained on this subject 16

SECTION 2. General facts connected with the distribution of vegetable tribes—Distribution of the great families or classes,—of the lesser families or orders;—of genera—Lastly, of species . . . 21

Paragraph 1. Distribution of plants in reference to the three great families or classes 21

Paragraph 2. Distribution of orders or families, and of genera 22

Paragraph 3. Analogy in the vegetation of parallel but distant regions 25

Paragraph 4. Of species common to distant countries—Enumeration of botanical provinces 28

SECTION 3. Of the means provided by nature for the dispersion of plants—Facts relating to the migrations and colonies of plants 34

Paragraph 1. Of the dispersion of plants by human agency 34

Paragraph 2. By means of animals . . 35

Paragraph 3. Diffusion of seeds by means of the atmosphere 37

Conservation of seeds in soil . . . . .

Paragraph 4. Diffusion of plants by water 42

SECTION 4. Phenomena connected with the vegetation of islands, and of opposite coasts 43

SECTION 5. Recapitulation and conclusion 50

CHAPTER III.

Of the Dispersion of Animals.

SECTION 1. Of the lower orders of animals 54

SECTION 2. Of the dispersion of insects 56

Digitized by Google

PAGE

SECTION 3. Of the dispersion of birds 59
SECTION 4. Of the dispersion of marine animals 62
SECTION 5. Of the dispersion of mammifers and reptiles of the land—Division of the earth into zoological provinces 68
SECTION 6. Peculiar characters of each of the great zoological provinces 71
Paragraph 1. Terra Australis or Austral Asia 71
Paragraph 2. Intertropical and South America 76
Paragraph 3. Intertropical and South Africa 80
Paragraph 4. Indian Archipelago . . . 81
Paragraph 5. Zoology of Polynesia . . 83
SECTION 7. Distribution of the species comprised in the most numerous families of quadrupeds . . . 85
SECTION 8. Concluding remarks on the distribution of tellurian animals 94
SECTION 9. General inferences from facts relating to the dispersion of organized beings—Bearing of the conclusion obtained on the history of mankind. 96
Note on the Contents of Book I. 98

BOOK II.

CONSIDERATIONS RELATIVE TO THE QUESTION, WHETHER THE VARIOUS RACES OF MEN ARE OF ONE OR OF SEVERAL SPECIES.—ANALOGICAL INVESTIGATION.

CHAPTER I.

Analysis of the different Methods of determining on Identity and Diversity of Species.

SECTION 1. Meaning attached to the terms species—genera—varieties—permanent varieties—races . . . 105

Digitized by Google

PAGE

SECTION 2. Observations on the means of determining as to identity and diversity of species—Analogical investigation — Ethnographical investigation 109

SECTION 3. Analogical investigation of the nature of varieties—Different heads of this inquiry enumerated 111

SECTION 4. First head of the analogical investigation of species—Laws of the animal economy in species. 114

Paragraph 1. Of the duration of life in general 115

Paragraph 2. Of the longevity of the Africans 123

Paragraph 3. Of the longevity of the American and other races of men . . . 128

Paragraph 4. Of the progress of physical development, the periodical phenomena of the constitution, the state of the natural and vital functions in different races 130

General conclusion 137

SECTION 5. Second head of the analogical investigation—inferences with respect to sameness or distinctness of species, derived from the phenomena of propagation between different breeds . . 138

Conclusion 146

Paragraph 2. 146

Paragraph 3. Of mixed human races . . 147

SECTION 6. Third head of the analogical investigation of species—Pathological considerations . . . 150

Paragraph 1. Of contagious and epidemic diseases 151

Paragraph 2. Endemic diseases . . . 154

Conclusion 160

Note on the Contents of Chapter I. 161

CHAPTER II.

Analogical Investigation continued — of the Psychological Comparison of Human Races.

SECTION 1. General Remarks on the psychical history of particular species 165

Digitized by Google

PAGE

SECTION 2. Psychical characteristics of mankind in comparison with brutes 169
Paragraph 1. Gesture 172
——— 2. Family relations and habits . 173
——— 3. Use of speech 173
——— 4. Necessary arts of life . . . 174
——— 5. 174
——— 6. Of human sentiments . . 175
SECTION 3. Of the psychical characters of the Bushman or Hottentot race 177
Paragraph 1. Effects of the introduction of Christianity among the Hottentots . 183
SECTION 4. Of the psychical character of the Esquimaux . 186
Paragraph 1. Of the paganism of the Esquimaux 188
——— 2. Of the conversion of the Greenlanders to Christianity 191
SECTION 5. Psychical history of the Negro races 197
Religion of the Negroes 197
Immediate objects of worship 200
Relations of their deities to each other . . . 200
Fetisses or charms 201
Worship—prayers to the gods 202
Sacrifices 203
Funereal rites 204
Sacred festivals—pilgrimages 205
Orders of priests, their offices, and powers . . 206
Figments—auguries or omens by birds . . . 208
Holy Water 208
Immortality of the soul—state of retribution 209
Metempsychosis 210
Of the conversion of the Negroes to Christianity 212
SECTION 6. Concluding remarks 215

CHAPTER III.

Analogical Investigation continued—External Diversities—Varieties of Complexion in Human Races—Inquiry whether the Differences of Colour constitute Specific Distinctions.

SECTION 1. General remarks—of the principal varieties of

Digitized by Google

PAGE

complexion observed in human races—phenomena of correspondence 217
Paragraph 1. Of the melanocomous variety 220
——— 2. Of the leucous variety . . 221
——— 3. Of the xanthous variety . . 226
SECTION 2. Of the structure of the parts on which the variety of colour depends 232
Paragraph 1. Of the eyes 232
——— 2. Of the skin 233
——— 3. Of the hair 237
Note on Sections 1 and 2 239
SECTION 3. Of variety in the colour of some other parts . . 240

CHAPTER IV.

The same Inquiry continued—Varieties of Form and Structure.

SECTION 1. General remarks—instances of the origination of varieties—of the seven principal varieties of mankind 241
SECTION 2. Of the Negroes 247
SECTION 3. Of the Papuas 249
SECTION 4. Of the Alfourous and Australians 254
SECTION 5. Of the Iranian or Indo-Atlantic, and of the Turanian nations 257
Indo-Atlantic or Iranian nations 262
Turanian nations 263
SECTION 6. Of the American nations 268
SECTION 7. Of the Quaiquæ and Saabs, or the Hottentot and Bushman races 272

CHAPTER V.

Varieties of Form continued—National Forms of the Skull.

SECTION 1. General views—diversities in the form of the skull 275
SECTION 2. Of the substance and texture of the skull in different races 282
SECTION 3. Of prognathous, or narrow and elongated skulls 284

Digitized by Google

PAGE

Paragraph 1. Of the shape of the skull in the Negro 284

——— 2. Skulls of the Papuas, Alfourous, and Oceanic nations 298

SECTION 4. Oval form of the skull—crania of the Indo-Atlantic or Iranian nations 303

SECTION 5. Of pyramidal or broad-faced skulls 305

Paragraph 1. Of the skulls of the Turanian nations 305

——— 2. Of the skulls of the Aboriginal Americans 308

——— 3. Skulls of the Quaiquæ, or Hottentot race 312

SECTION 6. Of artificial modifications of the form of the cranium—elongated skulls of Titicaca 315

CHAPTER VI.

Varieties of Form—Diversities of Shape in the Skeleton.

SECTION 1. General observations—varieties in the shape of the pelvis in different races of men 322

Researches of Soemmerring, of Vrolik, and of Weber 322

SECTION 2. Of the form of the trunk—length and shape of the limbs 333

CHAPTER VII.

Analogical Investigation continued—Survey of the Varieties displayed in other Departments of the Animal Creation, and Comparison of these with the Phenomena above described.

SECTION 1. Of varieties of colour in animals 339

Note on Section 1. 343

SECTION 2. Of peculiarities in the constitution connected with the varieties of colour 344

SECTION 3. Of the varieties of texture in the human skin,

Digitized by Google

PAGE

and of some analogous phenomena in other species 345

SECTION 4. Of varieties in the form and structure of animals analogous to the diversities in human races above described 349

CHAPTER VIII.

Analogical Investigation continued—other Considerations related to the same Inquiries—Conclusion of this Argument.

SECTION 1. Of diversity of stature 358

SECTION 2. Of the different kinds of hair which distinguish particular races of men 361

SECTION 3. Of the hereditary transmission of varieties—of atavism 366

SECTION 4. Recapitulation and conclusion of the analogical inquiry 371

Digitized by Google

DESCRIPTION OF THE PLATES.

FIG. 1 is a specimen of the oval or oeidal form of the cranium, characteristic of the Indo-Atlantic, by Blumenbach termed Caucasian nations. The skull from which this engraving was taken was that of a Greek named Constantinè Demetriades, a native of Corfu, who was long known at Oxford, where he was a teacher of the modern Greek language. The cranium is now in the museum of Mr. Richard Smith, at the Bristol infirmary. The engraving is coloured from a drawing by Mr. Holmes.

FIG. 2 is a representation of one of the elongated skulls brought by Mr. Pentland from the valley of Titicaca, in the highlands of Peru. It cannot be doubted that the peculiar shape of this skull is produced by artificial means, viz. by pressure on the forehead, applied during an early period, and long continued. The skulls of the flat-head Indian and North American are modified in a very similar manner, though not to the same degree, as any person may be convinced by examining one of the crania belonging to that race, of which there is a specimen in the collection at Guy's Hospital. The skull from which this figure was taken is that in the museum of the College of Surgeons. For an opportunity of obtaining it I am indebted to the kindness of the curator, the able and distinguished anatomist, Mr. Owen.

FIGS. 3, 4, 5, 6, 7, 8, are specimens of that form of the cranium which I have termed Prognathous, *i. e.* having the maxilla, and especially the alveolar portion, remarkably prominent. This is expressed by the term which is formed similarly to προχειλος used by Lucian. The four first figures belong to woolly-haired, the last four to straight-haired races of blacks.

FIG. 3 is the skull of Philip Bernard, a Creole native of Cuba,

Digitized by Google

whose parents were both slaves brought from the coast of Africa. The skull, of which the annexed figure, drawn by Mr. Holmes, is a very good representation, is in the museum of Mr. Richard Smith. It has the peculiar formation of the Negro in a greater degree than any skull or figure that I have seen. The upper jaw is remarkably and surprisingly prominent, and the facial angle proportionably small. The African peculiarity in this skull, as in general, depends on the greater anterior development of the bones of the face, which begins with the greater space of the frontal sinuses. The cranial cavity is not small when considered by itself, or with reference to the probable stature of the individual to whom the skull belongs, nor is the anterior part of the cavity remarkably deficient in space ; the forehead is not so narrow and compressed laterally as in many Negroes, and even in very many European heads which I have seen. I shall have occasion to return to the description of this skull below.

Fig. 4 is the skull of an Ashantee Negro. The Ashántee or Asiánti, a tribe of the Juta race, are among the most cultivated of the Pagan nations in Africa. The general shape of their head approaches much more to the European form than that of Fig. 1 ; but a peculiarity may be noticed, which was first pointed out by Mr. Owen in some Negro skulls. In it the temporal bone adjoins the frontal, the sphenoidal failing to send up the process which usually divides them. The same character exists, as Mr. Owen has shown, in the skull of the orang.

Fig. 5 is a copy of the figure of a Kaffer skull given by Dr. Knox, in the Wernerian Transactions. In this skull, although it has evidently the prognathous form of African heads, a great improvement is very manifest, in the amplitude and convexity of the forehead, as well as of the occiput.

Fig. 6 represents the skull of a Tasmanian, or native of Van Diemen's Land. This cranium is in the museum of the College of surgeons : I obtained it through the kindness of Mr. Owen. The general form of this resembles the skull of Philip Bernard, but the forehead is somewhat higher : the occiput likewise is more developed, and this is a character which belongs to the Oceanic race, and nearly all the insular nations of the Pacific.

Fig. 7 represents the skull of an Australian savage, and which

Digitized by Google

is in the museum of the College. It resembles figures 3 and 4, in its general form. The longitudinal ridge running from the forehead to the occiput, which is frequently observed in Australian skulls, is conspicuous in this. The ridge formed by the frontal sinuses is likewise prominent, and there is a deep notch over the nasal processes of the frontal bone. These characters are very strongly marked in the skulls of the Oceanic nations, as in those of New Zealanders and Otaheitans. The deeply marked depression above the ossa nasa is observable in Fig. 9, representing the skull of an Alfoura. The space marked by the insertion of the temporal muscle in this, as generally in prognathous skulls, particularly in those of Negroes, is deeply impressed.

Fig. 8 represents the cranium of an Alfouron Endamene, the aboriginal race of New Guinea, the Moluccas and of many of, if not all, the islands of the India archipelago. They are supposed, with great probability, by M. Lesson, to be of the same race as the miserable hordes of Terra Australis. This figure and the two following are taken from the magnificent work of M. Daperrey.

Fig. 9.—The front view of the skull of an Alfouron Endamene. It may be observed that the plane of the zygoma is nearly level with the sides of the hand, with the planes of the parietal and frontal bones. Lines drawn from the zygomatic arches on both sides to the most projecting parts of the frontal bones, and prolonged upwards, do not form here, as in the skulls represented in the next plate, a triangular figure, a line drawn from one zygomatic arch to the other being the base.

Fig. 10 is the basis cranii in the same. Of these more will be observed hereafter.

Figs. 7, 8, 9, 10 belong to the class of skulls which I have termed Pyramidal. Lines drawn touching the zygomas, and passing to the laterally projecting parts of the frontal bones, meet over the summit of the forehead and form a triangle, having for base a subtending line determined by the lower edges of the zygomas. Figs. 7 and 8 are both American skulls, though neither probably belongs to the aboriginal American form: they both approximate to the form which I have termed Turanian. In both the face has a remarkably, and even a strikingly singular flatness, and the whole

Digitized by Google

front of the head has nearly the shape of one side of a pyramid. The flatness of the face is scarcely perceivable in these rough sketches; it is, however, immediately striking when the skulls are examined and compared.

Of the Four Figures, representing the Basis of the Skull, prefixed to the title-page.

It has been proved by Mr. Owen, that some of the most important diversities in the form of skulls, as distinguishing different races of the same species as well as different species, are displayed by a comparative view of the basis of skulls. I have followed this suggestion by giving representations of the basis cranii in the three most distinct forms of the human skull, and these are placed in the same view with the basis of the skull of the adult orang or simiæ satyrus, which is from Mr. Owen's engraving in the first volume of the Zoological Transactions. The three sketches here given are those of the skulls of an Esquimaux, an European, a Negro, and an Orang.

1. The Esquimaux, from a skull in the museum of the Bristol Institution. The basis is somewhat broader than that of either of the remaining three. Its antero-posterior diameter is least in proportion to its transverse.

2. The European. The skull is one of a French soldier killed in the battle of Waterloo, said to have been one of the imperial guards of Napoleon.

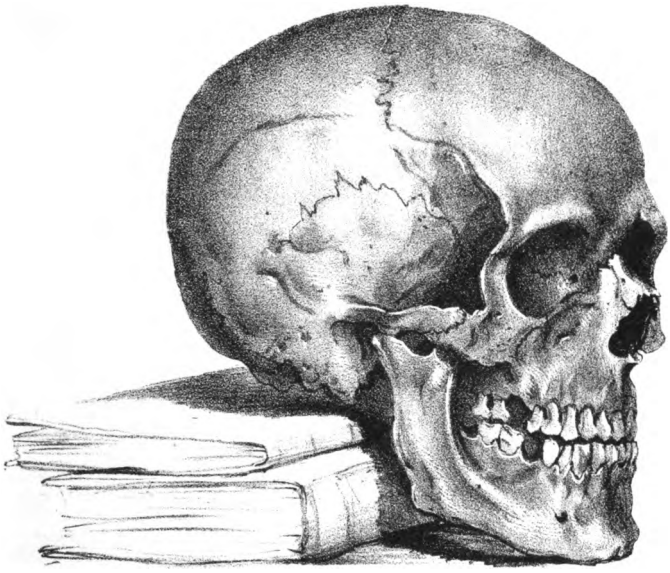
It may be observed, that the foramen magnum, in this skull, is situated more posteriorly than in the following outline, which is that of the skull of a Negro, most strongly characterised by the peculiarities of the Negro races. This refutes the frequent assertions of those who approximate the Negro to the Orang, and assert that the black man resembles that beast particularly in the position of the foramen magnum.

3. The skull of which the basis is here figured is that of Philip Bernard, before mentioned, and represented at the head of the engravings of prognathous skulls.

On comparing these four figures, the reader will find all the observations I have collected on the proportions of the skull as displayed by this view of it completely verified.

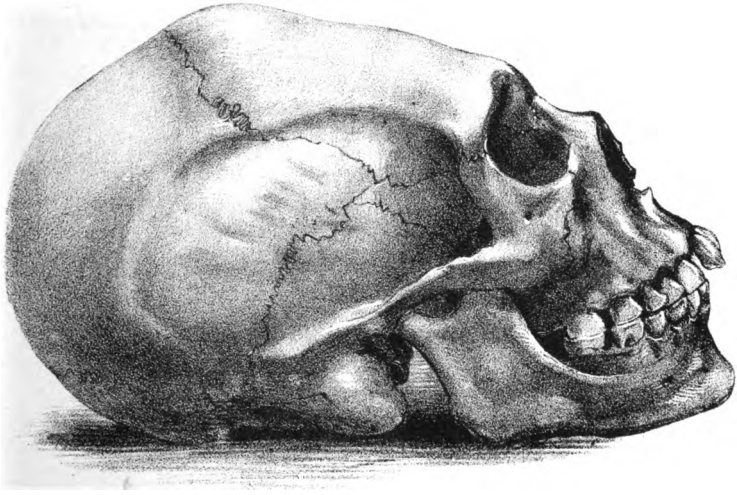
Digitized by Google

Fig. 1.



A Greek.

Fig. 2.

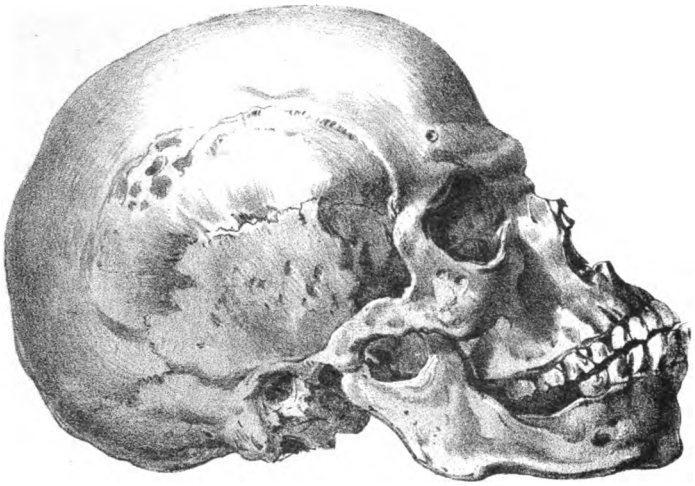


Elongated Skull from Titicaca.

Digitized by Google

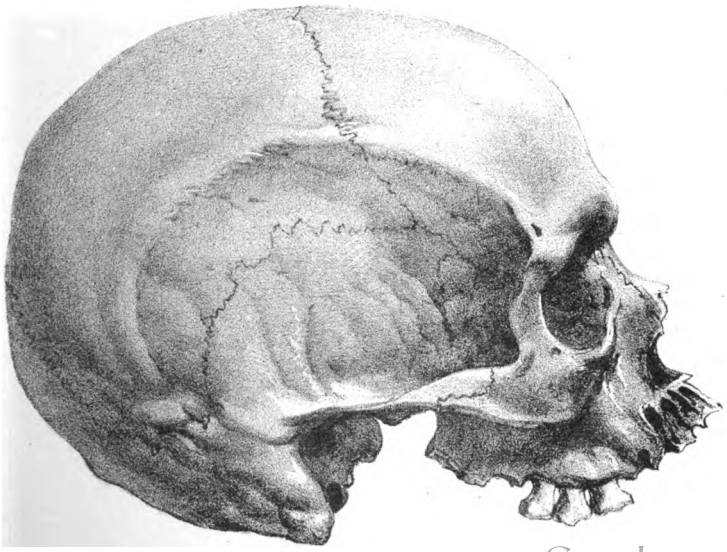
Digitized by Google

Fig.3.



Creole Negro.

Fig.4.



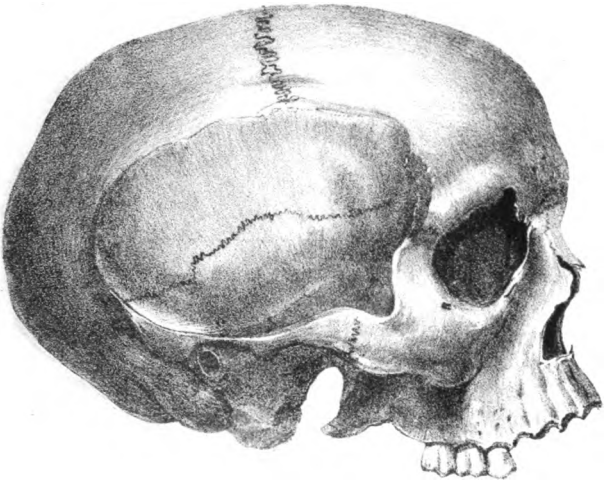
Ashantee Negro.

Digitized by Google

Day & Son, Lith.

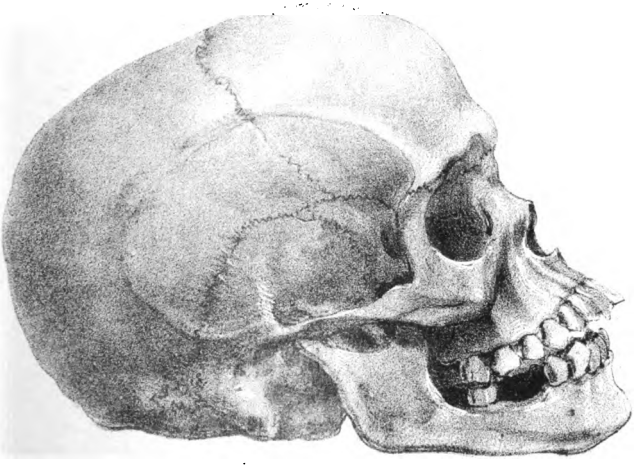
Digitized by Google

Fig. 5.



A Kaffir

Fig. 6.

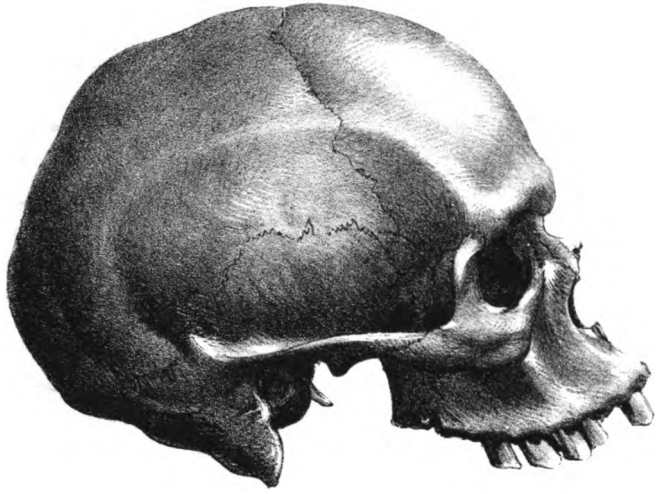


A Tasmanian

Digitized by Google

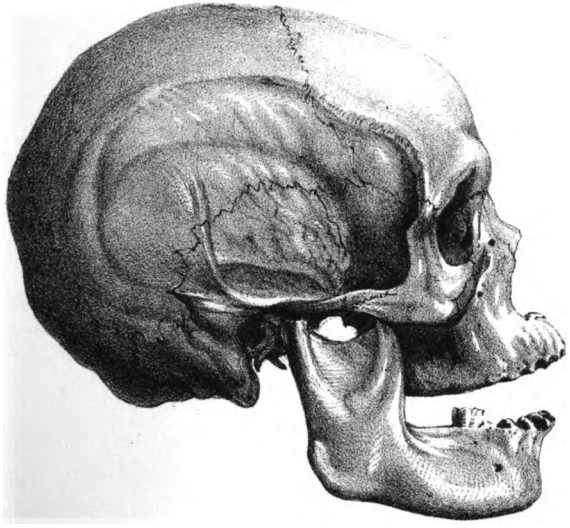
Digitized by Google

Fig. 7.



An Australian

Fig. 8.



An Alfourou Endamene.

Digitized by Google

Day & Son, Lith.rs to The Queen.

Digitized by Google

Fig 9.

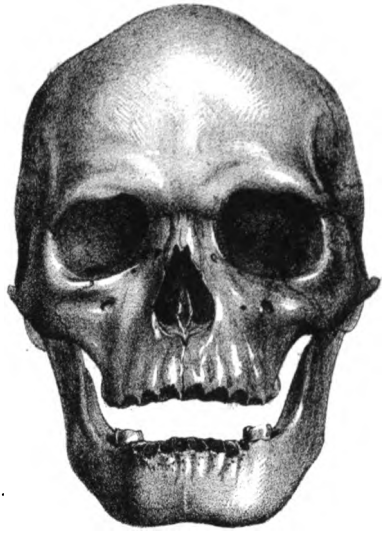
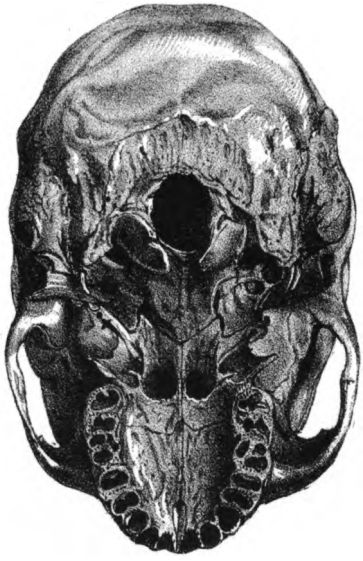


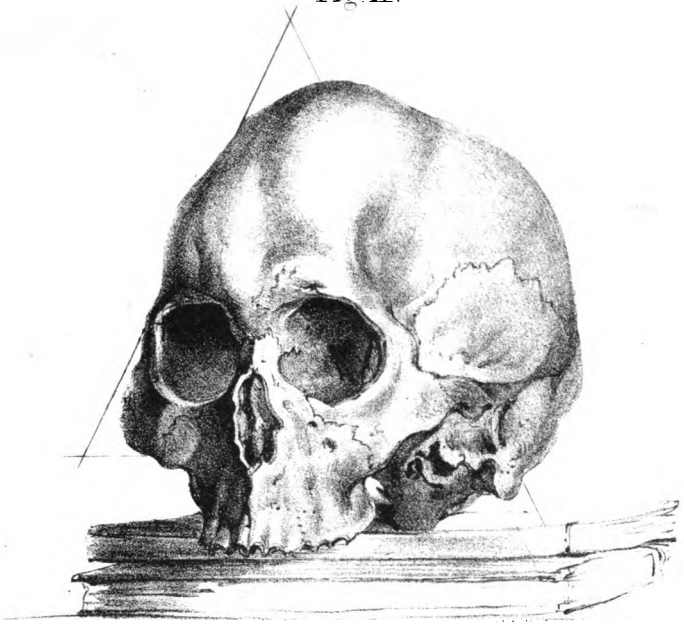
Fig.10.



Digitized by Google

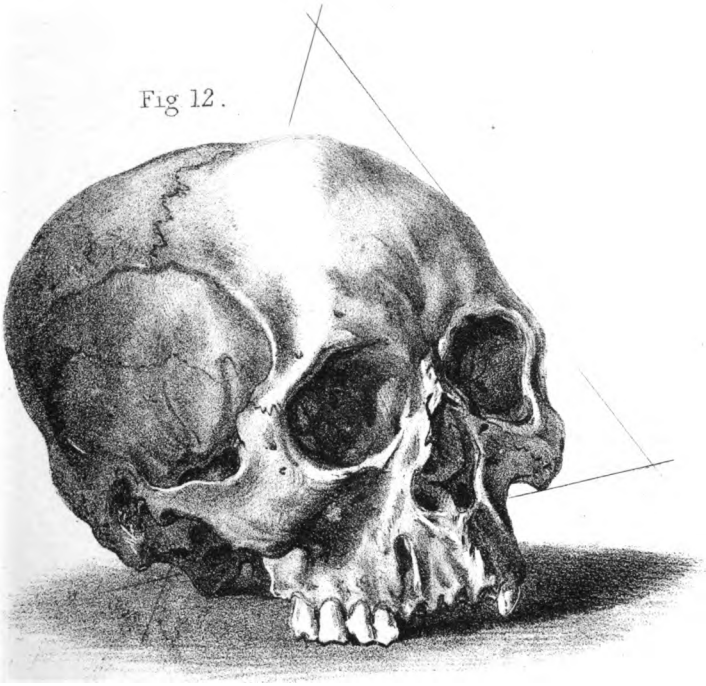
Digitized by Google

Fig. 11.



An Esquimaux.

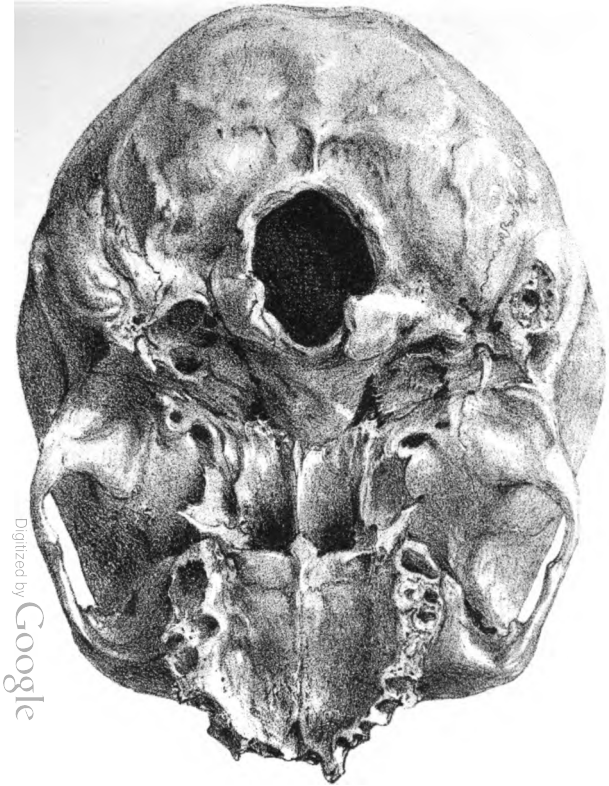
Fig 12.



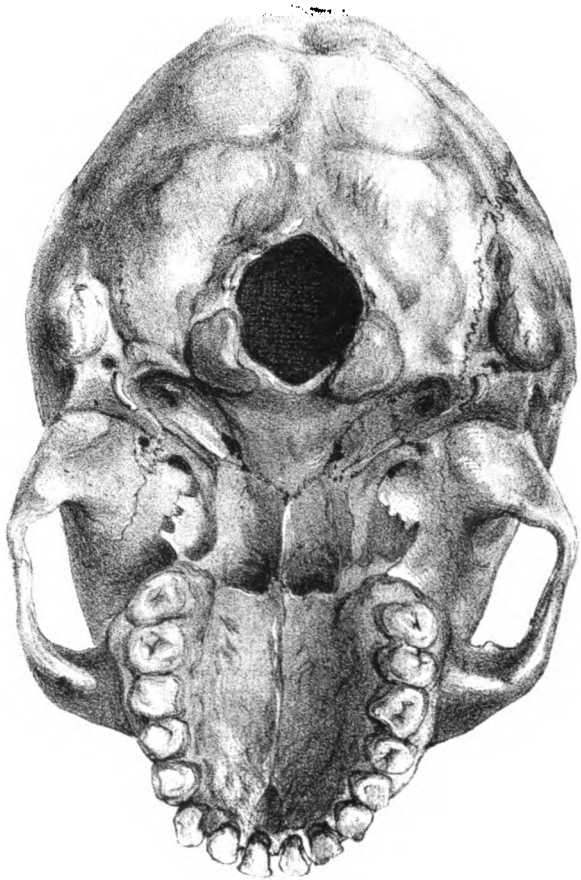
A Carib.

Digitized by Google

Digitized by Google



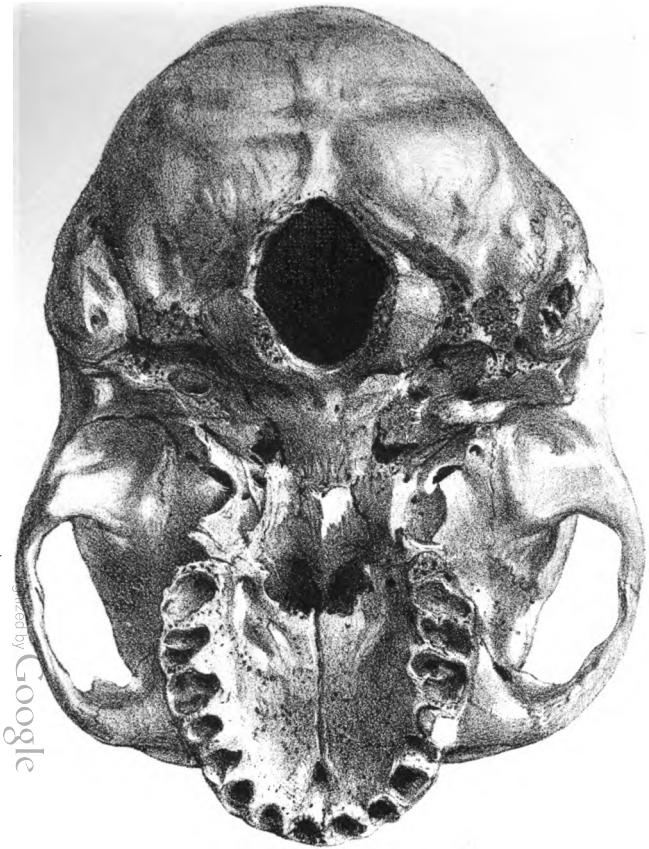
European
One of Napoleon's Guards killed at Waterloo



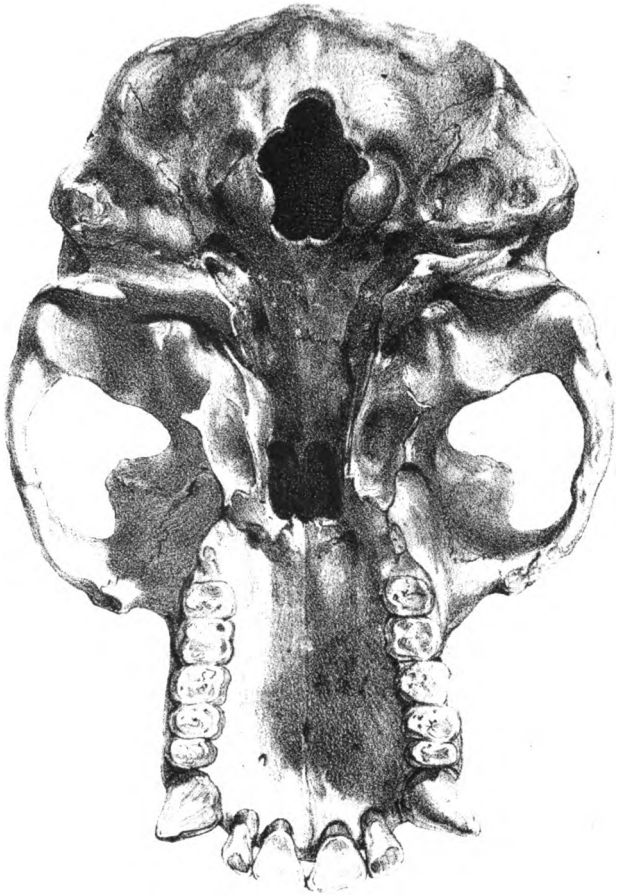
Negro
Skull of Phillip Ramsay

Digitized by Google

Digitized by Google



Esquimaux



Orang or Simia Satyrus

Digitized by Google

Digitized by Google

RESEARCHES

INTO THE

PHYSICAL HISTORY OF MANKIND.

INTRODUCTION.

SECTION I.—*General Statement of the Inquiries which form the subject of the following Work.*

THERE is scarcely any question relating to the history of organized beings, that is fitted to excite greater interest, than inquiries into the nature of those varieties in complexion, form, and habits, which distinguish from each other the several races of men. Our curiosity on this subject ceases to be awakened, when we have become accustomed to satisfy ourselves respecting it with some hypothesis, whether adequate or insufficient to explain the phenomena: but if a person previously unaware of the existence of such diversities, could suddenly be made a spectator of the various appearances which the tribes of men display in different regions of the earth, it cannot be doubted that he would experience emotions of wonder and surprise. If such a person, for example, after surveying some brilliant ceremony or court-pageant in one of the splendid cities of Europe, were suddenly carried into a hamlet in Negroland, at the hour when the sable tribes recreate themselves with dancing and barbarous music, or if he were transported to the saline plains over which bald and tawny Mongolians roam, differing but little in hue from the

Digitized by Google

yellow soil of their steppes, brightened by the saffron flowers of the iris and tulip:—if he were placed near the solitary dens of the Bushmen, where the lean and hungry savage crouches in silence, like a beast of prey, watching with fixed eyes the birds which enter his pitfall, or the insects and reptiles which chance may bring within his grasp;—if he were carried into the midst of an Australian forest, where the squalid companions of kangaroos may be seen crawling in procession, in imitation of quadrupeds;—would the spectator of such phenomena imagine the different groupes which he had surveyed to be the offspring of one family? and if he were led to adopt that opinion, how would he attempt to account for the striking diversities in their aspect and manner of existence?

To those who have considered the subject of this inquiry with the greatest attention, and are well aware of all its bearings, the task appears scarcely less difficult to discover a solution of the problem that may satisfy all doubts. It is found to involve a number of subordinate questions, in close relation with subjects which have long been the themes of controversy among naturalists and philosophers. Among these are investigations belonging to physiology, as well as others of a different kind, comprising researches into the nature of moral and intellectual diversities, or those of mind and social character, and the perhaps still more difficult inquiries which relate to the origin and formation of languages.

It will be the principal object of the following work to collect data for illustrating these subjects, and for elucidating the inquiry, whether all the races of men, scattered over the surface of the earth, distinguished as they are from each other in structure of body, in features, and in colour, and differing in languages and manners, are the offspring of a single stock, or have descended respectively from several original families. This problem is so extensive in its bearings, and in many particulars so intricate and complex, that I can scarcely hope to discover evidence conclusive in respect to every part of the investigation. I shall endeavour to collect and throw upon it all the light that can be obtained from different sources.

Digitized by Google

SECTION II.—*Probable Considerations on one side of the Question.*

That every part of the world had originally its "autochthones," or indigenous inhabitants, adapted to the physical circumstances of each climate, is the conjecture which any person who allowed himself to speculate upon the subject would be at first inclined to adopt. Many probable reasons suggest themselves in favour of this opinion, and it seems to afford a ready solution of some of the most difficult questions which the history of mankind presents. Hence its general prevalence among the ancients, though it was at variance with the traditions of their mythology; and hence the willing reception given to the same hypothesis by many naturalists and speculative writers of modern times.

This doctrine, in the first place, appears to account for all the varieties in figure and complexion which are observed in different nations. It explains the diversity of colour so remarkable between the native races of Africa and the inhabitants of Europe. It accounts for the woolly appearance of the hair in the Negro tribes, and for its flowing and glossy texture in the Esquimaux, and for the peculiar features and structure of limbs belonging to either race, by representing these nations as tribes of people originally distinct. The singular physiognomy and proportions of the broad-faced Kalmuks, and the pot-bellied Samoiedes; the humps and other well-known deformities of the Bushmen; the hairy bodies and apish countenances of the Mallicolese, occasion no further difficulty to the physiologist, as soon as he has determined to regard them as the distinguishing characters of so many different races.

The history of languages presents facts which are very difficult of explanation, while we maintain the opinion that all the families of men, and all their dialects, are derived from a common origin. The antiquity of some languages carries us back to a very early period in the history of mankind. We trace the Egyptian language already existing in the time of the Exodus, and even in that of the patriarch Joseph, if not so early as the days of Abraham; and even the dialectic

Digitized by Google

differences of the Semitic speech are plainly alluded to in the history of Jacob and Laban. The oldest compositions of the Greeks and of the Hindoos, and still more, the remote date to which it is necessary, on historical grounds, to carry back the separation of those tribes who have preserved dialects of the Indo-European language, oblige us to ascribe an equal antiquity to the mother-tongue of the Japetic nations. Other facts might be adduced, sufficient to prove that various idioms have existed, and have possessed their distinctive characters, as well as their affinities, from the most remote period of time to which the antiquity of nations and the history of mankind enable us to refer. How then are we to account for the origin of so many distinct forms of human speech as we know to have existed, on the hypothesis that all the races of men are descended from one family? On the supposition that these races had the commencement of their existence separately, or by distinct originals, all such difficulties vanish.

By adopting the same opinion we may save ourselves the trouble of accounting for the origin of moral and intellectual diversities, or for the differences in manners and habits which have been thought to characterise particular races. As tribes of animals differ from each other in instincts and other physical qualities, so the various human races, if such exist, may have had their peculiar endowments of intellect and their characteristic habits.

By availing ourselves of the same resource we might succeed in explaining many remarkable facts in the history of nations and of the world; or we should, perhaps, rather escape from the necessity of accounting for them. It has often been observed that whenever the enterprising spirit of modern navigators has brought them to hitherto unknown lands, though ever so remote and difficult of access, they have almost invariably found such countries already stocked with inhabitants. The natives of distant and insulated regions, for the most part, have been barbarous people, in many instances unacquainted with the art of navigation, even in small canoes: other tribes, though they have possessed vessels of rude construction, have been too ignorant and timid to venture out of sight of their own shores. It is difficult to imagine by what

Digitized by Google

means the savage inhabitants of such distant tracts can have been transported into them from other parts of the world. Nations who have been discovered thus separated from the rest of mankind have been generally found to retain no tradition of their arrival: in many instances they have imagined themselves to be the only human beings in existence, and have testified great surprise in finding themselves, in this particular, mistaken. Other tribes, not so entirely rude, and who appear to have derived from foreigners the first rudiments of civil culture, have preserved the record of an era when they emerged from their primitive barbarism, after having remained, from immemorial time, in a savage state, ignorant of civil arts and of the existence of civilized men, until some stranger, some Hercules, or Manco-Capac, some child of the ocean, or of the sun and moon, happened to set foot upon their shores. Many such nations have been found destitute of those common arts and resources which it seems difficult to suppose that men could ever have forgotten or have lost when once acquired, and which scattered tribes must, as we are ready to conclude, have brought with them, had they migrated from those countries which we generally regard as the cradle of our race. I allude to the art of domesticating animals, to the use of milk, and to the possession of bread-corn. These considerations have disposed many to adopt the opinion, that each distant country was originally provided by Nature with a peculiar stock of home-born inhabitants.

To these reflections we might add many others tending to a similar result,* but what has been already said will suffice to show that the opinion which has been stated is supported by many presumptive arguments, and that it affords an easy

* We might remark further, in pursuing the same train of observations, that vestiges have been discovered, spread through extensive regions of the world, of a primeval population, which had there dwelt for ages, and had multiplied, and had been swept away before the earlier inhabitants of the same countries known to history made their appearance. The remains of ancient military works in various parts of North America, as well as the discovery of skulls and skeletons entombed, which display a peculiar structure of body, indicate that continent to have been inhabited of old by tribes of a different race from those nations who have been supposed to be its aborigines. And the Lenni-Lenape or

Digitized by Google

reply to some of the most difficult questions which present themselves in relation to the organized world and its archæology. Whether it is the conclusion at which we are ultimately to arrive, after a careful investigation of particulars, does not yet appear. Perhaps, indeed, this way of getting rid of doubts and perplexities is more like the cutting a knot than the unloosening it.

SECTION III.—*Of Arguments which are urged on the opposite side of the Question. Relation of these Inquiries to the Scriptural History of Mankind.*

I must now proceed to consider some of the most obvious reasons which have been adduced in support of an opposite opinion.

There is, in the first place, one argument which has been thought by many to be conclusive as to the whole question, and to render any further investigation superfluous. I allude to the inference deduced from the Sacred Scriptures ascribing one origin to the whole human family.

Although nothing can be further from my intention than to detract from the authority and importance of the Sacred Writings, I yet do not feel that I can, with propriety, avail myself of their testimony in the present instance.

I am not prepared to adopt an opinion which has been expressed by writers of various times, that the Scriptures of the Old Testament comprise only the history of one particular family of men, and that other tribes may have been created to whose origin they make no allusion. To me, as I confess, it appears evident that by the writers themselves, who were employed in the composition of these books, the Holy Scriptures were contemplated and set forth as containing a record

Original People of the Algonquin stock preserve traditions which confirm this opinion. They relate that when their ancestors first crossed from the westward the Namæsi-Sippu, or River of Fish, or Mississippi, they found the land already occupied by tribes of a different complexion and figure from their own, who fled from their approach. In Northern Asia even tradition is silent as to the history of the extinct race of men, whose only vestiges are tumuli spread over the vast regions of Siberia, and containing the remains of bodies, with golden and silver ornaments, and distinguished by a peculiar style of sepulture.

Digitized by Google

of the dispensations of the Almighty Creator to all mankind; and if this be the fact, it can hardly be doubted that an account is comprised in them of the origin of the whole human family.

It may be observed, that those who hold with entire conviction the divine authority of the Holy Scriptures, are yet accustomed to receive different portions of their contents, if not with different degrees of assent, yet with an assent modified by different considerations. Many subjects are treated in these books in regard to which the only rational inquiry is, what in fact the Holy Scriptures have delivered respecting them. Such are all matters which transcend the scope of the human faculties; as the existence and nature of invisible agents, the future state, and the relations of man to the Unseen Power to which he is accountable for his actions. On these subjects, with respect to which we must otherwise have remained profoundly ignorant, Providence has condescended to give us by revelation such knowledge as it was important for us to possess. In such instances the Holy Scriptures are the sole "*principium cognoscendi*;" the only appeal is to them. But the most sincere believers in revelation do not give precisely the same species of assent to those parts of the Sacred Writings which relate to subjects open to the ordinary methods of investigation; such as matters of fact and of historical testimony. These portions of Scripture have ever been regarded as admitting, and even as challenging the most unwearied and severe scrutiny. Truth can never be in opposition to truth; and the investigation of all subjects comprehensible and scrutable to the human faculties is the undoubted privilege of a rational understanding. To silence inquiry in such instances by an appeal to the Scriptures seems to imply an apprehension lest something may be discovered that may prove them to be erroneous; it indicates a secret doubt of their entire truth. The palpable and almost ridiculous absurdities into which some writers have been led, in their attempt to speculate upon subjects of scientific inquiry, by availing themselves of inferences deduced from texts of Scripture, are sufficient to convince us of the unreasonableness of this proceeding. On the other hand it may

Digitized by Google

well be remarked, that many investigations, which at first had been thought likely to furnish objections against the truth and authority of the Sacred Records, have been found ultimately to confirm and elucidate them. From all these considerations it appears better to proceed to the inquiry to which the following pages are devoted, as if the testimony of the Sacred Scripture were altogether indifferent as to its decision.

Section IV.—*Inadequacy of historical Sources of Information.*

Nor can any sufficient and conclusive evidence be obtained in these inquiries from researches merely historical. M. Baillie, Sir William Jones, and other writers on the ancient history of the East, have displayed a remarkable connexion between the traditions of the most celebrated nations of antiquity, whose descent from a common ancestry they have hence inferred. Perhaps this conclusion may be allowed to have been established with respect to the Indians, the Greeks, the Persians, and the Teutonic nations: in all these instances, indeed, affinity of languages renders the kindred origin of the respective nations extremely probable. On historical grounds we might add to the preceding nations those of the Semitic family, the Hebrews, Syrians, Arabs, who, though they differ essentially in language from the Indo-European race, have preserved similar histories or traditions. If we join to all these some African nations, the Egyptians, Abyssinians, Berbers, or Lybians, which is all that the most sanguine antiquarian or philologist could pretend to claim, we still fall short of anything like proof that all mankind derived their origin from a single stock. How are we to bring within the pale the African Negroes, with their multitudinous jargons; the Hottentots; the Australians; the Papuas, or woolly-haired tribes who are scattered through the islands of the great Southern Ocean; the Esquimaux and the Pesserais in the opposite extremities of the New World, and in the intermediate space, the anciently civilized but singular Aztecas and Incas? Most of these nations are destitute of any vestiges which point to a common origin. With respect to those races of men whose

Digitized by Google

insulated existence and peculiar aspect and manners are most calculated to excite our curiosity and doubt, historical investigations are entirely unavailing.

SECTION V.—*Method to be followed in the Investigation.*

It appears to be the general result of all these considerations, that we cannot obtain satisfactory evidence on the subject of this inquiry from historical testimony, or from arguments founded on general probabilities. It only remains for us to seek it through the medium of researches into the natural history of the organized world, and by considering in detail a variety of particulars connected with the history of living species. In the way of investigation thus suggested, the inquiry resolves itself into the two following problems.

1. Whether through the organized world in general it has been the order of Nature to produce one stock or family in each particular species, or to call the same species into existence by several distinct origins, and to diffuse it generally and independently of propagation from any central point; in other words, whether all organized beings of each particular species can be referred respectively to a common parentage?

2. Whether all the races of men are of one species?—whether, in other words, the physical diversities which distinguish several tribes are such as may have arisen from the variation of one primitive type, or must be considered as permanent and therefore specific characters?

I shall now proceed to enter upon the former of these inquiries.

Digitized by Google

Digitized by Google

BOOK I.

ON

THE ORIGIN AND DISPERSION

OF

ORGANIZED BEINGS:

COMPRISING CONSIDERATIONS RELATIVE TO THE QUESTION, WHETHER EACH SPECIES IN THE ANIMAL AND VEGETABLE WORLD EXISTS ONLY AS THE PROGENY OF ONE RACE, OR HAS SPRUNG ORIGINALLY FROM SEVERAL DIFFERENT SOURCES.

Digitized by Google

Digitized by Google

PART I.

ON THE

ORIGIN AND DISPERSION OF ORGANIZED BEINGS.

CHAPTER I.

INTRODUCTORY REMARKS — OPINION AND ARGUMENT OF LINNÆUS—MODE OF INVESTIGATING THE SUBJECT.

THE inquiry to which we have now to direct our attention is, whether, throughout the organized world, including both of its great departments, it has been the method of Nature, if that expression may be used, to produce at first only one family in each particular species, or to call beings of the same specific structure into existence simultaneously from different beginnings, and to diffuse them over the world from many distinct centres or original points: in other words, whether all the existing plants and animals of each species can be referred respectively, with a degree of probable evidence that may be deemed satisfactory in such a question, to a common stock?

It would be in vain to look for a reply to this inquiry to any arguments *à priori*, or supposed probabilities, founded on the nature and fitness of things, or on what it may appear to philosophers advisable, and what inexpedient for Providence to have performed. Discussions of this kind, though often indulged in, are vague and fluctuating, and incapable of affording us any secure ground. The human imagination is almost bewildered, when it attempts to go back to that period which gave origin to the organized world and its

Digitized by Google

inhabitants. So many operative causes, totally different from any that we are now acquainted with, must have been employed in setting on foot that series of phenomena which we term the course of Nature, that we are in danger of losing ourselves in doubts and conjectures when we advert to the subject, and it requires the greatest care to avoid wandering into wild and visionary speculations. It is only by a careful survey of actual facts, and an accurate analysis of their relations, that any light can be thrown on the history of organized species, and the circumstances and conditions of their origin and early existence. In attempting to follow the particular inquiry above suggested, it will be necessary to take into consideration a great number of facts, to examine accurately their bearings, and to collect the inferences which arise from their comparison.

Linnæus maintained, that in every species of plants as well as of animals, only one pair was originally produced. "Unum individuum ex hermaphroditis et unicum par reliquorum viventium fuisse primitùs creatum, sana ratio videtur clarissimè ostendere."

He defended this position by a very ingenious argument, of which the following is nearly the substance:—

Experience proves to us that every family of human or other living creatures has a tendency to multiply, and that the progeny naturally becomes more numerous at every successive generation.

If we follow the history of the race in imagination, tracing the line perpetually onwards, we find the number greater at each subsequent step in the series, than in the step immediately preceding, and we perceive the number of individuals in each kind to be greater to-day than it was yesterday.

If now we turn our thoughts in the opposite direction, and follow the ascending line, we observe each species reduced at every step to a smaller number, many deriving their existence from few, and these few from still fewer: nor is there any term at which we find reason to stop, until we come to a single pair.

Linnæus afterwards proceeded to show, that Nature has

Digitized by Google

provided such means of multiplication and dispersion, as seem only requisite on the hypothesis adopted by him.

As examples of the multiplication of species, he remarks that one poppy-seed has been known to produce a plant containing 32,000 seeds, and one seed of tobacco, in a good soil, to multiply 40,320 fold.

These considerations are not without some degree of force; at least they seem to render one conclusion more probable than another. But nothing altogether satisfactory can be derived from so speculative an argument.

Perhaps there is no other way of investigating the history of particular species, and throwing some light on the inquiry, whether each tribe is derived from one or from many originals, than by collecting the facts which relate to their multiplication and dispersion, and tracing the distribution of genera and species over different parts of the earth. If it should appear, on examination, that animals or plants of each kind have their existence, in general, in those tracts only to which it is probable they may have wandered, or whither they may have been conveyed, by accidental means, from some single point—a point which may be looked upon as the primitive or original seat of the tribe—there will be a sufficient reason for believing the whole number belonging to each species respectively, to have descended from a single origin. But if, on the contrary, organized beings of the same species are met with in places remote from each other, effectually separated by vast distances, or by natural barriers, which the locomotive powers bestowed by Nature on particular tribes cannot have enabled them to pass; and if such examples are not rare exceptions to a general law, but matters of frequent observation, it must be allowed that creatures of the same kind had probably distinct and separate origins.

It will be necessary to pursue the inquiry suggested by this observation, under separate heads, as it relates to the different orders of organized beings. I shall begin with the dispersion of plants, and proceed then to the lower, and afterwards to the higher departments, as they are termed, of animated nature.

Digitized by Google

CHAPTER II.

OF THE DISPERSION OF PLANTS, AND OF THE PRIMARY HABITATIONS OF INDIVIDUAL SPECIES.

SECTION I.—*Three hypotheses which have been maintained on this subject.*

THERE are only three conjectures as to the original habitations and the dispersion of Plants, which can be thought in any degree probable. They are,

First, That all species of Plants whatever had in common their primary seat in one particular region, whence they have been subsequently spread into the countries where they are now found.

Secondly, That every species or distinct tribe in the vegetable creation, originated from one particular centre or birth-place, but that the primary habitations of different species were in different regions of the earth.

Thirdly, It has been conjectured that the vegetable tribes are spread over the surface of the globe, underived from any particular local origins, or centres of propagation; and that plants of every kind have been brought into existence wherever all the conditions were to be found which favoured their development. According to this notion, particular tribes may have been from the beginning of their existence, as widely diffused as they are at the present day; nor is it necessary, when we find the same species in two distant places, to inquire how it was conveyed from one to the other. Writers who adopt this opinion, suppose that plants were always to be found nearly in the sites where they now exist; an exception being made in regard to certain species, which have been either designedly or accidentally conveyed by men from one country into another.

Each of these three opinions has found supporters among naturalists of high reputation.

Digitized by Google

Linnæus embraced and defended the first of these suppositions. He conjectured that the habitable world was limited during the first age to one region of no great extent; the only tract in the surface of our planet, which had been as yet laid bare by the subsidence of the primeval ocean. In this fertile spot were congregated the originals of all the species of plants which have since existed on the earth, together with the first ancestors of all animals and of the human race. "In quâ commode habitaverint animalia omnia, et vegetabilia læte germinaverint." In order to accommodate the various habitudes of so many organized beings, and to provide a diversity of climates suited to their several natures, Linnæus imagined this common birth-place of all living creatures to have been situated in some warm region of the earth which contained a lofty mountain-range: on the heights, and in the hollows and declivities of this were to be found all temperatures and every clime, from the torrid to that of the frozen zone.*

Such an imaginary scheme is more allied to poetry or fiction, than to a serious investigation of the phenomena of nature. The hypothesis of Linnæus is irreconcilable with the facts most generally known and established with regard to the distribution of Plants.

Botanists of the present day are divided between the two last of the three conjectures which I have stated. Rudolphi, who is followed by many writers, has contended strongly in favour of the position that the same external agencies, the same conditions of climate, soil, moisture, atmosphere, and geographical situation, never fail to call into existence, or to be found in local connexion with plants of the same kinds, without reference to the means or possibilities of the transmigration of species from one region to another.† Others find reasons for concluding that there were given to all the vegetable tribes original centres of their existence; and they even seek, in the case of any particular species, a spot where it was first produced, and whence it has been spread.

* De Telluris habitabilis incremento: in Amœnitat. Academ.

† Rudolphi's Beyträge zur Anthropologie und allgemeinen Naturgeschichte: 3. Ueber die Verbreitung der Organischen Körper.

Digitized by Google

Professor Wildenow was one of the first who adopted this hypothesis; and he maintained it under a particular modification. Wildenow multiplied the Linnæan centres of creation. He perceived that it was impossible to account for the phenomena by supposing one primary seat or birth-place of all living creatures: he imagined that organization began in many different foci, all of which were on primitive mountains, the first that were left dry by the waters of the subsiding ocean. On the higher tracts of these primitive mountains, as soon as they became fitted to support vegetation, Wildenow supposed that all the plants which have since existed were first produced: as the surface of the ocean gradually lowered itself, the different tribes of the vegetable creation found room to extend themselves on every side; and they descended by degrees from the heights into the plains. In these, according to the opinion of Wildenow, are to be found only such species as may be traced to the feet of the nearest mountains, and it is thus possible, by different mountain-ranges, to divide the flora of one region from that of another.*

In this representation there is some truth, but scarcely sufficient foundation for such an hypothesis. It has been well observed by Rudolphi, that a person who has once ascended the Alps may easily remember how the vegetation assumed a new character from stage to stage. Instead of recognising on the tops of the mountains, which are assumed to be the original birth-places of vegetable tribes, a great multitude of the plants which form the vegetation of the plains, assembled round their common centres, he finds in such places very few species, and those of a peculiar character. As he descends again to a lower level, the multitude and variety of plants increases, but in the valleys and at the feet of the hills, he loses sight of those mountain-tribes, supposed to be the ancestral sources of all vegetation. As he proceeds to the banks of rivers, to marshes, or salt lakes, or to the sea-coast, or towards the dwellings of men, new vegetable forms everywhere display themselves; no Alps, no mountain-

* Wildenow—Grundriss der Kräuterkunde.—Rudolphi über die Verbreitung oder die angeblichen Wanderungen der Pflanzen.

Digitized by Google

chains display the vegetation which belongs to the sea-shore; but in the midst of the land, wherever salt-springs break forth, the maritime tribes display themselves."* These observations oppose great obstacles to our reception of Wildenow's hypothesis, that the primitive mountains of the earth have been the original centres of the vegetable creation. It has been further remarked by De Candolle,† that without considering the difficulty which we experience in tracing the proofs of this doctrine, or rather the want of any evidence to establish it, great doubts exist whether the species of plants which vegetate in the present day, are to be identified with those which grew in times anterior to the origin of secondary formations, and of which the impressions and other remains are discovered in rocks of later date. Those curious researches, but very lately entered upon with some degree of accuracy by M. de Sternberg, and which M. Adolphe Brogniart already seems destined to perfect, indicate clearly, as M. De Candolle has observed, that our present vegetable tribes are different from the antediluvian species, and consequently that there has been a new development of vegetation on the surface of the earth, subsequent to the era of the secondary formations.

A gradual accumulation of facts obtained during late years, in respect to the distribution of plants through different regions of the earth has laid open to naturalists new and important points of view, from which they have been enabled to see further into the real science of botanical geography. The knowledge indeed, as yet acquired, of the whole vegetable creation is very far from being complete. It has been calculated by M. De Candolle, that the total aggregate of vegetable species already described or observed in botanical collections, amounts to 56,000,‡ a number which he supposes to be rather below than above the reality. After taking into consideration the period of time which has elapsed since the

* Rudolphi, ubi supra, p. 120.

† De Candolle, Géographie Botanique, Dict. d'Histoire Naturelle.

‡ De Candolle has explained his reasons for believing that the 27,000 species indicated in Persoon's Synopsis, may be extended by a more accurate discrimination to 56,000. See Dict. des Sci. Nat. tom. xviii. p. 420.

Digitized by Google

discovery of the greater number of these species, after comparing the proportion which the European species bear to foreign kinds, and endeavouring to estimate the extent of countries scarcely examined or as yet wholly unexplored, and the probable number of the vegetable tribes which they contain, the same writer has concluded that the plants already collected are about half the existing number, and consequently, that the total aggregate of species which vegetate on the earth, is between 110,000 and 120,000: a vast number, which illustrates the admirable variety of nature, and proves that the laws of botanical geography rest as yet but on an imperfect knowledge of the existing tribes. The information, however, which has already been acquired of the different assemblages of plants, or of the floras of particular countries, is becoming every day more extensive, and the comparison of different regions in the vegetable world appears already to have furnished sufficient data for some very interesting and satisfactory conclusions. On exploring with greater accuracy the botany of countries distant from each other, naturalists have become more and more aware of the fact, that each region of the earth has its separate botanical creation, or if we may so speak, a select arrangement of vegetable species appropriate to itself; and the greater the accuracy of discrimination that has been introduced into the inquiry, the more strongly distinguished from each other have different countries become, in the comparison of their respective aggregates of plants. The data on which this conclusion is founded have been accumulating for many years, and have been the work of many different contributors. Link investigated the flora of Northern Germany, and the calcareous districts: Thunberg explored the botany of the Cape, Adanson, Smeathman, and others, that of intertropical Africa; M. De Candolle has made known the vegetation of France, Wahlenberg the vegetable productions of Lapland, of Switzerland, and of the Carpathian chain: Pursh those of North America; Mr. Robert Brown has explored the botany of New Holland, and has elucidated the collection of other botanists in Africa. But the science of botanical geography is principally indebted to the comprehensive

Digitized by Google

and philosophical mind of M. de Humboldt, whose enlightened genius has penetrated the obscurities of so many regions of science. M. de Humboldt's Essay on the Geography of Plants was the first work, as M. De Candolle observes, which displayed the real extent and relations of this science.* In his subsequent works, and still more in his personal researches, the same writer has further contributed to increase the sum of knowledge on these subjects, of which he has displayed the relations in a most brilliant manner in his Prolegomena to the American Flora.† It would be foreign to my purpose to trace the series of these discoveries. I shall merely state, in as brief a manner as possible, some general results to be deduced from the researches of M. de Humboldt, Mr. Robert Brown, M. de Candolle, and other writers, and point out their relations to the subject which I have proposed to investigate.

SECTION II.—*General facts connected with the distribution of vegetable tribes—Distribution of the great families or classes, of the lesser families or orders, and of genera; lastly, of species.*

Paragraph 1.—Distribution of Plants in reference to the three great families or classes.

Among the most striking facts in Botanical Geography, are the different proportions which plants of the three great families bear to each other in different zones.‡ The proportional number of dicotyledonous plants increases as we approach the equator, and diminishes towards the poles. Cellular or acotyledonous plants follow an inverse ratio, and de-

* Essai sur la Géographie des Plantes, accompagné d'un tableau physique des régions équinoxiales. Paris, 1805.

† See likewise his work, entitled "De Distributione Geographica Plantarum secundum cœli temperiem et altitudinem montium Prolegomena." Paris, 1817.

‡ Mr. R. Brown was the first botanist who displayed the relations between the three great divisions of the vegetable world. See Appendix to Flinders' Voyage to Terra Australis, and observations on the Herbarium of the Congo, appended to Tucker's Voyage to the River Zaire, pp. 422, 479. M. de Humboldt, in 1815, followed the same method of research, extending it to different orders or natural families.

Digitized by Google

crease towards the equator, while they increase towards the poles; but monocotyledonous plants, in which the ferns are comprehended by M. De Candolle, undergo comparatively little variation of number, and constitute everywhere about the sixth part of the entire flora. If we compare by themselves the two families of vascular plants, the monocotyledonous increase regularly towards the pole and lessen towards the equator. This applies chiefly to continents; for in many islands the proportion of monocotyledonous plants is greater than according to the ratio of latitude, owing, as it appears, to the abundant supply of moisture.*

Paragraph 2.—Distribution of orders or families, and of genera.

The application of the above-stated universal laws of proportion in the distribution of vegetable tribes, belongs to the comparison of the three great classes. The facts which relate to families, more properly so called, or to the natural orders of plants, are more limited; but the distribution even of these depends upon physical conditions, though often upon such as are not manifest. This may be inferred from the fact noticed by M. de Humboldt, that the proportional numbers of plants belonging to particular families, in any given regions, have mutual relations. "If we know in any country under the temperate zone, the number of Cyperaceæ or of Compositæ, it will be possible to estimate that of the Gramineæ or of the Leguminosæ."†

In many instances Nature seems to have deposited plants, if we may use such an expression, upon different parts of the earth, arranged according to their natural affinities; particular families having certain principal *foci*, where the plants

* De Candolle, Dictionnaire d'Histoire Naturelle.

† Sur les loix que l'on observe dans la distribution des formes végétales, par Alexandre de Humboldt. Dictionnaire d'Hist. Naturelle.—The following are the expressions in which these remarkable inferences are conveyed in M. de Humboldt's Prolegomena.

"Disquisitiones istæ ex Arithmetica botanica petitæ *leges* nobis patefecerunt, quarum imperio natura in quâvis zona subjecta est. Penitius autem cognoscentur, quando major pars terræ a viris doctis accurate erit perlustrata. Ubicunque enim, sub eodem parallelo, mirabilem harum legum consensum in-

Digitized by Google

that belong to them have been produced in the greatest number of individuals and variety of species. It may be said, that plants belonging to certain natural families are placed in particular groupes, each having a principal centre around which the genera and species comprised in it are more numerous, and display the characteristic form of the order in the greatest perfection. At a distance from these central points, the common type of the order becomes gradually evanescent, or undergoes modifications.

In some instances, whole genera, and even entire families of plants are confined to particular regions. The Hesperideæ are peculiar to India and China; the Labiatifloræ belong to South America; the Epacrideæ are nearly confined to Terra Australis, where their species are very numerous; a few being distributed to the isles of the Pacific. In some instances, a few solitary tribes, forming however distinct species, are found at a distance from their congeners, which are otherwise assembled in one region. All the Passifloræ belong to America, except one, which is in South Africa. De Candolle observes, that all the species of Mesembryanthemum inhabit the Cape of Good Hope, except M. nodiflorum and copticum, which are found in Corsica and in Barbary. In the same country are all the Ixiæ, except the Bulbocodium; all the Gladioli, except the Gladiolus communis found in France; all the Heaths, in number two or three hundred, except five or six found in Europe; and nearly all the Oxales, except three species which are wild in France, and some found in America.

The manner in which tribes thus related to particular regions are grouped is very remarkable. Mr. Brown has observed, that in Terra Australis, the foci of peculiar vegetation

venies: atque is est, in quâlibet regione, nexus inter singulam tribum et summam plantarum phanerogamarum, ut quoties Graminearum numerum cognoscas, inde probabiliter non solum universum numerum Phanerogamarum queas æstimare, sed etiam Compositarum, Labiatarum et aliquarum tribuum. Quippe videmus stirpium familias modo ab æquatore polos versus numero specierum augeri, modo a polis versus æquatorem; interdum etiam certæ familiæ —v. c. Labiatæ, Umbelliferæ, Cruciferæ—in zona temperata numero specierum maxime abundant, polos et æquatorem versus rarescunt."—De Distributione Geog. Pl. Prolegomena, p. 41.

Digitized by Google

occur almost exclusively between the thirty-third and thirty-fifth degrees of south latitude, and principally at the two opposite extremities of this tract; that is, near the eastern and western coasts. These remarks are illustrated by the distribution of the Proteaceæ, a family of plants almost entirely confined to the southern hemisphere, where it is extensively dispersed. The Proteaceæ are generally, though very unequally, spread over all the great southern continents; they have been observed also in the larger islands of New Zealand and New Caledonia, but hitherto in none of the lesser ones. In America they have been found in Tierra del Fuego, in Chili, Peru, and in Guiana; but, in this continent, the number of their species is comparatively small, and their organization little varied. The American tribes of Proteaceæ have much greater affinity with those of New Holland than of Africa. In Africa the Proteaceæ occur in great abundance and variety about the Cape, in the same parallel which contains the principal number in Terra Australis. But, in the latter country, they have their chief seat: here, more than four hundred species belonging to this order have been already found. They abound at the two principal foci, but diminish very remarkably in the intermediate space. Those genera of Australian Proteaceæ, which bear the nearest resemblance to the African tribes of the same order, exist on the western coast, and those which most assimilate to the American tribes, on the eastern. Two genera only of this order are found in more than one of the southern continents, but particular species have a very limited extent: they are not only distinct in the tracts separated by seas, but not one species has been found common even to the eastern and western shores of New Holland.

There are several other families principally belonging to Terra Australis, which are partially dispersed over the southern countries separated from that continent by seas. In some instances the branches of these Australian families are found in the islands of the Indian Ocean; in some others they are spread in an opposite direction, over the isles of the Pacific, and on the shores of South America. Several species of Epacrideæ, in New Holland a very numerous family, are

Digitized by Google

found in New Zealand; a few of them in the Society, and even in the Sandwich Islands. Only one plant of this family, an unpublished species, exists in Tierra del Fuego. The leafless Acaciæ are very abundant in Terra Australis, at the two principal foci. One hundred species are found in that country, and are peculiar to it; only seven other species are known; of which five are natives of the tropical islands of the southern hemisphere, and one of the Sandwich Isles, where it forms the largest tree.*

Paragraph 3.—Analogy in the vegetation of parallel but distant regions.

Regions situated under similar latitudes and resembling in soil, temperature, and local circumstances, display, in general, a certain analogy in the character of their vegetation. It is important to observe the particular nature of this correspondence or analogy.

It may be laid down as a general observation, that in distant countries where the physical circumstances are similar, the vegetation resembles, but that this resemblance does not consist in the identity of species. In many instances, there is found in two such regions only a general analogy in the vegetable forms; certain families, or genera, in one replacing similar tribes in the other. In other instances the genera are more widely spread, and different species belonging to the same genera are found in several regions.

Thus the productions of the antarctic zone resemble those of the northern countries. The Dwarf Birch, which, in northern Europe, occupies the highest tract on the borders of perpetual snow, is replaced in Tierra del Fuego by the Betula Antarctica. In a similar manner, on ascending mountains in temperate and equatorial countries, species analogous to those of colder zones are discovered in succession; parallel temperatures, though under different latitudes, displaying analogous modes of vegetation.

America contains many genera in common with Europe and Asia. In some instances the particular species are distributed generally to North America and to Europe, as are those of the

* Brown's Appendix to Flinders.

Digitized by Google

Fraxinus, Pinus, Populus, Tilia: in others to America and Asia; as are the Juglans, Magnolia, Vitis: in others, they are common to all these continents, as the Acer, Salix, and Delphinium. In the whole world there are known only two species of Liquidambar, two of Panax, two of Platanus, two of Stillingia, two of Planera; one species in each of these genera inhabits Asia and the other America. Instances equally striking are mentioned by De Candolle, in which species belonging to genera, equally restricted in number, are distributed to North America and to Europe.

Similar observations are formed on comparing the three great equatorial countries of America, Asia and Africa. The intertropical regions of these three continents display genera common to two, or to all of them; but the species are different in each. America and Africa contain, between the tropics, different species of Cratæva, Bertiera, Elæis. Sagus and Strophranthus are, in a similar manner, divided between equatorial Africa and Asia. Species of Psychotria and Besonia are in Asia and America; and all the three equatorial regions contain distinct species of Melastoma, Stercutia, and Jussieua. Again, Cytinus, Sphenoclea, Melothria, Gyrocarpus, Sauvagesia, each containing only two known species, distribute them separately in the like manner.*

In the southern hemisphere, the three great continents contain towards their southern extremities, three very remarkable botanical provinces. A certain analogy has been observed in the vegetable forms which display themselves in all these regions; but there is by far the strongest resemblance between the vegetation of South Africa and that of Terra Australis, under the same parallels. In reference to this subject, I shall cite M. Leschenault, who has drawn the most striking picture of the aspect of the Australian forests.

"If the animal kingdom in New Holland offers remarkable peculiarities which isolate it, if I may be allowed the expression, from all other parts of the world, the vegetable kingdom has a character no less distinctive. This character relates not only to botanical differences, but likewise to a na-

* De Candolle, ubi supra.

Digitized by Google

tural physiognomy, which would be remarked by the most careless observers. The vegetation only of the southern parts of Africa can be compared to that of New Holland: in the same latitudes, we find innumerable legions of heaths and proteæ, which include many shrubs remarkable for their graceful and delicate forms, adorning the otherwise barren soil of either climate."

"But in all the places we have visited, and above all on the western side of New Holland, we do not find, in the great masses of vegetation, either the majesty of the virgin forests of the new world, or the variety and elegance of those of Asia, or the delicacy and freshness of the woods of our temperate countries of Europe. The vegetation is generally gloomy and sad; it has the aspect of our evergreens or heaths: the plants are for the most parts woody; the leaves of nearly all the plants are linear, lanceolated, small, coriaceous and spinescent. This contexture of vegetable productions is the effect of the aridity of the soil, and the dryness of the climate: it is, without doubt, to these same causes that the rarity of cryptogamous and herbaceous plants is owing. The grasses, which elsewhere are generally soft and flexible, participate in the stiffness of the other vegetables. The greater part of the plants of New Holland belong to new genera; and those included in the genera already known, are of new species. The natural families which prevail, are those of the Heaths, the Proteæ, Compositæ, Leguminosæ and Myrthoideæ. The larger trees all belong to this last family, and almost exclusively to the genus Eucalyptus.

"The families which I have mentioned are spread very abundantly, and form a great part of the vegetation. This remark proves to what an extent the system of natural families is in accordance with the method of nature, which seldom renders species isolated, but on the contrary, reunites them, nearly always in great number, upon the same soil and in a similar climate."*

* Observations de M. Leschenault, forming an Appendix to Peron's Voyage autour du Monde.

See also M. Lesson.—Tableau Physique de la Nouvelle Hollande. "Tous les végétaux de la Nouvelle Hollande ont un caractère unique, c'est celui de posséder

Digitized by Google

The analogy between the systems of vegetation in these three southern countries, depends, as the observations of M. Leschenault would lead us to suppose, and as those of Mr. Brown demonstrate, on the same sort of correspondences as those above described. There are very characteristic and extensively diffused tribes in either country, which are wholly wanting in the other. Such are, in New Holland, the genus Eucalyptus, and the leafless Acaciæ, each consisting of about one hundred species already known. These, taken together, comprise, according to Mr. Brown, in respect to numbers, and the vegetable matter they contain, nearly one half of the whole vegetation of Terra Australis. No traces of them have been found in South Africa. That country, on the other hand, has several genera, very characteristic of its vegetation, which are entirely wanting in New Holland. In other instances, certain families in one region replace analogous tribes in the other. The Epacrideæ, one hundred and forty species of which are nearly confined to Terra Australis, appear there as substitutes for the Ericeæ, a numerous and diversified order in South Africa.

We are informed by Mr. Brown, that the general character of South American vegetation probably recedes more from the Australian than the latter does from the South African. Yet, in Chili and Tierra del Fuego, there are certain tribes of plants nearly corresponding to some Australian genera.

Paragraph 4.—Of *species* common to distant countries—enumeration of botanical provinces.

The instances already collected are sufficient to prove, that the general law of nature is the distribution of different,

un feuillage sec, rude, grêle, aromatique, à folioles presque toujours simples : par toute la terre, en effet, les mimosæ ont des feuilles composées, mais il était donné à la Nouvelle Hollande d'en produire un grand nombre à pétiole devenu feuille simple. Cette coupe similaire donnée à la foliaison semble être accommodée à la sécheresse du sol, et destinée à multiplier les surfaces par où s'opère la nutrition du végétal." " En dernier résultat," concludes M. Lesson, " les forêts de l'Australie ont quelque chose de triste et de brumeaux qui fatigue la vue : la teinte du feuillage est d'un vert glauque, monotone : les rameaux sont à demi depouillés de leurs écorces fongueuses, ou celles-ci se détachent par lanières qui flottent au gré des vents."

Digitized by Google

though analogous species, to separated regions where the physical conditions are similar. We might almost venture to consider those cases, in which the same identical species are found in different continents, in the light of exceptions to a general fact. But the nature of these instances must first be examined.

Very many plants of simple structure are widely diffused, the same species existing in distant countries. This fact struck the observation of Linnæus, who says, "Miramur muscos, fungos, byssum et mucorem ubique crescere." A similar remark has been the result of extensive researches made by modern travellers, and it has been fully confirmed by M. de Humboldt and Mr. Robert Brown. It is now well known to be a general fact, that cellular or agamous plants, which are looked upon as the lowest orders in the vegetable creation, or as those of most simple structure, are extensively dispersed. Two-thirds of the Lichenosæ observed in Terra Australis are also natives of Europe. Of the Musci and Hepaticæ one third part, and of the submerged Algæ found on the shores of New Holland one sixth are European species; and of the discovered Ferns of the same region, which exceed one hundred species, twenty-eight have been recognised in other countries.*

Many of the monocotyledonous tribes likewise are widely diffused. Many Grasses and Cyperaceæ are common to Europe, and to Terra Australis, and to South America. M. de Humboldt found not only Mosses, but Grasses and Cyperaceæ which are well known as European species.

Very different are the facts established in regard to the dicotyledonous tribes found in various countries: yet a few of these are common to distant regions.

It has been observed by M. de Humboldt, that in comparing the vegetation of the old and new continents, a general fact may be recognised, parallel to that which was observed by the Count de Buffon in respect to the distribution of animals.† It is principally in the arctic regions where the two

* General Remarks on the Botany of Terra Australis, by R. Brown, Esq. F.R.S. Appendix to Flinders' Voyage, p. 591.

† "Quod ad plantas phanerogamas attinet, ferè eidem legi subjectas esse videas, quam disertus naturæ interpres, Buffon, in animalibus zonæ torridæ,

Digitized by Google

continents approach towards each other, and are almost joined, that most of the plants common to both regions have been discovered. Some few have been found in other parts of America and of the old world; but if we abstract from the number those species which appear to have been transported by human agency, the number of these common kinds everywhere diminishes as we approach the southern regions, where the continents are more widely separated. Among the 2891 Phanerogamous species, described by Pursh as natives of the United States, there are three hundred and eighty-five which are also found in the northern, or in the temperate parts of Europe; and among these there are several, as M. de Humboldt has observed, which can scarcely have been transported by men; as the Satyrium Viride and Betula Nana. On the other hand, M. M. de Humboldt and Bonpland, in their travels in equinoctial America, found only about twenty-four species which were common to the new continent and to any part of the old; and these were all belonging to monocotyledonous tribes, viz. Cyperaceæ and Gramineæ. The agamous plants, of which more numerous species are common to the two regions, obey the same law: the number is greater towards the north than to the southward.*

vim habere observavit. Ex magno numero stirpium, quas in Americæ plaga æquinoctiali, Bonplandio atque mihi legere contigit, exceptis forsan arbusculis quibusdam maritimis (Rizophora Mangle et Avicenia Tomentosa), in herbariis nostris huc usque ne unam quidem dicotyledonem antiqui orbis offendimus, quam constaret ab Europeis, post patefactum novum orbem, non invectam esse.

"Nos certe, quanquam herbariis diligentissime comparatis, in Phanerogamis Americæ æquinoctialis longe a littore lectis, non nisi *monocotyledones;* sed earum ultra 20—24 glumaceas, nacti sumus."

* De Candolle. Dict. des Sciences Naturelles.

"Rebus his diligentur perpensis patebit, plantas monocotyledones non eidem legi ac dicotyledones, subjectas esse, *hasque solas,* ratione modi quo per varias terras continentes fusæ sint, cum animalibus comparari posse. Nam neque ex quadrupedibus, neque ex avibus animans ulla *zonæ torridæ* utriusque orbis communis est; neque reptile ullum, auctore viro summo Cuviero, dissentientibus licet herpetologorum pluribus, qui veram Boam Americæ cum Pythone antiquæ continentis confundunt.

"Si ex plantis novi orbis longe plurimæ peculiares illi sunt (nam utrique continenti communes ne quadragesimam quidem partem Phanerogamarum Americæ jam cognitarum efficere videmus) necesse est, ut nunc inquiramus qua ratione stirpes illæ, secundum cœli temperiem, diffusæ sint, et quibus limitibus versus polos

Digitized by Google

In Terra Australis, the aggregate number of plants known to Mr. Brown is 4100. Of these, one hundred and sixty-six are common to that country and to Europe; one hundred and nineteen of the latter are agamous plants, thirty-two monocotyledonous, and only fifteen dicotyledonous. Of these fifteen several are such as may be suspected to have been transported by men; but this cannot be said of all of them. However, all of them, and indeed nearly the whole of the phanerogamous plants which are common to Terra Australis and to Europe, are such as are likewise found in America, and several of them also exist in other regions.

