Werk

Titel: The Anthropological Treatises of Johann Friedrich Blumenbach ... with Memoirs of
Autor: Blumenbach, Johann Friedrich
Verlag: Longman, Green, Longman, Roberts, & Green
Ort: London
Jahr: 1865
Kollektion: Blumenbachiana
Digitalisiert: Niedersächsische Staats- und Universitätsbibliothek Göttingen
Werk Id: PPN640266037
PURL: http://resolver.sub.uni-goettingen.de/purl?PPN640266037
OPAC: http://opac.sub.uni-goettingen.de/DB=1/PPN?PPN=640266037

LOG Id: LOG_0028
LOG Titel: Beyträge zur Naturgeschichte. Erster Theil = Contributions to Natural History, Part I.
LOG Typ: chapter

Contact

Niedersächsische Staats- und Universitätsbibliothek Göttingen
Georg-August-Universität Göttingen
Platz der Göttinger Sieben 1
37073 Göttingen
Germany
Email: gdz@sub.uni-goettingen.de

BEYTRÄGE

ZUR

NATURGESCHICHTE,

VON

JOH. FR. BLUMENBACH,

PROF. ZU GÖTT. UND KÖNIGL. GROSSBRIT. HOFRATH.

ERSTER THEIL, ZWEYTE AUSGABE.

GÖTTINGEN:
BEY HEINRICH DIETERICH. 1806.

CONTENTS.

Appendices.

CONTRIBUTIONS TO NATURAL HISTORY,

BY

J. F. BLUMENBACH.

PART THE FIRST.

I.

On Mutability in the Creation.

"YES, that's the way of the world," says Voltaire; "we can't get any more purple, for the Murex has long since been exterminated. The poor little shell must have been eaten up by some other larger animals." "God forbid," answer the physico-theologians; "it is impossible that Providence can allow of the extinction of a species[1]." Thus says the noble village pastor of Savoy in *Emilie*, "There is no creature in the universe that may not equally be looked upon as the common centre of all the rest." And, says another in addition, "There is no one, so to say, which is not that for all the rest of the creation, which the head of Phidias was for the shield of his artificial Minerva, which could not be removed without the whole of the great work falling to pieces."

"Rather than that," says Linnæus, "let nature create new sorts. Thus not far from Upsala, on the island Södra-Gaesskiaeret,

---

[1] See Pennant's *History of Quadrupeds*, Vol. I. p. 161. "Providence maintains and continues every created species; and we have as much assurance, that no race of animals will any more cease while the earth remaineth, than seed-time and harvest, cold and heat, summer and winter, day or night."

a new plant has appeared, the *Peloria,* that is undoubtedly a sort of new creation." "Ah," they answer, "nature is an old hen, which will certainly lay nothing more fresh at this time of day." "Certainly not," decides Haller; "and such errors should be denounced, because they will be eagerly snapped up by the atheists, who will be only too glad to demonstrate the instability of nature as well by the appearance of new species, as by the pretended extermination of old kinds. And this must not be; for if order in the physical world comes to an end, so also will order in the moral world, and at last it is all over with all religion."

If I may presume to put in a word here myself, my opinion is that on all sides too much has been made of the matter. The murex exists up to the present day just as much as in the time of the old Phœnicians and Greeks;—the peloria is a monstrous freak of nature, and no new particular independent species. Nature is made common, but is not exactly an old hen,—and the creation is something more solid than that statue of Minerva, —and it will not go to pieces even if one species of creatures dies out, or another is newly created,—and it is more than merely probable, that both cases have happened before now,—and all this without the slightest danger to order, either in the physical or in the moral world, or for religion in general. For my own part it is exactly in these things that I find the guidance of a higher hand most unmistakeable; so that in spite of this recognized instability of nature, the creation continues going on its quiet way; and on that very account it is my opinion that it is well worth the trouble, after such an immense deal has been written upon the pretended unchangeableness of the creation, just once to recollect on the other hand the proofs of the great alterations in it. To do this I shall be obliged to go some way about.

II.

A Peep into the Primitive World.

Every paving-stone in Göttingen is a proof that species, or rather whole genera, of creatures must have disappeared. Our limestone swarms likewise with numerous kinds of lapidified marine creatures, among which, as far as I know, there is only one single species that so much resembles any one of the present kinds, that it may be considered as the original of it; and this is that particular kind of the Terebratulæ in the Mediterranean and Atlantic waters, which from their appearance have received the name of the cock and hen[1]. For one of the two delicate bellied shells rises behind over the other at the junction, and so when it is seen in profile it has some resemblance to a cock which is treading a hen.

Amongst the quite countless host of other lapidified marine creatures, who have found their grave in our soils, there are no doubt many (as amongst the Mytilites, Chamites, Pectinites, &c.) to which most naturalists attribute as many distinct originals, but I have very often compared, in these instances, the petrifaction[2] with the pretended original, and it is not my fault if I have come to the conclusion that both are unmistakeably specifically distinct from each other[3].

In a very great number of the remaining lapidifications of this country the forms differ so very surprisingly from all creatures now known, that I hope no one will in future really

---

[1] *Anomia Vitrea.* Chemnitz's *Conchylien-cabinet,* B. VIII. Tab. LXXVIII. fig. 707—709.

[2] [Three words are employed somewhat loosely by Blumenbach: *versteinerung, petrefact, fossil:* I have translated them, *lapidification, petrifaction,* and *fossil* respectively.—ED.]

[3] Nearly the only, but therefore all the more important, use of the knowledge of lapidifications, is the solution which the history of the changes of the earth's surface derives from it; but unfortunately to arrive at this requires the most extreme accuracy of observation, especially when we come to the comparison of petrifactions with their pretended originals. Want of accuracy in this has already produced the most extraordinary cosmogonical errors.

try to reckon them amongst these last[1]. I will mention two genera only out of all, the Belemnites[2] and the Ammonites, of both of which I have before me all sorts of different species from most of the countries of Europe, and even from Asia, and which will also most likely be found in the other parts of the world, the islands of the fifth part excepted[3]. At present they reckon about 200 different species of the Ammonite genus; and I do not think this is an exaggeration[4], although I have never considered it worth while to count them up advisedly. No true representative of any one of these 200 species has yet been found in the existing creation. It is plain also from observing well-preserved Ammonites, that notwithstanding some are of quite colossal size, they must have been very slender-shelled, light, and unattached conchylia, and could not have lived, as was at first suggested as an evasion, sunk in the depths of our seas. And as we now, by the great voyages through which the king[5] has caused the larger portion of the fifth part of the world to be discovered, and the boundaries of our earth to be ascertained, are coming to be better acquainted with the

---

[1] Superintendent Schröter considers it as one of the chief uses which we derive from the study of petrifications, that they help us to fill up the gaps in the gradation of nature. "Without them," says he, in the 3rd Vol. of his *Einleitung in die Geschichte der Steine, &c.*, s. 94, "we should find the most wonderful gaps in this gradation and chain of nature, which are fortunately filled up for us by means of the science of lapidifications." If we found this remark in any other writer, we should consider it as something witty upon the asserted gradation of nature with regard to the generation of her creatures; for all this *can* only mean that what the Creator has not given us *in natura*, at least He has had cast in effigy for the assistance of the physico-theologians and their allegorical images of chains and links in His creation. On this I will say a little more in the *additions*, at the end of this part.

[2] Belemnites are even still some of the commonest of lapidifications. The Chevalier D' Hancarville, *Recherches sur l'origine des Arts de la Grèce*, B. 1. s. 2,—an unparalleled book—gives as a reason why we do not find them in still larger numbers —that so many of them were *shot* away, if we can trust his assertion, in the childhood of mankind. For, says he, "before they used copper or iron to arm the points of their darts with, they used to employ these Belemnites. The Arundel marbles place the epoch of the discovery of iron in the year 87 after the arrival of Cadmus in Greece. Before that epoch the spears of the Greeks were *necessarily* armed with these Belemnites, the name of which has been handed down to our time, and shows the use."

[3] J. R. Forster, *Bemerkungen auf seiner reise um die Welt*, s. 19.

[4] In the *Breslauer Sammlungen* of 1725, it is stated that the zealous and sagacious collector of petrifactions, Rosinus of Munden, had already collected over 300 sorts of Ammonites.

[5] George III.

ocean than the firm land of our planet, we must consequently give up the hope that the representatives of these widely scattered animals, like thousands of other fossils, are still living, sunk in our oceans.

III.

An old Preadamite Creation has already lived out its existence.

Putting all these things together, in my opinion it becomes more than merely probable that not only one or more species, but a whole organized preadamite creation has disappeared from the face of our planet. Out of all existing theories of the earth with which I am acquainted, there is no single one by which the instantly apparent peculiarities of the petrifactions in our calcareous strata can be brought into any order. But they will be at once easily explained, as soon as it is understood, as I have said, that our earth has already suffered a complete revolution, and experienced one last day. It is plain that other so-called cosmogonical phenomena, as, for instance, the quantity of fossil bones of the elephant, rhinoceros, and other animals of the present earth, which have been dug up in this country, and more of the same kind, must unfortunately be accurately separated and divided from that complete revolution. This it is, if I mistake not, which has till now always been the rock on which even the most sagacious theories of the earth have foundered, so soon as they have endeavoured to refer all these phenomena, which are so different from one another, to one single common revolution, and to explain all by one and the same catastrophe[1]. A naturalist, who is as sagacious as amiable, has recently attempted to connect the origin of those fossil bones found in

[1] In opposition to this view, I have in the *Specimen Archæologiæ Telluris*, &c. Gött. 1803, 4to, endeavoured to explain the old history of our planet, and especially the nature, and also in general the sequences of the totally different catastrophes it has gone through, by which the numerous fossil remains of former organic creations have come into their present positions, principally by a critical comparison of these fossils with the organized bodies of the present creation. Of these also a word below, in the additions, at the end of this part.

this country belonging to foreign land-animals and the actual lapidifications of the marine creatures in our calcareous strata in this way with each other, by supposing that the present position of those land-animals is not their original home, but that after their death they fell into rivers, and so by degrees were huddled together by the currents on the existing floor of the sea. But those localities, at all events where I myself have examined the position of the large exotic bones, are very difficult to reconcile with that hypothesis. Thus, for instance, I have myself examined at Burgtonna, in Gotha, the bed of both the elephants which were dug up there in 1695 and 1799, and found that it was so completely made up of strong layers of marl, which were so full of small, delicate, and for the most part uninjured land and river shells and the like, that I consider it is quite impossible this bed could ever have been the floor of the sea; but that most likely the elephants, rhinoceroses, and tortoises, of all of which I have got together[1] instructive specimens for my collection from the Tonna marl-strata, must have been naturalized at one time in that country, no one knows how long after the supposed general revolution. This general revolution, from which may be dated the countless extinct organized creatures in the calcareous strata, is again quite different from the subsequent later one, which must have occurred when the earth was remodelled[2].

---

[1] Comp. Hofr. Voigt, *Ueber Einige Physicalische merkwurdigkeiten der gegend von Burgtonna im Herzogthum Gotha* in his *Magazin für Physik und Naturgeschichte*, B. III. st. 4.

[2] There was a time when the origin of all petrifactions, and the general revolution of the earth itself, was deduced from the Noachian deluge. But, as one of the most sagacious and also certainly one of the most orthodox theologians, R. Walsh, has assured me, we are far from doing the slightest violence to the authority of Holy Scripture, when we deny the universality of the flood of Noah; and in like manner, I cannot for my own part form any satisfactory idea, after what I gather from the history of animals themselves, about the universality of that deluge. Thus, for instance, the pilgrimage which the sloth (an animal which takes a whole hour in crawling six feet) must in that case have performed from Ararat to South America, is always a little incomprehensible. We are obliged, with St Augustine, to call in the assistance of the angels, who *jussu Dei sive permissu*, as he expresses himself, first of all collected all the animal kingdom in the ark, and then distributed them again *ad locum inde*, in the distant islands and quarters of the globe.

IV.

Remodelling of the Primitive World.

After therefore that organic creation in the Preadamite primitive epoch of our planet had fulfilled its purpose, it was destroyed by a general catastrophe of its surface or shell, which probably lay in ruins some time, until it was put together again, enlivened with a fresh vegetation, and vivified with a new animal creation. In order that it might provide such a harvest, the Creator took care to allow in general powers of nature to bring forth the new organic kingdoms, similar to those which had fulfilled that object in the primitive world. Only the formative force having to deal with materials, which must of course have been much changed by such a general revolution, was compelled to take a direction differing more or less from the old one in the production of new species[1].

So that we naturally find very few creatures in the present creation which are exactly like the lapidifications of the primitive world, as, for instance, the shell-fish of the Atlantic and the Terebratula mentioned above of our calcareous rocks of the present day. On the other hand, there are quantities of such petrifactions which appear like the present organic bodies, and therefore, as I have said already, on a mere hasty comparison are often taken to be identical with them, but which upon closer inspection present most unmistakeable differences in their formation, and may serve as an example how the formative force in these two creations has acted in a similar, but not exactly in the same way. As to the possible objection, that this difference might also have been occasioned solely by *degeneration* acting for a long series of thousands of years, it can be very

---

[1] So that the formative power of nature in these remodellings partly reproduces again creatures of a similar type to those of the old world, which however in by far the greatest number of instances have put on forms more applicable to others in the new order of things, so that in the new creatures the laws of the formative force have been somewhat modified, as Lucretius expresses himself:

'quod potuit, nequeat; possit, quod non tulit ante.'

easily refuted by those examples in which the difference between fossil and recent shells, which are sufficiently like each other in general, is still of that quality that it unfortunately cannot be considered either as a consequence of degeneration, or as an accidental monstrosity, but can hardly be considered as anything else than an altered direction of the formative force. To give one example out of many. In the North Sea there is a shell, whose pretty house is generally known under the name of *Murex despectus;* and at Harwich on the coast of Essex there is found a fossil shell, which in its general habit has so strong a resemblance to that *Murex*, that at the first glance one might be mistaken for the other. But, in the recent species, as usually happens, the twistings are to the right; whereas, on the contrary, in the fossil species the twists are exactly the other way, to the left[1]; and it is just as contrary to experience to find the fossil *Murex* marked to the right as the recent *Murex* to the left. Such a thing is not a consequence of degeneration, but a remodelling through an altered direction of the formative force.

V.

Mutations in the Existing Creation.

According to all probability therefore a whole creation of organized bodies has already become extinct, and has been succeeded by a new one. So much variation is however to be observed, or, as Haller called it, but falsely, instability of nature, even in this new one, that a person might easily, *à priori* as they say, embrace the idea in this too of the extinction of whole species, and the fresh appearance of others, even if both these observations were not made more than merely probable by actual data.

---

[1] See a pair of instances of this singular fossil, *Murex contrarius*, from my collection, in the second part of the *Abbildungen Naturhistorischer Gegenstände.* Gött. 1797, Tab. xx.

Thus there was still to be found in the time of our fathers, on the Isle of France and on some of the small neighbouring islands, but in no other place in the world, so far as is known, a species of large, plump, lazy land-birds, whose flesh is repulsive, the *Dodos*[1]; whose locality was circumscribed, because they could fly no better than the Cassowary. But according to the account of M. Morel, who instituted a search with that view at the very place itself, this bird has ceased now to exist. It has been exterminated out and out. This is no more incomprehensible or improbable than that the last wolf in Scotland, as is known to have been the case, should have been shot in 1680, although a hundred years before great wolf-hunts used to be held. Just in the same way, but somewhat earlier in England, and thirty years later in Ireland, these beasts of prey were destroyed also. Thus plainly neither the *fauna* nor the *flora* (as these lists of indigenous beasts and plants are called) of a country remain always the same. Creatures enough die away in a locality, and fresh ones again become naturalized and spread themselves. It may be by design, as the carp which has now been artificially naturalized in many northern countries; or accidentally, as the rats of the old world have managed to engraft themselves on the new. So there is nothing contradictory in the idea that also once in the universal flora or fauna of the creation (but especially in the latter), as we have said, a species may have become extinct; and on the other hand a fresh one may likewise be sometimes very easily created subsequently.