A diversity not less striking has been discovered on comparing the vegetation of other southern countries with that of Europe and the northern regions. Although the proportion of European plants in Terra Australis is so small, it appears, as Mr. Brown has remarked, to be greater than that which is found in the south of Africa. "The vegetation of the Cape of Good Hope," he continues, "not only in the number of species peculiar to it, but in its general character, as depending on the extensive genera or families of which it is composed, differs almost as widely from that of the northern parts of the same continent and the south of Europe, as does that of the corresponding latitude of Terra Australis from the flora of India, and of Northern Asia. The same writer has also observed, that the proportion of European species in South America, is probably still smaller than in South Africa, though our means of judging on this point are insufficient. However, some European plants are known to exist in South America. The two Forsters found in Tierra del Fuego, the Pinguicola Alpina, Galium Aparine, Statice Armeria, and Ranunculus Lapponicus. Wildenow has remarked, that it may be questioned whether these naturalists were not deceived as to the specific identity of some plants with their European analogues, owing to the want of an op-

ac montes, a frigore circumscribantur. Considerantes primum non nisi loca plana zonæ frigidæ et temperatæ, mirabimur quantopere, sub eodem parallelo, in ambabus continentibus annua temperies differat. Non est hic locus, causas hujus differentiæ exponendi, quas jam alias demonstravimus; sufficit in hoc argumento rationes diligentius, quam antea factum est, numeris exponere." A. de Humboldt, De distributione Geographica Plantarum.

Digitized by Google

portunity of comparing them. De Candolle has made a similar observation, with respect to the older botanists in general. They were too ready to admit, without discrimination, identity of species, when they discovered in distant regions plants resembling those of Europe.

In parts of the same continents remote from each other, or isolated by mountainous barriers, or cut off by sandy or rocky deserts or by wide rivers, which, however, are less effectual causes of separation than those before mentioned, different aggregates of plants are likewise found; and though the limitation of species is in such examples not so decided as in some of the instances already pointed out, it is yet very strongly marked. Several attempts have been made, with reference to these observations, to distribute the surface of the earth into different regions of vegetation or botanical provinces.

The following is the enumeration adopted by M. De Candolle.

1. The Hyperborean region, which comprehends the northern extremities of Asia, Europe, and America.

2. The European region, comprehending all the middle parts of Europe, excluding the countries which approach the pole, as well as those which border on the Mediterranean, and reaching eastward nearly to the mountains of Altai.

3. The Siberian region, including the great steppes of Siberia and of Tartary.*

* It was long ago observed by Gmelin, that the eastern part of Siberia constitutes a distinct province in the animal and vegetable world. In the preface to his Flora Sibirica, Gmelin has remarked that the river Yenisei seems to be a natural limit with respect to organized productions between Europe and Asia. "After passing to the eastward of this river, the traveller sees every thing under new appearances: a new and unusual vigour reigns in the vegetable creation. The mountains, which to the westward, as far as the Uralian chain appeared only scattered, now take full possession, and are interspersed with the most beautiful valleys. New animals, the Argali, Musk, and others, begin to show themselves. The plants of Europe disappear, and Nature begins suddenly to display a creation of vegetable tribes peculiar to Asia." Pallas has confirmed these remarks of Gmelin, with some modifications. He says, that in the western parts of Siberia, immediately beyond the Uralian chain, the vegetation still remains similar to that of Pannonia: very few of the plants proper to Siberia are there seen, especially in the lower countries towards the north. On ascending the Irtish towards the chain of Altai a variation is perceived

Digitized by Google

4. The Mediterranean region, comprehending the whole geographical basin of the Mediterranean, viz. that part of Africa which lies to the northward of the Zahara, and those countries in Europe which are sheltered to the northward by chains of mountains more or less continuous.

5. The eastern European region, comprehending the countries which border on the Euxine and the Caspian.

6. India and its Archipelago.

7. China, Cochin-china, and Japan.

8. New Holland.

9. South Africa, beyond the tropic.

10. Abyssinia, Nubia, and the coast of Mozambique, on which our information is very defective.

11. Equinoctial western Africa, including the borders of the Congo, Senegal, and Gambia.

12. The Canary islands.

13. The United States of North America.

14. The western coast of North America within the temperate zone.

15. The Antilles.

16. Mexico.

17. Intertropical South America.

18. Chili.

19. Southern Brazil, and Buenos Ayres.

20. The Magellanic countries.

Lastly, each of the islands sufficiently remote from mainlands to afford a peculiar vegetation, ought to be added to this catalogue.

the plants of the mountainous tracts begin to have affinity to those of the Yenisei. In the high plains beyond the Oby many plants abound, which are wanting in western Siberia, in the lower countries, and are only found towards the Altaic mountains. As you go up the Yenisei, the vegetation of the mountains takes the ascendancy; to the southward of Lake Baikal is its true native seat. In the easternmost tracts of Siberia and Kamtschatka, even in the low hills and plains, most of those plants are found which grow on the steppes, and some of them in the northern marshes which border the icy sea. See Pallas, Reisen in Siberien, French translation, vol. vi. p. 157.

It seems hence that the vegetable tribes of this region have their true native seat in the high chain of Altai and Sayan, and that from this tract, where they are truly indigenous, they descend along the courses of the great rivers, sparingly towards the western parts, but in great abundance to the eastward of the Yenisei.

Digitized by Google

It has been observed by M. De Candolle, that the vegetation of these several botanical provinces is so distinct, that when we read in the works of scientific travellers, accounts which state the plants of one region to have been discovered in another, we ought not to admit the fact as perfectly established, without a careful inspection of particular specimens.

I shall now proceed to survey a different series of facts related to the same inquiry, and point out their bearing on the conclusions which I have already obtained.

SECTION III.—*Of the means provided by Nature for the dispersion of Plants—Facts relating to the migrations and Colonies of Plants.*

It seems to have been a part of the economy of Nature, if such an expression may be allowed, to provide for the diffusion of the vegetable tribes. This may be inferred from the extreme minuteness of many seeds, admitting their transportation by winds through spaces of indefinite distance, and from the wings and feathery appendages with which other seeds are provided. In order to form a correct estimate of the efficacy of this and other causes, which contribute to the same result, we must survey facts connected with the actual dispersion of plants. The means by which the transportation of seeds have been effected are of various kinds. One of the most obvious is human agency.

Paragraph 1. — Of the dispersion of Plants by human agency.

It has been observed, that mankind have almost everywhere surrounded their abodes with artificial plantations; they have changed the most desert spots, and the most dreary morasses, into corn-fields and gardens; and there is, even in the northern extremity of Europe, scarcely a poor hamlet where some exotic tree, or at least some vegetable of foreign extraction, is not to be found.* Together with these

* Rudolphi über die Verbreitung oder die angeblichen Wanderungen der Pflanzen.

Digitized by Google

plants designedly introduced, others are conveyed accidentally. Thus, with rice and other kinds of grain many plants have come in which are still found among them, as the knap-weed; and others which have become very widely spread, as the Erigeron canadense. It was thus that hemp, as well as the thorn-apple, was first introduced, neither of which are natives of these countries. De Candolle observes, that the inhabitants of the south of Europe sow together with the wheat of Barbary, the wild plants of Algiers and of Tunis. He reports an instance of the accidental diffusion of seeds from other importations. Near the gate of Montpellier, there is a field appropriated to the drying of foreign wools after they have been washed. Scarcely a year passes, in which some foreign plant does not make its appearance in this field. He mentions Psoralea palæstina, Hypericum crispum, Centaurea parviflora.* Many plants have been dispersed, in the first instance, from gardens among surrounding countries, and have become naturalized. Linnæus remarked, that the Erigeron canadense was introduced into gardens near Paris from North America. The seeds had been scattered by the wind, and this plant was, in the course of a century, spread over all France, Italy, Sicily, Belgium, and Germany.† A great number of European plants have been introduced by colonists in the Cape of Good Hope. Thunberg has carefully enumerated these; but he has reckoned among them several species, the introduction of which, in this manner, has been thought, by some writers, scarcely probable. Such are Lemna gibba, Typha latifolia, Corrigiola littoralis, Alsine media, Rumex aquaticus, Bambusa arundinacea.‡

Paragraph 2.—By means of animals.

It has often been said, that animals contribute to the dispersion of plants. Light seeds may adhere to the fleeces of

* De Candolle, Dict. des Sci. Nat.

† Linnæus in Amœn. Acad. de Coloniis Plantar.

‡ Thunberg, Flora Capens. tom. i. fasc. 1. Rudolphi über die Verbreitung der Pflanzen, 114.

Digitized by Google

sheep, or to the fur of other quadrupeds, and may thus be carried from one place to another. That there is truth in this conjecture, we may learn from the observation made by De Candolle at Montpellier. This, however, as Rudolphi observes, cannot here be a method of dispersion attended with very important results. Seeds could scarcely be conveyed by quadrupeds to very distant places.

Seeds are frequently carried by birds after being swallowed, and they have been ejected without having their vitality impaired. Some seeds are even in a state more fit for vegetation after passing through the stomachs of birds, a fact of which Mr. Lyell has mentioned a singular proof. Farmers, in some parts of England, who wish to plant quick-set hedges, cause the seeds of the white-thorn to be first eaten by turkeys, in order to hasten the growth of the plants which spring from them.* The seeds of the Mistletoe and Juniper are well known to be conveyed by birds.

Wildenow advanced the opinion, that the great number of water-fowls which migrate annually from cold and warm climates, are the principal means of rendering marine plants so widely dispersed as they are known to be; by carrying with them the seeds of such plants, either in their stomachs, or adhering to their feathers. Rudolphi, however, declares, that he has examined a great variety of water-fowls and other birds of passage, without ever finding seeds adherent to them. He adds, that the birds of passage arrive in an extremely lean state, and with their stomachs perfectly empty, thus precluding all probability of their conveying undigested seeds.†

These considerations render it improbable, that birds perform a very important part in the diffusion of seeds to distant places; but they occasionally convey even large seeds from one tract of country, and probably from one island to another. Mr. Lyell has cited the relation of Captain Cook, who says, that Mr. Forster shot a pigeon with a wild nutmeg in its crop: this happened in the Isle of Tanna, where no

* Lyell's Principles of Geology, book iii.

† Wildenow, Grundriss der Kräuterkunde, 3 auflag. Rudolphi, über die Verbreitung der Pflanzen, p. 116.

Digitized by Google

nutmegs ever had been found.* I was lately informed that a piece of ground, in Herefordshire, which had been a grove of fir-trees, and which had been laid bare by fire, was afterwards covered by oak-trees, which sprang up spontaneously. A person who was surveying the ground, and wondering at the appearance of the young wood of oak-trees, happened upon the spot to shoot a jay with an acorn in its mouth, and he concluded, that he had thus found a clue to what had appeared a mystery.

By far the most important agencies in the diffusion of seeds, are, doubtless, those of the atmosphere and of water.

Paragraph 3.—Diffusion of seeds by means of the atmosphere.

Rudolphi contends, that the diffusion of plants by means of aërial currents, must be of more limited influence than it is commonly supposed to be. He thinks, that winds can scarcely convey even those seeds which are provided with pappi or winglets over many miles, or further than the immediate vicinity of places where they originate: plants could only thus be widely spread when their dispersion is continuous, and not interrupted by great intervals of space: when the same species are found in the mountains of Lapland, and in the Alps of Switzerland, without appearing in the intermediate countries, it is difficult to suppose, as Rudolphi has remarked, that they could have been spread from one of these places to the other by means of aërial currents. This writer deems it impossible to explain by this or any other known method of diffusion, such facts as those observed by Oloff Swartz, who found European mosses in the mountains of Jamaica, and even several of the phanerogamous plants of Europe, as Scirpus lacustris and autumnalis, Hydrocotyle vulgaris, Alsine media, Euphorbia chamæsyce, Sisymbrium nasturtium, Medicago lupulina, indigenous in the West India islands. He remarks, that M. de Humboldt found, in the mines of New Spain, the same subterranean cryptogamous plants which are known to grow in deep excavations of the

* Lyell's Geology, book iii. ch. 5.

Digitized by Google

earth in Europe. These facts appear to Rudolphi inexplicable on any other hypothesis than on that of the universal diffusion of plants wherever physical conditions exist adapted to their nature, independently of original dispersion from any given centres.

But before we conclude with Rudolphi, that the dispersion of plants is more extensive than it is possible to explain, without admitting something closely bordering on the theory of equivocal production, we must take into the account a variety of facts, which plainly indicate a very extensive diffusion of seeds through the atmosphere, as well as through soils, and the possibility of their being preserved in the earth, under a variety of circumstances, for an indefinite period of time, so that particular kinds are almost everywhere at hand, and ready to make their appearance as soon as conditions are present which favour their development.

It is well known, that when a piece of ground is laid bare, it is speedily covered with vegetation, and that this consists not uniformly of plants which grow in the immediate neighbourhood, but often of species which are only found at very distant places. It happens, indeed, not unfrequently, that in soils newly turned up, plants appear which have not been seen in the same districts within the memory of man. These would appear to be, partly kinds which are transported by the atmosphere, and take root on a new surface which affords them a very congenial soil, but principally plants of which the seeds have lain concealed for many years, at great depths under-ground, until they are brought up under circumstances favourable to their vegetation.

It is commonly observed, that clover is ready to spring up wherever wood-ashes have been strewn, or where weeds have been burnt. It is said that the same thing happens when soap-lees have been spread upon the ground. Here the soil imbued with vegetable alkali, affords a congenial receptacle to seeds which are very generally diffused through the air.*

* I am informed by Professor Graham, that after any hill-pasture in Scotland has been laid dry and limed and the surface broken, white clover always makes its appearance.

Digitized by Google

Many remarkable facts are referable to this or to some analogous explanation.

The growth of certain plants is known to prepare soils for other species, which vegetate after such plants more readily than elsewhere, and even spring up spontaneously, or without seeds purposely deposited. When vast forests are destroyed by fire in countries previously uncultivated, either by men with the view of bringing the ground under tillage, or in those accidental conflagrations which break out occasionally, and spread devastation through whole regions, it is known, that certain kinds of trees are usually replaced by others. The same trees do not reappear in the same spots, but they have successors which seem regularly to take their place. Thus the pine forests of North America when burnt, afford room to forests of oak-trees. The particular kinds of seeds are never long wanting to which the new soil is congenial. If we had only to find an explanation of the spontaneous appearance of mushrooms or of mould, we might, perhaps, be disposed to admit the theory of equivocal production, where it is difficult to account for the presence of seeds; but the production of oak-trees without acorns will scarcely be thought probable, though the latter supposition may, perhaps, be not more beyond the sphere of possibility than the former. If the presence of acorns is admitted as sufficiently indicated by the appearance of oak-forests on a new surface, a similar admission will be made as to the pre-existence of seeds in all analogous circumstances.

In some instances it appears clear, that seeds cannot have been newly introduced; and we are obliged to conclude, that they had long lain buried beneath the surface of the soil. This was the case in the following instances which I relate on the authority of Professor Graham of the university of Edinburgh.

Previous to the year 1715, no broom grew in the king's park at Stirling, but in that year a camp was formed there, and the surface of the ground consequently was broken in many places. Wherever it was broken broom sprang up. The plant was subsequently destroyed; but in 1745 a similar growth appeared after the ground had been again broken

Digitized by Google

for a like purpose. Some time afterwards the park was ploughed up, and the broom became generally spread over it. Some years ago, a gentleman planted a garden in Stirlingshire, and as he was about to make a washing-green in the immediate neighbourhood, he took from six to nine inches of soil off the surface of the field, and carried it into the garden; he then sowed the washing-green with grass-seeds. In the field thus uncovered seedling broom appeared as thick as the grass which had been sown. Broom is a frequent plant throughout the whole district in which the king's park and this gentleman's garden are situated, but the seeds could not have been supplied by the wind, as Professor Graham concludes, from the following reasons: first, because they are heavy, round, and without wings; and, secondly, because all the broom-seed in the parish could not have produced such a crop, as that which sprang up in the said bleaching ground. How long the seeds must have remained in the ground cannot even be conjectured; no cause can be imagined which can have conveyed them within many years either to the king's park, or the bleaching ground. The fact cannot be attributed to the agency of winds for the reasons above stated, and the form of the ground is such, that no stream of water could have transported them, or have covered them afterwards with soil. Such an effect must have resulted from the operation of causes continued during a long period of time.

In several places in the neighbourhood of Edinburgh, the breaking of the surface, as Professor Graham assures me, produces an abundant crop of Fumaria parviflòria, although the same plant had never before been observed in the neighbourhood.

A gentleman near Dumfries lately cut in a steep bank a new approach to his house, and immediately a large quantity of Verbascum thapsus sprang up.

Another fact of a similar kind, which I likewise owe to Dr. Graham, would serve to indicate, if there were any doubt on the subject, what is the true explanation of the preceding. "To the westward of Stirling there is a large peat-bog, a great part of which has been flooded away by raising water

Digitized by Google

from the river Teith and discharging it into the Forth, the under-soil of clay being then cultivated. The clergyman of the parish standing by while the workmen were forming a ditch in this clay, which had been covered with fourteen feet of peat-earth, saw some seeds in the clay which was thrown out of the ditch: he took some of them up and sowed them; they germinated and produced a crop of Chrysanthemum segetum. What a period of years must have elapsed while the seeds were getting their covering of clay, and while this clay became buried under fourteen feet of peat-earth!

These facts, which clearly prove that seeds may be concealed in the earth for an indefinite period without losing their vitality, must have an important bearing on the theory of the dispersion of plants. They show that there is no necessity for resorting to so bold an hypothesis as that of equivocal production, in examples which would be otherwise very difficult of explanation.

To return to the consideration of the diffusibility of seeds by means of atmospheric currents, it cannot be doubted, that their agency is productive of considerable effects in the dispersion of the lighter seeds, such as those of mosses, fungi, and lichens; these are diffusible through the air in an impalpable powder, like thin smoke, which may be blown to very distant places, and under the influence of permanent aërial currents, such as the trade-winds, may be conveyed, as it would appear very probable, from one part of the world to another. M. de Candolle has recorded an observation which seems to place this supposition beyond all reasonable doubt. At Quimper Corentin, on the south-west coast of Britanny, he discovered on some trees two lichens, the sticta crocata and the physcia flavicans, which have never been found in any place in France. These lichens are peculiar to Jamaica, and M. de Candolle supposes that their seeds had been carried thence by the south-westerly winds, which prevail during a great part of the year on this part of the French coast.*

* Essai sur la Géographie Botanique.

Digitized by Google

Paragraph 4.—Diffusion of plants by water.

It is certain, that plants have been transferred from one country to another, by means of currents in the ocean, and by rivers; and it is probable, that water is one principal medium of the dispersion of seeds. It is well known, that plants of the sea-coast are among those which are most extensively spread in different regions.

The seeds of these plants are of such a character, that they are not easily destroyed in the waters of the ocean, and of those which appear less likely to be thus preserved, it probably happens occasionally that a few escape out of the great number which are exposed to the causes of injury. It is easy to collect facts of this description, many of which were known to Linnæus, and are recorded in the Amœnitates Academicæ.* The seeds of the Cassia fistula, Anacardium occidentale, Mimosa scandens, Dolichos urens, Guilandina bonduc, and several other plants of Jamaica and the equinoctial countries in America are occasionally collected in the Hebrides, whither they are conveyed by the Gulf-stream.† Numerous instances of a similar description may be collected in the works of botanists and scientific travellers.‡

Streams of fresh water descending from Alpine regions bring with them the seeds of plants, and it is common to find a similar flora along the banks of rivers, and even the plants of mountains occasionally reappearing where the waters have deposited them.§ Mr. Lyell cites a fact remarked by Keith and others, that the southern shores of the Baltic are visited by seeds which belong to the interior of Germany, and the western shores of the Atlantic by seeds which have been generated in the interior of America.

* Amœn. Academicæ. De Coloniis Plantarum.

† Pennant's Voyage to the New Hebrides, 1772, p. 23. Sloane in Philos. Transactions. No. 223, p. 398. M. de Humboldt's Travels, i. p. 59.

‡ Amœn. Acad. De Telluris habitabilis incremento.

§ De Candolle, Dict. des Sci. Nat.

Digitized by Google

The greatest difficulty presented by the diffusion of plants, when we adhere to the theory of their propagation, and reject that of equivocal production and of the spontaneous generation of the same species in distant places, arises from those not very uncommon instances in which aquatic plants occur in the rivers and marshes of countries remote from each other. Rudolphi says, that he possessed specimens of Potamogeton natans collected in St. Domingo, in nothing different from that of Europe. The Nymphæa lotus, supposed formerly to have been peculiar to Egypt and India, grows also in Hungary. Wildenow remarked, that Zannichellia palustris, Lemna minor, and polyrrhiza, and several other water-plants, are indigenous both in Europe and in North America.

It must be remarked, that many of these plants are very generally and almost universally spread, and their discovery in two distant places is so much the less remarkable. In other instances we must have recourse, in order to account for them, to the changes which the surfaces of various lands have undergone, and to extensive inundations. We can only thus explain, as De Candolle observes, such facts as the discovery of the Aldrovanda in the basins of the Po and of the Rhone. The same fishes and other fresh-water animals are also found in lakes which have no communication. The dispersion of these as well as of aquatic and even of mountain plants, can only be explained by reference to inundations, which in various times have covered extensive portions of our continents.*

Section IV.—*Phenomena connected with the Vegetation of Islands, and of opposite Coasts.*

We have seen in a former section, that the vegetation of countries separated by wide oceans, or by great distances of space from each other, consists *in general* of peculiar tribes; and that when, in regions parallel in latitude and similar in physical conditions, Nature reproduces analogous forms, or

* De Candolle, ubi supra.

Digitized by Google

families and genera resembling each other, and even allots species of the same genera to different countries; the *species* of plants are yet for the most part distinct in regions thus cut off from each other. We have likewise observed, that although the general law of Nature is what we have stated it to be, yet many exceptions to it may be found. We have in the next place remarked, that Nature has provided means for the dispersion of the vegetable tribes, which have been, to a certain extent, effectual in giving origin to colonies or migrations of plants, and that many plants have actually been conveyed by such means to distant shores where they have vegetated. The most striking of these instances were, as it was to be presumed, examples in which species had been conveyed to climates unfavourable to their multiplication. Had the climate of the Orkneys been congenial to the plants brought by the Gulf-stream, an abundant vegetation from the seeds thus conveyed would long ago have been formed, and we should not be able to ascertain the fact of any recent transportation of plants from tropical climates by the great oceanic currents. But since we know that plants have actually migrated from distant coasts, the fact being here shown by circumstances unfavourable to their multiplication, and since it is highly improbable that these are the only instances of the same kind which have taken place, have we not reason to advert to the same fact in other examples, when identical species are found vegetating in distant places? A survey of the vegetation of islands and opposite shores will throw light upon this subject.

We may observe in the first place, that in small islands, very remote from continents, the species of plants are very few, and sometimes quite peculiar. Thus in Kerguelen's Land, or the Island of Desolation, when visited by Captain Cook, although there was soil sufficient to afford a considerable verdure, it was found that this appearance entirely depended on one small plant, and the whole flora of the land contained only sixteen or eighteen species, including some sorts of mosses, and a kind of lichen. There was not the least appearance of a shrub in the whole country, nor were there any animals except seals and marine birds. These animals were

Digitized by Google

only visitants; but all the plants were thought by Mr. Anderson, from whom we have the account, to be peculiar to that island.

We have one instance of an island at no great distance from a continent having a peculiar vegetation. Mr. R. Brown has remarked, that there is not even a single indigenous species, characterising the vegetation of St. Helena, that has been found either on the banks of the Congo, or on any other part of the western coast of Africa. Does the diversity of marine and atmospheric currents more completely separate this island from the continent than its situation would imply, or are the nature of soil and other local circumstances, the cause of so marked a diversity? The last supposition seems the most probable; because, not only the species of plants, but likewise the genera in St. Helena, are different from those of the African coast.

But, generally, the flora of islands near to continents consists in part of species found also on the nearest main-lands. In some examples of this kind, circumstances confirm and seem fully to establish a conclusion which presents itself as a probable conjecture, namely, that in such cases the plants have been conveyed from one shore to the other. The Araucaria excelsa of New Caledonia has been found in New Holland. If a doubt is raised whether it migrated from one place to the other, we have to observe, that the same tribe inhabits also the intermediate Norfolk island, and that the part of New Holland where it exists is the coast opposite to the islands before mentioned. The Goodenia littoralis which grows on the western shores of Terra Australis, has been found on the opposite coast of South America: it is also found in New Zealand, which is situated between those shores.

M. de Candolle has remarked, that the British isles contain 1485 vascular plants, of which there are only forty-three that have not been discovered in France.

Malta and Sicily have some plants which belong to Europe, and others of an African stock.

The opposite shores of the Mediterranean present a remarkable sameness in their vegetation. Out of 1577 species

Digitized by Google

observed by M. Desfontaines in Barbary, there are only about three hundred, or scarcely one fifth part of the whole number, which are not known in Europe.*

The Canary islands, according to M. de Humboldt, contain plants found in Portugal, in Spain, in the Azores, and on the north-west coast of Africa. According to De Candolle, of five hundred and thirty-three vascular plants found in the Canaries, two hundred and twenty-three have been discovered in Africa.† A great number of species, and even entire genera, are peculiar to Teneriffe, to Porto Santo, and to Madeira.

Mr. R. Brown inferred, from the botanical specimens collected by Professor Smith in St. Jago, that the flora of the Cape de Verd islands is intermediate between the vegetation of the adjoining African Continent and the Canary isles.‡

But the principal insular region of our globe is the great Southern Ocean, including the Indian seas, and the most remote spaces of the Pacific. Much information has been collected on the botany of this region by the two Forsters, more lately by Mr. R. Brown, by Labillardière, Chamisso, and other scientific men who accompanied the French and Russian expeditions, and lastly by M. Lesson. This writer appropriates the term Polynesia to the groupes of islands and archipelagos of the Indian seas, including the Sunda, Molucca, and Philippine islands, with New Guinea, of which he considers the chains of Louisiade, the New Hebrides, and New Zealand to be continuations, and he comprises under the name of Oceania, the more remote groupes of the Pacific. The former, which consist according to M. Lesson of primitive, or as he terms them primordial formations, are regarded by him as the terminal points, and the débris of the great Austral Asiatic continent, which has undergone disruption in its equatorial region: the islands of Oceania on the other hand are of volcanic and madreporic origin, of recent

* Personal Narrative,—Translation, p. 270, vol. i.

† Dict. des Sci. Nat. p. 406.

‡ Brown's Appendix to Capt. Tuckey's Voyages, p. 476.—See also Extracts from Smith's Journal, in Tuckey's Narrative, p. 29.

Digitized by Google

formation, posterior to the era of the present surface of our planet.*

The vegetation of Oceania is composed, according to this excellent naturalist, of plants exclusively Indian, or analogous to those of equatorial India, of the Sunda isles, Moluccas, and New Guinea. Their distribution has evidently taken place from Polynesia eastward to Oceania, and towards Easter island and the American coast. M. Lesson observes, that the vegetable kingdom, so luxuriant in the isles of Polynesia, lessens gradually in richness as we advance towards the east. The isle Juan Fernandez, however, has not yet been examined, and it would be not surprising if this ancient volcano should be found to bear the flora of the continent which it approaches.

The Indo-Polynesian vegetation displays itself in all its splendour under the equinoctial line. Majestic in the Sunda isles, it spreads progressively over the numerous Malayan and Tidorian possessions, and appears in all its grandeur and luxuriance in the eastern Moluccas, and the land of the Papuas. It is there, that numerous Palms, Cycades, and Ferns assume the graceful and slender form of light columns: immense forests are composed of lofty trees, such as the *gatip* or Inocarpus edulis, bread-fruit-trees, nutmeg-trees, and Spondias: it is in the depths of these forests that we meet with the esculent plants of the Oceanian people, shrubs and legumes of innumerable and various forms. In observing the mass of this vegetation, we find it perceptibly diminishing as we approach the straits of Torres, which only a few species traverse, belonging to genera by no means extensive. Such are the cabbage-bearing Arec, the Indian Erythrine, two wild nutmeg-trees, and the Flagellaria indica. Continuing to examine the flora of the chain, reaching southward of Polynesia, viz. New Britain and New Ireland, we find again the same luxuriance; the forests are still peopled with the Areca and sago-trees, with great Ferns, and Drymyrrhizeæ. Proceeding towards higher latitudes, in the New Hebrides and

* Hist. Nat. des Mammifères et des Oiseaux découverts dépuis 1788 jusqu'à nos jours. Par R. P. Lesson, Paris, 1828.

Digitized by Google

New Caledonia these tribes become less numerous; and still further southward the Austral temperate zone completely changes the physiognomy of vegetation, and the Isle of Norfolk, has, in common with New Holland, the Araucaria, found also in the harbour of Balade, and with New Zealand the Phormium tenax. It is, however, remarkable, that this vast island, composed of two lands separated by a channel, though so near New Holland, and lying under the same latitude, differs from it so completely, that they display no resemblance in their vegetation. Yet New Zealand, so rich in genera peculiar to its soil and little known, has some Indian plants, such as pepper, the olea, and a reniform fern, which is said to exist in the Isle of Maurice.

The high lands of southern Polynesia between the tropics partake of the alimentary plants of the Indian islands, which have spread themselves in different directions to the most distant clusters, in a manner which it is difficult to explain, since it is often contrary to the prevalent course of winds and currents. Nearly all the high islands of oceania bring forth almost spontaneously bread-fruit-trees, the taro, or esculent arum, sugar-canes and bananas. At Taiti is found the Hibiscus rosa-sinensis, so abundant in the Moluccas; the Pandanus, Gardenia florida, the cyatheæ, the cratæva, figs and bamboos, there display their several tribes. And it is on this island, as M. d'Urville observes, that a multitude of Ferns begin to appear which inhabit this zone, spread hence and even from the Marquesas to the Moluccas, some even reaching to the Isle of France. Easter island, beyond the tropic of Capricorn, presents but a small number of species, and these are of Indian tribes; such are Hibiscus populneus, some mimosas and a solanum, which the younger Forster found also at Taiti.

" It is more easy to trace the way in which vegetation has spread to the low coral islands, and we have often followed the different stages of its progress. The flora here consists but of a few species. The manner in which this interesting phenomenon has taken place, answers almost exactly to the description, somewhat poetical, but true in its main principles, of vegetable migrations, sketched in so

Digitized by Google

delightful a style by M. Bernardin de St. Pierre, and M. Chateaubriand."

A review of the general bearing of the phenomena connected with the vegetation of islands, brings out results strongly confirmatory of the dispersion of species from particular central points. Islands of considerable extent, and particularly those of ancient formation, though near to continents, have in several instances peculiar systems of vegetation; but where the flora of islands is not peculiar, it is almost everywhere precisely of that character which we should anticipate from the local conditions and proximities of the mainlands or neighbouring shores.

A comparison of the flora on the different coasts of intertropical continents has developed some relations which we must not omit to notice.

Upwards of six hundred plants were collected by Professor Smith in the neighbourhood of the river Zaire, which have been compared by Mr. Brown with the plants of other coasts within the tropics. Of these six hundred species,

Twenty-two are common to equinoctial Africa, India, and America.

Thirteen are common to Africa and America, and unknown in India.

Seventeen are common to Africa and India, and not found in America.

Most of these plants are strictly equinoctial, and they are such whose dispersion cannot be ascribed to human agency. It was observed by Mr. Brown, that most of them were found on the lower parts of the river Zaire, where they form but a small part of the entire vegetation, and that most of the dicotyledonous plants in the list, are such as produce seeds capable of preserving their vitality a long time in the currents of the ocean, particularly those belonging to the orders Malvaceæ, Convolvulaceæ and Leguminosæ, two of which are among the most numerous families on all equinoctial shores.

Digitized by Google

Section V.—*Recapitulation and conclusion.*

We may now compare the results which arise from the facts stated in this chapter, with the three suppositions laid down in the outset, respecting the origin of plants.

In the first place it is obvious that the hypothesis of Linnæus, which represents all plants whatever as originating from a common centre, is wholly irreconcilable with the phenomena. It is unnecessary to say anything further on this part of the subject. We have seen, that various parts of the world, remotely separated, possess each of them a vegetable kingdom in a great measure, at least, peculiar and distinct from the productions of other countries.

The same considerations are, perhaps, equally conclusive against the third hypothesis, that the species of plants are universally diffused wherever climates and physical conditions in general are congenial to their existence and propagation. This opinion, which has been held by many eminent naturalists, seems to be most clearly refuted by the following arguments.

1. It would be easy to discover districts, situated respectively in North America and in Europe, or in equinoctial America, Africa, and Asia, in which all the same physical conditions exist, namely, a parallel temperature and elevation, a similar soil, and the same degrees of humidity in the atmosphere; yet the species of plants in these several districts will be far from being identical. The vegetable tribes will present in each respectively, analogies of form and general character; but few, if any, of the same species will be found in localities thus separated.*

2. Instances may frequently be observed in which plants become naturalized in countries where they had never existed until they were conveyed by human agency, or by the accidental transportation of seeds. When this has once happened the results prove, that the climate and all external

* Vide De Candolle, ubi supra, p. 402.

Digitized by Google

conditions are perfectly congenial to their nature, since they have spread, in a short time, over extensive regions, and have appeared to supplant, in some places, the indigenous tribes. Previously to the importation of seeds, the physical conditions locally present had no power of producing such plants; nor does it appear, that their existence is so connected with external conditions as to have been from the origin of things necessarily or naturally co-extensive with them. When introduced they multiply, just as horses and oxen from Europe have produced herds which cover the immense plains of Paraguay.

It appears, then, that the phenomena connected with the distribution of plants are only reconcilable with one hypothesis, or rather they lead us clearly to one inference; namely, that the vegetable creation was originally divided into a limited number of provinces. Each country had its peculiar tribes, which at first existed not elsewhere. This conclusion results most distinctly from the general difference in the species belonging to each of the great continents; a difference never called in question in respect to the principal masses of vegetation, and the great aggregate numbers of plants which, by their situation at a distance from sea coasts, and by the nature of their seeds, are removed from the chances of transportation; and, secondly, from the arrangement of gregarious plants round some particular foci, the individual species being spread out in various directions with reference to the central points.

If we now revert to the question, of what nature are the exceptions to this general inference; or whether it is probable, that the plants which are found in different botanical provinces were indigenous in all of them, or have been dispersed from one original seat; the following considerations deduced from facts already surveyed, will serve to point out which is the probable conclusion.

1. That there are natural provisions for the dispersion of plants, and causes actually in operation which have this result.

2. That the species of plants are widely spread or re-

Digitized by Google

stricted to particular places, nearly in the proportion in which they appear to be thus diffusible or otherwise. The diffusible nature of seeds belonging to the cryptogamous species has been often adverted to, and by many has been thought to afford a sufficient explanation of the almost universal dispersion of the cellular tribes of plants. M. De Humboldt seems, indeed, to admit the original diffusion of the fungi and other agamous plants, but M. de Candolle with greater reason rejects this opinion. He remarks, that the determination of species is very difficult in these tribes of simple structure, and that the minuteness of seeds explains the wide extension of such tribes. Among the more perfect plants, it seems that the species which vegetate on the sea coast and at the mouths of rivers are the most widely spread.

Thus the phenomena to be explained coincide with the supposition, that plants have been accidentally spread, when we advert to the facilities afforded by their nature and organization. They equally agree with this hypothesis when we direct our attention to the situation of countries. For,

I. The phenomena related to the dispersion of plants to islands and sea coasts, are, as we have seen, in many instances such as to force upon us the conviction, that particular species have spread themselves from one place to another. I now refer to some of the facts connected with the dispersion of plants over different islands in the Pacific, and with the corresponding vegetation of opposite shores. But generally considered, the diffusion of tribes over islands coincides with what we should expect to find on the supposition now contemplated, and gives the negative to any other.

II. The different proportions in which the same species occur in the flora of continents and great regions tend to establish the same belief. I allude to the fact, that so many tribes are common to the northern continents where they approach and afford facilities for migration; and that the number diminishes as the great lands become separated by wider oceans towards the equator, till in the south we find

Digitized by Google

regions so entirely diverse in their botanical productions, as are those of South Africa, South America, and Austral Asia.

On the whole we may conclude, with a great degree of probability, that each tribe of plants, and especially of the more perfect plants, had on the earth one original habitation, from which it has been dispersed according to the capabilities afforded by its structure, and the aid of external agencies.

Digitized by Google

CHAPTER III.

DISPERSION OF ANIMALS.

SECTION I.—*Of the lower orders of Animals.*

ON adverting to the dispersion of animals, we are struck by a fact in close analogy with one of the most general observations presented by the survey of the vegetable tribes, and their local distribution. I allude to the almost universal dispersion of organized beings of the smallest size and most simple structure, and the more limited existence of those whose organization is complex, and their bulk comparatively great. We have seen, that botanists explain this fact, as far as the vegetable kingdom is concerned, by reference to the universal diffusion through the atmosphere of the minute seeds which produce the simplest plants. Recourse has been had to a similar expedient for explaining facts which otherwise bring us to the doctrine of equivocal generation in the animal kingdom; but still greater difficulties here stand in the way. These difficulties have been strongly stated by Rudolphi, who was a decided supporter of the theory of the spontaneous origin of animals. Rudolphi argues, that Infusory Animalcules are everywhere produced of the same form and structure. He says, " I am not acquainted with any researches into the nature of these creatures made in other quarters of the world; but as they are so similar in the different countries of Europe, we may expect that they will be found to agree for the most part in other regions. Those simple structures, which are so speedily produced at the decay of larger animals, require very little for their existence, and the requisite conditions are easily fulfilled. After the acute researches of Treviranus the elder, no one will, as formerly, mistake these creatures of a moment. Truly, I know

Digitized by Google

nothing more ridiculous, than the theory which peoples heaven and earth with seeds, which come nobody knows whence, and quietly wait for the moment, when some naturalist is about to make experiments, in order to spoil his work, and surprise him by the appearance of so many interlopers. As mould and various fungi generate themselves under the necessary conditions, so likewise do these infusory animalcules; and the most unbridled fancy can hardly imagine, that the infusoria were produced in Asia, and from thence have been spread over the world." From the infusoria, Rudolphi goes on to make similar strictures on the production of other zoophytes; but he seems to consider the facts which relate to intestinal worms the most conclusive in favour of the theory which he has adopted.*

I shall not enter at large on the discussion of so wide a question as that which refers to the existence of equivocal or spontaneous generation, since it appears to be but remotely connected with the main subject of my inquiry. Whether those minute creatures, whose size is so small as to baffle all accurate researches into their mode of origination, produce themselves and begin to exist without parentage or not, nothing of this kind can be predicated of animals whose nature admits of more satisfactory investigation; and although reasoning from the known to the unknown can amount to nothing more than probability, yet to proceed in the reverse direction would be perfectly absurd.† The inquiry, whether species of animals proceed generally from many, or in the instance of each species from a single original stock, cannot derive illustration from any surmises founded on the supposed presence of minute beings of simple organization wheresoever the conditions exist which appear compatible with their pro-

* Rudolphi's Beyträge zur Anthropologie, &c. § 130, u. s. f.

† The reasons which have induced most of the naturalists of the present day to reject the doctrine of equivocal generation, may be stated under two heads; first, the argument of analogy derived from the known fact with respect to all the higher orders of animals, as well as of plants; secondly, the negative argument arising from experiments, such as those of Spallanzani, and Sennebier, which prove that by precluding the access of minute seeds and ova floating in the atmosphere, the production of minute animal and vegetable life is prevented, in a very great measure at least, from taking place.

Digitized by Google

duction. We must proceed to establish inferences from particular facts, and from a survey of what actually is known in respect to each different department of the animal creation. From the known facts we shall be enabled to draw inferences which will be sound and firm, as far as they relate to particular departments of nature, whatever may be the case in other regions yet involved in obscurity.

I shall now trace the phenomena connected with the dispersion of animals, arranging them according to the elements and the departments of the world inhabited severally by particular tribes, rather than the order of the zoological system: I proceed, first, to insects and birds; secondly, to marine animals; thirdly, to animals of the land, including mammifers and reptiles.

Section II.—*Of the dispersion of Insects.*

The local existence of insects is closely connected with that of the plants and animals which afford them sustenance, and which, in many instances, furnish them their only places of concealment and abode. We should, therefore, previous to any inquiry respecting facts which particularly relate to insects, expect to find the same laws prevailing in this part of the creation, as in the dispersion of vegetable tribes, and in that of other animals. A great number of insects are especially limited in the sphere of their existence by the presence of particular plants. With the exception of mosses, algæ, and lichenosæ, which are, in a great measure, exempted from contributing to the support of the insect tribes, there are few species in the vegetable creation which are not destined to afford habitation and sustenance to one or more species, and in numerous examples, several different kinds of insects are appropriated to one plant. One half at least of the insect tribes are thus limited to particular regions, since it appears, according to MM. Kirby and Spence, that phytiborous and carnivorous insects exist in nearly equal proportions. But the remaining half are not much more at large with respect to the sphere of their existence, since the animals on which they feed can in general be supported only under given

Digitized by Google

conditions of nutriment and climate, which are themselves determined by localities. The noxious insects which man carries with him are said to be the only kinds which are universal.

Fabricius had some knowledge of the geographical distribution of the insect tribes and of their local relations, but the subject had never been fully investigated until this, as well as most other questions in the natural history of the insects and arachnides occupied the attention of M. Latreille. The following are the general conclusions of this celebrated naturalist, with respect to the dispersion of species in this department of nature.*

1. The whole or a very great number of the arachnides and insects inhabiting countries of which the temperature and the soil are the same, but separated by great distances, are composed, in general, of different species, if the countries are under the same parallels. All the insects and arachnides which have been brought from the eastern parts of Asia, as China, are distinct from those of Europe and Africa, whatever the latitudes and temperatures of the Asiatic countries may be.

2. The greatest part of the same animals differ, besides, specifically, when the countries which they inhabit having a similarity in the soil and temperature are separated one from another, the differences of latitude being of no consequence, by natural barriers which interrupt the communication between these animals or render it difficult; such as seas, lofty chains of mountains, and vast deserts. The arachnides, insects, and even the reptiles of America and of New Holland, cannot be confounded with the animals of the same classes inhabiting the old continent. The insects of the United States, although often very similar to ours, are different in some characters. Thus the tribes which inhabit the kingdoms of New Grenada and of Peru, countries near to Guiana and likewise equinoctial, are yet in a great measure different from those of Guiana, separated from them by the Cordillera which divides the climates of these countries. In passing from Piémont into

* Introduction à la Geographie Générale des Insectes et des Arachnides, par P. A. Latreille. Mémoires du Muséum d'Hist. Nat. tom. iii.

Digitized by Google

France by the Col de Tende, a very sudden change is perceptible. These remarks may have exceptions, relative to aquatic species. We are acquainted with insects whose habitation extends very far. The thistle-butterfly, termed "La Belle Dame," so common in our climate, and even in Sweden, is found in the Cape of Good Hope. New Holland likewise has a species very near to it. The sphinx of the *nerion*, and sphinx *celerio*, have for their northern boundary our climate, and the Isle of France for their southern limit. Among the aquatic insects, the *dytiscus griseus* inhabiting the waters of the ci-devant Provence, and of Piémont, is not uncommon in Bengal.

It appears from some further observations by the same writer, that the distribution of genera and the species composing them, in this department of the animal creation, bears some analogies to those general facts which we have observed in the dispersion of plants, and to the laws of geographical diffusion which prevail in other departments of zoology. M. Latreille was aware of this relation. He remarks, for example, an approximation in the entomology of America to that of the Austral countries and the eastern parts of Asia. But this observation refers to genera of which particular species are the peculiar stock of each country, and not to any example in which the same species is found in separate regions. The insects of New Holland are often of the same genera with those of the Moluccas, and the south eastern parts of India: they have much affinity with those of New Zealand and New Caledonia, and generic relations, as we have observed, with those of America: yet the entomology of New Holland has, according to M. Latreille, a peculiar type.

Many instances have been pointed out by naturalists in which tribes of insects existing in one region, but absent in another where the climate is parallel and the local conditions apparently similar, are replaced by analogous groupes. The honey and wax of Europe, Asia, and Africa, are prepared by bees of the same genus with our common hive-bee. In America, this genus is not to be found in the native state, but is replaced by Melipona and Trigona; and in New Holland, by a still different but undescribed representative.

Digitized by Google

The Melolonthidæ and Rutelidæ of the old and new world, are represented in Terra Australis by the brilliant and numerous Anoplognathidæ. The Rhipicera of the Brazils is of a different type from that of New Holland. The singular genus Cremastocheilus of North America has the Genuchus K. for its representative in Africa, and the Lucani of other countries give place in New Holland to the Lamprima of Latreille, and the Ryssonotus of M'Leay.*

MM. Kirby and Spence have enumerated some of the principal genera of insects which impart a peculiar entomological character to different regions. They observe that the genera Manticora, Graphipterus, Glaplegous, Eurychora, Pneumora, Masaris, and many others, are peculiar to Africa. In Asia alone we find Mimela, Euchlora, Colliuris, Catascopus, Apogonia, a peculiar form of Horia. In America, Agra, Galerita, Nilion, another type of Horia, Tetraonyx, Rutelia, Doryphora, Alcernus, Erotylus, Scotinus, Cupes, Corydalis, Labiolus, Heliconia, Castnia. In New Holland, Hellulo, Edephastomas, Anoplognathus, Agrotiphila, Cerapterus, Heleus, Adelium, Paropses, Achirus, Thynnus.

Section III.—*Of the dispersion of Birds.*

The geographical distribution of birds has seldom engaged the attention of zoological writers, and with the exception of Professor Illiger's "Tabellarische Uebersicht,"† in which the abodes of 3,800 species were the subject of inquiry, scarcely any systematic attempt has been made to elucidate this department of natural history. The ornithology of many extensive regions, abounding in tribes of birds, has been as yet so imperfectly explored, that it would be impossible for any naturalist of the present day, to treat this subject with an extensive and satisfactory examination of all its bearings.

Buffon imagined the total number of species existing in the class of birds to be about 2,000. It has been stated, that

* MM. Kirby and Spence's System of Entomology.

† Tabellarische Uebersicht der Vertheilung der Vögel über die Erde. Ablandlungen der K. Akademie der Wissenschaften in Berlin. b. x.

Digitized by Google

6,000 species are already ascertained, and many new species are added every year to the catalogue. The whole number in existence must be very much greater than this aggregate, since 500 species have been ascertained in the colony of the Cape,* while the ornithology of most intertropical countries, which abound in tribes of birds, has been, in comparison, little explored. Europe and the United States are, perhaps, the only regions the winged tribes of which have been adequately compared. The known birds of the new world were reckoned by Charles Lucien Bonaparte, in 1827, to be three hundred and ninety-six species, of which three hundred and eighty-two belong to the United States. The number of species ascertained in Europe in 1832, was stated by the author of an excellent paper in the Quarterly Review, to be three hundred and ninety-five, of which two hundred and seventy-seven species are natives of Britain and Ireland. The species of Europe and of North America have been classed under one hundred and seven genera, of which sixty-four are common to both continents.

Of all existing tribes of animals, birds and the cetacea are, partly owing to their structure, and in part by the nature of the media they inhabit, best fitted for extensive migration. Accordingly in these tribes, and scarcely in any others, there are individual species which appear to be almost universally spread. The locomotive powers of some birds are so great, that scarcely any natural barriers are capable of setting limits to their migration. The only boundaries which confine them are uncongenial climates, or physical circumstances incompatible with their existence. Some of the largest birds of prey are found in many distant countries. It has been observed, that even those tribes which are nearly or wholly destitute of the power of flight, are more extensively spread than the wingless animals: that the ostrich, for example, is to be found over all Africa, from the Cape of Good Hope to the Cyrenaik, and from Cape Verde to Babel-mandeb; that the same osprey, or fishing eagle, wanders along the shores

* South African Quarterly Journal, No. 1. p. 10.—Quarterly Review, vol. xlvii. p. 853.

Digitized by Google

of Scotland, and on those of the south of Europe and of New Holland. The Chinese goshawk is said to reach from the south-eastern tracts of Asia to the western coast of Europe, inhabiting many intermediate stations and extending across the broad expanse of the American continent: the lammergeyer haunts the heights of the Pyrenean, the mountains of Abyssinia, and the Mongolian steppes. The penguin falcon occurs in Greenland, Europe, America, and New Holland.* The structure of these tribes, or the local circumstances of the countries where they were placed, affords a full and adequate explanation of the fact that their wanderings have been so extensive. On the other hand it appears as a general observation, that tribes in respect to which these conditions are found to be reversed, are confined to a very limited range. This is the case especially with birds inhabiting islands and endowed with but weak powers of flight. An example may be found in the species belonging to the parrot tribe, of which the number known some years ago amounted to two hundred and thirty-nine. These are divided into groupes, which are distributed separately to different parts of the world, to India, to Africa, and to America. The lories inhabit New Guinea, Moluccas, and other eastern islands, but are unknown to the new world. Owing to the weakness of their flight, one island of an archipelago often contains a peculiar species which is wanting in other islands of the same groupe.† Another illustration of the same remark is furnished, as Mr. Lyell has observed, by the humming-birds. They are peculiar to the New World, where a few have a wide range; Trochilus flammifrons is common to Lima, Juan Fernandez and the Magellanik, but other species are peculiar to one of the West India islands.‡ The common grouse peculiar to Britain is a similar instance of single collocation.

It may be remarked, that the distribution of genera among birds to different countries, displays the same method of

* Quarterly Review, vol. xlvii. p. 357.

† Remarks on the History and Distribution of the Genus Psittacus, or Parrot. —Edin. Philo. Magazine, May, 1832.

‡ Principles of Geology, vol. ii.

Digitized by Google

arrangement, if we may use that phrase, as that which has always been observed in the dissemination of plants and of the insect tribes. As ornithology has advanced, it has been found more and more requisite to divide extensive families of birds into different groupes, distinguished from each other by some peculiarity of character, or by a leading deviation in the nature and habits of species from the nature and habits of other species belonging to the same family. It appears more and more as knowledge becomes more extensive and particular, that groupes thus constituted have different geographical relations. Thus in the late work, still incomplete, of the excellent naturalist M. Lesson, the vulture tribe, or as they are more properly termed the Vulturidei, are separated into departments, and distinguished by particular names. Of these the true Vultures and the Percnopteri belong to the old world; the Sarcoramphi belong to South America, as well as the Catharti and the Iribins, and the Gypaëtes is proper to Europe. New Holland is distinguished from the rest of the world in having none of the vulture tribe, which are there replaced by the different races of Caracaras or Polybori.*

Section IV.—*Of the dispersion of marine Animals.*

The inhabitants of the ocean are not so entirely limited by those abrupt barriers which confine within particular regions the natives of the land, of islands separated by seas, or of continents divided by rivers and chains of lofty mountains. It seems likely, that many of the marine tribes should be found to take a wide range, and to wander wherever the vast regions of the ocean afford them an open path. The natural history of these tribes is among the most imperfect departments of zoology, and the undefined characters of particular species has long favoured the error of those who have regarded some of them as cosmopolites. Mistakes of this description have been pointed out by M. Péron in regard to the tribes of Phocæ. Under the name of Phoca ursina, or sea-bear, more than twenty species have been described, or merely indicated,

* Hist. Nat. des Oiseaux, p. 12.

Digitized by Google

by various authors, which are distinguishable from each other, not only in colour, form, size, and the relative position of their fins, but even in the number of their teeth and the presence or want of external ears. Not less confusion has prevailed respecting the Phoceæ vitulinæ or sea-calves, an imaginary species supposed to inhabit at the same time the frozen oceans of either pole, and to bask under the equatorial sun. Even the barriers which confine the ocean, were thought to have set no limits to the progress of this tribe, which has been said to have made its way into the Caspian, and what is still more strange, to have peopled with the native herds of the salt sea, the fresh-water lakes of Baikal, Ladoga, and Onega. Some writers have found no difficulty in supposing that seals, which breathe at the surface of the sea, could yet find a passage through subterraneous conduits from the Euxine to the Caspian. Others have preferred to make them travel up the great rivers of Asia, from the frozen ocean to the elevated lakes in the steppes of eastern Tartary, getting over some part of the journey on the land by means which are not explained. The facts which these conjectures are intended to make plain, rest on the authority of such writers as Langius and Isbrandt, and it is supposed with great probability by Péron* and by Lesson,† that the pretended seals of fresh-water Siberian lakes are otters.

Most of the instances in which marine animals have been supposed to have so wide a range, appear to have been reported on the authority of ill-informed persons, and so many mistakes have been detected in these relations as prove them to be unworthy of belief. Facts connected with the dispersion of seals, as well as of the Cetacea, have been investigated by MM. Péron and Le Sueur, and more recently by M. Lesson. By Peron it has been proved, that Steller and Fabricius have described two different animals under the designation of Phoca Leonina, and that three great species of Phocaceæ inhabiting the Austral seas have been confounded with the

* MM. Péron et Le Sueur sur les Habitations des Animaux Marins. Annales du Muséum, tom. xv.

† Lesson's Hist. des Mammifères, tom. iv. Les Phoques.

Digitized by Google

true sea-lion of the south. If so much uncertainty prevails with respect to some of the largest Phocæ of our northern hemisphere, it is probable, as MM. Péron and Le Sueur have observed, that still greater errors are involved in the history of the innumerable marine animals which inhabit all the regions of the Antarctic ocean. "How can we admit these improbable instances of identity in species which are registered in so many works? Observed even to the present day almost exclusively by men who are strangers to all the principles of science, incapable of making the comparisons and distinctions which it exacts; the majority of these animals are so little known, that it is impossible to determine anything with respect to their species." The same writers conclude by declaring, that among those tribes which they have been able to examine with their own eyes, or with regard to which they have obtained accurate information from others, there is not a single animal belonging to the marine amphibiæ of the antarctic region, which is not distinguished by specific characters from analogous tribes in the northern seas.

The dispersion of the Phocaceous tribes has been more recently investigated by M. Lesson. "These native inhabitants of the sea are nowhere more abundant, nowhere united in more numerous herds than upon the coasts of lands smitten with death, or enveloped in the ices of the pole. Here, indeed, have their savage tribes preferred to remain for ages, and here the number is continually increased by the destructive disposition of man, which incessantly pursues them, and drives them from milder climates."

The Atlantic ocean, as well as the Mediterranean and Caspian seas, the Indian ocean and the Red sea, the equatorial, as well as the arctic and antarctic oceans, are nurseries of seals; nevertheless we can confidently lay it down as an undoubted truth, that the Phocaceæ which live under the equator, and between the two tropics, are merely isolated or solitary tribes, rarely united even in small companies; and that those which live round the north pole, or upon the boundaries of the south pole, unite in great herds, or form innumerable legions. Some travellers have likewise pretended,

Digitized by Google

that the phocaceæ are found in the fresh waters of the lake Baikal.* Such a fact requires strict examination before it can be established. Some naturalists worthy of credit, and among others M. Péron, have remarked that it was easy to mistake otters for phocaceæ; and it is very probable that this error has been committed. It has been for a long time believed—and this mistake is of greater importance, since it has contributed to confound our nomenclature—that certain species of phocæ exist indifferently in either hemisphere: framed in conformity with this idea, the descriptions of Steller and Fabricius have been made to agree with those of Forster, Pagés, Dampier, and others. Péron has first pronounced strongly against this opinion, and we fully coincide with him. In fact, large animals, and the phocæ among others, have bounds which they seldom pass. The marine elephant, for example, has never been found in the northern hemisphere, nor has one of the phocæ of the north been observed in the south; and if the sea-lion, bear, and sea-cat of Krakenninikow and Steller are looked upon as synonymous with the animals so termed by Pernetty and Forster, the name which so improperly unites them, and which is given by navigators without reflection to all amphibious animals, has had more share in this than any resemblance or analogy of form.

"Adopting thus the views of Péron, which no example invalidates, while, on the other hand, every observation seems to strengthen them, we shall find that the phocæ may be distributed geographically into three groupes; first, Atlantic phocæ of the north pole; secondly, Arctic phocæ of the Pacific ocean; thirdly, Antarctic phocæ."†

M. Péron was not less decided in pronouncing on the entire diversity of the cetaceæ inhabiting the northern and the southern oceans. He considers it to be entirely by mistake that the Balæna mysticetus was supposed to swim around Spitzbergen, as well as in the seas of the antarctic pole. On this subject M. Lesson has expressed a different opinion. He admits the conclusion of M. Péron as almost universally

* Krakenninikow's "Travels in Siberia and to Kamtschatka."

† Lesson, ubi supra, p. 373.

Digitized by Google

correct, even with respect to the majority of cetaceæ, but contends, that it is not applicable, if we can rely upon the present state of our information, to some of the whales and cachalots which are capable of traversing the equatorial seas from one polar region to the other. It is generally admitted, as he observes, that the best known among the great cetaceæ, are spread through all seas on the globe, and that the same species of whales or macrocephalous cachalots belonging to the northern seas are found in the great ocean, whether in the waters which wash the north-west coast of America, or in the seas of Cape Horn, or southward of New Holland. The whale-fishers whom we have consulted on this subject have, in fact, always affirmed this identity; and the whales or fishes that we have seen under all the parallels of the north or south, or under the equator, in the Pacific, as well as Atlantic Ocean, have appeared to us to differ in no respect from the species of cetaceæ in the northern seas, such as they have been described. But we know that the same remark does not hold with respect to dolphins; these are subject to the laws imposed upon all animals in a state of nature; they do not go beyond certain limits. Within these limits are all the conditions appropriated to their support; there they find the kind of nourishment which is proper for them, the nature and temperature of the waters to which their organs are accustomed; all the requisites of their existence are included under these latitudes: thus to the south belong the delphinapter of Péron, and its representative in the north is the beluga: thus the dolphins of the coasts of Iceland, or even of Europe, are by no means the same as those of the antarctic seas.*

The dispersion of fishes has been still less an object of research, but in this instance the leading facts direct us to a similar conclusion. The fishes of the Red Sea, as Mr. Lyell has observed, are said to differ entirely from those of the Mediterranean. Flying fishes are almost confined to the intertropical oceans, and different species are found in the Atlantic and in the eastern seas. The electric gymnotus belongs exclusively to America, and the silurus electricus to the rivers of

* Lesson, Hist. Nat. des Cétacés, p. 9.

Digitized by Google

Afric ; while the torpedo, which is dispersed over all the tropical seas, is found also in the temperate regions.*

The greatest difficulty connected with the distribution of fishes is the discovery of the same species in fresh-water lakes remote from each other, and spread at great distances and at different elevations over mountainous regions. Such phenomena have a close relation to those which are displayed by the diffusion of aquatic plants of the same species through inland seas and lakes; and the only satisfactory solution of these facts is to be obtained by reference to inundations and land-floods, the frequent occurrence of which in different periods is attested by historical and by geological proofs. It is supposed by Gmelin and by Mr. Lyell, that birds, and particularly the anseres, retain occasionally the minute eggs of fishes among their feathers, and transport them from one lake to another.†

MM. Péron and Le Sueur have adopted a similar conclusion respecting the lower departments of marine animals. They begin with asserting a just claim to attention. " No voyager has collected a greater number of animals than we have done in the southern hemisphere; we have observed, described, and drawn figures of them all in their native spots: we have brought with us many thousand species into Europe, where they are deposited in the Museum of Natural History at Paris. Let these numerous animals be compared with those of our hemisphere, and the problem of their identity or diversity will be solved, not only with regard to species of a more perfect organization, but even with respect to all those which are of more simple structure, and which, on that account, might seem likely to have received from nature less variety of form. Let those who doubt, examine not merely the species of Doris, of Aplysia, of Salpa, of Nereis, Aphinome, Amphitrite, and that multitude of molluscæ and worms, which offered themselves successively to our observation; let them descend also to the Holothuriæ, to the Actiniæ, the Beroes, the Medusæ; let them extend their researches even to those shapeless Sponges, which all agree in regarding as the

* Lyell's Principles of Geology, p. 2.

† Gmelin in Amœnitat. Acad. 75.—Lyell's Geology, vol. iii. p. 3.

Digitized by Google

lowest term of degradation, or rather of simplicity in animal structure. Among all this immense assemblage of antarctic animals, it will be found, that there is not one which exists in the seas of the northern hemisphere."*

Section V.—*Of the Dipersion of Mammifers and Reptiles of the Land. — Division of the Earth into Zoological Provinces.*

When we engage in similar inquiries with relation to animals of larger bulk and destitute of wings, such as quadrupeds and reptiles inhabiting the land, the various questions that present themselves appear to be more capable of solution and encumbered with fewer difficulties. By reason of their bulk or stature, these animals are easily observable: they do not elude our view as do the Phocæ and Cetaceæ and other marine tribes in the deep waters of the ocean. Nor are we subjected in this instance to the same causes of ambiguity which perplex the researches of botanists into the history of plants, the seeds of which are liable to be carried down by rivers, and transported by marine currents to distant shores, where they vegetate and establish new colonies, which may be mistaken for original centres of diffusion. In comparing the wild mammifers which inhabit separate countries we are enabled to draw inferences with greater certainty from the facts which present themselves; and hence the conclusions, which with respect to dicotyledonous plants, as well as other tribes of animals, could only be stated as highly probable or at most as general facts, may be maintained almost without exception in the instance of quadrupeds and reptiles inhabiting the land.

Animals thus limited in their power of locomotion, are confined within the regions which gave them birth by natural barriers which prevent their dispersion. The climates and temperatures which furnish the necessary conditions of their

* Hist. de tous les Animaux qui composent la Famille des Méduses, par MM. Péron et Le Sueur. Ann. de Muséum, tom. xiv.

Digitized by Google

existence, are perhaps only to be found within a certain tract. In general the limits which restrain the dispersion of repent and progressive animals are high mountain-chains, which often are the demarcations of climates, and beyond which new systems of vegetation as well as new animated tribes exist; or they are wide rivers or branches of the sea which intersect continents and separate islands. Hence, by a reference to the geographical features of countries, we may divide the earth into a number of regions fitted to become the abodes of particular groupes of animals. We shall find on inquiry that every one of the provinces thus conjecturally marked out is actually inhabited by a distinct assemblage of peculiar mammifers and reptiles, as they are likewise in most instances the appropriate seats of distinct systems of vegetation, and of particular families in the lowest departments of animated nature.

In the first place, it is obvious that the only latitudes where the great continents are sufficiently near to allow a possible transit to wild quadrupeds from one into the other, are those of the arctic region. In the extreme north, the coasts of Asia, Europe, and America, form almost one continuous tract; the narrow strait which separates the old and new continents is partially frozen over in winter; the distance is further broken by intervening islands, and a passage becomes practicable from one region to the other for such animals as are able to endure the intense cold of the arctic circle. This tract is accordingly one of the great provinces of the animal kingdom; it contains tribes of quadrupeds common to all the northern regions of the world.

Secondly.—The temperate zone of the earth to the northward of the equator, is divided by the ocean into two great districts. The temperate region of Asia and Europe affords a vast tract, passable by migratory animals from Europe, through Asia, and as far as the shores of the northern Pacific. This ocean sets an insurmountable barrier; accordingly, the same tribes ought to be in many instances found spread from the western to the eastern extremities of the old continent in the temperate zone, while the four-footed inhabitants of the same zone in the new world should be races

Digitized by Google

peculiar to it, and such as never make their appearance in the old world.

Thirdly.—The equatorial region contains three great tracts, separated from each other by wide seas. We must expect to find in them three distinct assemblages of intertropical quadrupeds, viz. the American, the African, and the Indian.

Fourthly.—The great and numerous islands of the Indian Archipelago, separate, and perhaps anciently torn from the continent of Asia, form with reference to their geographical position, a distinct region of the earth, which is similar in climate and in its vegetable productions to the hottest parts of Africa. Here we shall expect to discover mammifers and reptiles of peculiar character.

Fifthly.—Beyond the Indian Archipelago, we find a remarkable country, very fertile in vegetable productions. Papua includes New Guinea, New Britain, and New Ireland. The lofty mountain ranges which support it, spread themselves out in several great arms, and run southwards into the Pacific, forming straits and groupes of islands, everywhere attaining a considerable elevation. The Archipelago of Solomon, the Arsacidæ, Louisiade, Santa Cruz, Tierra del Espiritu Santo, the New Hebrides, New Caledonia, and perhaps the two long islands of New Zealand, appear to be branches of the same central region.

The more remote groupes of islands in the great southern ocean may be reckoned as parts of the same zoological province. The whole of this region is placed under circumstances likely to call forth the most abundant productions of organized nature. In fact its vegetation is luxuriant; but as we might expect to find in conformity with the preceding observations, the animated creation is as remarkably deficient in its principal tribes.

Sixthly.—Beyond the Indian seas, but separated from New Guinea only by straits, we find an extensive continent differing from the rest of the world in all its physical peculiarities. Terra Australis or Austral Asia, according to the best informed observers, is peculiar and striking in its geological aspect. It is equally remarkable for the singularity

Digitized by Google

of its vegetation. In no part of the world has the animal creation so distinct and peculiar a character.

Seventhly.—The southern extremities of America and of Africa contain countries situated under a similar climate. The temperate parts of these continents, as well as that of Terra Australis, are thus so many insulated regions. In all we may expect to find peculiar tribes.

I shall now attempt a general survey of the animated tribes inhabiting these several provinces, taking them in a different order from that to which I have enumerated them.

Section VI.—*Peculiar Characters of each of the great Zoological Provinces.*

We have already observed that in each of the great botanical provinces, the system of vegetation there indigenous, displays a peculiar aspect or a character of its own, which distinguishes it from the aggregates of plants indigenous in other parts of the world. A similar remark may be applied to the distribution of animals; and I shall now endeavour to collect the most striking particulars which illustrate this observation, and point out its bearing on the principal subject of my inquiries.

Paragraph 1.—Terra Australis or Austral Asia.

There is no other extensive region so remotely separated from countries in corresponding latitudes, as is the great island or continent of New Holland, and there is no other part of the world which has so peculiar an assemblage of organized beings. This great region may be said to contain within itself a particular creation, an organized world of its own. South Africa, and the Magellanic countries, differ in their productions from the rest of the continents of which they are prolongations, but in Terra Australis living nature displays a peculiar type and new forms, which seem to deviate from the laws of co-existence, generally regarded as universal conditions of life. Botanists have observed in the

Digitized by Google

vegetation of this country a peculiar physiognomy. It is equally striking that many tribes of animals indigenous in the same region, though differing from each other, display some remarkable attributes of organization which may be looked upon as common characters.

It is well known that the great class of warm-blooded quadrupeds constituted by Linnæus, under the name of Mammalia, has two distinctive characters. It is understood as implied by the term, that the tribes to which it belongs are those which bring forth their offspring in a mature state; in that state in which the young animal ceasing to be organically united to the body of its mother, is fit to enter upon its independent existence, and to be entrusted to the spontaneous impulses of its own instinct. The offspring of mammifers, unlike that of birds and amphibious animals and the lower orders of the creation, passes at once from the state of fœtal or uterine existence, to that of separate life and locomotion. A second feature, considered to be not less essential to animals comprised in the class of mammalia, consists in the endowment of a double heart and a double vascular system, with more ample organs for breathing and evolving heat. To the universal conjunction of these leading characters of structure, no exception was for a long time believed to exist, and it would have been deemed in the highest degree improbable that such a fact should ever have been discovered.

It must, however, now be admitted, that a remarkable deviation from the general character of the mammalia has taken place in the marsupial tribe, of which Terra Australis is well known to be the principal abode. Nature has fitted these animals for a sort of double gestation, having provided the females with a pouch formed by a fold of the abdominal tegument and supported by marsupial bones. The pouch encloses the organs of suckling and receives the embryos, which are transferred to it, as yet little developed, from the uterus; and in this new receptacle they are subjected to different and peculiar modes of vitality, until at a later period the offspring, becoming more robust and capable of temporary separation from the pouch, begin to accustom themselves to the open air and the exercise of their instinctive

Digitized by Google

faculties, but take refuge at the least alarm in their former retreat. It is not determined in what precise manner the embryo is conveyed from the uterus into the pouch, though the remarkable discovery of peritoneal canals in the female kangaroo by Mr. Owen has seemed likely to afford an explanation. Nothing however can be more obvious than the fact, that the existence of this marsupial structure, in providing for the premature removal of the embryo from the uterus, constitutes an important deviation from the essential character of the mammalia. A still greater deviation is however that which has been noted in another tribe, bearing some remarkable analogy to the marsupial animals. I allude to the monotremes, creatures which, though warm-blooded quadrupeds, are provided with a system of reproduction so anomalous, that naturalists have differed widely from each other as to the station to be assigned to them in the system of organized beings. M. Cuvier placed the monotremes at the end of the edentata, but this was with reference merely to their organs of mastication. Authors who direct their attention to the reproductive system, and particularly M. Lesson, place them as a separate class between birds and reptiles, as an intermediate link which connects these departments of the animal kingdom to the mammalia. The monotremes are provided with cloacæ analogous in every respect to the cloacæ of birds; they have no abdominal pouch, but the presence of marsupial bones displays in their organization the rudiment of this structure. Their reproduction appears to be ovo-viviparous, and the envelope of the membranous egg being torn is supposed to afford an exit to the fœtus, which may then be considered as hatched.* Their manner of lactation has only been the theme of doubtful conjectures. Their skeleton is equally anomalous, and it displays a clavicle common to the two shoulders, similar in structure to that of birds.

It is impossible to determine or even to conjecture what are the circumstances in the physical state of the Austral land, which require the existence or favour the development of structures so peculiar; in other words, how it comes to pass

* M. Lesson, tom. iv.

Digitized by Google

that the warm-blooded quadrupeds of this region are generally constructed for an earlier exclusion of the embryo from the uterus than those of other regions. The plastic operations of nature, or those physical processes which, under the guidance of a supreme intelligence, gave origin and a peculiar modification to the different tribes of organized beings, are beyond our scrutiny. It may perhaps hereafter be discovered how such a peculiarity of structure is adapted to the local conditions of the region, what congruity or fitness there is between them. But that there is a local relation between these modifications of form and the climate in which they display themselves is undoubted: in order to be convinced of it we need only survey hastily the distribution of the monotremes and marsupial tribes.

"Previous to 1789," says M. Lesson, "the only marsupials known were the didelphes or filanders of America, mentioned by Marcgraf and Pison, and the phalanger of the Moluccas, described by Valentine, and figured by Seba. Buffon knew only six didelphes, one chironectes, viz. the little otter of Guiana; two phalangers or couscous. Naturalists of the present day have distinguished with accuracy twelve genera of these animals, in which are comprised a great number of species."

Though the marsupial animals are considered as a single family, a term which might be applied in one sense to the rest of the mammalia, they differ widely in all other respects. Among them are found true carnivorous animals as well as insectivorous, rodentia or gnawers, herbivora and edentata. These tribes differ in respect to their teeth, their digestive organs, their feet, and consequently their habits. The dasyuri are carnivorous, and correspond to the weasel tribe of the old world. The thylacine represents the wolf, and has been described as belonging to the canine family. The sarigaes belong to America, the phalangers to the Moluccas, the parameles are found in New Guinea as well as in New Holland; but by far the greater part of this numerous family, including a very considerable number of species, belong exclusively to Terra Australis. This character, as M. Lesson observes of *marsupiality*, seems to form for New

Digitized by Google

Holland a true zoological law, from which only three mammifers can be excepted;—namely, the roussette or frugivorous bat of the intertropical parts, the phocæ on the shores, and the Australian dog which followed the miserable natives in their first emigration into this destitute region. M. Lesson here associates with the marsupialia the monotremes, which have the rudiments of the same structure, but he does not confound these different tribes. "Rien ailleurs," he says, "ne peut donner l'idée des êtres singuliers qu'on a nommés paradoxaux, et qui sont l'ornithorhynque et l'échidné. Le premier, à corps couvert de poils, à bec de canard, à pieds garnis d'ergots, vénéneux, pondant des œufs, semble être une créature fantastique, jetée sur le globe pour renverser par sa presence tous les systèmes admis sur l'histoire naturelle; car on peut soutenir avec tout autant de raison qu'elle appartient aux quadrupèdes, aux oiseaux, ou aux reptiles."

The same writer has observed that few countries are so rich in ornithology as New Holland, and that remarkable phenomena similar to those which characterise the mammifers of that region appear also in its birds. The greater part, unable to derive subsistence from fruits which are wanting to the Australian forests, have peculiar modes of sustenance; those which feed upon insects have tongues organized as in the birds of other climates, but the parroquets, the blackbirds and many of the sparrows, obliged to pump out the sweet juices which exude from the corollæ of flowers, are endowed at the extremity of the tongue with bundles of papillæ, resembling a pencil, and enabling them to absorb the whole of this fluid, which is only to be obtained in sparing quantities. The birds of this region vary in the colours of their feathers, but are generally remarkable for some singularity of structure or plumage. Thus instead of the swan of other countries, of a spotless white, New Holland has one of a deep black, and it has black cacatoos replacing the white cacatoos of the Moluccas.* The most frightful reptiles

* Ce serait outrepasser les bornes de cet article, que de s'étendre longuement sur les espèces rares et curieuses qui peuplent cet étrange climat; nous ne pouvons nous dispenser toutefois de citer quelques oiseaux des plus remarquables parmi ceux qu'on y trouve. En première ligne sont ce superbe ménure, dont la queue est

Digitized by Google

are found in the same climate; the poison of some is fatal in a few minutes. The intertropical country partakes in the productions of New Guinea, and has likewise the bicarinated crocodile of the Moluccas. Numerous lizards, and different species of skinques and of agami abound in New Holland; the most striking are the gigantic black and yellow skinques, and those singular saurians the phylluri, having leaf-shaped tails. There are likewise numerous serpents, some of which are well known to be extremely venomous. The chelonians, the molluscæ, the insects, the zoophytes of Terra Australis, present phenomena of singular form and organization, which are scarcely less remarkable. For a description of these I must refer to the works of the excellent naturalist whom I have so frequently cited.

Paragraph 2.—Intertropical and South America.

The equatorial and southern parts of America constitute a vast region which might be subdivided into many zoological provinces. The western part, including the Brazils, is distinguished by peculiar physical and geographical features, and limited by well-marked boundaries. The tropical and the temperate countries lying westward of the Cordilleras might be divided into two other provinces; and a fourth, of a very distinct kind, and bearing much resemblance to South Africa, is formed by the great plains of the Pampas. Tierra del Fuego must be reckoned as a fifth district, and one of a particular description is the vast interior country, covered by dense and lofty forests and intersected by the rivers Paraguay and Uruguay. In several of these regions peculiar phenomena relating to the animal kingdom might be traced and examined, and it would perhaps be not difficult to distin-

l'image fidèle dans les solitudes Australes de la lyre harmonieuse des Grecs; ce loriot prince-regent, dont la livrée est mi-partie—de jaune d'or et de noir de velours, ces oiseaux satins, ces cassicans variés, ces philédons nombreux, ce scytrops dont le bec imite celui de toucan; ce céréopsis cendré, ce casoar Austral, ce faucon d'un blanc de neige, ces moineaux webomgs, ces traquets superbes, ces perruches de toute taille, et de toute couleur, ces bruyants, martin-chasseurs, ce moucherolle crepitant dont le cri imite à s'y méprendre le claquement d'un fouet, et tant d'autres espèces rares et precieuses pour l'ornithologiste, et qu'il serait fastidieux de nommer.

Digitized by Google

guish the zoological character of each department. But as neither zoology nor physical geography constitutes the subject of this work, I shall confine myself to some very general remarks on the whole region of South America.

The zoology of South America has some features which remind us of that peculiar to Terra Australis. It recedes considerably from the character of the animal kingdom proper to Asia, and perhaps, in a greater degree, from that of Africa.*

It was observed by the Count de Buffon, that the largest quadrupeds are natives of the old world, and strangers in America. "Nature," says this ingenious and eloquent writer, "seems to have adopted a smaller scale in the formation of animals for the new world, and to have framed man alone in the same mould as elsewhere." To Asia and Africa belong the various species of elephant, rhinoceros, and hippopotamus, and giraffe, camels, horse, and most of the ox kind. The fossil remains of large animals have been discovered in America, but those now existing are in general smaller than the tribes inhabiting the old world.

It may be observed, that the races of animals which have the most powerful and perfect structure belong chiefly to the old world. Those of the new have, in general, a character of organization which places them lower in the scale of animated beings.

Those carnivorous animals, for example, which have the greatest vigour and courage, are confined to Asia and Africa. The lions, tigers, hyænas, the fiercest of the cat and dog kinds, all such animals as are taken for symbols of energy, strength, and ferocity are among them. The American tribes, which approach the most nearly to the kinds above mentioned, are in general much more gentle and feeble than the African and Asiatic species. The swiftest and most agile quadrupeds, as well as the most graceful and beautiful, chiefly belong to the old continent; and those, likewise, which are the most

* The zoological features of Paraguay are extensively described in the work of Don Felix de Azara, and those of the eastern region of South America in the great work of Von Spixand Martius.

Digitized by Google

useful to man. Among these are the antelopes,* including a great number of species, as well as the goat, horse, ass, and ox kinds.

On the other hand, we find in the new world most of those singular races, in the formation of which Nature seems to have deviated most from her ordinary rules. Such are the tribes which Linnæus referred to his order of Bruta: they are termed by Cuvier, Edentes, or quadrupeds defective with respect to teeth, all of them being deficient in the organs of mastication.

America contains, for example, the whole family of tardigrades or sloths, which Buffon characterises as defective monsters, as rude and imperfect attempts of Nature. Cuvier has remarked of the living species of this tribe, "that we find in them so little relation to ordinary animals, the general laws of organization prevailing among the species at present existing apply so little to them, the different parts of their bodies appear to be so much in contradiction to the laws of coexistence which we find established through almost the whole animal kingdom, that we might really suspect them to be the remains of another order of things, the living relics of that pre-existing nature, the ruins of which are elsewhere discovered only in the interior of the earth; and we might conjecture that these creatures have escaped, by some miracle, the catastrophes which have destroyed the other species that were their contemporaries."†

Besides the living species of sloth, two gigantic creatures of the same singular family are known to us by their organic remains: one of these is supposed to have been of the size of an ox; the other as large as a rhinoceros. They have been termed megalonyx and megatherium. Their relics have been found only in America.

* The mountainous parts of America contain some animals allied to the argali, or wild sheep. Three species have also been described which are nearly related to the antelopes, but which are supposed to form a separate natural family, requiring a distinct classification from the antelopes of the old continent. —Transactions of the Linnæan Society, vol. xiii. p. 40.

† Buffon's Hist. Naturelle, Article des Tardigrades.—Cuvier, Mém. sur le Mégalonyx. Annales du Muséum, tom. v.—Item, Mém. sur le Mégatherium, par le même.—Ibid.

Digitized by Google

The fossil animals above mentioned resembled in some peculiarities of structure the myrmecophagæ, a tribe which also recedes from the common characters of quadrupeds in several respects, but particularly in being entirely destitute of teeth. They are peculiar to the new world. The same observation may be applied to the armadilloes, of which there are numerous species. These belong to the order of Bruta: they have grinding teeth, but neither tusks nor incisores.

Some of these animals resemble more particularly the singular tribes already mentioned as characterising the zoology of New Holland: but they are in their reproductive economy entirely similar to the mammalia properly so termed. The torrid parts of America contain, however, a distinct marsupial family, analogous to the Australian tribe, though consisting entirely of peculiar species, and even of genera distinct from those of New Holland. The relation of this structure to the local circumstances of the region is here equally unknown, but the marsupial animals of America differ from those of Terra Australis in various particulars; in some of which we discover a remarkable fitness for the countries which they are destined to inhabit. The differences of the American genera and species of marsupial animals have been described by M. Geoffroy St. Hilaire. I shall only remark, that the structure of the American kinds is more fitted for agility than that of the pouched animals of New Holland, and that Nature has provided them with long prehensile or muscular tails, which constitute a fifth limb, singularly useful to animals which are the inhabitants of vast and lofty forests.

There are other tribes in the same region of America possessing a similar conformation. The sapajous, a numerous tribe of monkeys peculiar to these countries, have a slender, spider-like form, which gives them great agility in climbing trees; they have also prehensile tails, like those of the didelphis. The same countries contain also the myrmecophagæ, or American ant-eaters, the kinkajou, and hystrix prehensilis; all of which are, in this respect, similar to the opossum.

We have here an instance of evident adaptation in the

Digitized by Google

structure of animals to the nature of the districts in which they are destined to dwell.

The hoofed animals found in South America are of different structure from those of southern Africa. The organization of the former renders them fit inhabitants of the precipitous Cordilleras, while the form and structure of the gnous and springboks, and other antelopes, and of quaggas and zebras, are adapted to the vast and dry plains of Caffraria.

In the lower departments of animated nature, the observation which I have cited from Buffon seems to be reversed. The reptiles of America display, when compared with those of the old continent, the greatest bulk and most powerful structure. This is remarkable in the batrachian, but still more in the saurian and ophidian tribes.

Paragraph 3.—Intertropical and South Africa.