The pimple-worm[2] in pigs, which Malpighi was the first to discover, is quite as real and perfect an animal in its kind as man and the elephant in theirs. But, as is well known, this animal is only found in tame swine, and never in any way in the wild pig, from which however the former is descended. It would seem therefore that this worm was no more created at the same time

[1] *Didus ineptus.* See *Abbildungen Naturhistorischer Gegenstände* Part IV. Gött. 1799, Tab. XXXV.

[2] *Hydatis finna.* See *Abbildungen Naturhistorischer Gegenstände* a. a. O. Tab. 39.

as the original stock of the hog than, according to probability, the allied species of the bladder worms, which have been lately discovered, just like those hydatids, in the flesh and among the entrails in human bodies, which must needs have been created after the original parents of mankind. *How* indeed this subsequent creation took place, that I can no more say than how in early times the first spermatic animalcule came into being; that however they *were* subsequently created seems to me undeniable, and I lay that to the account of the great mutability in nature, and this great mutability itself to the active and wise determination of the Creator.

How very limited would be even the sphere of man's operations without this capacity for variation in nature through the labour he may himself bestow upon it. Is it not precisely through this attribute that he becomes really the lord and master of the rest of the creation? To see how much may be done in this way let a man only consider the astonishing alterations which since the discovery of the New World have reciprocally been caused and been experienced by it and the Old.

VI.

The degeneration of organized bodies.

The degeneration of animals and plants from their original stocks into varieties also belongs to the astonishing experiences of variability in creation. In the middle of the 16th century the only tulip known in Europe was the common yellow one. Two hundred years later no kind of flower had a more passionate admirer than these, of which the then Margrave of Baden-Durlach collected no less than three thousand specimens of different varieties[1]. It is not much longer since the first wild green canary bird was brought from its home to Europe, yet these creatures have long since branched out into every sort of variety, not only of colour but also of appearance itself.

---

[1] *Bibl. Raisonnée*, T. XXXIV. p. 284.

The origin of this degeneration has been sought principally in the influence of climate, aliment, and mode of life; and certainly many effects of these three things in degeneration appear unmistakeable. Thus, taken altogether, growth is retarded by cold, and the particular climate of this or that part of the world will have certain manifest operations on the organized bodies which are indigenous to it. As in Syria, many kinds of mammals have astonishingly long and silken hair. Of course very often some of the principal effects which are ascribed to degeneration either run into and destroy one another, or one may equally counteract the other and take away its effect; so that no decided opinion can be arrived at on many of the phenomena of degeneration. Enough that the phenomena themselves must be held as unmistakeable consequences of the variability of nature.

VII.

In domestic animals especially.

The effects of degeneration must naturally have operated in the most profound and various way on those domestic animals which man has for so many generations kept in subjection to himself, to such an extent that they propagate in that condition, and with whom it is not, as in the case of elephants, necessary to catch every individual in the wilderness; and which also can inhabit foreign climates, and are not, like the reindeer, confined within a narrow fatherland.

The common domestic hog is the best example of all, and I select it the more readily because the pedigree of this animal is far less dubious than that of many others. The dog degenerates in many ways, even under our very eyes, but it is not completely made out, and would be very difficult completely to make out, whether all dogs are only varieties of one and the same species or not. Many great naturalists have avowedly considered the shepherd's dog as the common original stock of all the others. Others have put the wolf, the jackal, and the

dog together. Others, again, think it not improbable that we ought to assume more than one original stock amongst dogs themselves. In my opinion there is a great deal to be said for the last idea. Not only have we a great difference of appearance in dogs in and of themselves; but they must be very much changed during the long thousands of years since man brought up this animal more than any other in closer intimacy with himself, and partly transplanted it along with him into foreign climates, so that perhaps the original wild[1] dog can no more be found. And this seems to me a ground for assuming that there is more than one original race of dogs, because many, as the badger-dog, have a build so marked, and so appropriate for particular purposes, that I should find it very difficult to persuade myself that this astonishing figure was an accidental consequence of degeneration, and must not rather be considered as an original purposed construction to meet a deliberate object of design[2].

In the hog, again, the power of mere degeneration is much more clearly visible. So far as I know, no naturalist has carried his scepticism so far as to doubt that our domestic hog is descended from the wild boar, and besides this is one of the beasts which was utterly unknown in America before the arrival of the Spaniards, and was first transplanted there from Europe. Meanwhile, notwithstanding the short space of time which is incontrovertibly proved by documents, some of these swine which have been transplanted into that part of the world have degenerated in the most astonishing way into the most extraordinary varieties. Those which were brought from Spain in 1509 to the West India island Cubagua, which was then

---

[1] The difference between being wild originally and becoming wild must be most carefully observed during investigations of this kind. Thus in both worlds we have immense numbers of horses which have become wild; but no one is acquainted with the original wild horse. Thus even in the beginning of the past century wild goats and also wild corn were to be found on the little island of Juan Fernandez (the solitary abode for four years of poor Selkirk, whose true history De Foe has worked up in his Robinson Crusoe); but neither of these belonged originally to the country any more than the wild monkeys which have propagated themselves even up to the present time on the rock of Gibraltar.

[2] See the additions at the end of this Part.

famous everywhere for its pearl fisheries, degenerated into an extraordinary race, with toes which were half a span long[1]. Those in Cuba became more than twice as large again as their European progenitors[2].

This was not the way in which in the old world the tame hog degenerated from the wild hog; but rather in its covering, especially with respect to the woolly hair between the bristles; in the strikingly different form of the skull; in the whole growth, &c. How endless again is the difference in the varieties of the domestic hog itself; that of Piedmont being almost without exception black; that of Bavaria reddish brown; that of Normandy white, &c. How different is the breed of the English hog, with its curved back and pendent belly, from that of the north of France, which is easily distinguished from the former by its elevated croup and its down-hanging head, and both again from the German hog. Hogs with undivided hoofs are to be found gregarious both in Hungary and Sweden, and were known long ago to Aristotle, to say nothing of other more remarkable varieties.

VIII.

Degeneration of Man, the most perfect of all domestic Animals.

But what is the reason that the hog degenerates so particularly? why so much more than any other domestic animal? The solution of this problem flows directly from what has been said above. For the very reason that it is just this animal which is more exposed than any other to the causes of degeneration. No other of our commonly called domestic animals has experienced such a manifold influence of climate as the hog; for no other has been so widely scattered as this over the five parts of the world. None has been subjected so much to the operation

---

[1] Herrera, *Hechos de los Castellanos en las Islas de Tierra Firme del Mar Oceano*, Vol. I. p. 239, Madrid, 1601.

[2] Clavigero, *Storia Antica del Messico*, T. IV. p. 145.

of variety of aliment; for no animal is so omnivorous as the hog, &c. There is only one domestic animal besides (domestic in the true sense, if not in the ordinary acceptation of this word[1]) that also surpasses all others in these respects, and that is man. The difference between him and other domestic animals is only this, that they are not so completely born to domestication as he is, having been created by nature immediately a domestic animal. The exact original wild condition of most of the domestic animals is known. But no one knows the exact original wild condition of man[2]. There is none, for nature has limited him in no wise, but has created him for every mode of life, for every climate, and every sort of aliment, and has set before him the whole world as his own and given him both organic kingdoms for his aliment. But the consequence of this is that there is no second animal besides him in the creation upon whose *solidum vivum* so endless a quantity of various *stimuli*[3], and therefore so endless a quantity of concurring causes of degeneration, must needs operate.

IX.

A very peculiar physiological singularity of the human body.

In order to receive those *stimuli* the *solidum vivum* has been prepared by the forces of life which reside within it, whose diverse although still concurring kinds I have in another place endeavoured to set out and distinguish more precisely[4]. Amongst

---

[1] Even however in the common acceptation of the word man has been before now considered a domestic animal. De Luc says that a very profound psychologist of his acquaintance could find so little connection between the limited power of man's comprehension and the circumference and depth of his actual knowledge, that there must have been in the primitive world a class of higher existences on earth, to whom man acted as a sort of domestic animal and have so received great benefit from the then lord of the creation.

[2] More particularly on this in Part II.

[3] I make use of both these words of art which are universally accepted in the physiology of organized bodies and have an universally understood meaning without turning them into German, since they, as well as the words *organized bodies* hemselves, would certainly lose in clearness by translation.

[4] *Institut. Physiolog.* s. IV.

these, by far the most common, and which predominates in both kingdoms of organized creatures, is *contractility*, which is very nearly the same thing that Stahl, one of the most profound physiologists, spoke of under the not sufficiently distinct name of *tone*, or, after the Leiden school, *actuosity*.

The locality of this commonest of vital forces is the mucous membrane, (commonly, but improperly called the cellular tissue,) which constitutes the foundation of almost the whole of an organized body. Thus in a human body, except the enamel of the teeth and some of the outermost coverings of the skin, all the remaining parts consist principally of the mucous membrane, saturated, so to say, and incorporated with other substances. Besides, the mucous membrane is the first organic substance which nature forms out of inorganic saps. Thus the plastic lymph which is squeezed out by inflammations of the lungs is first turned into loose mucous membrane, and this again into the so-called pseudo-membranes with true blood-vessels, &c. The greater or smaller compactness of the mucous membrane however itself differs exceedingly in the different periods of life, and also according to the specific diversity of the species of organized bodies. In the eel, for instance, it is infinitely finer than in the trout. It has been observed, and that long ago, by sagacious zootomists, for instance, our own Zinn, that man, in comparison with other creatures, which are most nearly allied to him in respect of bodily economy, namely the rest of the mammals, has, *ceteris paribus*, the finest and most compact mucous membrane. Let it be well understood *ceteris paribus*, for we must not compare an old gipsy with an unborn lamb.

This exceptional compactness of the mucous membrane and the consequent superior quality of the commonest vital force is, as it seems to me, one of the most distinctive and greatest privileges of man. It is exactly this privilege by which he is enabled to arrive at his greatest object, the habitation of the whole earth, just in the same way as the various kinds of corn, through their delicate and compact cellular texture, are better enabled to thrive in the most different climates than the stronger

cedars and oaks. In proportion as this exceptionally compact membrane is in man, as I have said, the first and most important factory of the formative force, it will be easily understood from all these things taken together, how in consequence man is exposed in the formation of his body and its parts to all sorts of degeneration into varieties. It is not improbable moreover that this is the reason why the hog exactly like man can live in the most different climates, and also exactly like him degenerates in manifold ways. At all events there are many remarkable singularities in both creatures with respect to their mucous membrane, as appears most strikingly in the peculiar skin (*corium*), which at bottom is nothing else than the mucous membrane of the outer surface of the body indurated and penetrated with nerves and vessels. Perhaps here too may be found the reason of the similarity which has so often been asserted since the time of Galen between the taste of man's and hog's flesh. As to the reason why, on the other hand, both creatures differ so much from one another in a thousand other ways besides their bodily structure, no one will ask, who knows anything from physiology of the strikingly peculiar privileges by which man, especially with respect to the other noble kind of vital powers, the reaction of the sensorium, &c., is elevated above all the rest of the animal creation.

X.

Something tranquillizing on a common family concern.

There have been persons who have most earnestly protested against their own noble selves being placed in a natural system in one common species with Negroes and Hottentots. And again, there have been other people who have had no compunction in declaring themselves and the orang-utan to be creatures of one and the same species. Thus the renowned philosopher and downright caprice-monger Lord Monboddo says in blunt words, "the orang-utans are proved to be of our species by marks of humanity that I think are incontestable."

On the other hand, another, but not quite so straightforward a caprice-monger, the world-renowned fire-philosopher Theophrastus Paracelsus *Bombastus*, cannot comprehend how all men can belong to one and the same original stock, and contrived on paper for the solution of this difficulty his two Adams.

Perhaps, however, it will contribute something to the tranquillization of many upon this common family affair, if I name three philosophers of quite a different kind, who however much they may have differed otherwise in many of their ideas, still were completely of accord with each other on this point; possibly because it is a question which belongs to natural history, and all three were the greatest naturalists whom the world has lately lost—Haller, Linnæus, and Buffon—all these three considered man different by a whole world from the orang-utan, and on the other hand all true men, Europeans, Negroes, &c., as mere varieties of one and the same original species. It will however be very likely of much more service to most of my readers, if instead of these three names I give the three principal rules which I have always followed, as I have reason to think, with the greatest advantage in my investigations on this subject, and through which I have fortunately escaped many an otherwise sufficiently common, but false conclusion.

I. In these investigations we must have principally before our eyes the physiology of organized bodies. We must not remain attentive merely to man, and act as if he was the only organized body in nature; and must expect to find some differences in his species which are strange and puzzling, without forgetting that all these differences are not a whit more surprising or unusual than those by which so many other species of organized bodies, equally degenerate under our eyes.

II. Neither must we take merely one pair of the races of man which stand strikingly in opposition to each other, and put these one against the other, omitting all the intermediate races, which make up the connection between them. We must never forget that there is not a single one of the bodily differences in any one variety of man, which does not run into some of the others by such endless shades of all sorts, that the naturalist or-

physiologist has yet to be born, who can with any grounds of certainty attempt to lay down any fixed bounds between these shades, and consequently between their two extremes.

III. Inasmuch as no firm steps can be taken in the determination of the varieties in mankind, any more than in the rest of natural history, without actual knowledge, I have laid down for myself as the third principal rule for a considerable number of years, since I busied myself with these investigations, to make use of everything, so as to provide myself always more and more supports in this behalf out of nature itself. For all the accounts on that point which one adopts, even with the most critical judgment possible, from others, are in reality, for the truth-seeking investigator of nature, nothing more and nothing further than a kind of symbolical writing, which he can only so far subscribe to with a good conscience, as they actually coincide with the open book of nature. And in order to pass an opinion upon that, he must make himself as well read and through that gather as much experience as possible in this book; and this is what I have always endeavoured to do to the best of my ability in my studies on the natural history of mankind. The result of this earnest labour has surpassed all my original expectations, so that I now find myself in possession of a collection for the natural history of mankind, which was the first regular and instructive, and complete one, and so far as I know remains still the only one of its kind.

XI.

On Anthropological Collections.

It seems above everything else hard to understand how it is that considering the zeal with which natural history has been cultivated at all times amongst all scientifically civilized nations, the naturalist was so very late in finding out that man also is a natural product, and consequently ought at least as much as any other to be handled from the point of natural history according to the difference of race, bodily and national peculiar-

ities, &c. Already in the last century the great collectors of writings on natural history,—Gesner, Aldrovandus, Jonston, and Ray,—in their numerous, and also voluminous, and always classical works, embraced the history of all the three natural kingdoms; everything in fact, with the single and solitary exception of the natural history of man himself. And, if I am not mistaken, it was no naturalist by profession, but a mathematician in Upsala, Harald Waller, who was the first that finally in the beginning of the last century attempted to fill up this void which had for such a wonderful length of time remained open in a writing[1], which was a large one for those days, and which forms quite an epoch in the history of natural history.

It is not, however, less astonishing that still for many decades of years after this, the natural history collectors, though in other matters their boundless acquisitiveness not only degenerated into luxury, but very often into folly, still, in order to fill their cabinets, preferred making incursions all over the creation, rather than into that department which could assist the natural history of mankind and his varieties[2]. It is of course easily seen that the construction of such a regular and instructive apparatus for this department is implicated with incomparably greater difficulties than in most other departments of natural collections. That, however, these are not insuperable when the collector shows zeal and perseverance, and can obtain the active co-operation of men who have opportunities of helping him in his object, is shown by the most remarkable portion of my anthropological collection, I mean the skulls of foreign nations.