Intertropical Africa and the temperate countries to the southward form another insulated region. We find the animal creation assuming here a character almost as peculiar as that which is displayed by the vegetation of the same countries. In the inferior departments of animated nature this peculiarity is apparent. A prodigious number of insects are found near the Cape of Good Hope, which are unknown in other countries. Lichtenstein collected there between six and seven hundred species, of which, Professor Illiger found that three hundred and forty were entirely new.* In mammalia, southern Africa contains several peculiar genera, which are spread over various spaces towards the north, according to their capability of enduring the heat of tropical countries. In many instances this region contains the same genera which are found in temperate climates to the northward of the line; but then the southern are different from the northern species. Thus we find the quagga, the zebra, and some other species of the horse kind, corresponding with the ass and the jiggetai of Asia. The south of Africa is spread out into fine level plains from the tropic to the Cape. In this region, says Pennant, Africa opens at once a vast treasure of hoofed quadrupeds. Besides the horse genus, of which five species

* Lichtenstein's Travels in Africa, vol. i.

Digitized by Google

have been found, there are also peculiar species of rhinoceros, of the hog and the hyrax among pachydermatous races, and among ruminating animals the giraffe, the Cape buffalo, and a variety of remarkable antelopes, as the springbok, the oryx, the gnou, the leucophoë, and the pygarga.*

Paragraph 4.—Indian Archipelago.

The Indian Archipelago forms a third intertropical region, which may be imagined to connect Asia and Terra Australis, and which bears to these countries the same geographical relation, as Darien and the Gulf of Mexico to the two Americas. There are many facts which, in the opinion of M. Lesson, prove that this central portion, as he terms it, of eastern Asia, once formed part of a great continent. He remarks, that these islands contain great living species of quadrupeds, which are, in some instances, common to several different isles, and that the channels by which they are separated, are shallow, and intersected by banks apparently the remains of ground submerged.† Yet it must also be observed, that several of these equatorial islands have particular species which they seem alone to have preserved. It is remarkable, though not contrary to general analogy, that the isles of this archipelago reproduce genera, though not species, found in the New World, and hitherto regarded as peculiar to it. Such are the tapir, the couroucous, and a green rupicola. In the seas of this region is found the dugong, so long believed to be the creature of imagination. Sumatra and Borneo are supposed to contain some species which are identical, such as the Indian elephants and the orang. The former, which have received the names of Javanicus and

* Pennant's Hist. of Quadrupeds.—Burchell's Travels.—Gmelin, System. Nat.—Cuvier, Règne Animal.

† The momentum with which the waters of the equatorial ocean are borne against the eastern side of America, though it has hollowed out the Gulf of Mexico, has not been sufficient to break through the ridge of the Cordilleras. In the eastern seas no similar mountain-chain existed to support the connexion between Asia and Terra Australis. A comparison of the geographical facts which discover themselves in other equatorial regions, goes far to confirm the opinion of M. Lesson.

Digitized by Google

Sumatrensis, belong more especially to Sumatra. This island contains also a great number of monkeys, particularly the semnopitheci, and a variety of other mammifers, among which are the viverra musangua and the tupaca tana of Raffles, and the Indian tapir, discovered also in Malaya. It is probable that Borneo yet conceals many unknown tribes: among those which are chiefly noted in that great island, the orang-outan is said to exist also in Cochin-China. Java also contains some new species."*

To the Malayan archipelago belong most of the flying quadrupeds. With the exception of bats, nearly all those mammifers which are enabled by their structure to support themselves in the air for a short time, and to imitate imperfectly the flight of birds, are natives of the Indian archipelago. In the Linnæan order Primates, the flying lemures or galeopitheci, which, as M. Lesson observes, approach most nearly to the maki, have three species in the Sunda, Molucca and Pelew islands.† The taguans, or flying nocturnal squirrels, of which several species inhabit Java and the nearest islands, are peculiar to the same archipelago and the neighbouring coasts.‡ The roussettes or frugivorous bats, so termed though very distinct from the rest of the bat tribe, are likewise very numerous in the Malayan islands. Yet among the marsupial animals, while the tribe generally termed phalangers are distributed to Terra Australis and the Moluccas, it seems that the flying phalangers, lately termed petauristæ, and distinguished as a separate groupe, have only been discovered in New Holland. Animals of the lacertine tribe abound in the hotter parts of this archipelago, and lessen, in variety, as we proceed towards the east.§ Crocodiles, though found in Java, Timor, Borneo, and Bourou, are only represented in New Ireland by a large tupinambis. The birds of this region are of endless variety and resplendent beauty. Java and Sumatra possess many species, but the groupe of isles termed the Land of Papuas is unrivalled in

* Lesson, tom. ii. p. 25.

† Tom. iv. p. 413.

‡ They have been described by Raffles and Horsfield in the Linn. Transactions.

§ Lesson, tom. ii. p. 29.

Digitized by Google

the gaudy and various plumages of its feathered tribes. To this region belong the splendid birds of paradise, the great promeropes. The lories and the parroquets, the most beautifully clothed among the parrot tribe, belong principally to the Moluccas and the neighbouring countries.

Paragraph 5.—Zoology of Polynesia.

Beyond the Malayan archipelago a high mountain-land extends towards the south-east, several arms or branches of which support great islands of considerable length, or long chains or series of smaller islands. New Guinea is the centre or nucleus of this insular region. Issuing from the eastern extremity of this elevated country, a vast circuit of islands, under the names of New Britain, New Ireland, Solomon's Isles, Louisiade, the New Hebrides, New Zealand, surrounds all the eastern side of Terra Australis, and has been supposed to have originally formed with it one great continent. Thus far, according to M. Lesson, a primordial or primitive region exists: beyond it, in the wide spaces of the great southern ocean, the numerous groupes which are interspersed through it, are of volcanic and madreporic origin.

The vegetation of New Guinea displays all the splendour and magnificence which belong to the most fertile lands in the torrid zone, and nothing in animated nature can surpass the bright and resplendent colours with which the birds of the same region are decorated. These tribes exceed all others in the beauty of their plumage, and in the variety of their forms. New Guinea seems fitted to be the centre of new tribes of quadrupeds; but, in this respect, the fact turns out contrary to expectation. The whole region which I have lately defined, seems to be remarkably deficient in mammiferous animals. In New Guinea few species are as yet known. The babiroussa exists at Bourou and as it appears in New Ireland: and it can, therefore, hardly be wanting in the vast and unexplored forests of New Guinea. The couscous or spotted phalangers are found there, as well as the pelandoc and the sus papuensis or New Guinea hog. In New Ireland is the white phalanger.

Digitized by Google

New Guinea and New Ireland are still supposed, as it was long ago imagined by Forster, to be the source whence the isles of the southern ocean derived all the mammifers which they possess. These, as it is well known, are a very small number. Even New Zealand has no native quadruped, except the seal. The roussette keraudren has spread from the Philippines over the Marian isles as far as Oualan, but is unknown beyond that island. In the Sandwich isles there is a small crepuscular bat. Two species of rat, the hog, the dog, and gallinaceous fowls are very extensively dispersed. Rats exist almost everywhere, where men are or have been, and in Oualan there is a mus decumanus or surmulot which multiplies in the neighbourhood of the village of Lulé. The hog termed *booaa* at the Society isles, is only found in the southern groupes of the ocean, and is wanting in the Marian isles. The breed is everywhere that which is termed Siamese; it exists at Port Praslin in New Ireland, and in New Guinea. The dogs termed *ouri*, of which the flesh is eaten at feasts, are likewise wanting in some of the islands. The Papuas of New Guinea keep them half-domesticated. The natives of New Ireland term them *koull:* the breed is of small size, with pointed muzzle and upright ears. M. Lesson says, "They appeared to us to resemble in every respect the breed of dogs which follow the miserable natives of New Holland. They eat whatever they can find; and chiefly feed on crabs which they catch on the reefs of the sea-shore. The natives of New Ireland consider them delicate food." The dogs of New Caledonia are, according to the same writer, precisely similar. They appear to have followed the Papua tribes, for they are found at the Fiji islands, but are wanting a little further among the people of the Tonga isles, who are of a different race, as well as at Oualan and the Caroline and Marian islands, towards the north. At Easter island, the most remotely situated in the great southern ocean, there are no domestic animals except fowls and rats; even these last are eaten by the natives.*

* I have collected these particulars from the various narratives of voyages to the southern ocean; many of them from the scientific works of Forster and Lesson.

Digitized by Google

SECTION VII.—*Distribution of the Species comprised in the most numerous families of Quadrupeds.*

The quadrumanous tribe are strongly contrasted with mankind in regard to the extent of their dispersion or the space which they inhabit on the earth. Although the form and organization of the simiæ are much more diversified than those of the most distantly separated races of men, yet the range of the whole monkey tribe is extremely limited, while that of mankind is almost universal. In the old as well as in the new world, the simiæ, in their wild and natural state, are nearly confined to the intertropical region, and of that they inhabit but particular portions. One species only, the magot, is known to advance into Europe to the twenty-seventh degree of north latitude, where it has become naturalized on the rock of Gibraltar, under a climate but little different from that of the opposite coast of Africa. In general the hottest regions, and particularly level countries covered with vast forests, are the favourite abodes of the quadrumanous tribe. There are some exceptions, however, to this observation: a few species live at the Cape of Good Hope, and some in Paraguay, in both of which countries they reach towards the thirty-fifth degree, or even the thirty-eighth of south latitude.*

The different genera belonging to the monkey tribe are distributed in the old world as follows:—Of the orangs or anthropomorphous apes, the troglodytes or chimpanzés are in Africa, the orang-outan or pongo, in Sumatra and Borneo. The gibbons, or the long-armed apes, are in the Sunda isles and the Malayan peninsula. The tribe of guénons inhabit Africa exclusively, viz. the Cape of Good Hope, the coasts of Loango and of Guinea; there are none of them in India. The semnopitheci are only in India, as likewise are the macaucos. Of the two known species of magot, one is an African and the other an Indian race. The cynocephali are found in Africa, at the Cape, and likewise in Arabia; the mandrills,

* Lesson, Hist. Nat. des Mammifères, tom. iii. Les Singes.

Digitized by Google

on the coast of Guinea. Most of these distinct genera or subdivisions of the simiæ compose many individual species: all are restricted to some particular province. From this summary indication it appears that the intertropical region of the old world is far from being generally inhabited by the monkey tribe. They are found in all the hot regions of Africa; but the island of Madagascar has not a single species; and the quadrumani which there replace them are lemurians. In Asia, the coast of India and Cochin-China and the great Sunda isles are the only spots where monkeys are found. They are wanting in the Moluccas, in New Guinea, and the whole extent of Terra Australis, and the lands of the great southern ocean.

America, says M. Lesson, contains a great number of species, which differ entirely from those of the old continent.* They inhabit the vast forests of Brazil and Guiana, and the banks of the Orinoco, and the other great rivers. New Spain has only a few species, and Northern Paraguay but three or four. Neither Peru, Chili, nor Mexico Proper, contains any race of monkeys; and this tribe of animals is confined in the new world to the space bounded on the westward by the Andes, northward by the isthmus of Panama, and southward by the Rio-de-la-Plata.†

The lemurian tribe are the makis and the indris, confined to Madagascar; two species of loris in India; several species of galago, all inhabitants of Africa; and the tarsiers, natives of the Moluccas.‡

In the cheiropterous tribe, which forms the first division of zoophagous animals, the pteropi or roussettes and some other bats nearly allied to them, constitute a very distinct family. Numerous species of roussettes inhabit the shores

* The American species are divided into three tribes or sub-genera. 1. Sapajous, or monkeys with prehensile tails. 2. Sagouins. 3. Ouistitis, termed arctopitheci, or monkeys with bears' claws; having, instead of flattened nails, claws resembling those of the rodentia or glires.

† Lesson, Hist. des Mammifères.

‡ On the distribution of the monkey and lemurian tribes, see Cuvier, Reg. An. i. p. 119.—M. Geoff. St. Hilaire, Mém. sur les Atèles. Ann. du Mus. tom. vii. § 13. Tableau des Quadrumanes, tom. xix.—Magazin Encyclopédique, tom. vii.—Mémoire sur les Espèces du Genre Loris, Annales du Mus. xiv.

Digitized by Google

of the Indian ocean and the Malayan archipelago. Several of these are in the Moluccas, the Isle of Tinian, Amboyna, Java, and Sumatra; others in Madagascar; some in Africa. The pteropus keraudren has been found at the Marian isles, and at Oualan; and another species, pt. tonganas, was discovered by MM. Quoy and Gaimard at Tongataboo. Other tribes of bats, agreeing with the roussettes in their general character as well as in the countries to which they are distributed, are the pachysomes, the cynopteræ, the macroglosses, the harpyes, and the hypodermes. The true vespertiliones or crepuscular bats are found in nearly all countries: they feed on insects and small animals. Eighteen species have been enumerated by M. Geoffroy Saint Hilaire, and not less than fifty-six by M. Lesson. Some of them are extensively dispersed, but the greater number are found only in some limited tract, not one species being common to the old and the new world.* The plecotæ, or long-eared bats, were separated by M. Saint Hilaire from the vespertiliones, as were the nycticeæ by Raffinesque.† They are distributed as the former. The taphians of similar habits are all of the old continent.‡ Of the molossi, fourteen species are enumerated by Lesson: they belong to the new world. The numerous tribes of phyllostomes, vampyres or blood-sucking bats, forming a separate family, which is strongly distinguished from all the rest of the cheiropterous tribe, are also peculiar to the warm regions of America.

The insectivora are neither very widely spread, if we consider the range of particular species, nor are they greatly diversified. They are confined towards temperate climates; and none of them are known to exist in different regions, being remote from each other. The erinacei or hedgehogs

* Cuv. R. A.

† Lesson, v. p. 111.

‡ Lesson, 127. See Description des Roussettes et des Cephalotes, deux nouveaux Genres de la Famille des Chauve-souris. Par M. Geoffroy St. Hilaire. Annales du Mus. d'Hist. Nat. tom. xiv. Mémoire sur les Phyllostomes et les Mégadermes. Par le même. Ibid. tom. xv. Mém. sur le Genre et les Espèces du Vespertiliones, l'un des Genres de la Famille de Chauve-souris. Par le même. Ibid. tom. viii. Item, sur les Rhinolophes, tom. xv. p. 162. Mémoire sur quelques Chauve-souris d'Amérique formant une petite Famille sous le nom Molossus. Par le même. Ibid. tom. vi.

Digitized by Google

are in the temperate parts of Europe, Asia and Africa. Of the genus sorex or shrew there are many species, some in the middle countries of Europe, others in Siberia, some in Egypt, and in southern Africa; others in the temperate parts of America. Of the desman or mygale, long known in the Pyrenees, there is a distinct species in Russia, and these animals are replaced by the subgenus chrysochloris at the Cape of Good Hope. Analogous to the hedgehogs is the tribe of tenrecs, natives of Madagascar and naturalised at the island of St. Maurice. The scalopes in the temperate parts of America were long confounded with the shrews and moles. They form a distinct tribe containing several species. Lastly, the moles of Canada are a distinct species from those of Europe.*

The bears are divided into a variety of species, but their exact number is unknown, and their limitations are by no means determined. Late writers consider as distinct species many races of bears which were formerly regarded as mere varieties of the ursus arctos: such are, 1. The bear of the Pyrenees and Asturias. 2. The Norwegian bear. 3. The Siberian. 4. The bear of Libanus, described by Ehrenberg and Hemprich. 5. The black bear, remarkable for its flattened forehead; its country is unknown, and it is doubtful whether the species can be considered as distinct. 6. The labiatus of Bengal, supposed by Shaw to be a sloth. 7. The thibetanus. 8. The isabellinus of Dr. Horsfield, from Nepaul. 9 & 10. The bears of the Malayan archipelago and that of Borneo, termed by Horsfield helarctos.

America has several peculiar species of bears, as ursus ornatus, the bear of Chili; 2. the black bear of North America; 3. the bear described by Dr. Richardson as a variety of the European bear; 4. the large grisly bear, described by Umfreville and Mackenzie, and by Lewis and Clark, which is carnivorous and extremely fierce. The instincts of this species are very remarkable, and differ singularly from those of the other bears of the country.

The Polar bear being capable of enduring the rigours of

* Lesson, Hist. de Mammifères, tom. v. Cuvier, Règne Animal.

Digitized by Google

an arctic climate, is peculiar to neither of the great continents.*

Several plantigrade animals are arranged by naturalists as subgenera of the bear tribe, as the raccoons of North and South America, the coatis, the badgers, the gluttons and wolvereens: these have not a very extensive range, and are severally appropriated to particular countries.†

The same remark may be applied to the otters, the mustelæ and viverræ, of which a great number of species are distinguished by late naturalists: those which are found in countries distant from each other are marked by peculiar characters.‡

Of the dog kind several species endure an arctic climate; and these are common to Europe, Asia and America. The lagopus or isatis is found at Spitzbergen, and is traced through the north of Asia to Kamtschatka, and thence through some of the Kurilian isles to the shores of America, to Hudson's Bay, and to Greenland. The fox, wolf, and lycaon, are also common to the arctic countries. Dr. Richardson, who has given an excellent account of the wolves, foxes, and dogs of North America, associates with the European wolf the canis lupus occidentalis, of which he considers the amarok of the Esquimaux, and several tribes of hunting animals in the plains of the Missouri, to be varieties. Many tribes of wolves and foxes, which are considered as distinct species, are adapted to warm or temperate climates; and these are confined to a limited space, some in America, some in Asia, others in Africa. Of all regions Africa most abounds in foxes. To the corsac or mesomeles of the Cape several other distinct species may be added, which have been made known by Rüppell and Delalande, in Nubia, Abyssinia, and the Cape of Good Hope. The megalotis or long-eared fox of Illiger, the famel found by Rüppell in Kordofan, and the

* Lesson, Hist. des Mammifères, tom. v. Cuvier, sur les Ossemens du Genre de l'Ours qui se trouvent dans certaines Cavernes de Hongrie et d'Allemagne. Annales du Muséum, tom vii. Pallas, Spicileg. Zoolog. fascic. 14.

† Cuvier, sur les Mouffettes et la Zorille. Annales du Mus. tom. ix.

‡ Cuvier, Règne Animal:—item. Cuvier, sur les Espèces d'Animaux Carnassiers, &c. in Annales du Mus. tom. ix.

Digitized by Google

fennec of Bruce, are species peculiar to Africa, as well as the cynhyæna, a new genus first described by Temminck.

M. Lesson has enumerated several wild or nearly wild races, which may be considered as varieties of the domestic dog. These are the dingo or canis Australasiæ,* the dog of the Himalaya, and the wild dog of Sumatra, described by Hardwicke. It seems doubtful whether the dog of the Malouine or Falkland isles is a distinct species, or a variety of the culpœus described by Molina.† Of the last kind M. Cuvier has enumerated twenty-seven or twenty-eight species, in an elaborate monograph inserted in the Annals of the Museum. Of these it appears that not one species is common to America and the eastern continent: even the lynx of Canada is now believed to be a distinct kind from the European. The African species are generally confined to Africa, and the Indian to the eastern side of the Indus. But the lion and the leopard endure a more temperate clime, and they are found, accordingly, not only in Africa and in India, but in the intermediate countries of Persia and Arabia. We learn from Herodotus and Aristotle that the lion was formerly an inhabitant of Greece. It seems that Homer has alluded to a peculiarity in the structure of the lion, which has only been known to naturalists very recently.‡

M. Lesson has divided the cat tribe into nine subgenera; 1. the lions, to which belongs the puma of America, the couguar of Buffon; 2. Tigers; § 3. Pantherine cats. There are several in Asia and Africa, and one species, the jaguar, in America. 4. Oceloïds, or species resembling the ocelotl, all belonging to America. 5. Rimaus, or Malayan cats,

* The dog of New Ireland termed poull, which, as we have seen, differs but little, if at all different, from the canis Australasiæ. The Australian dog is pronounced by M. Lesson, to be certainly of the same stock with that of New Ireland and the isles of Bouka and Bougainville. Less. iii. p. 221.

† Hist. Nat. de Chili. Bougainville's Voyage.

‡ M. Deshaies in Ann. Sc. & Nat. xvii. Lesson, v. p. 335.

§ One of the most remarkable facts connected with the history of the tiger, is the existence of this species as an indigenous inhabitant of the countries near Lake Baikal, and the river Jenesey. Though the Siberian tiger differs considerably in some particulars from the Indian, it is supposed, by M. Lesson, to be merely a variety of the same species.

Digitized by Google

which replace the tiger in the Malayan Archipelago. 6. Guépars or hunting tigers, in Asia and Africa. 7. Servals in torrid Africa, and Viverrine cats, which replace the servals in India. 8. True cats, of which there are several tribes scarcely to be distinguished. The felis catus is a native of Europe, and a variety is described by Pallas, in Mongolia. 9. Lynxes, of which there are several distinct species peculiar to the old continent, and others to America. According to M. Lesson, the Canadian lynx appears to be a different species from that of Sweden.*

I have already referred to the geographical distribution of the phocaceous tribes, and of the marsupial animals, which complete the catalogue of species belonging to the zoophagous order, or the carnassiers of the French nomenclature.

The rodentes, the glires of Linnæus, form a most extensive family, which have been greatly multiplied by the discoveries of modern travellers in different countries. In M. Lesson's last enumeration of genera belonging to this order, they amount to sixty-one, in which are not mentioned a great number of subgenera. The species included in these genera taken collectively, would amount to many hundreds. The more accurate researches of modern naturalists have proved that the existence of individual species is in general limited to districts of no great extent: particular groupes are represented in distant countries by analogous tribes; but in most instances the species in one region collectively resemble each other much more that those of a remote country; so that we find subgenera in Europe corresponding with other subgenera in Asia, and again with forms differently modified on the other side of the Atlantic. Thus America, which abounds in species of the squirrel tribe, has all its species distinguishable by a particular character from those of the old continent. The species of rodentes appear never to be identical in remote countries. Perhaps one or two exceptions ought to be made to this remark. but they are such as do not invalidate its truth. They occur in races of animals which have become more or less associated with mankind. The

* Lesson, v. p. 356.

Digitized by Google

most remarkable are the three species of common European mures, the domestic mouse, the rat, and the mus decumanus or surmulot, which appear to have introduced themselves wherever man has taken up his abode. All of these are found in North America, where there are likewise many peculiar species. The rat is found in all the islands of the Pacific, and in the isle of Oualan the decumanus has made its appearance near the dwellings of men. The Antilles have the pilori, or mus pilorides.* In other instances a more exact examination has established a different opinion, in regard to species which had been thought to exist in parts of the earth remote from each other. The rabbit of the straits of Magellan resembles the lepus cuniculus of Linnæus, and has been supposed to be the same tribe; which appeared so much the more remarkable, as rabbits are mentioned as existing in these coasts in the voyage of Pigafetta, who accompanied Magalhaens in the voyage of discovery which made them known. Baron Cuvier and M. Lesson have come to the conclusion that it is decidedly a distinct species.†

The bruta or edentata are distributed in a remarkable manner. All the sloths are of American birth, not only the existing species but likewise those huge monsters now, as it seems, extinct, which Baron Cuvier has termed megatherium and megalonyx. The armadillos belong to the same region as well as the myrmecophagæ, which are replaced in the old continent by the octeropus and the manis of Africa, by another manis, the Indian pangolin, and by the monotremes of Terra Australis.

Hoofed animals are considered as forming the second great division of mammiferous quadrupeds. As their species are much less numerous and their bulk greater than that of animals which have fingers or claws, their distribution is more accurately known.

Of elephants and rhinoceroses it is well known that several species exist distributed separately to the hot regions of Asia

* Lesson, v. p. 445.

† Cuvier, Règne Animal.—Lesson, Hist. des Mammif.

Digitized by Google

and Africa.* The extinct races, organized as it would appear to be inhabitants of cold regions, were much more widely dispersed: the extinct elephant was capable of enduring the climate of the north, and existed in both of the great continents.†

The tapir was long supposed to be peculiar to America, in a living state, though the remains of two extinct species have been discovered in Europe. Another living species of tapir has lately been discovered in Sumatra and Malacca: it appears to have been long well known in China, and it is described, according to M. Lesson, in many Chinese books.

The species belonging to the hyrax and the hog tribes, are peculiar to warm climates, and to limited regions. The wild boar wanders further towards the north than any of his congeners. He is found in various parts of Europe; but has never been seen to the northward of the Baltic. This species accordingly is not indigenous in America, though the warm parts of America are very congenial to it: domestic hogs have run wild there, and have formed herds of vast numbers.

Among ruminant animals, the camelopardalis, antelopes, and goats, are confined to the old continent. Some peculiar species of sheep are found in America, and some tribes which are considered as representatives of the camel and the antelope, as well as others which bear the same relation to the musk; no species of either of these kinds being common to both continents.

Some species of the deer and ox kinds inhabit very cold climates, and these have found their way through the arctic countries from Europe and Asia to America, or in a contrary direction. Those species which are unable to sustain inclement seasons, have a limited range in either continent.

A survey of the habitations of the reptile tribes would furnish a number of facts of a parallel kind to those which

* M. Lesson describes three species of plewolena proper to India, Java, and Sumatra, tom. iv.

† Bougainville's Voyage round the World.—Pennant's History of Quadrupeds.—Cuvier, Règne Animal.—Mém. sur les Eléphans, vivans et fossiles, par M. Cuvier, Annales du Muséum.

Digitized by Google

I have mentioned. Each of the principal geographical districts would be found to possess, not only peculiar species, but appropriate genera, or families.

The distribution of the crocodile tribe has been already adverted to. Among the other genera which belong to the saurian family, Africa possesses the monitors, and most of the chamæleons, one species of the latter belonging to the Moluccas. The iguanas and jeckos are more numerous, and more widely dispersed; some species are natives of South America, others of different parts of the old continent. The serpents are extensively spread; but the warm climates of America claim the rattle-snake tribe, the cæciliæ, or naked serpents, as well as the subgenera termed ophisaurus and amphisbæna, and several species of boa.*

In the frog tribe, the pipa belongs to South America; and it has been observed by Cuvier, that some of the testudines and lacertæ of the same regions resemble these animals in certain particulars of structure.

The reptiles of New Holland are likewise of very peculiar character.

Section VIII.—*Concluding Remarks on the distribution of tellurian Animals.*

The preceding facts relating to the distribution of species afford some results which deserve consideration.

The remark made long ago by the illustrious Count de Buffon is abundantly confirmed. In the extreme north, where the two great continents approximate, and an almost connected land extends from the west of Europe eastward through America and Greenland, several species of animals appear to be common to the borders of either continent, such as the Polar bear, and other quadrupeds of the bear and dog kinds. The number of species common to different continents even in this northern tract, is evidently very much less than it was supposed to be by Buffon, Pen-

* Cuvier, Règne Animal. See also a variety of memoirs on crocodiles, &c. in the Annals of the Museum, by the same author.

Digitized by Google

nant, and other naturalists of the last century. With the foregoing exceptions, and without any others, as far as zoological researches have yet gone, it may be asserted, that no individual species are common to distant regions. In parallel climates analogous tribes replace each other; sometimes, but not frequently, the same genus is found in two separate continents; but the species which are natives of one region are not identical with corresponding races indigenous in the opposite hemisphere.

A similar result arises when we compare the three great intertropical regions, as well as the extreme spaces of the three great continents which advance into the temperate climate of the southern hemisphere.

Thus the tribes of simiæ, of the dog and cat kinds, of pachyderms, including elephants, tapirs, rhinoceroses, hogs, of bats, of saurian and ophidian reptiles, as well as of birds and other terrene animals, are all different in the three great continents. In the lower departments of the mammiferous family, we find, that the bruta or edentata of Africa are differently organized from those of America; and these again from the tribes found in the Malayan archipelago and Terra Australis.

The general result to which all these observations tend is confirmed by a survey of phenomena connected with the zoology of islands. This will appear from the two following general facts.

First. Small islands, situated at a remote distance from continents, are in general altogether destitute of land quadrupeds, except such as appear to have been conveyed by men or to have found their way by accidental means. Kerguelen's land, or the Isle of Desolation, Juan Fernandez, New Shetland, and other antarctic isles, the Gallapagos, the Islas de Lobos, contained, when discovered, no mammiferous inhabitants except seals. In the groupes of islands in the great southern ocean, though many of them are of great extent and remarkable fertility, abounding in luxuriant vegetation, no warm-blooded animals were found, except a few species which appear to have been conveyed, or to have found their way, from the Malayan archipelago.

Digitized by Google

Secondly. Animals found in islands situated near to continents are generally of the stock which belongs to the main lands. This remark will apply to the British and Mediterranean isles, and to all islands so situated of which the zoology has been explored.

Section IX.—*General Inferences from Facts relating to the dispersion of Organized Beings.—Bearing of the Conclusion obtained on the History of Mankind.*

I have gone over the different series of facts connected with the dispersion of organized beings, both plants and animals, as extensively as it appeared necessary to do. I fear indeed that some of my readers may have thought the preceding details too particular and diffuse. To me it appeared so important to establish on a broad ground-work the inference which I am about to deduce, that I have chosen to incur the risk of being too minute, rather than that of leaving anything uncertain that could be elucidated by research.

There appears to have resulted from the foregoing inquiry, sufficient evidence to establish one out of the three hypothetical statements which were expressed at the commencement of this investigation, and to show that the other two are irreconcilable with the phenomena of Nature.

1. The hypothesis of Linnæus, that all races of plants and animals originated in one common centre, or in one limited tract, involves difficulties, which in the present state of our knowledge amount to physical impossibilities. It is contradicted by the uniform tenour of facts, both in botany and zoology.

2. The second hypothesis, which supposes the same species to have arisen from many different origins, or to have been at the period of their first existence generally diffused over separated countries, is also irreconcilable with facts. It does not appear that Nature has everywhere called organized beings into existence, where the physical conditions requisite for their life and growth were to be found.

3. The inference to be collected from the facts at present known, seems to be as follows:—the various tribes of organ-

Digitized by Google

ized beings were originally placed by the Creator in certain regions, for which they are by their nature peculiarly adapted. Each species had only one beginning in a single stock; probably a single pair, as Linnæus supposed, was first called into being in some particular spot, and the progeny left to disperse themselves to as great a distance from the original centre of their existence, as the locomotive powers bestowed on them, or their capability of bearing changes of climate, and other physical agencies, may have enabled them to wander.

The bearing of this general conclusion on the inquiries hereafter to be pursued is sufficiently obvious. We have now to investigate the question, whether all the races of men are of one species in the zoological sense, or of several distinct species. If it should be found that there is only one human species in existence, the universal analogy of the organized world would lead us to the conclusion, that there is only one human race, or that all mankind are descended from one stock. It is the more improbable that a plurality of races exist in one species with reference to man than with regard to any inferior tribe, as the locomotive powers of mankind, aided by the resources of human sagacity, are greater than those of brute animals.

Digitized by Google

NOTE ON THE CONTENTS OF THE FIRST BOOK.

It may have appeared to some of my readers, that the general conclusion deduced in the preceding chapters, relative to different centres of the organized creation, is at variance with the scriptural record of an universal deluge. I shall make some observations on this subject before I proceed further.

It certainly appears difficult to reconcile with known facts the opinion maintained by Linnæus and by Pennant, which is, indeed, a very prevalent one, that all the tribes of tellurian animals now existing have descended from a stock that was preserved in the ark of Noah. But this difficulty is not materially increased by the conclusions to which I have been led by researches into the distribution of organized beings. It must have been obvious to any person, on reflection, that all the living tribes of quadrupeds, and other animals of the land, could never, in their natural state, have coexisted in one region. Polar bears, hippopotami, the inhabitants of the torrid and the frigid zones, must have dwelt in those zones from the earliest periods of their existence. If it be necessary to suppose, that creatures of all living tribes were collected from different climates into one spot, in order that they might be preserved in the ark of Noah, this could only be done by supernatural agency; and the difficulty attending the supposition is not materially enhanced by the view which I have taken of the dispersion of tribes.

Such an event as the congregating by supernatural agency of animals from all regions of the earth, and restoring them afterwards by a similar agency to their natural and primitive abodes, which last part of the hypothesis is a necessary condition, although a most surprising miracle, must certainly have been within the power of the Almighty Creator; but it is obvious to remark, that if such a suspension of the ordinary laws of Nature was really manifested, it is singular that we should find no intimation of it in the Scripture narrative. It seems to be erecting much upon a small foundation,

Digitized by Google

if we should venture to infer that such a miracle took place, from the simple record handed down to us. It is there said, that a command was given to Noah, which, in St. Jerome's words, is as follows: "Ex omnibus antimantibus mundis tolle septena et septena, masculum et fœminam; de animantibus verò immundis duo et duo, &c.—de volatilibus cœli septena et septena—ut salvetur semen super faciem universæ terræ." Here is no intimation of any extraordinary means set in action for the congregating of animals from distant regions. I am by no means disposed to take up the argument of those expositors, improperly termed Neologians, since their attempt is by no means novel, who, professing to maintain the truth of the sacred history, explain all miraculous relations in evident contrariety with the conception of the narrators themselves; but I do not apprehend that we depart from the obvious meaning of the passage above cited, by supposing that it refers to the stock of animals peculiar to the region inhabited by men before the deluge, which were, perhaps, chiefly the domesticated kinds, and the clean, or those used for sacrifice in the patriarchal institutions. These races, which would otherwise have perished, were, as it seems, to be preserved with man, and to spread themselves with him in later times over the world.

But if we have to answer the inquiry, whence and where originated, or where preserved, the races of wild animals now existing in distant regions; we must, I apprehend, make a selection out of the two following suppositions.

1. That the "universa terra" or the whole earth which was submerged, was only the *οἰκουμένη*,—the habitable world, the region inhabited by mankind. It might be said in favour of this hypothesis, that as the end proposed and expressed in the announcement of the deluge was the destruction of the depraved human race, this would have been accomplished by the submersion of the habitable world, and that all remotely separated regions, with the tribes of animals which they contained, may have been spared. The inhabited region was, as we learn from previous passages in Genesis,* some

* In it were the rivers Perath and Hiddekel and the land of Havilah, the situation of which was evidently well known. See Bochart's Canaan, and Michaelis' Specimen Geographiæ Hebræorum Exteræ.

Digitized by Google

part of Upper Asia, of unknown extent; and in this same region is to be found the native seat of most of the tribes of animals which were domesticated by man in the earliest times, and which have accompanied him in his later wanderings over the earth. These, at least many of them, are still

It was in the higher region of Asia, that MM. Buffon and Baillie, the former founding his doctrine upon a physical theory of the world, the latter on the indications of ancient astronomy and the earliest traces of the history of human society, placed the cradle of our race. (See Buffon's Epoques de la Nature, and Baillie's Lettres à M. de Voltaire.) It is interesting to observe that the same speculations which still amuse the philosophers of Europe, were long ago anticipated. Whether the following passage in Justin suggested to either of these writers the hypothesis which became so celebrated, I shall not pretend to determine: "Si ignis," says Justin, "prima possessio rerum fuit, qui paullatim extinctus sedem terris dedit; nullam prius quam septentrionalem partem, hyemis rigore ab igne secretam: adeò ut nunc quoque nulla magis rigeat frigoribus."—"Quod si omnes quondam terræ submersæ profundo fuerunt; *profectò editissimam quamque partem decurrentibus aquis primùm detectam;* humillimo autem solo eandem aquam diutissimè immoratam; et quantò prior quæque pars terrarum siccata sit, tantò priùs animalia generari cœpisse. Porrò Scythiam adeo editiorem omnibus terris esse, ut cuncta flumina ibi nata in Mæotim, tum exinde in Ponticum et Ægyptium mare decurrant." Lib. ii. cap. 1. From all this it appears that there were some in the time of Justin, who supposed the northern tract of Asia to have been the region of the world first inhabited, and that they maintained this hypothesis by two arguments, which happen to have been favourite speculations with some persons in more recent times. In the first place they contended that if the element of fire once held the whole globe, as it was conjectured, in a state of intense heat, and different countries became habitable in proportion as the heat abated, the more northern region, where cold is now most severe, would be the first that would become sufficiently temperate for the existence of organized beings. Secondly, it was argued, that if all the countries now inhabited were once beneath the surface of the ocean, the most elevated regions would first emerge from the subsiding waters, which would continue for a longer time to cover the lower levels, and the more early each country became dry and uncovered by the sea, the more early would it be fitted for the abode of men and animals. Now Scythia was more elevated than other parts of the world, since rivers there took their rise which discharged themselves into remote seas, as into the Mæotis, the Pontic, and the Mediterranean.

The hypothesis of a central heat, formerly much greater than at present, appears to rest, since the researches of MM. Fourier, Cordier, and others, on a more secure basis than the conjectures of Justin and of Buffon; but as for any supposed relation between this theory and the history of mankind, it is altogether refuted by the fact, that the rate of refrigeration appears to be so slow, that no considerable difference can have taken place since the earliest era to which the origin of the human race could with the slightest probability be referred. Lettres sur les Révolutions du Globe. Par D. Bertrand, 8vo. Paris, 1828.—Cordier sur la Temperature de l'Intérieur de la Terre, Annales du Muséum, 1827.—Bulletin des Sci. Naturelles de Ferrussac, tom. xiii.

Digitized by Google

found in their wild state, as well as the cerealian gramina, which have been, perhaps, the most universal food.

2. That the whole earth was submerged, and that on the subsidence of the waters a new creation of organized beings took place, suited to the climate of every region; and that among these new races, mankind and the tribes which had been their contemporaries and companions spread themselves in later ages. In this representation, mankind and the races of animals coeval with them, are survivors from an era anterior to the last creation of organized beings.

Some persons will make an objection to this opinion, that it assumes a fact not mentioned in the Scriptural history; namely, a partial creation posterior to the Noachian deluge. This must be granted. But is it to be presumed, that the sacred Scriptures contain an account of all that it has pleased the Almighty to effect in the physical creation, or only of his dispensations to mankind, and of the facts with which man is concerned? And of what importance could it be for men to be informed at what period New Holland began to contain kangaroos, and the woods of Paraguay ant-eaters and armadillos?

The proof of this hypothesis, that a new creation of animals has taken place since the era of the Noachian deluge; or as, perhaps, I should rather say, the attempt to show that it is not altogether improbable or unsupported by analogy, must rest upon geological facts. It can scarcely be doubted that organized tribes have more than once disappeared, at least from extensive regions of the earth, to make room for new orders of beings. If, for example, we compare the organic remains of the first great era of the creation, by which I mean those which are discovered in the older rocks and down to and including the period of the coal formation and the carboniferous limestones, the era of encrini and of gigantic monocotyledonous plants—if we compare these with the relics contained in the lias, the vestiges of the saurian period, we trace a great epocha in nature, the commencement of an entirely new order of things. The intermediate formation of sand and marl was the bottom of the ocean which covered the old world, and laid the foundation of a new. But in the

Digitized by Google

saurian period none of the contemporaries of mankind seem to have existed. Repeated revolutions of the earth appear to have taken place between that age and the origin of the tribes which are coeval with men. It is within this interval, that all the numerous tribes of pachydermes, whose relics are found in the gypsum of Paris, had the commencement and the termination of their existence. Now if it be allowed to have been a part of the order of things in remote ages of the world, that the creation of organized beings, either partially or universally, should be renewed at different periods, as the sequel of some great cataclysms, or, perhaps, in consequence of some physical changes in the surface of our planet, which had rendered it an appropriate habitation for beings of a different organization from those which had previously existed in it, there is nothing remote from this analogy in the supposition, that after the last great deluge which has overwhelmed the *ζελδωρον ἄρουραν*, a similar renovation should have taken place.

I do not profess to advocate either of these suppositions, but have merely laid them before my readers, who will select from them that which may be most satisfactory to them, or discover, if they can, one that may be preferable to either.

Digitized by Google

BOOK II.

CONSIDERATIONS RELATIVE TO THE QUESTION,

WHETHER THE VARIOUS RACES OF MEN ARE OF ONE OR OF SEVERAL SPECIES.—ANALOGICAL INVESTIGATION.

Digitized by Google

Digitized by Google

CHAPTER I.

ANALYSIS OF THE DIFFERENT METHODS OF DETERMINING ON IDENTITY AND DIVERSITY OF SPECIES.

SECTION I.—*Meaning attached to the terms Species—Genera—Varieties—Permanent Varieties—Races.*

THE meaning attached to the term *species* in natural history is very definite and intelligible. It includes only the following conditions, namely, separate origin and distinctness of race, evinced by the constant transmission of some characteristic peculiarity of organization. A race of animals or of plants marked by any peculiar character which has always been constant and undeviating, constitutes a species; and two races are considered as specifically different, if they are distinguished from each other by some characteristic which the one cannot be supposed to have acquired, or the other to have lost through any known operation of physical causes; for we are, hence, led to conclude, that the tribes thus distinguished have not descended from the same original stock.

This is the purport of the word species, as it has long been understood by writers on different departments of natural history. They agree essentially as to the sense which they appropriate to this term, though they have expressed themselves differently according as they have blended more or less of hypothesis with their conceptions of its meaning. Thus Cuvier, with reference to the animal kingdom, and not without an allusion to the favourite speculations of some of his contemporaries, says, "We are under the necessity of admitting the existence of certain forms which have perpetuated

Digitized by Google

themselves from the beginning of the world, without exceeding the limits first prescribed: all the individuals belonging to one of these forms constitute what is termed a species." And M. de Candolle, admitting that there is something hypothetical in the sense attached by him to this term, observes, that "we unite, under the designation of a species, all those individuals who mutually bear to each other so close a resemblance as to allow of our supposing, that they may have proceeded originally from a single being or a single pair." He adds, "that this fundamental idea is evidently founded on an hypothesis, at least as far as its particular applications are concerned, though it is the only one which conveys precisely what naturalists mean by *species*. The degree of resemblance which authorizes our bringing together individuals under this designation varies very much in different families; and it happens not unfrequently that two individuals belonging really to the same species, differ more among themselves in appearance than do others of distinct species: thus the spaniel and the Danish dog are, as to their exterior, more different from each other than the dog and the wolf. And the varieties of our fruit-trees offer greater apparent differences than many species."*

M. de Candolle is certainly right in limiting what is hypothetical in the conception of species in its particular applications. The meaning of the term, as I have endeavoured to define it, is sufficiently distinct. To discover some better ground-work than hypothesis on which to rest in particular applications, is the main object of this part of my work.

It is worth while to remark, that the same meaning seems to have been originally attached to the word *genus* or γένος,† which we now appropriate to *species*. These terms, as well as our English word *kind*, came at length to be applied, by unscientific observers, to particular assortments of organized beings, which so resemble each other as to suggest an idea of some near relation between them. Naturalists, however, finding that such expressions as the ox-kind, the dog-kind,

* M. de Candolle. Physiologie Végétale, tom. ii. p. 689.

† The word γένος might have been defined—οἷα γίγνονται καὶ ἀφ' ὧν.

Digitized by Google

the cat-kind, were, in popular language, too comprehensively applied to correspond with the results of accurate observation, introduced the use of the term *species*, to designate exactly what genus originally expressed.

It is evident that there exist in Nature, beyond the limits of what we now term species, certain groupes or assortments comprising tribes, whether of plants or animals, in which the particular races are strikingly similar to each other, and of which all the individuals or breeds in each group are very clearly distinguished from those belonging to other groupes. Such are all the species of the horse kind; the races of oxen, buffalos, bisons, and auroxen, and the dog and cat kinds furnish other familiar examples. We are unacqainted with any physical causes capable of producing such differences of structure as those which distinguish from each other the different breeds comprehended in each of these groupes; yet they appear to be so modelled upon particular types, that many persons have been led to entertain an opinion, that the differences between such tribes are posterior in time to the era of their first existence. The phenomena of resemblance appear to require some explanation, not less than those of diversity; and a reference of several slightly varied forms to a common type, cannot fail to suggest the idea of original affinity.* Our observation of the influence which external agents have exercised on races of organized beings reaches back† to no very remote period; and it seems by no means improbable that this influence may have been more powerful in the early stage of the existence of each tribe, than it

* M. Geoffroy Saint-Hilaire, et M. Serres. Mem. du Muséum, 9ème année.

† This is undoubtedly true, if we consider the subject on an extensive scale; and the observation as a general one is not refuted by particular instances in which the antiquity of species has been demonstrated, even though M. Bonastre found, either represented or preserved, eighty existing plants in the remains of ancient Egypt, and M. Kunth a twentieth part of our actual plants in the fragments of mummies. These relations are, as it must be admitted, very surprising. De Candolle speaks of *such* facts as establishing the permanency of species for a period of 3,000 years. But it must be remembered that the art of embalming in mummies, was still in use subsequently to the establishment of Christianity in Egypt; and even in the time of St. Augustin, viz. in the fifth century. See Blumenbach, Beytraege zur Naturgeschichte, and Walch de Mumiis Christianis in Comment. Reg. Soc. Sc. Goetting. tom. iii.

Digitized by Google

is at present known to be.* It is true that this kind of speculation loses a great part of its probability when pursued to the extent to which those naturalists carry it, who maintain generally the transmutation of genera and species; and it might be argued, in opposition to their views, that there are in many departments of nature defined groupes referable to particular types or generic forms, which are still very distinct and strongly marked. But we are stopped in limine, by the consideration that all such ideas are merely conjectural, and that the investigations in which we are engaged, refer to matters of fact and not to probabilities. In the present state of our knowledge, a genus is to be considered as an assortment of tribes, on a principle merely of resemblance, and it may, therefore, include more or fewer species, according to the particular views of the naturalist: and the term *species* must be solely applied to those collections of individuals which so resemble each other that, by referring merely to the known and well-ascertained operation of physical causes, all the differences between them may be accounted for, and present no obstacle to our regarding them as the offspring of one stock, or, which is the same thing, of races precisely similar.

Varieties, in natural history, are such diversities in individuals and their progeny as are observed to take place within the limits of species. Varieties are modifications produced in races of animals and of plants by the agency of external causes; they are congenital: that deviation from the character of a parent-stock which is occasioned by mixture of breed, has been regarded as a kind of variety; but varieties are quite as well known in the animal kingdom as the mere result of agencies, often little understood, on the breed, independently of such mixture. Varieties are hereditary, or transmitted to offspring with greater or less degrees of constancy.

Varieties are distinguished from species by the circumstance that they are not original or primordial, but have arisen,

* See some excellent observations by M. Geoffroy Saint-Hilaire, and M. Serres, in the Mémoires du Muséum, 9ème année.

Digitized by Google

within the limits of a particular stock or race. *Permanent varieties* are those which having once taken place, continue to be propagated in the breed in perpetuity. The fact of their origination must be known by observation or inference, since the proof of this fact being defective it is more philosophical to consider characters which are perpetually inherited as specific or original. The term permanent variety, would otherwise express the meaning which properly belongs to species. The properties of species are two, viz. original difference of characters and the perpetuity of their transmission, of which only the latter can belong to permanent varieties.

The instances are so many in which it is doubtful whether a particular tribe is to be considered as a distinct species, or only as a variety of some other tribe, that it has been found by naturalists convenient to have a designation applicable in either case. Hence the late introduction of the term *race* in this indefinite sense. Races are properly successions of individuals propagated from any given stock; and the term should be used without any involved meaning that such a progeny or stock has always possessed a particular character. The real import of the term has often been overlooked, and the word race has been used as if it implied a distinction in the physical character of the whole series of individuals. By writers on anthropology, who adopt this term, it is often tacitly assumed that such distinctions were primordial, and that their successive transmission has been unbroken. If such were the fact, a race so characterised would be a species in the strict meaning of the word, and it ought to be so termed.

SECTION II.—*Observations on the means of determining as to Identity and Diversity of Species—Analogical Investigation —Ethnographical Investigation.*

From what has been said it is obvious, that there must, in some instances, be a difficulty in ascertaining whether two races of animals or of plants, belonging to the same genus,

Digitized by Google

and similar in many respects but different in others, are in reality so many distinct species or merely varieties of one species. The doubt can only be removed by a comprehensive survey of the phenomena related to the origin of varieties in breeds, and of facts in the animal economy, connected with their propagation. The inquiry divides itself into two heads; the first is an investigation of *phenomena taking place in the particular races to be compared,* and in respect to which the question has been set on foot; the second refers to other tribes bearing some analogy in their structure, and in the general laws of their economy to these particular races. The most immediate and decisive proof that the diversities observed between any given tribes constitute only varieties, arises from the discovery of corresponding phenomena of variation in those very races which are the subjects of comparison. Thus, if any one should maintain that asses are degenerated horses, he would establish his opinion to the conviction of every one, if he could only point out an instance in which horses have actually degenerated into asses. A less direct though still sufficient evidence may be furnished by facts which bear, by analogy, on the subject of research. If it can be proved that certain deviations in the form and structure of individuals, analogous to those which are the subjects of inquiry, actually occur in other tribes, that a provision is made for their development in the laws of the animal economy, that there is nothing in the change supposed to have taken place out of the usual course of organized nature, the inference that such deviations constitute merely varieties, and do not amount to specific distinctions, will be established with a considerable degree of probability, though scarcely with that decisive evidence which the direct manner of proof affords. In adverting to researches into the physical varieties of mankind, the former method of inquiry must be termed the historical or ethnographical one, and the latter the analogical. The first comprises a survey of the different races of men, an investigation of their physical history, the ethnography, as it is termed, of every tribe of the human family, undertaken and pursued in such a manner as to enable us to determine what changes

Digitized by Google

have actually arisen in the physical characters of nations or human races. The second involves every consideration founded on physiology, or the laws of the animal economy, that may serve to elucidate the relation of different tribes to each other in respect to their physical characters and constitution. It will be my endeavour in the course of this work to go through both of these investigations, and lay before my readers their results; but I shall take up these two departments of inquiry in a different order from that in which I have mentioned them. Several motives have determined me to pursue this plan, but principally the impression that my readers will proceed with greater facility and advantage to the ethnographical researches, which form the greater part of my work, after they have directed their attention to the physiological and anatomical facts to be comprised in the other part.

SECTION 3.—*Analogical Investigation of the Nature of Varieties—Different Heads of this Inquiry enumerated.*

This part of our inquiry ought to comprise a survey of the whole theory of varieties arising in the breed or progeny of organized beings, and an investigation of the nature of such deviations from the structure of the race, as well as of the circumstances by which their extent is limited or confined within certain bounds. It includes the attempt to determine what in the structure of species is permanent, and what is liable to transmutation, a question bordering closely on subjects of controversy, which have been much discussed among naturalists of the present day. By confining myself strictly to the examination of facts, and avoiding whatever is conjectural and imaginary, I shall spare myself the necessity of entering on disputed ground. The question to which I have to direct the attention of my readers is, what are the characters of organization which are permanently transmitted in the species of animals and of plants, without change or variety, and what are those which are liable to deviation?

It seems to be a fact, that the most permanent and invari-

Digitized by Google

able characters in the animal kingdom and those which are accordingly fitted to distinguish species, consist chiefly in the general laws or arrangements of the animal economy in each tribe.

An objection which is likely to be offered to this remark is, that the structure of parts is essentially anterior to their functions; that functions are merely the results of organization, and ought accordingly to be considered in the last place, all distinctions and classifications being founded on the structure of organs.

Such an observation proposed in abstract terms is very specious, and it would be well founded if our knowledge of structures were more complete than it is. But in the present state of our science, we have frequently no other method of discerning most important diversities of organization than by noting the phenomena of functions. Articulate speech is among the most important attributes of humanity, but this faculty would, perhaps, never have been demonstrated by anatomical examination of the human vocal organs, or by a comparison of the structure of these with corresponding parts in the orang. Until the organization of living bodies shall have been so fully explored as to elucidate in every instance the whole capabilities of structure, we must consider functions as leading facts on which classifications and inferences may be founded not less securely than on what we know of organization itself. Nor does any material difference exist in this point of view between the two series of facts.

In general, the most constant peculiarities in the races of animals, and those which accordingly best answer the purpose of specific characters, consist, as I have already observed, in the great laws which govern the functions of the animal economy. The physiological characters of race are liable to few and unimportant deviations. Particular species have, in general, one limit in regard to the average duration of life, the circumstances connected with the reproduction of their kind, such as the number of their progeny, the times and frequency of breeding, among mammifers, the period of utero-gestation, and among birds, the interval between laying and hatching eggs. The other natural functions are subject

Digitized by Google

to the same laws: tribes of the same species are with some varieties subject to the same diseases. Their animal or psychical faculties are equally constant: in general, their instincts and habits are found remarkably uniform. Few if any important diversities in respect to any of these principal laws of the animal economy are known to take place within the limits of one and the same species; while, on the other hand, those tribes which most strongly resemble each other in outward form, but are yet specifically distinct, are found in reality to differ in the particulars above mentioned. Such are the permanent characters of species. There are, indeed, diversities in the internal constitution, as evinced by the phenomena of temperament and predisposition, springing up within the race; but these do not interfere with the principal laws of the animal economy. It is in the external and less essential parts that varieties principally take place. In the texture and coverings whether hairy or woolly of the skin, the absence or presence and the size of horns and other appendages, the colour or complexion, and in some instances in the number of fingers and toes;—in all these particulars, varieties frequently spring up within one and the same species, to the transmission of which there is a strong tendency in the animal economy. Similar observations may be made, *mutatis mutandis*, with respect to the vegetable creation. The species of plants display, as it is well known, varieties of the most striking appearance; and these are confined to the least essential, but which are often the most conspicuous parts of vegetation, while the organs of fructification are unaffected by such changes, and retain a permanent character.*

I shall now proceed to inquire, with respect to all these several particulars, what physiological facts can be established that may tend to illustrate the relations of races to each other, both in the lower departments of nature and in mankind, and I shall begin with some of the particulars in the physical history of races which are the most constant, and which scarcely deviate within the limits of the same species. The subject naturally divides itself under the following heads:—

* De Candolle, Dict. des Sci. Nat.

Digitized by Google

1. The great laws of the organized system, or with respect to sentient beings of the animal economy, all the principal facts which relate to the natural and vital functions, the periods and duration of life, the economy of the sexes, the phenomena of parturition and reproduction, are with slight deviations resulting from external agencies, constant and uniform in each particular species.

2. Connected with the same subject are the phenomena relating to the mixture or blending of races, and the propagation or sterility of hybrids. In the circumstances related to this series of facts, it is possible that some information may be obtained on the distinctive characters and discrimination of species.

3. The pathological history of species and of races is a branch of physiological history which has not been so much investigated as its importance seems to merit. It is one at least the consideration of which must not be omitted.

4. The psychical endowments of particular tribes, comprehending all their faculties of sense and perception, as well as their instincts and propensities, their modes of action and habits, constitute an important part of the natural history of species. These characters are, when viewed on an extensive scale, subject to few variations; they may be said, indeed, to display a surprising uniformity.

5. After considering what bearings the facts observed under these different heads have on the inquiry respecting the human family, we shall proceed to the more variable characters of species, and to the deviations which frequently arise in the same identical race, and constitute particular tribes.

SECTION IV.—*First Head of the Analogical Investigation of Species—Laws of the Animal Economy in Species.*

Animals of the same species are subjected to nearly uniform laws with respect to all the principal functions of the animal economy. Among the most constant characteristics of species are the circumstances connected with reproduction, the times and frequency of breeding, in mammalia,

Digitized by Google

the period of utero-gestation, and in birds that of sitting upon eggs, the number of progeny brought forth at a time, and the period of suckling or watching over the young. The progress of physical development and decay is likewise ordained by nature to take place in each species according to a certain rule. The periods at which individuals arrive at adult growth, the different changes which the constitution undergoes at particular ages, the periods of greatest vigour and of decline, and the total duration of life are given, though with individual exceptions and varieties, to every species of animals. There are exceptions and variations, but these are within certain prescribed limits, and obey definite laws.

On the other hand, it may be observed as a very general fact, that animals belonging to tribes which nearly resemble each other, but are yet specifically distinct, differ in a decided manner with respect to the same particulars.

Thus the wolf and the dog, though proximate species, differ remarkably as to the period of utero-gestation. The she-wolf appears to carry her young ninety days, while the period of gestation in the bitch is well known to be sixty-two or sixty-three days;* the former being longer by nearly one-third part than the latter. We are acquainted with no similar deviation in the animal economy within the limits of any one species, and it is very unlikely that such a fact will ever be observed.

Paragraph 1.—Of the Duration of Life in general.

The duration of life proper to each species is subject, like other characters of the physical constitution, to individual varieties. The peculiarities of temperament and organization on which these individual varieties depend are, like other analogous properties, more or less disposed to become hereditary, and by transmission common to whole families. Indi-

* The Count de Buffon asserts that the period of utero-gestation of the wolf is above one hundred days. An instance is reported in the fourth volume of the Annals of the Museum of Natural History, in which the gestation of the wolf was from eighty-nine to ninety-one days.

Digitized by Google

viduals in some families appear, indeed, to grow old, if we may use the expression, at an earlier period of life than in others. But all these variations appear within certain limits, and they are all proper to individuals, and disappear when aggregates or large numbers of individuals are compared.

I shall hereafter exemplify this last remark, but I must first observe, that besides that variety in the duration of life which belongs to individual peculiarity of constitution, there is another sort of difference depending upon climate. In tribes of animals whose local sphere of existence is, by the conditions of their physical structure, circumscribed within one region, there exist only individual peculiarities; but in species which are spread over vast regions, or inhabit indifferently the whole world, certain varieties take place in respect to the *average duration* of life, and the progress of physical development, which are the obvious results of different external agencies.

The proportionate duration of human life in different climates has lately been an object of statistical inquiries, in which many distinguished writers have been engaged. It would be superfluous to enter on the present occasion into the statements connected with this subject; but it is necessary to form some idea of the manner and extent in which the duration of life is affected by climate, in order to be prepared for estimating the facts which relate to longevity in particular races of men.

It is well known that the proportional number of individuals who attain a given age differs in different climates; and that the warmer the climate, other circumstances being equal, so much the shorter is the average duration of human life. Even within the limits of Europe, the difference is very great. In some instances, according to the calculations of M. Moreau de Jonnès, the rate of mortality, and inversely the duration of life, differ by nearly one-half from the proportions discovered in other examples. The following is a brief extract from a table presented by this celebrated calculator to the Institute. The table comprehends returns belonging to different periods, illustrative of the effect produced by political changes and improvements in the state of society on the

Digitized by Google

duration of human life. I have omitted this part, and have only abstracted that which illustrates the influence of climate.

Table exhibiting the annual mortality in different countries in Europe:—

In Sweden, from	1821 to 1825	1 death in	45
Denmark . .	1819 „	„	45
Germany . .	1825 „	„	45
Prussia . .	1821 to 1824	„	39
Austrian Empire	1825 to 1830	„	43
Holland . .	1824 „	„	40
England . .	1821 „	„	58*
Great Britain .	1800 to 1804	„	47
France . . .	1825 to 1827	„	39.5
Canton de Vaud	1824 „	„	47
Lombardy . .	1827 to 1828	„	31
Roman States .	1829 „	„	28
Scotland . .	1821 „	„	50

The difference of twenty-eight and fifty is very considerable; but even the latter rate of mortality is considerably greater than that which the data collected by M. Moreau de Jonnès attribute to Ireland, Norway, and the northern parts of Scotland.

In approaching the equator we find the mortality increase, and the average duration of life consequently diminish. The following calculation obtained by the same writer will sufficiently illustrate this remark.†

Latitude.	Places.	1 death in
6° 10′	Batavia	26 inhabitants
10° 10′	Trinidad . . .	27 „
13° 54′	Sainte-Lucie . .	27 „
14° 44′	Martinique . . .	28 „
15° 59′	Guadaloupe . . .	27 „
18° 36′	Bombay	20 „
23° 11′	Havanna	33 „

* There must be a mistake in this number. According to Porter and Reikman, the number of annual deaths in England from 1821 to 1831, is one in fifty-one.

† Notice sur la Population des États de l'Europe, par M. Moreau de Jonnès. —De l'Homme et de ses Facultés, par M. Quetelet.

Digitized by Google

It has been observed that in some of these instances the rate of mortality appears greater than that which properly belongs to the climate, as some of the countries mentioned include cities and districts known to be by local situation remarkably unhealthy. In some the mortality belongs in great part to strangers, principally Europeans, who coming from a different climate suffer in great numbers. The separate division from which the collective numbers above given are deduced will sufficiently indicate these circumstances.

In Batavia, 1805	Europeans died . . .	1 in 11
	Slaves	1 „ 13
	Chinese	1 „ 29
	Javanese, viz. Natives .	1 „ 40
Bombay, 1815	Europeans	1 „ 18.5
	Mussulmans	1 „ 17.5
	Parsees	1 „ 40
Guadaloupe, 1811 to 1824	Whites	1 „ 22.5
	Free-men of colour . .	1 „ 35
Martinique, 1825	Whites	1 „ 24
	Free-men of colour . .	1 „ 23
Grenada, 1815	Slaves	1 „ 22
Saint Lucia, 1802	Slaves	1 „ 20

The comparatively low degree of mortality among the free men of colour in the West Indies, and the Javanese and Parsees, in countries where those races are either the original inhabitants, or have become naturalized by an abode of some centuries, is remarkable in the preceding table. It would seem that such persons are exempted, in a great measure, from the influence of morbific causes which destroy prematurely Europeans and other foreigners. That the rate of mortality should be lower among them than in the southern parts of Europe, is a fact which, in the present state of our knowledge, it is difficult to explain.

It would appear that in the hotter climates a great part of those who would otherwise attain to longevity, are carried off prematurely by various causes of disease. In all countries, however, particular individuals escape from the noxious influence of causes which shorten the existence of the majority;

Digitized by Google

and of these we shall be enabled to collect a sufficient number to prove that the attainable duration of life, or the term of longevity, is nearly the same in different races of men. As this position is one of great importance with respect to the inquiry which I have principally in view, I shall endeavour to establish it upon sufficient evidence.

It was calculated by Buffon, that a third part of the human race die before the age of ten years; one-half before that of thirty-five; two-thirds before fifty-two, and three-fourths before sixty-one years of age. A very different computation has been made by later writers. According to Hufeland's estimate, out of a hundred individuals born, fifty die before their tenth year, and six only live to be above the age of sixty.*

It may be thought that the instances of centenarians are so few and scattered, that a collection of their numbers is rather a matter of accident than calculation. I do not believe this to be the case; and I have selected this particular class of aged persons, as examples of longevity in different races, because I find instances frequently on record, owing to their having been regarded as matters of singular occurrence and curiosity, and therefore preserved in periodical accounts and other documents.

It is difficult to ascertain from data now existing, the proportional number of centenarians in the whole community. It was calculated from the bills of mortality in London, that one individual in 3,126 reaches his hundredth year. But in 1751, the total number of deaths amounted to 21,028: in this number there were fifty-eight persons aged ninety, thirteen aged one hundred, and one aged one hundred and nine; giving one centenarian to 1,617; and in 1762, out of 26,326 deceased there were eighty-five aged ninety, and only two centenarians. From 1728 to 1758, during a period of thirty years, the total number of deaths in the bills of mortality amounted to 750,322. In this number, two hundred and forty-two persons exceeded the hundredth year.† The tables

* Hist. Nat. du Genre Humain, par M. Virey, Paris, 1824.

† Easton on Longevity, Salisbury, 1799.

Digitized by Google

of mortality, constructed in this country, do not go up so high as the hundredth year; but in a table for the Belgic states, M. Quetelet has given the numbers of persons above ninety years of age as follows:—

In 10,000 births, the age of	90	is attained by 682
	91	 510
	92	 387
	93	 282
	94	 207
	95	 153
	96	 105
	97	 67
	98	 39
	99	 20
	100	 10
	101	 5
	102	 2
	103	 1
	104	 0

M. Quetelet informs us, that at the commencement of 1831, there were ten centenarians in Belgica, of which eight were in the three provinces of Hainault, Namur and Luxembourg. Limbourg and eastern Flanders had each one, and there were none in the province of Brabant, Antwerp, West Flanders and Liege. The three oldest of these centenarians were aged one hundred and four, one hundred and ten, and one hundred and eleven. They belonged to Luxembourg; the others did not exceed one hundred and two years.

Haller made a collection of facts relating to longevity, and obtained notices of upwards of one thousand individuals who exceeded their hundredth year. Of these sixty died between the hundred and ten and one hundred and twentieth year, twenty-nine were between one hundred and twenty and one hundred and thirty years old, fifteen between one hundred and thirty and one hundred and forty years; and seven exceeded this last term, of whom one lived to be one hundred and sixty-nine years old.

Mr. Easton of Salisbury, in a curious work on longevity, has collected notices of one thousand seven hundred and

Digitized by Google

twelve persons who exceeded their hundredth year, and from these the following table has been deduced.

Of males and females who lived from one hundred to one hundred and ten years, (both inclusive,) the instances have been one thousand three hundred and ten:

Above	110	to 120	277
„	120	„ 130	84
„	130	„ 140	26
„	140	„ 150	7
„	150	„ 160	3
„	160	„ 170	2
„	170	„ 180	3

The following is a collection of instances of very advanced ages by the same writer.

Apollonius of Tyana	in A.D.	99	aged 130
St. Patrick		491	„ 122
Attila		500	„ 124
Llywarch Hên		500	„ 150
St. Coemgene		618	„ 120
Piastus, king of Poland		861	„ 120
Thomas Parr		1635	„ 152
Henry Jenkins		1670	„ 169
The Countess of Desmond		1612	„ 145
Thomas Damme		1648	„ 154
Peter Torton		1724	„ 185
Margaret Patten		1739	„ 137
John Rovin and his Wife		1741	„ 172 & 164
St. Mongah or Kentigen		1781	„ 185

Beyond the limits of Europe there are numerous instances of well-authenticated longevity.

Baron Larrey states, that there were, at Cairo, thirty-five individuals upwards of one hundred years of age.

It has often been related, that the cenobites of Mount Sinai live not unfrequently to the age of one hundred and ten or one hundred and twenty years.

Old men are mentioned by travellers in Arabia, Barbary, Syria, and Persia, to exceed not unfrequently one hundred years of age.

Digitized by Google

The following * are instances of longevity which occurred in America or the British colonies, in persons either of European descent, or born in Europe, but resident abroad during the greater part of their lives.

Mr. C. Cotterel died at Philadelphia, aged one hundred and twenty years and three days; afterwards, his wife, aged one hundred and fifteen; after living together ninety-eight years.†

At Laurens district, South Carolina, died Mr. Solomon Nibel, aged one hundred and forty-three years: he emigrated from England in 1696, aged nineteen.‡

At Whitehall, near New York, Henry Francisco, aged one hundred and thirty-four, died in 1820. He was present at the coronation of Queen Anne of England.§

At Campbell, Virginia, died in 1821, Mr. C. Layne, aged one hundred and twenty-one. He was born in Buckingham county, in 1700. He has left a widow aged one hundred and ten, and a numerous and respectable family to the fourth generation.||

In Fairfax county, Robert Thomas, aged one hundred and seven, died in 1821. At Bow, in New Hampshire, in 1823, died Samuel Welsh, aged one hundred and twelve years and seven months.¶

Died at Spanish Town, Jamaica, Nov. 21, 1829, Mrs. Judith Crawford, aged one hundred and fifty-one years: she retained her bodily strength and her faculties until within a few days of her death. She remembered the earthquake in 1692.**

Died at Goshen, in Union district, South Carolina, July, 1630, Samuel Selby, upwards of one hundred and one years of age.††

* These instances were communicated to me by the late Dr. Edmund Fry, who collected them from various authentic sources.

† Benj. Martin's Miscellaneous Correspondence in Prose and Verse.—Jan. 1761.

‡ Times, Sep. 22, 1820.

§ Baldwin's London Mag.—Jan. 1821.

|| London Mag.—Aug. 1821.

¶ Morning Herald.—June 2, 1823.

** Gent. Mag.—April 1830.

†† Gent. Mag.—Sep. 1830.

Digitized by Google

Died at Mount Grace, in Jamaica, December, 1830, Mrs. Mary Innes, aged one hundred and twenty years.*

Died in the island of St. Helena, in September last, Mrs. Eliz. Honoria Frances Lambe, aged one hundred and ten years and four months. In the year 1731, she was housekeeper to General Pike. She was married eight times, and left many descendants, of whom two hundred and sixty yet live. "She died in the full persuasion, that the Millennium will happen in 1836, and that the charter will be renewed to the East India Company." — Extract from the Times, Sep. 8, 1831.

Paragraph 2.—Of the Longevity of the Africans.

It has been supposed by some, that the Negro race is of shorter life than the European.†

Dr. Winterbottom informs us, that "few of the inhabitants of Guinea arrive at old age." He says, that "they turn old much sooner than Europeans, and appear in a state of decrepitude when the latter have scarcely reached the grand climacteric." M. Adanson makes a similar remark of the natives of Senegambia. "The Negroes of Senegal," he says, "are really old at the age of forty-five, and sometimes earlier." Accounts of the same purport are given by Bosman and others, respecting the natives of Guinea and Congo.

The shortness of life observed among the Africans by these authors, appears to be the result of circumstances. The condition of savages, their exposure to noxious influences, and the particular situation of these tribes on the African coast, sufficiently accounts for the fact, without supposing any peculiarity in the race.

We are informed by Mr. Oldfield, that the coast of Africa, near the river Nunn, is extremely unhealthy, being covered with a luxuriant vegetation of mangroves and plants of the

* Suppt. Gent. Mag.—Dec. 1830.

† M. Virey says, that the Negro race is in general more short-lived than the European.—Hist. Nat. du G. H. par M. Virey, tom. i. pp. 143—365.

Digitized by Google

strand, exposed to inundations and extensively swampy.* The natives are very thoughtless and dissolute: they are subject to diarrhœas, dysenteries, and a variety of cutaneous diseases. Considering the general condition of the country, the state of the natives, their irregularity of living, it is not surprising, says Mr. Oldfield, to find that few of them attain old age. It was remarkable to observe so few aged men in the Eboe country, considering the vast population.

The same writer has observed, that in the Nyffe territory, which is a fine open country, the natives attain a good old age. He says, "We met with several aged people said to be upwards of eighty years old." He visited Mallum Dando, formerly king of Rabbah, an old man with a long white beard, who died soon afterwards, at the age of one hundred and fifteen years.

Other instances of considerable longevity in Africa, are recorded by Winterbottom, Patterson, and Barrow. There is reason to believe, that the constitution of Negroes is better adapted to the climate which they inhabit than that of Europeans; and that the average duration of life would be greater among Negroes in such a climate, than among Europeans inhabiting the same region. This, however, would not establish the conclusion, that the Negro race is absolutely of equal life with the European. In order to render this probable, we must collect instances in which they appear to have attained an age equally advanced.

I have examined the registers of slaves on some estates in the West Indies, in which I have observed frequent instances of advanced ages. Many are set down as seventy and eighty years old. This is the more remarkable, since the causes tending to shorten life operate with so much severity upon the enslaved population of the West India islands, where it has been stated, that one Negro slave dies annually out of five or six, whereas among the free-blacks who serve in the English army, the annual mortality is only one in 33.3.†

* Memoirs by Mr. Oldfield, Surgeon to the late Expedition to explore the source of the Niger.

† Elements of Medical Statistics by Dr. B. Hawkins.—Quetelet sur l'Homme et ses Facultés.

Digitized by Google

Edwards, in his history of the West Indies, says, that Negroes in these islands often attain to a great age: he mentions one instance of a negress, aged one hundred and twenty years, and a second of one who was strong and healthy at the age of ninety-five, or upwards.*

The following instances are collected from a variety of sources.†

December 5th, 1830, died at St. Andrews, Jamaica, the property of Sir Edward Hyde East, Robert Lynch, a negro slave in comfortable circumstances, who perfectly recollected the great earthquake in 1692, and further recollected the person and equipages of the Lieutenant Governor, Sir Henry Morgan, whose third and last governorship commenced in 1680, viz. one hundred and fifty years before. Allowing for this early recollection the age of ten years, this negro must have died at the age of one hundred and sixty.‡

Died at Kingston, Jamaica, Catherine Lopez, a negro woman, at the age of one hundred and thirty-four years.§

Died April 6th, 1821, at Fellowship Hall, Jamaica, Margaret Darby, a free-black woman, at the age of one hundred and thirty years. She retained all her faculties to the last moment.‖

Died at Frederick Town, North America, in 1797, a mulatto man, said to be one hundred and eighty years old.¶

Died in Spanish Town, Jamaica, Dec. 20th, 1820, a negro woman named Mary Goodsall, at the age of one hundred and twenty.**

Died Feb. 17th, 1823, in the Bay of St. John's, Antigua, a black woman named Statira. She was a slave, and was hired as a day-labourer during the building of the gaol, and was present at the laying of the corner-stone, which ceremony took place one hundred and sixteen years ago. She

* Hist. of West Indies.
† Communicated by Dr. Fry.
‡ Supplem. Gent. Mag. June, 1821.
§ Monthly Mag. Jan. 1807.
‖ Blackwood's Mag. July, 1821.
¶ Morning Post, Dec. 25, 1804.
**Blackwood's Mag. Jan. 1822.

Digitized by Google

also stated, that she was a young woman grown, when the President Sharpe assumed the administration of the island, which was in 1706. Allowing her to be fourteen years old at that time, we must conclude her age to be upwards of one hundred and thirty years.*

April 7th, 1827, died at Falmouth, Jamaica, Rebecca Tury, a black woman, at the age of one hundred and forty years, as correctly traced from the deeds of her owners. She retained her faculties to the last.†

Died in South Carolina, Tom, a negro man, belonging to Mrs. Bacon, at the age of one hundred and thirty years.‡

At Jamaica, November 10th, 1830, died Francis Peat, a black slave of Kingston, aged one hundred and thirty, leaving many descendants to the fourth generation.§

Died Oct. 12th, 1830, in Jamaica, aged one hundred and twenty years, Jane Morgan, a negro woman, formerly belonging to George Crawford Ricketts, Esq. attorney-general of the island.‖

Juan Moroygota, a native of the parish of Tabio, of the canton of Cappaquina, who completed his hundred and thirty-eighth year, on the 12th of June, 1828. At this advanced age, he enjoys perfect health, and works every day as an agricultural labourer.¶

Died in Jamaica, 1821, Joseph Bam, a negro belonging to the estate of Morice Hall, at the age of one hundred and forty-six.**

Sept. 3d, 1831, in Jamaica, died a creole negro woman, named Catherine Hiatt, formerly belonging to the Honourable John Hiatt; she frequently said she was a good-sized girl at the insurrection of the Coromantee negroes, in Carpenter's Mountains, Clarendon, which happened in 1690; from this, her age is computed to have been upwards of one hundred and fifty years. She never bore a child: she retained all her

* Times, Oct. 2, 1823.
† St. Jago Gazette.
‡ Gent. Mag. July, 1829.
§ Gent. Mag. April, 1831.
‖ Gent. Mag. March, 1831.
¶ Gazeta de Columbia, Nov. 28, 1828.
** Gent. Mag. Dec. 1831.

Digitized by Google

faculties to the last moment, and did coarse needle-work a very short time previous to her death.*

Sept. 8th, died in Jamaica, Frances Johnson, a Samboo woman slave, aged one hundred and seven years, retaining all her faculties to the last.†

A complete proof that negroes are not short-lived people, under circumstances favourable to their longevity, is afforded by the late census of the population of New Jersey. The whole aggregate number of the inhabitants of that state was computed to be upwards of 320,000 souls, of which number 20,000 and upwards were negroes, and 300,000 white people. Among the 300,000 whites, there were existing, at the date of the census, only two individuals one hundred years of age, while among the 20,000 negroes, there were not fewer than eleven persons who had lived a century and upwards.

From the facts above stated we might infer, that many other countries are even more congenial to the negro race than their native Africa, or at least more favourable to longevity. But we are not sufficiently informed of the actual condition of the African nations, and particularly of what relates to the statistics of that part of the globe, to allow of our drawing any positive conclusions on this subject. The intertropical region of Africa is probably more congenial to the constitution of negroes, than to that of other human races.

It may be observed, that there are many instances of longevity on record, which have occurred among other African nations; I mean among tribes not usually included under the designation of negroes. Mr. Patterson has mentioned the instance of a Kaffer, aged ninety years,‡ and Mr. Barrow,§ and more recently Mr. Burchell,‖ have seen Hottentots who had exceeded their hundredth year.

* Gent. Mag. Supplem. Dec. 1831. † Gent. Mag. Supplem. Dec. 1832.
‡ Patterson's Travels in Caffraria.
§ Barrow's Travels in the interior of Africa.
‖ Burchell's Travels in South Africa.

Digitized by Google

Paragraph 3.—Of the Longevity of the American and other races of men.

It has been supposed by some that the native Americans are of shorter life than the races of men inhabiting Europe.

Dr. Rush informs us, that the Indians of North America have at an earlier period than Europeans the marks of old age, and that longevity is more rare among them than among white people.

It may be suspected that the fact asserted by Dr. Rush ought to be attributed to accidental circumstances, and to the peculiar state of the tribes from whom his information was obtained. The native Americans appear, from the accounts given by many well-informed writers, to be rather remarkable for longevity.

Don Felix de Azara seems to have formed this opinion of the natives of South America. In describing the Charruas of Paraguay, he says that they never lose their hair, which only becomes grey by half in persons aged about eighty years.

The Mexicans, says Clavigero, become grey-headed and bald earlier than the Spaniards; and although most of them die of acute diseases, it is not very uncommon among them to attain to the age of a hundred years.*

"Among those Americans," says the same writer, "whose great fatigues and excessive toil do not anticipate their death, there are not a few who reach to the age of eighty, ninety, and a hundred years; and, what is more, without there being observed in them that decay which time commonly produces in the hair, in the teeth, in the skin, and in the muscles of the human body."†

We have a similar observation from M. de Humboldt respecting the native Americans. He says, "It is by no means uncommon to see at Mexico, in the temperate zone, half way up the Cordillera, natives, and especially women, reach a hundred years of age. This old age is generally comfortable; for the Mexican and Peruvian Indians preserve their

* Mexican History, book i. † Idem, Dissertations.

Digitized by Google

strength to the last. While I was at Lima, the Indian, Hilario Pari, died at the village of Chiguata, four leagues distant from the town of Arequipa, at the age of one hundred and forty-three. He had been united in marriage for ninety years, to an Indian of the name of Andrea Alea Zar, who attained the age of one hundred and seventeen. This old Peruvian went, at the age of one hundred and thirty, from three to four leagues daily, on foot.*

Another race of men, very different from the above-mentioned, and also from the generality of Europeans, are the Laplanders. According to Rheen, who is cited by Sheffer,† the Laplanders are rather remarkable for long life. He says, "the Laplanders, not being subject to any dangerous distempers, grow old, and live even to a great age: some live above a hundred years, but most to seventy, eighty, or ninety years. Notwithstanding which, they lose not much of their natural vigour, being able to traverse the highest mountains and thickest woods, and manage all other affairs as before; neither get they any grey hairs till they are very old."

We might be almost inclined to suspect, from these statements, that the longevity of some other races of men, instead of falling short of the average duration of life, rather exceeds the term prevalent in those nations who inhabit most of the countries of Europe. But on the whole, it does not appear that any well-marked differences exist between the several races of men, that can furnish a constant character.

It is interesting, in connexion with this subject, to notice the very wide interval which separates from mankind the tribe of animals most approximating to them in physical structure. Of all the simiæ, and indeed of the whole brute creation, the orangs and the troglodyte most nearly resemble man: this analogy is very striking in the internal organization, on which the natural functions principally depend. According to M. Lesson, who has with great accuracy described the

* Political Essay on New Spain.

† Sheffer's History of Lapland.

Digitized by Google

family of simiæ, and the tribe of orangs in particular, there are satisfactory grounds for believing that the full term of existence for the chimpanze, or troglodyte, is about thirty years. This is a longer period of life than other naturalists have attributed to any of the tribe, and may perhaps be considered as its full period of longevity.

Paragraph 4.—Of the Progress of Physical Development, the Periodical Phenomena of the Constitution, the state of the Natural and Vital Functions in different Races.

There are many circumstances connected with the state of the natural and vital functions which are strikingly characteristic of species, as being remarkably uniform within the limits of one species, and different in races well known to be distinct. Among these, the specific temperature of the body, the frequency of the pulse, and states of all the functions of physical life are included, as well as all the phenomena connected with breeding in the economy of the female.

The specific temperature, and the ordinary frequency of the pulse, are well known to be nearly uniform in all races of men.

With respect to the periodical phenomena of the constitution, before we can appreciate the differences which may belong to races of men, we must first advert to those which are the immediate results of external agencies, particularly of circumstances related to climate. It is well known that climates give rise to a considerable difference in the period of puberty, which is much more early in hot than in cold countries, in the same races of people. The period of child-bearing is generally observed to commence and cease at a younger age in tropical climates than in temperate ones, and to be latest of all in extremely cold countries. There is also a considerable variation dependent on the habits of society. The women of the peasantry in Europe have a more tardy appearance of the catamenia than the inhabitants of cities, especially the higher orders. In the state of manners which exists in populous cities, the time at which these phenomena commence is much accelerated; they are greater in degree,

Digitized by Google

and occasion much more disturbance in the system, by their excess and occasional irregularities.

In England, the age at which the catamenia make their appearance is generally about thirteen or fourteen years, sometimes a year or two earlier or later; and the age of puberty in the male sex is from fourteen to sixteen years. In the north of France a difference is perceptible in these periods, which are accelerated in proportion to the temperature.* In Italy, the phenomena of the female economy related to the uterine system are established at twelve years of age, and in the south of Spain marriages take place at that period.† In Minorca, according to Cleghorn, puberty commences at the eleventh year, and at Smyrna, women are sometimes mothers at eleven or twelve years of age. In Persia, Chardin reports that the females have the catamenia at nine or ten years of age. The age of ten is the ordinary period, according to Niebuhr, in Arabia. In Jamaica, says Mr. Long, the women attain earlier to maturity, and sooner decline than in the northern climates; they often marry very young, and are mothers at twelve years of age.