---

1 *De Varia Hominum Forma Externa*, 1705, 4to. After him came in 1721 the never-to-be-forgotten polyhistor of Hamburg, J. A. Fabricius, with his *Diss. critica de hominibus orbis nostri incolis, specie et ortu avito inter se non differentibus.*

2 What perverted and extraordinary notions, even till lately, distinguished naturalists had of what ought to be comprised in such a natural-historical or anthropological collection, may be seen from the following passage in Bomare's *Diction.* T. VI. p. 633, 1791, where he is saying what a cabinet of natural history ought to possess. "The cupboard which contains the history of man, consists of an entire myology, a separate head preserved, a brain, the parts of generation of either sex, a neurology, an osteology, embryos of every age with their after-birth, monstrous productions, and an Egyptian mummy. There should also be some nice pieces of anatomy represented in wax and wood, and some stony concretions taken from the human body."

There are two questions which have often been put to me on the sight of these skulls, namely, what utility can be made of this collection? and then how can any one be certain of the genuineness of the foreign skulls? These questions are so natural and so reasonable, that the answers to them may properly find a place here.

1. This collection has amongst other things been useful to me in determining the principal corporeal characteristics of humanity, which it is my opinion I have found to consist in the prominent chin and the consequently resulting upright position of the under front teeth. In the animals there is scarcely a particular chin which can be considered as comparable to that of man: and in those men who, as is often said, seem to have something apish in their countenance, this generally resides in a deeply-retreating chin. The upper front teeth have indeed in many nations of different races a more or less oblique direction, whereas, on the other hand, the under ones in all that are known to me stand up vertically.

2. Also for the determination of the really most beautiful form of skull, which in my beautiful typical head of a young Georgian female always of itself attracts every eye, however little observant.

3. As a leading argument for the identity of mankind in general, since here also the boundless passages between the two extremes in the physical scale of nations, from the Calmuck to the Negro, join unobservedly into each other.

4. Then also as an evidence of the natural division of the whole species into the five principal races of which I shall speak in the next section.

5. Of the mixture of these races with each other, which is as clearly expressed in the skulls of the Cossacks, Kirghis, &c., as anywhere in the Mulattos.

6. For the refutation of many erroneous conclusions as to the pretended similarity of structure, and consequently of relationship between distant nations, as between the old Egyptians and the Chinese, or between these and the Hottentots, &c.

7. On the other hand, for a nearer conclusion on the pro-

bable parentage of puzzling populations, as of the old Guanches of the Fortunate Islands from the Libyan stock of the old Egyptians.

8. For this is learnt from a comparison of the mummy skulls with the Egyptian works of art, that they distinguish three sorts of national characters, which differ very decidedly from one another, of which one is most like the Abyssinians, another the Hindoos, and the third the Berbers, or ancient Libyans.

9. This collection also helps to explain many physiological and national peculiarities, as the extremely wide passages in the nostrils of the keen-scented Negroes and North American Indians.

10. And also, as an example of what has been lately disputed in some quarters, of the constantly enduring shapelessness which many savage tribes, as, for instance, the Caribs and the Choctaws artificially infix upon the heads of their children by continual pressing and binding. Of the various other interesting ideas which the inspection of this collection of skulls calls up, I can only think of the truly melancholy one—that it contains so many relics of former respectable tribes, who have been from time to time, and now are, almost entirely destroyed by their conquerors, just as the Caribs of the West India Islands, the Guanches of the Canary Islands, &c. who have suffered the same fate as some useful varieties of domestic animals, such as the great Irish hound, and the St Bernard's dog, which seem now to be exterminated from the creation.

As to the other of the two questions mentioned above, it will be most easily answered by this fact, that every skull is numbered, and has its own particular description in a special collection of the incidents belonging thereto, which contains all the certificates of them, and the original letters, notices, and a comparison with copies, like portraits[1], of which I myself have

[1] Of the value of such really portrait-like and characteristic representations (with which unfortunately their rarity stands in exact proportion) for comparison with the skulls, I can give one example out of many. Twelve years ago I re-

collected a rare apparatus, and also with the characteristic descriptions of the most exact writers of natural history, and of travellers: in short everything that makes up complete warranties, as they have been used in the *Decades* which have been composed from this collection. Besides this, care has been taken in the mode of arrangement, that where it was possible to obtain more than one skull of any savage nations, these, at all events, should stand side by side together, in order to show at the first glance the persistent resemblance with which the heads of each one of those peoples who have mingled only with each other, so far as concerns their national character, seem to be all cast in one mould. They are in this way so easy and so securely distinguished and recognized, that it is to be hoped no one at the sight of this collection will be in the condition of the Cynic Menippus[1] after his suicide, who, on his arrival in the nether world, said of the skulls which were collected, that forsooth they all looked exactly alike, and who was too obtuse to pick out even that of the beautiful Helena from the others.

XII.

Division of Mankind into Five principal Races.

To return again to the three rules laid down above, which have given rise to this digression. After many a year's industrious observance of them I have arrived at no new striking

---

ceived from Labrador the skull of an Esquimaux, and afterwards through the kindness of Sir Jos. Banks a masterly likeness of Mycock, a deceased Esquimaux woman, who was known in 1795, through the missionary reports of the evangelical brotherhood. She had been in London in 1796, when Sir Jos. had this speaking likeness of the size of life painted by the famous portrait painter John Russell. The resemblance between the remarkable character of this picture with that skull strikes every observant eye that compares them together. In order to prove it to the unobservant, I have had the circumference of that skull, and also that of the picture drawn by means of a glass plate, and then traced from that on two leaves, and when these two are held exactly upon one another against the light, the two drawings in all their parts cover each other like a pair of equally large and equiangular triangles.

[1] In Lucian's *Dialogues of the Dead.*

discovery, but what must be just as satisfactory a conclusion to me, the conviction of an old truth in natural history, on which doubt has been recently cast in some quarters. I have endeavoured particularly to depend upon sensible experience, and where I could not avail myself of this, on the accounts of active and trustworthy witnesses, and after all that I have thus learnt about the bodily differences in mankind, and all the comparisons thus made with the bodily differences in other species of organized beings, especially in the case of the domestic animals, I have found no single difference in the former which may not also be observed in many of the latter, and that too as an unmistakeable consequence of degeneration. Consequently I do not see the slightest shadow of reason why I, looking at the matter from a physiological and scientific point of view, should have any doubt whatever that all nations, under all known climates, belong to one and exactly the same common species.

Still, in the same way as we classify races and degenerations of horses and poultry, of pinks and tulips, so also, in addition, must we class the varieties of mankind which exist within their common original stock. Only this, that as all the differences in mankind, however surprising they may be at the first glance, seem, upon a nearer inspection, to run into one another by unnoticed passages and intermediate shades; no other very definite boundaries can be drawn between these varieties, especially if, as is but fair, respect is had not only to one or the other, but also to the peculiarities of a natural system, dependent upon all bodily indications alike. Meanwhile, so far as I have made myself acquainted with the nations of the earth, according to my opinion, they may be most naturally divided into these five principal races:

1. *The Caucasian*[1] *race.* The Europeans, with the exception of the Lapps, and the rest of the true Finns, and the western Asiatics this side the Obi, the Caspian Sea, and the Ganges along with the people of North Africa. In one word,

[1] [These well-known terms do not occur in the first edition (1790) of this treatise: but were first used in the third ed. of *De generis hum. &c.* in 1795. ED.]

the inhabitants nearly of the world known to the ancient Greeks and Romans. They are more or less white in colour, with red cheeks, and, according to the European conception of beauty in the countenance and shape of the skull, the most handsome of men.

2. *The Mongolian.* The remaining Asiatics, except the Malays, with the Lapps in Europe, and the Esquimaux in the north of America, from Behring's Straits to Labrador and Greenland. They are for the most part of a wheaten yellow, with scanty, straight, black hair, and have flat faces with laterally projecting cheek-bones, and narrowly slit eyelids.

3. *The Ethiopian.* The rest of the Africans, more or less black, generally with curly hair, jaw-bones projecting forwards, puffy lips, and snub noses.

4. *The American.* The rest of the Americans; generally tan-coloured, or like molten copper, with long straight hair, and broad, but not withal flat face, but with strongly distinctive marks.

5. *The Malay.* The South-sea islanders, or the inhabitants of the fifth part of the world, back again to the East Indies, including the Malays, properly so called. They are generally of brownish colour (from clear mahogany to the very deepest chestnut), with thick black ringleted hair, broad nose, and large mouth.