Diversities of an opposite kind are observed in northern climates. In the north of Germany, the catamenia do not commence until the fifteenth year, according to Blumenbach. In some parts of Europe the period is still more tardy.

Linnæus informs us, that the women of the Laplanders have the catamenia, in general, less copious than the Swedes. He adds, that obstructions of the catamenia are very rare among them, excepting those who live in the service of the colonists; these are occasionally troubled with such irregularities, and are subject, in consequence, like the females of other races, to epistaxis and œdematous swellings of the legs.

Such being the variety in this respect which obviously results from climate in the European races and in Asiatics of the same complexion and physical variety, we may expect to find a difference between the inhabitants of Europe and the native people of Africa and America.

* Fitzgerald, Mem. p. 3. Virey, Gen. Hum. p. 130. † Virey, 130, tom. i.

Digitized by Google

We are informed by various writers that the females among the African nations have the catamenia very early.

Mr. Burchell says, the girls among the Bushmen are betrothed at seven years of age, which however implies nothing more; but he adds, that they are sometimes mothers at twelve, or even at ten years of age.

In the hot and low country of the Eboes, the females, according to Mr. Oldfield, have the catamenia at eight or nine years of age. He was informed that the periods frequently return every third week, having a duration of about three days.

In the West Indies we have an opportunity of comparing the white and black people under the same climate, though not precisely under the same circumstances. I have frequently made inquiry on the same subject of medical practitioners who have lived in the West Indies, and the uniform result of this inquiry has been, that there is no difference in respect to the age of puberty, the period of fecundity, or any of the circumstances connected with the catamenia, between white women and negresses.

Few persons have possessed greater opportunities of acquiring information on the physical condition of the Africans than Dr. Winterbottom. This writer declares that there is little difference in the age of puberty between the African and the European. With regard to the catemenia, he observes: "I am unable to speak with precision respecting this excretion in the natives of Africa, but among the settlers at Free Town, in Sierra Leone, my opportunities of observation were very extensive. It may be proper to remark that these people, who are generally called Nova-Scotians, because brought from that country to Sierra Leone, are blacks who were either carried to America when very young, or were born there of parents who came from Africa. Of course they are sufficiently acquainted with the customs of white people, and they live nearly in the same way as the lower classes of people in Europe. Among the Nova-Scotian women, the catamenia have precisely the same appearance as among Europeans, who are usually exposed to the open air; and the same varieties occur with regard to quantity, periods of

Digitized by Google

recurrence, &c., nor have they experienced any material alteration by change of climate."

If any race of men deviates more than others from the common standard in these particulars, I apprehend it to be the aborigines of America. Among them, although the bodily frame is endowed with great muscular strength and fortitude, the powers of life in the natural and vital functions, as they are termed by physiological writers, are at a low ebb. Dr. Rush says, that out of eight Indians whose pulses he examined at the wrist, he did not meet with one in whom the arteries beat more than sixty-four strokes in a minute. It is commonly supposed, that the fecundity of the American women is less than that of the females in other races,* and that the sexual affections among these people are less powerful. Some writers have indeed plainly intimated a suspicion of an important and specific difference between them and other races of men in these particulars. In order to clear up all doubts on this head, I shall cite the testimonies of some of the best informed observers.

Dr. Rush assures us, that the women of the North American tribes seldom begin to be subject to the catamenia till they are about eighteen or twenty years of age, and that these phenomena generally cease before they are forty years old. "They have the catamenia in small quantities, but at regular intervals. They seldom marry till about twenty: their marriages are rarely unfruitful: miscarriages seldom happen among them. Their labours are short, and accompanied with little pain; and after a few days they return to their usual employments."†

These observations refer chiefly to the tribes in the northern and middle parts of the United States. In the account which was published by Mr. James, of an expedition to the Rocky Mountains, we have information on many points connected with the physical and moral history of the nations in

* Don Felix de Azara says, in describing the Indians of Paraguay: "J'admire la hauteur de leur taille, la grandeur et l'élégance le leurs proportions; qui n'ont point d'égales dans le monde; et en même tems, je ne doute pas de leur peu de fécondité."

† Dr. Rush on the Diseases and Medicine of the American Indians.

Digitized by Google

the interior of North America, on the various branches of the Missouri. In some of the above-mentioned circumstances this account differs from that of Dr. Rush.

"In the young squaw," says the editor of this work, "we were informed that the catamenia, and consequent capability of child-bearing, take place about the twelfth or thirteenth year, and the capacity to bear children seems to cease about the fortieth year; but as superstitious notions prevent these Indians from taking any note of their ages, these periods are stated with some hesitation." The same writer adds, that "child-birth is remarkably easy among these women. Sterility is rare. The usual number of children may be stated at from four to six in a family, but in some families there are ten or twelve." It is added, that children are often suckled till they are three years of age.* Perhaps this fact, together with the other circumstances of savage life, may fully explain the small number of children frequently, but not constantly observed in the families of these tribes.

The different ages at which puberty takes place among the American races, mentioned in these two accounts, on the accuracy of which we have reason to rely, may be ascribed to the difference of climate.

We are assured by M. de Humboldt, that the women of the Chaymas, in South America, are often married at the age of twelve. This celebrated writer is inclined to attribute the precocity of the Chayma women, not to climate, but to a peculiarity of the race.† That he is not correct in this opinion may perhaps be shown by comparing the facts related by him with the observations above cited from Dr. Rush and Mr. James.

Some additional observations to the same effect may be collected from the work of Professor Keating, of the University of Pennsylvania, containing a series of excellent and interesting memoirs on several of the native races of the

* Account of an Expedition from Pittsburgh to the Rocky Mountains. By Edwin James, Botanist, &c. to the Expedition. Vol. i. p. 214, of the London edition. In the same place the reader will find a copious and accurate account of the physical peculiarities of these races.

† Personal Narrative, vol. iii. p. 232.

Digitized by Google

American continent. From this work I shall cite some remarks which bear upon the subject now under consideration.

In an account of the physical character of the Potowatomi tribe, belonging to the great Algonquin race, and residing near lake Michigan, we are informed, on the testimony of Metea, a Potowatomi chief, that the period of gestation in the women of that tribe varies from eight to nine months, and is seldom attended with sickness or nausea. The catamenia commonly commence at the age of fourteen, and continue until fifty, and in some cases until the sixtieth year. This last is probably only in cases of disease. Metea added, "That it is not uncommon to see a woman with grey hairs, whose catamenia have not ceased. Irregularities are not uncommon, as well as obstructions: but on these subjects it seems that the informant of the author spoke with reserve."

The same writer has the following remarks on the Dacotas, or Sioux, another American race, distinct from the Potowatomi and other Algonquin nations.

"Sterility among women is by no means uncommon, neither is it disreputable. It frequently happens that a woman, reputed barren, will bear children if she change her husband. The catamenia commence later among the Dacotas than among the Potowatomis, for with the former they seldom come on before the age of fifteen or sixteen, while in the latter they appear at fourteen; this difference is easily accounted for, by the more severe climate which the Dacotas inhabit, and by their greater exposure to privations of every kind." "Women are frequently liable, during pregnancy, to lethargy and sick stomach; and we are informed that the Dacota women have their faces covered with spots, in the same manner as white women. Being hardened to exercise, they attend to their usual occupations, even in the last stages of gestation."

Many other particulars are added to the preceding, which are not less important in respect to the physical history of the American races. For these I must refer my readers to the original work.*

* Narrative of an Expedition to the Source of St. Peter's River, &c. By W. H. Keating, A. M. Vol. i. chapters 3 and 8.

Digitized by Google

M. Rollin, surgeon to the expedition under the unfortunate La Pérouse, has given us very sufficient information respecting the physical character of several races in different parts of America, particularly of the natives of the western coast at Baie des Français, of the people of California, and those of Chili. The following is an extract from his general remarks on all these nations collectively.*

"The natural progress of life," he says, "among these nations, in all its periods of increase and decay, appears to be the same as with us; but the climate, their mode of life, and other habits, may have introduced some slight differences."

"In Chili and California the appearance of the beard, and the change of the voice, announce the age of puberty, in males about the thirteenth year. The girls arrive at puberty about the age of eleven or twelve, of which the enlargement of the breasts, and the appearance of the catamenia, are the usual indications. The quantity in which this periodical phenomenon takes place, varies in different individuals, according to their constitution and manner of living. If no accident interrupt the natural course, it takes place every month, and continues from three to eight days. Women are subject to it until about the fortieth year; but it is not uncommon for some to afford signs of fecundity at a more advanced age."

"Old age and decrepitude announce themselves among these nations, as in civilized countries, by the decrease of the humours, the loss or decay of sight, and other senses, and a change of colour in the hair of the head and beard."

"Women who have borne several children, have their breasts loose and pendent, and the skin of the pelvis corrugated, like Europeans in similar cases, without any observable difference."

"These nations have very nearly the same passions, the same sports, and the same manner of living; are equally violent in the expression of joy and anger, which the slightest action is sufficient to excite."

* Physiological Memoir on the Americans, by M. Rollin.

Digitized by Google

We are informed by Don Felix de Azara, that the women of the Charruas, Guarani, and all the other savage nations in Paraguay, and the eastern parts of South America, are remarkable for the paucity in which the catamenia make their appearance and return.

The general conclusion which results from a comparison of all the preceding testimonies is, that there is no marked and decided difference between the different tribes of men in respect to the principal phenomena of physical life, or in those processes which are termed by physiological writers the natural functions. It seems that the phenomena connected with child-bearing and the uterine system are different in white and black women who inhabit different climates, in relation merely to climate. The races differing most in these respects from the European are the native Americans, whose constitution of body appears to be endowed with a lower degree of irritability; hence, there is less of activity in their vital functions, or the processes of physical life are carried on in them with less vigour and intensity. But this difference is by no means so great as to allow of a question whether it amounts to a specific distinction, since it does not exceed, and perhaps scarcely equals the degree of difference which subsists between individuals of the same nation or kindred. It is to be expected that varieties in the temperament of particular individuals in respect to the early or late commencement and termination of the prolific period and the degrees of fecundity, would manifest themselves more or less as characters of breeds or races, as they are known to do even in the vegetable tribes;* but such variations among human races are evidently confined within very narrow limits; they do not exceed the measure of individual variety.

* Plants, as M. de Candolle observes, display hereditary characters; and races of plants, as it is well known to horticulturists, may be obtained by certain management which are precocious or tardy in bearing, or which are capable of flowering repeatedly, as well as others which resist the action of cold or of heat. De Candolle, Physiol. Veg. ii. 738. Knight, Hortic. Transact.

Digitized by Google

SECTION V.—*Second head of the Analogical Investigation—Inferences with respect to sameness or distinctness of Species, derived from the Phenomena of Propagation between different breeds.*

From the capability of propagating or the sterility of animals sprung from the blending of different breeds it has been supposed that a criterion may be drawn, whether the races from which such animals are engendered, are of the same or of distinct species. It is well known that mules are in general barren, or incapable of procreating; and it has been supposed that all other hybrid animals—a term applied to the offspring of a male and female of different species, are equally sterile. From this circumstance naturalists have attempted to determine what races of animals are of distinct species, and what breeds are only accidental varieties of the same species. It has been concluded, that if the offspring of two individual animals belonging to different breeds is found to be capable of procreation, the parent animals, though differing from each other in some particulars, yet belong to the same species; if the offspring so engendered is sterile, an inference has been drawn that the races from which it descended are originally distinct.

The great advocate for this doctrine was the celebrated John Hunter, and since the time of Hunter, it has been adopted by many of the most distinguished naturalists. Other writers have altogether rejected it as an opinion founded on a hasty and too general induction from a few facts. It must be allowed that the exceptions to the supposed law of nature rendering sterile all hybrid productions, are very numerous, and that when they are stated collectively in the manner in which this has been done by Rudolphi,* they have a most imposing appearance, and are well calculated to excite our doubt as to the soundness of the general conclusion to which so many particular facts are opposed.

* Rudolphi, Beyträge zur Anthropologie und allgemeinen Naturgeschichte.

Digitized by Google

The casual intermixture of breeds, or the production of hybrids, is a phenomenon observed occasionally in almost every department of nature, and in many instances it must be admitted that hybrids have been found to be capable of procreation. We must take a brief survey of the principal observations which have been collected in reference to this subject.

The existence of hybrids in the vegetable kingdom is a fact well known, since the time of Linnæus, who indeed imagined this phenomena to be much more frequent and to take place under a greater variety of circumstances than more accurate investigation has been found to warrant. Hybrid plants are continually produced in gardens between proximate species, by a process well known to horticulturists. In the state of nature they are very rare; and although the observation of botanists has been directed to this subject during more than one hundred years, the number of hybrid plants as yet discovered to have been produced in the wild and natural condition of the vegetable tribes, amounts in the last and most accurate enumeration only to forty.* Of these it has been ascertained that several are absolutely sterile, the ovary being constantly found at the period of maturity to contain no embryo. This is the case of the medicago versicolor, which according to M. de Candolle is a hybrid between M. sativa and falcata; with the ranunculus lacerus and two other ranunculi, which are all hybrids, according to the same writer, and with the known hybrids of the verbascum, digitalis and polygonum. There are two hybrid centaureæ which are commonly reported to be fertile, but M. de Candolle says, that he has observed them in gardens, and has constantly discovered them to be sterile. With respect to all the remaining instances of hybrids produced among plants in the natural state, it has never been ascertained whether they can be reproduced or not.

Among the insect tribes examples of irregular unions between different species are cited by some naturalists, but

* Physiologie Végétale ou Exposition des Forces et des Fonctions vitales des Végétaux, par M. Aug. Pyr. de Candolle, tom. ii. 1832.

Digitized by Google

they appear to be of rather ambiguous character. Rossi's observation of the coupling of cantharis melanura, with the female of the elater niger, though cited by Treviranus and Rudolphi, has been received with the doubt which belongs to a very improbable relation,* and the conjunctions of different coccinellæ, which are testified by Fabricius, do not afford an unequivocal example of the union of different species, since, according to the opinion of Illiger, accidental varieties of the coccinella have been frequently mistaken for distinct kinds.†

Hybrid productions are reported by naturalists among fishes. Rudolphi declares that he has seen a carp of a mule breed, and Bloch has cited various writers who have brought forward instances of a similar kind.‡ The principal examples of mule fishes upon record have occurred, as it seems, from the intermixture of different species of the cyprinus. Defay mentions a hybrid between the barbus and carpio; and Bloch a similar production, intermediate between the cyprinus blicca and brama.

Among birds similar productions are more frequent, and of more various kinds. Bechstein mentions mules from the canary-bird with the goldfinch, the siskin, the bramblefinch, the greenfinch, the greater linnet, the bullfinch, the lesser linnet, and the chaffinch.§ The same writer says that the tetras urogallus, or cock of the wood, will breed with the T. tetrix, as well as with the domestic fowl, and with the turkey. Treviranus has collected many other instances;‖ a bastard progeny between the anas glaucion and the anas querquedula is described by M. Geoffroy St.-Hilaire,¶ and one between the goose and the swan, by M. Frederic Cuvier.**

* Rossi, Memorie di Verona, t. viii. Meckel, Traité Gen. d'Anatomie comparée. See Treviranus, Biologie, th. iii. viii. 416. Rudolphi's Beyträge, p. 160.

† Fabricii Systema Eleutherator. t. i. Rudolphi ubi supra.

‡ Bloch's Naturgeschichte der Fische Deutschlands, t. i. Rudolphi ubi supra.

§ Gemeinnützige Naturgeschichte der Vögel Deutschlands, b. i. Leipz. 1807. Rudolphi, p. 161.

‖ Treviranus, Biologie, th. iii.

¶ Annales du Muséum, t. vii.

** Ibid. t. xii. p. 122.

Digitized by Google

With respect to Mammifers, it is well known, as M. Rudolphi contends, not only that hybrid productions are very numerous, but that they are not unprolific. Mules, properly so termed, are not always barren; a fact which was known to Aristotle: the instances of their breeding are supposed to be not unfrequent in warm countries. Several examples are upon record in which asses and zebras have bred together.

The mixed offspring between the wolf and the dog has frequently been described,* and the progeny of the dog and the fox,† and the dog and the jackal is well known. In all of these mixed productions the hybrid animal has been found to be capable of procreation.

Sparrmann declares, that the offspring of the Ethiopian hog and the common swine is prolific.‡ The bisons of America and those of India are said to breed readily with the horned cattle of Europe, and the lumps of the bisons to disappear in the course of several generations.§ What appears still more remarkable is, that sheep and goats are asserted by many authors to produce an offspring which is capable of breeding again with either of its parent stocks, so that in many generations the effect of this intermixture is lost, and the progeny will become completely sheep or goats according as the propagation is continued with either kind.‖ Rudolphi even declares, on the authority of Hellenius, whom he considers as a witness fully deserving of credit, that a female Sardinian roe became pregnant by a ram, and produced young ones which resembled the father in form, but the mother in colour. These hybrid animals were afterwards made to breed for two successive generations with common Finnish rams;

* Maschim Naturforscher, St. 15. In this instance the hybrid was prolific. Hunter in Philos. Tr. 1787—89. Geoff. St.-Hilaire. Ann. du Muséum, tom. iv. Rudolphi's Beyträge.

† Pallas (N. Nord. Beyträge) gives from Pennant two instances of generation between the dog and wolf, and one between the dog and the fox, in which last the offspring, a female, afterwards produced young by a dog. Rudolphi ubi supra.

‡ Sparrmann's Voyage to the Cape.

§ De la Nux.—Zimmerman's Zoolog. Geograph.

‖ Buffon. Hist. Nat.—Cogitationes quædam de An. hybrid.—Aboæ, 1798.—Rudolphi's Beyträge, p. 165.

Digitized by Google

until at length the mixed breed came to resemble in every respect the common breed of Finnish sheep.*

All these instances are obtained from among animals in a state of domestication; a fact of a different description is reported by Steller, whom both Pallas and Telesius considered to be worthy of confidence. Steller declares, that in Behring's Islands, sea-lions or phocæ jubatæ frequently breed with the female phocæ ursinæ or sea-bears.†

Such examples of mixed generation, when brought together, form a large aggregate, and might, at the first view of the subject, tempt us to believe, that there is really, in nature, no impediment to the propagation of hybrid animals; a conclusion which, indeed, some of the writers cited in the preceding pages appear desirous of bringing us to admit. But a question here suggests itself which is not easily to be answered by those who maintain this doctrine. If there is no principle in nature which impedes the unrestrained intermixture of species, how is the order and at the same time the variety of the animal creation maintained? If animals of different species mixed their breed in the ordinary course of things, and hybrid races were often propagated, the animal world would soon present a scene of strange confusion: its various tribes would become everywhere blended together, and we should, at length, scarcely discover any genuine and uncorrupted races. It may rather be affirmed, that this universal confusion of all organized tribes would long ago have been effected. But how opposite is such a state of things from the real fact. The same uniform and regular propagation of species holds still throughout all nature, nor are the limits of each kind less definite than they are supposed to have been some thousand of years ago. It is plain that in some manner the preservation of distinct tribes has

* It has often been said, that the animals called giummari, or jumars, are procreated from parents of the ox and horse kinds. Meckel has shown this to be a groundless opinion. Anat. Comparée, tom. i. p. 402. Buffon had previously rejected it. Equally groundless are the stories related of intermixture between dogs and cats, turkeys and domestic fowls.—Meckel. l. c.

† Steller's Ausführliche Beschreibung von sonderbaren Meerthieren, Halle. Rudolphi ubi supra.

Digitized by Google

been secured, and that universally, or throughout all the different departments of the organized creation.

Of what nature are the causes by which the intermixture of living tribes is so effectually prevented? It would appear, that several different circumstances cooperate to this result.

In the first place, it seems evident that races of animals in the wild and natural state are kept distinct not merely by the sterility of mules, but perhaps chiefly by the fact that such creatures are seldom or never brought into existence. It would appear that there is a mutual repugnance, or at least a want of inclination to intercourse, between animals of different species, while they remain in their wild and unrestrained condition, which prevents any blending of kinds, and might be sufficient alone to account for the fact that hybrid productions are in that state almost unknown.* Exceptions are reported to the universality of this observation. I have already cited the fact reported by Steller as to the different tribes of phocæ among which it is said that intercourse occasionally takes place. It has been stated, though I know not on what evidence, that the stag has been known to follow the female of the fallow-deer. In some old book of voyages relations are to be found which report that male apes of the African and of the Indian species have carried away negresses or other human females, and have lived with them in the woods. It has been well observed by M. Lesson, in his work on Mammifers, that all these reports are defective in evidence; they are apparently as unfounded as they are in every way improbable.†

It would appear that captivity and restraint, or at least long exclusion from females of their own species is requisite in order to prepare animals of one tribe for intercourse with those of another kind. It is in this way that equine mules are engendered. Even this, however, is not always successful, as it appeared in the experiments made by the Count de Buffon on the wolf, the fox, and dog, who repeatedly kept

* This view of the subject appears long ago to have occurred to a German naturalist, who laid it down as a positive rule, "Wenn sich Thiere *von Natur* mit einander gatten, so ist solches ein unfehlbares Kennzeichen, dass sie von einerlei Specie sind." Frisch, cited by Blumenbach de Gen. H. V. N.

† Lesson, Hist. des Mammifères et des Oiseaux. Les Orangs, tom. iii.

Digitized by Google

animals of these tribes together under circumstances most favourable to their intercourse, without any such result, which in these instances at least was obviously prevented by nothing else than a mutual repugnance.* The existence of this aversion was so apparent as to cause the Count de Buffon to doubt for a time, though he afterwards found reason for changing his opinion, the truth of Aristotle's assertion, that dogs, wolves, and foxes will sometimes breed together.

But in the second place, when animals of different species have been brought to cohabit, it appears that in many instances no offspring is produced, and that when conceived it is not so regularly brought to perfection as the progeny, unadulterated, of one species. Many such births are prevented by abortion. In many, conception never takes place at all, though all the preliminary conditions appear to have been fulfilled.†

Lastly, the permanent distinction of tribes is further secured by the sterility of hybrid productions.

We have seen that occasional exceptions are known to this general fact; but these though curious and remarkable as isolated phenomena, are not of such a description as to indicate any real infringement of the law of nature which maintains the diversity of tribes in the organized world. Hybrid animals have never been known to propagate their kind; that is, by cohabiting with other hybrids of an opposite sex to engender an offspring similar to themselves. It has been only when coupled with animals of a pure breed that hybrids have been known to produce at all. Mules have been found capable of bearing an offspring begotten by horses, but there is no instance upon record in which two mules have been known to breed together. A similar observation holds good with respect to the hybrid animal generated between the dog and the wolf, and to that between the dog and the jackal. This latter animal has been found capable of breeding with a

* Buffon, Hist. Nat. du Chien. I beg the reader who doubts the reality of this supposed natural repugnance to read Buffon's account of his experiments.

† See the account of an experiment in which no conception took place after a full and sufficient trial between a male fox and a terrier bitch, of which the details are given in Dr. Baron's Life of Dr. Jenner, p. 74.

Digitized by Google

dog, but it has never been ascertained that two such hybrid creatures could breed together. Human care and interference are perpetually necessary in order to originate and maintain the existence of such breeds.* Without this interference they would never have existed, and when called into existence would speedily disappear.†

In the vegetable kingdom, it is well known that hybrids produced by cultivation, are sometimes capable of bearing seed, though in a great many instances they are completely sterile. The extreme rarity of hybrid plants observed in a state of nature, and the difficulty which is experienced in preserving them in gardens afford, as M. de Candolle has observed, strong reasons for believing that even in the case of prolific hybrids, fecundation is difficult and incomplete. The impediments opposed by nature to the fecundation of hybrid plants are referred by M. de Candolle to several different principles. He conjectures that the pollen of hybrid anthers is wholly or partially deficient in granules, and that on this difference depends the absolute sterility of some, and the comparative, though still defective, fecundity of other hybrid plants. With this supposed defect, he compares the fact, "que les mulets stériles d'animaux sont privés d'animalcules." That some cause of this description must influence the results of experiments would appear evident from the observations of M. Gærtner, who found that the number of grains fertilized in each fruit is much less in the attempts to produce hybrid fecundation than in the natural process. It is conjectured also by M. de Candolle, that abortion of the germs or some monstrosity in the organs of fructification are among the causes which impede the reproduction of hybrid flowers. It appears, however, that in some instances these hybrid plants can be made to reproduce, either by blending them with the primitive kinds, or with other

* It is said that female mules in Arabia being pregnant by horses often perish in giving birth to their young, but that the Arabs are accustomed to preserve the foals as well as their dams by the Cæsarean section. "Lettere sull' India Orientale."—Rudolphi, Beyträge,—ubi supra.

† See some excellent observations on this subject in Mr. Lyell's Principles of Geology, book iii.

Digitized by Google

hybrids. But this rare fertility has never been known to become permanent. According to Professor Lindley, it has never exceeded the third generation. The result of all the observations which have been made upon this subject, is as M. de Candolle has remarked, that "all such intermediate breeds tend incessantly to extinction, by the difficulties which are opposed to their reproduction. This explains the rarity of their appearance, and reconciles the permanence which is observed among the distinct species of nature with the real existence, often, however, exaggerated, of hybrid or temporary tribes, which are thus reduced into the class of monstrous productions."

It seems on the whole evident, all the departments of the organized creation being considered, that the energy of propagation is very defective in the union of different species, and subsequently in the reproduction of hybrid animals or plants. The result of experiments has uniformly proved that if such a stock can be kept up for a few successive generations, which has only been done by a reunion with a pure breed, it has at length disappeared, or at least ceased to exist as a peculiar race.

Paragraph 2.—

It may be worth while to compare with this conclusion the well known results of crossing or intermixing varieties or races differing from each other in colour and form, but still belonging to the same species. Both horticulturists and those who are engaged in breeding cattle and other domesticated animals, are well aware of the advantages to be derived from this resource; the former, in improving the varieties of fruit-trees and other vegetable productions, and the latter, with relation to breeds of oxen, horses, sheep, swine, and dogs. Mixed breeds are very often produced superior in almost all their physical qualities to the parent races, and particularly with so much vigour of propagation, that they often gain ground upon the older varieties, and gradually supersede them. This one property of greater fecundity is often the

Digitized by Google

particular reason for the selection, and the circumstance which induces agriculturists and the breeders of cattle to adopt new races in preference to the old ones.

Paragraph 3.—Of mixed human races.

A question now offers itself to our consideration with respect to mixed races in the human kind, whether they are, in the phenomena of their propagation, analogous to hybrid productions or to the blended offspring of tribes which are merely varieties of the same species.

Now the undoubted fact is, that all mixed races of men are remarkable for their tendency to multiplication. The men of colour, or the mixed breed between the white Creoles and the Negroes, are well known in many of the West Indian isles to increase rapidly, and this chiefly by family connexions among themselves. Hence there has resulted a particular caste in many places so numerous and so rapidly gaining ground, as to give rise to serious apprehensions that they are destined to become at length the dominant tribe in the community.* In other parts of the world, in almost every example in which different varieties of mankind are brought into social relations at all similar to those of the Negroes and Creoles, or offering facilities for intercourse, similar results have taken place. I shall here only point out in a brief manner some few of these instances which I shall have future occasion to investigate, when considering the ethnography of particular countries and the physical history of particular races of mankind. In Africa there are several remarkable instances of a similar description. The Griquas, or bastard Hottentots, the mixed race between the Dutch colonists and the aborigines of South Africa, form on

* "Partout injustement réprouvés," says M. Bory de St. Vincent, "les Mulâtres ne manquent cependant pas de cette beauté et de cette intelligence qui résultent en général du croisement des espèces et des races. Les Nègres portent envie à la supériorité qu'ils prétendent s'arroger comme tenant des Blancs; ceux-ci qui ne trouvent pas qu'il soit criminel de les procréer, n'imaginent pas non plus qu'il soit atroce de les dégrader, et c'est un trait déshonorant de l'histoire des hommes d'espèce Japetique, que des coutûmes avouées autorisent cette inhumanité."—Dict. Class. d'Hist. Nat.

Digitized by Google

the borders of the colonial settlements a numerous and rapidly increasing race. The Griquas now occupy the banks of the Gariep or Orange River, for the space of at least seven hundred miles, where their numbers were estimated some years ago to be at least 5,000 souls. They are powerful marauders, and harass by their predatory incursions all the native tribes in their vicinity, and are frequently troublesome to the neighbouring colonists. Great numbers of the same mixed race are in other parts thriving agriculturists; and there is a large community at Griqua Town settled under the government of the Missionaries of the United Brethren, by whose means they had been converted to Christianity and have adopted the habits of civilized society.* Another mixed tribe in Africa has become one of the most powerful nations in that continent. The Fellatahs are, according to the most recent and accurate accounts, a mixed progeny from the intermixture of the Red Poules, the old inhabitants of Fouta Dhiallo and Fouta Torro, with the Iolofs, Jallonka, and Torodos, as well as with other black nations with whom they have coalesced.† The intermediate race resulting from this intermixture has become so much more numerous and powerful as to have superseded the original Poules in their native lands, and to have spread themselves moreover by conquest over a great part of the interior of Soudan. In South America, both the European colonists and the Negroes whom they have introduced have intermixed very extensively with the native population. In Brazil, the mixed breed between the Negroes and the aborigines are termed Cafusos: they are a very peculiar race, whose physical character has been described by Von Spix and Martius.‡ The Spaniards have everywhere intermixed with the native people in South America. In Paraguay, the mixed breed constitutes, according to Don Felix de Azara, a great majority of the people termed Spaniards or white men; and they are said to be a people superior in physical qualities to either of the races from

* For an account of the Griqua, or bastard Hottentot race, see Thompson's Travels in South Africa.

† Mollien, Voyages en Afrique.—Golberry, Voyage au Sénégal.

‡ Von Spix und Martius, Reisen in Brasilien. th. 1.

Digitized by Google

which they have sprung, and much more prolific than the aborigines. The following is the description given of them by Azara: "Ces métis s'unirent en général les uns aux autres, parcequ'il ne passe en Amérique que très peu de femmes Européennes, et ce sont les descendans de ces métis qui composent aujourd'hui au Paraguay la plus grande partie de ce qu'on appelle Espagnols. Ils me paraissent avoir quelque superiorité sur les Espagnols d'Europe, par leur taille, par l'élégance de leurs formes, et même par la blancheur de leur peau. Ces faits me font soupçonner non seulement que le mélange des races les améliore, mais encore que l'espèce Européenne l'emporte à la longue sur l'Americaine, ou du moins le sexe masculin sur le feminin."*

In the north of Asia there are innumerable instances of intermixture of breed between the Tartar, Mongolian and Tungusian races, and the Russians and Chinese, who are predominant over the other nations of that continent. Pallas informs us, that even intermarriages between Russians and Tartars with the Mongolians, who differ widely from both of these races in their physical character, are very frequent in Mongolia.

The children born from these marriages are thus described in Pallas's Memoir on the Mongolian Nations. "Ces enfans ont d'agréables et quelquefois de superbes figures, tandis que ceux d'origine purement Kalmuke ou Mongole conservent jusqu'à dix ans une figure difforme et boufflé, un aspect cacochyme, qu'enfin la croissance du corps fait disparaître."†

Similar observations may be made in different parts of Europe. The Celtic and Slavonic races were not so strongly marked in their physical differences from the German or Teutonic race as many other tribes of mankind, yet there existed some physical peculiarities which distinguished these nations. It may be observed that, in many instances, the intermixture has produced breeds physically superior to the majority of either ancestral race. This may be remarked in some parts of Ireland: where the Celtic population of that

* Voyages en Amérique Meridionale du Don Félix de Azara.

† Pallas, Mémoire sur les Tribus Mongoles. Mém. du Muséum, 1828.

Digitized by Google

island is nearly unmixed, they are, in general, people of short stature, small limbs and features; where they are intermixed with English settlers or with the Lowlanders of Scotland, the people are remarkable for fine figures, tall stature, and great physical energy. It would be easy to multiply instances of this description, but I shall not proceed further at present.

On a review of all the facts connected with the propagagation of mixed breeds we may conclude, that real hybrids are either barren or so little prolific that their stock is destined soon to become extinct; while the mixed offsprings originating from different races within the limits of the same species generally exceed in vigour and in the tendency to multiplication the parent races from which they are produced. I do not wish to erect an important conclusion upon this one argument, but its evidence as far as that extends, and considerable weight will be allowed to it, is manifestly favourable to the doctrine that the several tribes of men are but varieties of the same species.

Section VI.—*Third Head of the Analogical Investigation of Species.—Pathological Considerations.*

It has been well observed by a celebrated German physician, C. W. Hufeland, that the comparative pathology of living tribes and species must be more attentively studied and more fully elucidated than it has yet been, before we can render complete our acquaintance with their physical history. The diseases and predispositions to disease peculiar to certain races, constitute as much a part of the physical description, and enter as fully into the aggregate of distinctive characters belonging to these races, as any feature in their anatomical structure. It is much to be regretted, that the sources of information are very defective in reference to this subject. We are only enabled to collect facts which are as yet so few and so imperfectly understood, that they sometimes appear discrepant and contradictory in their bearing. This is particularly the case with respect to the inferior tribes of the animal creation, and the reasons are so obvious, that they do not

Digitized by Google

require to be specified. The pathology of these tribes is so imperfectly known, that we are not enabled to deduce from this quarter any general inferences which may be afterwards compared with, and may tend to elucidate the bearing of analogous facts collected from the history of mankind. The pathology of human races is somewhat more advanced, and the facts related to it rest on less doubtful authority, but they are of very limited extent.

Paragraph 1.—Of contagious and epidemic Diseases.

Observations on contagious diseases,* or on complaints which are capable of spreading from one individual over a whole community, may throw some light on the limitations of species. If it should be proved, that the influence of morbid poisons is, *in general*, confined to some particular races and is destitute of agency on other species, in respect even to tribes the most nearly approaching in form and organization, we might avail ourselves of this fact as a criterion by which the question might be determined with some degree of probability, whether all human races originate from the same stock. The state of knowledge on this subject is at present too imperfect to warrant any positive conclusions.

It is, indeed, well known, that some contagious diseases are communicable from one tribe of animals to another. Cow-pox affords the most familiar example. Without assuming it to be a certain fact, that this disease is identical with that which in horses is termed the grease, and that it has been communicated from the horse to the cow through human intervention, points which have been, however, in my opinion, fully established by Dr. Baron, it is certain that the ass, the dog, the goat, and the sheep are capable of receiving the vaccine disease by inoculation, and that matter taken from pustules so

* In the category of contagious diseases, I mean, in order to preclude all controversy, to comprise only such distempers as are considered, like small-pox and measles, to arise solely from contagion. Diseases which are thought to become under particular circumstances infectious or capable of spreading, of which the class is very indeterminate, are not meant to be included under the term adopted in the text.

Digitized by Google

produced affords the genuine cow-pox in the human species.* It is obviously very probable, that the same susceptibility would be found, on experiment, to exist in many other tribes. Small-pox, as we might conjecture from its analogy to cow-pox, is likewise communicable to many species. M. Viborg, at Copenhagen, is believed to have communicated this disease from the human subject by inoculation to asses, dogs, and swine.† It had been reported long ago by Jansen, a physician at Amsterdam, that an ape was affected with pustules from the contagion of small-pox;‡ but without displaying any of the other symptoms of the disease. The cow is likewise said to receive the small-pox by inoculation.§

Hydrophobia is another malady which, by a peculiar method of inoculation, is known to be communicable to many species of animals, though it probably originates only in the dog. Instances have likewise been reported in which the poison of glanders, a disease commencing in horses, is said to have affected grooms, who have had wounds in their hands, and have become accidentally inoculated.

There are other contagious diseases, which, as far as the evidence yet obtained extends, are incommunicable from the human to other species, though it does not appear that any race of men has an immunity from their influence. One of these is the yaws, a disease which, though principally known among Negroes, also attacks Europeans. We are informed by Dr. Thompson, that repeated attempts have been made in the West Indies to communicate this disease to rabbits, dogs, and fowls, by different methods of inoculation, but that they have all failed. He adds that there is an eruptive disease in cattle, which the Negroes in Jamaica term the yaws, but that it bears no analogy to the complaint so termed in man. Is this disease the cow-pox?‖ Dr. Kerr, in his excellent treatise on yaws, contained in the Cyclopædia of Practical Medi-

* Dr. Baron's Life of Dr. Jenner, page 243.

† Medical and Physical Journal. Sept. 1802. Dr. Baron's Life of Jenner, page 216.

‡ Blumenbach, de Gen. Han. Var. Nat.

§ Dr. Baron, ubi supra, page 216.

‖ Edin. Med. and Surg. Jo. vol. xv.

Digitized by Google

cine, has likewise remarked that " repeated experiments have proved the impossibility of transferring yaws by inoculation beyond the human species." Attempts have been made to inoculate an ape with the poison of syphilis, but they have failed.* Other contagious diseases, such as measles, scarlatina, hooping-cough, are not known to extend their influence beyond the human species. I am uncertain whether to include plague in the same order of diseases with those above mentioned. When this disease has been committing its ravages, and almost depopulating whole cities and districts, it might be supposed that domestic animals would have suffered, if they were capable of receiving the contagion. Nothing of this kind, as far as I know, is on record. Murrains among cattle are indeed said to have preceded some fatal epidemics, but there is no evidence that these were the genuine plague; and it appears to me, that Dr. Baron has succeeded in rendering it extremely probable that they were epidemical invasions of small-pox, and not the bubonic pestilence or plague, properly so termed. In general the distempers which attack different species of animals, as of cattle, are not observed to spread from one to another, however severe their effects may be in the destruction of the particular kind in which they originate. It has been observed that sheep and pigs have been carried to the West Indies in the same vessel, and that a distemper apparently contagious has broken out in one kind, without affecting the other in the smallest degree. Even among plants it has been remarked, that a disease which is very destructive of one species, will not attack others, even the most nearly allied to it.

On the other hand, it is well known with respect to the contagious diseases affecting mankind, that there is none which is peculiar to one race, or incapable of attacking others; though the predisposition to any given disease is different in different races, as it is known to be in the several families of the same race or nation. On the whole, the inferences resulting from facts relating to contagious and epidemic diseases are, as far as their evidence extends,

* It has been asserted, but I know not on what authority, that this disease has been communicated to dogs.

Digitized by Google

favourable to the doctrine that all human tribes belong to one and the same species.

Paragraph 2.—Endemic diseases.

The facts relating to endemical diseases and predispositions to disease, deserve our closest attention, and lead apparently to some curious results. Before we can collect these results, it will be necessary to attend to particulars.

Some of these diseases are properly termed *endemical*, though they are not the immediate result of local influences; the constitutional predisposition to them is inherent in particular races. It seems to originate in local influences, but these influences must be exerted during a long course of years, and perhaps during several generations, in order to bring forth the morbid tendency. This observation must be illustrated by some examples.

The Plica Polonica is a disease exhibiting remarkable phenomena, on which some recent information has been communicated in Hufeland and Osann's Journal, in 1834.*

"This complaint," says Hufeland, "is peculiar to districts on and in the neighbourhood of the Vistula, whence its denomination. The Germans term it Weichselzopf, Cæsaries Vistulana. From this circumstance it has been supposed to be a disorder arising from merely local causes, or depending immediately on climate. But if such was the fact, the inhabitants without exception would be subject to the disease. We find, on the contrary, that the Germans who inhabit the same districts, and are exposed to the same local influences, if they have not an entire immunity from the plica, are at least affected by it much more rarely, and, as it would seem, only as the result of contagion or communication with infected persons. We even find villages close by each other, one of German and the other of Polish population, the disease being prevalent in the latter, and not existing in the former. It has formerly been supposed to originate from the dress of the people, from their wearing skin and fur, and the practice

* Merkwürdige Fälle von Plica Polonica zur Aufhellung ihrer verborgenen Formen gesammelt, von Dr. Kützin zu Bromberg.

Digitized by Google

of shaving their heads; but the Russians wear the same sort of dress, and the Turks likewise shave their heads, yet neither have the plica. Just as little can we account for this fact by reference to the uncleanly habits of the Polish boors, since the Russian peasantry are not much behind them in this respect, and yet have no weichselzopf. All these considerations render it to me very probable that the plica, with respect to its origination, belongs to the class of national and not local diseases. It is peculiar to a particular race of men, namely, to the Sarmatic, and not generally to the whole Slavonic family, which includes the Sarmatian, the Russian, Bohemian, and the proper Slavonian branches; for these last-mentioned races do not partake of the affection." *

The Poles, or the Sarmatic race, as Hufeland terms them, belong originally to the same stock as the Russian and Bohemian. We have therefore in this instance a proof that a tribe of people, by long residence in a given district, are capable of acquiring a peculiar hereditary and national variety of constitution, predisposing them to a particular disease from which other tribes of the same original stock are altogether or very nearly free.

Other equally striking instances may be found, in which predisposition to diseases is only acquired by individuals after long residence, or even by races after some generations passed in the climate productive of such diseases. This appears to be the case with the species of elephantiasis, or elephant-leg of Barbados, and other intertropical countries. The endemical disease of Barbados must be distinguished from the leprosy so well known in the lazar-houses of Madeira and other places, which is termed by some writers elephantiasis, and by others, lepra Arabum. The former disease attacks, as might be supposed, the black indigenous races more readily than Europeans, or the descendants of Europeans. The elephant-leg of Barbados has long been known as an endemic among the black population, to which it was confined until 1704. At that period it was first known in a white man; but before 1760, when he died, it had become a common disease among the white people of the island. In

* Vorwort üben Raçen-Krankheiten, von C. W. Hufeland.

Digitized by Google

Demerara this disease attacks the Negroes principally, but also sometimes the whites. It is more frequent among Dutch than English families, the former having been longer resident in the country. It is however said to be unknown among the native Americans. Their different habits of life and the different localities occupied by them, are perhaps the causes of this exemption. In Ceylon a similar disease prevails among the indigenous people and the Creoles, or descendants of Europeans born in the country, but does not appear among emigrants, whether Europeans, Africans, Hindoos, or Malays. The only case recorded in an European, is that of a man who had been resident at Point de Galle from thirty to forty years. Europeans likewise escape a similar disease, which affects the natives of Cochin in the Peninsula.

An affection analogous to the elephantiasis of Barbados, is said to take place in the same island in oxen, dogs, and poultry; and in these animals it probably arises from the same influences of climate. The participation of so many different species in this endemical sort of tumor may remind us of the steatopyga, or accumulation of fat about the root of the os coccygis, which is common to the Hottentots and the South African breed of sheep. The elephant-leg of Barbados is the peculiarity of certain individuals, as is the hump of the Hottentot; neither of these appearances is common to all the individuals of the race chiefly predisposed to the affection. Nor is the steatopyga confined entirely to the Hottentots among human races, though it is chiefly known in this tribe of men. We are informed that it occurs in a less degree among the Kaffers, and various tribes of black people on the eastern coast.

The yaws has been already mentioned among contagious diseases, but the predisposition to it is in the strict sense of the term an endemical affection, since it prevails more strongly, as we may judge from the greater frequency of the disease, in some races, namely among the Negro nations, than in others, without being entirely confined to the former. The yaws is indigenous in the western parts of Negroland, whence it has been conveyed to the West Indies, and to the

Digitized by Google

American continent with slaves from Africa. This disease has been considered by some as peculiar in Africa to the Negro race: but Dr. Winterbottom, whose residence at Sierra Leone enabled him to acquire correct information, asserts that this is by no means the case; and his opinion has been established by well-marked examples of the disease described by himself and others, in persons of European birth and descent. In the West Indies and in America it sometimes, though rarely, attacks the white inhabitants. Sprengel distinguishes two varieties of this disease, the proper yaws and the pians, which he says was originally endemic in one district of the coast of Guinea, the kingdom of Sanguin, and is not so readily communicated to white persons as the former variety. By most authors they are considered as the same disease.

It appears evident, that the predisposition to yaws, or the susceptibility of the disease, is greater in the Negro than in the European race; and, in this respect, yaws is very nearly parallel to the plica Polonica, which attacks so much more frequently the race which has long inhabited the banks of the Vistula, than the more recent settlers. It would be interesting to know whether any particular tribes of Negroes are more subject to yaws than others. This is the case, as we are informed by Dr. Winterbottom, with respect to lepra, or the elephantiasis of the East, which prevails endemically among the native tribes near Sierra Leone, as it is well known to do in many other places and among very different races of men. Winterbottom inform us, that this disease does not appear to be so common among the Bulloms and Timmanees, as among the Foulahs and Mandingos.

It has been observed, that cretinism, which is an endemical disease in the Valais, and in some other parts of Switzerland, is more prevalent in and among the descendants of Savoyards and the old residents, than in the families of persons from the higher parts of Switzerland, or of Frenchmen who have settled in the country.*

* In the report of M. Rambuteau, prefect of the department of the Valais, to the Minister of the Interior. Dict. de Médicine.

Digitized by Google

On the whole it appears evident, that races of men acquire predispositions to particular diseases by a residence of several generations in particular districts. Hence, then, varieties of predisposition are no proof of diversity of origin.

On this principle we may explain, without reference to any other hypothesis, the remarkable fact proved by the late researches of Dr. Clarke, that Negroes and Malays are the victims of tubercular phthisis in much greater proportions than other races of men. By a calculation founded on data which relate to the West Indian army of Britain, it appears, that in every thousand deaths among the whites, chiefly as I suppose, if not almost wholly, natives of Europe, one hundred and twenty arise from pulmonic diseases, while in every thousand deaths among the blacks, four hundred and seventy-two are attributed to the same cause. Dr. Clarke has likewise shown, that in Ceylon, the deaths from phthisis in one thousand deaths from all diseases, are in Europeans 43, in Malays 58, in Kaffers 146, in Indians 59; thus proving, that in other races of men inhabiting tropical climates, the greater frequency of tubercular disease is in as great proportion; whence he concludes, that predisposition to such diseases is brought forth in the organic structure of the human body by residence in hot climates.

The excessive proportion of deaths by phthisical disease among the native races of hot climates, compared with those which take place in strangers from cold countries, depends in great part on the greater mortality produced among Europeans by morbific causes peculiar to tropical regions, when compared with that which takes place among the native inhabitants. Negroes and other natives of hot countries bear with comparative impunity many other agencies which are highly destructive of life among Europeans. We must not, however, suppose from this fact, that the Negro is by nature exempt from the susceptibility of those diseases which destroy so many of the whites. Dr. Winterbottom assures us, that this is far from true; that the native blacks of Sierra Leone often have remittent and intermittent fevers, which run their course precisely as they would do in Europeans, who, by what is termed seasoning, have accommodated themselves to

Digitized by Google

the climate.* He adds, that the same diseases are very common among the Negroes who were brought from Nova Scotia to live at Sierra Leone. This remark illustrates the nature of that immunity from tropical diseases which some have ascribed to Negroes as a specific character. Dr. Clark of Dominica, in describing the yellow fever which prevailed in that island in 1793—6, observes, that the "*new Negroes*," who had lately been imported from the coast of Africa, were all attacked by it. The Negroes who had been long in the town or on the island escaped.† It is well known, that the Negroes on the African coast suffer greatly in unhealthy districts from dysenteries, diarrhœas, and other diseases which arise from local causes.‡ The native tribes of America are likewise subject, according to Dr. Rush and others, to remittent and intermittent fevers, dysenteries, and other diseases analogous to those which attack Europeans under similar circumstances. The yellow fever appears to have been known in America long before the arrival of Europeans. Such, at least, is the result of information obtained by M. de Humboldt. This appears to have been the pestilence, which was termed matlazahuatl, and which ravaged the empire of the Aztecas before the arrival of Cortes and the Spaniards.

The native tribes of America, as we learn from the information obtained by M. Say and Professor Keating, are likewise subject to the same constitutional diseases as other races of men. The account given by these writers of the diseases of the Sioux clearly proves that the morbific causes which affect the constitution of Europeans, have the same influence, with very slight differences which are easily accounted for, as those of the native Americans. It appears, for example, that the latter are subject to disorders of the nervous system, excited by mental emotions: that cases of fits and of insanity are attributed among them to disappointments in love, and that such disorders are so frequent as to be often feigned.

Similar observations respecting the diseases of northern

* Winterbottom, vol. ii. pp. 14—22.

† Medical Tacts, vol. viii. Winterbottom, ubi subra.

‡ Winterbottom.—See Mr. Oldfield, Memoir on the Medical History of the countries visited in the late expedition to explore the Niger.

Digitized by Google

Europe may be collected from the accounts of Lapland by Sheffer and by Linnæus, and of Asia by Pallas and Gmelin.

From a review of the whole subject considered in this section it appears, that the great catalogue of diseases which afflict mankind are common to the whole human family. They differ in different climates; and local circumstances often engender a predisposition to particular disorders in races which have been long subjected to their influence. These are all comparatively slight modifications. The pathological history of different races appears to illustrate and confirm the inference, already deduced from researches into their physiology, that a common nature belongs to all mankind.

Digitized by Google

NOTE ON THE CONTENTS OF CHAPTER THE FIRST.

In page 132, I have stated the general results of inquiries obtained from medical practitioners in the West Indies in reference to the physiology of the Negroes. The following queries were sent some time since to Dr. Huggins, a very intelligent physician, who has had great opportunities of observation during a long residence and very extensive practice in the island of St. Vincent, and by him the replies were given which are appended to the queries. They cannot fail to be interesting to many of my readers.

Question 1. Is longevity frequent among the Negroes of St. Vincent's?

Answer. I have known a great many very old negroes, whose exact ages could not be ascertained. At the time of the hurricane in 1831, I had a record of the mortality in the whole of my practice from the year 1813, and in every year there were deaths of negroes computed to be sixty, seventy, or eighty years of age, and upwards. My father will be eighty-four years old in May next, and the negro woman who carried him about as a child is still living, and at the age of ninety-six enjoying good health, upright in figure, and capable of walking several miles. On a property belonging to a nephew of mine, there is an old woman who has five great-grandsons and one great-grandaughter, which great-grandaughter has six children, and is daily expecting a seventh. The age of this great-great-grandmother is not known, but her daughter, the great-grandmother, has been doing nothing for very many years, I believe for the last twenty. On an estate in the Caraib country, under my own medical charge, out of two hundred and forty apprentices, there are one hundred and five Africans, whose average

Digitized by Google

age is computed at fifty-eight, and on another property not far distant, out of about the same number of people there are one hundred and three Africans, whose average age is estimated at fifty-six. This fact will at once explain the principal cause of the decrease in this and other islands so much dwelt upon by the abolitionists. It is obvious, that there is a great disproportion of aged people, and that the per-centage of mortality must be considerable during the next ten or fifteen years. So it is with the whole island, more or less. At the time of the registration, 1817, there were upon one estate in my own practice one hundred and eighty-eight Africans: of these one hundred and ten or one hundred and twenty have died, principally within the last ten years; yet the actual strength of the gang is now greater than it ever was, notwithstanding the diminution in the number.

Qu. 2. At what age do the negro women begin and cease to be subject to the catamenia?

Answer. There is some difficulty in answering this question, arising from the negro women never knowing their own ages, or being able to answer questions regarding time: but as far as my opinion or information goes, I should say, that there was no difference in these respects between black and white women. The black girls in this island often do not commence menstruating until they are seventeen and upwards, but this is late, and I have imagined that it may be attributed to their early habits of licentiousness.

Qu. 3. Is there any difference in these respects, or in any of the circumstances connected with the catamenia, between negresses and white women?

Answer. There is no difference that I am aware of.

Qu. 4. Is there any difference in the period of utero-gestation or any of the circumstances connected with child-birth, between negresses and white women?

Answer. None that I am aware of.

Qu. 5. What are the prevailing diseases among negroes?

Answer. Worms, dysenteries, colds and coughs, and other pulmonic complaints, rheumatism, inflammatory fevers, dropsies, also herpetic and itchy eruptions, ulcers, hernias inguinal and umbilical, menstrual obstructions. Two-thirds of the

Digitized by Google

patients come into the hospitals with functional derangement of the stomach and chylopoietic viscera, and are relieved by an emetic, and one or two purges of calomel. Pure idiopathic fever, or the common bilious or remittent fever affecting the white inhabitants, may be said to be almost unknown among the negroes. Indeed there are medical men, of great experience too, who have never witnessed a case, and are therefore sceptical as to those of which they hear accounts—but I have myself witnessed many cases, and several of them fatal. But then the diseases of the district in which I have practised, the Caraib country, have always differed from those of other parts of the island, in being of a more inflammatory nature, and requiring a freer use of the lancet. This may be accounted for by its peculiar situation. The peculiar and very extraordinary disease, termed " mal d'estomac," answering to the " marasmus anhæmia " of Dr. Good, is still frequent, but by no means so common as formerly. Phthisis pulmonalis occurs much more frequently than has been supposed. I have examined negro lungs as thickly studded with tubercles as I have seen in Europe. Insanity is by no means uncommon among the negroes, notwithstanding the assertion of Sir Andrew Halliday to the contrary. I have had many patients.

Qu. 6. Is yaws prevalent, and do Europeans ever contract it?

Answer. The yaws has been very prevalent here, but is now becoming more rare. Europeans do occasionally contract it. I have attended a white family labouring under it.

Qu. 7. Is elephantiasis prevalent, and are Europeans or white men, in any degree, subject to it?

Answer. Elephantiasis (meaning the elephantiasis or lepra Arabum) is very prevalent among the negroes; and Europeans do occasionally become affected with it, but very rarely. I have had no white patient myself, and have only heard of three or four. If by elephantiasis be meant the elephant or Barbados-leg, I would say that it is confined to the negroes, having never seen or heard of a case in a white person.

Digitized by Google

Qu. 8. Are negro children in any respect inferior to white children in their faculties?

Answer. Negro children do not appear in any respect inferior to white children in their faculties. On the contrary, they seem to be generally more forward as infants, a circumstance, no doubt, to be attributed to their being left much to themselves, for being thus thrown more upon their own resources they become earlier engaged in the exercise of their faculties.

Digitized by Google

CHAPTER II.

ANALOGICAL INVESTIGATION CONTINUED—OF THE PSYCHOLOGICAL COMPARISON OF HUMAN RACES.

SECTION I.—*General Remarks on the Psychical History of different Species.*

THERE is scarcely any trait in the description of animals which is more characteristic of species than the psychical qualities with which Providence has severally endowed them. Under the term psychical endowments I mean to include the whole of the sensitive and perceptive faculties of animals, their intellect, or what in them approaches most nearly to the nature of intellect, as well as their instincts, feelings, propensities, and habitudes of action; all that corresponds in the lower orders of the creation to the powers and attributes of the mind in man. I have adopted this expression, psychical properties or endowments, because I cannot find another that will so well answer my purpose. To speak of the minds of brute animals would be to take a liberty in the use of words that would hardly be tolerated, and our language supplies no better means than what I have chosen for expressing the sense which that term would convey.

All the tribes of animals are characterised by dispositions, habits and instincts appropriated to particular species. Nothing, for example, is more remarkable in the dog kind, than the inclination of the whole tribe to associate themselves with man; whence it has arisen that in all ages, and in almost

Digitized by Google

every corner of the globe, they have been his companions and devoted followers. In this respect, the dog is strikingly contrasted with his congeners, as the wolf, the fox, and the jackal, animals so strongly resembling the dog in structure, that by many naturalists all these tribes have been identified. The fierce and untamable disposition of the wolf, separates him at a wide distance from the dog. The gregarious habits of the wolf equally distinguish him from the solitary fox. In all these instances there is just sufficient evidence, independently of diversities of instinct, and arising from physical considerations alone, to mark out these several tribes of animals as so many distinct species, and we find in reality these proximate species characterised by different instincts.

In laying down, as a law of nature, the general observation that each species has its given instincts universally characteristic of it, we must not omit to take into our account the fact, that variations are likewise to be traced, though of a more limited extent, in the psychical manifestations of particular tribes. Such variations, as it has been fully shown by Jacobi, bear everywhere a close relation to corresponding varieties in bodily structure.* Some breeds of dogs, for example, pursue wild animals in the chase by sight, and others by the sense of smell; according as they have received from nature a more perfect development of the visual or olfacient organs. It may be said, that since all the varieties of the dog tribe are generally supposed to belong to a single species, the variety of instinct in these different breeds of dogs affords one instance in which the preceding observation must be modified. I do not assume as certain that all the various breeds of dogs belong to a single original race, although the great number of essential points in which they all resemble each other afford a strong, and to myself a convincing proof, that no specific difference exists among them. If, however, this be allowed for the present, and we recognise the fact, which is indeed beyond dispute, that the instinct of dogs undergoes considerable modifications in connexion with corresponding varieties in their bodily structure and the dif-

* Sammlungen für die Heilkunde der Gemüthskrankheiten, von Dr. Max. Jacobi, Elberfeld, Th. 1.

Digitized by Google

ferent aptitudes for action which thence result, we may still maintain the position that they have many remarkable qualities in common, which taken collectively are sufficient to constitute a peculiar psychical character, and that the lesser varieties of instinct belonging to the dog tribe do not interfere with the general observation above laid down. This observation, it must be remembered, is not that the same species of animated beings does not display some variety in its instincts, but that the same instinctive attributes do not belong to several species.

Perhaps it would not be easy to point out two species of animals confessedly distinct, which are more similar in their form and structure than the African and Asiatic elephants. Now the psychical qualities of these tribes differ. The African elephant, though partially tamed in ancient times for the purposes of warfare, has never been known to display that docile understanding and gentle temper which are so remarkable in the elephants of India, and particularly in those of Ceylon.

The ox kind, and the bison and the buffalo, are species nearly allied, though perhaps not so closely related as the different tribes of elephants. Similar differences in regard to psychical endowments exist between these animals. One of the species above mentioned is among the most subdued slaves, and the immemorial companions of mankind; the others are but imperfectly tamable by any means that have been devised.*

Other instances may be pointed out in which, between races separated by naturalists at a much greater distance in the zoological system, the psychical character constitutes the most striking and in reality the most essential differences. Sheep and goats, as it is well known to all, constitute distinct genera. It has been observed by a celebrated naturalist who has attempted to sum up the distinguishing characters of these two kinds, that the most decided differences are to be sought in their habits and instincts. The sheep, always stupid or of the most simple understanding, from its birth timid and inert,

* See Sir Francis Buchanan's Journey in Mysore, Canara, and Malabar, vol. iii. 4to.

Digitized by Google

follows its dam, the same feeble and defenceless animal that it is destined to remain through its life, an emblem everywhere of unresisting innocence. The goat, agile and ever roaming, shows its disposition not less early: the young kid, driven by its instinct, seeks in the first hours of its existence the clefts and summits of rocks, which nature already points out to it as its future abode.

Among the most surprising instincts of mammiferous tribes are the migratory propensities of the lemmings, or wandering rats. The migrations of these tribes are well known to be executed with surprising energy, and with the universal accord of the whole tribe. But to each tribe the migratory movement, as well as other habits, is peculiar. The lemmings of the Scandinavian Alps are not found far towards the east: even in Russian Lapland they are unknown, and they are replaced near the shores of the Polar seas and in the Ural, by a race different in aspect and in colour, and smaller by at least one-third. These races may be considered as species nearly approximating: they are distinguished by a striking difference of instinct. The Scandinavian lemmings are said to lay up no provisions, and to have only a single chamber in their dwelling-places, while the Uralian tribe excavate numerous apartments, and provide for the winter season by storing up magazines of the rein-deer lichen.*

If now we direct our attention to other departments of the animated world, we shall observe the phenomena of psychical life more diversified; but in the endless variety of instincts bestowed by nature on different tribes, we shall find them everywhere severally distributed and typical of particular species. Among insects especially it is most remarkable that all the species in each tribe display peculiar habitudes and various modes of energy extending to everything within their sphere of action and of existence: they have different methods of providing for their young; construct their nests of different materials; place them in different situations; deposit their eggs, and protect them in different ways; each peculiarity in the characteristic

* Dictionnaire Class. d'Hist. Nat.; art., Campagnol. Quarterly Review, vol. xlvii. p. 339.

Digitized by Google

habits of the species being common to all the individuals comprised in it. In order to be fully convinced of the truth of this remark, we have only to read the admirable descriptions given by MM. Kirby and Spence, of the habits of the hymenoptera, and particularly of the wild bees and wasps. The xylocopa violacea, which bores cylindrical tunnels in the trunks of trees; the melitta fodiens, which perforates earthy banks; the apis manicata, which places her eggs in membranaceous coverings in holes; the apis muraria, which builds for them stone-walls; the apis papaveris, which covers them with the leaves of the wild poppy; the centuncularis, or rosen-biene,* which lines her burrows with rose-leaves, are all different species of bees, distinguished from each other by their specific habits more strongly than by any discovered peculiarity in the structure of body belonging to each tribe. Analogous varieties of instinct distinguish the different species of wasps, among which the odynerus muraria is remarkable, as well as the several species of cynips, or gall-wespe,† of which one tribe produces the rose-galls, another those of the oak, and a third, the galls of the carica, or wild fig; and likewise the several races of tinia and curculio. Each species in these several tribes obeys laws or principles of action entirely peculiar to its own kind, and distinct from those which govern all other kinds. Other families of insects and arachnoides are equally diversified by habits appropriate to their respective species. Almost every species of spider is distinguished by a peculiar method of spinning its web.

Section II.—*Psychical Characteristics of Mankind in comparison with Brutes.*

In order to illustrate the foregoing observations, and promote the object which I had in view in bringing them before my readers, I think it necessary to dwell somewhat longer on the psychical characters proper to certain tribes, and particularly to advert to the psychical endowments of human races.

* Blumenbach, Handbuch der Naturgeschichte. † Ibid.

Digitized by Google

Since the resembling tribes among the lower animals differ so remarkably from each other, as to their instinctive properties or faculties and habits, each species having its prescribed and characteristic laws of action, and its peculiar manner of existence, which separate all the individuals comprehended in one tribe from those which belong to species most nearly approaching to it, it becomes interesting to us to know whether any human races are distinguished from each other in a like manner. If this should appear, after due examination, to be the fact, a strong argument would thence arise, tending to establish a specific diversity between different tribes of men. If, on the other hand, we should be able clearly to trace the same mental endowments, similar natural prejudices and impressions, the same consciousness, sentiments, sympathies, propensities, in short, a common psychical nature or a common mind, participated in by all the different branches of the human family, the result would be a strong inductive argument against the existence of more than one human species. The most full and complete investigation of this problem would require a comprehensive survey of human nature in its different relations. I cannot attempt to go over so wide a field, but shall endeavour to obtain satisfactory results from a survey of the subject in some particular points of view.

It will be advisable, before we proceed to a particular description of different races of men, shortly to compare some of the most striking universal characters of mankind with the corresponding qualities of those tribes, among the lower animals, which most nearly approximate to man.

In the functions of the animal economy it has often been observed that the Simiæ most resemble man: in the general structure of the body and limbs they approach most nearly to the human kind: in the psychical characters of the monkey tribe we shall find a corresponding analogy to our own; and though this remark can obviously have reference only to the lower and merely animal qualities of man, it is a sort of resemblance or correspondence which has powerfully fixed the attention of naturalists, and even of casual observers.

The Simiæ, says M. Lesson, appear organized to be the connecting link between man and the lower orders of animals:

Digitized by Google

in general organization, indeed, they are much nearer to man than to the brutes, and it is only in relation to intelligence and judgment that they remarkably recede from human beings; to mankind they bear the most complete resemblance in the structure of the viscera and the destination of parts. Thus in the brain and its connected structures, in the perfection of the organs of sense, of sight, hearing, and touch, in the length and position of the intestinal canal, everything in the simiæ is the counterpart of what we discern in the human body. The orang-outan is indeed the only ape in which the vermiform appendix has been found, which we know to be adherent to the extremity of the cæcum; and it may be proper to observe, that the stomach of the white-rumped semnopithecus dissected by M. Otto, instead of being simple was found to be composed of several spacious cavities separated by contractions, and indicating that the animal is by nature subjected to a particular diet, consisting of roots and plants.

The brain of the simiæ has three lobes, of which the posterior covers the cerebellum. The researches of M. Tiedemann indicate the most complete analogy in the structure of the brain between the orang of Borneo and man, and great differences between this orang and the lower simiæ. According to Tiedemann, the brain of the orang differs from that of other simiæ, and approaches to the human brain in a great many striking particulars, in respect to which differences have been traced between the brain of man and that of the monkey tribes in general.*

To these certainly remarkable analogies presented by the organ of the understanding, M. Lesson subjoins the resemblances which have been traced between mankind and the

* These particulars are as follows: I cite from M. Lesson. 1st. Absence of the medullary fasciculus, named trapezium, which, in the animals possessed of it, is situated behind the cerebral ganglion, the point whence issue the auditory and facial nerves. 2dly. The existence of a sloping hollow, posterior to the cerebellum. 3dly. In a greater number of furrows and laminæ in the same part. 4thly. In the presence of two distinct maxillary tubercles. 5thly. In more numerous and at the same time less symmetrical convolutions and anfractuosities of the cerebrum. 6thly. In the existence of fissures directed towards the cornu ammonis. Now all these are characteristics of structure in the human brain. Lesson, Hist. des Mammifères, tom. iii. p. 233.

Digitized by Google

simiæ in the form of the cranium favourable to the maintenance of an erect position. In a future part of this work I shall find a more proper place for some further inquiry into anatomical relations. It will be sufficient for the present to observe that the analogy in this respect between mankind and the simiæ, has been supposed to be very much greater than it really is. The skulls of the adult chimpanze and orang-outan, differ, as Mr. Owen has clearly demonstrated, much more from the human cranium than it has been hitherto supposed.

Paragraph 1.—Gesture.

Are any of the simiæ destined for an upright posture? This is a question relating to physical circumstances, though intimately connected with psychical considerations.

It is now perfectly ascertained, says M. Lesson, that the gesture of the orangs is never agile and natural, unless when they employ all their limbs. It is only by accident, and often with the help of branches of which they lay hold, or in climbing steep places, that the orangs tread for a few moments upon their posterior limbs alone. By long and repeated instruction, they can be taught to walk upright, but their insecure gait, and the constant habit of resting on the outer edge of the foot, clearly prove this position to be very unnatural to them.*

Condemned to support his trunk by his four limbs, the orang can after all be a very imperfect approximation to man. This circumstance involves an almost infinite number of modifications in the psychical condition of the tribe.

* The truth of this observation, which contradicts an old and prevalent notion, has been fully proved from anatomical structure, by Mr. R. Owen, in his excellent Memoir on the Osteology of the Chimpanze and Orang, in the first volume of the Transactions of the Zoological Society. The same fact has been established by actual observation. M. Fred. Cuvier has given some valuable remarks on the habits of a living orang. He says—"Cet orang-outang était entièrement conformé pour grimper et pour faire son habitation des arbres. En effet, autant il grimpoit avec facilité, autant il marchoit péniblement." "Il passoit facilement d'un arbre à un autre lorsque les branches de ces arbres se touchoient, de sorte que dans une forêt un peu épaisse il n'y auroit eû aucune raison pour que cet animal descendît jamais à terre, où il marchait difficilement."—Annales du Muséum, vol. xvi. Mr. R. Owen on the Osteology of the Chimpanze.

Digitized by Google

Paragraph 2.—Family Relations and Habits.

Monkeys appear to resemble man in many of their social habits and dispositions. In the state of nature they go in little troops, which appear to be led by old and experienced chiefs. "The authority of adults over their young is absolute, and the former are said to maintain it by means of chastisement." It is supposed that the sapajous and gibbons are monogamists, but in all the other tribes the females are common. The paternal affection is however remarkably strong in the monkey tribe. The females of the chimpanze watch their offspring during two complete years, with the most tender solicitude, and the young apes are so strongly attached to their mothers, that if the latter are killed, they can hardly be separated from the bodies. Instances have been known evincing a degree of maternal love not exceeded in the human species. A female of the simia entellus has been seen, when feeling herself mortally wounded, to collect all her strength, and in a dying effort to place her young in a state of security.*

Paragraph 3.—Use of Speech.

The use of articulate language has always been regarded as one of the most remarkable endowments of mankind. The universality of its existence among men is not a less striking fact than its total absence among brutes, even among those which are nearest to man, and in whose organization nothing has been discovered that precludes the endowment of speech. We may account for the fact, that there is no tribe of men without speech, by supposing language to have been handed down from one original to various branches of the human family. But contingencies may have occurred, and, we are apt to think, must have happened in a long course of ages, and amidst the wanderings of a scanty population over previously untrodden wildernesses, fitted to interrupt the traditional preservation of this acquirement. How many stories have been

* Lesson, Hist. Nat. tom. iii. p. 248.

Digitized by Google

handed down of children lost or abandoned by their parents, and nourished in deserts by wild animals, or fed by their own instinct upon berries and other spontaneous fruits. Mothers who have been dumb or almost speechless have borne children, and have perhaps ere now brought them up in wild tracts without society. We might thus account in part for the origin of new languages. But there are no dumb hordes, or tribes of savages destitute of speech.

Paragraph 4.—Necessary Arts of Life.

The use of fire, of artificial clothing, of arms, and the art of domesticating animals, are characteristic habits of mankind. Though tradition goes back to the period when these practices are said to have been first adopted, they are now universal. There is no great division of the human family among whom some traces of these arts are not found.

Paragraph 5.

It is not in respect to these more variable traits of human action that we must compare man with the lower species, or one tribe of mankind with another. The same race who in the age of Tacitus dwelt in solitary dens, amid morasses, have built St. Petersburg and Moscow; and the posterity of cannibals and phthirophagi now feed on pillau or wheaten bread. The habits of men undergo changes from time to time, in all that refers to their diet and the supply of bodily wants, and they do not admit of comparison with the uniform customs of the lower tribes, which are precisely the same in every respect to-day that they were in the times of Homer and of Aristotle.

There are however uniform traits in human nature, habitudes both intellectual and moral, which may be regarded as fixed principles of action, and in this point of view will admit a comparison with the invariable psychical qualities of brute animals. The instinct of the brutes has been already illustrated by one profoundly philosophical writer through a com-

Digitized by Google

parison with the internal governing principle—the ἡγεμονικὴ of human action.* I shall attempt to pursue this investigation, adapting it to my own particular point of view, which is ultimately the comparison of human races with each other.

Paragraph 6.—Of Human Sentiments.

The outward characteristics which I have before enumerated would be sufficient to discriminate mankind from the brute tribes which most nearly imitate him; but it must be obvious on a little reflection, that it is not in these solely or even principally that the difference consists, which separates mankind at so wide an interval from the most anthropomorphous of animals. The sentiments, feelings, sympathies, internal consciousness and mind, and the habitudes of life and action thence resulting, are the real and essential characteristics of humanity. But in order to consider this observation in a way that may enable me to apply it satisfactorily to the subject I have in hand, it will be necessary to contemplate it in a particular point of view.

If we could divest ourselves of all previous impressions respecting our nature and social state, and look at mankind and human actions with the eyes of a natural historian or as a zoologist observes the life and manners of beavers or of termites, we should remark nothing more striking in the habitudes of mankind, and in their manner of existence in various parts of the world, than a reference which is everywhere more or less distinctly perceptible to a state of existence after death, and to the influence believed both by barbarous and civilized nations to be exercised over their present condition and future destiny by invisible agents, differing in attributes according to the sentiments of different nations, but universally believed to exist. The rites everywhere performed for the dead, the various ceremonies of cremation, sepulture, embalming, mummifying, funereal processions, and pomps following the deceased, during thousands of successive years in every region of the earth—innumerable tumuli scattered over

* Dr. Hancock on the Relations of Instinct.

Digitized by Google

all the northern regions of the world, which are perhaps the only memorials of races long extinct—the morais, pyramids, and houses of the dead, and the gigantic monuments of the Polynesians—the magnificent pyramids of Egypt, and of Anahuac—the prayers and litanies set up in behalf of the dead as well as of the living, in the churches of Christendom, in the mosques and pagodas of the East, as heretofore in pagan temples—the power of sacerdotal or consecrated orders, who have caused themselves to be looked upon as the interpreters of destiny, and as mediators between the gods and men—sacred wars, desolating empires, through zeal for some metaphysical dogma—toilsome pilgrimages performed every year, by thousands of white and of black men, through various regions of the earth, seeking atonement for guilt at the tombs of prophets and holy persons—all these and a number of similar phenomena in the history of nations, barbarous and civilized, would lead us to suppose that all mankind sympathise in deeply impressed feelings and sentiments, which are as mysterious in their nature as in their origin. These are among the most striking and remarkable of the psychical phenomena, if we may so apply the expression, which are peculiar to man; and if they are to be traced among races of men which differ physically from each other, it will follow that all mankind partake of a common moral nature, and are therefore, if we take into the account the law of diversity in psychical properties allotted to particular species, proved, by an extensive observation of analogies in nature, to constitute a single tribe.

The history of moral sentiments among different nations and of their religion and traditional and peculiar metaphysics, if it could be collected from data everywhere correct, would bring us very near to a satisfactory conclusion on the subject of these inquiries. The attempt to engage in this investigation will lead me far out of the path of strictly physical research; yet I shall enter upon it to a certain extent, since the results which in a limited survey I may hope to obtain, will tend, if I am not mistaken, to clear up one considerable obscurity, and to solve a problem the nature of which is now sufficiently obvious to my readers. I shall endeavour in the following

Digitized by Google

pages to collect the most striking and characteristic particulars relating to the moral impressions, and the superstitions of some of the most dissimilar races of men, and as this will tend still further to illustrate their mental history, I shall add such authentic statements as I can find, in reference to the attempts which have been made to spread Christianity among such tribes. This course of proceeding may at first appear to some of my readers out of place, but I am persuaded that they will, on consideration, admit the propriety of adopting it.

Section III.—*Of the Psychical Characters of the Bushman or Hottentot race.*

Writers on the history of mankind seem to be nearly agreed in considering the Bushmen or Bosjesmen of South Africa as the most degraded and miserable of all nations, and the lowest in the scale of humanity. M. Bory de St. Vincent describes them in his usual manner as differing most widely from what he terms the Japetic species of men, and as forming the transition from the genus homo to the genera of orangs and gibbons: he even finds analogies between them and the macacos.

Of all species of men, this race, approaching as it does in its form most nearly to the second genus of bimanous animals, is still more closely allied to the orangs, through the inferiority of its intellectual faculties. Happily for themselves, he continues, these people are so brutish, lazy, and stupid, that the idea of reducing them to slavery has been abandoned. "A peine peuvent-ils former un raisonnement, et leur langage, aussi stérile que leurs idées, se réduit à une sorte de gloussement qui n'a presque plus rien de semblable à notre voix. D'une malpropreté révoltante qui les rend infects, toujours frottés de suif ou arrosés de leur propre urine, se faisant des ornemens de boyaux d'animaux qu'ils laissent se dessécher en bracelets ou en bandelettes sur leur peau huileux, se remplissant les cheveux de graisse et de terre, vêtus de peaux de bête sans préparation, se nourrissant de racines sauvages ou de pances d'animaux et d'entrailles qu'ils ne lavent

Digitized by Google

même pas, passant leur vie assoupis ou accroupis et fumant, par fois ils errent avec quelques troupeaux qui leur fournissent du lait. Isolés, taciturnes, fugitifs, se retirant dans les cavernes, ou dans les bois, à peine font-ils usage du feu, si ce n'est pour allumer leur pipes qu'ils ne quittent point. Le foyer domestique leur est à-peu-pres inconnu, et ils ne bâtissent pas de villages, ainsi que les Cafres, leurs voisins, qui regardent ces misérables comme une sorte de gibier, leur donnent la chasse, et exterminent tous ceux qu'ils rencontrent. On les a dit bons parce qu'ils sont apathiques, tranquilles, parce qu'ils son paresseux, et doux, parce qu'ils se montrent lâches en toute occasion."*

No picture of human degradation and wretchedness can be drawn which exceeds the real abasement and misery of the Bushmen, as we find it displayed by the most accurate writers who describe this people. Without houses or even huts, living in caves and holes in the earth, these naked and half-starved savages wander through forests in small companies or separate families, hardly supporting their comfortless existence, by collecting wild roots, by a toilsome search for the eggs of ants, and by devouring, whenever they can catch them, lizards, snakes, and the most loathsome insects. It is no matter of surprise, that those writers who search for approximations between mankind and the inferior orders of the creation, fix upon the Bushmen as their favourite theme.

But accurate observers who cannot be suspected of undue prepossession towards opposite sentiments and representations of human nature, have drawn a less unfavourable picture of the moral and intellectual character of the Bushmen. Mr. Burchell, who sought and obtained opportunities of conversing with them and observing their manner of existence, though he found them in the most destitute and miserable state, yet discovered among them traits of kind and social feelings, and all the essential attributes of humanity.†

* Dictionnaire Class. d'Histoire Naturelle, Artic. Homme.

† Among other interesting remarks of Mr. Burchell's tending to the same result, we find an observation that the females among the Bushmen, though nearly naked, displayed as much the signs of modesty as Europeans. "The girls were

Digitized by Google

It must not be forgotten that the Bushmen are not a distinct race, but a branch or subdivision of the once extensive nation of Hottentots. This was at one time denied. Lichtenstein, who was followed by other writers, asserted, that the Bosjesmen are a peculiar family of men; he regarded them as entirely distinct from all the other inhabitants of southern Africa. A careful comparison of their language with that of the Korah and other Hottentots convinced Professor Vater that there is an essential affinity between them, and in recent times this conclusion has been fully established by local inquiries, and no diversity of opinion at present exists upon the subject. We are assured by one of the latest and best writers on South Africa, that the Bushmen are the remains of Hottentot hordes, who subsisted originally, like all the tribes of southern Africa, chiefly by rearing sheep and cattle, but who have been driven by the gradual encroachments of European colonists, and by internal wars with other tribes, to seek for refuge among the inaccessible rocks and deserts of the interior. "Most of the hordes," says the same writer, "known by the name of Bushmen, are entirely destitute of flocks and herds, and subsist partly by hunting, partly on the wild roots of the wilderness, on reptiles, locusts, and the larvæ of ants, or by plundering their hereditary oppressors, the colonists of the frontier. Having descended from the pastoral, to the state of robbers and hunters, the Bushmen, as we are assured, have necessarily acquired, with their increased perils and privations, a more resolute and ferocious character: from a mild, confiding and unenterprising race of shepherds, they have been gradually transformed into wandering hordes of fierce, suspicious and vindictive savages; by their fellowmen they have been treated as wild beasts, until they have become assimilated to wild beasts in their habits and dispositions."

as delicate in feelings of modesty, as if they had been educated in the most decorous manner." He adds, that they are pleasing by a sprightly and interesting expression of countenance, though far from beautiful, and although their features have the peculiar type of the Bushman race. Mr. Thompson fully confirms this account, and even gives a still more favourable description of the females of the Bushmen.—Travels in Africa, vol. i. 434.

Digitized by Google

Difficult as it may be to imagine a change from the state of herdsmen to that of the miserable Bushmen, the transition has been actually observed and described. Among the Hottentot tribes, the Koranas are well known to be the most advanced in all the possessions and improvements which belong to the pastoral life. A late traveller in Africa, whose narrative is replete with good sense and the marks of accurate knowledge, has traced from observation the process by which hordes even of the Korah race have been reduced from the life of peaceful herdsmen to the condition of hunters and predatory savages. The Koranas, as visited by Mr. Thompson on the Hartebeest river, had actually undergone this transition: having been plundered by their neighbours, and driven out into the wilderness to subsist upon wild fruits, they had adopted the habits of the Bushmen, and had become assimilated in every essential particular to that miserable tribe.*

Considering the pastoral Hottentots and the Bushmen as one race, I shall make some remarks on their mental character in general, in order to furnish the ground for a comparison between this and other families of men.

We must attempt to estimate the character of the Hottentot race, not from their present degraded condition, after the cruelty and oppression which they have endured from European colonists during so many generations have broken their spirit and reduced them to bondage or exile, but from the accounts left by older writers of the condition of these tribes soon after the first settlement of the Dutch colony. The voyager Kolben has given us a full and circumstantial account of the Hottentots at this time, and many of his statements are singularly at variance with the description which late writers have drawn. The original Hottentots were a numerous people, divided into many tribes under the patriarchal government of chiefs or elders: they wandered about with flocks and herds, associated in companies of three or four hundred persons, living in kraals or movable villages of huts constructed of poles or boughs and covered with rush mats,

* Thompson's Travels in South Africa.

Digitized by Google

which were taken down and carried on pack-oxen. A mantle of sewn sheep-skins was their clothing; their arms were a bow with poisoned arrows and a light javelin or assegai. They were bold and active in the chase, and although mild in their disposition were courageous in warfare, as their European invaders frequently experienced.