Each of these five principal races contains besides one or more nations which are distinguished by their more or less striking structure from the rest of those of the same division. Thus the Hindoos might be separated as particular sub-varieties from the Caucasian; the Chinese and Japanese from the Mongolian; the Hottentots from the Ethiopian; so also the North American Indians from those in the southern half of the new world; and the black Papuans in New Holland, &c. from the brown Otaheitans and other islanders of the Pacific Ocean.

XIII.

Of the Negro in particular.

"God's image he too," as Fuller says, "although made out of ebony." This has been doubted sometimes, and, on the contrary, it has been asserted that the negroes are specifically different in their bodily structure from other men, and must also be placed considerably in the rear, from the condition of their obtuse mental capacities. Personal observation, combined with the accounts of trustworthy and unprejudiced witnesses, has, however, long since convinced me of the want of foundation in both these assertions. But I need not repeat everything which I have elsewhere publicly expressed in opposition to those views; though there are one or two points I cannot leave quite untouched[1]. I am acquainted with no single distinctive bodily character which is at once peculiar to the negro, and which cannot be found to exist in many other and distant nations; none which is in like way common to the negro, and in which they do not again come into contact with other nations through imperceptible passages, just as every other variety of man runs into the neighbouring populations.

The colour of the skin they share more or less with the inhabitants of Madagascar, New Guinea, and New Holland. And there are imperceptible shades, up from the blackest negroes in North Guinea to the Moors: amongst whom many, especially the women, according to the assurance of Shaw, have the very whitest skin that it is possible to imagine. The curly woolly hair is well known not to be common to all the negroes, for Barbot says, even of those in Nigritia itself, that some have curly and some have straight hair; and Ulloa says just the same of the negroes in Spanish America. Secondly, this so-

[1] A quantity of the most instructive remarks on this point, taken from nature itself, is to be found in the praiseworthy Dr Th. Winterbottom's *Classical Account of the Native Africans in the Neighbourhood of Sierra Leone*, where the author of this classical work spent four years as physician to the colony.

called woolly hair is very far from being peculiar to the negroes, for it is found in many people of the fifth race, as in the Ygolotes in the Philippines, in the inhabitants of Charlotte Island and Van Diemen's Land, and also in many of the third variety, who, however, are not reckoned as negroes. Many Abyssinians have it, as the famous Abba Gregorius, whose handsome likeness, which Heiss engraved in 1691, after Von Sand, I have before me[1]. Sparrmann also says of the Hottentots, that their hair is more like wool than that of the negroes themselves; and this I find confirmed by the pictures of Hottentots and Kaffirs, which many years ago were forwarded with some transplanted plants from the Cape to Joseph II., and of which I have obtained exact copies, through the kindness of Counsellor von Jacquin. As to the physiognomy of the negro, the difference no doubt is astonishing if you put an ugly negro (and there are ugly negroes as well as ugly Europeans) exactly opposite the Greek ideal. But this is precisely to offend against one of the rules given above. If, on the contrary, one investigates the transitional forms in this case also, the striking contrast between the two very different extremes vanishes away; and, of course, there must be extremes here as well as in the case of other creatures which degenerate into all sorts of races and varieties.

I can, on the contrary, declare that amongst the negroes and negresses whom I have been able to observe attentively, and I have seen no small number of them, as in the portrait-like drawings and profiles of others, and in the seven skulls of adult negroes which are in my collection, and in the others which have come under my notice, or of which I have drawings and engravings before me, it is with difficulty that *two* can be found who are completely like each other in form; but all are more or less different from one another, and through all sorts of gradations run imperceptibly into the appearance of men of other kinds up to the most pleasing conformation. Of this sort

---

[1] "He had curly hair like other Ethiopians," says his friend Ludolph in the description which he gives of him.

was a female creole, with whom I conversed in Yverdun, at the house of the Chevalier Treytorrens, who had brought her from St Domingo, and both whose parents were of Congo. Such a countenance—even in the nose and the somewhat thick lips—was so far from being surprising, that if one could have set aside the disagreeable skin, the same features with a white skin must have universally pleased, just as Le Maire says in his travels through Senegal and Gambia, that there are negresses, who, abstraction being made of the colour, are as well formed as our European ladies. So also Adanson, that accurate naturalist, asserts the same of the Senegambia negresses; "they have beautiful eyes, small mouth and lips, and well-proportioned features: some, too, are found of perfect beauty[1]; they are full of vivacity, and have especially an easy, free and agreeable presence." Now this was exactly the case with the negress of Yverdun, and with several other negresses and negroes, whose closer acquaintance I have since that had the opportunity of making, and who have equally convinced me of the truth of what so many unsuspected witnesses have assured me about the good disposition and faculties of these our black brethren; namely, that in those respects as well as in natural tenderness of heart[2], they can scarcely be considered inferior to any other race of mankind taken altogether[3]. I say quite deliberately, taken altogether, and *natural* tenderness of heart, which has never been benumbed or extirpated on board the transport vessels or on the West India sugar plantations by the brutality of their white executioners. For these last must be nearly as much without head as without heart, if after such treatment they still

[1] "Of a perfect beauty."

[2] "The mildness of the Negro character," says Lucas, the famous African traveller, in the *Proceedings of the African Association.*

[3] Listen to one guarantee for all, our own incomparable Niebuhr: "The principal characteristic of the negro is, especially when he is reasonably treated, honesty towards his masters and benefactors. Mohammedan merchants in Cairo, Jeddah, Surat, and other cities, are glad to buy boys of this kind; they have them taught writing and arithmetic, carry on their extensive business almost entirely through negro slaves, and send them to establish business places in foreign countries. I asked one of these merchants, How he could trust a slave with whole cargoes of goods? and was told in reply, 'My negro is true to me; but if I were to conduct my business entirely by white men, I should have to take care that they did not run off with my property.'"

expect to find true attachment and love from these poor mismanaged slaves. That excellent observer of nature, Aublet, in his true and masterly description of the natural goodness of the negro's character, rests upon the confessions of the Europeans who have been in captivity amongst the Algerines, and have openly admitted that in that position they felt just as ill disposed and just as hostile to their then masters, as a negro in like case could possibly feel towards his master in the colonies. On the other hand, I have daily for a long time had an honest negress before my eyes, of whom I often said in my mind, what Wieland's Democritus says of his good, soft-hearted, curly-locked black, and what has also been so frequently asserted by other unprejudiced observers of uncorrupted blacks, and amongst others very recently with true and warm gratitude by the stout Mungo Park, that it is not worth while to scrape together here the proofs of these facts[1].

At the same time it will not be at all superfluous to point out here some not so well known though remarkable examples of the perfectibility of the mental faculties and the talents of the negro, which of course will not come unexpectedly upon any one who has perused the accounts of the most credible travellers about the natural disposition of the negro. Thus the classical Barbot, in his great work on Guinea, expresses himself as follows: "The blacks have for the most part head and understanding enough: they comprehend easily and correctly, and their memory is of a tenacity almost incomprehensible; for even when they can neither read nor write, they still remain in their place amidst the greatest bustle of business and traffic, and seldom go wrong."—"Since they have been so often deceived by Europeans, they now stand carefully on their guard in traffic and exchange with them, carefully examine all our wares, piece

---

1 Many speaking examples of the real gratitude, and above all of the humane character, and also of the excellent capacities of our black brethren, are to be found in the following three works, whose meritorious authors were long in the West Indies, and are amongst the most capable and unprejudiced observers of the Negro; Oldendorp's *Geschichte der Mission der evangelischen Brüder auf. S. Thomas*, &c. 1777; Ramsay's *Essay on the Treatment and Conversion of African Slaves*, 1784; Nisbett's *Capacity of Negroes for Religious and Moral Improvement*, 1789.

by piece, whether they are of the samples bargained for in quality and quantity; whether the cloths and stuffs are lasting, whether they were dyed in Haarlem or Leyden, &c."..."in short, they try everything with as much prudence and cunning as any European man of business whatever can do." Their aptitude for learning all sorts of fine handy-work is well known. It is estimated that nine-tenths of the ordinary craftsmen in the West Indies are negroes[1].

With respect to their talents for music, there is no necessity for me to call attention to the instances in which negroes have earned so much by them in America, that they have been able to purchase their freedom for large sums, since there is no want of examples in Europe itself of blacks, who have shown themselves true virtuosos. The negro Freidig was well known in Vienna as a masterly concertist on the viol and the violin, and also as a capital draughtsman, who had educated himself at the academy there under Schmutzer. As examples of the capacity of the negro for mathematical and physical sciences, I need only mention the Russian colonel of artillery, Hannibal, and the negro Lislet, of the Isle of France, who on account of his superior meteorological observations and trigonometrical measurements, was appointed their correspondent by the Paris Academy of Sciences.

Dr Rush of Philadelphia is at work upon a history of the negro, Fuller, in Maryland, who has lately become so famous through his extraordinary capacity for calculation. In order to test him on this point, he was asked in company how many seconds a man would have lived who was seventy years and so many months, &c. old. In a minute and a half Fuller gave the number. Others then calculated it, but the result was not the same. "Have you not forgotten," said the negro, "to bring into account the days of the leap-years?" These were then

---

[1] On the exceptional skill for art, "of the soft and benevolent" negroes in Houssa or Soudan in the interior of Africa, see our Hornemann's *Tagebuch seiner reise von Cairo bis Murzuk*. This book gives us much important information upon the condition of the soil and population of this remarkable part of the earth, which no European before him had visited.

added, and the two calculations coincided exactly. I possess some annuals of a Philadelphian calendar, which a negro there, Benj. Bannaker, had calculated, who had acquired his astronomical knowledge without oral instruction, entirely through private study of Ferguson's works and our Tob. Mayer's tables[1], &c. Boerhaave, de Haen, and Dr Rush[2] have given the most decided proofs of the uncommon insight which negroes have into practical medicine. Negroes have also been known to make very excellent surgeons. And the beautiful negress of Yverdun, whom I mentioned, is known far and wide in French Switzerland as an excellent midwife, of sound skill, and of a delicate and well-experienced hand. I omit the Wesleyan Methodist preacher, Madox, and also the two negroes who lately died in London, Ignatius Sancho and Gustavus Vasa, of whom the former, a great favourite both of Garrick and Sterne, was known to me by correspondence[3]; and the latter, whom I knew personally, has made himself a name by his interesting autobiography[4]; and also many other negroes and negresses who have distinguished themselves by their talents for poetry. I possess English, Dutch, and Latin poems by several of these latter, amongst which however above all, those of Phillis Wheatley of Boston, who is justly famous for them, deserve mention here[5].

---

[1] J. M'Henry, of Baltimore, has printed biographical accounts of this man, and, as he expresses himself, regards "this negro as a new proof that mental faculties bear no relation to the colour of the skin."

[2] This philosophic physician writes of an excellent negro who to my knowledge is still living, to Dr Derham in New Orleans: "I have conversed with him upon most of the acute and epidemic diseases of the country where he lives, and was pleased to find him perfectly acquainted with the modern simple mode of practice in those diseases. I expected to have suggested some new medicines to him, but he suggested many more to me. He is very modest and engaging in his manners, and does business to the amount of 3000 dollars a year."

[3] *Letters of the late Ignatius Sancho, an African*, third ed. London, 1784, 8vo, with the beautifully engraved likeness by Bartolozzi, after Gainsborough's picture.

[4] *The Interesting Narrative of the Life of Olandah Equians, or Gustavus Vasa, written by himself*, third ed. London, 1791, 8vo; in German, Göttingen, 1792, 8vo.

[5] *Poems on Various Subjects, Religious and Moral*, by Phillis Wheatley, *Negro Servant to Mr John Wheatley of Boston*, 1773, 8vo. A collection which scarcely any one who has any taste for poetry could read without pleasure. Some particularly beautiful selections from them are to be found in the famous prize essay of the worthy Clarkson, *On the Slavery and Commerce of the Human Species.*

There are still two negroes who have got some reputation as authors, and whose works I possess, whom I may mention. Our Hollmann, when he was still professor at Wittenberg, created in 1734 the negro, Ant. Wilh. Amo, Doctor of Philosophy. He had shown great merit both in writing and teaching; and I have two treatises by him, of which one especially shows a most unexpected and well-digested course of reading in the best physiological works of that day[1]. In an account of Amo's life, which on that occasion was printed in the name of the University Senate, great praise is allotted to his exceptional uprightness, his capacity, his industry, and his learning. It says of his philosophical lectures: "he studied the opinions both of the ancients and moderns; he selected the best, and explained his selections clearly and at full length." It was in his fortieth year that the negro Jac. Elisa Joh. Capitein studied theology at Leyden; he had been kidnapped when a boy of eight years old, and was bought by a slave-dealer at St Andrew's river, and got to Holland in this way at third-hand. I have several sermons[2] and poems by him, which I will leave to their own merits; but more interesting and more famous is his *Dissertatio politico-theologica de servitute libertati Christianæ non contraria*, which he read publicly on the 10th March, 1742, in Leyden, and of which I have a translation in Dutch[3], of which again four editions were struck off, one immediately after the other. Upon this he was ordained preacher at Amsterdam in the church d'Elmina, whither he soon afterwards departed. Professor Brugmans of Leyden, who procured for me the writings of this

---

[1] The title of the first is, *Diss. inaug. Philosophica de humanæ mentis ἀπαθεία seu sensionis ac facultatis sentiendi in mente humana absentia, et earum in corpore nostro organico ac vivo præsentia, auctore* Ant. Guil. Amo, *Guinea-Afro.* The other is entitled, *Disp. philosophica continens ideam distinctam eorum quæ competunt vel menti vel corpori nostro vivo vel organico.*

[2] *Uitgewrogte Predikatien ins Gravenhage en t'Ouderkerk aan den Amstel gedaan door* Jac. Elisa Jo. Capitein, *Africaansche Moor, beroepen predikant op D'Elmina aan het Kasteel St George,* Amst. 1742, 4to.

[3] *Staatkundig-Godgeleerd Onderzoekschrift over de Slaverny, als niet strydig tegen de Chrystelyke Vryheid,* Leiden, 1742, 4to, with the beautifully engraved likeness of the author by F. von Bleyswyck. Another portrait of him, after P. van Dyck, has been given by me in the first part of the *Abbildungen Naturhistorischer Gegenstände,* Tab. 5.

ordained negro, sends me word also that according to the circumstances there are two stories about his fate there; either namely that he was murdered, or that he went back to his own savage countrymen, and exchanged their superstitions and mode of life for what he had learnt in Europe. In this last case, his history forms a pendent to that of the Hottentot who was brought up in Europe and civilized, whose similar and thorough patriotism has been immortalized by Rousseau[1]. Nor is this irresistible attraction to the ancestral penates at all events a bit more strange than the fact, that, as is known, Europeans enough, who have been made prisoners of war by the North American Indians, or even by the Caribs of the West Indies, when these still constituted a respectable and warlike nation, and have lived a long time with them and become used to them, have found such a great delight in this wild state of nature as to lose all desire of changing it, and coming back to their own countrymen; nor are there wanting instances, especially among the French Canadians, who of their own free-will have gone over to the savages there, and taken up the same kind of life as they[2].

Finally, I am of opinion that after all these numerous instances I have brought together of negroes of capacity, it would not be difficult to mention entire well-known provinces of Europe, from out of which you would not easily expect to obtain off-hand such good authors, poets, philosophers, and correspondents of the Paris Academy; and on the other hand, there is no so-called savage nation known under the sun which has so much distinguished itself by such examples of perfectibility and original capacity for scientific culture, and thereby attached itself so closely to the most civilized nations of the earth, *as the Negro.*

---

[1] See the vignette to his *Discours sur l'inégalité parmi les hommes.*

[2] Lieut. Paterson speaks of a German at the Cape, who had completely come over in this way to the Hottentots, and had then already lived twenty years in the midst of them, and was entirely naturalized and considered as one of them.

XIV.

The Kakerlacken.