Kolben extols the good moral qualities of the Hottentots. "They are, perhaps, the most faithful servants in the world. Though infinitely fond of wine, brandy, and tobacco, they are safely entrusted with them, and will neither themselves take, nor suffer others to diminish any such articles when committed to their trust. To this quality they add the greatest humanity and good nature. Their chastity is remarkable, and adultery, when known among them, is punished with death. They are dirty in their habits, slothful and indolent, and though they can think," as he says, "to the purpose, they hate the trouble of thought." Kolben considered their intellect as by no means deficient. He declares, that "he has known many of them who understood Dutch, French, and Portuguese to a degree of perfection; one, particularly, who learnt English and Portuguese in a very short time, and having conquered the habits of pronunciation contracted from his native language, was said by good judges to understand and speak them with surprising readiness and propriety. They are even employed by Europeans in affairs that require judgment and capacity. A Hottentot named Cloos was entrusted by Van der Stel, the late governor of the Cape, with the business of carrying on a trade of barter for cattle with the tribes at a great distance, and he generally returned, after executing his commission, with great success."

The internal character of the mind is best known by discovering the religious ideas and impressions. It has often been said, that the Hottentots are destitute of all belief in a Deity or a future state. Enslaved and separated from their fellows, and scarcely able, without constant toil, to support life, some may have lost the power and habit of reflection and all traces of sentiment; but Kolben assures us, that the Hottentots of his time had a firm belief in a supreme power, which they termed "Gounya Tekquoa," or the god of all gods, saying, that he

Digitized by Google

lived beyond the moon. They paid him no adoration, but they worshipped the moon at the full and change, by sacrifices of cattle, with distorted faces and postures, shouting, swearing, singing, jumping, stamping, dancing, and making numerous prostrations, repeating an unintelligible jargon of words. "They also pay a singular veneration to a peculiar kind of beetle, the appearance of which is supposed to be particularly fortunate. They have an evil deity called Toutouka, whom they represent as a little crabbed, ill-natured being, a great enemy to the Hottentots and the author of all the mischief in the world. They offer sacrifices to him in order to soften his temper. All sudden pain, accidents, or sicknesses, are attributed to witchcraft. Charms and amulets are in high esteem among them. Kolben thinks they have not the least notion of rewards and punishments: yet, says he, that they believe in the immortality of the soul seems evident from these particulars:—first, that they offer up prayers to saints, or good Hottentots departed: secondly, that they are apprehensive of the return of departed spirits to molest them; for which reason, on the death of any person they remove their kraal, believing that the departed souls remain about the places which they formerly inhabited: thirdly, they believe it is in the power of witches or wizards to lay these spirits."

A faithful and correct account of the conversion of these people to Christianity, would not fail to display in striking points of view many traits in their moral and intellectual history. The early endeavours that were made to induce them to receive the truths of Christianity, were met with the same obstinate resistance of which we hear so much in almost every similar instance; and one writer has given as the summing up of his observations, that "the Hottentots, in short, seem born with a natural antipathy to all customs and every religion but their own." This remark is exemplified by the account of a Hottentot boy, who was bred up by the governor Van der Stel, in the habits and religion of the Dutch, and having learnt several languages and discovering a very promising genius was sent to India and employed in public business. After his return to the Cape, he stripped off his European dress, clothed himself in a sheep-skin, and pre-

Digitized by Google

senting himself to the governor, emphatically renounced the society of civilized men and the Christian religion, declaring that he would live and die in the manners and customs of his forefathers.* In this we trace one characteristic trait of human nature, as it exists in other races of men. A sort of instinctive and blind attachment to the earliest impressions made upon the mind is one of our strongest intellectual propensities. In the example above cited, it appears to have been equally powerful in the mind of the Hottentot as it is known to be in more cultivated nations; yet this has not prevented the spread of Christianity in the same race of people, when introduced among them under different circumstances.

Paragraph 1.—Effects of the Introduction of Christianity among the Hottentots.

It is indeed surprising, after all that we have heard of the sloth and brutish sensuality of the Hottentots, to learn that no other uncivilized race has given a more willing ear to the preachers of Christianity, and that none has been more strikingly and speedily improved by its reception, not only in moral character and conduct, but also in outward condition and prosperity. So rapid has been the spread of civilization around the settlements of the United Brethren, by whom the task of introducing the Christian religion among the Hottentots was undertaken, as to have given rise to a general notion that the missionaries of that church direct their endeavours in the first place to the diffusion of industry and social arts, and make religion a secondary object of attention. This, however, they uniformly deny. It is the unvarying statement of these missionaries, deduced from the experience of a hundred years of patient service and laborious exertions among the rudest and most abject tribes of human beings, that the moral nature of man must be in the first instance quickened, the conscience awakened, and the better feelings of the heart aroused by the motives which Christianity brings with it, before any improvement can be hoped for in the out-

*Kolben's Voyages and Natural History of the Cape of Good Hope.

Digitized by Google

ward behaviour and social state; that the rudest savages have sufficient understanding to be susceptible of such a change; and that when it has once taken place, all the blessings of civilization follow as a necessary result.

The first attempt made to spread Christianity among the Hottentots, was by a missionary named Schmidt, a man of great zeal and courage, who undertook this task in the early period of the Moravian church. He arrived in South Africa in 1737, and having settled at some distance from the Cape, soon collected a small congregation of Hottentots, by whom he was much beloved. Being obliged to sail to Holland, his return was prevented by adversaries, under pretence of zeal for the purity of doctrine and peace of the church. The undertaking was suspended during nearly fifty years. It was renewed under more favourable auspices in 1792. The new missionaries sought out the ruins of Schmidt's abode. They found some aged Hottentots who still revered his memory, and laid the foundations of the settlement of Bavian's Kloof, since termed Gnadenthal.

The school established by the missionaries was soon attended by many Hottentots, both children and adults; and the religious instructions, by reading the Bible and expositions, were frequented by many attentive hearers. The historians of the mission say, "The reverential stillness with which the Hottentots attended these meetings, the eagerness with which they listened to the discourses, and the emotion visible on their countenances astonished the missionaries, who had been told that they would find it impossible to fix the attention of their hearers even to the shortest address of a serious nature." The number of scholars increased, and soon amounted to two hundred, who were instructed in the open air. Many Hottentots came from a considerable distance, bringing their families and their cattle with them, and associated themselves to the settlement. The colonial boors became alarmed at the idea of being deprived of the services of their Hottentots, and on many occasions threatened, and even attempted the destruction of the settlement; but these menaces were averted, and it became at length apparent even to this class of the inhabitants that the Hottentots who had become Christianized

Digitized by Google

under the instruction of the missionaries were far more useful and trustworthy servants, than the sensual and degraded pagans whom they had previously been obliged to employ.

In the course of a few years, the Hottentots began to resort from all parts of the colony, and increased the population of Bavian's Kloof. The missionaries were slow and cautious in baptizing converts, until they thought that evidences were perceptible of repentance and faith. There were, however, in 1799, two hundred and thirty-eight Hottentot houses; the number of inhabitants amounted to 1,234, of whom three hundred and four were actual members of the congregation, eighty-four of them having been baptized during the year.

When the Cape colony came under the power of the English, the beneficial results of instruction imparted to the Hottentots by the missionaries of the United Brethren were so manifest, in the improvement of manners and industry, that the missions obtained the steady and uniform protection and favour of government. Gnadenthal had now grown into a populous settlement, displaying the best effects of human culture, and occupied by numerous and thriving families of husbandmen, who obtained a rich produce from the soil over which their ancestors had wandered for ages without attempting to improve it. In addition to this settlement, another tract, termed Groenekloof, was given by the government to the United Brethren. In the course of a year, from being a wilderness, it was made to bear a plentiful crop. The missionaries reported that in conducting their temporal concerns "the Hottentots gave evidence that they were under the influence of Christian motives. They went diligently to work in building their huts, and cultivating their grounds, and God blessed the labour of their hands." Some of the Dutch farmers expressed their surprise at the change which they witnessed in these people. "They were astonished," say the missionaries, "in seeing how the wretched drunken Hottentots, when they get to Gnadenthal, and hear the word of God, truly receive grace, and *become quite a different sort of people.*"

Perhaps nothing in this account is more remarkable than the fact, that so strong a sensation was produced among the

Digitized by Google

whole Hottentot nation, and even among the neighbouring tribes of different people, by the improved and happy condition of the Christian Hottentots, as to excite a general desire for similar advantages. Whole families of Hottentots, and even of Bushmen, set out for the borders of Caffraria, and performed journeys of many weeks, in order to settle in Gnadenthal. Individuals of the Tambuki nation, and some from the Damaras beyond Great Namaqualand, resorted to Groenekloof, and there took up their abode. It is a singular fact in the history of barbarous races of men, that the savage Bushmen, of their own accord, solicited from the colonial government, when negotiations were opened with them with the view of putting an end to a long and bloody contest, that teachers might be sent among them, such as those who had dwelt among the tame Hottentots at Gnadenthal. "History," says the historian of the mission, "probably furnishes few parallel examples of a savage people, in treaty with a Christian power, making one of the conditions of peace that missionaries should be sent to instruct them in Christianity."

I have not room to add further details from this account. The facts which I have extracted have an important bearing on the psychical history of a curious and interesting race of human beings, and could not be omitted in connexion with the inquiry in which I am engaged. Those who will candidly consider them and give them their due weight, will allow that they prove the existence of the same principles of action, and of the same internal nature in the Hottentot race as are recognised in other divisions of mankind; and this conviction will be increased by a careful perusal of all the details which the missionaries have afforded of the progress of the work, and of the moral changes which accompanied it.

Section IV.—*Of the Psychical Character of the Esquimaux.*

The manners and habits of the Esquimaux have been so generally made known by late writers that it is unnecessary for me to enter into any full and particular description of them. I shall in this place confine myself to a few preliminary remarks on the general condition and habits of this

Digitized by Google

race, and shall principally endeavour to collect such traits as may serve to illustrate their intellectual and moral state, the character of their minds, their natural endowments and susceptibility of mental culture. To fulfil this purpose, I know of no better means than an inquiry into their old national superstitions, and their modes of thinking and feeling in relation to subjects remote from the cognisance of the senses: and secondly, an account of the reception and progress of Christianity among them.

The habits of the Hyperborean people, says M. Lesson, are nearly the same wherever they have been carefully observed. Living on tracts of the earth where living nature seems to be expiring, buried under the eternal ices of the pole, their industry is directed towards fishing and the chase, which are their only resources for support, and in which they have acquired great skill. The rigour of the climate during long winters has obliged them to dig for themselves subterraneous abodes and storehouses for the provisions which they lay up against the season when they can no longer fish or hunt. During the long polar nights which the aurora borealis feebly illuminates, the Esquimaux, buried under the ice and snow in yourtes excavated deeply in the soil, feed upon dried fish, or the flesh of whales, and drink with delight the oil which they have laid up in bladders. They sew with nerves their winter garments made of the skins of seals, the hair of which serves the purposes of fur; and make their summer dress of the intestine of the largest whales, which resembles varnished stuffs.

The Esquimaux is skilful in the chase of foxes and sables, whose skins serve him for clothing, and for an object of barter in the traffic of the arctic people. He boldly harpoons the cetacea; his darts made of bone and pointed stones are surmounted with inflated bladders, the resistance of which upon the water wears out the strength of the whale, who speedily rises, and exposes himself to fresh attacks.

Superstitious to excess, says the same writer, the Polar race, with some slight shades of difference, displays the same religious sentiments prevalent among all its tribes. Their loose morality renders the men addicted to polygamy, and

Digitized by Google

causes them to prostitute without shame their wives and daughters, whom they regard as creatures of an inferior order, to be disposed of according to their pleasure.

In Greenland, and in Labrador, missionaries of the United Brethren have long had settlements among the native people, who are of the same race which is elsewhere spread along the shores of the Polar Seas. From these missionaries we have obtained much more accurate information respecting the habits of the people than from any other quarter. The following particulars, which I extract from their accounts, relate chiefly to the Esquimaux of Greenland, from whom, however, it is well known that the western tribes of the same race differ but in accidental circumstances.

Paragraph 1.—Of the Paganism of the Esquimaux.

The voyagers who first described the natives of Greenland formed very erroneous opinions respecting them. It was reported that they worshipped the sun, and sacrificed to the devil. Sailors who had observed them look intently on the heavens, on rising in the morning, hence derived the first of these notions: the second arose from the discovery of flat square stones, strewn with cinders and bones: it was concluded that these were places of sacrifice, and to whom should they sacrifice but to the devil? When the Moravian missionaries learnt their language, and were able to converse with them, they found these notions to be quite erroneous.

The Greenlanders, like other nations, believed in the existence of supernatural powers exercising control over the destinies of men. It appears, however, as we might *à priori* imagine, that they had in general no clear idea of a Creator or a creation. "They knew not, and perhaps the generality of them never considered, whether things were always as they are or not." Yet, if we may believe the Moravian missionaries, whose good faith seems above suspicion, there were some philosophers among these Pagan seal-catchers, who speculated on the doctrine of final causes. An Esquimaux told one of the missionaries that he had often reflected that a kadjak, with all its tackle and implements, does not grow of

Digitized by Google

itself into existence, but must be made with labour and contrivance. But a bird, he added, is constructed with greater skill than the best kadjak, and no man can make a bird. "I bethought me," said the Greenlander, "that he proceeded from his parents, and they from their parents; but there must have been some first parents—whence did they come? Certainly, I concluded there must be a being able to make them and all other things; a being infinitely more mighty and knowing than the wisest man."

The Greenlanders believed universally in the existence of spirits, good and evil, besides the souls of men. The angekoks, or diviners, who pretended to have visited frequently the realm of souls, describe them as pale and soft; not to be felt, if any one should attempt to grasp them. They believed in a future existence, which was to be without end. This elysium was generally placed by them in the abysses of the ocean, to which the deep cavities of rocks are avenues. There dwells the great spirit Torngarsuk, and his mother, under a joyous and perpetual summer, where a shining sun is obscured by no night; there is a fine limpid stream, abounding with fine seals, fish, and fowls easy to be caught, and even to be found boiling alive in a great kettle. But these seats of the gods can be approached only by those who have displayed great courage and address, who have mastered many seals and have undergone hardships, have been drowned in the sea, or by women who have died in child-bed. Here is obviously the persuasion that virtue, bravery at least, is rewarded in the future life. Before the disembodied soul enters Torngarsuk's realm, it undergoes a sort of purgation by sliding, five days or longer, down a rugged rock, which is thereby full of blood and gore. Unfortunate souls who perish in cold winter, or boisterous weather, incur a risk of being utterly destroyed on the road. Annihilation is regarded by the Greenlanders, as by other nations, with peculiar horror; and to prevent it, the survivors abstain for five days from certain meats, and from all noisy work. The fictions of this people are not so definite as to admit of no variations in the site and description of elysium: some fancy it to be the sky, and say that the northern lights

Digitized by Google

are the dances of sportive souls; others maintain this state of agitation in the air to be the destiny of worthless souls, who will there be half-starved, and tormented by ravens. It seems on the whole that the future state of the old pagan Esquimaux or Greenlanders, was in a great measure a state of retribution, of rewards and punishments. Happiness and misery were at least not dispensed with indifference to merit and demerit.

Torngarsuk is the chief of spirits, dwelling in his happy subterranean mansion. His mother or wife is a mischievous being. This Proserpine of the north lives in a great house under the ocean, where by magic spells she can detain all the animals of the sea. In the oil-jar under her lamps, sea-birds swim about. Her throne is guarded by rampant seals, or defended by a great dog, who never sleeps but the twinkling of an eye. So many curious traits occur in the description of this infernal goddess and her abode, which recal the Proserpine of classical mythology, and the Pattala of the Hindoos, and the subterranean scenes of enchantment among the Arabs, that we might well be inclined to derive these fables from a common source, if the resemblance between them was not better accounted for by referring it to the common laws of the human mind, and to the tendency of the imagination to create similar fictions with reference to particular subjects, and under the influence of corresponding feeling and impressions. But this brings out so much the stronger a proof, that the mind is the same in different countries and in different races of men.

The Greenlanders likewise believe, that the souls of the dead are sometimes seen near their places of burial. The sun and moon have their tutelary genii: water, air, and fire, mountains and caves are the abodes of nereids, and salamandrine spirits. Giants and pygmies, and monsters with dogs' heads, find their place in this as in so many other mythologies.

The natives of Greenland were strongly imbued with the notions so prevalent among mankind in different regions, that there must be a particular class of men fitted to mediate between the people and supernatural powers. These persons in Greenland were termed angekoks, that is, sorcerers and

Digitized by Google

diviners. Many families living together, according to Crantz, always keep an angekok as their counsellor on particular occasions; and if they cannot get one they are despised, and pitied as miserable wretches. In order to become an angekok, it is necessary to abandon for a long time the intercourse of men; to macerate the body by long fasting, and by strenuous intensity of thought, like that of the Indian sannyasis performing puja, to distract the mind almost into madness. When a Torngak, or familiar spirit, is obtained by these efforts, the individual becomes an angekok, and thenceforward is possessed of the united powers of sorcerers and magicians. On all occasions of distress or sickness the angekoks are applied to for relief. It is believed that they can take diseases off or lay them on; that they can enchant or dissolve the spell of the enchanted arrow; that they can call blessings down or chase spectres away. If they have to do with a sick patient, they must mutter something over him, and blow upon him to cure him; or they must fetch and implant a healthy soul in him, or perhaps only predict if he will recover or die. By other enchantments they discover if an absent man is living or dead. They cite the soul of a man to appear before them, and if they wound such a soul with a spear, the man must die a lingering death. The witches of Greenland are exactly parallel to the witches of England, according to the belief of our ancestors.

Paragraph 2.—Of the Conversion of the Greenlanders to Christianity.

The account of the conversion of the Esquimaux to Christianity and to civilization, as given by Crantz from the simple and unaffected narrative of the Moravian missionaries, cannot be read without a lively interest. In the long and painful struggle, almost leading to despair of ultimate success, and in the event which rewarded their labours, the history of these missions affords a specimen of what has taken place in almost every similar instance, where the promulgators of Christianity have been sincerely devoted to their undertaking, and have been endowed with sufficient

Digitized by Google

zeal and perseverance, and with other requisite qualifications. Among the Greenlanders, as elsewhere, many years of patient labour were toiled through, and many a prediction had been heard of utter failure in so vain and impracticable an undertaking, before a more encouraging prospect was opened, or any perceptible effect was produced upon the minds of ignorant savages. In the resistance long made by these people to Christianity, as well as in the circumstances which attended its ultimate reception, we perceive the workings of the same mind which has often displayed itself in other races of men. It was in 1721, that Egede, the apostle of Greenland, established the first Danish mission in that country. He was followed by missionaries belonging to the Unitas Fratrum. After an interval of fifteen years, we find Crantz, the historian of this community, thus confessing the total want of any apparent result of their long and painful exertions. "Hitherto," he says, "they had not seen the trace of any permanent impression from the truths they had held forth. The Greenlanders who came from a distance were stupid, ignorant, and void of reflection: and the little that could be told them in a short visit, even if it was heard with attention, died away in their perpetual wanderings. Those who lived constantly in the immediate neighbourhood of the missionaries, and had been instructed so many years, were not grown better, but most of them worse; they were disgusted, tired, and hardened against the truth." When pressed to give a serious attention to the doctrines of Christianity, they either showed their dislike openly, or excused themselves in terms like the following:—"Show us the God whom you describe," said they, "then we will believe in him, and serve him. You represent him too sublime and incomprehensible; how shall we come at him? Neither will he trouble himself about us. We have invoked him when we have nothing to eat, or when we have been sick, but it is as if he would not hear us. We think what you say of him is not true, for if you know him better than we, then do you by your prayers obtain for us sufficient food, a healthy body and dry house, and that is all we desire or want. Our soul is healthy already, and nothing is wanting, if we have but a

Digitized by Google

sound body and enough to eat. You are another sort of folk than we: in your country, people may perhaps have diseased souls; and indeed we see proofs enough, in those who come here, that they are good for nothing; they may stand in need of a Saviour, and of a physician for the soul. Your heaven and your spiritual joys and felicities may be good enough for you, but this would be too tedious for us. We must have seals, fishes, and birds; for our soul can no more subsist without them than our bodies. We should not find these in your heaven; therefore we will leave your heaven to you and the worthless part of the Greenlanders; but as for us, we will go down to Torngarsuk; there we shall find an exuberance of everything without any trouble."

The first individual of this nation who became a convert was a man of extraordinary mental powers in such a state of society, and one whom the missionaries always mention as altogether a most remarkable person. His name was Kajarnak. They describe him as "a man whom they cannot but wonder at, when they consider the great supineness and stupidity of the Greenlanders in general, and that they can comprehend nothing except what they are daily conversant with. But this man," they continue, "scarcely hears a thing twice before he understands it, and retains it in his mind and heart. At the same time he shows an uncommon love to us, and a constant desire to be better instructed; so that he seems to catch every word out of our mouths, which we have never perceived in any Greenlander before." Kajarnak had come from a remote part of Greenland: he was a stranger to the missionaries, and was immediately interested with their representations of the Christian religion, and impressed with the narrative, which in a simple and emphatic manner they delivered, of the most striking events of the evangelical history.* Kajarnak became a zealous convert

* The following is the account which the missionaries transmitted of the manner in which doctrines so remote from their habits of thought penetrated the minds of the first converts among the Esquimaux:—

"In the summer of 1728, many natives of the southern country visited the settlement. One day when a missionary named John Beck was employed in copying part of a translation of the Gospels, he read a portion of it to these

Digitized by Google

and disciple of the missionaries, and was a willing and able instrument in propagating the doctrine which he had embraced among his countrymen. A few of them soon followed his example; and a small community of proselytes was formed, which in a few years increased to a considerable number.

When such a commencement had once been made, the conversion of the Esquimaux of Greenland to Christianity seems

savages, and took an opportunity of explaining it to them. 'The Holy Spirit,' say the missionaries, 'prompted this brother to describe the agonies and death of Christ with more and more energy; and he exhorted them with a warm heart to think seriously how much it had cost our Saviour to redeem us, and that on that account they should by no means withhold their hearts from him, which he had earned at so dear a price; for he had been wounded, and shed his blood, and died to purchase them, and had endured such anguish of soul, that it made him sweat blood. At the same time he read, out of the New Testament, the history of our Saviour's agony on the Mount of Olives, and of his bloody sweat. Then the Lord opened the heart of one of the pagans, whose name was Kajarnak, and he stepped up to the table, and said with a loud, earnest, and affecting voice, 'How was that? tell me that once more, for I fain would be saved too.' 'These words,' says the missionary, 'penetrated my very soul, and kindled in me such an ardour, that I gave the Greenlanders a full account of our Saviour's whole life and death, and of the counsel of God for our salvation, while tears ran down my cheeks.' From that time Kajarnak became a disciple of the missionaries, and was a willing and able instrument in propagating the Christian doctrine among his countrymen."

In a further account of the state of the new converts, written a few years after the transaction above related, we find the following reflections.

"Though the woeful state of the heathen still grieved the brethren, yet the fruits of grace which they discerned in Kajarnak and the rest of the catechumens rejoiced them more and more. They evinced plain signs, not only of a true consciousness of a Divine Being and of a profound reverence for him; not only joy that Christ will raise the dead, and that believers will be happy in another world, but *principally* a real sense of their own misery, a joy in the love of God manifested to the fallen human race in the atonement by Christ, and a growing desire after the word of life. It was plainly to be seen that the work of grace had taken deep root in their hearts, by a change of life, by a voluntary abstinence from heathenish vanities, and by cheerfully enduring the reproach of their infidel countrymen, by whom they were forsaken, hated, and despised. Kajarnak, after his country people had been catechised by the missionaries, used to subjoin an exhortation, that, having been so long ignorant, they should now embrace the truth with a willing and thankful heart, and let it effect a true change; or he would sometimes conclude with a short but fervent prayer. And here let it be observed, that this was not a thing he was ordered or led to do, but of his own free impulse. He had at the same time a clear head, helped his teachers to the words they wanted in the language of the Greenlanders, and often corrected them, because he pretty well understood their meaning."

Digitized by Google

to have proceeded rapidly. In the year 1744, it was evident that a considerable effect had been produced upon the minds of the people generally; great numbers were interested in the subjects which the missionaries set before them. In 1748, not less than two hundred and thirty converts resided at New Herrnhut, thirty-five of whom had been baptized during the year. "Though these people are not without imperfections," say the historians of these missions, "it is yet evident that they are advancing. Their intercourse with one another is become more and more characterised by mutual kindness and the proofs of real conversion." A few years afterwards it was observed, that though nearly two hundred persons baptized by the missionaries had finished their earthly career, the congregation now consisted of four hundred persons. "Since 1742, when the first general awakening of the natives commenced, the increase has been considerable in proportion to the population of the country." Several new colonies had now been established by the Danes, provided with missionaries from the royal college at Copenhagen. These were stationed in different parts of the country. Two additional settlements were founded by the United Brethren in 1758 and 1774, at Lichtenfels and at Lichtenau, near Cape Farewell, where there was soon a congregation of two hundred and five baptized Greenlanders. In the conclusion of the history drawn up a few years ago, it is observed, that since the commencement of the mission a very remarkable moral change has taken place in the state of the country and the character of the natives. "Along the whole extent of the western coast, the barbarities of savage life and the enormities ever attending Paganism where it is dominant are now rarely to be met with; and the state of the country, compared with what it was eighty, or but fifty years ago, may be termed civilized. The nature and climate of this dreary region, and the methods by which the natives procure their subsistence, necessarily preclude the introduction of many arts of civilized society. The people can neither till the land nor employ themselves in manufactures. A Greenlander can neither live in the European manner nor clothe himself like an European, dwelling as he does on sterile rocks

Digitized by Google

and under the rigours of a polar sky. Yet it may be said with truth, that the converted Greenlanders, by the habits of industry which they have acquired since the introduction of Christianity among them, by their contentment amidst privations and hardships, and by the charity of the more affluent towards their needy brethren, strikingly exemplify the doctrine, that in every circumstance of life and in every station, a religious life is great gain, having the promise of reward in this world and in that which is to come."*

The particulars which I have collected relating to the superstitious opinions and impressions of the Greenlanders in their primitive state, and especially the facts connected with their conversion to Christianity and civilized habits, are sufficient, if I am not mistaken, to prove that the mind of the Esquimaux has the same moral and intellectual constitution as that of other human beings. They have the same elements of moral feeling, the same sympathies and susceptibilities of affection, the same conscience or internal conviction of accountableness more or less obscurely or clearly impressed, the same sentiments of guilt and self-condemnation, the same desires of expiation, which are common to so many other nations in almost every degree of mental culture. The most elevated of these principles are only recognised in the natural or pagan state of these men as mere rudiments of higher and better understanding, or as scintillations now and then shooting forth. When those doctrines and representations are opened to them which have been found, in so many other parts of the

* Historical Sketches, p. 64.—From the accounts recently published it appears that a fourth mission has been established, and that the number of Christian Greenlanders belonging to the Moravian church, which excludes those under Danish Lutheran ministers, is 1808. In this last account we are informed, that "the effects of Christianity upon the moral and social state of the Greenlanders has been in every respect most cheering and beneficial. The national superstitions have everywhere almost entirely disappeared. The practice of sorcery is almost unknown upon the coast. Cruelty and licentiousness, with a whole train of attendant vices, have, through the influence of Christianity, given way to brotherly kindness, good order, decorum, and such a measure of civilization as is compatible with peculiar circumstances. The mind of the Greenlander has been cultivated and his heart softened and purified; though his mode of life is still rude, and his habits greatly at variance with European ideas of comfort and civilization."

Digitized by Google

world, congenial to the human mind, and as such have been received by the most polished, as well as by the most barbarous nations, they have produced their wonted effects upon the Esquimaux. The minds of these people appear to be, as to all essential principles of feeling and understanding, in harmony and in strict analogy with those of other men. Such a mind can hardly be supposed common to different species of organized beings.

SECTION V.—*Psychical History of the Negro Races.*

I proceed to offer some remarks on the Negro races. It may appear irregular to take up this part of the subject in the order in which it now occurs; but some advantages will arise from this method, and I do not think it liable to any valid objections, because the Hottentots and Negroes, though resembling in some respects physically, are yet clearly to be distinguished from each other. There was, therefore, no impropriety in describing the Esquimaux intermediately, who may, indeed, be as nearly allied to either of the abovementioned races as they are to each other.

As I have collected fuller accounts of the religious belief and practices of the Negroes, than of the superstitions of other races, and as these will best illustrate the mental character of the people, I shall immediately commence with the religion of the African Negroes.

It is commonly said, that the religion of the African nations, of those, at least, who have not embraced Mohammedanism, is the superstition of Fetisses, that is, of charms or spells. This expression conveys a notion that is not perfectly correct. The superstition of charms or spells holds a principal place in the minds of the idolatrous Negroes; but this does not preclude a very general prevalence in their belief of the first principles of natural religion. It may be observed, that among nations enjoying a much higher degree of mental culture, the prevalence of superstitions and practices more or less resembling the Fetissism of Africa, may be recognised: such are a belief in destiny or fatality, astrology, necromancy,

Digitized by Google

charms, spells, omens, lucky and unlucky days, fortune, and the good and evil genius of individuals.

"The word fetisso," says Barbot in his description of Guinea, "is a Portuguese word signifying charm or spell. It is not a native African term, though used by the Negroes of the Gold Coast, after the Portuguese. These Negroes term their idols Bossum, or Bossefoe. Father Godfrey Loyer, apostolical prefect of the Jacobites, who made a voyage to the kingdom of Issini, and studied the temper, manners, and religion of the natives, says, that it is a great mistake to suppose, that fetisses are the gods of the Negroes. He declares that they have a belief in one universally powerful being, and that to him the people of the countries visited by Father Loyer address prayers.

"Every morning," he says, "after they rise, they go to the river-side to wash, and throwing a handful of water on their head, or pouring sand with it to express their humility, they join their hands and then open them, whisper softly the word 'Eksuvais." Then lifting up their eyes to heaven, they make this prayer:—'Anghiûme mamé maro, mamé vice, mamé shike e okkori, mamé akaka, mamé bremlic, mamé unquan e aconsan;' that is, 'My God, give me this day rice and yams, give me gold and aigris, give me slaves and riches, give me health, and grant that I may be active and swift.'"

The excellent missionary Oldendorp, who appears to have had rare opportunities, and to have taken great pains to become accurately acquainted with the mental history and character of the Negroes, assures us, that he recognised among them an universal belief in the "existence of a God," whom they represent as very powerful and beneficent. "He is the maker of the world and of men: he it is who thunders in the air, as he punishes the wicked with his bolts. He regards beneficent actions with complacency, and rewards them with long life. To him the Negroes ascribe their own personal gifts, the fruits of the earth, and all good things. From him the rain descends upon the earth. They believe that he is pleased when men offer prayers to him in all their wants, and that he succours them in dangers, in diseases, and

Digitized by Google

in seasons of drought. This is the chief God, who lives far from them on high: he is supreme over all the other gods."*

"Among all the black nations," says Oldendorp, "with whom I have become acquainted, even among the utterly ignorant and rude, there is none which did not believe in a God, which had not learnt to give him a name, which did not regard him as the maker of the world, and ascribe to him more or less clearly all the attributes which I have here briefly summed up. As, however, the Negroes always designate God and the heaven by the same term, it is doubtful whether they do not regard heaven itself as the Deity;† but, perhaps, their notions are not so clear as to have led them even to contemplate this distinction.

"Besides this supreme beneficent divinity whom all the various nations worship in some way or other, they believe in many gods of inferior dignity, who are subject to the chief Deity, and are mediators between him and mankind. Such are the powers which they reverence in serpents, tigers, wolves, rivers, trees, hills, and large stones. The more stupid among the Negroes certainly imagine the serpent, the tiger, and the stones to be themselves gods, that the tree understands them, and the tiger gives them rain; on the other hand, the more intelligent look upon these objects as representations of the inferior gods, and imagine that local deities dwell unseen under certain trees or on particular hills. This appears from the fiction which the priests of Akkran have invented respecting the subordination of the tutelar gods under the supreme divinity, and from the notion that these gods absent themselves during a certain season of the year, while the visible objects remain."

* The author begins his account of the religion of the Negroes with an assurance, which has every appearance of being made in perfect good faith, that he will relate nothing which he has not received immediately and exactly from the Negroes themselves. See C. G. A. Oldendorp's Geschichte der Mission der Evangelischen Brüder auf den Caraibaischen Inseln St. Thomas, St. Croix, und S. Jan. 1777, s. 318.

† The same observation has been made by the Jesuit Duhalde as to the Chinese. Whangti, the supreme divinity, is also the heaven. So in fact was Jupiter, both among the Latins and the Greeks, as it is expressed in the well-known passage of Ennius and the parallel one of Euripides. Perhaps the Semitic people were the only race whose language displays a purer or more metaphysical conception.

Digitized by Google

Immediate Objects of Worship.

" These gods are either national or domestic. Thus the Fida, besides the great serpent, which is adored by the whole nation, have each their particular smaller serpents, which are worshipped as household gods, but are not esteemed so powerful by far as the great one to whom the smaller serpents are subjected. Where the latter are unable to assist, their worshippers have recourse to the great serpent. The national deity of the Kanga is an elephant's tooth, and that of the tribe of Wawa, a tiger. The Sember have wooden gods in human form, which they call Zioo. The Loango also have similar carved idols of both sexes, some clothed, some naked and painted, as well in their dwellings as in sacred buildings. They are served by priests, who are said to be inspired by them, and give out the answers of the gods as oracles. Some of the Amina call the Creator of the world and of their nation Borriborri, and imagine that he has a wife, who is called Sankomaago, by whom he has a son Sankombum, who is the mediator between man and the superior deity."

Relations of the Deities to each other.

" These inferior powers are appointed by the chief deity as tutelar gods over certain countries, men, animals, plants, rivers, &c. and must yearly give an account of their conduct. This is done in a general assembly of all the gods at the court of the chief divinity. He who has given satisfaction, is confirmed by the great god in his tutelar office of protecting spirit for a year, and is marked with a red-hot iron: but those who have permitted the evil spirit to disseminate unjust wars among the nations, or have wilfully allowed pestilence or fires and such evils in the territory entrusted to them, are deposed from their office, expelled from the rank of gods, and made mortals. From despair and malice such deposed gods are accustomed to embrace the party in opposition to the divinity, and become maleficent spirits. I have taken this account," says Oldendorp, " of the relation of the inferior gods to the higher deity from the journal of Christian

Digitized by Google

Prottens, a native African, who had been for a long time in the community of the brethren."

Fetisses or Charms.

The fetisses of the Negroes, which hold so prominent a part in their superstition, are of the same nature as the spells and charms of the northern nations, and as the amulets and talismans of the east.

"Fetisses, or schambos," says Oldendorp, "as they are called by the Wawa, are sacred things, which have received a peculiar power from God, as well to drive away the evil spirits, as to succour in all sorts of diseases and dangers, especially against enchantment. They have not the dignity of gods; although it might be supposed from the peculiar veneration of the Negroes for these fetisses that they were the objects of their national worship, as indeed many ignorant people say. They ornament not only themselves, but also their idols with these fetisses, which descend by inheritance from parents to children, who preserve them with the greatest care. Others are preserved in particular houses, over which overseers are appointed. The Mandongo willingly receive for their fetisses any thing that has been struck by thunder, Thus we perceive that the Negroes only venerate their fetisses because they believe that something divine has been united to them; and how could this take place more manifestly than in the instance of thunder, which they look upon as the peculiar attribute of the Deity, and proceeding immediately from him?

"The Negroes employ these fetisses especially as a means of protection against every thing which they esteem evil or hurtful. Thus the Ibo, when they go to war, bind fetisses with cords round their bodies, to protect them from wounds; and the Amina expect the same advantage from a consecrated cow's tail. They make use of them particularly to preserve them from the evil spirit, and his hostile attempts. They believe that he is the origin of all evil. He is the enemy of the good God; he seeks to mislead men, to injure them, destroy them, and after death to get their souls into

Digitized by Google

his power. They never consider themselves secure from his snares.

"No African nation makes the malevolent demon an object of worship, or calls upon him for assistance, but they are universally afraid of this powerful agent, and seek to appease him with favours. Thus, for example, the priests of Amina, before they bury their dead, place some costly things upon a place cleansed for this purpose for the evil spirit, whom they term *Didi*. They call him, and give him to understand that these gifts are for him, and that he must be contented with them and leave the dead alone. When they wish ill to any one, they curse him by the *Didi*, Kalliampemba, or by whatever name they address the evil spirit."

Worship—Prayers to the Gods.

We have seen that the Negro nations have agreed with other races of men, in the belief that supernatural powers exist, to whose control all things are subject, and that they differ not materially from other nations in their conception of the nature, attributes, and relations of the gods to each other. It seems that they further agree with European and Asiatic nations in the methods by which they endeavour to conciliate the favour of the unseen beings to whose power they hold themselves to be subject. The principal of these have been everywhere prayers and sacrifices. "The Negroes," says Oldendorp, "profess their dependence upon the Deity in different ways, especially by prayers and offerings. They pray at different times, in different places, and as the Amina Negroes told me, in every time of need. They pray at the rising and setting of the sun, or eating and drinking, and when they go to war. Even in the midst of the contest, the Amina sing songs to their god, whom they seek to move to their assistance by appealing to his paternal duty. The daily prayer of a Watje Negress was—'O God! I know thee not, but thou knowest me; thy assistance is necessary to me.' At meals they say, 'O God! thou hast given us this, thou hast made it grow;' and when they work, 'O God! thou hast caused that I should have strength to do

Digitized by Google

this.' The Sember pray in the morning, 'O God! help us: we do not know whether we shall live to-morrow; we are in thy hand.' The Mandongo pray also for their deceased friends. They pray in the presence of their idols and fetisses. The solemn prayers which are made by a tribe or nation, are accompanied by dancing to the sound of instruments, and are pronounced with terrific cries. The Akkran frequently interrupt their dances by kneeling down.

"The requests which they make to God, refer to their bodies, health, good weather, rich harvests, victory over their enemies, and such things. In a continued dry season, the Wawa assemble in a melancholy procession, whilst they bind leaves upon their bodies and heads, before the schambeo-house, in which a tiger is worshipped as god. With howling and lamentation they represent to him their necessity, and pray that he will cause it to rain, since they must otherwise all die of hunger. Among the Loango, upon a similar occasion, an offering of cattle is brought. When this is accomplished with the customary ceremonies, the priest, who is as well an enchanter, desires the people to hasten home, not to be surprised by the rain. Among the Koromanti Negroes, the women go in procession to their priest, whom they call *belum*, bring him all sorts of fruits, and beg him to procure them rain. The Watja beseech the new moon to give them strength for labour, and the Amina even request their god to pay their debts."

Sacrifices.

"The sacrifices constitute the most important part of their worship, which are performed in sacred places by consecrated persons. The sacred places are those, where one of their divinities dwells, visibly or invisibly; particular buildings or huts, hills, trees, remarkable for their age, height and strength. They have also sacred groves, which are the abodes of a deity, which no Negro ventures to enter, except the priests.

"The oblations of the Negroes consist of oxen, cows, sheep, goats, fowls, palm-oil, brandy, yams, &c. Human sacrifices

Digitized by Google

are offered by some nations. On joyful occasions they offer white, and on sorrowful, black animals. The sacrifices take place partly at appointed seasons, and partly occasionally. The intention of them is to gain the favour of the deity, to procure help in sickness or in war, and rain in dry seasons, or to manifest their gratitude for benefits received. Oblations are also brought for the dead.

"When the young men of Temba go to war, the old ones, who remain at home, seek to gain for them the protection and assistance of Sioo, their divinity, by prayers and offerings. They fall upon their knees before the image, offer him sheep and fowls, pour out the blood and entrails before him; but they dress the flesh for a meal for themselves. If the design of the sacrifices is not obtained and the expedition does not succeed well, the fault is not laid upon Sioo: they do not doubt his willingness to assist; he has been unable for this time to prevail against the powerful god of the enemy. In order to obtain rain, the Amina sacrifice many sheep and fowls, and beseech the Tankoubum to cause rain to flow as plentifully from heaven as their blood has flowed for him. Many oblations are made for the sick, and many presents made to the priests, that they may assist in restoring them to health. If the sick person dies, the priests are persuaded that the gods wished for his soul: against this no presents could be of service. If he recovers, his friends prepare a great feast, and offer for a testimony of gratitude, white sheep and fowls."

Funeral Rites and Sacrifices.

"Even the dead are not buried without sacrifices. A white hen is slain by the priest before the corpse comes to the grave, and the bier whereon the body lies is sprinkled with its blood. This custom was introduced by the nation of the Kagreut. These people offer to the deity a tame animal when they till their ground, and vow another of the same kind if God will bless their produce. Human sacrifices are very rare among the Negroes, but not entirely unknown. In Old Kalabar a child ten months old was hanged upon a tree with a living fowl, for

Digitized by Google

the recovery of the king, which M. Seelgrave relates as an eye-witness. Thus the king of Dahomee sacrificed to his god, out of gratitude for the victory granted to him, four thousand captive Fidans, and caused their heads to be cut off, and piled together in a heap."

Sacred Festivals.

"At the annual harvest-feast, which nearly all the nations of Guinea solemnize, thank-offerings are brought to the deity. These festivals are days of rejoicing which the Negroes pass with feasting and dancing, and they prove their gratitude to their divinities by pouring out before them and offering to them a portion of their prepared food. They likewise give back to their gods, in gratitude, a part of every thing they earn. The Karabari have the peculiar custom on such feast-days of hunting the old evil spirit out of their villages before they celebrate their harvest-feast. The Watje assemble at harvest upon a pleasant plain, when they thank God thrice upon their knees, under the direction of a priest, for the good harvest, and pray to him for further blessings. When they have risen, the whole assembly testify their gratitude to God and their rejoicing, by clapping their hands. After this divine service, a joyful feast follows, for which each family kills and prepares white sheep and fowls."

Pilgrimages.

"Among the annual festivals is the pilgrimage of the nation of Fida to the great serpent. The people collected before the house of the serpent, lying upon their faces, worship this supposed divinity, without daring to look upon him. Except the priests, the king alone has this favour once. In the same manner the Wawa hold an annual service in honour of a tiger, whom they look upon as a god, and whom a priestess serves. They do not only then solemnly worship him, but bring him oblations of maize, fowls, sheep, and such things. These are first set before the tiger, who is ornamented at this solemnity with schambos or fetisses, and what he leaves is

Digitized by Google

made into a sacrificial repast, which is accompanied with dances and other amusements. A Negro also annually solemnizes the day on which he first shed the blood of a human being."

Of the Order of Priests, their Offices and Powers.

Like all the nations of antiquity the pagan Negroes ascribe to a particular class of men the office of mediators between mankind and the gods. The priests in Africa, as elsewhere, are the only individuals who can offer acceptable sacrifice to the divinity; they alone are interpreters of the divine will. To this function they join that of diviners or magicians, masters of spells and amulets. It is really wonderful to discover so extensive an analogy in the opinions of men and of races separated from each other from immemorial time, not only in the general principles of natural religion which conscience and the internal feelings impress upon the understanding and belief, but in all the various phases and modifications of superstition, and in the modes by which crafty and designing men have availed themselves of the weakness and credulity of the people.

"The priests and priestesses are the sacred persons upon whom the divine service of the Negroes depends, and who, as they suppose, have confidential intercourse with the gods, and interpret their will. They alone understand by what means the wrath of the deity may be appeased. To them it belongs, to present the offerings to the gods, and to be the intercessors between them and the people. They convey the questions of the people to the gods, who reply by the mouths of the priests. It is not, therefore, to be wondered at, that they are held in the greatest esteem by the people, and exercise almost boundless authority over them. No Negro will transgress the priest's commands. Even after death, in the performance of sacred ceremonies at the burial of the body, the assistance of the priest is necessary, for he alone understands how to prevent the evil spirit from getting the soul into his power.

"At times of sickness, warlike expeditions, and in other

Digitized by Google

important affairs, the Negroes desire to be assured of the issue by a divine answer. In such cases, the Amina bring a sheep, either entirely white or black, to the priest, who sacrifices it, and with its blood sprinkles a large vessel; whereupon he receives an answer to the question laid before him. If a Fida Negro is sick, he causes the serpent to be interrogated through the priest, whether his disease proceeds from God, or from enchantment. Together with the answer which he receives, a remedy is shown him, by means of which he may recover. But if the disease is fatal, he receives the melancholy intelligence, that he can be cured by no possible means. In this case, the priest or priestess takes no reward for their trouble, which is required in all other instances. The great snake unasked reveals impending wars to the priestess, who does not fail to give intelligence of it to the king. She tells him the name of the enemy; appoints the time of the invasion and the fortunate or unfortunate issue of the affair. In the latter case, she gives him the prudent advice, to save himself by a speedy flight. She also foretells to the king the time when ships will arrive. The priests, likewise, foretell dearth and sterility, as the effect of the anger of the gods, who, however, may be appeased by presents and sacrifices. Nothing is so concealed that the priests cannot foretell it; even the fate of souls after death is known to them, and from them it can be learnt whether each individual is gone to God or to the evil spirit.

"The priests of the Negroes are also the physicians, as were the priests of Apollo and Esculapius. The notions which the Negroes entertain of the causes of diseases are very different. The Watje attribute them to evil spirits, whom they call Dobbo. When these are very numerous, they ask of their sacred cotton-tree permission to hunt them out. Hereupon a chase is appointed, and they do not cease following the demons with arms and great cries, until they have chased them beyond their boundaries. This chase of the spirits of disease is very customary among many nations of Guinea, who universally believe that many diseases arise from enchantment, and others by the direction of the deity."

Digitized by Google

Ingenious Figments by which these pretensions are maintained.—Auguries or Omens by Birds.

" It is not in consequence of the unskilfulness of physicians that their remedies are of little use during the rainy season, but, as they say, on account of the absence of their gods, who are obliged to appear, in this dangerous season, at the court of the superior deity. Consequently, the priests cannot get advice from them, and they can do nothing effectually without instruction. During the absence of the protecting spirits, which lasts six weeks, the sacred drum is not beaten, no holidays are held, and the dead are interred without noise or songs, and without being bewailed. Among the Fida, those who have received no help in their sickness from the small snakes or household gods, turn to the great serpent, who discovers through the priests a medicine, or reproves them for not having sufficiently honoured, or entirely obeyed the inferior gods; and to regain their favour he advises them to offer fowls and the like to them, to appoint a feast in honour of them, and to invite an assembly, to sing, play, dance, and make merry. In this way the inferior gods will become favourable to them, and heal them. When the Mokko, by the instruction of the priests, have brought an offering for a sick person, they leave a portion of the sacrificial meat for the birds, and decide upon the cure or death of the patient by the deportment of the birds towards the food. Some of the sacrificial blood is sprinkled upon the medicaments which the sick person is to take."

Holy Water.

" The priests of the Akrissons take of the holy water, which flows from the hole in the rock in which their god Kinka dwells, and give it to the patients, who are to wash themselves with it, and be cured of their infirmities. Some Kassenti offer for a sick person a hen at a sacred tree, which they worship on their knees, and they pour a thick pap of maize over it before the tree, part of which they take to anoint the patient.

Digitized by Google

" Of the Bliakefa, the priests of Karabari and of Sokko, it is remarkable, that they give some instruction to the people concerning the Divinity and prayer. The Negroes come to them for this purpose either singly, or in companies, when they pray with them on their knees, that God, whom they call Tschukka, will protect them from war, captivity, and the like. They promise to these priests that they will use their slaves mildly, and give them two days in each week for their own concerns. Some priests are likewise sorcerers; but among several nations, the Sokko and Watje for example, the latter office is distinguished from the former."

Immortality of the Soul.

" There is scarcely any nation of Guinea which does not believe in the immortality of the soul, and that it continues to live after its separation from the body, has certain necessities, performs actions, and is especially capable of the enjoyment of happiness or misery. The Amina call the soul and the shadow by the same name; and some of the Watje nation told me, that they consider the soul to be of as subtile a nature as is the shadow."

State of Retribution.

" The Negroes believe almost universally that the souls of good men, after their separation from the body, go to God, and the wicked to the evil spirit, whence at the death of their chiefs they make use of the expression, 'God has taken their souls.' The Loango imagine the abode of the blessed to be where Sambeau Pungo, that is God, dwells, but hell to be above in the air, which others on the contrary suppose to be deep in the earth. They believe that the souls which go to the evil spirit, become ghosts, and reappear; and because they preserve their inclination to do evil, torment those whom they dislike in sleep; and besides, flutter about in the air, and make noises and disturbances in the bushes. If any one, therefore, is said to appear on the third day after his death, it is a proof that he is not gone to God. The body

Digitized by Google

of a Negro, of whom a wicked neighbour pretends to have seen the spirit, is not buried with honour, among the Amina. The Negroes imagine also, that even the good souls are often compelled to pass by the evil spirit before they go to God; when this wicked spirit endeavours to bring them into his power. Hence arises a custom, which the Amina observe: survivors satisfy the claims of the Dide, as it has been before observed. The Mokko affirm, that they free themselves from the claims of the evil spirit, by proving to him, that they belong to God, by the marks which they have upon their bodies, to which nothing can be objected. The Ibo say, that each soul is accompanied upon the way to its appointed place by two spirits, a good and evil one, and has to pass a dangerous part, a wall, by which the road is divided. The good spirit helps a pious soul happily by; on the other hand, a wicked one knocks his head against it. After this, two roads open; a narrow one, by which the good soul is led by his benevolent director to God, and one broad, by which the wicked soul, under the guidance of the malevolent spirit, is conducted to a darker place."

The representations which these ignorant people give of the situation of the blessed, is very similar to their other ideas. Their conduct towards the deceased gives us to understand that they suppose the future condition to be little different from the present life, and they believe them to be affected with the same wants which they have here. On which account they not only place for some time food upon their graves, but give them likewise their wives, servants, and slaves in the other world.

Metempsychosis.

The Karabari and several other black tribes believe in the doctrine of the transmigration of the soul from one body to another, and imagine that the soul of a dead person revives in the body of the next child born after his death. It is fully established by the assurances of the Negroes, that they believe in the transmigration of a human soul into the body of a bird, fish, or other creature. This belief in metempsy-

Digitized by Google

chosis has a very injurious effect upon many Negroes. If their slavery is too severe in the West Indies, they destroy themselves with the prospect that their souls will wander to their country, and there revive in the body of a child. Some fully believe that they will rise alive in Guinea. Murderers and such criminals are shut out from the privilege of commencing a second happier course of life in a strange body. Abarre, the evil spirit, will ordain this as a punishment: they fly about as ghosts, and by inclination torment men with frightful appearances.

I could cite other writers on the history of the African nations who confirm the statements given by Oldendorp, though none of them have written so clearly and distinctly, and apparently from such full and satisfactory sources of information. Many similar observations occur in the accounts obtained by fathers Loyer, Labat, and by Bosman. From the last-mentioned writer I shall cite some further particulars.

Bosman mentions their superstitious fear of ghosts and apparitions. He says, "they stedfastly believe the apparitions of spirits and ghosts, and that they disturb and terrify some people. If any considerable person dies, they are perplexed with horrid fears, fancying that he appears for several nights successively before his late dwelling."

"They have long been acquainted with the division of time into weeks, and each day of the seven has its proper name in their language. Their sabbath falls on our Tuesday, except at Ante, where, like that of the Mahomedans, it is on Friday. No person is then permitted to fish, which is the only difference."

In their belief of lucky and unlucky days, oracles, omens, and the like, the Negro tribes might almost be supposed to have formed their opinions on the model of the Greeks and other nations of antiquity. "The inland Negroes," says Bosman, "divide time into lucky and unlucky days. The great period of good fortune lasts in some countries nineteen, and the lesser seven days; between these are seven unfortunate days. During the unlucky days they neither travel, till the land, nor undertake any affair of consequence, but remain altogether idle. The Aquambo people will not even willingly

Digitized by Google

receive any presents made to them on these days. The inhabitants of some districts differ from those of others as to the particular days which they hold to be lucky and unlucky."

Of the Conversion of the Negroes to Christianity.

We have seen that the Negroes of Africa display in their original and primitive state of mind, untaught by foreign instructors at least within the reach of history, the same tendencies to superstitious belief, as well as the same moral impressions as the rest of the human family. It only remains, in order to fill up this part of the mental history of the Negro race, to remark, that they have given a ready reception to foreign religions both true and false. Mahomedanism is well known to have spread in Africa. Soudan sends its yearly pilgrims to venerate the sacred stone; and the sable hadji is as highly revered on the Niger and the western Nile, as the Syrian pilgrims among the Moslems of Damascus. But I have not room for tracing the progress of Islam, and it will probably be more satisfactory to my readers to observe the result of endeavours which have been made by European teachers to bring Negroes to the Christian religion. Of these we have some of the most successful examples in the efforts of missionaries sent out by the church of the United Brethren. An interesting account of the proceedings of these well-meaning and devoted persons is to be found in the undisguised and simple narrative of Oldendorp. I shall abstract from it a brief statement of such particulars as are necessary, in order to point out the way in which the rudiments of true and uncorrupted religion found their way into the minds of the Africans, and to show how far the process of their conversion, indicates an agreement of feeling and sentiment between them and other divisions of mankind.

The first attempts to convert the slaves of the Caribbean islands to Christianity had their occasion in a meeting of some followers of Count Zinzendorf, with one Anthony, a Negro from the island of St. Thomas, who had been baptized at Copenhagen. This man represented in so strong colours the wretchedness and ignorance of his countrymen and

Digitized by Google

relatives, and urged so zealously his entreaties on the brethren to undertake their conversion, that the congregation at Herrnhut, before whom he had been induced to appear, were disposed to make the attempt. The difficulties of the enterprise were great, and they were not lessened by Anthony, who affirmed, that in order to promote the conversion of slaves, the missionary must himself consent to become a slave. Even under these conditions several of the brethren were willing to devote themselves to the task. The names of the heroical men who voluntarily offered themselves, believing themselves specially called to the undertaking, were Leonard Dobel and Tobias Leupold. Leupold did not go, the lot having determined otherwise; and David Nitschmann was substituted for him; who entered on the voyage with similar expectations.

The business was commenced under the most unfavourable circumstances. The work proceeded slowly at first and amidst great opposition; yet a small number of hearers was soon collected, some of whom gave signs of sincere conversion, and of disgust at their former courses of life. Circumstances required the return of the missionaries to Europe, and an interval ensued during which the mission was suspended. It was renewed in 1734 on the arrival of Martin, a zealous preacher and a man of great energy, whose exhortations were followed with so much effect, that when Bishop Spangenberg visited the mission in 1736, he found in not less than two hundred blacks who attended the services of the brethren, a great desire to be instructed in the Christian religion, and three individuals, who, on a careful examination, were judged to be in a fit state to receive baptism. It is impossible to read the narrative of Oldendorp without being convinced of the perfect sincerity of thewriter, and the truth of his account. It proves that no other means were used to influence the Negroes, that no other motives were put in operation to affect their minds than those of which the promulgators of Christianity availed themselves in the first ages of the church. "Full of ardour for the salvation of men," says Oldendorp, "Martin declared tothe poor slaves the infinite kindness and condescension of the Saviour, what for their sakes he had done and suffered, and how worthy he was of their gratitude

Digitized by Google

and love." "If he once received concerning any individual the impression that a change had been commenced in his mind, he never lost sight of such a person, but with the greatest constancy followed up his work till he gained him over to the cause of religion. By the constant exhortations of the Brethren a perceptible change was produced in the minds and characters of the Negroes: and notwithstanding the unfavourable circumstances and the bad examples by which they were surrounded, it became manifest, not only that the number of professed converts increased, but that motives and influences were in operation capable of effecting a moral revolution in their minds and character. And so deep was the impression which had been produced, that when the colonial government, jealous of innovation, threw the missionaries into prison, baptized Negroes were found ready to carry on the work of exhortation, and contribute greatly to increase the number of converts. When in the following year, 1739, Count Zinzendorf visited the island, he was filled with astonishment at the greatness of the work which had been accomplished. It seems, that at this time the number of Negroes who regularly attended the preaching of the gospel amounted to eight hundred."

The other Danish islands, St. Croix and St. Jan, were afterwards visited by the Moravian missionaries, whose exertions were attended with like success. I shall not attempt to follow the steps of their progress, which are described by the writer so frequently cited. In his conclusion he gives the summary of its results, from which it appears, that in the year 1768 the number of Negroes who had been baptized in the three islands by the missionaries during thirty-four years, amounted to 4,711.

In this very general statement of the facts connected with the conversion of Negroes in these islands, the principal evidence is yet wanting by which it may be proved, that the minds of Negroes are, not otherwise than those of Europeans, capable of receiving all the impressions implied in conversion to Christianity. This evidence can only be fully appreciated by those who read in detail the biographical notices, and other particulars detailed by the historians of the

Digitized by Google

community to which Oldendorp as well as Crantz belonged. But no part of this evidence is more conclusive than the selection of short homilies composed by Negro preachers or assistants, and addressed by them to congregations of their countrymen. Some of these, though they do not rival in strength of diction the discourses of Watts or Doddridge, breathe the same spirit, and were evidently written under the influence of the same sentiments and impressions. A selection of these addresses has been appended by Oldendorp to his work, which I have so often cited.

Section VI.—*Concluding Remarks.*

It would be easy to collect information on the mental history of other races of men, tending to establish with respect to them the same conclusion which I have already drawn, after describing the Esquimaux, the Hottentots, and the Negroes. The inquiry would not be without interest, and I shall hereafter take an opportunity of pointing out at least some of the sources from which data may be obtained for pursuing it. But it would not greatly strengthen my argument, and I am unwilling to occupy a larger space than is necessary in the discussion of questions which may be thought remote from the principal object of a work professedly devoted to physical researches. There are no races of men so widely differing from each other in structure of body, and in physical properties, as the three above mentioned, and the fourth class of nations with whom they have been throughout compared: if therefore the principal conclusion is allowed with respect to these instances, it will scarcely be thought disputable in others.

If the evidence adduced in the foregoing pages is sufficient to establish the conclusions which I have ventured to deduce from it, it may be affirmed that the phenomena of the human mind and the moral and intellectual history of human races afford no proof of diversity of origin in the families of men; that on the contrary, in accordance with an extensive series of analogies above pointed out, we may perhaps say,

Digitized by Google

that races so nearly allied and even identified in all the principal traits of their psychical character, as are the several races of mankind, must be considered as belonging to one species.

Nor can it be pretended, that any intellectual superiority of one human race over another, which can be imagined to exist, furnishes any argument against this conclusion. If, for example, it were allowed that the Negroes are as deficient in mental capacity as some persons have asserted them to be, this could not prove them to be a different species, since it must be allowed that there are differences equally great, and even greater, between individuals and families of the same nation. It would certainly be no difficult matter to discover particular men, and even entire families in this country, who are intellectually weaker than any reasonable person could pretend the generality of Africans to be. On this ground it would therefore be impossible to argue with effect in favour of diversity of species, which confessedly requires the constant transmission of distinguishing characters. On the other hand, there is nothing more probable than the supposition, that the average degree of perfection in the development of the brain as of other parts of the system, differs in different nations with the diversities of climate and other elements of the external condition, and with the degrees of social culture. It is probable that the condition of men in civilized society produces some modification in the intellectual capabilities of the race. But without going into any of these conjectural discussions, it will be quite sufficient for my present argument, if it is allowed, that there are *some* Negroes whose mental faculties fully attain the standard of European intellect. As this is a position which can scarcely be disputed, I think it superfluous to enter at present on a discussion, which in fact is not strictly within the scope of my present argument. The reader will find, however, in the sequel, some testimonies on the subject, which may be thought sufficient.

Digitized by Google

CHAPTER III.

ANALOGICAL INVESTIGATION CONTINUED—EXTERNAL DIVERSITIES—VARIETY OF COMPLEXION IN HUMAN RACES—INQUIRY WHETHER THE DIFFERENCES OF COLOUR CONSTITUTE SPECIFIC DISTINCTIONS.

SECTION I.—*General Remarks—Of the principal varieties of Complexion observed in Human Races—Phenomena of Correspondence.*

THE course which I have proposed to follow, brings me now to consider the perceptible varieties of colour and organization. It has often been observed that the external parts of animals, such as their integuments, hair, feathers, horns, or other similar appendages, are more subject to varieties of form and colour than the structure of internal parts. Whether this remark is well founded or not, it is certain that very considerable variations actually take place in many species of animals, as well as of plants, in the colour, conformation, and texture of the outward parts. I have to determine, if possible, whether those differences of external character which display themselves when human races are compared with each other, are instances of this description, or depend upon original diversity. I shall begin with colour, and in the first place describe the varieties which subsist in this particular among the human inhabitants of distant regions.

The term complexion is generally applied to the colour of the skin, but this is well known to be related to various hues in the hair, as well as in the pigment of the eye. It has been thought also, there is some variety in the colour of other parts. The different colours of the hair, the skin, and the eyes, generally correspond in a perceptible manner. In par-

Digitized by Google

ticular, the colour of the skin bears a relation to that of the hair, and there is an intimate connexion between these phenomena, indicating their dependence on a common cause.

Men who have white or red hair, have generally what is termed a fair skin, that is, a complexion not merely of white or light hue, but owing to the peculiarity of its texture, of a ruddy tint. This is derived from the transparent nature of the skin, transmitting the colour of the blood which circulates in the cutaneous tissue.

Black-haired persons have sometimes skins as white, but not so fair and transparent as the light-haired. The skins of the former also differ from those of the latter, in regard to the effect produced upon them by exposure to the heat and light of the sun. When so exposed, the complexion of the black-haired presently acquires a brown or yellowish hue, very different from the tinge produced in the sanguine, whose skin, as well as that of the albino, becomes reddened, inflamed, and blistered. If therefore black-haired persons are very white, they may be considered as etiolated or bleached by artificial protection from light, or at least from the solar rays; and when exposed freely to the influences of climate, their colour is found to differ nearly in proportion to the temperature of different countries. The women of Syria and of Barbary are often very white,* though they have black hair, but this is the result of careful protection from the sun. And in Europe, black-haired women are termed brunettes, from the hue which the skin acquires on ordinary exposure.

The colour of the eye corresponds with that of the hair, but with more frequent exceptions, for it is not very uncommon to see black-haired persons with light blue or grey eyes: the converse is more rare, red or white-haired persons having very seldom or never black eyes. Generally white-haired or very light flaxen-haired persons have either very light blue eyes, or the choroid is red from a total absence of the pigment, which in other instances covers its surface, and

* "Les femmes qui habitent dans les villes de Barbarie sont d'une blancheur presque rébutante, d'un blanc de marbre qui tranche trop avec le rouge très vive de leurs joues." Buffon, on the authority of Bruce, Hist. Nat. tom. v.

Digitized by Google

from the hue of the blood being perceptible through the transparent coats.* Such red-eyed persons are termed albinos. Their physical condition is not so strongly distinguished from that of other very fair persons, as it is commonly supposed, and both appear to be only different degrees of the same constitution; for the albino has been known to acquire the pigment, and to become a person of the ordinary fair complexion with blue eyes.†

The preceding remarks indicate the propriety of dividing the complexions of mankind into three classes, distinguished by the colour of the eyes and hair. This division will be

* It is observed in the Dublin Journal of Medical and Chemical Science, No. V. that the fact asserted here may be proved by killing a white rabbit, and cutting one of its eyes out of the orbit: the vessels being thus divided, and the blood suffered to escape by immersion in water, the iris and pupil then appear quite colourless, both by reflected and transmitted light.

† I extract the following interesting particulars from the Dublin Journal, No. XV. above cited. They are from the able and distinguished editor, Professor Graves:—

"Last year, Dr. Ascherson informed me that he had seen a case of the after development of the pigment of the eye, in an albino boy, three years old. This child had at its birth white hair, and violet-coloured eyes, with dark red pupils; at the end of the third year its hair was light brown, and its eyes were blue; but they had still in a remarkable degree, though less so than before, that restlessness peculiar to albinos. This was the only case of the kind I had ever heard of, except that communicated by Michäelis, in Blumenbach's Medicinische Bibliothek, vol. iii. p. 679; which however rests only on the uncertain authority of some peasants. Singularly enough, (says Dr. Graves,) I had soon after the good fortune to meet with a similar case myself. In my younger days, there were two children, a brother and sister, living near me, who presented such striking symptoms of leucosis in their eyes, hair, and skin, that they were recognised as albinos even by non-medical persons. My attention was lately drawn to them by an advertisement I saw in the papers, in which their name occurred, and I learned that the brother had become a tobacconist; but, to my great astonishment, on going to see him, I found that his eyes had changed from violet red to grey, and his hair from white to light brown, and that the susceptibility of the eyes to the light had greatly diminished. There is a circumstance in some degree analogous to this subsequent development of the pigment of the eye, which though much less striking, is of frequent occurrence, namely, that in children born with grey or blue eyes, they gradually become brown before the expiration of the first or second year. How far Rudolphi's statement is correct, that the secretion of the pigment of the eye is more copious in youth than in middle age, I am not prepared to say. Desmoulins also maintains, that the pigment of the eyes diminishes in old people, as is notoriously the case with that of the hair."—Dublin Journal of Medical and Chemical Science, No. XV.

Digitized by Google

found very convenient and useful in facilitating an inquiry into the nature of such varieties. It is likewise necessary, in order to prevent the frequent repetition of descriptive phrases, to adopt some technical expressions or appropriate terms, under which all the characteristics of each class may be collectively understood and recalled, without the necessity of recapitulation. I shall therefore adopt the following terms and descriptions.

1. The black-haired or melanocomous or melanous variety, characterised by black or very dark hair.

2. The xanthous variety, distinguished by yellow, or what is termed red or light brown hair, and by eyes of a blue or other light colour. The skin is, in persons of this description, generally fair, as I have before remarked.

3. The leucous variety. Individuals of the human kind who belong to this class, are termed albinos, but the expression is not usually applied to animals, and it is desirable to have some generally applicable epithet. The distinguishing characters of this variety are a red hue of the choroid as already described; the hair is usually either white, or of a pale or cream colour, its texture being peculiarly soft and resembling combed flax; the skin is very light and fair, and easily reddened and blistered on exposure to the sun, even in albinos born in the Negro race.

I shall now add a few particulars respecting these varieties of complexion.

1. *Of the Melanocomous variety.*

The black-haired variety forms by far the most numerous class of mankind. It is the complexion generally prevalent, except in some particular countries, chiefly in the northern regions of Europe and Asia, where races of the xanthous variety have multiplied, and it may be looked upon as the natural and original complexion of the human species. This variety is distinguished by the hair, both crinal and pilar, being quite black. The crinal hair in these races is of various texture and growth, from the long and lank hair of the native Americans, to the fine crisp hair of the African Negroes. But varieties in the texture of hair will be considered

Digitized by Google

in a separate place; here we have only to speak of its colour.

The hue of the skin varies in the black-haired races from a deep black, which is the colour of some African nations, to a much lighter, or more dilute shade. The dusky hue is combined in some nations with a mixture of red, in others with a tinge of yellow. The former are the copper-coloured nations of America and Africa; the latter the olive-coloured races of Asia. In the deepness or intensity of colour we find every shade or gradation, from the black of the Senegal Negro, or the deep olive, and almost jet-black of the Malabars and some other nations of India, to the light olive of the northern Hindoos. From that we still trace every variety of shade among the Persians and other Asiatics, to the complexion of the swarthy Spaniards, or of black-haired Europeans in general.

2. *Of the Leucous variety.*

Examples of the leucous variety have been noticed in almost all countries. Either they more frequently occur in dark-coloured races and in hot countries, or they have been more the objects of attention, when appearing under such circumstances.

In Europe they are by no means infrequent; Blumenbach says he has seen sixteen instances in Germany. European albinos present some variety of appearance. Their hair is sometimes as white as that of old age, and not differing in texture from that of the ordinary kind; at others it is of a very pale yellowish white, or cream colour, flowing in long straight bundles of soft, silky texture, which Blumenbach with reason compares to goat's wool. I have seen examples of both, in persons born in Europe, of genuine European descent. Those African albinos who are termed white Negroes, have coarse woolly hair of a white colour. The red iris has often a tremulous motion, and the eye is very sensible to light. The skin in European albinos is like that of the very fair sanguine complexion.

Digitized by Google

The following are descriptions of this variety, as it appears in different races.

Among the copper-coloured native Americans, in the Isthmus of Darien, it is, according to an intelligent eye-witness, remarkably frequent. The albinos or blafards of Darien, are thus described by Wafer:—

"These persons are white, and there are of them of both sexes; yet there are but few of them in comparison of the copper-coloured, possibly but one to two or three hundred. They differ from the other Indians chiefly in respect of colour, though not in that only. Their skins are not of such a white as those of fair people among Europeans, with some tincture of a blush or sanguine complexion; yet neither is it like that of our paler people, but it is rather a milk-white, lighter than the colour of any European, and much like that of a white horse.

"For there is this further remarkable in them, that their bodies are beset all over, more or less, with a fine, short, milk-white down; but they are not so thick-set with this down, especially on the cheeks and forehead, but that the skin appears distinct from it. Their eye-brows are milk-white also, and so is the hair of their heads, and very fine withal, about the length of six or eight inches, and inclining to a curl.

"They are not so big as the other Indians, and their eye-lids bend, and open in an oblong figure, pointing downwards at the corners, and forming an arch, or figure of a crescent, with the points downwards. From hence, and from their seeing so clear as they do in a moonshiny night, we used to call them moon-eyed. For they see not well in the sun, poring in the clearest day, their eyes being weak, and running with water, if the sun shines towards them; so that in the day-time they care not to go abroad, unless it be a cloudy dark day. Besides, they are a weak people in comparison of the others, and not very fit for hunting and other laborious exercises, nor do they delight in any such; but notwithstanding their being thus sluggish and dull in the day-time, yet when moonshiny nights come, they are all life and activity,

Digitized by Google

running abroad in the woods, and skipping about like wild bucks, and running as fast by moon-light, even in the gloom and shade of the woods, as the other Indians by day; being as nimble as they, though not so strong and lusty. The copper-coloured Indians seem not to respect them so much as those of their own complexion, looking on them as something monstrous. They are not a distinct race by themselves, but now and then one is bred of a copper-coloured father and mother, and I have seen of less than a year old of this sort."*

Albinos have been observed in many islands of the Indian and great southern ocean. The following is the description of them in Otaheite, by Captain Cook:—"During our stay on this island we saw about five or six persons whose skins were of a dead white, like the nose of a white horse; with white hair, beard, eyebrows and eyelashes; red tender eyes, a short sight, and scurfy skins, covered with a kind of white down. We found that no two of these belonged to the same family."† An individual of this class was seen on the same island by Mr. Bankes and Dr. Solander, and described by them: "his skin was of a dead white, without the least appearance of what is called complexion, though some parts of his body were in a small degree less white than others: his hair, eyebrows, and beard were as white as his skin; his eyes appeared as if they were blood-shot, and he seemed to be very short-sighted."‡

In Java, Ceylon, and other neighbouring islands, albinos are well known. Here, and on the continent of India, they are termed "Chakrelas, or Kakkerlakken," that is, cock-roaches. Dubois has thus described the albino variety, as it appears among the Hindoos:—"It is no uncommon thing to meet with a class of persons among the Hindoos, who are born with a skin much whiter even than that of Europeans. But it is easy to perceive that it is not a natural colour, because their hair is altogether as white as their skin; and in general their whole exterior appearance is unnatural. They have this distinguishing peculiarity, that they cannot endure

* Wafer's account of the Isthmus of Darien, 1699, also Phil. Transact. 1763.
† Cook, apud Hawkesworth, ii. 188. ‡ Ibidem, p. 200.

Digitized by Google

the light of the broad day. While the sun is up, they cannot look steadily at any object; and during all that time they contract their eyelids so as apparently to exclude vision. But in return, they are gifted with the faculty of seeing almost every object in the dark." He adds, "that these individuals are termed by Europeans in India 'chakrelas.' By the Hindoos they are looked upon with horror, and their bodies, like those of persons labouring under cutaneous diseases, are cast upon a dunghill, or left to be eaten by wild beasts."

Among the black races of Africa white Negroes are frequently born; they are looked upon as great curiosities, and are often collected by the black kings, and kept as objects of wonder or ornament. Many of these white Negroes, though as I believe not all of them, are albinos. The following are some examples described by eye-witnesses:—

Dr. Winterbottom has described, from his own observation, several instances of this variety occurring in Negro families at Sierra Leone and other neighbouring parts of the African coast. The following are selected from them:—

"At Malacurry, in the Soosoo country, I saw a girl about nine or ten years of age, born of black parents: her skin was of an unpleasant dead-looking white, and pretty smooth, though beginning to assume a cracked appearance, owing to the action of the sun. There was a man of the same colour belonging to this town, but he was then absent."

"At Wankapong, I saw a young man about eighteen years of age, tall and well-formed, whose father had been a white Negro. This young man's mother, three brothers, and two of his sisters were black, but one sister was white like himself. His skin, from exposure to the sun, had acquired a slight reddish tinge, and was covered with a great number of black or brown spots, like freckles, some of which were nearly as large as a sixpence. It was much rougher and harsher to the touch than the woman's, feeling almost like the skin of a lizard. He complained very much of the action of the sun, which cracked his skin, and sometimes occasioned it to bleed. He was also peculiarly sensible to the bites of insects. His hair was of a dirty white, and woolly; the iris of the eye was of a reddish brown colour, and his sight very weak.

Digitized by Google

" At Bottoe, on the Kroo coast, I saw another appearance of this kind in a man about twenty-five years of age. His parents were black, and had several black children, but they had two white ones, himself and a sister. The man was very tall, rather robust, but awkward in his gait. His skin was nearly of a cream colour, and freckled from exposure, but so very much unlike that of European sailors, who expose themselves without shirts to the sun, that the difference was very striking at some distance. His eyes were of a reddish colour, and very weak, appearing red round the edges of the tarsi, and constantly winking in a strong light. His skin was uncommonly coarse in its texture, and the sebaceous glands were very large and numerous. He was married to a black woman, but had no children; his sister, whom I did not see, was married to a black man, and had two black children."

Buffon has given a minute description of a white Negress, born in the island of Dominica, of black parents, who were natives of Africa. She was not quite five feet high, and well proportioned in her body, but not exactly so with respect to her head, which was too large in proportion to the trunk. The author adds, " Tous les traits de la face sont absolument semblables à ceux des Nègresses noires, seulement les oreilles sont placées trop haut." " Les lèvres et la bouche, quoique conformées comme dans les Nègresses noires, paroissent singulières par le défaut de couleur: elles sont aussi blanches que le reste de la peau, et sans aucune apparence de rouge: en général la couleur de la peau, tant du visage que du corps de cette Nègresse blanche, est d'un blanc de suif qu'on n'auroit pas encore épuré, ou si l'on veut d'un blanc mat blafard et inanimé; cependant on voyoit une teinte légère d'incarnat sur les joues lorsqu'elle s'approchoit du feu, ou qu'elle étoit rémuée par la honte qu'elle avoit de se faire voir nue." " Les mamelons étoient d'un rouge assez vermeil." " Sa tête étoit bien garnie de laine: cette laine est très touffue et frisée, naturellement blanche à la racine et roussâtre à l'extrémité."

" Les yeux sont remarquables par un mouvement très singulier:" " ses paupières n'étaient pas plus amples qu'elles le sont ordinairement; elle pouvoit les fermer, mais non pas les ouvrir au point de découvrir le dessus de la prunelle, en sorte

Digitized by Google

que le muscle élévateur paroit avoir moins de force dans ces Nègres blancs que dans les autres hommes: ainsi les paupières sont toujours à demi fermées. Le blanc de l'œil est assez pur, la pupille et la prunelle assez larges. L'iris est composé à l'intérieur, autour de la pupille, d'un cercle jaune indéterminé; ensuite d'un cercle mêlé de jaune et de bleu, et enfin d'un cercle d'un bleu foncé, qui forme la circonférence de la prunelle: en sorte que vus d'un peu loin, les yeux paroissent d'un bleu sombre." Many other particulars are minutely detailed in the original description of this individual, to which I must refer the reader; but the following observation deserves particular notice.

" Au reste, les personnes, auxqu'elles cette Nègresse blanche appartient, m'ont assuré que presque tous les Nègres mâles et femelles qu'on a tirés de la Côte d'Or en Afrique pour les îles de la Martinique, de la Guadaloupe, et de la Dominique, ont produit dans ces îles des Nègres blancs, non pas en grand nombre, mais un sur 6 ou 7 enfans."*

In this instance the iris was coloured, and not devoid of the pigment, as it is in perfect specimens of the albino variety. This is an approximation towards the character of the flaxen-haired and blue-eyed variety of mankind.

3. *The Xanthous variety.*

The Xanthous variety is a term which I adopt to include all those individuals who have light brown, auburn, yellow or red hair. With hair of these colours is almost always combined a fair complexion, which on exposure to heat acquires not a black or deep brown hue, but more or less of a red tint; and this is not merely the effect of the blood in the cutaneous vessels, but of a peculiar secretion which imparts its colour to the skin. The pigment of the eye is in this variety of a light colour; a light grey, or azure blue, is the most common hue: but it has sometimes various shades of yellow or brown, and occasionally a green-yellow tint.

This variety passes insensibly into the others; it would be

* See Buffon. Supplement, tom. iv. p. 559 et seqq.

Digitized by Google

difficult to determine whether some individuals belong to it or to the melanous: and again, the characters of the xanthous variety are in some instances intermixed with, or passing into those of the albino by intermediate gradations.

There is something in the temperately cold regions of Europe and Asia, which favours the production of this variety; for it is in these countries chiefly that it prevails, and is in some instances the general character of whole tribes. From this fact we must conclude that there is in the climate of these countries some quality congenial to the constitution of body connected with this complexion. Either it springs up more frequently there than elsewhere, or when it casually appears, multiplies and is propagated more extensively. It is not uncommon to find it prevailing in high mountainous tracts, while in the neighbouring low grounds it gives place to the melanic variety. But this is not the place to consider the connexion of varieties with local or other causes.

The xanthous variety springs up out of every melanocomous tribe. Sometimes it forms the majority of a tribe or nation, though more frequently only a part. The Jews, like the Arabs, are generally a black-haired race, but I have seen many Jews with light hair and beards, and blue eyes, and in some parts of Germany, the Jews are remarkable for red, bushy beards. The Greeks were probably, in Homer's time as now, in general of the melanous variety; yet it appears from the use of such epithets as πυῤῥὸς ξανθὸς and γλαυκῶπις, that the xanthous complexion was not unfrequent. Among the Romans a grey-eyed child was considered as something disgusting, perhaps bordering on the monstrous, which indicates that it was rare.* The Germans had generally blue eyes, and red or yellow hair, in the time of Tacitus;† but this is by no means the fact in the present day. Among the genuine Celts

* Lucretius, lib. iv.

† I suspect that the remark on the complexion of the ancient Germans has never applied to the Suevi, the ancestors of the Allemanic Germans, but to the Gothic, Scandinavian, and Anglian races; who are very distinguishable from the eastern Germans, in the present time, by their greater fairness of complexion, and more regular and softer features. See Dr. E. Clarke's Travels in Scandinavia, part i. chap. 1.

Digitized by Google

there were at least some melanous tribes, as the Silures; yet Strabo repeatedly assures us, that the Celtæ of the continent, viz. of Gaul, were nearly as yellow-haired as the Germans. Many of the Russians are light-haired, though the mass of the Slavonian nation is of the melanous variety. And among the ancient Scythians, Herodotus informs us that the tribe termed Budini were xanthous. The Laplanders are generally of the dark complexion: but the Finns, Mordouines, and Votiaks, who are allied to them in race, are xanthous. Many of the northern Tungusians or Mantschu Tartars are of the xanthous variety, though the majority of this nation are black-haired. Even among the Kalmuks and Bouriæts, as Pallas informs us, the xanthous variety springs up. The same variety appears among the South Sea Islanders, the aborigines of America, and in many other nations.

The xanthous variety appears not only in those melanocomous races which are of less swarthy shade, such as the nations already mentioned; among the ancient Egyptians it seems to have arisen occasionally; Diodorus says, that red-haired persons were not frequent in the native stock of Egypt, but light brown hair has been found in Egyptian mummies. And among the Negro races of Africa, both in their native climate, and in other places to which they have been transported, the xanthous variety frequently appears. This fact requires some further details.

I have already cited some accounts of the appearance of white Negroes. The instances I have selected were examples of the leucous variety. It seems to be generally believed that all white Negroes are albinos; this appears to be however by no means the fact. On the contrary, I find that a considerable proportion, perhaps the greater number of the individuals termed white Negroes, are either genuine examples of the xanthous variety, or resemble that variety in some respects, and appear to exhibit gradations between the albino and the xanthous. Some of them have all the characteristics of the xanthous.

Dr. Winterbottom mentions what he regarded as an intermediate step between the common African complexion and the albino. It was the instance of a man, who though born

Digitized by Google

of Negro parents, was of a mulatto complexion, and much freckled, and who had strong red hair, disposed in very small wiry curls over his whole head.*

Marcgraf saw in the Brazils an African woman, whose skin and hair were red.†

Dr. Winterbottom remarks, that when the beard of a Negro has been exposed during the dry season to a hot sun, the ends of the hair frequently acquire a reddish or burnt appearance. This is nothing extraordinary; but he adds, that sometimes this is the natural colour of the hair, independently of exposure to the sun. "In a family at Free Town, in Sierra Leone, the children had red or copper-coloured skins, and woolly hair of a dirty red or singed colour." "At the same place," he adds, "I saw a mulatto man, belonging to the Kroo coast, whose hair was a pale red, such as occurs in England, and disposed in very small curls over his head; his skin was very much freckled, his eyes were black, and not affected by the glare of sun-light." This man was evidently of intermediate variety between the Negro and the xanthous.

Blue eyes, or brown eyes, appear to be not uncommon, as well as red or yellow hair, in what are termed white Negroes. Dr. Winterbottom describes two white Negroes in the Mandingo country, from the testimony of an eye-witness. "In both of these the iris was of a light blue colour, the eyes were very weak, and unable to support the light of the sun; the hair was woolly and white," the skin was rough, and had red patches here and there. He describes, from his own observation, a white Negro woman whom he saw at Dumboya, near Wankapong, in the Soosoo country, whose parents, brothers and sisters, were all black. She had borne a black child to a black man, so that no doubt could be entertained of her being of genuine Negro origin. He says that her skin was coarse, dry, and wrinkled. In parts exposed to the sun it was of a reddish tinge, or cream-colour; but in parts less exposed of a dirty white. Large black spots like freckles, produced by the sun, were scattered over it. These are

* Winterbottom, ii. p. 170.

† Marcgraf, Tractatus Brasiliæ, p. 12. Blumenbach, p. 182.

Digitized by Google

frequent effects of heat on a skin not fitted by nature, as that of the black Negro is, to endure it. The hair of this woman " was of a dirty yellowish white, but woolly and crisp. Her eyes were of a light bluish colour, very weak, constantly twinkling. The eyebrows and eyelashes were nearly white." " I was informed," says Dr. Winterbottom, " that a boy of a similar appearance resided in the neighbourhood."

The skin is sometimes quite healthy in appearance, and the complexion ruddy, like that of Europeans of sanguine temperament. Pallas has minutely described a white Negress seen by him in London, in 1761. She was born of Negro parents in Jamaica, and was sixteen years of age. She was of small stature, fair complexion, with ruddy lips and cheeks. The iris of her eye was neither red nor blue, but of brownish grey colour: her eyes were weak, and impatient of a bright light, which was said to have arisen chiefly from the small-pox. Her hair, which was quite woolly of texture, was of a light yellow colour, or what the French call " blond."* This girl had the Negro features strongly marked, and had every appearance of genuine Negro descent.

A white Negro is described by Dr. Goldsmith, who saw him exhibited in London. He says, " upon examining this Negro I found the colour to be exactly like that of a European; the visage white and ruddy, and the lips of the proper redness." " However," he adds, " there were sufficient marks to convince me of his descent. The hair was white and woolly, and very unlike anything I had seen before. The iris of the eye was yellow, inclining to red; the nose was flat, exactly resembling that of a Negro, and the lips thick and prominent."†

In this example the characters of the complexion seem to have been intermediate between those of the albino and the xanthous. The same remark may be applied to the following instance, described by Dr. Winterbottom. He says, " in the colony of Sierra Leone, there is a girl about nine or ten years of age, born in Nova Scotia, who has all the features of a

* Pallas. Novæ Species Quadrupedum, pp. 10, 11.

† Goldsmith's History of the Earth and of Animated Nature, vol. ii. p. 241.

Digitized by Google

Negro, with woolly hair, of a dirty white colour, and whose skin equals in whiteness that of a European, without any thing disagreeable in its appearance or texture. Her eyes are between a red and light hazel colour, but not much affected by the light." In this instance, however, it must not be omitted, that the parents were both Mulattos.

White Negroes are by no means unfrequent in Congo; and we have accounts from earlier voyagers, stating that individuals of that description were kept as objects of curiosity at the court of the king, or emperor. They are generally described as having a white skin, with grey eyes, and red or yellow hair. A more particular account of them will be given in the sequel.*

If the hair alone were found to vary in the Negro, this would amount only to a singular anomaly, and as such it seems to have been regarded by Blumenbach: but when we find this character combined with blue, grey, or brownish-grey eyes, and a white ruddy skin, it must be allowed that the individuals presenting these appearances are examples of the xanthous variety, and of something approaching to the sanguine complexion, as it is termed among Europeans, though springing up in a Negro race. It appears that some of those called white Negroes are of this description, while others are albinos, and in not a few the peculiarities seem intermediate between these two varieties.†

Mr. Burchell has given a description of an individual of

* The fact of red hair occurring among the Negroes of Congo has been alluded to by Blumenbach, who observes in confirmation of it, that he has seen many Mulattos with red hair; and says that Groben has made the same remark of the Mulattos of Sierra Leone.

† Arthaud has made some remarks which were sufficient to show that all white Negroes are not albinos. He says, "Toutes les observations prouvent que les Nègres blancs ne diffèrent des autres que par la couleur: que leur constitution n'est pas aussi robuste que celle des autres Nègres, sans être aussi faibles ni aussi dégradée qu'on l'a dit; *qu'ils ont quelquefois de la carnation*, et les lèvres vermeilles: que leur tête est couverte *d'une laine rousse*, et qu'ils ont des poils lanugineux, de la même couleur, sur les autres parties du corps; que leur vue n'est pas aussi bonne que chez les autres hommes: *que l'iris est diversement coloré*, etc." Journal de Physique, October, 1789; cited by Blumenbach. See French edition of his work, entitled, "De l'Unité du Genre Humain, et de ses Variétés," p. 275; and a note by the Translator, p. 277.

Digitized by Google

the xanthous variety born from the race of black Kaffers in South Africa. The parents, who were genuine Kaffers, had lived as servants at Van Heerden's farm, and had left their child, a female, when an infant, and returned into their own country. When Mr. Burchell saw her she was sixteen years old, stout, and of short stature. "The colour of her skin was that of the fairest European, or more correctly described, it was more pink and white." "Perhaps it will be more intelligible to a painter," says Mr. Burchell, "if I describe it as being compounded of a pure white, and a moderate tint of vermilion, without the admixture of any other colour. Her hair was of the same woolly nature as that of her country-women, but it was of a singularly pale hue, nearly approaching to the colour which is termed flaxen. Her features, however, were those of a genuine Kaffer."

In all races of dark complexion the xanthous variety occasionally springs up. Instances appear now and then among the natives of the islands in the Pacific. In some of these groupes, as in the Marquesas, brown hair and light complexions are frequent; in others, they are rare phenomena. In the isle of Otaha, Dr. Forster informs us that he saw one man who had a complexion lighter than all the rest. He had red hair. In these islands the xanthous, or fair individuals, have never been confounded with the albinos or leucous.

Section II.—*Of the Structure of the Parts on which the variety of Colour depends.*

Paragraph 1.—Of the Eye.

The colour of the eye is well known to depend upon the pigment lining internally the choroid tunic, and imparting its peculiar hue, which is visible through the other transparent coats. The pigment is a peculiar secretion from the vessels of the choroid. In the albino and the leucous variety in general it is wanting, and the eye has a red or rose-colour, arising, as I have before observed, from the blood which

Digitized by Google

circulates in the vessels of the choroid and iris. The pigment has been known to make its appearance, as I have said, though originally wanting; and thus an actual transition has displayed itself, from the xanthous and the leucous variety, which in the general state of the constitution approximate to each other, both being connected with that habit of body termed the sanguine temperament.

Paragraph 2.—Of the Skin.

The variety of hue which the skin displays in different races of men depends entirely on substances external to the cutis vera, or true skin. This outer covering or case of the whole body, which the Germans term haut or hide, and French anatomical writers corion or corium, is nearly of the same consistence and of the same white colour, in all human races. External to the cutis there are, as it is well known, certain layers of a substance various in consistence, and scarcely organized; in these, which may be regarded as secretions from the vessels of the cutis, is the seat of colour. They are commonly designated the rete mucosum of Malpighi, and the cuticle, but their anatomical structure is by no means completely known, although many authors of great celebrity have occupied themselves in this investigation. Among these Albinus,* Camper,† Haller,‡ Soemmerring,§ Blumenbach,‖ Lawrence,¶ have directed their attention particularly to the anatomical state of these parts, as giving rise to the peculiar hue of the dark races of men: and if the subject has not been fully elucidated, it must be concluded that some particular obscurity and difficulty lies in the way.

It appears from various observations, that there is some difference in the cuticle of the Negro and that of the European. This substance is well known to be of various thick-

* Albini Dissert. secunda de Sede et Causâ Coloris Æthiopum et cæterorum Hominum, &c. Leyd. Bat. 1737.

† Rede über der Ursprung und Farbe der Schwarzen, 1764.

‡ Elem. Physiologiæ, t. v.

§ Soemmerring über die Körperliche Verschiedenheit des Negers, u. s. w.

‖ Blumenbach de Gen. Hum. Var. Nat.

¶ Lawrence's Lectures on the Nat. Hist. of Man.

Digitized by Google

nesses in different parts of the body. In the palms of the hands and the soles of the feet it is thick, and this is one reason why these parts are whiter in the Negro than other parts of the body. It is said to be of somewhat coarser texture in the Negro than in the white man.* In the dead body it is hard and dry; in the living it has a somewhat oily surface, especially in the Negro, whence the peculiar velvet-like softness of the skin in the African races.

Haller observed that the cuticle consists, in the Negro, in a healthy state, of two distinct and separate lamellæ.† Soemmerring could never distinguish this double fold of the cuticle in those parts of the body where it is usually thin. On the other hand he declares, that he once found the cuticle distinctly separable into two folds in an European female, of which he preserved the preparation in his museum.

The cuticle itself is besides not quite so white in the Negro as in Europeans, according to Soemmerring's observations. It has, especially on some parts of the body, a brown and darker hue in the former; yet it is not in this part of the integument, which is more easily examined, since it may be separated from the body by vesication, that the chief peculiarity of complexion consists.

The dark colour of the Negro principally depends on the substance interposed between the true skin and the scarf-skin. This substance presents different appearances, and it is described sometimes as a sort of organized net-work or reticular tissue, at others as a mere mucous or slimy layer; and it is odd that these somewhat incompatible ideas are both conveyed by the term rete mucosum, given to the intermediate portion of the skin by its original discoverer Malpighi.

The cuticle is adherent in the fresh state of parts to the rete mucosum, and both together are easily separable from the cuticle, but it is very difficult to detach the cuticle alone from the subjacent rete and true skin. On examining this middle membrane when either of its coverings is removed, with a magnifying glass, it has, as Soemmerring observes, the

* Soemmerring, p. 45. † Prin. Lin Phys. 424. Soemmerring, l. c

Digitized by Google

appearance of an irregular net-work. "This mucous net-work," says the same writer, "constitutes, as long as it is fresh and unimpaired, a sort of third skin difficultly separable from the outer covering, but more easily from the cutis, and evidently in some places thicker than the cuticle itself. It cannot however without much trouble be shown as a particular detached skin, or as a continuous and self-subsisting membrane, at least in any considerable portions, and I could only succeed in this attempt at the scrotum. It then appears lighter on the cuticular than on the interior surface. When putrefaction however takes place, the skins are easily separated, and then the Malpighian reticle, or middle membrane, dissolves into a soft slimy mucus, which may easily be washed away like an unctuous pigment from the cutis, or scarf-skin. The colouring matter sinks in water, and settling forms again a layer, somewhat resembling a membrane. Its appearance in this state is compared by Mr. Lawrence with that of the pigment of the eye, to which it bears a striking analogy, and probably almost an identity of nature.

Thus it appears that the chief seat of colour in the black men is an unorganized extra-vascular substance, falsely termed a membrane or skin, in fact nothing more than a peculiar matter secreted from the leatis. Hence we need not be surprised when we find Dr. Gordon asserting, that after trying all the usual means, he has never been able to succeed in discovering such a membrane in white persons.

It appears from pathological and other facts, that the presence and absence of the coloured pigment depends on modifications in the state of the skin, which may take place even after the birth of the individual. It is no uncommon thing to see white persons with black or dark-coloured patches on the skin, of various extent. Many females have a dark tinge extending over a considerable space round the nipple during pregnancy, which disappears in a great measure afterwards. This is unexplained by any pathological principle; but the change of colour which happens at such periods, varies in its degree of intensity as well as in the space occupied by it; and in some individuals it has been known to cover the

Digitized by Google

abdomen,* and even to affect the whole body. Bomare, in an article cited by Blumenbach, mentions a French peasant whose abdomen became entirely black during each pregnancy;† and Camper has given a particular account of a female of rank, who had naturally a white skin and a beautiful complexion, but whenever she became pregnant, began immediately to grow brown:—"Vers la fin de sa grossesse," he says, "elle devenait une véritable Négresse."‡ After delivery the dark colour gradually disappeared. Dr. Strack, in a work on intermittent fevers, which is cited by Soemmerring, mentions the case of a man who became, after a fever, as black as a Negro. Blumenbach says, that he possesses a part of the skin taken from the abdomen of a beggar, which is as black as the skin of an African. Haller, Ludwig, and Albinus have recorded similar instances. These facts are quite sufficient to prove that, independently of the influence of solar heat, a physical change may take place, connected with the state of the constitution, which imparts a black hue to the skin, similar to that which is natural to the African race.

This colouring matter is also liable to disappear by absorption in skins to which it is natural. Instances are not unfrequently observed in different countries in which Negroes gradually lose their black colour, and become as white as Europeans. An example of this kind is recorded in the fifty-seventh volume of the Philosophical Transactions. Klinkosch mentioned the case of a Negro, who lost his blackness and became yellow,§ and Caldani declares that a Negro, who was a shoemaker at Venice, was black when brought during infancy to that city, but became gradually lighter, and had the hue of a person labouring under a slight jaundice.‖

The black substance is capable, like other products of vascular cutis, of being regenerated when partially destroyed.

* Soemmerring, loc. c.

† Camper, Kleine Schriften, Soemmerring, 47.

‡ "Une autre," says the learned writer, "a toujours la jambe gauche noire dans cette circonstance."

§ Klinkosch, De verâ Natura Cuticulæ, Prag. 1775. Soemmerring, l. c.

‖ Caldani, Institut. Physiol. p. 170.

Digitized by Google

The contrary has been asserted, and it has often been said that cicatrices in Negroes remain always white; an assertion which has been ascertained by Mr. Lawrence* to be altogether without ground.

From these facts it appears evident that a substance analogous to the mucous pellicle, which covers the cutis in the Negro, is liable to be secreted occasionally in white persons, and that in the Negro this matter is capable of being absorbed. It is therefore a safe inference that a substance exists in Europeans, although in white races the rete mucosum has never been demonstrated,† which is analogous to it in its nature. As the cutis is always white, and the cuticle inorganic and susceptible of little variety in its state, there must be something interposed between the two on which colouration depends, and this is probably analogous to the cutaneous pigment in the African.

It cannot be doubted that the other dark-haired races of men have the same colouring membrane, if so it ought to be termed, as the Negro. Albinos born in such races are, as we have seen, white; if then the cutis and epidermis are as in other individuals, their whiteness must depend on the want of the rete mucosum, as it is known to do in white Negroes, or albinos of African descent.

Paragraph 3.—Of the Hair.

The hairs issue from bulbs or roots, situated in the cellular web under the cutis. These bulbs have an external vascular root, which is probably the source whence the hair derives its nourishment; there is besides a membranous tube, or sheath, which envelopes the hair, and passes out with it through the different layers of the skin. The hair itself consists of an external horny covering, and an internal or vascular part, termed medulla, or pith. The pith or medulla

* Lawrence's Lectures, l. c.

† Mr. Lawrence says that there is in the Hunterian collection, a portion of white skin with the cuticle turned down; a small portion of thin transparent pellicle has been subsequently separated from the cutis. In the instance mentioned by Soemmerring of the cuticle separable into two thin layers, it is not improbable that the interior pellicle is the representative of the middle skin.

Digitized by Google

appears to be endowed with a species of vitality, or organization susceptible of vascular action, since it undergoes certain changes in disease, which cannot be accounted for on any other principle. In the plica polonica, it is said that the hairs bleed when cut: it is well known that they become white in old age, and grief and anxiety have been observed to render them white in a very short space of time. Bichât affirms that he has seen at least five or six examples in which such a change of colour has taken place in less than eight days: in one person, known to the same writer, the hair became almost entirely white in the space of one night, the effect of some sudden and poignant grief. It is doubtless in this vascular medulla, whatever its structure may be, that the colour of the hair resides. The outer covering is of a substance analogous to the cuticle, the nails, and the horns of animals.

The colouring principle is manifestly of a common nature in the skin and hair. It has been asserted by a French anatomist,* who has displayed much ingenuity in his researches into this subject, that the colouring matter of the skin is produced and secreted in the bulbs of the hair. This opinion was formed from an attentive observation of the phænomena which ensue after the black pigment, in the skin of the Negro, has been destroyed by the application of blisters, or by any means producing vesication. In the process of restoration the black matter first begins to reappear at the pores through which the hairs make their exit. From these pores, as from centres, it is gradually seen ramifying in different directions, and insensibly proceeds to cover the whole space which had lost its colour. The same opinion receives some support from the fact, that parts which are most completely devoid of hair, as the soles of the feet, and the palms of the hands, are in the Negro and other black men of a much lighter shade than the rest of the body. In spotted Negroes, or Negroes who have white spots on parts of their bodies, it has been remarked that the hairs issuing from the white patches, are themselves perfectly white. Still it is scarcely possible that the bulbs can be the only seat of the

* Recherches sur l'Organisation de la Peau, &c. par M. Gaultier.

Digitized by Google

secretion of this colouring matter, for the skin of the Negro is occasionally black in some parts which are quite destitute of hair, as on the inside of the lips. The secreting fabric, whence issues the colouring matter, is apparently spread in a certain degree over the whole cutis.

Whatever conclusion may be the true one on some of these points, it is undoubted that a close connexion exists between the colouring principle in both of these parts.

For the sake of facilitating comparison, I shall divide the hair into crinal and pilar, terming crinal that of the head, beard, &c., and pilar that which grows upon the trunk, particularly on the breast and on the limbs. The manes and tails of horses, and other animals, are analogous to the crinal hair of mankind, and the hair which is generally spread over their bodies is analogous to the pilar.

NOTE ON SECTIONS I. AND II.

From what has been said of the seat and cause of variety in complexion, it must be apparent, that in the instances before described, a light colour of the skin and eyes makes its appearance in dark races; the choroid of the eye being coloured as in fair Europeans, and the hair yellow or red, are examples of the xanthous and not of the leucous variety, since the pigment is present which gives a hue to the eyes in persons of the former class, as well as the colouring matter in the hair.

It must be apparent to the reader, that as the colour of the skin passes by a gradual transition from the deeper black to a light shade, and even to a white or colourless state, we cannot well divide human races into particular classes by reference to the complexion of their skins. The colour of the eye displays more strongly marked divisions, but, on the whole, the hair chiefly, but in conjunction with other characters, affords the most convenient principle of arrangement.

Digitized by Google

SECTION III.—*Of variety in the Colour of some other parts.*

It had been asserted by some anatomists before the time of Soemmerring, particularly by the elder Meckel, and Wagler of Brunswick, that the brain of the Negro is of darker colour than that of white men. Meckel thought this to be the case particularly with the white or medullary portion. A different opinion was that of Walter, who thought that the cineritious portion was somewhat darker.

Soemmerring endeavoured to ascertain the truth in this disputed question, and dissected carefully the brains of three Negroes in the presence of several other anatomists, viz. Professor Weichman, Professor Schumlanski of Petersburg, and Billmann of Cassel, taking care to compare on the spot the fresh brain of a European. The result was that he could not discover either the cineritious or medullary substance to be in the least darker than in Europeans. He even thought the colour rather paler in the African than in the European brain. Camper had made the same observation in the examination of four brains of Negroes; and Professor Bonn of Amsterdam had declared that he could not perceive the Negro brain to be of darker hue than that of white men, though he thought the pia mater of a deeper tinge. On the whole we must conclude, as Soemmerring observes, that there is no remarkable difference as to colour in the brains of Negroes and Europeans.

Digitized by Google

CHAPTER IV.

THE SAME INQUIRY CONTINUED.—VARIETIES OF FORM AND STRUCTURE.

SECTION I.—*General Remarks—Instances of the origination of Varieties—Of the seven principal Varieties of Mankind.*

DIVERSITIES in form, in the shape of the body and the proportion of the trunk and limbs, as well as in the figure and structure of particular parts, exist in almost every species. We must take a brief survey of the phenomena of diversity observed in the human form, and then proceed to compare these phenomena with those which display themselves in other tribes. A few previous remarks on the origination of such varieties will assist us in forming some conception of their nature.

On extending our view over the organized world, we perceive no other quality so generally characterising the works of nature as an infinite and inexhaustible variety. Human art aims at precise uniformity in its productions; while Nature seems, if we may be allowed the expression, to be everywhere satisfied with resemblance. Her purposes are attained by displaying that sort of general analogy which is still compatible with individual variety. It is most probable, that no two individuals were ever produced in any species with complete and perfect sameness of form and structure. This character in all the productions of nature was remarked by Lucretius, whose poetical imagination has led him in this instance, in spite of his atheistical philosophy, to the conception of a final cause.

Digitized by Google

Præterea genus humanum, mutæque natantes,
Squammigerûm pecudes, et læta armenta, feræque,
Et variæ volucres, lætantia quæ loca aquarum
Concelebrant, circum ripas fonteisque lacusque,
Et quæ pervolgant nemora avia pervolitantes;
Horum unum quodvis generatim sumere perge;
Invenies tamen inter se distare figuris.
Nec ratione alia proles cognoscere matrem,
Nec mater possit prolem; quod posse videmus,
Nec minus, atque homines, inter se nota cluere.

And again he applies the same observation to other departments of nature:—

Postremo quodvis frumentum, non tamen omne
Quodque in suo genere inter se simile esse videbis,
Quin intercurrat quædam distantia formis.
Concharumque genus simili ratione videmus
Pingere telluris gremium qua mollibus undis
Littoris incurvi bibulam pavit æquor arenam.

The variety in form, prevalent among all organized productions of nature, is found to subsist between individual beings of whatever species, even when they are the offspring of the same parents. Another circumstance equally remarkable is the tendency which exists in almost every tribe, whether of animals or of plants, to transmit to their offspring, and to perpetuate in their race, all individual peculiarities which may thus have taken their rise. These two general facts in the economy of organized beings lay a foundation for the existence of diversified races, originating from the same primitive stock and within the limits of identical species; and by noticing the phenomena which associate themselves with both of these principles, we appear to make some progress towards an explanation of the varieties which distinguish from each other different races of men. But there is a question which remains to be answered, and that one of no very easy solution, before we can determine to regard this or that instance of diversity as an example referrible to variety thus originating and perpetuated. This question is, what is the extent of deviation in structure, or what are the limits within which it is restricted? That there are such limits can hardly be questioned, since without these, one species would be for ever

Digitized by Google

passing into another—no tribes of animals or of plants would be defined and characterised, and like only to itself. Even those physiologists who contend for what is termed the indefinite nature of species, admit that they have limits at present and under ordinary circumstances. Whatever diversities take place happen without breaking in upon the characteristic type of the species. This is transmitted from generation to generation: goats produce goats, and sheep sheep. But the new characters of organization, which spring up as it were casually in the breed, and which, owing to our ignorance of the circumstances of their rise, are termed accidental varieties, are transmitted perhaps with equal constancy. These remarks will be illustrated by an account of some particular instances of variety in structure, springing up for the first time in races of men and of animals, and perpetuated by hereditary transmission.

A singular variety of sheep has appeared within a few years in New England, which furnishes an example of the origination of variety in form. The first ancestor of this breed was a male lamb, produced by an ewe of the common description. This lamb was of singular structure, and his offspring in many instances had the same characters with himself. These were shortness of the limbs, and greater length of the body, in proportion; whence this race of animals has been termed the otter breed. The joints also were longer, and their fore-legs crooked. It has been found advantageous to propagate this variety, because the animal is unable to jump over fences. The following facts seem conclusive as to the permanency of the breed, and are very remarkable.

"When both parents are of the otter breed, their descendants inherit the peculiar appearance and proportions of form. I have heard but of one questionable case of a contrary nature."

"When an otter ewe is impregnated by a common ram, the increase resembles, wholly, either the ewe or the ram. The increase of a common ewe, impregnated by a ram of the new breed, follows entirely the one or the other, without blending any of the distinguishing and essential peculiarities of both.

Digitized by Google

"Frequent instances have happened where common ewes have had twins by otter rams, when one exhibited the complete marks and features of the ewe, the other of the ram. The contrast has been rendered singularly striking when one short-legged, and one long-legged lamb, produced at a birth, have been seen sucking the dam at the same time."*

Several instances may be adduced of variety in structure equally striking, originating in the human kind, and in like manner propagated through many generations.

The growth of supernumerary fingers or toes, and corresponding deficiencies, is a fact of this description. Maupertuis has mentioned this phenomenon; he assures us that there were two families in Germany, who have been distinguished for several generations by six fingers on each hand, and the same number of toes on each foot. Jacob Ruhe, a surgeon of Berlin, was of one of these families, and marked by their peculiarities, which he inherited from his mother and grandmother. His mother had been married to a man of the ordinary make. She bore eight children, of whom four resembled the father; the other four partook of the mother's peculiarity. Jacob Ruhe transmitted his supernumerary members to his posterity.

Reaumur mentions a family which had a similar peculiarity. The grandfather had a supernumerary finger on each hand, and an additional toe on each foot. His eldest son had three children with the same peculiarity. The second, who had the usual number of fingers, but in whom the thumb was very thick and appeared as if composed of two united together, had three daughters with the supernumerary members; the third had the natural structure; a daughter with a very thick thumb brought forth a son with the additional finger.†

* Thomson's Annals of Philosophy, No. 2, Col. Humphries, on a New Breed of Sheep. Philos. Transact. 1813. Part i.

† This variety has frequently occurred. Instances are recorded among the ancients. Pliny says, "Digiti quibusdam in manibus seni. C. Horatii ex patriciâ gente filias duas, ob id sedigitas appellatas, accepimus, et Volcatium sedigitum illustrem in Poetica."

The six-fingered variety springs up sometimes among the Negroes in the West India islands and the American states. Dr. Gibson, author of an inaugural disser-

Digitized by Google

Sir Anthony Carlisle has given an account of a family, in which the supernumerary toes and fingers were transmitted through four generations. The first instance was a female, who had six fingers on each hand, and six toes on each foot. She had ten children like herself, and an eleventh, who only differed from her in having one hand naturally formed.*

The following phenomenon is perhaps more curious than any of the foregoing. In a family at Iver, the individuals for nine generations had perfect thumbs, but instead of fingers, had only the first phalanx of each, and the first and second joint of the ring-finger of the left hand, these rudiments of fingers having no nails. This is said to be the description of the whole family, as it had been with slight variations that of nine numerous generations. It is added that it was the women only who had the misfortune of entailing this defect upon their offspring, which they did almost uniformly.†

Perhaps the most permanent peculiarity recorded, is a singular thickness of the upper lip, in the Imperial house of Austria. This peculiarity is believed to have been introduced into the Hapsburg family, many centuries ago, by an intermarriage with the ancient house of Jagellon.‡

It is well known to medical practitioners, that the same observation equally applies to those minute varieties of organization, which give rise to peculiarities of habit or temperament, and predispose to a variety of morbid affections, as deafness, scrofulous complaints, and the whole catalogue of disorders in the nervous system. Even those singular peculiarities termed idiosyncrasies are often hereditary, as in the instance of a remarkable susceptibility of the action of particular medicines.

Many examples of similar variety will be mentioned in the

tation, in which are many curious and original observations, says, that he has met with such instances. In all the examples which occurred to his notice, except one, the little finger and toe were redundant. In one case a thumb and great toe were supernumerary.

* Philos. Transact. 1814.

† This account is taken from the Edinburgh Medical and Surgical Journal, vol. iv. p. 252.

‡ Coxe's Memoirs of the House of Austria.

Digitized by Google

sequel, which are not less remarkable than the preceding. These have been cited on the present occasion in order to establish the fact, that such deviations really take place, that varieties of structure are not always referrible to ancestors and to original difference transmitted from first parents, but arise in breeds previously destitute of any such characters, and when they have once arisen, become permanent in the stock.

Variations are observed every day in the shape of the human body, in the size and form of the head and the proportion of parts. The causes which give rise to these phenomena, are various influences which have exerted their agency on the parents previous to the birth or perfect development of offspring so characterised. Whatever the external agencies may be which give rise to such phenomena in one country, their variety and consequently the diversity and extent of their influence must, as it would seem, be much greater when different regions and different climates are compared with each other. Hence, we should not be surprised in finding the native inhabitants of one part of the world differing from those of another more widely than the inhabitants of any one country differ among themselves. Whether all the phenomena for which we are seeking to account, admit of such an explanation, is still to be determined.

I shall not at present attempt to describe all the varieties which exist in the form and configuration of the human body in different nations, or of the peculiarities of every race of men. The more particular enumeration of natural diversities belongs to the latter part of this work, which refers to the origin, history, and affinities of nations. It will be sufficient for my present purpose to examine the most striking and remarkable of these varieties. If any tolerably certain inferences can be drawn respecting these greater deviations, it is obvious that they will hold, *à fortiori*, of those which are less considerable.

On comparing the principal varieties of form and structure which distinguish the inhabitants of different countries, we find that there are seven classes of nations which may be separated from each other by strongly marked lines. Among

Digitized by Google

their principal characteristics are peculiar forms of the skull, but these are by no means the only differences which require notice and particular description. These seven principal classes are, first, those nations who in the form of their skulls and other physical characters resemble Europeans, including many nations in Asia and some in Africa; secondly, races nearly similar in figure, and in the shape of the head, to the Kalmuks, Mongoles, and Chinese. These first two classes of nations will be designated, for reasons to be explained, Iranian and Turanian nations. I shall hereafter state my reasons for avoiding the use of the terms Caucasian and Mongolian races, which have been adopted by many late writers in designating these divisions of mankind. The third class are the native American nations, excluding the Esquimaux and some tribes who resemble them more than the majority of the inhabitants of the New World. The fourth class comprises only the Hottentot and Bushman race. A fifth class are the Negroes: the sixth, the Papuas or woolly-haired nations of Polynesia: the seventh, the Alfourou and Australian races. The nations comprised under these departments of mankind differ so strikingly from each other, that it would be improper to include any two of them in one section, and there is no other division of the human family that is by physical traits so strongly characterised. There are, indeed, some nations who cannot be considered as falling entirely within either of these divisions, but they may be looked upon as approximating to one or another of them.

Section II.—*Of the Negroes.*

The physical characters of the Negro races are so well known, that it is needless to enter into a particular description of them in this place. It has often been said that, independently of the woolly hair and the complexion of the Negroes, there are sufficient differences between them and the rest of mankind to mark them as a very peculiar tribe. This is true, and yet the principal differences are perhaps not so constant as many persons imagine. In our West Indian

Digitized by Google

colonies very many Negroes, especially females, are seen, whose figures strike Europeans as remarkably beautiful. This would not be the case if they deviated much from the idea prevalent in Europe, or from the European standard of beauty. Yet the slaves in the colonies, particularly in those of England, were brought from the west coast of inter-tropical Africa, where the peculiarities of figure which in our eyes constitute deformity in the Negro are chiefly prevalent. The black people imported into the French and to some of the Portuguese colonies, from the eastern coast of the African continent, and from Congo, are much better made. The most degraded and savage nations are the ugliest. Among the most improved and the partially civilized, as the Ashantees and other interior states, the figure and the features of the native people approach much more to the European. The ugliest Negro tribes are confined to the equatorial countries; and on both sides of the equator, as we advance towards the temperate zones, the persons of the inhabitants are more handsome and well-formed.

In a later period of this work I shall cite authors who have proved that many races belonging to this department of mankind are noted for the beauty of their features, and their fine stature and proportions. Adanson has made this observation of the Negroes on the Senegal. He thus describes the men. "Leur taille est pour l'ordinaire au-dessus de la médiocre, bien prise et sans défaut. Ils sont forts, robustes, et d'un tempérament propre à la fatigue. Ils ont les yeux noirs et bien fendus, peu de barbe, les traits du visage assez agréables." They are complete Negroes, for it is added that their complexion is of a fine black, that their hair is black, frizzled, cottony, and of extreme fineness. The women are said to be of nearly equal stature with the men, and equally well made. "Leur visage est d'une douceur extrême. Elles ont les yeux noirs, bien fendus, la bouche et les lèvres pétites et les traits du visage bien proportionnés. Il s'en trouve plusieurs d'une beauté parfaite." Mr. Rankin, a highly intelligent traveller, who reports accurately and without prejudice the results of his personal observation, has recently given a similar testimony in regard to some of the numerous tribes of

Digitized by Google

northern Negroland, who frequent the English colony of Sierra Leone. In the skull of the more improved and civilized nations among the woolly-haired blacks of Africa, there is comparatively slight deviation from the form which may be looked upon as the common type of the human head. We are assured, for example, by M. Golberry, that the Ioloffs, whose colour is a deep transparent black, and who have woolly hair, are robust and well made, and have regular features. Their countenances, he says, are ingenuous, and inspire confidence: they are honest, hospitable, generous and faithful. The women are mild, very pretty, well made, and of agreeable manners.* On the other side of the equinoctial line, the Congo Negroes, as Pigafetta declares, have not thick lips or ugly features; except in colour they are very like the Portuguese. Kaffers in South Africa frequently resemble Europeans, as many late travellers have declared. It has been the opinion of many that the Kaffers ought to be separated from the Negroes, as a distinct branch of the human family. This has been proved to be an error. In the conformation of the skull, which is the leading character, the Kaffers associate themselves with the great majority of woolly African nations. The craniology of these races will come under our consideration in the following chapter, and we shall have a proper opportunity for describing the differences which subsist between particular African nations, when we enter upon the ethnographical inquiries which form the subject of the succeeding books.

Section III.—*Of the Papuas.*

The name of Papuas is perhaps most commonly applied to tribes of people, whose colour, approaching to black, varies in the deepness of its shade, and whose hair is neither lank nor absolutely woolly. Races of this description are known on the coasts of many islands in the Malayan seas, such as Waigiou, Sallawaty, Gummen, and Battenta, and about the

* Golberry's Travels in Africa, vol. i. Mudford's Translation, p. 47.

Digitized by Google

shores of New Guinea, from Sabelo to the Cape Dory, where they have been described fully by MM. Quoy and Gaimard. These insular and littoral tribes are in fact, as the writers above mentioned have proved, a mixed race, between Malay settlers and the genuine Papuas. This has been inferred from the mixed state of their language, as well as of their physical characters and their religious customs, which partake in some parts more, in others less, of the corrupt Mahomedanism of the Malays and the Paganism of the native Papuas. The same conclusion appears highly probable, when it is considered that the small tribes into which these people are divided, under the rule of petty chiefs termed rajahs, are spread over tracts just intermediate between the Malayan isles and the Land of the Papuas, namely, on the shores of small islands clustered together under the equator, and continually receiving new Malay settlers from Tidor and Ternate, as well as Papuas from New Guinea, and even some Alfourous from the mountains in the interior. The governing and the commercial caste are the Malays, who hold the mixed Papua race in subjection. The latter are described as indicating by their puny stature, timid character, and the leprous diseases which are prevalent among them, the unwholesome influence of the tracts which they inhabit, and of their mode of life.

Such, as M. Lesson observes, are the Papuas, who were visited by d'Entrecasteaux, Rossel, La Billardière, de Freycinet, Quoy and Gaimard. They must be distinguished carefully from the genuine Papuas, who inhabit the northern parts of New Guinea and the great adjoining islands of New Britain, New Ireland, as well as the groupes which extend southward into the Pacific Ocean, and which are distinguished in maps by the terms of Louisiade, Bouka, Santa Cruz, and Solomon's Islands.

The results obtained by M. Lesson from his researches into the history of these races, differ materially from the opinions advanced by Mr. Crawford. According to Lesson, the Papuas bear the closest resemblance to the Madecasses, or as he terms them, Cafro-Madecasses, the race of people who occupy the greater part of Madagascar; this remark

Digitized by Google

applies to many of the habits and traditions, as well as to the physical constitution, common to these races. The Papuas, as Lesson concludes, are not the aborigines of the Indian Archipelago; their migration appears to have been posterior in time to that of the Oceanic tribes, a migration which has not reached into the remote spaces of the Pacific, which spread itself along the northern coast of New Guinea, then over New Britain, New Ireland, the Isles of Bouka, of Bougainville, the Admiralty Isles, the Archipelago of Solomon, of Santa Cruz, the Tierra Australe del Espiritu Santo, and New Caledonia. These inhabitants of New Guinea distinguish themselves by the name of Papuas, reserving the denomination of Endamênes to the black tribes with coarse and lank hair, who inhabit the interior of the same country. The latter are the people who are termed by various writers Alfourous, Alfoërs, or Haraforus. They are, according to the information obtained by M. Lesson, the aboriginal inhabitants of the great islands of the Malayan archipelago: they still occupy all the inland and mountainous parts of New Guinea, and all the southern coast, whence they appear to have spread themselves in miserable and scattered hordes over the barren wilderness of New Holland. They appear, however, never to have passed the strait which cuts off from that continent the Land of Diemen. In the latter country, the woolly-haired race can only be supposed to have found their way by passing along the groupe of the New Hebrides, and from New Caledonia.*

Such is the theory adopted by M. Lesson, respecting the migration of these people, which I have alluded to in order to point out the probable connexion of different tribes, and to give a general idea of the extension of the Papua races. In a future part of this work it will be my turn to collect what traces I may be enabled to find for the elucidation of this subject. I shall now proceed to the physical description of the Papua race, and shall then collect some further notices of the Alfourous.

" The woolly-haired race spread over the northern parts of

* Mémoire sur les Papouas ou Papous, par MM. Lesson et Garnot. Annales des Sci. Nat. tom. x. 1827, p. 93.

Digitized by Google

New Guinea, distinguish themselves by the terms Arfaki, or mountaineers, and Papuas, or people of the sea-shore. These last live in scattered and insulated tribes, and in a continual state of dissension and hostility. Their villages built upon the water and upon piles, consist of a few huts under the authority of aged chiefs. The stature of the people is generally of the middle height, but there are among them tall and well-grown men. Their limbs are well proportioned, and their figure is often robust and athletic. The colour of their skin is black, mixed with an eighth part of yellow, which imparts to it a clear tint of various intensity. The hair is black, very thick and moderately woolly. They wear it frizzled out in a very remarkable manner, or let it fall upon their necks in long and twisted masses. Their countenance and features are regular except their noses, which are somewhat flattened, with the nostrils enlarged in the transverse direction. Their chins are small and well formed; their cheek-bones are prominent, their foreheads elevated, their eyebrows thick and long. Their beards are thin; they let them grow upon the upper lip and chin, like many African nations. The physiognomy of the Papuas easily reflects the feelings which animate them, and which arise from mistrust, suspicion, and all the most hateful passions, indicating a remarkable predominance of purely instinctive faculties over those of intelligence.* The women are generally ugly, yet we observed in New Guinea some girls who were well made, and whose regular and soft features were remarkable. Formed for servitude and obedience, this sex among the Papuas and many African Negroes, is subjected to the rudest labours, which their rigorous and inflexible masters disdain to partake."

* Lesson remarks that the more remote men are from a state of civilization, the more their instinctive faculties are proportionally developed. The senses of the Papuas are more perfect than those of Europeans. They have a more piercing sight, and their hearing is more acute. M. Lesson adds, that the masseter and temporal muscles are in this race of great strength, their only business being to satisfy a voracious appetite, and this function absorbing all their faculties. Thus, he says, "we remarked on several skulls, numerous crests, roughening the whole anterior part of the temporal fossæ, and serving to give the fibres of the crotaphyte muscles strong points of attachment.

Digitized by Google

"The natives of Bouka, with whom we communicated, displayed all the characters and all the habits of the Papuas, and wore, like them, their long and woolly hair frizzled out. The natives of Port Praslin, in New Ireland, and those of the Isle of York, in the channel of St. George, differ not from the latter; only there were among them a greater number of tall and robust men; but many individuals were remarkable for the light shade of their complexion, approaching the tawny and slightly bronzed hue of the Oceanic nations. The persons of the old men among these different nations were generally calm, placid and impassible; yet we observed rapid changes pass over their countenances. The treacherous and cunning looks of some were as remarkable as the suspicion and mistrust expressed by others, and the simplicity and frankness of a small number. If we examine," says M. Lesson, "the physical conformation of the natives of the great island of Madagascar, properly so termed, known under the name of Madecasses, we shall find among three or four human varieties which inhabit that great island, black tribes, whose limbs are proportioned with regularity, and whose forms display vigour and activity. The Madecasses have a handsome figure, and among them I observed a great number of men of fine stature. Their hair, moderately woolly, is tied over the occiput in great ringlets; their skin is a dark brown mixed with yellow; their noses are slightly flattened, their mouths large; in a word, the whole of their countenances and regular features would represent the portrait of a Papua of Doréry, of Beraae, or New Britain, New Ireland, or of Bouka. The hair of all these people is in general very crisp, stiff, and at the same time very thick. Some families of New Guinea, Waigiou, and of Bouka, give it the frizzled-out and singular form, which is the characteristic of the Papuas. But other tribes, as those of Bony, in New Guinea, of New Britain, and New Ireland, let it fall upon their shoulders in long and floating ringlets. The Papuas go quite naked, and cover their shoulders and breasts with incisions, ranged in curved or straight lines. This custom, which distinguishes many tribes of the interior of Africa, is practised by all the natives of Madagascar, as well as by

Digitized by Google

the black races in the western parts of the Pacific, in Van Diemen's Land, and in New Holland. The Papuas are fond of covering their heads with the dust of ochre mixed with grease, which reddens their hair and their whole countenance. They wear abundance of feathers in their heads, and ornaments of shells, as well as in their girdles and on their arms. A custom exclusively belonging to this race, is that of wearing bracelets of a dazzling whiteness, made very artfully and polished, which they probably fashion from the large extremity of the great conches which are found in the neighbouring seas." Some of these ornaments, according to M. Lesson, are precisely similar to those which are found about Egyptian mummies.

The author of these remarks endeavours further to illustrate the relation, which he evidently supposes to subsist, between the Papuas and Madecasses, by showing that there are unquestionable affinities in the dialects of these nations. This is not a fit place for entering into ethnographical inquiries. In a future part of my work I shall endeavour to examine the questions which relate to the analogies known to exist between the colonies of tribes scattered through the southern oceanic region, which have given rise to a variety of speculative theories. For my present purpose it is sufficient to recognise the fact, that the Papuas and Madecasses, whether allied in lineage or not, belong to the same variety of the human species, since they resemble in form and colour, and more particularly in the texture of their hair, which in general differs both from the woolly hair of the Negro and Hottentot, and from the lank hair of other nations. It must at the same time be noticed that some Papua tribes have hair nearly resembling that of the African races. We shall see that the Papuas are not the only variety of mankind which is supposed to be spread over the oceanic region from Madagascar to New Holland.

Section IV.—*Of the Alfourous and Australians.*

Another race equally interesting in relation to the natural history of mankind, and hitherto much less known, at least

Digitized by Google

in the countries to which we have already referred, are the Alfourous. According to M. Lesson, who has given the results of his own personal inquiries, the primitive population of the Indian archipelago consisted of tribes of blacks with rough but lank hair, very distinct from the Papuas. These tribes appear to have been supplanted in some islands at various periods by more powerful races, who have either extirpated them, or have driven them from the coasts into the mountainous and desert parts in the interior. They are yet to be found in all the wildest and most inaccessible tracts of Polynesia, under which term M. Lesson comprehends all the lands bordering on or contained in the Malayan archipelago, reserving the name of Oceania for the remote groupes of islands in the Pacific. The central parts of most of the Moluccas are still occupied by Haraforas or Alfoërs; the Philippines by tribes of the same description, whom the Spaniards term Los Indios; Mindanao by the Negros del Monte; the interior of Madagascar by Virzambers;* of all which countries these races appear to be the aboriginal inhabitants: in the interior of New Guinea tribes of a similar description are termed by the Papuas Endamênes.†

The Alfourous or Endamênes live in the most miserable manner. Continually at war with their neighbours, they are solely occupied in endeavouring to preserve themselves from attacks, and escape the snares laid for them. The custom prevalent among the Papuas of the coast, of putting their prisoners to death, and erecting their spoil as trophies, accounts for the difficulty we find of observing them, even in New Guinea: and two or three men, reduced to slavery, whom we saw at Doréry, are the only ones we have met with. The Papuas described them to us, as of a ferocious character, cruel and gloomy, possessed of no arts, and passing their whole lives in seeking subsistence in the forests. But we cannot

* Robert Drury is the only writer who has given from personal knowledge any tolerable account of the Virzambers or Ovales, the lank-haired people who inhabit the interior of Madagascar.

† Mémoire sur les Tasmaniens, sur les Alfourous et sur les Australiens, par MM. Lesson et Garnot, Ann. des Sci. Nat. tom. x. p. 149.

Digitized by Google

regard this hideous picture, which each people draws of its neighbouring tribe, as authentic. The Endamênes whom we saw, had a repulsive physiognomy, flat noses, cheek-bones projecting, large eyes, prominent teeth, long and slender legs, very black and thick hair, rough and shining, without being long. Their beards were very hard and very thick. An excessive stupidity was stamped upon their countenances —probablythe effect of slavery. These savages, whose skin is of a very deep, dirty brown or black colour, go naked. They make incisions upon their arms and breasts, and wear in their noses pieces of wood nearly six inches long. Their character is taciturn, and their physiognomy fierce: their motion is uncertain and slow. The inhabitants of the coasts gave us some details of the Endamênes; but as they seemed to us to be dictated by hatred, and as their accounts differed, whether because the sense of what they told us was badly understood, or they related to us statements which they did not themselves credit, with the intention of inspiring us with fear, we think it useless to make a race of men known by false or inexact descriptions, whose history is still enveloped in thick darkness.

The Endamênes, confined in the interior of New Guinea, in the northern region of that country, still continue, as is supposed by M. Lesson, to be the sole possessors of the southern coast; if they reach to the northern limits of Torres' Straits, the supposition that in former times they may have passed over the channel, and spread themselves in the vast regions of Terra Australis, becomes very probable. M. Lesson refers the Australians to the class of Alfourous. The following is the general description of their physical character.

The stature of the Australians is moderate and often below the mean. The limbs among many tribes are slender, thin, and, in appearance, of unproportioned length, while some individuals, on the contrary, have them stout and well-proportioned. Their hair is not woolly; it is hard, very black and thick; they wear it dishevelled, and in general short, in frizzled masses. Their beard is of the same nature as their hair; commonly rough and tufted on the sides of their face. Their countenance is flattened, their nose very large, with

Digitized by Google

nostrils almost transversely placed, thick lips, mouths of unproportioned width, teeth projecting, but of the finest enamel. Loose circular ears very amply developed, and eyes half closed by the laxity of their upper eyelids, give to their physiognomy a savage and repulsive aspect. The colour of their skin, generally of a smoky black, varies in its hue, which is never very deep. The Australian women, still more ugly than the men, have squalid and disgusting forms; the distance which separates them from the *beau idéal* appears immense in the eyes of an European. A great number of families place in the septum of the nose, round sticks, from four to six inches long, which give a ferocious aspect to their countenances. This custom was found to exist among all the Papuas.

Section V.—*Of the Iranian or Indo-Atlantic, and of the Turanian Nations.*

If we divide the continent of Asia by a line running from west to east in the direction of the longest diameter of the Euxine, passing at first along the chain of Caucasus, dividing the Caspian, going along the Oxus nearly to the source of that river, thence turning to the south-east and following the direction of the Himálaya mountain range, and descending to the Gulf of Bengal, we shall separate by this line two great regions of the world which have been from the earliest periods the abode of two great classes of human races, differing from each other in their manners and social character, as remarkably as the arid and saline plains of Mongolia and the cold desert of Gobi differ from the warm and fertile countries of southern Asia. To the north-eastward of this line have been the immemorial abodes of many nations, clearly distinguished from each other by total differences of language, and equally separate in all that relates to their habits of life and social character, yet for the most part similar and agreeing among themselves in physiognomy, complexion, and configuration of body. To the southward and westward of the same line, we find other races widely distinguished from the preceding class in physical constitution, but agreeing with each

Digitized by Google

other in all the same particulars in which the former coincide, and differing in the same respects in which they differ. To term these separate classes of nations, as some writers have done, *two races*, would be to use this expression in a sense very different from that which is generally appropriated to it, or to assume what cannot be demonstrated or even rendered in the slightest degree probable. For what can be more conjectural than to assume that the Hindoos and the Arabs constitute one particular race or nation? or on the other hand, that the nomade Kalmuks who, since the age of Æschylus,* have continued to wander over their steppes, ever shifting their wheeled houses and roaming in quest of pasture for their flocks, are one people with the Chinese, settled from the days of Yao and Sha-un to the southward of the Hoang-ho, tilling the earth or dwelling in towns, and abhorrent from the customs of the desert; distinguished from the Kalmuks and from the rest of men by their monosyllabic speech? Or again, how can it be allowed that both these departments of mankind constitute one nation with the fishing Esquimaux, who feed upon blubber along the shores of the polar sea? That these and other races of men are of the same species, and that they descended from a singly created stock in the origin of the world, may be the conclusion at which we are to arrive at the end of our inquiries; but that the three classes of human tribes just named constitute one particular groupe, in a sense which implies the existence of some near affinity between them, cannot in the present state of our knowledge be presumed. They differ from each other in nearly all those circumstances which can be regarded as affording proofs of distinct race, and they are only connected by some resemblance in their physical characters. Now if it be supposed that such physical peculiarities are the result of external agencies, the same agencies may have exerted their influence on many unconnected tribes. If, on the other hand, the Mongoles are a race created with all the peculiarities which

* Σκύθας δ' ἀφίξει νομάδας, οἳ πλεκτας στέγας
Πεδάρσιοι ναίουσ' ἐπ' εὐκύκλοις ὄχοις,
Ἐκηβόλοις τόξοισιν ἐξηρτημένοι.
ÆSCH. *Prom. Vinct.* 715.

Digitized by Google

now mark them, it will be very probable, that many such originally distinct races may have sprung up simultaneously, or at different periods and in different places. For this and other reasons, I shall avoid the practice of late writers on the physical history of mankind, who have designated all the nations belonging to one of the two classes above marked out as tribes of the Mongolian race, and term all those of the other class Caucasian. It would be absurd to term the Chinese, Esquimaux; and it cannot be more correct to name the Esquimaux and Chinese, Mongolians. It is equally at variance with historical facts and with probability to comprise, as in one Caucasian race, the nations of Europe and of Mount Atlas, and of the chain of Himálaya. There is no truth in the assertion that the traditions of all these nations deduce their origin from Caucasus, which has been the immemorial seat of tribes proved by their languages to be entirely distinct from the Indo-European as well as from the Semitic nations. The mountains of Asia Minor, of Thrace, and of Hellas, are all famous in Grecian story. Mountains were of old, in the simple and primitive ages, which long preceded the erection of temples, consecrated to the worship of the unseen power whom all nations venerate. The tops of Olympus and Mount Meru in the poetry of Greece and India were the resting-places where Father Zeus and Indra descended from the clouds to converse with mortals. Caucasus came in for its share in the general respect paid to high places; but I cannot remember any tradition handed down by the fabulists or historians of Greece which admits of a construction answering to the hypothesis of M. Cuvier, or deducing the human race from Mount Caucasus.* Nor can any thing more to the purpose be traced in the mythology of the oriental nations. The authentic narrative of the Hebrews

* According to a story of which it is difficult to conjecture the meaning, it was the dwelling-place of Prometheus, where that ambiguous personage, by turns a Titian, a teacher of mechanical arts, and a maker of man, and then a natural philosopher, is said to have watched the movements of the heavenly bodies. "Hic primus Astrologiam Assyriis indicavit, quam residens in monte altissimo Caucaso nimiâ curâ et sollicitudine deprehenderat, &c."—Cic. Tuscul.

Digitized by Google

leads us certainly to Mount Ararat in Armenia for the resting-place of the ark, but that is far from Caucasus.

From the use of the terms Caucasian and Mongolian races, a common notion has arisen, that there are two separate human families, one of which came into existence on Caucasus, and the other in Mongolia, and that they gave origin respectively to the nations of Europe and of northern Asia. As this opinion is altogether groundless, it will be right to avoid the terms which appear to give it sanction. I shall distinguish the two classes of nations already mentioned, as great departments of the human family, differing physically, and inhabiting from remote ages different geographical positions, but without building any hypothesis as to their origin, or assuming any affinity between the nations belonging to each class, anterior to the origin of languages and the early glimmerings of the light of history. In describing, however, the physical characters of these nations, it will be necessary to adopt some epithet, which may comprise all the different branches of each department when they are to be spoken of collectively. To attain this end, I shall have recourse to a quarter from whence no similar misconception is likely to arise.

In the ancient mythical traditions and poetical history of the East, two classes of nations are distinguished from each other, as contrasted in character, and as engaged from the earliest times in perpetual enmities. Turan and Iran, coinciding with the northern and the southern regions above defined, are the countries where they have always dwelt, and where these nations carry on still the same conflicts which their forefathers waged in the days of Feridún, and Afrasiab. The more compendious accounts of eastern affairs collected by the Greeks are sufficient to identify these nations with the Scythians and with the Medo-Persians, whose mutual invasions were briefly recorded by Herodotus, and by Trogus Pompeius, and who disputed between them for ages the sovereignty of Upper Asia. The Scythians were the nations of the north, beyond Mount Imaus, of whom some branches at an earlier period had reached the neighbourhood

Digitized by Google

of Colchis. There is enough, as Niebuhr has shown, in the notices left by Hippocrates, of their physical traits to identify them with the class of nations whom I shall comprise under the indefinite and therefore more convenient designation of Turanian. That term will serve the purpose of a general appellation for all the races of men who inhabit the region northward of the Oxus and Imaus, or of the line before described; and who display more or less, and in more or fewer of their tribes, the same physical character with the Mongoles and Kalmuks, yet can by no means be identified or connected with them, by any proofs of national affinity. For the more southerly nations, resembling the ancient Persians in physical character, as the features of that people portrayed on the sculptures of Istakhar or Persepolis sufficiently testify, we may adopt the term Iranian as a distinctive epithet. Late researches, confirming the speculations of Sir William Jones, have shown it to be extremely probable that the region of Upper Asia, termed Iran, was the primitive seat of those families of nations who have most extensively spread the same type of features. In the borders of these countries, we find on one side the Semitic nations, the Indians on the other, the Armenians and the different branches of the Indo-European family extending towards the west. To the latter, the term Japetic has been appropriated by Schlötzer, while M. Bory de St. Vincent has chosen to designate the whole class of races who bear the same style of features as the Japetic species of mankind, deriving however the patronymic not from Japhet, but from Iapetus. We should not go beyond the bounds of very probable conjecture if we were to assume that Iran was the centre whence all the tribes of people having this same physical character originally were dispersed. Yet it must be admitted that there are some nations in the catalogue of whose origin from this quarter we could find no proof except physical resemblance; and as we have determined to assume nothing of that kind, unless when supported by historical proofs, the nations whom I term Iranian can only receive that epithet in the more general sense. I shall therefore use it only as synonymous and co-extensive with another name of less ambiguous meaning. As the races to be described

Digitized by Google

including the Hindoos, reach from the Indus to Mount Atlas and the Western Ocean, the term Indo-Atlantic will designate them accurately from their geographical position. The name of Turanian, but for the error of modern writers who have confounded the real Scythians with the Goths and the Slavonians and even with the Celts, might be interchanged with Scythian.

In some of the remarks introduced into this section I have anticipated what properly belongs to ethnographical research, and which therefore might have been reserved for a future part of my work; but it was necessary to premise these observations, as an apology for the introduction of new terms that were wanting for my present purpose.

Indo-Atlantic, or Iranian Nations.

From the mountains of Himálaya to the Indian Ocean, including the whole of Hindoostan and the Deccan, as well as Persia and Arabia, and from the Ganges in the east to the borders of the Atlantic, comprising the north of Africa, and the whole of Europe, a similar configuration of body prevails among all the inhabitants, with some few exceptions. Of this the Greeks seem to afford the most perfect model, in which, however, they scarcely exceed the type displayed as belonging to the ancient Persians by the sculptures of Persepolis. Complexion does not enter among the characters of this type, since it is of all shades, from the white and florid colour of the northern Europeans, to the jet black of many tribes in Lybia, and southward of Mount Atlas. In many races, as we shall hereafter prove, the type has degenerated. The ancient Celts appear, for example, to have had by no means the same development of the head as the Greeks, and the Indians display some differences in the configuration of the skull; but for the consideration of these differences a proper place will present itself in a future section. I shall now proceed to the nations of Northern Asia.

Digitized by Google

Of the Turanian Nations.

I shall make no attempt to enumerate, on the present occasion, all the races of men who partake of that configuration of body which characterises the whole class of tribes comprised under the term Turanian. The proper place for this enumeration will occur in a succeeding volume. I shall now describe only two of the most remarkable races belonging to this division, and differing most widely from each other, namely, the nomadic Kalmuks who wander over the great steppes of central Asia, and the Esquimaux on the shores of the Polar Sea, or along the coasts both of Asia and America. For an account of the Kalmuks, I shall abstract some particulars from Professor Pallas's admirable portrait of that people, in his memoir on the Mongolian nations.

Pallas has observed that it is easy to distinguish by the features of the countenance the principal Asiatic nations, when their stock is not blended by frequent intermarriages: but among these races that there is none in which this distinction is so strongly characterised as it is among the Mongoles. "If we abstract the circumstance of colour," says Pallas, "a Mongole bears less resemblance to other races of men than a Negro bears to an European. The particular conformation of the race is most remarkable in the shape of the skull prevalent among the Kalmuks; bnt the Mongoles proper and the Bouriaets bear to the tribe last mentioned so great a resemblance, as well in their physical as in their moral and social characteristics, that what can be predicated of one people is applicable to the rest.

"The Kalmuks are generally of middle stature: few are tall, and many are below the standard; the women especially are small. They are all well made, and I do not remember to have seen one deformed person among them. The only fault in shape, which is frequent among them, consists in an outward bending of their arms and legs, resulting from the practice of causing children to rest always in their cradles on a kind of saddle, and from the habit of riding on horseback continually almost as early as they are able to walk. The

Digitized by Google

Kalmuks have generally short necks; their limbs are thin and lean: even the principal and more opulent men among them are seldom corpulent, in which they differ from many of the Kirguse and other Tartar nomades.

"The characteristic features of the Kalmuks* are, eyes placed obliquely, the large angle of which descending towards the nose is slightly open and fleshy: eyebrows black, thin, and forming a low arch; a peculiar formation of the nose, which is generally flattened and squatted towards the forehead; cheek bones prominent; head and countenance very round. The ball of the eye is likewise very brown, the lips large and fleshy, the chin short, the teeth very white; they continue fine and sound even in old age. Their ears are of an enormous size, and loose from the head. All these characteristics are more or less apparent in every individual, and are often united in one person. It is a remarkable circumstance, that the mixture of Russian and Tartar blood with the Kalmuk and Mongole, produces very beautiful children, whilst those of Kalmuk and Mongole origin are of misshapen figure; until the age of six years they are bloated, and ill-complexioned; but in growth their features take a more regular form." The following remark, however, seems scarcely to agree with some of these assertions. "From the relations of many travellers, we should be induced to believe that *all* the Kalmuks have ugly and hideous figures. On the contrary, we see, as well among the men as women, many round and beautiful countenances; we even see women who have such beautiful and regular features, that they would find a great number of admirers among the Europeans."

In the perfection of the physical senses, tribes who lead a pastoral life do not by any means yield to savage nations, or those who live by hunting. The Kalmuks especially have the finest sense of smelling, the most perfect hearing, and an extraordinarily piercing sight. In their journeys and military expeditions their smell is of great service to them; it discovers to them from a great distance fires, or the scent of a

* M. Abel Rémusat and Jul. Klaproth give this orthography of the word Kalmuk.

Digitized by Google

camp; it marks out a favourable place for encamping, and the objects which may become their prey. Many of them only require to be near the burrow of a fox, or the habitation of any animal, and immediately discover whether the inmate is there or not.

By their hearing they discover at still more extraordinary distances the noise of cavalry in march, the place occupied by a suspected enemy, a herd of animals, or even a solitary one. For this they merely lie down flat upon the earth, and apply their ear to the ground.

But nothing is more admirable than the excellence of their sight, and the extraordinary distance at which, from a moderate elevation, the greater part of the Kalmuks can discover upon the plain steppe the smallest objects—the dust caused by a drove of cattle, or a body of cavalry, notwithstanding the difficulties which occur during the summer, the peculiar undulation of the surface of the ground, and the vapours which arise from it into a pure atmosphere, during the great heats of these countries. In the expedition which Oubachi, Vice-khan of the Torgots, made against the people dwelling below Kouban, the Kalmuk army would certainly have missed the enemy had it not been for a Kalmuk of the common class, who whilst he was feeding the horses, discovered from a moderately elevated position, at the distance of thirty versts, the smoke and dust of the enemy's army. He pointed it out immediately to those not less accustomed than himself, whilst Colonel Kidimskoi, even by the assistance of a telescope, could perceive nothing.

The Kalmuks are both in their faces and bodies tolerably white, at least, their children are all of that colour. But the custom of the lower people to let their children run about naked, under the sun and the smoke of their felt tents, and the habit of the men to sleep during the summer with no other covering than a pair of drawers, renders their colour generally tawny. On the other hand, the women are often very white. In the upper class, we see figures so delicate and pale, that it heightens the blackness of their hair; and in that particular, as well as in the *tout ensemble* of their countenances, the Kalmuks resemble the portraits of the Chinese.

Digitized by Google

"The hair is black even in new-born children, and I have never seen an exception to this fact among the Mongoles and Kalmuks. I have, however, information of one instance in a little Kalmuk girl, five years of age: to a physiognomy entirely Mongole, she united hair decidedly flaxen. I have been assured that there are likewise among the same people instances of brown hair. Among the Bouriaets I perceived one individual whose hair was of this shade; but these instances are so rare, that they should scarcely be taken into consideration. Moreover, nearly all the children produced by marriages of Russians with the Bouriaet women, have pitch-black hair, and resemble their fathers in that respect as well as in their features; these children are called Kargnie, in the country of Selinginsk, and Daouria.

"In all the nations of Mongolian race, the men, even when arrived at their full development, have the beard less thick than the European and Tartar nations. It is also slower in its growth: although thicker among the Kalmuks than the other tribes, it is still thin and scanty even with them. They generally wear small moustaches, and sometimes a small tuft of hair under the lower lip. Old men alone, particularly if they are monks or ecclesiastics, besides the moustaches at the corners of the lips and the patch on the lower lip, have some thin tufts on the chin to the turn of the neck; all the others are carefully plucked. They have seldom hair upon their bodies, because during their youth it is plucked by their mothers. The women do the same to themselves, except some places which they leave untouched."

Many of the nations who partake of the physical characters of the Mongolians, are nomadic tribes. As however the principal character by which this class is constituted is the form of the head and skeleton, I shall leave any further remarks that may be requisite on the extent and distribution of these nations to a future section of the present work, and hasten to conclude this article with a brief description of the seafaring race, who constitute the most remote branch of the Turanian nations.

A certain resemblance in habits and customs seems to con-

Digitized by Google

nect the Esquimaux, as M. Lesson has observed, with the Samoiedes, and the Ostiaks, and even with the inhabitants of Kamtschatka, and the Aleoutian islands.

"Les hommes de cette race," says the same writer, "ont une taille qui ne dépasse guère quatre pieds six ou huit pouces. Leur corps est trapu, sans être gras; leurs jambes sont raccourcies, mais assez droites et très fortes; leur tête est arrondie et d'un volume assez prononce pour paroître peu en rapport avec l'ensemble du corps. Le visage a cela de remarquable d'être large, court, et plat vers le front. Le nez est écrasé, sans être trop large; les pommettes sont fort élevées. La bouche est grande, les cheveux sont plats et noirs, naturellement gras et durs. La barbe est rare. Fabricius, dans sa *Faune du Groenland*, avoit déja dit: 'On a remarqué que les hommes du nord avoient un teint plus blanc, une chevelure plus blonde, à mesure qu'on s'avance vers les climats plus froids, mais, par exception, les habitants des environs du cercle polaire, tels que les Lapons, les Samoïédes, sont de petits hommes très bruns de peau, à cheveux et barbe très noirs. La nature plaça près d'eux, et par un singulier contraste, les grands et lymphatiques Finois, et près des Groenlandois les blonds Islandois, plus méridionaux.' La couleur des Esquimaux est en effet d'un jaune rougeâtre sale."

We shall have occasion to observe that the skulls of the Esquimaux, as well as of many circumpolar tribes, bring them into the same class of human races with the Kalmuk and other Turanian nations.

Digitized by Google

Section VI.—*Of the American Nations.*

The aborigines of America, or those nations whose abode in the western continent dates from a period antecedent to history, may be said to form a well-marked division of the human family, from which, however, we ought perhaps to except the Esquimaux and some other tribes. It has often been observed, that the nations of America bear a strong resemblance to each other in their most remarkable characters, both physical and moral. There are many striking circumstances in the accounts given by Molina and Azara of the southern tribes, which may be recognised in the nations of Mexico and Peru, and even in the descriptions which the most intelligent travellers have drawn from actual observation in the interior of North America. Herrera was, perhaps, one of the first who noticed particularly this resemblance, and drew from it a very obvious inference. "Es cosa notable," he says, "que todas las gentes de las Indias, del norte y del mediodia, son de una misma inclinacion y calidad, porque segun la mejor opinion procedièron de una misma parte; y asimismo los de las islas, à las quales passaròn de la tierra firma de Florida." These observations seem chiefly to be applied to the moral character of the native races; but there is an equal resemblance in the principal traits of their bodily structure. "The Indians of New Spain," says M. de Humboldt, "bear a general resemblance to those who inhabit Canada, Florida, Peru, and Brazil. They have the same swarthy and copper colour, straight and smooth hair, small beard, squat body, long eye, with the corner directed upwards towards the temple, prominent cheek-bones, thick lips, expression of gentleness in the mouth, strongly contrasted with a gloomy and severe look. "Over a million and a half of square leagues, from Tierra del Fuego to the river St. Lawrence and Behring's Straits, we are struck at the first glance with the general resemblance in the features of the inhabitants. We think that we

Digitized by Google

perceive them all to be descended from the same stock, notwithstanding the prodigious diversity of languages which separates them one from another."

Perhaps the degree of resemblance to a common type subsisting between the nations of America, may admit of comparison with that which is to be traced between the different nations of Europe, or among the races of Africa, or those of the north-eastern parts of Asia. It is not universally prevalent in the same degree, but there appears to be in every instance some approximation to it; yet there can be no doubt that the resemblance has been in general much exaggerated. It will be easy to prove that the American races, instead of displaying an uniformity of colour in all climates, show nearly as great a variety in this respect as the nations of the old continent; that there are among them white races with a florid complexion inhabiting temperate regions, and tribes black or of very dark hue in low and intertropical countries; that their stature, figure, and countenances, are almost equally diversified. Of these facts I shall collect sufficient evidence, when I proceed to the ethnography of the American nations. For the present I shall only offer a few general remarks respecting their most striking physical characters.

The nations of South America have in general flatter faces, and many of them a shorter and broader shape of body than the North Americans. In these respects the southern people are more like the Turanian nations than the northern tribes. The resemblance between the Chinese and the Brazilian nations appeared very decided to the German naturalists, Von Spix and Martius, who thought they discerned in both continents the same fundamental characters.

"The figure of the Chinese," as they observe, "is more slender; the forehead broader, the lips thinner and more alike, and the features in general more delicate and mild than those of the American who lives in woods; yet the small, not oblong, but roundish, angular, rather pointed head, the broad crown, the prominent sinus frontales, the low forehead, the pointed and prominent cheek-bones, the oblique position of the small narrow eyes, the blunt, proportionably small, broad,

Digitized by Google

flat nose, the thinness of the hair on the chin and the other parts of the body, the long smooth black hair of the head, the yellowish or bright reddish tint of the skin, are all characteristics common to the physiognomy of both races. The mistrustful, cunning, and, as it is said, often thievish character, and the expression of a mean way of thinking and a mechanical disposition, appear, in both, in the same manner. In comparing the Mongole physiognomy with the American, the observer has opportunity enough to find traces of the series of developments through which the Eastern Asiatic had to pass, under the influence of climate, in order at length to be transformed into an American. In these anthropological investigations, we arrive at the remarkable result, that certain characteristics, which constitute the principal differences of races, do not easily pass into others, whereas those which depend only upon *more* or *less*, gradually vanish or degenerate, through a series of different gradations." "The physiognomical characteristics of the Mongole, Caucasian, Malay, and American races blend with each other through so many shades, that we are involuntarily led to presume a common fundamental type for all these in distinction from the Ethiopian. This perhaps is most strikingly marked in the Mongole, and to it the above-mentioned various conformations must perhaps be referred as so many forms of development occasioned by climate."

The same writers in describing the tribes termed Puris, Coropos, and Coroados introduce some further observations on the general character of the American races, which I shall extract, as they seem to fill up the picture of these nations, and to convey a tolerably complete idea of their most striking physical peculiarities.

"All the Indians of the tribes of the Puris, Coropos, and Coroados, whom we saw here, had an extraordinary resemblance in make and countenance; and their individual features, probably from want of civilization, have more of the general physiognomy of the race, than is now the case in the other tribes. The Indians are of a short or middle stature, the men from four to five feet high, and the women a little above four; all are of robust, broad, compact make. It is very seldom that some

Digitized by Google

of a taller and more slender shape are seen among them. The breast is broad, the neck short and thick; the female breast is not so pendent as in Negresses, the belly very prominent. The extremities are short, the legs far from full, and the calves in particular thin, the arms round and muscular. The foot is narrow behind and very broad before, the great toe parted from the others. The hands are almost always cold, the fingers proportionably thin, the nails, which they constantly bite, are very short. The hue of skin is a darker or lighter copper-colour, differing a little according to the age, occupation, and health of the individual. Infants are of a yellowish white, like mulattoes; sick persons become of a brownish yellow colour; it is very rare to find among them albinos, or any that are dark-spotted. On the whole, their colour is darker in proportion as they are stronger and more active. On the lower part of the body, and the legs and arms, the red brown colour sometimes changes to a blacker shade; in the joints it is paler or whitish. The Indian, properly speaking, cannot blush, and the '*Erubescit, salva res est*,' cannot be applied to this unpolished race. It was only after long intercourse with the whites, and after receiving some education, that we perceived in the Indians a change of colour expressive of the emotions of their mind. Their skin is very fine, soft, shining; and when exposed to the sun inclined to perspiration. Their long, coarse, stiff, and glossy black hair hangs down thick, and in a disorderly manner. The beard of the men is in general thin, but we saw some men with thick beards. The crown of the head and cheek-bones are broad, corresponding with the breadth of the breast. The forehead is low, the temples projecting, narrow above and falling very much back. The back part of the head by no means hangs as low as in a Negro, whose skull is indeed narrow and much more oblong than that of the Indian. The countenance is broad and angular, and projects much less than in the Negro, but more than in the Kalmuk or the European. The ears are small and neatly made, rather turned outwards, not pierced and disfigured by heavy bodies. The eye is small and dark brown, placed sideways, the inner corner turned towards the nose: the eyebrows thin and very high in the middle; the nose is short, slightly depressed above, broad

Digitized by Google

below, but not so spread as the Negro; the nostrils are wide, standing very little out, the lips by no means so thick and swollen as in the Negro; the upper, not the lower, projects a little, or both are alike; the mouth is smaller and more closed than in the Negro. The teeth are very white, the front teeth very broad and even; the eye-teeth project. In general, the make of the Indian is robust, broad and short; whereas that of the Negro is tall and slender; thus it approaches nearer to the form of the other races, especially to that of the Chinese and Kalmuks, though the latter have lighter complexions and better formed features. We did not meet with any deformed persons or cripples among the Indians, for which reason some persons believed that they put them to death immediately after birth."*

Section VII.—*Of the Quaiquæ and Saabs, or the Hottentot and Bushman Races.*

Another department of the human family, associated with the races already described by the configuration of their skulls, are the Hottentots; a people divided into a number of different tribes, such as the Gamaaguas, the Gonaaquas and Koraaquas, who assume to themselves generally the national designation of Quaiquæ. The Bushmen, who are a division of the same race, term themselves Saabs.

Although so much has been written of late years on the history of the Hottentot and Bushman races, I do not find them anywhere better described than by Mr. Barrow. "The Hottentots," says this able writer, "are well proportioned, erect, of delicate and effeminate make; not muscular; their joints and extremities small; their face generally ugly, but different in different families; some having the nose remarkably flat; others considerably raised. Their eyes are of a deep chestnut colour, long and narrow, distant from each other; the inner angle being rounded, as in the Chinese, to whom

* Von Spix and Martius, Reisen durch Brasilien. English Translation of the first volume.

Digitized by Google

the Hottentot bears a striking resemblance. The cheek-bones are high and prominent, and with the narrow pointed chin form nearly a triangle. Their teeth are very white. The women when young are graceful and well made: the nipple is unusually large, and the areola much elevated; but immediately after the birth of the first child the breast becomes flaccid and pendant, and in old age becomes greatly distended; the belly becomes protuberant, and the posteriors are covered with a huge mass of pure fat. That elongation of the nymphæ, which is well known to characterise the Hottentot women, has been falsely ascribed to art. It is a natural variety of conformation."

The Moravian missionary Adolph Bonatz has given the following general description of the Bushmen in their present state.* "These people," he says, "are of small stature, and a dirty yellow colour; their countenance is repulsive; a prominent forehead, small, deeply-seated, and roguish eyes, a small depressed nose, and thick projecting lips are their characteristic features. Their constitution is so much injured by their dissolute habits and the constant smoking of dacha, that both old and young look wrinkled and decrepit; nevertheless they are fond of ornament, and decorate their ears, arms and legs with beads, iron, copper, or brass rings. The women also stain their faces red, or paint them wholly or in part. Their only clothing by day or by night is a mantle of sheep-skin thrown over their bodies, which they term a *kaross*. The dwelling of the Bushmen is a low hut or a circular cavity on the open plain, in which he creeps at night with his wife and children, and which, though it shelters him from the wind, leaves him exposed to the rain. They had formerly their habitation among rocks, in which are still seen rude figures of horses, oxen, and serpents. Many of them still live like wild beasts in their rocky retreats; to which they return with joy after escaping from the service of the colonists. I have never seen these fugitives otherwise occupied than with their bows and arrows: the bows are small, the arrows are barbed, and steeped in a potent poison of a resinous appearance, dis-

* Periodical Accounts of the Missions of the United Brethren.

Digitized by Google

tilled from the leaves of an indigenous tree. These they prefer to fire-arms, as weapons which make no report. On their return from the chase, they feast till they become drowsy; and hunger only rouses them to renewed exertion. In seasons of scarcity they devour wild roots, ants' eggs, locusts, snakes. As enemies the Bushmen are not to be despised. Their language seems to consist of snapping, hissing, grunting sounds, all more or less nasal."

Digitized by Google

CHAPTER V.

VARIETIES OF FIGURE CONTINUED—NATIONAL FORMS OF THE SKULL.

SECTION 1.—*General views: diversities in the form of the Skull.*

THE various races which I have briefly described afford the most remarkable instances of diversity which exist in the human kind. There are, indeed, several tribes extensively spread which do not strictly belong to either of these divisions, though they approximate to one or other of them, but investigations which belong to ethnography are beyond the inquiry with which I am now concerned. I shall endeavour to illustrate this subject by a careful analysis of the particular points of variation relating to form. Those which belong to complexion have been already considered. Varieties of form and structure refer themselves chiefly to peculiarities in the bony fabric, and I shall proceed to examine the characteristic differences which are discoverable in the skeletons of different races.

Of all peculiarities in the form of the bony fabric, those of the skull are the most striking and distinguishing. It is in the head that we find the varieties most strongly characteristic of different races. The characters of the countenance, and the shape of the features, depend chiefly on the configuration of the bones of the head. I shall describe the various forms of the human skull, after premising some remarks on the manner in which this examination has hitherto been conducted.

The first anatomist who attempted to distinguish and describe in an accurate manner the differences of form which have been discovered on comparing the skulls of different

Digitized by Google

human races, was Professor Camper. This writer invented a technical method, by which he imagined that he could display in a single measurement the essential difference of skulls as to form and capacity, not only in reference to various nations of men, but likewise as to the inferior species of animals. His own account of this method is as follows.

"The basis on which the distinction of nations is founded may be displayed by two straight lines, one of which is to be drawn through the meatus auditorius to the base of the nose, and the other touching the prominent centre of the forehead, and falling thence on the most advancing part of the upper jaw-bone, the head being viewed in profile. In the angle produced by these two lines may be said to consist, not only the distinctions between the skulls of the several species of animals, but also those which are found to exist between different nations; and it might be concluded that Nature has availed herself, at the same time, of this angle, to mark out the diversities of the animal kingdom, and to establish a sort of scale from the inferior tribes up to the most beautiful forms which are found in the human species. Thus it will be found that the heads of birds display the smallest angle, and that it always becomes of greater extent in proportion as the animal approaches more nearly to the human figure. Thus there is one species of the ape tribe, in which the head has a facial angle of forty-two degrees; in another animal of the same family, which is one of those Simiæ most approximating in figure to mankind, the facial angle contains exactly fifty degrees. Next to this is the head of the African Negro, which, as well as that of the Kalmuk, forms an angle of seventy degrees, while the angle discovered in the heads of Europeans, contains eighty degrees. On this difference of ten degrees in the facial angle, the superior beauty of the European depends; while that high character of sublime beauty, which is so striking in some works of ancient statuary, as in the head of Apollo, and in the Medusa of Sisocles, is given by an angle which amounts to one hundred degrees."

The measurement of this angle has been supposed to afford, in the first place, a criterion for estimating the degrees of intelligence and sagacity which Nature has bestowed on all

Digitized by Google

those animals possessed of a skull and brain; secondly, when applied to mankind, it becomes, according to the ingenious inventor, a foundation for the physiognomy of nations and individuals, a small facial angle denoting stupidity either in a whole tribe, or in particular persons, and the converse: and in the third place, it is proposed, in the same measurement, to find a distinguishing mark of the principal divisions of the human species.

In the application of this method to the estimate of sagacity or intelligence in individuals, or races of men, or different species of animals, it is evident that two positions are taken for granted, neither of which ought to be admitted without some proof. It is understood, as if the fact were self-evident, which it certainly is not, that intelligence bears some proportion to the development of the brain: in other words, that the quantity of brain, either positively—per se—or in relation to some standard, is a measure of the extent of mental power. The possession of mental faculties is scarcely predicated of the inferior animals, but if we refer to the aggregate of psychical endowments which in the inferior tribes stand in the place of the mental faculties in man, we shall find it very difficult to establish the conclusion as a general one, that the results of that internal energy which directs the actions of animated beings towards certain ends, are displayed in degrees that may be measured by the quantity of brain, and its approximating towards the form which it bears in man. It has been, indeed, remarked frequently, that the most wonderful instincts are manifested by termites and bees, and various other tribes of insects which have no organization resembling the cerebral lobes. It may be observed likewise that the faculties of animals are different in kind, and that we can form no definite notion of different quantities or degrees of sagacity and intelligence bestowed on the several tribes, nor conceive any possible method of estimating them. The psychical endowments of each tribe are perfect in relation to the sphere of existence for which it is destined. The instincts and modes of perception and of action, even in those animals most remote from mankind, are all equally adapted to their several ends. But, secondly, does the facial angle

Digitized by Google

measure the quantity of the brain? This can neither be estimated by means of the facial angle in different tribes, nor even in different individuals of the same species. The angle may become more acute or obtuse by greater or lesser breadth and thickness, or elongation of the upper maxillary bone, so as to give in several individuals angles of very different extent, while the proportion of the cerebral mass to the entire body or to any given parts, may remain precisely the same.

The only point of view in which the measurement of skulls by the facial angle can be of interest in my present inquiry, is as a distinguishing mark of particular races of men: and its value in this particular must depend upon its constancy or variableness. If it were always the same in skulls belonging to one race, and different in those of different tribes, it would form at least a leading character in the craniological history of races. But the reverse of this is the fact. It has been observed by Blumenbach, that the direction of the facial lines is often the same in heads of very different descriptions, which present no other analogy whatever, while it displays at the same time remarkable variations in skulls which are otherwise very similar, and belong to the same nation. "I have," says this distinguished writer, "now before me the cranium of a Negro, from Congo, and one of a Pole from Lithuania, in which the facial angles are nearly equal; yet when I compare the narrow, and laterally compressed skull of the African with the square head of the Sarmatian, I find between them a prodigious difference." He adds, "There are two Negro skulls in my possession presenting very different facial angles, but in all other respects so much alike, that they evidently appear to belong to the same race of men."

It is well known that all those peculiarities in the forms of the skull which are most characteristic of particular races, are yet liable to variation and to a degree of uncertainty. Hence it appears how little confidence can be placed upon one mode of measurement, or upon so limited and confined a character as the facial angle. This is indeed a feature to be taken notice of, in the description of the skulls of different nations, but it does not deserve an exclusive attention, to the

Digitized by Google

neglect of other traits, many of which are equally or more important.

Another remark on the peculiarities in the shape of the skull appears to have originated with Camper, which might have led him to more important and extensive observations. He observed, in his unpublished commentaries on the bones, that the breadth of the head differs in different nations; that the heads of Asiatics, by which he probably meant the Kalmuks, have the greatest breadth; that those of Europeans have a middle degree of breadth, and that the skulls of the African Negroes are the narrowest of all.

Blumenbach has made this circumstance the foundation of his arrangement and description of skulls. It does not appear that he was led to it by the suggestion of Camper, but as the result of his own observation, in a long and constant study of his collection of the skulls of different nations. He remarks that the comparison of the breadth of the head, particularly of the vertex, points out the principal and most strongly marked differences in the general configuration of the cranium. He adds, that the whole cranium is susceptible of so many varieties in its form, the parts which contribute, more or less, to determine the national character displaying such different proportions and directions, that it is impossible to subject all these diversities to the measurement of any lines or angles. In comparing and arranging skulls according to the varieties in their shape, it is preferable to survey them in that method which presents at one view the greatest number of characteristic peculiarities. "The best way of obtaining this end is to place a series of skulls, with the cheek-bones in the same horizontal line, resting on the lower jaws; and then viewing them from behind, and fixing the eye on the vertex of each, to mark all the varieties in the shape of parts which contribute most to the national character, whether they consist in the direction of the maxillary and malar bones, in the breadth or narrowness of the oval figure presented by the vertex, or in the flattened or vaulted form of the frontal bone." This way of examining and comparing skulls is termed by Blumenbach

Digitized by Google

the vertical method, in distinction from the facial angles and lines adopted by Camper and others.

When all the different forms of the human cranium are compared with each other in the way thus pointed out, there are, as Blumenbach observes, three varieties in the vertical figure distinguished from each other. The skulls of a Georgian, a Tungusian, and a Negro of Guinea, are given by him as specimens of the three varieties of form, which he terms Caucasian, Mongolian, and Ethiopic.

I must here observe with respect to the three vertical figures said by Blumenbach to differ in breadth, that the description of them given by Camper and by himself is not strictly correct. The vertical figure on the summit of the head, if we compare only the capacity of the bony cavity of the skull, is broader in Europeans, especially in the anterior portion, than either in the Mongolian or African. The three gradations in breadth are to be found only by taking the section of the whole head in the plane of the cheek-bones, and including the zygomatic projections. It is in fact the outward or lateral prominence of the zygomatic arches which gives to the Mongolian skull its apparent breadth, at least at the upper part; and it is the forward protuberance of the superior maxillary bone which constitutes the elongated figure of the African cranium.

Neither the measurement of the facial angle, nor the comparison of the vertical aspect of the cranium, affords so much insight into the peculiarities of its formation, as the view of the basis of the skull. The superior importance of this manner of examining the bony structure of the head has been demonstrated in the fullest manner by Mr. Owen, in his excellent memoir on the structure of the orang and chimpanzee. The relative proportions and extent, and the peculiarities of formation, of the different parts of the cranium, are more fully discerned by this mode of comparison, which has hitherto been much neglected, than by any other method. In order, however, to form a correct idea of the varieties in the shape of the head which are peculiar to individuals or to races, it is necessary to examine every part, and to compare all the

Digitized by Google

different aspects which the skull presents: the basis of the cranium, the vertical figure, the profile, and the front view, must all be described. By proceeding in this way, we find that all the varieties in the form of the human skull may be referred on a general comparison to three principal forms, which are the following:

1. The symmetrical or oval form, which is that of the European and western Asiatic nations. In this the head is of a rounder shape than in other varieties, and the forehead is more expanded, while the maxillary bones and the zygomatic arches are so formed as to give the face an oval shape, nearly on a plane with the forehead and cheek-bones, and not projecting towards the lower part as in other varieties of the human skull. The cheek-bones neither project outwards and laterally, nor forwards. The upper maxillary bone has the alveolar process well rounded, the anterior portion having a curve in a perpendicular direction. This gives a perpendicular and not a projecting position to the front teeth, to which the lower jaw and its teeth correspond.

As I can find no epithet more appropriate as a distinguishing term for this form of the skull, I shall term it the oval or öoidal form.

2. The narrow and elongated skull, of which the most strongly marked specimen is perhaps the cranium of the Negro of the Gold Coast. In these skulls the principal characters are referrible to the idea of lateral compression: the temporal muscles having a great extent, rising very high in the parietal bones, and being very large and powerful, subject the head to a force producing the effects of lateral compression and elongation. The cheek-bones project forward, and not outward; the upper jaw is lengthened and projects forward, giving to the alveolar ridge and to the teeth a similar projection. From the shape of the upper jaw alone would arise a diminution of the facial angle.

3. The broad and square-faced skull, which is that particularly of the Turanian nation. The Mongoles afford a good specimen of this form, and the Esquimaux an exaggerated one.

In this, the most striking character is the lateral or outward projection of the zygoma. The cheek-bones project

Digitized by Google

from under the middle of the orbit, and turn backwards in a large arch or segment of a circle, the lateral projection of the zygomas being so considerable, that if a line drawn from one to the other be taken as a base, this will form with the apex of the forehead a nearly triangular figure. The orbits are large and deep, the upper part of the face is remarkably plane and flat, the nose being flat, and the nasal bones as well as the spaces between the eyebrows nearly on the same plane with the cheek-bones. I shall give the following terms to these two varieties in the figure of the cranium, viz. to the narrow elongated form, that of *Prognathous*, from the prominence of the jaw; and to the broad-faced, that of *Pyramidal*, from the figure which the shape of the head exhibits when viewed in front.

The above descriptions are intended as general outlines, or as standards of comparison, to which the particular varieties may be referred.

Section II.—*Of the Substance and Texture of the Skull in different Races.*

Before I proceed to describe the different forms of the human skull, I shall make some remarks on the variety of its weight and texture.

One of the most striking characters in the crania of African Negroes is the great hardness, density and weight of the component substance. The whole bony case, destined to contain the brain, has often a whiteness and compactness of texture which give it the appearance of ivory or even of marble, rather than of the ordinary component material of the skull. This peculiarity in the cranium is accompanied by a corresponding condition of the skeleton, which in many Negroes is much heavier than in men of other races.

Soemmerring remarked the great hardness and density of the skull in the Negro; and he has cited a similar observation from Peter Paaw, who wrote on wounds in the head about two hundred years ago, and compared the crania of Africans

Digitized by Google

to iron helmets.* Paaw observed, that the Spanish soldiers who followed Cadamosto to Africa, were directed to avoid striking the natives on their heads; "experientiâ docti protenus dissilire ensem." A similar story was that which Herodotus reported, Αἱ μὲν τῶν Περσέων κεφαλαί εἰσι ἀσθενέες οὕτω, ὥστε εἰ θέλεις ψήφῳ μούνῃ βαλέειν, διατετρανέεις· αἱ δὲ Αἰγυπτίων, οὕτω δή τι ἰσχυραὶ, μόγις ἂν λίθῳ παίσας διαῤῥήξειας. There is a skull of an Egyptian mummy at the museum of the Royal College of Surgeons, which is of this dense, firm, and heavy consistence.

The great weight and density of the skull is however by no means a constant character among Negroes, nor is it peculiar to Africans.

It may be observed that great varieties occur in the weight and density of the skull in other departments of mankind. There is a great difference in the weight of European skulls, and I have seen some which I believe to be equal in thickness and density of substance to any African cranium. Such instances occur however most frequently, though not always, in persons of diseased constitution. Some of the crania of the New Zealanders are observed, by M. Lesson, to be thick, and of dense texture, and remarkably heavy. Blumenbach has figured in the sixth decade of his collection the skull of a Botocudo, which he describes as remarkably ponderous and large, and of a hard and dense bony texture.† He refers likewise to a passage in Purchas's relation of Pilgrimages, in which the same characters are ascribed to the whole tribe. This in a South American race is the more remarkable, since

* "Æthiopes quam dura crassaque habent capita, non os sed militarem te tangere dicas galeam. Norant Hispani qui, Aloisio Cadamusto teste, ducturi novum in insulam D. Thomæ, Angolam, vicinaque Aequatori loca militem, illud imprimis ipsis inculcant, ne cum incolis conflicturi unquam caput ipsis petant, experientiâ docti protenus dissilire ensem."—Succenturiatus anatomicus de Capitis Vulneribus. Lugd. Bat. 1616.

† "Cranium ipsum magnum et ossium texturâ densâ et durâ, calvariæque crassitie valde ponderosâ." This skull, with the exception of those characters which are constant in the human brain, approaches more to the skull of a Simia Satyrus than any one in Blumenbach's collection, though one or two Negroes have the superior maxillary bone more prominent. Decad. 6.

Digitized by Google

the skulls of the natives of the New World are in general, as Blumenbach has observed, particularly light.*

The following table exhibits the weights of several skulls, nearly of the same size.

	lb.	oz. avoirdupois.	
Skull of a Greek	1	11½	„
Of a Mulatto	2	10	„
Negro 1, ...	2	0	„
Negro 2, ...	1	12½	„
Negro 3, ...	1	5¼	„
Negro 4, (from Congo) . . .	1	11¾	„
New Zealander	1	10¾	„
Chinese	1	7½	„
Gipsy without the lower jaw .	1	13¾	—therefore with the lower jaw
at least . . .	2	0	

It appears from this that there is no constant difference.

Section III.—*Of Prognathous or narrow and elongated Skulls.*

Paragraph 1.—Of the shape of the Skull in the Negro.

I have already cited the testimony of many accurate writers, which are sufficient to establish the fact, that the black and woolly-haired inhabitants of Africa have frequently beautiful features, and scarcely differ in form from European nations. It may be observed, on the other hand, that individuals among other races are frequently seen who strongly resemble the more characteristic form of the African, and that examples might easily be found in which all the pecu-

* Azara mentions a circumstance which, if true, is worthy of observation, and tends to confirm the opinion that the American crania are generally light. "Un homme qui avait vécu longtemps parmi les Guaranys Chrétiens (in Paraguay) m'assure qu'il avait observé dans les cimetières, que les os des Indiens se convertissaient en terre beaucoup plutôt que ceux des Espagnols."—Don Felix de Azara, Voyages dans l'Amérique Méridionale, tom. ii. p. 59.

Digitized by Google

liarities of the Negro countenance are discernible in the persons of Europeans. Soemmering has made this remark, and he has cited Loder, who describes the skull of a Thuringian as affording the characteristics of the African race in a native of Europe, and sprung from European parents.

My present object is to describe those forms of the African cranium which recede most from the European, or Indo-Atlantic, as well as from the shapes which the skull assumes in other races of men. The following observations on the cranium of the Negro refer to that figure which is most peculiar and different from the type prevalent in other human races.

The chief peculiarities in the general form of the strongly marked Negro skull may be referred to the two characters of lateral compression, or narrowing of the entire cranium, and greater forward projection of the jaws. The head is proportionally narrower, and the upper jaw is more protruded forwards than in the ordinary form of other races.

Soemmerring, who was followed by Mr. White and many other anatomists, observed or fancied numerous points of relation between the skulls of Negroes and those of apes. Now as the Negro has the narrowest and most elongated of all human skulls, and as the crania of apes and all other animals of the monkey tribe are much longer and narrower than those of men, it could hardly be but that some points of analogy should display themselves between the ape and the Negro. These analogies are of much less weight than they have been supposed to be; but we must take some notice of the essential differences between the heads of the Simiæ and those of men, before we can estimate their importance and extent.

Of all the monkey tribe, the chimpanzee and the orang alone make any considerable approach towards the human form. These anthropoid apes are arranged by M. Geoffroy St. Hilaire and Mr. R. Owen in two sub-genera, termed Troglodytes and Pithecus.* The researches of Mr. Owen have lately thrown a most important light on the anatomy

* Annales du Muséum, tom. xix. Zoological Transactions, vol. i.

Digitized by Google

of these animals, in comparison with each other, and with man. Tyson, Camper, and earlier anatomists, who have written on the structure of the Simiæ, founded all their observations on orangs of immature age: hence their remarks on the facial angle, teeth, and the relative proportions of the cranium and the face, are erroneous when applied to the adult animal, and have led, as Mr. Owen has clearly proved, to an opinion that the transition from mankind to the Simiæ is much more gradual than it really is.* It is well known that in the immature and undeveloped state, anatomical relations are in many instances nearer than they appear when the entire being is perfected, and prepared for all the functions for which nature has destined it. Thus the human fœtus is well known to have a separate intermaxillary bone in common with the Simiæ and other inferior animals, while the absence of this separate structure in man has ever been regarded as one of his distinctive anatomical characters. It is no matter of surprise, that when the skull of the young chimpanzee was examined at the period when the small deciduous teeth only are developed, the resemblance to the human cranium should have been found surprisingly close. The brain in the ape attains its full size at a very early period: it is not destined for further development, like the human brain: consequently at the age when the jaws become enlarged and lengthened with the increase of the maxillary apparatus, and the zygomatic arch is extended without any corresponding downward growth and development of the brain, or extension of its containing cavity, the proportions of the cranium to the jaws undergo a material change. In the earlier period, when the cranial portion of the head preponderates over the facial and maxillary part, it approximates proportionally to the human form, the facial angle is wide, the occipital foramen is more central, and the zygomatic arches, when the basis of the skull is examined, appear confined to the anterior half of the cranium. All these characters of resemblance are surprisingly changed when adult skulls are compared. It then appears,

* Mem. on the Osteology of the Chimpanzee and Orang Utan, by Richard Owen, Esq. F.R.S., &c. Zoolog. Tr. vol. i. p. 343.

Digitized by Google

as Mr. Owen has shown, that strongly marked and most important characters distinguish the quadrumanous type from that of the human skull. The cranium, properly so termed, is a small rounded case, and is altogether posterior to, and not at all above the face. The antero-posterior diameter of the basis of the skull is very much longer than in man: the most striking circumstance which displays this difference is the different situation occupied by the zygomatic arch in the plane of the basis of the skull. In all races of men, and even in human idiots, the entire zygoma is included in the anterior half of the basis cranii; in the head of the adult troglodyte or chimpanzee, as well as in that of the satyr or orang, the zygoma is situated in the middle region of the skull, and in the basis occupies just one-third part of the entire length of its diameter. Posterior to the zygomata, the petrous portions have in the simiæ a large development in the antero-posterior direction. Another most remarkable character, in respect to which these anatomists have been greatly deceived who compared only young troglodytes with man, is the position of the great occipital foramen, a feature most important as to the general character of structure, and to the habits of the whole being. This foramen in the human head is very near the middle of the basis of the skull, or rather it is situated immediately behind the middle transverse diameter, while in the adult chimpanzee it is placed in the middle of the posterior third part of the basis cranii.* A third characteristic in the ape is the greater size and deve-

* I do not know whether the phrenologists have yet succeeded to their own satisfaction in reconciling with their doctrine the *apparent* contradiction which has resulted from the researches of Mr. Owen. It seems that the portion of the cranial cavity most defective in space, when the anthropoid ape is compared with man, is the region posterior to the great foramen. Consequently, according to the theory of proportionate developments, the organs most defective in the ape are those alloted to amativeness and philo-progenitiveness. Shall we be informed that satyrs are not amative, and that she-monkeys have no fondness for their offspring? Assuredly if we adhere to the fundamental principle of distributing the psychical properties of species according to the indications afforded by proportionate developments, we ought to place the faculties which chiefly distinguish men from the brutes in that part of the head which in mankind assumes so signal an augmentation of space; namely, in the occiput.

Digitized by Google

lopment of the bony palate, in consequence of which the teeth are much larger and more spread, and want that continuity which is, with a single exception, a characteristic of man; and intervals between the laniary, cutting and bicuspid teeth admit, as in the lower tribes of animals, the apices of teeth belonging to the opposite jaws. Fourthly, the basis of the skull is flat, owing to the want of that downward development of the brain, and of the bony case, connected with the greater dimension which the cerebral organ acquires in the human being, compared with the lower tribes.

The characteristic points of diversity above enumerated are perceived by examining the basis of the skull. There are others, perhaps, not less remarkable when the crania of adult apes are compared with the human skull in other points of view.

A character, for example, on which much stress has been laid, as one in which the orang approximates to the human form, and particularly to that of some races of men, is the facial angle. This angle contains, according to Professor Camper's measurement, 80° in the heads of Europeans. In some human skulls it has been considerably less, and has even measured only 70°, according to the same writer, in the heads of Negroes. In the orang it has been estimated at 64°, 63°, or 60°,* but this has been in the measurement of the skulls of young apes. It is stated by Mr. Owen, that the facial angle of the adult troglodyte is only 35°, and that of the orang or satyr 30°.†

Such being the extent of difference manifest between the skulls of those simiæ which most approach to the human form, a difference so great that the utmost diversity between human races is quite inconsiderable when compared with it, it becomes rather a matter of curiosity than of importance to the solution of any great question, to know whether the crania of any human tribes actually make a slight advance towards the type of the troglodyte or orang. Still the facts which Soemmerring and other anatomists have pointed out, are not to be overlooked.

* Lesson, Hist. Nat. des Mammifères, tom. iii. p. 230.

† Zool. Transact. vol. i. pp. 372, 373.

Digitized by Google

1. The antero-posterior diameter of the basis of the cranium is certainly somewhat longer in proportion to the transverse diameter in the skull of many Negroes than in those of Europeans. This is the main circumstance of approximation towards the ape, and that on which most of the particular instances of this approximation appear to depend. The difference is however very slight, and requires some care in order that it may be ascertained. I have several Negro skulls in which it may be discerned. On the other hand, in the skull of an Esquimaux the difference is decidedly of an opposite kind, so that if we are entitled to affirm that the skulls of Negroes display degradation when compared with the European, the same thing must be conceded of the European in comparison with the Esquimaux. The greater length of the antero-posterior diameter in the Negro depends almost entirely on the prominence of the upper jaw, which appears in the basis of the skull in the length of the longitudinal diameter of the bony palate, and in the face, in the forward projection of the alveolar ridge of the upper maxillary bone.

2. The position of the great occipital foramen has been considered as affording a strongly marked character of difference between the skulls of Negroes and Europeans.*

It was long ago observed by Daubenton, that the occipital foramen holds in the heads of all the inferior animals a position somewhat further backwards than in the human head. In the human head this foramen is near the middle of the basis of the cranium, or, as Mr. Owen has more accurately defined its position, immediately behind a transverse line dividing the basis cranii into two equal portions, or bisecting the antero-posterior diameter. In the head of the adult troglodyte the place of the foramen magnum is at the middle of the posterior third part of the basis; or if the antero-posterior diameter is divided into three equal portions, it will be found in the midst of the third division. In the heads of young apes which heretofore have been the subjects of comparison, this foramen is situated much more forward, or near

* Mémoires de l'Académie des Sci. de Paris, 1764; Sur les différences de la situation du grand trou occipital dans l'homme et dans les autres animaux.—Soemmerring über die verschiedenheit des Negers, w. s. f. p. 54.

Digitized by Google

to the middle of the basis of the skull: still its position is obviously posterior to the situation of the same foramen in the human skull. Soemmerring thought he perceived some difference in this same respect between the skulls of Europeans and Negroes. He considered the difference to be very slight, and expressed himself with doubt upon the subject; but by all the late writers who have cited his observation without taking much pains, as it would appear, to verify it, Soemmerring's statement has been repeated in much stronger terms.*

I have carefully examined the situation of the foramen magnum in many Negro skulls. In all of them its position may be accurately described as being exactly behind the transverse line bisecting the antero-posterior diameter of the basis cranii. This is precisely the place which Mr. Owen has pointed out as the general position of the occipital hole in the human skull. In those Negro skulls which have the alveolar process very protuberant, the anterior half of the line above described is lengthened in a slight degree by this circumstance. If allowance is made for it, no difference is perceptible. The difference is in all instances extremely slight, and it is equally perceptible in heads belonging to other races of men if we examine crania which have prominent upper jaws. If a line is let fall from the summit of the head at right angles with the plane of the basis, the occipital foramen will be found to be situated immediately behind it, and this is precisely the same in Negro and in European heads. I shall subjoin some further observations on this subject in the explanation of the plates.

3. It is chiefly the projection of the muzzle, or of the alveolar process of the upper maxillary bone that gives to the skull of the Negro its peculiar deformity, and to the face its ugliness and monkey-like aspect, and it is principally on this circumstance that the difference in the facial angle noticed by Camper between Negro and European heads depends. The facial angle differs greatly in individual Negroes, as

* "Etwas weniges mehr nach hinten als bey uns schienet mir dies Loch beym Mohren zu liegen."—Soemmerring, p. 54.

Digitized by Google

Blumenbach has observed, and in some Europeans it is scarcely if at all greater than in Africans. The difference between Negro skulls in this particular was noticed by Blumenbach in three crania represented in his first decade. In his work on the varieties of the human genus, he remarks, that the facial angle has the same capacity in the skull of a Pole and of a Congo Negro. A little greater protrusion of the alveolar process gives to this angle a very different extent, and it is by no means a measure, as Camper thought, of the capacity of the cranium and the amplitude of the brain.

Berthold has represented the form of a skull which he considers as that of a strongly characterised Negro, and particularly adverts to the configuration of the upper maxillary bone.* He describes this bone as being very long and broad, and in that part which reaches from the septum narium to the incisor teeth remarkably prominent. The alveolar process projects from the body of the maxilla in the shape of a bow. It forms " nicht ein winkel, sondern vielmehr ein wirkliches bogen." The passage into the nasal bones is not only rounded off, but smoothed over, forming a sulcus bounded by two margins. The anterior septum projects very little. The jugal process of the jaw describes with its under surface an arch equal to two-fifths of a circle.

4. The zygoma is large in the Negro, but the projection is forward and downward, not lateral or outward as in the Kalmuk: nor has it that circular sweep which it displays in the Esquimaux.

5. A curious instance of approximation to the structure of the cranium of the troglodyte has been noted by Mr. Owen in several Negro skulls, and in one skull of an Australian savage. This is the juncture of the temporal and parietal bones, and consequently the complete separation of the sphenoid from the parietal, which in European and in most African skulls meet for the space of nearly half an inch, a process of the sphenoid bone extending upwards to join the lower anterior angle of the parietal.

* Beyträge zur Anatomie, Zöotomie und Physiologie von A A. Berthold. Goett. 1831.

Digitized by Google

Mr. Owen has observed this conformation in six out of seven skulls of young chimpanzees.

It is remarkable that the orang, though more remote in most respects than the troglodyte, resembles mankind in this particular. In seven out of eight crania of young orangs, the sphenoidal bone joined the parietal, as it generally does in the human skull.

6. The orbits are thought to be more capacious in the Negro than in the European, especially in their external circumference. This is by no means an uniform character. I have several Negro skulls now before me, in which the orbits are smaller than in skulls belonging to other races.

7. Soemmerring observes, that the nasal bones in two Negro skulls lie almost in a plane, and do not form a saddle-shaped projection as in European skulls generally. In one of the skulls in his collection the nasal bones are each quadrangular; in the other, both run up together in a very narrow point, towards the frontal bone, and give to this part of the face a very ape-like expression. A similar character has been remarked by Dr. Hodgkin on several Negro skulls in the collection at Guy's Hospital. It is entirely wanting in other instances. I have a Negro skull in which the nasal bones have fully as much elevation as is common in Europeans.

That part of the lachrymal bone which principally receives the lachrymal sac is in some Negro skulls very small, and therefore the excavation for the sac is chiefly formed by the nasal process of the upper jaw-bone. A similar circumstance has been noted by Berthold.*

8. The aperture of the nostrils is very wide, and the space within allowed to the expansion of the olfactory organs considerably greater than in Europeans. This has been observed by Bonn and by Soemmerring. The latter remarks that in a North American skull in the collection of Blumenbach, the nasal cavities are still larger than in many Negroes.

It was long ago remarked by Haller, that there are black people in the Antilles, who distinguished by smell the track of a Negro from that of a Frenchman. That nature has

* Berthold's Beyträge, ubi supra.

Digitized by Google

given to the African a more sensible olfactory organ than to the European, would appear likewise from the construction and amplification of those fine, thin, bony lamellæ, which are probably destined to increase the extent of the surface of the Schneiderean membrane. In a Negro's skull described by Soemmerring, the cribreform plate of the ethnoid bone had remarkably great extent in the basis of the cerebral cavity. From this anatomical structure we may infer a greater perfection of the olfactory organ in Negroes when compared with Europeans; but it is among the Turanian and American races that great powers have been chiefly noted by travellers in the organs of smell, as well as of sight and hearing. Perhaps the black people in the Antilles, mentioned by Haller, may have been black Caribs, or persons of the mixed race between the Negroes and the aborigines. The Caribs, as well as other Americans, are known to have an acute olfactory sense.

9. The posterior openings of the nasal cavity are not less remarkable than those of the anterior; the pterygoid processes stand further apart, are stronger, and each forms for itself a rougher surface than those of Europeans.

10. The external opening of the organ of hearing is also wide and spacious, and as it appears, proportionately greater than in Europeans. The mastoid processes which, as Soemmerring observes, are scarcely discoverable in apes, are as fully developed in the Negro as in men of our race.* The styloid process of the temporal bone, which is entirely wanting in apes, even in the chimpanzee and orang utan,† is strongly marked in the Negro, and the small bones of the ear are neither larger nor different from those in an European. On the other hand, the vestige which Sommerring has observed of a fissure, or slightly traced suture, separating the incisor from the corner teeth, giving the appearance in this place of an intermaxillary bone, would seem to constitute a truly animal character. This is the observation of Soem-

* The mastoid process, as Mr. Owen observes, is represented in the chimpanzee by a protuberant ridge behind the auditory foramen, and its cellular structure is visible through the thin external table. See Mr. Owen's Memoir in the Zoolog. Transactions, vol. i. p. 357.

† See Mr. Owen's Memoir on the Osteology of the Chimpanzee, &c. Ibid.

Digitized by Google

merring. I must remark that I have examined many Negro skulls without having been able to discover any vestige of the suture said to mark the line of separation between the intermaxillary and the maxillary bones; and I do not believe this separation of the bony structure, or the traces of any intermaxillary bone, exists in the Negro. The foramen infra orbitalæ, and the channel, as well as the nerve and blood-vessel which it contains, are somewhat larger than in Europeans. I observe the same character in the skull of a Chinese.

11. The lower jaw-bone is in Negro skulls thick, strong, deep, and short. The angle of this jaw, in Europeans obtuse, approaches in Africa more nearly to a right angle, and the part covered by the masseter is large and rough. The spina mentalis and the traces of the suture are in some instances strongly displayed.* The extent of the posterior angle of the jaw is subject to variations in African as it is in European skulls.† There is nothing constant in this circumstance.

12. The teeth of Negroes are generally sound, strong, broad, thick, long, especially the incisors. Soemmerring found in an African skull three back-teeth above the usual number. Billmann has, however, counted the teeth in several living Negroes, and found no difference between their number and that of Europeans. Camper, in a letter to Forster, expressed an opinion that the injured condition which the teeth often display in the heads of Northern people depends on the want of room, the lower canine teeth pushing the incisors out of their places, while the jaws of many Asiatic and African nations afford larger space for the insertion of the teeth. The upper jaw projecting considerably more from the root of the septum narium, the muzzle is more prominent and angular in Negroes than in Europeans, and the teeth of the two jaws do not meet in directions so nearly parallel.

13. The osseous cavity destined to contain the brain is somewhat contracted in the heads of Negroes; in those individuals at least who have the peculiar conformation of the

* Berthold, ubi supra. † Soemmerring.

Digitized by Google

race strongly marked. This peculiarity, as Soemmerring has observed, is tolerably constant, though not to be found in the same degree in all African skulls. This writer says, that he has observed it in all the specimens which he has examined; yet he allows, that it may very probably be wanting in many others, since we observe parallel varieties in the heads of Europeans. On measuring the cavities of several Negro and European skulls, Soemmerring found that a string carried from the root of the nose along the middle of the forehead and over the sagittal suture to the posterior edge of the foramen magnum, was shorter in Negro skulls than in European crania *which had an equal length of face:* consequently that the upper vertical circumference of the head was less than in European skulls. The horizontal circumference was found to be less on a similar measurement. The longitudinal diameter from the forehead to the occiput, as well as the transverse diameter between the temples or parietal bones was also less in the Negro skull. The height, however, on the vertical diameter of the cerebral cavity appeared to Soemmerring to be rather greater in the Negro than in the European. These measurements indicate, perhaps, a somewhat inferior capacity of skull, but it must be observed that the standard of comparison is a sameness in the extent of the facial bones or an equal length of jaw; if the size of the upper jaw be considered by itself, in excess, the comparison brings no decisive result.

Some measurements of the skulls of different races are given by Dr. Knox, which differ widely from the above. In these the length of a line carried over the vertex from one mastoid process to the other, is in a Negress, 14.5, in an European female 14, and in two Australian skulls 21. It seems very difficult, if not impossible, to draw any conclusion from these measurements.

14. According to Blumenbach and Soemmerring the proportionate size of the bones of the face compared with those containing the brain, is somewhat greater in Negroes than in Europeans. Although the difference is very slight, it has been considered as an approach towards the highest order of brute animals.

Digitized by Google

15. It was observed by Kulmus and by Soemmerring, that the human brain in comparison with the nerves connected with it is of larger dimension than that of any inferior animal; in other words, that man has the largest brain in comparison with the nerves, or the centre of the nervous system larger in proportion to its parts.* This remark was confirmed by Munro,† and it has been supposed that the Negro displays in this respect an approximation to the lower animals. In some instances the nerves which issue from the foramina of the skull have been found somewhat thicker and stronger in the Negro than in European heads having brains of the same weight. The same observation has been made by Berthold. It is most striking in respect to the olfactory, the optic, and the fifth pairs. According to Dr. Knox, the foramina for the transmission of the hypoglossal nerves are very large in the Bushman as well as in the Negro.

On the other hand, the occipital foramen has been observed to be remarkably small in the Negro,‡ and this appears to me to be the case in several Negro skulls which I have compared.

16. Wormian or triquetal bones are thought to be rare in the skulls of Africans, and Blumenbach seems to have entertained a doubt whether they are found in the crania of any savage races.§ The first instance of their discovery in Negro crania was notified by Berthold, who found them of considerable size in the sutura mastoidea of a skull which undoubtedly belonged to a Negro, though its history was unknown.|| I have seen two Negro skulls having wormian bones, one of which is in my possession, and I understand from Dr. Hodgkin, that there is an Australian skull in the museum of Guy's hospital in which there are some of very considerable size.

* Soemmerring's Inaugural Essay, De basi Encephali et originibus nervorum cranio egredentium.

† Observations on the Character and Functions of the Nervous System. Edin. fol. 1785.

‡ Dr. Knox's Essay on the South African Nations. Memoirs of the Wernerian Society.

§ Geschichte und Beschreibung der Knochen in des menschlichea Körpers, s. 88.

|| Auffallend characteristisch gebildeter Mohnenschädel mit Wormischen Knochen in der Sutura mastoidea.

Digitized by Google

In a succeeding part of this work, when I proceed to consider the ethnography of Africa and the physical history of the different tribes particularly, there will be a more proper place than the present for mentioning the differences in national characteristics which are found in different parts of the continent. I shall only here observe, that the features of the Negro races are by no means widely diffused in so strongly marked a degree as the preceding description might lead us to suspect. They are nearly confined to a few parts of the coast under the equator. The forehead is much more elevated and the jaw less prominent in many nations of western Africa; and this is still more conspicuous on the eastern side of the continent. The Negroes of Mosambique have a considerable elevation of forehead, which is, however, narrow and somewhat conical in form. Their jaws are less protuberant. This may be seen in several skulls belonging to natives of Mosambique in the collection of Guy's Hospital.

It is still more remarkable in the Kaffer, as it may be seen in the outline of cranium in the adjoining plate, which I have taken from the engraving inserted by Dr. Knox in his memoir on the nations of South Africa. This was the first representation of a skull belonging to the race of Kaffers that has been published by any European anatomist; and the observations of the author are sufficient to prove, that the people who bear that appellation belong to the Negro stock, and are not a race foreign to Africa, or of late appearance in the continent which they inhabit. In all the peculiarities of organization which belong to the African nations, the Kaffers resemble the Negroes: their skulls have, though not in an equal degree, the same characteristics of shape. The extent of development of the upper jaw is in the Kaffer nearly as great as in the Negro, according to the testimony of Dr. Knox, who concludes that the Kaffers are "Negroes of the mountains: or Negroes changed by inhabiting an extratropical climate."*

* In a later part of this work, I shall have occasion to collect all the information that I can procure on the history of the Kaffer and other African nations, and shall then refer to facts which may tend to illustrate their origin and affinities.

Digitized by Google

Paragraph 2.—Skulls of Papuas, Alfourous, and Oceanic nations.

M. Lesson has made considerable additions to the knowledge previously obtained of the native races of the Austral countries. His remarks on the forms of the skull belonging to the Papuas, the Alfourous, and the New Zealanders, are in a great measure new. I shall translate them, as giving a comparative idea of the shape of the head in the various races of men above mentioned. It must be observed that the Papuas, described by M. Lesson, are not the genuine race of that name, but the people of mixed breed, partly of Malayan extraction, who inhabit Waigiou and other islands on the northern coast of New Guinea. Some skulls belonging to this mixed race are figured on the Atlas to the voyage of M. de Freycinet, and have been described by MM. Quoy and Gaimard, the companions of that distinguished navigator. M. Lesson collected some crania of the same description, and he brought with him several genuine skulls of the Alfoura race. He compares these with the crania of Mozambique Negroes, and with those of New Zealanders, which afford a specimen of the characters of the Oceanic nation.

"The skull of the hybrid Papua," says M. Lesson, "is remarkable for a considerable flattening in its posterior part; which forms a square surface, with the angles rounded. This position does not make the occipito-frontal diameter much smaller, comparatively, than the heads of Europeans, Alfourous and Mozambiques: but this is not the case with respect to the bi-parietal diameter, which is much larger, owing to the more considerable development of the parietal convexities. The coronal, although a little larger than that of an European, does not present differences so decided as to admit of description. The face is likewise larger, in consequence of the greater extent of the transversal diameter of the orbitary cavity, and of a slight flattening of the bridge of the nose. The opening of the nostrils is in every respect like that of an European: but the distance from one mastoid apophysis on

Digitized by Google

one side to that on the opposite side is greater. The vertical diameter is nearly similar to that which is common to the heads of Alfourous and Europeans.

The skull of the Alfourous approaches nearer to that of the African Negroes, that is to say, the Mosambiques. The differences which we observed are, 1st. a flattening of the lateral partition of the cranian arch, a position which causes a projection shelving on both sides at the summit of the arch: 2. The occipito-frontal diameter is a little more elongated in the former: 3. The shape of the face is rather less oblique than that of Mosambique, in such a manner that the facial angle is more open in the heads of Alfourous, whence it results, that the nasal bridge is more vertical. The nostrils are not quite so large. If we examine the balls, we find that they are less projecting among the Alfourous than the Mosambiques: but this projection is more considerable than in the Papua and the European, which is owing to the depth of the infra-orbitary fossæ. The jaws of the Alfourous, although less prominent than those of the Mosambique, are much more so in comparison with those of the Papua and the European. The heads of the Alfourous are intermediate in their general form between the skulls of the New Zealanders, and those of the Mosambique Negroes. Like the latter, the two jaws are so much elongated, that they may be compared to the face of an orang. The lower jaw of the Alfourous has the same development with that of the Mosambique, but it is narrower than that of the Papua. All three being compared to the lower jaw of the Europēan, they differ from it in the form of the bone in the basis or lower edge, and lastly in the symphysis. The anterior part of the body of the bone, instead of being inclined backwards, as in the European and New Zealander, is cut perpendicularly, which contributes in causing the arches of the teeth to project more. The basis of the jaw is more rounded, and is raised a little forwards in the Alfourous, Mosambique, Papua, and even the New Zealander. The bend is always less apparent among the Papuas. Placed upon a horizontal plane, the lower edges of the jaws do not touch in all places, as is the case in the European.

Digitized by Google

The lateral angles of the symphysis are consequently more rounded than the latter.

The coronal bone of a New Zealander is less bulging than that of an European. The external orbitary angles are much thicker, and the crooked line which separates them is also more projecting. The summit of the head is prolonged a little in the shape of a sugar-loaf, as in that of the Alfourous. The bridge of the nose has no peculiarity: the anterior part of the body of the lower jaw is placed very much as in the European, from which it only slightly differs in the rounding of the angles, and in the slight bend of the basis. The alveolar arches are a little more developed; the facial angle does not differ much from that of the European, and the external occipital protuberance alone is more strongly marked. Lastly, the bones of the cranium of the New Zealander are remarkable for their great thickness.

From these remarks and the approximation which appears to be manifested by them between the skulls of the several races described, it would almost appear that we may revert to the opinion of Blumenbach, who represents all the tribes of the great southern ocean as constituting one distinct variety of the human species. It seems that a general analogy really exists between the form of the cranium belonging to the Papuas, or woolly-haired nations, the Alfourous or Australians, and the Oceanic tribes, of whom the New Zealanders are a specimen, and that all these tribes partake in different degrees of the peculiar form of the Mosambique Negro. Tribes of people connected with the Alfourous, constitute a considerable part of the indigenous population of the Indian archipelago. They inhabit not only New Guinea and the Moluccas, but also, as we shall hereafter show, the Philippines: and it is probable that the interior of Borneo, and of other large islands, is occupied by tribes allied to the same race. By identifying this race with the Australians, M. Lesson has attempted at least to make one considerable step towards the elucidation of the history of this region and its inhabitants. The near relation of these races is at any rate very probable. In a future part of this work a more

Digitized by Google

proper place will occur for displaying this and other subjects relating to ethnography of the Austral countries. At present I shall confine myself to some further observations on skulls.

I do not believe that any crania exist in European collections belonging to the genuine Papuas of New Guinea. The Tasmanians, or inhabitants of Van Dieman's Land, may however be considered as an offset of this stock. The description of their physical character is quite consistent with this opinion. M. Anderson, who accompanied Captain Cook, has given the following account of the natives of Van Dieman's Land.

"Their colour," he informs us, "is a dull black, and not quite so deep as that of the African Negroes. Their hair is perfectly woolly.* Their noses though not flat are broad and full. The lower part of the face projects a good deal, as is the case of most Indians I have seen; so that a line let fall from the forehead would cut off a much larger portion than it would in an European. Their eyes are of a middling size, with the white less clear than in us. Their teeth are broad, but not equal nor well set. Their mouths are rather wide; but this appearance seems heightened by wearing their beards long, and clotted with paint, in the same manner as the hair on their heads."

Of this race, which is becoming fast extinct, we have several portraits by La Billardière, and M. Péron. I have annexed the drawing of a Tasmanian skull, which is in the Museum of the College of Surgeons. It exemplifies the characters ascribed above to the Papua race, and approximates more to the Negro, as might be expected, than the skulls belonging to the mixed breed of Papuas, described by M. Lesson, and by MM. Quoy and Gaimard, in the zoological department of the great work of M. de Freycinet.

* Captain Cook, as we are told by the writer of his work, on the authority of Captain King, was very unwilling to allow the last-mentioned fact, "fancying that the people who first observed it had been deceived from the hair being clotted with grease and red ochre. But Captain King prevailed on him to examine carefully the hair of the boys which was free from this dirt." He thus became convinced that it was naturally woolly, and assures us himself that it was as much so as that of the natives of Guinea.

Digitized by Google

There are many skulls of Australians in various collections. Blumenbach has figured two in his Decades. I have given the representation of one which is in the museum of the College of Surgeons. All the Australian skulls which I have examined are very similar, and I apprehend that M. Lesson's description of the crania will nearly apply to them. In both and all of them, the upper jaw has a good deal of the strongly marked Negro form; the alveolar process turns somewhat forwards and gives a projecting muzzle, and the head is compressed laterally, receiving, like the skull of the Negro, deep impressions from the high insertion of the temporal muscles on the upper portion of the parietal and temporal bones. The most peculiar character in the Australian skull is a very singular and deep depression at the juncture of the nasal bones with the nasal process of the frontal bone. This may be seen in the engraving. It is very conspicuous in most if not all the Australian skulls which I have seen. The same peculiarity is observable in the crania of many Oceanic tribes. Blumenbach observes, that the crania of a New Hollander, which he has represented in his third Decade, resembles in all its principal characteristics an Otaheitan skull, which he has just before described. The vertex of the Australian is rather more compressed. The summit of the head rises in a longitudinal ridge, in the direction of the sagittal suture. In the Australian skull in Dr. Munro's museum, the forehead is somewhat flat, the upper jaw prominent.* All the foramina except the infra orbital, remarkably large. Some of the insular nations in the Indian and Pacific oceans unite with the prognathous form of the skull, somewhat of the broad-faced type.†

* Dr. Gibson's Inaugural Dissertation, De forma Craniorum gentilitiâ. Edinb. 1808.

† The first attempt by any European artist to represent the countenance and physical character of a nation of the Austral seas, was probably a portrait by the old Dutch traveller Cornelius Le Bruyn, who in his Reizen over Moscovie, inserted the portrait of a Papua from Lange Eiland, on the coast of New Guinea. In this, the shape of the head, as Blumenbach observes, resembles closely that of Australian skulls. The countenance was observed to resemble the New Hollanders who were brought to England by Governor Phillip from New South Wales.

Digitized by Google

SECTION IV.—*Oval form of the Skull—Crania of the Indo-Atlantic or Iranian nations.*

The skulls of the Indo-Atlantic nations differ from those of other races, in having all their parts moderately developed, and they hold a middle place in many respects between the crania of the northern Asiatic and the Negro. The figure of the bony case is more oval if we take a horizontal section of the cerebral cavity. The shape of the face approaches more nearly to the same form; the cheek-bones make no regular projection as in the Turanian skull, in which the lateral prominence of the zygoma gives the section of the face a lozenge form.

Among European nations the Greeks have perhaps displayed the greatest perfection in the form of the head; in other words, it has been supposed that the Grecian race, in the configuration of the cranium which belonged to that people, have exhibited the characteristic traits of the Indo-Atlantic nations in the highest degree. This has been inferred from the remains of Grecian sculpture. It has been thought by some, that the statues of Grecian gods and heroes have been formed, not on the natural model of the Greeks, but by an ideal conception of the form calculated to give the expression of dignity and mental elevation. But Blumenbach has described a Greek skull in his collection, which agrees perfectly with the finest works of Grecian art, and affords good reason for believing that the Grecian profile, as displayed in ancient statuary, is not exaggerated or founded on any imaginary principles, but actually copied from the heads of Greek contemporaries with the artists. The skull to which Blumenbach refers, is described by him as of a rounded or oval form, "the forehead highly and beautifully arched, the superior maxillary bones under the aperture of the nostrils, joined in a nearly perpendicular plane, the cheek-bones even, and turning moderately downwards."*

The idea here obviously suggests itself of connecting the figure of the head, and consequently of the brain, among the

* Blumenbach Decad. Cran. sexta: also a memoir by the same writer in the sixteenth volume of the Goettingen Commentaries.

Digitized by Google

Greeks, with the high distinction attained by that people in philosophy and the fine arts. But before we can determine that this relation is essential and real, we must explain why other nations who partake of the same form have never displayed the same genius. According to Blumenbach, the skull of a Georgian female in his collection is equal in beauty of conformation to the Greek; indeed he only gives to the Grecian skull the second place; but the natives of Georgia have never been supposed to be possessed of any intellectual superiority. It may also occur to those who would refer the great mental power of the Greeks to the organization of their brains, to ask themselves the question why, if that opinion were true, did the Greeks cease, soon after the Roman world had become enslaved, to show any proofs of high intellect? How came it to pass that the subjects of the Byzantine empire, though in the possession of literature and all means of cultivating it, produced no great work of genius during the thousand years which intervened between Constantine the Great and Palæologus? Luxury, sloth, effeminacy, and servile obedience to their despotic rulers, many of whom, with Justinian, were barbarians, constituted the leading features of their character during all those ages, while the German and Latin nations in the west were rising to a higher cultivation, and displaying the greatest moral and intellectual energy: I am not prepared to deny that any connexion exists between perfection and the development and structure of the brain, and vigour in the exercise of the mental functions; but it appears to me that those who dogmatize on this subject, overlook many opposing facts, which they are bound to explain.

The shape of the head differs considerably in different nations, without going beyond those who belong to the class now under consideration. The varieties in the form of the skull in the European nations is the particular object of a work by one of the most distinguished writers of the present day, on physiology and natural history, and to it I must refer my readers who are particularly interested in this investigation.*

* W. F. Edwards, D. M. sur les caractères des races humaines. A Paris, 1829.

Digitized by Google

A considerable number of skulls have been found in barrows in different parts of Britain, and a much greater number might be collected if pains were bestowed upon this object. It might probably be not difficult to obtain a series of skulls displaying the national forms proper to each of the races of ancient Europe. The skulls found in old burial-places in Britain, which I have been enabled to examine, differ materially from the Grecian model. The amplitude of the anterior parts of the cranium is very much less, giving a comparatively small space for the anterior lobes of the brain. In this particular the ancient inhabitants of Britain appear to have differed very considerably from the present. The latter, either as the result of many ages of greater intellectual cultivation, or from some other cause, have, as I am persuaded, much more capacious brain-cases than their forefathers.

SECTION V.—*Of Pyramidal, or Broad-faced Skulls.*

Paragraph 1.—Of the Skulls of the Turanian Nations.

I have termed the nomadic people of northern Asia, who in the form of their skull resemble the Kalmuks, Turanian nations, for reasons already explained. I shall now proceed to a more particular account of the form of their skulls, observing that it belongs to many very distinct and widely-separated human races. Among all these the Mongoles have been the most celebrated as conquerors, and one of their tribes, the Kalmuks, have been most frequently visited by travellers from Europe. Hence the name of Mongoles as well as that of Tartars (which according to Klaproth belonged originally to the same people though it has been of late applied to the Turkish race) was extended to all the nations who bear to the real Mongoles some general resemblance. When the name of the latter people is so applied, it is used in a sense as vague and as widely extended beyond its real meaning as is the term Frank, by which the natives of Europe are designated in the East. To describe all the European nations as one race, under the name of Franks, would not be more improper than to designate the nations of northern Asia as the Mongolian race.

Digitized by Google

The same type of features, and the broad-faced and pyramidal form of the skull belong not more to the Mongoles than to many other nations quite distinct from them. The Ostiaks and Siberian Tschudish or Finnish nations partake of it: the offsets of the same stock in Europe, namely, the Hungarians and proper Finns, no longer display the same character, though it is fully preserved by some of the Laplanders. The Samoiedes in the north of Europe and Asia, as well as the Yukagers, Koriacs, Tschuktschi, Kamtschadales, and many other nations less known, have a similar form, as I shall endeavour to show by accounts hereafter to be cited. The Tungusian, or Man-tschu race, quite distinct from the Mongolian, as well as the Chinese, Indo-Chinese, the Tangusian or Tibetan, and the Japanese nations, belong to the same class. Some tribes of the Turkish or Tartar race display a similar conformation; though others have a different shape of the head, and resemble Europeans. Lastly, the Esquimaux, a race separated into a great number of hordes, and occupying the shores of the Polar Sea, from Asia, where they exist northwards of Kamtschatka, to Greenland in the west, have the pyramidal, or conoidal, or broad-faced skull in a most marked degree. By some the Esquimaux with the Samoiedes have been classed together as a separate branch of the human family, under the title of the Hyperborean race; but there is no sufficient reason for this separation, though perhaps the peculiar type of the whole class of tribes now described occurs in the Esquimaux in a somewhat exaggerated degree. I have given an accurate representation of an Esquimaux skull, in which the distinguishing characters are strongly marked. The most striking of these peculiarities are, 1st. The great lateral extension of the zygomatic arch: the cheek-bones do not project or advance forwards and downwards under the eyes, as in the prognathous skull of the Negro, but take an extension outwards, which meeting the jugal process of the temporal bone forms a rounded sweep, or arch or segment of a circle; hence the face is much broader in the plane of the cheek-bones and under the eyes than it is above or below, and instead of being of a somewhat flattened oval form, as in most Europeans, is of a lozenge shape, rising like one of the

Digitized by Google

faces of a pyramid almost to a point, with a ridge running backward from the summit of the frontal bone over the vertex, and towards the occiput. The upper part of the face is remarkably broad and flat: the slant of the forehead, and the anterior surface of the nasal bones, the cheek-bones and the alveolar part of the maxillary bone being all nearly on one plane. These characters are common to the skulls of the Chinese and the Esquimaux, though somewhat more strongly marked in the latter, in which the lateral projection of the zygoma is greater than in the crania of any other human race. The alveolar process of the upper jaw is more prominent in the Chinese, and turns up forward, though not so much as in Negroes. The spine supporting the septum narium is strongly marked in the Chinese. The nasal bones are rather flat, and the space between the eyes rather depressed in the Chinese.*

When we compare the basis of the skull in pyramidal and prognathous heads, we find the forms receding from each other to opposite extremes, while the European holds the middle character. The skull of an Esquimaux has the zygoma situated a little more forward than in the European. The transverse diameter of the basis cranii is longer in proportion to the antero-posterior than in other races: this is more especially the case in the anterior fourth part of the basis, when measured from the projection of the zygomatic arch: but it is also conspicuous when a transverse line is drawn across the basis of the skull from the body of the temporal bone between the origin of the zygomatic process and the meatus auditorius. The basis of the head is also more flat in the Esquimaux; the downward development of the brain, and the consequent downward extension of the cranial cavity, being somewhat less than in other heads; consequently the plane of the posterior third part of the basis is nearer to the plane of the middle region. I do not find this character in the Chinese skull. The circumference of the basis cranii in the European describes an oval figure: this is somewhat, though in a very small degree, lengthened and narrowed in the African: it is shortened in the Esquimaux, especially at

* I have made these observations in comparing skulls belonging to the two races.

Digitized by Google

the anterior part, as if one end of the oval figure had been flattened, the oval figure being otherwise somewhat wider than the figure formed by the circumference of the basis cranii in the other two classes of skulls.

All the foramina in the basis of the skull are perceptibly larger in the portraits of the Chinese and Kalmuks; some other characters are observable, which are not perceptible in the skulls. "The narrow and linear aperture of the eyelids extends upwards towards the temples, and the internal angle of the eye is depressed towards the nose, the superior eyelid being continued into the inferior by a rounded sweep." This conformation is not dependent on the shape of the skull, in which the orbits are quite level, those of the Chinese being nearly square or rather oblong, with a well-defined or sharp edge.* In neither of these skulls is the cerebral cavity much contracted; as much space being afforded as in many European skulls for the anterior part of the brain.

The zygomatic arches, though forming a round sweep when we turn the skull, present in the front view an angular appearance, owing to a slight projection of the lower edge of the arch. This is particularised from its affording a character which has been thought distinctive of the northern Asiatic nations from the Americans.

Paragraph 2.—Of the Skulls of the aboriginal Americans.

The skulls of the American tribes display the same broad and pyramidal form as the heads of Turanian nations. Travellers have been struck with the general resemblance which certainly subsists between these two departments of mankind. "What we have been stating as to the exterior form of the indigenous Americans," says M. de Humboldt, "confirms the accounts of other travellers, as to a striking analogy between the American and the Mongole race. This

* This is the case particularly in the skull of an Esquimaux. The cranium of an American, supposed to belong to an ancient and extinct race, found in a tumulus near Niagara, resembles the Esquimaux in almost every other respect, and particularly in the pyramidal or triangular form of the front face, but differs in having the edges of the orbit rounded off in a remarkable manner.

Digitized by Google

analogy is particularly evident in the colour of the skin and hair, in the defective beard, high cheek-bones, and in the direction of the eyes. We cannot refuse to admit, that the human species does not contain races resembling one another more than the Americans, Mongoles, Mantchoux, and Malays." The same writer mentions, as a characteristic of the American nations, "a facial angle more inclined, though straighter than that of the Negro;" and he adds, "that there is no race of men upon the globe in which the frontal bone is more depressed backwards, or which has a less projecting forehead." But this observation will not apply equally to all, and probably not to the greater part of the American races. On this subject I shall cite the observations of one of the best informed writers, whose statements are the result of personal observation.*

"The facial angle of the American cranium has been represented by Blumenbach at 73°, an obliquity which induced him to place the American Indian, in his series of the varieties of the human race, as the fourth in number. But his observations were made on the cranium of a Carib, and will not rigidly apply to the Western Indian, who certainly possesses a greater verticality of profile. Agreeably to the mensurations of Dr. Harlan, a cranium which we obtained on the plains of the Platte, exhibits an angle of 78°; a Wabash male, 78°; female, 90°; and a Cherokee only 75°."

Other points of difference may be referred to the direction of the orbits, the degree of prominence in the nose, and the shape of the cheek-bones.

"The line of the direction of their eyes is nearly rectilinearly transverse," says the writer above cited, in describing the lineaments of the Indians on the Missouri. "This," he adds, "is intermediate between the arcuated line of the eyes of Europeans, and that of the Indians of New Spain,

* See an excellent account of the physical characters of the nations of the Missouri, with observations on the peculiarities of the American tribes in general, chiefly drawn up from the notes of M. Say, in the second volume of James's History of the Expedition to the Rocky Mountains, under Major Long. P. 3, et seqq.

Digitized by Google

who, according to M. de Humboldt, have the corners of the eyes directed upwards towards the temple.

"The noses of the Indians in the interior of North America, are generally prominent and aquiline, with the wings not more dilated than those of white men. The pug-nose, and the more common form of the noses of the white Americans, of a concave outline, are regarded as remote from the standard of beauty. The lips are more tumid than those of the white Americans, but very far less so than those of the Negro. The lower jaw is large and robust; the teeth are very strong, with broad crowns; the chin is well formed."

It appears from this account that the American tribes here described differ from the Mongoles, in having prominent noses; but other nations of aboriginal Americans, and particularly several tribes in South America, who will be mentioned in the sequel of this work, appear to have as flat faces as any of the Asiatics.

The cheek-bones appear to constitute one of the most peculiar features of the Americans. Blumenbach and M. de Humboldt have made this remark. "The cheek-bones," says the writer before cited, "are prominent, but not angular, like those of the Mongole, and stamp a peculiarity on the contour of the face, characteristic of the American Indian."*

"The expression of the countenance is austere; often ferocious." This is a remark repeatedly made by the most observant travellers. "The females have broader faces, and a more lively expression."

The nasal cavities are large in the American head. This

* These remarks are confirmed by observations on the Potowatomis, and other aboriginal tribes, by Professor Keating, of the Pennsylvanian University, in the narrative of a late expedition to the Source of St. Peter's River. In describing Metea, a Potowatomi chief, this intelligent writer says, "Like most of the Potowatomis whom we met with, he is characterised by a low, aquiline, and well shaped nose; his eyes are small, elongated, and black; they are not set widely apart; his forehead is low and receding; the facial angle amounts to about eighty degrees. His hair is black, and indicates a slight tendency to curl; his cheek-bones are remarkably high and prominent, even for those of an Indian; they are not however angular, but present very distinctly the rounded appearance which distinguishes the aboriginal American from the Asiatic."—Keating's Expedition to the Source of St. Peter's River.

Digitized by Google

has been observed in several skulls, as in a cranium described by Blumenbach, who connects the circumstance with the powerful sense of smell for which these barbarians are celebrated.

The occiput is somewhat flat, and the protuberances which mark the seat of the cerebellum not very prominent; though in the Missouri Indian, they are still marked and distinct.

One of the most remarkable peculiarities of the American head, and one most generally observed by Blumenbach, is the largeness and depth of the orbits.

It may be questioned whether any of the characters laid down as distinguishing the American races from the Asiatic are constant and applicable to all the Nations of the New World. They chiefly relate to the numerous tribes of the Algonquin family, and to those allied to the Six Nations and to the Floridians. In these the features, especially the nose, are by no means so much flattened as in the Turanian nations. The same remark applies to other northern tribes, and especially to the Chepewyan. There are two skulls in the collection of Guy's Hospital which strongly resemble and have both the characters here described: one belonged to a Chippeway, and may be considered as a specimen of the Algonquin form, the other to a Chepewyan. I have obtained, through the kind assistance of Dr. Hodgkin, a representation of the latter, which I insert by preference, because no skull of this race, hitherto little known, has been seen in Europe.

Many skulls have been found in ancient tombs in various parts of the United States, which resemble the Esquimaux more than the present, or rather the late inhabitants of the country. Did these belong to races exterminated when the Lenni Lenape occupied the region eastward of the Mississippi, or has the physical constitution of the people undergone a change in the course of ages? There is a skull of this description in the museum of Guy's Hospital, of which an account is given in the descriptive catalogue of the collection by Dr. Hodgkin. It was found in a tumulus near Niagara, and is supposed to have belonged to an individual of an extinct race. The skulls of the flat-head Indians have some-

Digitized by Google

what of the same form, but their shape is modified by art. A cranium from an Indian burying-ground, supposed to have belonged to an Illinois savage, which was presented to Blumenbach by Dr. Barton, approaches more nearly to the Caucasian or European than to the Mongolian form: and M. de Humboldt assures us, that some tribes of Indians have European features.

I shall add further observations on particular tribes of Americans, when I come to the ethnography of the New World.

Paragraph 3.—Skulls of the Quaiquæ or Hottentot race.

Very little comparatively has been attempted towards the elucidation of the physical history, and particularly the craniology of the Quaiquæ or Hottentot race. Few skulls belonging to that people have been brought into European collections. It was formerly supposed that the Hottentots were a tribe of Negroes. Mr. Barrow was the first who perceived the resemblance which they bear to the Chinese and other nations with broad and flat-faced skulls. The cranium of a male Bushman is represented in Blumenbach's last decade, in which the lateral prominence and wide spread of the zygoma is very conspicuous, as well as the general unlikeness to the skulls of the Negro nations. In the head of the female Bosjesman examined by Cuvier it is remarked, that the "jaws are more projecting than in the Negro, the face wider than in the Kalmuk, and the nose flatter than in either." In Blumenbach's specimen of the same race, it is observed, that the jaws are not at all prominent, and the incisor teeth, with their alveoli, as well as the chin, on the same perpendicular line. In this respect the female examined by Cuvier seems to have been an exception. In the latter, it is likewise observed that "the orbits are very wide in proportion to their height, the entrance of the nostrils has a peculiar form, the palate a larger surface, the incisor teeth are oblique, the temporal fossæ more extensive." The occipital foramen is proportionally larger than in other heads, which, says Cuvier, "according to the views of Soemmerring would indicate an inferior nature." This

Digitized by Google

trait, however, according to the observation of Dr. Knox, is one point of agreement with the Kalmuk rather than the Negro skull, and the wide orbits remind us of the Esquimaux.

The last-mentioned writer has pointed out many remarkable traits of resemblance between the Hottentots and the northern Asiatic nations, and he has drawn an inference similar to that of Mr. Barrow, though without adverting to, and perhaps without having noticed Mr. Barrow's observation, viz. that the Hottentots were a tribe of the Mongolian race. The most striking particulars in which the Hottentots resemble the Kalmuks and other Turanian nations are,

1. Their complexion is nearly the same.

2. The head in both is broad and square.

3. "The face," says Dr. Knox, "is in the Kalmuk broad, flat, depressed, and the features as it were confluent. The face of the Hottentot resembles that of the Kalmuk, except in the thickness of the lips."

Mr. Burchell describes thus the face of the Hottentot:— "Space between the two cheek-bones flat; scarcely any perceptible ridge of the nose; end of the nose wide and depressed; nostrils squeezed out of shape; chin long and forward: narrowness of the lower part of the face a character of the race." These traits apply equally to the northern Asiatic.

"The nasal processes of the superior maxillary bones are large and broad." Hence the breadth at the root of the nose in the Bushman as well as in the Kalmuk.

4. It was observed by Mr. Barrow, that the "eyes of the Hottentots are of a deep chestnut colour, long and narrow, distant from each other, the inner angle being rounded, as in the Chinese, to whom the Hottentots bear, as he says, a striking resemblance."

5. "The cheek-bones," as the same writer observes, "are high and prominent; viz. outwards, for he adds that the narrow pointed chin forms with them nearly a triangle." Compare what has been said above respecting the skulls of the Esquimaux.

It was observed by Mr. Burchell, that the eyes of the Hottentot are so obliquely placed that lines drawn through the corners of each would not coincide, but would intersect each

Digitized by Google

other as low down as the middle of the nose. This is well known to be common to the Chinese.

6. Mr. Burchell observes, that the hands and feet are remarkably small in the Hottentot.

7. It is further remarked by Dr. Knox, that the whole figure of the Bushman displays the finest symmetry: their stature is very diminutive; he conjectures four and a half feet to be the average height of the males.

8. The Bushmen, according to Dr. Knox, have uncommon powers of vision. He says, "the acuteness of their sight almost exceeds belief. I have found it to be equal to that of most Europeans when aided by excellent hand-telescopes." We may compare this with the observation of Pallas on the extensive vision of the Kalmuks.*

The representation which I have inserted of a cranium of a Bushman will serve to point out to the eye, the analogy, which is undoubtedly very great, between the shape of the head in the Hottentot and Turanian races. I shall not draw the inference that the South African nation has any near connexion in lineage or descent with the Kalmuks; but it may be worth while to observe, that the physical and moral condition of the two races is very similar, and that the external circumstances under which they have existed from immemorial time have been nearly the same. Both are nomadic races, wandering with their herds through deserts remarkable for the wide expansion of their surface, their scanty herbage, the dryness of the atmosphere, and almost perpetual drought. Both races feed upon the milk and flesh of their horses as well as of their oxen. No countries can be more similar than are the vast steppes of central Asia, and the karroos of southern Africa.

The principal difference of the Kalmuk and the Bushman races is the texture of the hair, which in the latter is woolly. In both it is scarce and rare, and the woolly tufts which cover the head of the Hottentot, differ much from the thick wool of the intertropical Negro tribes.

On the comparison of the south African race with the

* Dr. Knox's Memoir.

Digitized by Google

northern Asiatics, my readers may find further observations in the work of M. Desmoulins, which was written subsequently to the Memoir of Dr. Knox.

SECTION VI.—*Of artificial Modifications of the Form of the Cranium.—Elongated Skulls from Titicaca.*

It was once a general opinion that national varieties in the shape of the head were produced, in a great part at least, by artificial means; that the flat noses and depressed features of the Negroes have acquired this form from the contrivances used in infancy to improve their beauty, according to the national taste. One writer, Barbot, supposed that the Negro children, carried continually on the backs of the females, get their noses flattened by striking them continually against the shoulders of their mothers. The opinion that varieties of form are to be attributed to art is as old as the time of Hippocrates, who relates that the Macrocephali, a people on the coast of the Euxine, were accustomed to lengthen by bandages the heads of young children, supposing length of the head to be a sign of courage, until that shape which art had first produced became naturally prevalent in the race; a fact which Hippocrates connected with his theory of generation.

In opposition to the opinion of those who ascribed the flatness of the features of Negroes to artificial compression, it was observed by Buffon, that the peculiarity of the race is already perceptible in young children. This observation was confirmed by Blumenbach, who has given an engraving of the skull of a Negro infant, and by Soemmerring, who declares that the shape of the African cranium may be distinctly recognised in the fœtus as early as the middle period of gestation.

Modern writers, on the other hand, have doubted the fact, that any such modification can be produced in the shape of the head. In opposition to this prejudice, Blumenbach has taken pains to collect a great number of testimonies, by which it is fully proved that many barbarous nations, and particularly those of the New World, have very generally followed

Digitized by Google

the custom alluded to. In particular it seems that the native people of Peru were so much in the habit of binding the heads of children and giving them an unnatural shape, that decrees were issued by the council of Spain, and a synod of the diocese of Lima in the latter part of the sixteenth century, prohibiting the practice.* It is impossible to examine the skulls of the Flat-head Indians, of the Caribbees, and of many other American nations, both in the northern and southern regions of the continent, without being convinced that artificial means have been used to modify the shape of the head.

This subject has acquired additional interest since the discovery of the very singularly shaped skulls of Titicaca. Of one of these skulls presented to the College of Surgeons by Mr. Pentland, I have given a representation in the first plate. The following is an account of them, which was inserted by Professor Tiedemann in the Zeitschrift für Physiologie, and translated by Dr. Graves.†

"During my short visit to Paris," says Tiedemann, "I saw, in the Museum of Comparative Anatomy at the Jardin du Roi, several skulls brought by Mr. Pentland from Peru, where he found them in sepulchres of a very ancient date. These skulls are remarkable for their unusually great length, the axis from the forehead to the occiput being much longer than what is observed in any other skulls I have seen, while the lateral axis is proportionally shorter, in consequence of which they seem compressed at the sides. The face is exceedingly projecting, and the forehead very retreating, so that the facial angle of Camper is smaller than in any known race of men. The os frontis is continued far backwards towards the vertex, and is very long, narrow, and flat. The parietal bones look partly backwards, and where they join the frontal bone make a remarkable arch or protuberance. The occipital foramen is large, and its plane looks not downwards and forwards, but somewhat backwards. The zygomatic processes are not prominent."

* Blumenbach cites the following authorities, Jos. Sanz de Aguire, Collectio maxima Conciliorum Hispaniæ et Novi Orbis.—Histoire du 3e Synode du Diocèse de Lima—Décret du 17 Juillet, 1385.

† Dublin Journal of Medical and Chemical Science. No. XV. p. 475, et seqq.

Digitized by Google

Mr. Pentland obtained these skulls in 1827, in the province of Upper Peru, now called Bolivia. He supposed them to belong to an extinct race of men. In his communication to M. Tiedemann he says, that "he found them in the ancient graves called Huacas, in the great alpine valley of Titicaca, which is likewise remarkable for being the country in which civilization, planted by the Peruvians, flourished to a degree unrivalled among the other tribes of the New World. These sepulchres have the form of high round towers, and in some places are constructed of enormous masses of masonry. The stones are very carefully and skilfully arranged, in a manner similar to that observed in the old structures of Greece and Italy, named by our antiquarians, Cyclopean. I have met them only in the valley of Titicaca, which extends from the seventeenth to the nineteenth degree of latitude south, and on the skirts of the Andes which form that valley. They occur in the greatest abundance in the provinces of La Paz, Oruro, Pacages, and Carangas. I examined several hundreds of these sepulchres, and in all of them found human skeletons, and in all the skull had the same singular shape. The skeletons are in a state of excellent preservation, a circumstance attributable to the great dryness of the climate, the country being situated about two thousand toises above the level of the sea. The skeletons belonged to persons of all ages, from the youngest child to the oldest man. All the heads, young and old, had the same form, from which I conceive that it may be with justice inferred that their peculiar shape was not artificially caused by pressure, as is the case with the Caribs and some other of the barbarous tribes of the New World. The heads presented to the French museum were selected from a great number, and were found in the following places: viz. the island in the lake of Titicaca, Chunguys, Tiaguanaco, Licasica, Tolapalea, and Lennas."

The present inhabitants of the interior of Peru belong to the same race which peopled the remainder of the continent of South America, and which is distinguished by a copper colour of the skin, a thinly scattered beard, straight, strong black hair, and a prominent nose. I am of opinion that the present inhabitants of Peru are derived from an Asiatic stock,

Digitized by Google

the last colony of whom migrated probably about the twelfth century. From these latter settlers sprang the dynasty of the Incas or Ingas, which dynasty was overthrown by the Spaniards, after it had lasted about twelve generations. The Asiatic emigrants had gradually spread themselves over the western coast of South America, conquering, as they spread, the natives of the country: and it is to the latter, in all probability, that the skulls in question belonged. Many sepulchres of the present race of Peruvian Indians occur along the coast of the Pacific Ocean, the skulls found in which agree in every respect with the form of that race, but in no instances do they possess the peculiar characters of those found in the interior. A careful examination of these skulls has convinced me that their peculiar shape cannot be owing to artificial pressure. The great elongation of the face and the direction of the plane of the occipital bone are not to be reconciled with this opinion, and therefore we must conclude that the peculiarity of shape depends on a natural conformation. If this view of the subject be correct, it follows that these skulls belonged to a race of mankind now extinct, and which differed from any now existing.

An excellent commentary on these observations is contained in the following remarks of Professor Scouler, of the Royal Dublin Society, who has visited some of the countries before mentioned, and has brought into Europe similar skulls; his communication is appended by Dr. Graves to the preceding statement.

"The Peruvian cranium described by Tiedemann," says this eminent naturalist, "in the preceding article, possesses so very remarkable a configuration, that we would be tempted to adopt his opinion, that it belonged to an original and primitive race, if we were certain that its form had not been produced by artificial means. If we remember that the practice of deforming the head by means of pressure has been very general throughout America, and the result has been the production of crania as anomalous as those of the ancient Peruvians, we shall rather admit that in this instance also compression has been employed. We are aware that the possibility of deforming the cranium by the application of

Digitized by Google

continued pressure has been denied by able anatomists; but it is unnecessary to examine their reasonings in a case where we can appeal to positive facts. That the Caribs of St. Vincent's flattened the heads of their children is well known; and an inspection of Blumenbach's engraving of a Caribbean skull will convince any one of the great amount of deformity which may be produced. The same custom prevailed in Carolina, according to Adair, and at the present moment it is practised by the Indians inhabiting the banks of the Columbia river and the Nootka Sound. Of the authenticity of this fact, as far as regards the Indians of the Columbia river, we can entertain no doubt, as we have enjoyed ample opportunities of witnessing every stage of the process, and have in our possession a complete series of skulls, in some of which the deformity is as great as in the Peruvian skull figured by Tiedemann. Among the Columbian tribes, the child, immediately after birth, is put into a cradle of a peculiar construction, and pressure is applied to the forehead and occiput. After the head has been compressed for several months, it exhibits a most hideous appearance; the antero-posterior diameter is the smallest, while the breadth from side to side above the ears is enormous, thus reversing the natural measurements of the cranium. As the individual increases in years the deformity becomes less, but even in the adult persons it is very great: from the excessive depression of the forehead the eyes appear as if turned upwards; a circumstance which gives a very peculiar physiognomy to the Indian. The process is slow and gentle, so that the child does not appear to suffer in any way from so unnatural a process, nor do the intellectual qualities of the individual appear to be in any degree affected by it; on the contrary, a flat head is esteemed an honour, and distinguishes the freeman from the slave.

"These circumstances are sufficient to establish the fact, that the human cranium may be distorted by artificial means; and thus render it probable that the skulls of the ancient Peruvians may have been disfigured by the same process. This opinion is greatly strengthened by other circumstances. Blumenbach has figured a deformed and compressed Peruvian

Digitized by Google

cranium from Quilca: the form is different from that of the skull represented by Tiedemann, and from those of the Indians of North-western America, but different modes and degrees of compression will produce different kinds of deformity. We have in our possession a skull in which the pressure has been applied diagonally, from the left half of the frontal to the right half of the occipital bone. In addition to these facts, we have the testimony of historians and travellers, that it was the practise in Peru to compress the heads of the children. The following authorities, as quoted by Blumenbach, are sufficient to establish this point. De la Condamine informs us that the custom prevails in South America, and that it was known to the Peruvians; and in the year 1585, the synod of Lima prohibited the custom under the pain of ecclesiastical punishments. The synod alludes to the practice as universally prevalent in Peru, and that it has fallen into disuse since the arrival of the Spaniards in that country."

These facts are sufficient to prove the possibility of modifying the human cranium by means of pressure, that the custom was very general throughout North and South America, and that the same practice prevailed among the ancient Peruvians; consequently, it is more probable that the ancient skulls of Titicaca owed their strange configuration to a process which we know is capable of explaining the phenomena, than that they constituted an original race, a circumstance of which we have no other evidence than that derived from the shape of the cranium. Professor Scouler has given the sketch of an infant skull of one of the Columbian tribes, which is as much elongated as the skulls brought by Mr. Pentland from Titicaca. The method used for the compression of the head is described as follows:

"Immediately after birth the infant is placed in a kind of oblong cradle, formed like a trough, with moss under it. One end, on which the head reposes, is more elevated than the rest. A padding is then placed on the forehead with a piece of cedar-bark over it, and by means of cords passed through small holes on each side of the cradle, the padding is pressed against the head. It is kept in this manner upwards of a year, and the process is not, I believe, attended

Digitized by Google

with much pain. The appearance of the infant, however, while in this state of compression, is frightful, and its little black eyes, forced out by the tightness of the bandages, resemble those of a mouse choked in a trap. When released from this inhuman process, the head is perfectly flattened, and the upper part of it seldom exceeds an inch in thickness. It never afterwards recovers its rotundity. They deem this an essential point of beauty, and the most devoted adherent of our first Charles never entertained a stronger aversion to a *round-head* than these savages.

"They allege, as an excuse for this custom, that all their slaves have round heads; and accordingly every child of a bondsman, who is not adopted by the tribe, inherits not only his father's degradation, but his parental rotundity of cranium."*

I have taken these highly interesting observations relative to the skulls of Titicaca, from Professor Graves's excellent Memoir on that subject, inserted in the Dublin Journal of Science for July, 1834.

* Cox's Travels on the Columbia River.

Digitized by Google

CHAPTER VI.

ANALOGICAL INVESTIGATION CONTINUED—DIVERSITIES OF SHAPE IN THE SKELETON.

SECTION I.—*General Observations—Varieties in the Shape of the Pelvis in different Races of Men.*

IN the figure of the body, in the size and proportion of the limbs, and in the degrees of strength and agility which thence result, great diversities are well known to exist both between individuals of the same race, and between different races of men. We have now to consider the facts which have relation to the last-mentioned instances of variety, and to estimate their extent.

The most important of these diversities of figure observed to exist between different races, depend upon the formation of the skeleton and the proportions of its component parts; and among the component parts of the skeleton, the pelvis is the principal foundation of these differences. On the shape of the pelvis the form of the body in a great degree depends.

It was observed by Soemmerring, that the loins and hips are more slender in the Negro, and the pelvis narrower than in Europeans. Of this fact, he says, he has been convinced by observing the Negroes who go naked by dozens into the Moors' bath at Cassel.*

Camper had previously given some measurements from which the comparatively narrow size of the pelvis in Negroes was indicated. Camper's measurements are as follows:—he compared the long diameter of the pelvis from one thigh-bone to another, with the small or transverse diameter.

* Soemmerring über die Verschiedenheit, u. s. w. 34.

Digitized by Google

In a Negro, the long diameter to the short, is as . .	39 . 27½
In an European	41 . 27
Yet the Negro was much taller than the European.	
In another European the proportion was	44 . 28
In the male skeleton belonging to Albinus	66 . 43
In a female European skeleton	49 . 28
In two others	44 . 28½
In the Farnese Hercules	48 . 34
In the Pythian Apollo	36 . 48
Venus de Medici	46 . 34*

Soemmerring has given the following measurements in inches:—

	in.	lines.		in.	lines.
In a skeleton of a Negro 20 years old, the long diameter is	3	11½	short diam.	3	7½
In a Negro of 14 years	3	2	. . . .	2	9
In an European 16 years old	4	3	. . . .	3	9
In an old European (shorter than the first Negro,	4	6	. . . .	3	11

From these measurements we are led to believe that the pelvis is smaller in both its diameters in the Negro than in the European: but the examinations made have been principally in males; and the well-known fact that Negro women have easy labours has given rise to a suspicion that the cavity and especially the aperture of the pelvis, is more capacious in the female. Mr. White has stated this to be the fact, on the authority of surgeons to ships employed in the Guinea trade.† But this opinion has not been established upon the evidence of accurate measurements.

It has long been suspected by physiologists that several national varieties exist in the form of the pelvis, and that there is some correspondence between these diversities and the shape of other parts of the skeleton, and even of the skull. The first writer who devoted much time and research to this inquiry was Dr. Vrolik of Amsterdam,‡ whose obser-

* Verhandlingen der Bataafsch Genootschap. Soemmerring, ubi supra.

† White on the Gradation of the Human Species.

‡ Considérations sur la Diversité des Bassins de différentes Races Humaines, par G. Vrolik, M.D. &c. Amsterdam, 1826.

Platen behoorende tot de Beschouwing van het Verschel der Bekkens in onder scheidene Volkstammen, door G. Vrolik.

Digitized by Google

vations had been reviewed and stated in a different relation, by Professor Weber, of Bonn.* Vrolik seems to have been led to these researches by the remark that the shape of the pelvis must have some influence, greater or less, on the conformation of the fœtus. He endeavoured to discover what peculiarities exist in the shape of the pelvis characteristic of different nations, by examining the form displayed by this part of the skeleton in a male and female Negro, in a female of the Hottentot or Bushman race, a male and female Javanese, and in a Mestizo, or a person of mixed breed, having one parent a Mulatto, and the other a white man or woman.

Vrolik has remarked that the differences between the pelvis of male and female Europeans are very considerable, but by no means so striking and well marked as those which are perceived when we compare the male and female of the Negro race. "The pelvis of the male Negro," he says, "in the strength and density of its substance, and of the bones which compose it, resembles the pelvis of a wild beast; while, on the contrary, the pelvis of the female in the same race combines lightness of substance, and delicacy of form and structure. Yet the pelvis of the female Negro, according to the same writer, though of light and delicate form when compared with that of the male, is in all the examples with which he is acquainted, entirely destitute of that transparent portion in which, in the European female pelvis, the bony plates are closely united. He has found this transparency in the pelvis only in one old Negro female, in which however the part in question, when held up to the light, yet appeared not entirely destitute of diploë intervening between the bony plates. But though this characteristic of the race is observed in the female as well as in the male, yet such is the neatness and roundness of form in the pelvis of the former, that nobody on a first view would suppose it to belong to the same nation as the corresponding bones in the skeleton of the male

* Die Lehre von den Ur- und Racen-formen der Schaedel und Becken des Menschen, von Dr. M. l. Weber, Professor der vergleichenden Anatomie, zu Bonn. u. s. w. Düsseldorf, 1830.

Digitized by Google

Negro. Delicate, however, as is the form of the pelvis in the female, it is difficult, as Vrolik thinks, to separate from it the idea of degradation in type, and approach towards the form of the lower animals. This character is imparted by the vertical direction of the ossa ilii; the elevation of the ilia at the posterior and upper tuberosities; the greater proximity of the anterior and upper spines; the smaller breadth of the sacrum; the smaller extent of the haunches; the smaller distance from the upper edge of the articulation of the pelvis, and the projection of the sacrum, or the shortness of the conjugate diameter; the smallness of the transverse diameters at the spines and tuberosities of the ischium, and the lengthened form which the pelvis derives from these peculiarities. All these characters, as he says, recall to our minds the conformation of the pelvis in the simiæ. The elongated shape of the pelvis in the Negress is, in short, the character on which this approximation depends. The ossa ilii assume a peculiar configuration. The summit of the inclined plane, which in the European is in the middle of the crest of the bones of the ilium, between the anterior and upper spine and the posterior and upper tuberosity, is situated in the Negress immediately above the posterior and upper tuberosity; being thus as remote as possible from its situation in the European. The anterior upper spines are placed lower in relation to the cotyloid cavities, and are also less prominent. The anterior and lower spines are nearer to the edge of the cotyloid cavity than in the European pelvis, in which a greater distance is here to be observed. The length of the antero-posterior diameter or of the conjugata, at the upper aperture of the lesser pelvis, is very great in comparison with that of the transverse diameter.

On the inner surface of the lesser pelvis the ischiadic spines are found to be more nearly together, which must not be considered as merely the consequence of the smaller breadth of the pelvis, since at the inferior opening we scarcely discover the space to be narrower than in the European, the ischiadic tuberosities being scarcely less widely separated. The pelvis is here as above, only longer at its anterior part;

Digitized by Google

the angle below the pubic articulation is more acute, and the aperture narrower than in the European.

The structure of the same parts in the Bushman and Hottentot race, is only known as yet by the skeleton of the female who died at Paris, in 1815.* The shape of the pelvis in this individual indicates, in Dr. Vrolik's opinion, the inferior condition of the race, or its greater "animality in comparison even with the Negro." In no individual exempt from deformity have the ilia been observed to assume so vertical a direction. They are likewise remarkable for their very great height, in proportion to their breadth. The breadth is about half an inch less than the pelvis of European females. The height is, on the contrary, much more considerable than in the latter: the ilia reach up beyond the level of the half of the fourth lumbar vertebra. The distance between the two anterior and upper spines of the ilium is a quarter of an inch less than in the smallest pelvis of the Negress measured by Dr. Vrolik, and nearly an inch less than the largest. The lower anterior spines, which by the inclination of the surfaces of the ilia in Negresses, are turned more inwards than the upper anterior spines, are here placed almost in a straight line under the latter. These circumstances give to the pelvis a cylindrical form, which we have not observed in any other example. The spines of the ischia are so wide apart, that in looking into the pelvis at an angle of forty-five degrees, their points cannot be seen. As in the pelvis of the Negro, the transparent part is also wanting in the Bushman, but it appears that less of the diploë exists in the latter, between the inner and outer bony plate. The sacrum is more concave from below upwards than in other females, and its basis pro-

* "La conformation," says M. Cuvier, "frappait d'abord par l'énorme largeur de ses hanches, qui passait 18 pouces, et par la saillie de ses fesses, qui était de plus d'un demi-pied." It seems that this female had the peculiarity of conformation so often remarked to be a character of the Bushman race. "Elle tait sur tablier soigneusement caché, soit entre des cuisses, soit plus profondément: et ce n'est qu'après sa mort qu'on a su qu'elle a possédait."

n the description and figure of a female of the Bushman race, given by G. Cuvier. Hist. Nat. des Mammifères, par F. Cuvier et Geoffroy St.-Hilaire.

Digitized by Google

jects further into the pelvis. By its great convexity at the posterior surface, a projection is formed by which it seems to rise higher. This projection is increased by the thickness of the bunches which surround the parabolic space at the lower and posterior part of the sacrum; for by this the lower and posterior part of the sacrum becomes more elevated at its point of junction with the os coccygis. The great thickness of these bunches is probably designed to increase the points of insertion for the thick fibres of the cellular tissue containing the mass of fat which, in the female Bushman, covers the hips and haunches. The ischiadic tuberosities are thicker and more knotty; their lateral and posterior surface is broader and more elevated than in any other female pelvis. The cotyloid cavities are turned more backwards than in other females; by which the pubic articulation is rendered more prominent before. The neck of the thigh-bone is shorter than in Europeans and even than in Negroes, and it has a more oblique direction. The angle under the pubic articulation is besides much greater than in European females.

In proceeding next to the description of the Javanese, Dr. Vrolik points out the wide differences in moral and physical circumstances which distinguish the conditions of the races already mentioned from those of the Indian islanders, whence, as he says, it is a probable conjecture, that the physical characters of these nations will be found to differ in a corresponding degree. I shall cite his words.

"Vivant dans un climat dont la chaleur s'élève souvent dans les régions montueuses à un degré considérable, mais ne se change jamais en feu brulant qui consume la terre ou fait périr la végétation; habitant un sol qui semble se rajeunir chaque année et ne cesse jamais de communiquer, avec richesse, les fruits de sa fertilité; se nourrissant surtout des productions du pays que son industrie cultive et recueille en abondance; adorant un Etre Suprême, et tenu par là au stricte accomplissement de ses devoirs, il jouit de tous les avantages de la vie patriarchale; tandis que son physique et son moral sont portés à un état de civilisation que nous

Digitized by Google

aurions vainement cherché chez les Nègres et les Hottentots."*

" Il y a dans la stature du Javanais, une admirable beauté de forme dans son maintien, une délicatesse engageante dans tous ses mouvemens, une singulière agilité, pour tout ce qui le touche ou l'affecte un degré très élevé de sensibilité, qui se déclare surtout dans son penchant pour la musique. Il n'y a donc pas de quoi s'étonner que cette délicatesse caractéristique se manifeste aussi dans le système osseux, et que le bassin, pour ce qui regarde sa forme et sa composition, y participe aussi. L'homme et la femme semblent posséder, tous les deux, cette singulière délicatesse; mais indépendamment de celle-ci, quant la forme caractéristique n'indiquerait pas leur différence, encore seroit-il facile de la déterminer ou par l'épaisseur de la substance, ou par la différence d'apophyses, d'éminences et de fosses."

The pelvis of the Javanese is distinguished, according to M. Vrolik, by its peculiar lightness of substance, by the smallness of its size, and by the form of the upper opening of its cavity, which is nearly circular. This writer has described and has given engraved delineations of the pelvis of a male and likewise of a female Javanese. From the first appearance of these, he says, " that any person would suppose himself to be examining bones belonging to a very young person, and nothing but the observation of decisive characters, such as are indicative of the age of full maturity, would be capable of dissipating this impression. We likewise perceive that the muscles which cover the bony surfaces of the pelvis or take their origin in it, are also of thickness, hardness, and strength inferior to those of Europeans, of Negroes and Hottentots, and that this mark holds in the two sexes, although more strongly marked in the male."

" The shortened form of the head," says M. Vrolik, " seems as if it were impressed on the round form of the upper passage

* Dr. Vrolik has given figures of the pelvis of a Javanese man who died in a hospital near Batavia, and that of a female who died in her twenty-third year. For these I must refer to his work above cited:—Platen behoorende tot de Beschouwing van het Verschel der Bekkens, &c.

Digitized by Google

of the little pelvis, a character which is in reality most distinctly manifest in the female, but is not wanting in the male. The diminished breadth of the transverse diameter at this part seems to imply a greater curve outwards of the ilia, in order to preserve a relative size with the abdomen and the thorax. This same inclination also causes the anterior and lower spines to be turned more inwards than in the pelvis of ordinary shape." "The smallness of the prominence of the basis of the sacrum is particularly deserving of notice. To this it must be added, that in none of the pelves belonging to other nations are the ischiadic spines so much turned inwards. Attention to these circumstances will sufficiently point out in what consists the characteristic form of the pelvis in the Javanese."

Professor Weber has examined the various forms of the human pelvis in a different point of view. By the measurement and comparison of a great number of pelves belonging to different races of men, he has proved that all the existing varieties in the shape of this bony structure reduce themselves to four principal forms, which are denominated and described by him as follows.

1. The oval form—die ovale ur-becken-form.

"An oval pelvis, so termed by us, is one in which the upper opening presents an egg-shaped figure, in such wise that this aperture at the anterior part, viz. at the symphysis pubis, is narrow, but towards the middle of the same aperture and the junction of the ilia with the os sacrum becomes gradually and proportionally widened, and again becomes somewhat narrower, in passing backwards to the promontorium, where it ends in an obtuse point.

"The conjugata has here a smaller dimension than the transverse diameter.

"The greater pelvis repeats in the usual manner the same form. The ilia are moderately distant from each other, evenly and proportionably excavated, and neither too obliquely nor too perpendicularly placed, the inner surfaces standing rather opposite to each other, and being neither turned wholly forward nor wholly side-wise. In similar proportions converge

Digitized by Google

the ossa pubis and ischia, and thus the cavity of the pelvis narrows itself by degrees. The sacrum is moderately narrow and long, and gently curved.

"The rami of the ischia lie rather backwards and do not project outwards, and the ischiadic processes retreat instead of projecting into the cavity of the pelvis. The finest proportion prevails throughout, and the pubic angle is neither very acute in the male, nor the pubic arch excessively prominent in the female.

"The capacity and elevation of this oval sacrum generally hold an intermediate place between those of the round and the cuneiform sacrum. The latter, to wit, is too narrow and too high, and the round pelvis, on the other hand, too broad and depressed.

"As we have already shown that the female cranium in comparison with the male has greater roundness, so we find also in the oval pelvis-form a certain difference in relation to the sexes.

"The female pelvis of this particular type, to wit, is rather oval, approaching to round—rundlich oval. The size and the distance of separation of particular parts are more considerable; the hip-bones lie further backward, and are with the sacrum lower or shorter, whence the whole sacrum is more spacious but lower, so that we must distinguish two varieties in this principal type, which are as follows.

"The oval or the male-oval form of the pelvis, which, in perfection, belongs to the male skeleton.

"The round-oval or female-oval type. It must be observed, however, that the former of these shapes is sometimes displayed in the female pelvis.

"2. The round form of the pelvis.

"A round pelvis is one in which the upper opening is cross-formed or round. The circumference, particularly at the symphysis and horizontal branches of the pubis, is more spread out than in the round-oval form, whence the conjugata has nearly the same extent as the transverse diameter.

"The ilia and ischiadic bones stand more perpendicularly, the sacrum is less in breadth, the os pubis smaller than in the

Digitized by Google

form next to be described, whence the cavities of the greater as well as of the lesser pelvis are round and nearly proportionably wide.

" 3. The square or four-sided form is the shape of a pelvis of which the sides, especially that formed by the os pubis, are flat and broad, so that the upper opening forms nearly a perfect square. The transverse diameter is greater than the conjugata.

" 4. The cuneiform shape—keilformige ur-becken-form—belongs to the pelvis which appears on both sides compressed, so as to be narrower from side to side than from front to back. The ossa pubis unite under an acute angle, and the horizontal branches run backward in a straighter direction than in the oval form; the conjugata is lengthened, and the upper opening is oblong rather than oval. The hip-bones are high and converge considerably below: their distance is less asunder than in the previously described forms: the shape of the os sacrum increases this narrowing, so that the cavity of the pelvis is smaller and more contracted that the oval figure. The oblong pelvis makes, however, in the female, some approach towards the oval shape."

The object to be attained by this distribution of the forms of the human pelvis is a proof of the fact that specimens of each kind are to be found in different races of men; whence is to be derived the important conclusion, that no particular figure is a permanent characteristic of any one race. In the previous parts of this work, M. Weber had laid down a similar arrangement in the forms of the skull. He had maintained that four principal forms, bearing corresponding designations, may be pointed out in the shapes of the head; and that skulls presenting a conformity with each and every one of these principal types are to be found in several different races. The examples which he has brought forward of different forms of the pelvis under each of the preceding divisions are as follows:—

Digitized by Google

1. Specimens of the oval form are:

a.—An oval pelvis of an European male, of which the conjugate diameter measures three inches nine lines; the transverse four inches three lines.

b.—An oval pelvis of a Botocudo. This pelvis is remarkably large; all its parts are strongly developed and stand in due proportion; the conjugate diameter is four inches, and the transverse four inches seven lines in length.

The whole pelvis displays no remarkable deviation from the form of a large oval pelvis in an European. A figure of this pelvis is given by Weber.

c.—A cross-oval pelvis of a female European, the highest degree of the oval type that is possible without transition into the round form: the conjugata is three inches ten lines, and the transverse diameter five inches in length. This pelvis, of of which a figure is given, is broad and low; proportionably narrow from back to front, so that the upper opening forms a cross oval figure.

2. Specimens of the round form:

a.—A round European female pelvis. The conjugate diameter four inches two lines, and the transverse four inches five lines.

b.—A round pelvis of a Negress. The conjugate diameter four inches three lines, and the transverse four inches seven lines. The round or cylindrical shape of this pelvis is striking at the first view: the whole character of this pelvis has the closest resemblance to that of the European pelvis just mentioned.

c, d, e.—The pelvis of a Negress, one of a female Hottentot, and one of a female Javanese, figured in plate 33.

3. Specimens of the square pelvis form:

a.—Square pelvis of an European female. The conjugate three inches ten lines, the transverse four inches eleven lines.

b and *c.*—Square pelves of a Javanese male and female.

d.—A square pelvis of a Mestizo.

e and *f.*—The pelvis of a Javanese man and one of a Mestizo, figured in plate 33.

4. Specimens of the wedge-shaped or oblong pelvis:

a.—An oblong pelvis of an European female, which has this shape in the highest possible degree. The conjugate diameter is four inches nine lines, the transverse four inches six lines.

b.—A similarly shaped pelvis of a female Botocudo. Its form comes under the present description and exhibits no peculiarity.

c.—A very similar pelvis of a Kaffer, somewhat narrower than the preceding.

Digitized by Google

d.—The pelvis of a Negress in Von Soemmerring's collection has the same character.

e, f, g.—Three other specimens of the oblong pelvis in Von Soemmerring's collection.

h.—The Negro pelvis in Vrolik's work already cited.

The conclusion at which M. Weber arrives after this extensive and accurate comparison is, that every form of the pelvis which deviates from the ordinary type, in whatever race it may occur, finds its analogues in other races of mankind. Thus two of the figures which he has given, representing in outline the upper opening of the pelvis in two Negroes, and which display the oblong form, coincide with each other and with the outline of an European female pelvis. Another figure of the pelvis of a Negress is round, differing from the preceding, and corresponds with that of a second European, as well as with the pelvis of the Hottentot female. The second Javanese pelvis and that of a Mestizo, which are square, resemble the square European pelvis. The oval form is found in the Botocudo pelvis and in several Europeans, and the oblong in the female Botocudo and the male Kaffer.

With all this the observations of M. Vrolik are still admitted; only it is to be taken into the account, that none of the characters which he has laid down are constant and belonging invariably to a particular race. According to M. Weber's opinion the most frequently occurring form among Europeans is the oval shape of the pelvis; the most frequent in the American nations is the round; the square in people resembling the Mongolians; and the oblong in the races of Africa.

Section II.—*Of the form of the Trunk—Length and shape of the Limbs.*

It was first remarked by Daubenton, that the foramen magnum is placed in quadrupeds behind the centre of gravity, whence an important difference arises in the relative position of the head and trunk in man and the inferior animals. The extent of this difference, when the human skeleton is compared with that of the simiæ, has been most fully made

Digitized by Google

known by Mr. Owen, who has shown that it is much greater in respect to the adult ape than it has been hitherto supposed. Since the time of Soemmerring it has been a general opinion that the Negro differs considerably from the European in the same circumstances, and that the head of the Negro is placed so much further backward on the vertebral column, as to occasion a material difference in the figure of the whole body. This opinion is founded on a very exaggerated idea of the real facts of the case. The foramen magnum is only posterior in the Negro skull to its place in the European in consequence of the projection of the upper jaw, particularly of the alveolar process. When considered in relation to the cranial cavity and the vertex, there is little or no difference between Negro heads and Europeans in this respect, and therefore there can be no material diversity arising from this supposed cause in the general form and attitude of the body.

It has been observed, that the skeletons of Negroes have, in some instances, six lumbar vertebræ. I have seen the same variety in an European; and Mr. Owen has noticed a curious approximation to it in an Australian skeleton. The number of the lumbar vertebræ in the satyr and troglodyte is four, according to Mr. Owen, but the skeleton of the pongo in the museum of the College of Surgeons has five; a fact which affords a similar instance of variety, if, as Mr. Owen appears to have proved beyond all reasonable doubt, the pongo is an adult orang.

The sternum is more arched, the ribs larger, more roundly curved, and the chest more expanded in some Negroes than in Europeans. This was remarked by Soemmerring, who observes, that although there are generally in the Negro seven true and five false ribs, as in Europeans, yet the eighth rib more nearly approaches to the sternum in the Negro; and in one instance there were eight ribs attached to that bone. Soemmerring says, that he has seen the same variety in Europeans. The greater number of true ribs was supposed by Soemmerring to be an approximation to the character of the simiæ. In this he was mistaken, as far as the anthropoid apes are concerned. The troglodyte, according to Mr. Owen,

Digitized by Google

has thirteen ribs on each side, of which seven are true, and six false.

Differences have been observed between Europeans, Negroes, and men of other races, in the relative length of the extremities compared to the trunk, and to the proportion of the limbs and the bones of the arms and legs to each other.

According to some writers, there is a difference between Negroes and Europeans in the proportionate length of the humerus and the ulna. "I measured," says Mr. White, "the arms of about fifty Negroes, men, women, and children, born in very different climates, and found the lower arm longer than in Europeans, in proportion to the upper arm, and to the height of the body. The first Negro on the list is one in the lunatic hospital at Liverpool, whose fore-arm measures twelve inches and a quarter, and his stature is only five feet ten inches and a half. I have measured a great number of white people from that size up to six feet four inches and a half, and among them one who was said to have the longest arms of any man in England, but none of them had a fore-arm equal to that of the black lunatic."

Mr. White has given a statement of these measurements in a table, from which it appears that in general the difference observed is not very considerable, and by no means greater than the varieties which are every day to be observed, on comparing many individuals of any race or nation.

In this instance of diversity observed by Mr. White, it was supposed that a signal approximation to the ape had been discovered; but the difference between adult apes and men in the length of the extremities is so great as to render all such comparisons very remote, and of very doubtful importance with respect to any ulterior conclusion. According to Mr. Owen, the arms of the orang reach to the heel, or at least to the ankle-joint; while in the chimpanzee or troglodyte they extend below the knee-joint. This is a most decided and widely-marked difference between the most anthropoid apes and the Negro races of men. Yet even the slightest approach to the former shape would be a curious circumstance, if it

Digitized by Google

could be fully established. It would tend, with other facts, to imply that the savage races of mankind have somewhat more of the animal even in their physical conformation than the more cultivated races, or those whose improvement by civilization may be dated from a very remote era in the history of the world.

It must be observed that this difference, if it really exists, on an extensive comparison, is only to be found in a scale of averages, the majority of Europeans differing from the majority of Negroes. There are many Europeans whose fore-arms are as long as those of Negroes, and there are Negroes who resemble Europeans. This consideration renders it difficult, if not impossible, to suppose that such a diversity can be owing to original difference of species. In the following chapter we shall inquire whether analogous diversities are known to exist in other tribes of animated beings.

Slender, lean, and elongated limbs are generally found in races who are badly fed, and in those whose food is chiefly or entirely of vegetables. It is observed by Mr. Lawrence that this is the case with the Lascars or Indian sailors who come to England in the East-India ships. Their legs also are long. A greater length of the arms and legs, and smallness of the hands and feet, have been remarked by many writers as general characters of the Hindoos. It was noticed by Hodges, whose remark has been cited by Mr. Lawrence in connexion with this subject, that when the sabres of Hindoos have been brought to England, the gripe has been found too small for most European hands. In the Peschernis of Tierra del Fuego, a half-starved tribe, who are probably of the same race or nation with the huge Patagonians, Forster observed that the thighs are thin and lean, and the legs bent, and badly formed. The natives of Van Diemen's Land and of New Holland are likewise small in stature, with long and slender limbs.

It has been a prevalent opinion that in merely physical powers savage nations are superior to those who are civilized, and that in proportion as the mental faculties become developed, the more the animal qualities become defective. Mr. Lawrence, in his lectures on the natural history of man, has

Digitized by Google

collected a great number of testimonies which completely prove this supposition to be erroneous. The experiments of Péron are well known. By these it was demonstrated that the Australians, Tasmanians, and Turanians, are very much weaker in limbs than the French and English. Even the American aborigines, as Mr. Lawrence has shown from the testimony of Herrera, Mackenzie, Heeren, Lewis and Clarke, and others, betray the same inferiority in physical strength. In engagements between troop and troop, or man and man, the Virginians and Kentuckians, according to Volney, have always the advantage over the American savages.*

The lower extremities are more apt to be crooked, and, as we should say, badly formed, in all other races when compared with Europeans, and the most civilized nations of Asia. Even among the higher and lower classes of the same community there is more difference, perhaps, in respect to this than in any other physical character; and it is not a matter for surprise that the diversity is greater when nations in different grades of civilization are compared.

Soemmerring has remarked, that in Negroes the bones of the leg appear to be bent outwards, under the condyles of the thigh-bone, so that the knees stand further apart, and the feet are turned more outwards than in Europeans.† This observation applies to two Negro skeletons in his possession, and to more than twelve living individuals whom he has seen. Soemmerring's remark is confirmed by Mr. Lawrence, who observes that this peculiarity is observable in the cast of a Negro belonging to the College Museum. "The tibia and fibula are more convex in front than in Europeans. The calves of the leg are very high, so as to encroach upon the hams. The feet and hands, but particularly the former, are flat; the os calcis, instead of being arched, is continued nearly in a straight line with the other bones of the foot, which is remarkably broad."‡

This high position of the gastro cranii muscles, and the clumsy form of the legs, have been observed repeatedly, as

* Lawrence's Lectures, p. 403. † Soemmerring, ubi supra, § 42.
‡ Lawrence, ubi supra, p. 408.

Digitized by Google

well as the flatness of the feet* and the hands. "The only peculiarity," says Dr. Winterbottom, "which struck me in the black hand and foot, were the largeness of the latter, the thinness of the hand, and the flexibility of the fingers and toes."†

I have enumerated the most considerable diversities in the form of the skeleton and the proportion of parts, which have been observed on comparing the different races of men. Whatever conclusion may be drawn respecting these greater instances of diversity will hold, in *à fortiori*, of those which are less. It would be tedious, and it is unnecessary to enumerate all these lesser varieties on the present occasion. I shall beg to refer my readers for an account of these to subsequent parts of this work, in which the physical histories of particular races is to be considered.

* White, ubi supra, p. 54.

† Winterbottom's Account of the Negroes of Sierra Leone, vol. ii. p. 257.

Digitized by Google

CHAPTER VII.

ANALOGICAL INVESTIGATION CONTINUED.—SURVEY OF THE VARIETIES DISPLAYED IN OTHER DEPARTMENTS OF THE ANIMAL CREATION, AND COMPARISON OF THESE WITH THE PHENOMENA ABOVE DESCRIBED.

SECTION I.—*Of Varieties of Colour in Animals.*

I NOW proceed to compare the phenomena of varieties already described in the colour and nature of the integuments, and in the figure of body, proportions of limbs, shape of the skull, and other variable characters of human races, with diversities more or less analogous in the lower tribes of the creation. I shall endeavour to estimate the extent of this analogy, and to determine how far it affords an explanation of the phenomena which it is my principal object to investigate. The varieties of colour and those of form and configurations do not coincide as uniform characters of races: I shall therefore give them a separate consideration, and shall begin, as previously, with the former.

There are few species, especially of domesticated animals, which do not display numerous varieties of colour. Most of these varieties may be enumerated under the following heads:—

1. Many of these tribes afford specimens of a colour analogous to that of the black-haired human races. Horses, asses, oxen, sheep, dogs, cats, hogs, rabbits, fowls, with black hair or wool, or feathers, and a dark-coloured or black skin which is found to accompany either, are familiar examples.

Digitized by Google

2. The leucous variety is almost equally frequent. It occurs frequently among domesticated animals, in rabbits, cats, dogs, oxen, asses, sheep, hogs, goats. It has been found in many wild species, as in monkeys, squirrels, rats, mice, hamsters, moles, opossums, weasels, martins; in the polecat, of which the common ferret is supposed to be the white variety.* In the buffalo, the roe, the camel,† elephant,‡ rhinoceros, the stag and the jaguar of Mexico,§ the common bear of northern Europe,‖ the badger and beaver,¶ it has occasionally appeared. Several species of birds, as crows, blackbirds, canary-birds, partridges, fowls, peacocks, exhibit similar phenomena, having their feathers of a pure white colour, and their eyes red.**

3. The xanthous variety is not less familiarly known. Rabbits, dogs, oxen, cats, with light brown or yellow hair, afford examples of it. The chestnut-horse, which has the mane and tail of a light yellowish brown colour, is precisely analogous to the xanthous complexion in mankind.

All these varieties in the colours of animals sometimes spring up casually and sporadically; in other instances, they are generally prevalent in particular breeds. In the different parts of England, Wales, and Scotland, there are different breeds of cattle and of horses. In some districts, the oxen are always black; in others, brown or spotted. The cattle of particular counties are immediately recognised by their colour. Blumenbach has noticed many examples of the same kind. He remarks that all the swine of Piedmont are black;†† those of Normandy, white; and those of Bavaria, of a reddish brown colour.‡‡ The same author observes that the

* Blumenbach. De l'Unité du Genre Humain.

† Shaw's Zoology.

‡ White elephants are mentioned by Ælian. De Animal. lib. iii. cap. 46.

§ Von Humboldt mentions a white variety of the cervus mexicanus and of the jaguar.

‖ Pallas, Spicileg. Zoolog. fascic. 14.

¶ Pennant's Hist. of Quadrupeds.

** Blumenbach, ubi supra.

†† He says, "When I passed through that country during the great fair for swine at Salenche, I did not see a single animal of any other colour than black."

‡‡ Blumenbach's Beyträge zur Naturgeschichte. Some of the remarks contained

Digitized by Google

oxen of Hungary are of a greyish white; in Franconia, they are red. Horses and dogs are spotted in Corsica. The turkeys of Normandy are black; those of Hanover almost all white. In Guinea, the dogs and the gallinaceous fowls are as black as the human inhabitants of the same country.*

Ælian informs us that Eubœa was famous for producing white oxen; it was termed Ἀργιβόεια.†

The same writer says, that the river Xanthus was supposed to have received its name from the yellow fleeces of the sheep which fed upon its banks. The water of this and some other rivers was fancied by the ancients to render the wool of sheep yellow.‡

In the Mysore there are three varieties of colour in the sheep; they are red, black, and white, and these are not distinct breeds.§

M. Gmelin informs us that the domestic cats in Tobolsk, the capital of Siberia, are generally of a red colour.

The ass of the Carnatic presents singular varieties of colour; some are of the usual ash colour, while others are almost black, in which case the cross on the shoulders disappears. Milk-white asses are also to be found, but they are rare. These are not distinct species, for black individuals have sometimes ash-coloured colts, and vice versâ.‖

Some remarkable facts are mentioned by Azara with relation to the colour of horses and oxen in Paraguay. It is well known that both these races have run wild in South America, and the climate being congenial to them, have multiplied prodigiously in the fertile plains in the neighbourhood of the river Plata. Azara says that all the wild horses are of a chestnut or bay-brown colour, while the tame horses are of all colours, as in other countries. Hence he conjectures this to

in this work were previously published in the "Magazin für das neueste aus der Physik," in a paper which was translated and published in the Philosophical Magazine, vol. iii.

* Blumenbach, de l'Unité du Genre Humain.

† Ælian, lib. xii. cap. 36.

‡ Ælian de Animal. lib. viii. cap. 21.

§ Dr. F. Buchanan's Journey in Mysore, Canara, and Malabar.

‖ Ib. ubi supra.

Digitized by Google

be the original colour of the race. He makes a parallel observation respecting the oxen:—"La couleur des troupeaux domestiques varie beaucoup; celle des sauvages est invariable et constante; c'est-à-dire, brun-rougeâtre sur le dessus du corps, et noir sur le reste; une de ces deux couleurs domine plus ou moins. Cela peut faire soupçonner que le couple primitif de l'espèce étoit de cette couleur que l'on appelle osco."*

Animals of a light colour often have eyes of a light hue.† Some species are however nearly uniform in the colour of the pigment, notwithstanding varieties in the hair. The iris of the horse is of the same hue in black and white horses; but in the cream-coloured horses, the iris is also cream-coloured.

Animals of the leucous variety probably have the same condition of the eyes which is so commonly observed in the human albino. A white mouse in the possession of Blumenbach exhibited intolerance of light: it kept its eyes closed even in the twilight.‡

In animals the hair or wool of which is black, the skin is well known to be also of a dark or black hue. In this there are varieties. Hunter remarked, that the skins of the black and of the white horse are of the same hue; which he explains by the fact that all foals are of the same colour, and that though the hair becomes afterwards different, the skin retains its original hue. This appears to be a singular anomaly. That the skin generally varies with the hair or fur, is well known to furriers, and to those who prepare the skins of animals for various purposes. It has been remarked, that the skin of the black buffalo is of a particularly dark colour. The hue of this species is generally black, but varieties are seen, white, grey, and of a bay or reddish colour. So close is the connexion between the colour of the skin and that of its hairy or woolly covering, that it has been deemed of importance to ascertain in the ram from which the flock was to be bred, the colour of the skin, by inspecting his

* Azara, Voy. dans l'Amérique Mérid. tom. i. p. 578, et seq.

† I have seen a yellow-haired dog with one eye of a blue colour.

‡ Blumenbach in Comment. Reg. Soc. Scient. Gott. vol. vii. Lawrence's Lectures on the Natural History of Man, p. 293.

Digitized by Google

mouth. If there was the least blackness or swarthiness in the tongue or mouth, the ram was rejected from the flock, that he might not communicate an injurious taint to the fleeces of the lambs.

> "Illum autem, quamvis aries sit candidus ipse,
> Nigra subest udo cui tantum lingua palato,
> Rejice; ne maculis infuscet vellera pullis
> Nascentum."*

NOTE ON SECTION I.

The foregoing comparison between the varieties of colour in mankind, and those which occur in other warm-blooded animals, is complete as far as it respects the colour of the hair. The melanocomous races of men are analogous to animals with black hair; those of the xanthous variety, to light brown, or bay, or yellow-haired animals: and the albinos in the human kind, to white-haired animals with red eyes, which are well known.

But it does not appear that this comparison throws any light upon those varieties which distinguish the several melanous races from each other. There is nothing, as far as I know, in other species, exactly parallel to that difference in the hue of the skin or in the shade of colour, which is found between a black-haired individual of the European race, and the African Negro, or the Peruvian. In all these tribes of men, the hair, both crinal and pilar, is quite black: they are therefore all analogous to those animals whose hair, or fur, or wool is black. It is well known that in animals with black fur or hair, the skin itself is of a blackish hue, more or less intense; but nobody has made any observations which tend to show that the shade of colour varies in intensity in the same species in a manner analogous to the gradation of shades which we remark in mankind, when we compare different melanous races. But this difference is perhaps not so considerable as that which occurs between the melanocomous, xanthous, and leucous varieties. In the latter instances the

* See Bakewell on Wool, p. 150.

Digitized by Google

secretion which gives its hue to the complexion is different in kind; in the former it chiefly differs in degree. And we shall prove by adducing a number of facts that these degrees insensibly pass into each other. There are, in reality, many nations of the melanous variety, in which some tribes, or families, approach to the extremes of whiteness or blackness in complexion, which fall within the limits of this variety, as before defined. And this takes place in instances where we cannot refer the phenomenon to any mixture of races. Nor is it surprising, when we consider how frequently the xanthous and leucous varieties spring up out of the melanous.

Section II.—*Of Peculiarities in the constitution connected with the Varieties of Colour.*

Many writers have called the albino a diseased variety of mankind: others have thought the Negro owes his blackness to a particular disease; both these suppositions are groundless, but it is obvious that if they were established, they would throw no light upon the nature of the varieties in question, or on their causes: since a congenital disease is only an example of that variation of structure which is so general a phenomenon among organized beings of all classes.

But there is a certain laxity or delicacy of constitution and structure connected with the peculiar hue of the light-coloured varieties. White has often been termed, from Lord Bacon's time, the colour of defect. The whiteness of hair is owing to a defect of a peculiar secretion. This may be confined to the pilar structure, as in horses which have patches of white hair on places where the skin has been rubbed and injured; or it may be conjoined with weakness of structure or want of vigour in other parts, or in the whole constitution. The feet of horses are thought to be more tender and susceptible of disease when white than when of darker colour. The hoariness of old age is a want of secretion connected with defect of vigour. The oxen of Hungary are said to become white after

Digitized by Google

castration.* The whiteness of some animals during winter, is apparently owing to the defect of the secretion of colouring matter, for promoting which the stimulus of heat is necessary.*

In the albino a want of the secretion which gives colour to the hair, eye, and skin, is connected with a peculiar delicacy of constitution.

The xanthous variety appears to have a degree of the same delicacy. Medical writers, from the time of Galen, have remarked a certain degree of irritability and delicacy of constitution in what they term the sanguine temperament. Persons of very fair complexion are often less robust than those of more swarthy hue: and they are more subject to a variety of diseases. Men of the choleric and melancholic temperaments, which are both characterised by black hair, are well known to have generally sounder and more vigorous constitutions, and to be less susceptible of morbific impressions from external causes than the sanguine. The Negro constitution has some peculiar morbid predispositions, but in many respects is endowed with greater vigour than that of lighter complexion. The muscular fibre in the Negro is said to be of a brighter red than in the generality of men, and apparently capable of more vigorous contraction.†

SECTION III.—*Of the Varieties of Texture in the Human Skin, and of some analogous Phenomena in other Species.*

Besides the variety of colour, other peculiarities have been remarked in the skin of the Negro, and of some other races.

Dr. Winterbottom says that the skin of Negroes is always cool, at least more so than that of Europeans in the same climate, and that it is also remarkable for its sleekness and velvet-like softness.‡ A parallel observation has been made by Bruce and other writers respecting several African tribes.§ The skin of the Otaheiteans is of a similar kind.‖ This cool-

* Blumenbach, p. 131, sect. 38.
† Brown's Travels.
‡ Winterbottom, vol. i. p. 180.
§ Bruce, vol. iv.
‖ Hawkesworth, vol. ii. p. 187.

Digitized by Google

ness and softness of the skin depends probably on the rete mucosum, for albinos, both among the Africans and Otaheiteans, are remarked to have skins which become rough, blister, and crack easily on exposure.* The same state of the skin has been observed among the Sumatrans† as well as among the Caraibs and in the women of Asiatic Turkey.

Burckhardt has made some singular observations on the skin of the Negro, which seem difficult to reconcile with the foregoing: he says, "the Arabs of Berber are chiefly distinguishable from the Negroes by the nature of their skin, which, though very dark-coloured, is as fine as that of an European, while that of the Negro is much thicker and coarser." He remarks also of the Nouba slaves that "the palm of their hands is soft, a circumstance by which they particularly distinguish themselves from the true Negroes, whose hands, when touched, feel like wood."‡

The unctuous softness of the skin in the Negro and other dark-coloured races, is probably connected, as Blumenbach has supposed, with a peculiarly abundant transpiration. It is conjoined with a peculiar odour, which is well known in Negroes and in the Caribbee Indians.§

The same author observes that the race of dogs found in

* Winterbottom, vol. ii. Hawkesworth, ibid.

† Marsden.

‡ P. 312.

§ "Ils ont tous une odeur forte et désagréable. Je ne puis rien indiquer qui put en approcher l'idée. Quand on trouve ailleurs une odeur semblable on l'appelle, aux îles Antilles, une odeur de Caraïbe, ce qui prouve l'embarras, où l'on est, de la désigner." Thibault de Chanvalon, cited by Blumenbach. De l'Unite du Genre Humain, p. 181.

"The Peruvian Indians," says Von Humboldt, "who in the middle of the night distinguish the different races by their quick sense of smell, have formed three words to express the odour of the European, the Indian American, and the Negro: they call the first *pezuna*, the second *posco*, and the third *yaio*."

Mr. James, in the Narrative of a Journey in North America, already cited, informs us that the peculiar odour diffused by the body of the Indian, seems not to be caused so much by the cutaneous transpiration as by the custom of rubbing the skin with odoriferous plants and with bison grease. The same writer observes, that to the acute smell of the Indian, the odour of a white man is disagreeable. Expedition, &c. vol. ii. p. 6.

Digitized by Google

Egypt has a similarly smooth, glabrous, and unctuous skin, and a transpiration particularly abundant.

Whatever difference subsists between the skin of the Negro and that of other tribes of men seems to fall within the degrees of variation which are liable to arise in one species. Many considerable variations might be pointed out in the texture of the integument in several species of animals. Buffon has remarked an instance of this kind in the domestic ass. He observes that the principal variety which takes place in this animal in consequence of domestication, consists in the texture of the skin. The skin becomes softer in the domesticated race, and loses those little tubercles which are dispersed over its surface in the onager. It is of this tuberculated skin of the wild ass that the Levantines make the grained leather termed *chagrin*.*

It is unnecessary to accumulate facts from the lower tribes in the creation to illustrate this subject. I shall conclude this section with the description of a very remarkable variety which has appeared in the human species.

The first account of this phenomenon is to be found in the Philosophical Transactions for the year 1731. A boy, aged fourteen years, was brought by Mr. Machin, one of the secretaries, from the neighbourhood of Euston-hall in Suffolk, his native place, and exhibited to the Royal Society. His body was covered by a remarkable kind of integument, which is thus described by Machin.

" His skin, if it might be so called, seemed rather like a dusky coloured thick case, exactly fitting every part of his body, made of a rugged bark or hide, with bristles in some places; which case covering the whole, excepting the face, the palms of the hands, and the soles of the feet, caused an appearance as if those alone were naked and the rest clothed. It did not bleed when cut or scarified, being callous and insensible. It was said he sheds it once every year, about autumn; at which time it usually grows to the thickness of three quarters of an inch, and then is thrust off by a new skin which is coming up underneath. It was not easy to

* Buffon sur la dégénération des animaux.

Digitized by Google

think of any sort of skin or natural integument that exactly resembled it. Some compared it to the bark of a tree; others thought it looked like seal-skin; others like the skin of an elephant, or the skin about the legs of a rhinoceros; and some took it to be like a great wart, or number of warts uniting and overspreading the whole body. The bristly parts, which were chiefly about the belly and flanks, looked and rustled like the bristles or quills of a hedgehog shorn off within an inch of the skin."

The second account of this person was communicated to the Royal Society by H. Baker. He was at that time forty years of age, and had been shown in London, by the name of the porcupine man. He is described as being "a good-looking well-shaped man, of a florid countenance, who, when his body and hands are covered, seems nothing different from other people. But except his head and face, the palms of his hands, and bottoms of his feet, his skin is all over covered, in the same manner as in the year 1731, which therefore," continues Mr. Baker, "I shall trouble you with no other description of, than what you find in Mr. Machin's account above mentioned; only begging leave to observe, that this covering seemed to me most nearly to resemble an innumerable company of warts, of a dark brown colour, and a cylindric figure, rising to a like height, and growing as close as possible to one another, but so stiff and elastic, that when the hand is drawn over them they make a rustling noise."

"When I saw this man in the month of September last, they were shedding off in several places, and young ones of a paler brown observed, succeeding in their room, which he told me happens annually, in some of the autumn or winter months, and then he is commonly let blood, to prevent some little sickness which he else is subject to, whilst they are falling off. At other times he is incommoded by them no otherwise than by the fretting out his linen, which he says they do very quickly, and when they come to their full growth, being then in many places near an inch in height, the pressure of the clothes is troublesome."

"He has had the small-pox and has been twice salivated, in hopes of getting rid of this disagreeable covering; during

Digitized by Google

which disorders the warting came off, and his skin appeared white and smooth like that of other people; but on his recovery soon became as it was before. His health at other times has been very good during his whole life.

"But the most extraordinary circumstance of this man's story, and indeed the only reason for my giving you this trouble is, that he has had six children, all with the same rugged covering as himself; the first appearance whereof in them as well as in him, came on in about nine weeks after the birth. Only one of them is living, a very pretty boy, eight years of age, whom I saw and examined with his father, and who is exactly in the same condition."

"It appears therefore past all doubt," says Mr. Baker, "that a race of people may be propagated by this man, having such rugged coats or coverings as himself; and if this should ever happen, and the accidental original be forgotten, it is not improbable they might be deemed a different species of mankind."

It seems that a third generation of this singular family is in existence. A description of two individuals, who must be of the third degree from the original patriarch of the stock, has been published by Dr. W. G. Tilesius and by Blumenbach. Mr. Lawrence has given an abstract of these accounts. "Two brothers, John Lambert, aged twenty-two, and Richard, aged fourteen, who must have been grandsons of the original porcupine man, Edward Lambert, were shown in Germany, and had the cutaneous incrustation already described. Tilesius mentions, that the wife of the elder, at the time he saw him, was in England, pregnant. I have seen an individual, whose skin was covered with warty excrescences, and who gave himself out to be a descendant of the Lambert family."

Section IV.—*Of Varieties in the Form and Structure of Animals analogous to the diversities in human races above described.*

In all departments of organized nature, varieties of structure exist in different degrees within the limitations of

Digitized by Google

species, and in all instances they display nearly similar phenomena; it is, therefore, most probable that they would be found, if accurately examined, to depend on analogous causes. This observation would seem applicable to the varieties or races, so termed, which are known to arise in the species of plants. But the nature and origin of these diversities in the vegetable world is a subject of more difficult investigation than that of varieties in the animal kingdom;* and as the latter affords a sufficiently ample field for the observation of analogies, I shall confine myself to a comparison of the phenomena of diversity in structure as they are manifested in different tribes of animals with those which I have already observed in human races.

In pursuing the analogical method of investigating of this subject, we now have to consider what varieties in figure and the structure of parts, and especially in the bony fabric of the body, can be discovered in the lower tribes of animals, which correspond with and may tend to illustrate the diversities of form described in the preceding sections.

Varieties of form and structure occur in different degrees in most races of animals; but it is well known that they are most numerous and remarkable in tribes which have been domesticated, and which have propagated their kinds for many generations under the various circumstances, often remote from those of nations to which the art of man has subjected them. Nearly all the domestic animals exist in great variety of breeds, while the untamed inhabitants of the forest display very little diversity in their forms. The dog, which has been the companion of man from the earliest times, and has followed him into all climates, has been mentioned by Pallas as

* The opinion of M. de Candolle as to the origin of varieties in the vegetable kingdom is well known. He attributes these to hybridity or intermixture of species. It would be presumptuous in me to express any opinion on a subject connected with vegetable physiology in opposition to M. de Candolle, but is it not probable that a certain analogy prevails through all departments of organized nature, in the *originating causes*, as well as the *phenomena* of varieties, and is not M. de Candolle's opinion singularly at variance with the general fact fully conceded by himself, I mean the sterility of hybrid plants in the wild state, without any one exception as yet established?

Digitized by Google

a striking example of the former observation.* In fact, the breeds of dogs exhibit the greatest variableness in structure and animal qualities, and the dog has been contrasted in this point of view with the elephants, which are seldom propagated in captivity, but caught fresh from the wilderness, and in reality display very little variation.

It has been observed by Sturm and by J. F. Meckel, that the shape of the head furnishes in general the principal diversities which are characteristic of particular races in the species of animals and especially of the superior kinds. The proportional length and thickness of the neck present, likewise, important characteristics of race which are very remarkable in the breeds of horses. The chest varies also in breadth in different families of the same species. Meckel also observes that the length, the height, and the proportional breadth of the posterior parts furnish in like manner characters which distinguish races from each other, as do also the length and thickness of the tail. The pelvis is in proportion broader or narrower with constancy in different breeds. We find likewise in the limbs similar diversities in other respects, which reduce themselves under two heads: first, the proportion established between particular subdivisions of the limbs compared with each other and with the whole body; and, secondly, the relations between the subdivisions themselves. But it is most frequently on the form and configuration of the whole body that these diversities principally consist.

Varieties of inferior importance, as Meckel observes, occur in particular systems, or textures, or parts of the body, and these are often very constant: such are varieties in the texture, form, and development of the epidermis or of parts related to it. Scales, feathers, hairs, among which parts horn may be reckoned, although the bony system concurs in particular but variable conditions to the formation of horses, furnish numerous instances of this description.

The disposition, form, and development of the organs of reproduction furnish, likewise, remarkable varieties. Under this observation, M. Meckel alludes to the size and develop-

* Pallas, Spicileg. Zoolog. fasc. 4.

Digitized by Google

ment of the mammæ in human races, and to the elongations of other parts of the system which are remarked in the races of southern Africa.

The stature and the mass of the body also characterise races. The different races of horses, oxen, sheep, and dogs, and of the last especially, furnish, says M. Meckel on this head, the most indubitable examples.

Colour, especially that of the skin, and its appendages, presents, likewise, distinctive characters, though less constant and less general ones: hence it commonly happens, that one kind of hue, though in different shades, is proper to a particular race.*

The various breeds of dogs are alluded to both by Pallas and by Meckel as affording the most striking instances of diversity in species, but some writers have denied the evidence of this example, and have imagined, that there are originally distinct races of different species of dogs. Some, on the other hand, have thought fit to identify the whole dog tribe with the wolf, the jackal, and the fox. The truth seems to lie between these two extremes. It has been proved by M. de Serres that sufficiently characteristic differences may be traced between the skeletons of the dog and the wolf, the fox and the jackal, to constitute separate species, but it does not appear that any such distinctions can be established between the different breeds of dogs. The figure of the skull and the proportionate length of the limbs in comparison with the trunk differ in the several races, and the instinct displays some corresponding varieties, the animal being naturally impelled to procure its prey by the aid of those organs, whether of sight or of smell, which are more fully developed in each breed. In the most highly domesticated races, it appears that the cranium is more fully developed and recedes further from the form of the skull proper to the wolf than in those which are less cultivated, though there is no strongly marked line of discrimination. The mastiff resembles the wolf most: in proceeding from the mastiff to the spaniel all the differences become greater: the

* Traités général d'Anatomie comparée, par I. F. Mechel, traduit de l'Allemand. Paris, 1828, tom. i. p. 418.

Digitized by Google

structure of the maxillary bones and of the teeth undergo alterations. The orbits are larger in dogs than in foxes, and in foxes than in wolves; in the highly domesticated breeds of the dog they are the largest of all.*

Among domesticated animals no species afford, as Blumenbach has observed, more striking and undoubted proofs of the effect of domestication and of changes in external conditions in modifying the structure of breed, and no exception can be taken against the evidence which is in this instance to be found. "No naturalist," says Blumenbach, "has carried his scepticism so far as to doubt the descent of the domestic swine from the wild boar. It is certain that before the discovery of America by the Spaniards, swine were unknown in that quarter of the world, and that they were first carried thither from Europe. Yet, notwithstanding the comparative shortness of the interval, they have in that country degenerated into breeds wonderfully different from each other, and from the original stock. These instances of diversity, and those of the hog kind in general, may therefore be taken as clear and safe examples of the variations which may be expected to arise in the descendants of one stock."†

In following this observation, Blumenbach remarks, "that the whole difference between the cranium of the Negro and that of an European, is by no means greater than that equally striking difference which exists between the cranium of the wild boar and that of the domestic swine. Those who have not observed this in the animals themselves, need only to cast their eyes on the figure which Daubenton has given of both."

"I shall pass over," he adds, "the lesser varieties of breed, which may be found among swine, as among men, and only mention that I have been assured by M. Solzer, that the

* Memoir on the distinctive characters of the dog, the wolf, and the fox as supplied by the skeleton, by M. Marcel de Serres. Edinb. Philos. Jo. July, 1835, p. 244.

† Beyträge zur Naturg. *ubi supra.* See also a comparison between the human race and that of swine, by the same author, published in the Magazin für das neueste aus der Physik, and translated in the third volume of the Philos. Mag.

Digitized by Google

peculiarity of having the bone of the leg remarkably long, which in the human kind is observed among the Hindoos, has been remarked with regard to swine in Normandy. They stand very long on their hind-legs,"—"their back, therefore, is highest at the rump, forming a kind of inclined plane; and the head proceeds in the same direction, so that the snout is not far from the ground."

"Swine," continues Blumenbach, "in some countries have degenerated into races which, in singularity, far exceed every thing that has been found strange in bodily variety among the human race. Swine with solid hoofs were known to the ancients, and large breeds of them are found in Hungary and Sweden. In the like manner the European swine, first carried by the Spaniards in 1509 to the island of Cubagua, at that time celebrated for its pearl fishery, degenerated into a monstrous race, with toes which were half a span in length."

There are breeds of the solid-hoofed swine in some parts of England. The hoof of the swine is also found divided into five clefts.

Buffon had before remarked the varieties of the hog tribe. "In Guinea," he observes, "this species has acquired very long ears, couched upon the back; in China, a large pendent belly, and very short legs; at Cape Verde and other places, very large tusks curved like the horns of oxen; in domestication, half pendent and white ears."*

The different breeds of sheep afford varieties equally remarkable. The following account by Pallas of the sheep of the Kirguis is worthy of observation. He says, "On ne trouve nulle part des moutons aussi grosse ni aussi difformes que ceux des Kirguis. Ils sont plus élevés qu'un veau naissant, et fort pesans. Ils ressemblent un peu pour les proportions aux moutons des Indes. Ils ont la tête très bosselée, du grandes oreilles pendantes; la lèvre inférieure dévance beaucoup la supérieure. La plûpart ont une ou deux verrues couvertes de poils qui leur pendent au cou. Au lieu de queu, ils ont un gros peloton de graisse rond presque sans laine au-des-

* Buffon sur le dégéneration des animaux. Hist. des Quadrup. tom. vii.

Digitized by Google

sous." He remarks, "that although removed into other countries, these sheep retain their peculiarities."*

If we compare the different breeds of sheep which are found in Africa, in Tartary, in various parts of Europe, and consider them all as the modified offspring of one stock, as they are generally supposed to be, we shall have greater instances of deviation than any found in mankind; and this will be more especially the case, if we compare all the breeds of sheep with the wild argali, which is supposed to be the natural type and original of the race.†

Some great diversities in figure and in the proportion of parts are to be found in the horse and the ox kind. "What a remarkable difference," says Blumenbach, "is there in these respects between the horses of Arabia and Syria, and those of northern Germany; between the long-legged oxen of the Cape of Good Hope, and the short-legged breeds of England!" Blumenbach has observed, "that there is less difference in the form of the skull in the most dissimilar of mankind, than between the elongated head of the Neapolitan horse and the skull of the Hungarian breed, which is remarkable for its shortness and the extent of the lower jaw."‡ In this country the heads of the race-horses differ much in form from those of the draft-horses. Wild horses are observed by Pennant to have larger heads in proportion, and foreheads of a round and arched form.§

It was remarked by a writer who has displayed an admirable talent of philosophical reflection and research, that a series of skulls, from the large head of the wild horse to the short head of the Hungarian breed, or the slender head of an English racer, would display more remarkable deviations in form than any that can be found in the crania of human races. These observations on the extent of variety in breeds of horses are illustrated by a description given by Professor Pallas of a race descended from horses which have run wild in eastern

* Pallas. Voyages en Sibérie.

† See a description of the Argali, or wild sheep of Siberia, in Pallas's Spicilegia Zoologica.

‡ Blumenbach, de l'Unité du Genre Humain.

§ Pennant's History of Quadrupeds.

Digitized by Google

Siberia, in the vast open plains near the sources of the Tschugan. These animals, which are the remote offspring of domesticated horses, now differ from the Russian breed in having larger heads and more pointed ears: their mane is short and bristly, and their tail has become shorter. Their colour is said to be almost uniformly of a dun or brown. Pied and black horses are very rare among them. Pallas adds, that their principal traits, or those which distinguish them from domestic breeds of the horse kind, and which may be considered as characteristics acquired by the stock since it ran wild in the desert, are as follows:—they have larger heads than domestic horses, with more vaulted foreheads; their mouths are more hairy, and the mane comes down lower on the shoulders; their limbs are stronger, their back less arched or vaulted; their hoofs are smaller and more pointed; their ears are longer and are bent forwards.*

The urus, or aurochs, which has been supposed to be the wild stock of our domestic oxen, has the fossa lachrymalis remarkably deep. Our oxen have no trace of it.†

The goat exhibits varieties of form. There is a breed of goats near Jerusalem of various colours, black, white, and grey; the ears are remarkably long. The goats of Aleppo are of two breeds; one is like the English, the other somewhat larger, with ears often a foot long, and broad in proportion.‡

No animals exhibit greater diversity of form than the

* Pallas. Voyage en Sibérie, tom. vii. p. 91; tom. i. p. 377.

† Blumenbach, *ubi supra.* It must not, however, be omitted, that the generally received opinion, which makes the urus or aurochs the wild representative of our domestic cattle, has lately been controverted by M. Cuvier. This author has described the fossil skull of an animal of the ox tribe, which he conceives to have been the true prototype of the domesticated breeds, and to have become extinct in its natural condition. It differs considerably, according to Cuvier, from that of the urus. It appears that the ancients were acquainted with two wild animals of this tribe; viz. the urus and the bison, and that one of them has perished. Pliny distinguishes them, and Seneca mentions them both in the following lines:—

> " Tibi dant variæ pectora tigres,
> Tibi villosi terga bisontes,
> Latisque feri cornibus uri."—*Seneca, Hippol.*

See Cuvier sur les Os Fossiles de Ruminans. Annales du Muséum d'Hist. Nat. de Paris, tom. xii.

‡ Dr. Russell, vol. ii. p. 150.

Digitized by Google

domestic fowls. " Some of them," says Pallas, " are large, some extremely small; they are tall, dwarfish; have small, or large and double combs; some have tufts of feathers on their heads; some have bare and yellow legs, others have their legs covered with feathers." What is still more remarkable is, that there is a breed without rumps, common in some parts of England, and another with five claws. The fowl of Padua, of which Pallas has published an account, has a peculiarity in the conformation and capacity of the skull, which is, perhaps, a greater deviation from the usual structure than any other species of animal presents.*

The want of horns is a character of some breeds, both of sheep and oxen: the sheep of Crete and Sicily, and the oxen of Abyssinia, present a singular contrast to these breeds, in the number or enormous size of their horns. In Paraguay there are breeds of oxen without horns, descended from the common horned race. This circumstance is remarked with surprise by Azara, who contrasts it with a fact much more extraordinary, if true,—that the horses in the same country are sometimes seen with horns.

If we take a collective survey of these diversities in the figure and proportions of parts distinguishing particular breeds in the several species of animals, we discover that the primitive type is stamped upon each kind, with a considerable allowance for the origination of new varieties in form and organic structure. The deviations from a common model in mankind are less in degree than those which are found in many other species, and they are in kind analogous, as far as such analogy can be expected.

* Pallas, Spicileg. Zoolog. fascia 4. The upper portion of the skull is dilated into a shell of hemispherical form, full of small holes. The whole cavity of the dilated bone is filled with an unusual abundance of the cerebral substance.

Digitized by Google

CHAPTER VIII.

ANALOGICAL INVESTIGATION CONTINUED—OTHER CONSIDERATIONS RELATED TO THE SAME INQUIRIES—CONCLUSION OF THIS ARGUMENT.

SECTION I.—*Of Diversity of Stature.*

THERE is no variety of stature in the different races of men which can afford any ground for suspecting them to be of distinct origin or species. I shall therefore pass over this subject at present with a very brief notice. The particular varieties of stature which are known, as they characterize different nations, will be adverted to when I proceed to the physical description of each race.

There are no varieties of stature in different nations which are so considerable as those which frequently occur in the same family.

Perhaps the tallest race of men existing are the Patagonians. They are usually from six to seven feet high. Pigafetta, who accompanied Magalhaens, in the first voyage performed round the world, gives their height at eight Spanish feet; that is, seven feet four inches in English measure. Commodore Byron, who saw and conversed with many companies of these people, says, that few individuals were much short of seven feet high. An Englishman of six feet two inches appeared among them as a pigmy among giants. They were large and muscular in proportion. It must be observed, that Byron did not measure them.*

Captain Wallis, who landed afterwards on the same coast,

* Hawkesworth's Voyages.

Digitized by Google

measured several of the Patagonians. He says, that he saw one man six feet seven inches high, several of six feet five or six inches; but that the stature of the greater part was from five feet ten to six feet.*

The stature of the Patagonians was measured with great accuracy by the Spanish officers of the expedition to the Straits of Magalhaens, in 1785 and 1786. They found the common height to be from six and a half to seven feet, and the tallest was seven feet one inch and a quarter high.†

America not only produces the tallest, but also some of the most diminutive specimens of the human kind. The natives of Tierra del Fuego are described by Forster as a set of miserable, destitute, and puny savages. The Esquimaux, in the northern tract of the New World, are a still more diminutive people. This race was first seen by Europeans at the time when the Norwegians, who sailed from Old Greenland under Lief, in 1001, discovered Wineland in Canada, or Newfoundland. The natives of this country were described by the Norwegians as pigmies, only two cubits high, and were termed skrællings, sprigs, or dwarfs. Modern and authentic accounts represent the stature of the race as generally lower than five feet.‡

Africa produces some very small races. The Bushmen are perhaps the most deformed of mankind. Two individuals of this nation, seen by professor Lichtenstein, were scarcely four feet high.

The story of the Quimos, or Kimos, a nation of pigmies, said to inhabit some mountainous tracts in the interior of Madagascar, is now generally discredited. According to Commerson, a female of this nation, who was purchased by the French governor at Fort Dauphin, was about three feet and a half high, and had long arms reaching to her knees. She was probably a person affected with morbid deformity.

I shall examine the accounts of these nations in a future part of this work. At present they are mentioned only that they may be included under the observation already

* Hawkesworth's Voyages.

† Voyage to the Strait, cited by Mr. Lawrence p. 440.

‡ Crantz's History of Greenland.

Digitized by Google

suggested, that every variety of stature which has been found to occur as the general character of a whole race, is frequently surpassed by individual examples among the inhabitants of the same country. Many natives of Europe from eight to nine feet high have been described and exhibited in their time as objects of curiosity, and historical testimonies remain of giants somewhat exceeding this enormous stature. These persons were taller than the Patagonians. On the other hand, dwarfs are not infrequent, still smaller than the reported stature of the Kimos.*

Both dwarfs and giants have offspring of similar stature to their own, so that a race of men might easily arise of extraordinary smallness or gigantic size. Of the propagation of giants, we have an experimental proof in a fact related by Dr. J. R. Forster. It is well known, that the king of Prussia had a corps of gigantic guards, consisting of the tallest men who could be drawn together from all quarters. A regiment of these huge men was stationed during fifty years at Potsdam. "A great number of the present inhabitants of that place," says Forster, "are of a very high stature, which is more especially striking in the numerous gigantic figures of women. This certainly is owing to the connexions and intermarriages of the tall men with the females of that town."

A dwarfish stature is in like manner hereditary. A well-proportioned dwarf of Nuremberg, who measured nearly three feet high, has been mentioned by several writers. Her parents, brothers, and sisters, were dwarfs.†

The different breeds of domestic animals vary from each other in size much more than individuals the most different in stature among mankind. The small Welsh cattle, compared with the large flocks of the southern counties in England, or the Shetland ponies with the tall-backed mare of Flanders; the Bantam breed with the large English fowls, are well-known examples. More striking instances are mentioned by naturalists. In the isle of Celebes, a race of buffaloes is said to exist, which is of the size of a common sheep; and Pennant

* Count Borwluski measured twenty-eight Paris inches; he had a brother of thirty-four inches, and a sister of twenty-one. Lawrence, p. 484.

† Lawrence, *ubi supra*, p. 424.

Digitized by Google

has described a variety of the horse in Ceylon, not more than thirty inches in height.*

SECTION II.—*Of the different kinds of Hair which distinguish particular Races of Men.*

The short crisp hair of the Negro, Hottentot, and some other races of men, is so different from the long, glossy and flowing hair of the Esquimaux and other native Americans, and even from the hair of most Europeans, that there are perhaps no diversities to be found among mankind, which afford a more probable argument than this for constituting different species.

It is common to term the crisp hair on the head of the African "wool," on account of the resemblance it seems to bear to the wool of sheep. Whether this denomination be correct, must depend on the distinction between hair and wool, which it is desirable, if possible, to ascertain.

We are assured by an intelligent writer on the nature and growth of wool, that the peculiarity which has obtained the name of wool for some kinds of hair, is the smallness, softness, and pliability of the fibre. These qualities render it capable of being spun and woven into a cloth, which will felt or mill into one uniform texture, and in which the process of fulling will cover the surface of the threads with a pile. The author adds, that "when the hair of any animal is too hard and elastic to admit of the same effect being produced by a similar process, we cease to call it wool." †

Another writer on the same subject remarks the two following distinctions between hair and wool:—

1. Wool falls off altogether in a mass, and leaves the animal

* Pennant's History of Quadrupeds.

† See Bakewell on Wool, p. 9. He further remarks, "that some wool has a much nearer resemblance to hair, in the hardness and elasticity of its fibre, than other wool equally fine. Cloth made of such wool is hard and harsh to the touch, loose in its texture, and the surface of the thread is bare." — Ibid. It would seem from this, that the main distinction between wool and hair must be in the nature and surface of the filament, which renders it capable, or not, of felting.

Digitized by Google

bare; while hairs fall off singly, and from time to time. 2. The growing part of the fibre of wool varies in thickness according to the season, being thicker in proportion to the warmth of the atmosphere, and smallest of all in winter. On the contrary, the filament of hair is generally of uniform thickness, or tapering a little towards the point.

We may notice that this latter difference, if it be a constant one, is not the essential distinction; and as for the former, the falling off of the fleece in a mass seems to be the result of its being previously interwoven, and in some degree felted together, so that it is impossible for any part to fall off until the filaments are nearly all detached from the skin.* There is no reason to suppose that they all become detached simultaneously, any more than hairs.

After all that has been said on the difference between hair and wool, it appears that there is no absolute distinction between them. When hair becomes very fine and crisp, it is termed wool: the characters of these substances pass insensibly into each other. Therefore if the hair of the African be really such a substance as is properly to be termed wool, it is not by this denomination characterised as something altogether different in kind from the hair of other men.

There is, however, a strongly marked peculiarity in the hair of the Negro. The filaments are evidently finer and shorter. They have a peculiar spiral twist, and apparently a roughness of surface which occasions them to become matted, and in some measure felted together into a mass. This is certainly an approximation to the character of wool. Forster has observed, that the filaments of the hair of the Negro issue from smaller bulbs than those of European hair.†

We may observe, in the way, that every intermediate gradation that can be imagined has been found in a variety of instances, between the crisp hair of the African races, and the lank hair of other nations. In Africa the Hottentots are said to have hair still more crisp, or like wool, than the Negroes;‡ the tribes called Kaffers have hair like that of the Negroes;

* See Bakewell on Wool, ibid.

† Observations made on a Voyage round the World, by J. R. Forster, &c.

‡ Sparrman's Travels.

Digitized by Google

others have it longer. There are other nations in Africa who are black, and in other respects resemble Negroes, but who have curled hair, not crisp. The Papuas have crisp hair, but unlike that of the Africans, it grows to such length that it admits of being bushed out into a periwig, three feet in diameter. The hair of the natives of Van Diemen's Land is as crisp as that of the Africans, though the New Hollanders have straight hair, and in the New Hebrides it is of intermediate character, differing considerably in the natives of the same island.

I have seen hair on the heads of some Europeans so remarkably similar to that of the Negro, that it was scarcely possible to distinguish one from the other.*

In other departments of nature we meet with varieties in the covering of animals, very similar to this variety in mankind.

The sheep affords an instance of this class, which is the most generally known, and the most clearly ascertained. Some sheep bear wool, others hair, and this without any difference of species, or even of race. In some respects this variation is parallel to that of human hair, in others not strictly so.

It is well known that if a flock of sheep is neglected, and no attention paid to their breed; that is, to the selecting of rams and ewes of the finest fleeces for propagation; the fine wool gives place to a much coarser growth of the same kind, intermixed with kemps or strong hairs. The breed seems gradually to degenerate towards the characters of the argali, or wild sheep of Siberia, which has generally been supposed to be the original stock whence all the varieties of domesticated sheep are derived. The argali, according to Pallas, is covered with hair, which in summer is close like

* Particularly of a boy born near Somerton, in Somersetshire, whose parents are both English rustics, with no peculiarity of appearance; the boy had hair which appeared so similar to that of an African, that on a minute comparison I could discern no other difference than that of colour, and perhaps a slight diversity in the surface; the hair of the Somersetshire youth being somewhat more glossy than that of the Negro. This boy was so singular in appearance, owing to his woolly head of hair, that his parents were accustomed to receive money for showing him to strangers.

Digitized by Google

that of the deer, but in winter becomes rough and curled, resembling coarser hair intermixed with wool.* The breeds of sheep kept by the Kirguis-Kaisacs are very similar, with respect to their fleeces, to the argali. They are covered with strong hair, intermixed with coarse wool. We are assured by Pallas, that into whatever countries the breed may be removed, its character continues to be the same.†

It has often been observed that the sheep now existing in the West India islands are covered with coarse hair. They are descended from the woolly sheep of Europe. The change has generally been attributed to the heat of the climate.

Dr. Anderson has called this opinion in question, and conjectures that a different race of sheep may have been propagated in the West India islands. But we have no reason to believe that any other breed was ever introduced into the West Indies, than those of England, and perhaps of Spain. No sheep existed in the islands at the time of their discovery. The different characters of the West India breed must therefore be the effect of the circumstances under which they have existed and propagated their kind. Among these, I am inclined to agree with Mr. Bakewell in believing that the most important is, that they have been neglected by man, particularly with respect to their breed. The heat of the sun, and variation of temperature, will indeed produce a considerable change in the growth of wool on one individual animal; and if those same animals, which are hairy in the West Indies, were brought to England, and properly fed and treated, their appearance would soon be altered to a certain degree. But whatever effect might arise from such an alteration of external circumstances, a great difference would still remain between West Indian sheep and the native sheep of England; and this difference, now inherent in the stock, is strictly analogous to the variety in mankind.

Mr. Bakewell has described a sheep brought from the Mississippi. In figure it exactly resembled our Wiltshire sheep, and was probably the remote offspring of that race. "It was a fine healthy animal, but it produced no fleece. It was

* Pallas, Spicileg. Zoolog. † Pallas, Voy. en Sibérie, tom. i.

Digitized by Google

thinly covered with short coarse hairs, or kemps, under which there was a slight appearance of a fine down or wool." "This," adds the author, "might probably have been increased by proper management."*

On the whole it appears that a considerable change is speedily produced on the fleece of the sheep by the influence of climate. This kind of variation has a close analogy to the diversity between the hair of the Negro and European. But independently of the effect of climate, it seems that there is a great variety in the fleeces of sheep, depending on the breed, and the circumstances of propagation; and this difference, since it constitutes a character which affects the whole progeny, is analogous to the diversity between the different kinds of hair in the human race.

Some other animals besides the sheep are well known to vary in their natural covering in no less a degree.

Goats are both hairy and woolly. Some goats are covered with rough, others with smooth hair. Other races of goats, without any difference that can be supposed to constitute a distinction of species, produce fine wool: as those of Cashmere, from whose fleece the shawls are fabricated. The goats of Lycia are mentioned as producing wool, in the time of Ælian.

The goats of Angora, in Anatolia, produce a fine silky hair of snowy whiteness, and great length. It is remarkable that the cats and rabbits of the same district resemble the goats in the colour and texture of their hair, a circumstance which seems, as Blumenbach has remarked, to imply some peculiar influence of climate on the covering of these animals.

Some breeds of dogs have a covering of close harsh wool, others of softer wool. It can hardly be imagined that these animals are of distinct species from those breeds of dogs which are covered with hair, or that they had different prototypes among the races of wild animals. Wild dogs are not woolly. We have therefore in the dog species fully as great

* The same author has given an account of two English ewes, which were transported to St. Domingo. These animals, soon after their arrival on the island, became languid and sickly, lost their wool, and in twelve months a harsh, sparing crop of hair was observed on them. Bakewell, p. 154.

Digitized by Google

a variety in the texture of the hair, as there is among the races of men.

Blumenbach has observed, that there is a difference in the hair of swine, which he thinks analogous to that of the human kind. He remarks that fair hair is soft, and of a silky nature; black hair coarser, and among several tribes of men, woolly. In like manner among the white swine in Normandy, the hair on the whole body is longer and softer than that of other swine, and even the bristles on the back are very little different, but lie flat, and are only longer than the hairs on other parts of the body. They cannot therefore be employed by the brush-makers. The difference between the hair of the wild boar and of the domestic swine, particularly in regard to the softer hair between the strong bristles, is, as it is well known, much greater."*

Section III.—*Of the hereditary Transmission of Varieties—of Atavism.*

All varieties of structure which are congenital, or a part of the original constitution impressed upon an individual from his birth, or arising from the development of a natural tendency, are hereditary, or liable, with a greater or less degree of certainty, to be transmitted to offspring. In general the peculiarities of the individual are transmitted to his immediate descendants: in other instances they have been observed to reappear in a subsequent generation, after having failed, through the operation of some circumstances quite inexplicable, to show themselves in the immediate progeny.† This fact has been noticed by Lucretius:—

Fit quoque ut interdum similes existere avorum
Possint, et referant proavorum sæpe figuras;

* Blumenbach, *ubi supra*. Comparison between the human race and swine.

† MM. Duchesne and Sagevet have adopted the term Atavism to describe this phenomenon, which is fully recognised in the animal kingdom, and by some supposed to prevail among plants. M. Sagevet has drawn this conclusion without any degree of doubt or hesitation. M. de Candolle does not consider the fact as fully established in the vegetable creation, but as very probable from analogy, and as serving, if admitted, to explain some remarkable appearances. See Physiologie Végétale, lib. iii. tom. ii. p. 758.

Digitized by Google

Propterea quia multa modis primordia multis
Mista suo celant in corpore sæpe parentes,
Quæ patribus patres tradunt à stirpe profecta.
Inde Venus variâ producit sorte figuras,
Majorumque refert voltus, vocesque, comasque."

I have already mentioned some examples of variety in structure transmitted to the progeny through several generations, and I shall adduce many instances of the same description in a future part of this work, when I proceed to consider the causes which have contributed to the formation of particular races of men.

As the complexion depends on minute varieties of structure, or of the texture of parts, the diversities of colour may in reality be referred to the peculiarities of organization. The phenomena of colour, however, and the modes of its transmission to offspring, are more distinguishable, and the facts relating to this subject deserve to be considered separately.

The offspring of parents of the same complexion is generally like them, unless when a new connate variety springs up in the race, a phenomenon which it is not our present object to investigate. The circumstances which give rise to such appearances will be considered hereafter.

But when the parents are of different complexions, the offspring is in some cases of intermediate colour; in other instances it nearly resembles one parent, and seems to derive no peculiarity from the other. It is difficult to say on what circumstances these variations in the phenomena depend, but I shall endeavour to lay down some general observations respecting them.

1. When the parents are of two different varieties, as one of the melanous variety, and the other of the xanthous or leucous, the offspring often follows one parent chiefly or entirely.

This appears to be always the case in respect to the offspring of an albino and a black-haired parent. It seems that there are families of Negroes in which there is an hereditary tendency to produce white children, but in such races no intermixed colour is apt to make its appearance. An instance of this description has been related by Dr. Parsons in the fifty-fifth volume of the Philosophical Transactions. As the

Digitized by Google

facts of this case are very remarkable and well authenticated, I shall copy the account which was communicated to the writer by a respectable lady who had resided in Virginia.

"About nineteen years ago, in a small plantation near to that of this family, which belonged to a widow, two of her slaves being black, were married, and the woman brought forth a white girl, which this lady saw very often, and as the circumstances of the case were very particular, I shall make mention of them here:—When the poor woman was told the child was like the children of white people, she was in great dread of her husband, declaring at the same time, that she never had any thing to do with a white man in her life, and therefore begged that they would keep the place dark that he might not see it. When he came to ask her how she did, he wanted to see the child, and wondered why the room was shut up, as it was not usual. The woman's fears increased when he had it brought into the light; but while he looked at it he seemed highly pleased, returned the child, and behaved with extraordinary tenderness. She imagined he dissembled his resentment till she should be able to go about, and that then he would leave her; but in a few days he said to her, 'You are afraid of me, and therefore keep the room dark because my child is white, but I love it the better for that; for my own father was a white man, though my grandfather and grandmother were both as black as you and myself; and although we came from a place where no white people were ever seen, yet there was always a white child in every family that was related to us.' The woman did well, and the child was shown about as a curiosity; and was, at about the age of fifteen, sold to Admiral Ward, and brought to London in order to be shown to the Royal Society."

Mr. Jefferson has mentioned seven instances of the appearance of the albino variety which fell under his knowledge; in several of these, the individuals who had this peculiarity had children. Three female albinos were the offspring of the same black parents; they had two other full sisters who were black. Two of these albino women bore black children to black men. The fourth example mentioned by Mr. Jefferson was that of a woman, whose parents came from Guinea; they

Digitized by Google

had three other children who were black. This woman was an albino, and bore an albino child to a black man. The sixth example was a white Negress, who bore a black daughter to a black man. The seventh instance was that of a male, who is not said to have had any children.*

Among the instances of white Negroes mentioned by Dr. Winterbottom, there are some in which this character was transmitted. One of them was a young albino man, whose father had been a white Negro, and his mother a black woman. From these parents were born five black and two white children. In another case a man and a woman, both albinos, were born of black parents, who had several other children that were black: both of these albinos were married to blacks. The man had no children; the women had black children.†

Phenomena of this description are not confined to the result of marriages between albinos and black persons; they take place also when other whites are married to blacks. The following instance, related by Dr. Parsons, affords a proof of this assertion:

"A black man married a white woman in York several years ago; of which," says Dr. Parsons, "I had an account from an eye-witness. She soon proved with child, and in due time brought forth one entirely black, and in every particular of colour and features resembling the father, without the least participation from the mother."

A similar observation may be made in other instances, when Europeans of the xanthous variety have been married to persons descended from the darker races of the melanic variety. I have seen a family of several children, the offspring of an European of sanguine complexion and a very dark woman of colour, born in the West Indies. Some of the children are as dark as the mother, others very fair, and of sanguine complexion, with light eyes.

A gentleman with whom I lately conversed, assured me that he knew a family of mixed breed from the West Indies, in which one individual, a young man, was of very dark

* Jefferson's Notes on Virginia, p. 119.

† Winterbottom's Account of the Negroes of Sierra Leone, vol. ii. p. 170.

Digitized by Google

colour, and had African features; his sister had English features, a fair complexion, and red hair.

Mr. White mentions the case of a Negress who had twins by an Englishman; one was perfectly black, with short, woolly, curled hair; the other was white, with long hair.

Instances have occurred in which the offspring of parents of different colours have had different parts of the body of different complexions. The following fact is related by Dr. Parsons in the Philosophical Transactions:

"A black man, servant to a gentleman, who lived in the neighbourhood of Gray's Inn, married a white woman who lived in the same family, and when she proved with child took a lodging for her in Gray's-Inn-lane. When she was at her full time the master had business out of town, and took his man with him, and did not return till ten or twelve days after this woman was delivered of a girl, which was as fair a child to look at as any born of white parents, and her features exactly like the mother. The black at his return was very much disturbed at the appearance of the child, and swore that it was not his; but the nurse who attended the lying-in woman soon satisfied him, for she undressed the infant and showed him the right buttock and thigh, which were as black as the father, and reconciled him immediately to both mother and child. I was informed of the fact, and went to the place, where I examined the child, and found it true. This was in the spring of the year 1747, as my notes specify."

Some very curious instances of a similar description have been cited by Mr. White from the Zoological Magazine.*

* White on the Regular Gradation, &c. p. 123.

They are as follows:—1. 1759, a girl was born in Somersetshire, with the hair on her head of two remarkably distinct colours. After she was grown up a little, the hair on the right side appeared of a jet black, resembling the father's; while that on the left side was of a carroty red, resembling the mother's; each occupying one-half of the head, &c. 2. A few years ago, a person kept a public house in Tooley-street, Southwark, the whole right side of whose body was white, and the left side black. His father was white, and his mother black. 3. A Mr. John Clark, of Prescot-street, Goodman's Fields, is said to have had half of his body white, from his navel upwards, and the other half black. His father was a native of Africa, and his mother an Englishwoman.

Digitized by Google

2. In other instances the offspring between a Negro and an European is what is properly termed a Mulatto; that is, a person of intermediate complexion and general character. This is perhaps more especially the result of marriages between Negroes and Europeans who are not of the fair or xanthous complexion, which is most opposite to that of the Negro, but of the melanous or black-haired variety, but it is also a common fact in all intermarriages of Europeans with Africans.

Section IV.—*Recapitulation and Conclusion of the Analogical Inquiry.*

On a general survey of the phenomena of variation which display themselves in the colour, the structure of integuments, in the hair or other natural covering of the skin, and in the figure and proportions of parts in the inferior animals, we are led to the conclusion that these varieties, which are manifest in all tribes in a domesticated state, or existing under great diversity of external agencies, are in almost every particular strictly analogous to the varieties which distinguish from each other the several races of men. If we consider the great differences of external condition, whether depending upon physical circumstances, as those of climate and local situation, or on the moral state, viz. the various modes and degrees of barbarism or civilization, we should expect to discover much greater and more important diversities in mankind than in the inferior tribes, confined as they are for the most part to regions of limited extent, and to a comparatively simple and uniform manner of existence. The conditions, then, under which these varieties are manifested, are in strict analogy.

When we go on to the enumeration of particulars, we find, in the first place, in the colour of human races, no room for hesitation or doubt, as to the propriety of referring all the varieties which are known to variation from one stock. The white and black-haired, and the intermediate xanthous races, find their counterpart and representatives among most tribes

Digitized by Google

of domestic animals. Even in the more minute and less obvious peculiarities of organization related to the different complexions of mankind, the analogy still holds good. Similar peculiarities are connected with corresponding varieties in animals. In the next instance it appears, that all the differences of shape and conformation which are found among human races, are analogous in kind, though not equal in degree, to the diversities of structure and figure which the several races of domestic animals, such as dogs, horses, swine, sheep and goats, and gallinaceous fowls, display. It would be adverse to probability or contrary to all reasonable expectation, if the figure and structure of mankind, where the various tribes of men exist under circumstances most favourable to the development of such phenomena, should have been found to display less considerable or fewer examples of variation than we have actually discovered. Nor will the views which this comparison of analogous phenomena leads us to adopt be materially impeded or disturbed, even if the opinion of those writers should be perfectly established, who maintain that the skeleton of the Negro has some extremely remote correspondence to that of the orang, or has in several respects a more animal or brute-like character than the bony fabric of an European, since other species in the animal kingdom afford room for similar observations. We have noticed that particular breeds of dogs, viz. those which are the least improved and modified by domestication, indicate some analogies in structure to the wolf. We have reason to believe that similar analogies might be pointed out in the form of the skull, and in other particulars, between the wild or the less improved breeds of the horse kind, and the ass or the jiggetai, and that similar observations might be found applicable more extensively, if different, but proximate species, and especially such as are liable to degenerate into a variety of breeds, were compared accurately on a larger scale.

It therefore appears that the evidence afforded by analogical investigation relative to external varieties is complete, in so far as it relates to the phenomena of external variety.

Digitized by Google

Two inquiries will here suggest themselves to some of my readers; viz. Do these phenomena of variety depend on similar causes in mankind, and in the lower animals? in other words, do they display themselves under corresponding circumstances? Secondly, Are the varieties in mankind more permanent than in the lower tribes? Many of the varieties found in domestic animals take place, or commence, as it were, before our eyes, so that there can be no doubt as to their nature and origin. If human varieties are more permanent than those of the lower species, it will be said that the analogy fails in this particular.

1. With respect to the causes of varieties, or the circumstances under which they originate, or in connexion with which they may be found more or less uniformly to exist, we are not yet prepared for drawing any conclusions. It will be the object of the succeeding parts of this work to investigate the physical history of all the races of men which form the population of different countries. In the course of this investigation, it will appear how far their physical character exists in connexion with particular influences of climate and situation; whether or not they have local relations, and how far they may be connected with peculiarities of habit and the manner of life. At the conclusion of this inquiry, the proper place will be found for entering, with a prospect of success, on the consideration above suggested.

2. The inquiry which regards the permanency of varieties is the most difficult investigation which the physical history of mankind presents; and those physiologists who have maintained the original diversity of races, have rested their argument entirely on this ground. This subject also will, as I trust, be elucidated in the course of the succeeding parts of my work, in which I shall endeavour to trace by ethnographical researches how far the peculiar traits of different races are constant, and in what degree they have deviated from the original or the prevalent character of each tribe; and to discover examples, if any such exist, in which important alterations of figure and complexion have originated within the limits of history. In adverting briefly to the comparison of different species in this particular point of view,

Digitized by Google

we may observe that varieties in the tribes of animals are very different in regard to the constancy of their transmission. In some species they are much more regularly handed down to the offspring than in others: this is a well-known fact with relation to the vegetable tribes, and it has been already noticed and illustrated by Mr. Knight and other writers on the propagation of plants. In animals the same difference is observable: in certain races varieties are continually springing up, and they as speedily disappear. Perhaps the sheep may serve for one instance of these more variable tribes, in which likewise the varieties which arise are more ready to become again lost. In certain species varieties are, as it would appear, produced with greater difficulty; and in these, when once generated, they continue with greater permanency. In some instances it is not improbable that modifications in the form and texture of parts, originating but rarely, become in future time constant and invariable characters. We have, however, in all instances, sufficient evidence that the same law of hereditary transmission prevails in every tribe, by which qualities belonging to individuals, such at least as are congenital, have a tendency to preserve themselves in propagation, and to become appropriated to whole progenies. This is the principle on which the existence of permanent varieties depends; and we have already found sufficient evidence of its agency both in human races and in many of the tribes of animals and plants.

What has been already said in this brief recapitulation, has reference to the subjects considered in the few immediately preceding chapters, which treat of varieties in colour and the form chiefly of external parts. The analogical conclusion has been principally a negative one. I have endeavoured to establish the general fact, that no remarkable instance of variation is discoverable in mankind of which a parallel may not be found among the lower orders of the creation. Perhaps the evidence may be nearly as complete as the nature of the investigation could entitle us to expect it to be. Still it is of a

Digitized by Google

negative kind, and not so cogent of conviction as a positive argument would be. But here I must refer my readers to the conclusions obtained in the first and second chapters of the same book; viz. those which contained physiological and psychological comparisons. These conclusions carried with them something of positive evidence. In the first chapter it was attempted to be proved—the reader can judge with what degree of success—that tribes of animals which belong to different species differ from each other physically in a variety of particulars in which the most dissimilar of human races betray no such differences. In the first place, separate but even proximate species differ from each other in respect to the principal laws of the animal economy, as those which govern the duration of life, the periods of uterogestation, the facts which relate to reproduction. Human races coincide strictly in all these particulars. Secondly, different species of animals have different diseases, are subjected to different pathological laws, if I may use such an expression. All human races are liable to the same diseases; at least, the varieties which exist in these respects are such as are produced by the influence of climate. Thirdly, distinct species do not freely intermix their breed, and hybrid plants and animals do not propagate their kind beyond at most a very few generations, and no real hybrid races are perpetuated; but mixed breeds, descended from the most distinct races of men, are remarkably prolific. The inference is obvious. If the mixed propagation of men does not obey the same laws which govern the breeding of hybrids universally, the mixed breeds of men are not really hybrid, and the original tribes from which they descend must be considered as varieties of the same species. In the second chapter, which contains psychological comparisons, I endeavoured, in the first place, to establish on a broad scale the observation that species, even the most nearly resembling and belonging to the same genera, are endowed with peculiar psychical qualities, which are even more distinct, and therefore characteristic of particular species, than peculiarities of bodily structure; that all species, in fact, differ from each other in respect to their instincts, or those active principles which with wonderful constancy govern the lives and habits

Digitized by Google

of creatures belonging to each kind, and give to each tribe an uniform and unvarying character. Secondly, that mankind, however they vary in different ages and countries in respect to acquired habits and the arts of life, are yet subjected not less than the inferior tribes to the influence of certain impulses or active tendencies, which, like the instincts of animals, are constant and invariable. Thirdly, I attempted to prove, by a survey of some phenomena illustrative of the psychical character of some of the most dissimilar human races, that they all have common affections, sympathies, and are subjected to precisely analogous laws of feeling and action, and partake, in short, of a common psychical nature, and are therefore proved, with the same degree of evidence which has been obtained from the general observation above laid down, to belong to one species or lineage. Probable evidence from its nature admits of accumulation; and perhaps it will be allowed that a considerable mass of evidence has thus been collected in support of the same conclusion with respect to the tribes of mankind.

END OF VOL. I.

R. CLAY, PRINTER, BREAD STREET HILL.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google