These poor sufferers have come off in the history of man not a bit better than the honest negroes. There have been sceptics who were as unwilling to recognize the Kakerlacken for men of the same species with ourselves as the Moors. The latter were too black for them, and the former too white. In reality the examination of the Kakerlacken has nothing whatever to attach it to the domain of natural history, for it belongs to pathology. Meanwhile, as it has once been dragged into the former, and so has given handle to many wonderful mistakes, I think I may go so far as to say a few words about them; and they join on all the more easily to the former section, because their history was originally confounded with that of the negroes.

For at the very first of all a sort of men was remarked amongst these last, who were distinguished by an unusual whiteness or even redness of skin, and by hair of a yellowish white and pale red eyes; and of course these singularities would strike people more in negroes than in white men; and for that reason the Kakerlacken were first of all known by the name of Leucœthiopians. But just about the end of the last century they were found amongst the Americans also, and very shortly afterwards, besides these, amongst the East Indian populations. Still later Cook saw some on Otaheite and the Friendly Islands; and now at last it is clear that they are also to be found in Europe itself, and that too in greater numbers than we can altogether desire. Since I laid before the Royal Society of Sciences my observations on those two well-known Savoyards, whom I had the opportunity of examining in 1783, on an excursion which I made in company with the younger De Luc, from Geneva to Faucigny, and who afterwards went for some years to London, where they were described by the directors of the circus, I have received accounts of a round dozen of other Kakerlacken who have been found up and down in Germany alone, and have from most of them specimens of their own quite peculiar hair. It

seems to have been the case with the Kakerlacken as with many other wonders of nature, that they have been for a long time overlooked in many countries, because they were considered too great rarities to be expected. In one word, the Kakerlacken occur in all the five races of mankind.

Besides, this singularity is not peculiar to mankind alone, but shows itself also just as much in other warm-blooded animals, as in mammals and in birds. Amongst the former, we have notoriously the white rabbits and the white mice, and amongst the latter the white canary birds. On the other hand, in spite of all the researches I have made in that direction, I have not been able to find any single example of Kakerlacken among the animals with red cold blood, either amongst the amphibia or fish. That above all I consider the Kakerlacken as diseased, and consequently white canaries, &c. the same, will be strange to no one who is acquainted with their constitution. Their chief symptom consists in the singular colour of their eyes, the iris of which is a pale pink colour, and the pupils of the colour of a dark carnation, or very much like blackberry juice, whereas in a sound eye these last, whatever the colour of the iris may be, whether blue or brown, must always be entirely black. The reason of that redness lies in a total want of that part which is indispensable to clear sight, namely, the dark brown mucus which is spread over a great part of the inner apple of the eye, in order to absorb the superfluous rays of light. Consequently, the Kakerlacken through this deficiency are generally more or less shy of light. But this deficiency of the black pigment seems always to be only a symptom of an universal cachexia, which in human Kakerlacken finds its particular expression through the peculiar aspect of the skin and the yellowish-white colour of the hair; at least so far as I know, no one has ever observed that disease of the eyes without this quality of skin and hair.

The disorder is invariably congenital, and frequently hereditary in families. It seems to be incurable; at least I know of no case in which the symptoms related have ever been got rid of by any single Kakerlack. On the causes of this remarkable

disease I do not know how at this moment to say anything satisfactory; for as to the remark that an otherwise quick-seeing traveller, Foucher d'Obsonville, has made, that Leucœthiopians are begotten when the parents are taking mercury or cinnabar at the time, it is impossible to imagine it correct in many of the cases of the nations mentioned, and in many of the animals among whom Kakerlacken are found, even if the whole idea were not to the last extent extremely improbable. So also the old assertion, that no Leucœthiopian of either sex was capable of procreation, is completely untrue. De Brue has already found an instance in which a Leucœthiopian became pregnant by a negro, and a perfect young negro was born, and the well-known negro Vasa, in his above-mentioned interesting work, has given a remarkable account of a Leucœthiopian female, who was lately married in England to an European, and has borne him three genuine Mulattos with light hair.

APPENDIX I. To p. 284 *n.*

On the gradation in nature.

Two scientific societies, the one at Rouen and the other at Haarlem, have lately given out as the subject for a prize, *Whether the asserted gradation in nature has any real foundation or not?* I am acquainted with only one essay in answer to this question which was sent in to the last-mentioned learned society, whose renowned author, our worthy Professor De Luc, has handled the whole subject only from a metaphysical *à priori* point of view, and even in this way comes to the conclusion that there is neither continuity nor imperceptible gradation in the creation, and that the harmony of the creation is rather supported by marked differences, having sharply defined boundaries between them. On the other hand, I long ago[1] pointed out considerations against the reality of the structural conceptions of the gradation of creatures according to their mere exterior

[1] *Handbuch der Naturgesch.* p. 6, 7th ed.

form, and against the very well-meant, but at the bottom very presumptuous tendency towards this idea, which is found in many physico-theologians; and these are entirely empirical, taken from natural history itself, and from the visible constraint which, in all the various essays on such gradations, is done to nature. Who does not feel how constrained he is when Bradley carries up his scale from the simplest fossils through the vegetable and animal kingdom up to man, but has to put off what he cannot readily make fit into this scale into a second, by which he descends on the other side again from that elevation? or, when in order to stand fast by particular passages and connecting links, Vallisneri brings forward the analogy of grasshoppers with birds, Oehme the analogy of birds with house-flies and other *Dipteræ*, and when Bonnet chooses the shield-lice as creatures of the transition from other insects to the tape-worm, &c. We should find it much easier to excuse the older describers of nature, when, deceived by the great resemblance of the exterior, they located the armadilloes of the genus *Manis* with the lizards, or the sertularia, and above all the corals, with the cryptogamic plants; since with certainly quite as much reason, in consequence of an extremely superficial view of an outward structure very nearly resembling them, many even phanogeramic species of plants out of the genera *Saxifraga, Andromedæ, Aretiæ*, &c. in spite of all their remaining heterogeneity, have had a place found for them on the ladder close to the large-leaved moss.

When that extraordinary wonder-animal of the fifth part of the world, the *Ornithorhynchus paradoxus*, was discovered, many partisans of gradation looked upon it as a fresh support of that theory, whereas, it seems to me much rather to be a new evidence against its reality. It seems to me so very isolated a creature of its sort, that it can be no more brought into the natural arrangement of the animal kingdom without visible constraint, than the tortoises, cuttle-fish, &c., or than many genera of plants, as the *Vitis, Cissus*, &c. in that of the vegetable kingdom. Besides this, in the scale of Bonnet, and simple ones of that kind, the transition department from the birds to the quadrupeds has been long since filled up by the bat; and yet it would

be difficult to imagine two forms of mammals, which differ more surprisingly from each other, and which must therefore in any gradation stand further apart from each other, than those of the bat and the ornithorhynchus.

It must be understood that all that has been said here, as well as what was suggested above (p. 283), by the expressions quoted from an otherwise meritorious writer on the use of petrifactions, is only to be regarded as a warning against the misuse of the common conception of gradation, according to the outward form of creatures under the favourite images of ladders and links: since, on the other hand, the very greatest use may be made of this very metaphorical image not only towards the exercise of observation, but also with the greatest advantage towards the regular use of a natural system in the description of nature, and also for the most advantageous arrangement of natural collections. Only instead of the partisans of this gradation acknowledging its value in dividing the productions of nature into kingdoms, classes, &c., and as a means of methodizing study and an assistance to the memory, but allowing that it has no real existence in nature itself; exactly the opposite seems to have come of those structural conceptions, whose unmistakeable value for the science of method cannot be denied, but which are so very far from having any real ground in nature itself, that it has often happened to well-meaning physico-theologians that "they have attributed it to the Creator in the plan of His creation, and have made its completeness and connexion to be sought for in the fact that nature, as the expression goes, *makes no leap, because* creatures with respect to their outward habit can be arranged so closely in gradation one with another."

APPENDIX II. To p. 285.

On the Succession of the different Earth-catastrophes.

If petrifactions can be made of regular use for the archæology and the physical geography of the earth, as the surest

documents in the archives of nature for the fruitful history of the catastrophes which have been connected with our planet since its creation, the study of them, and its tendency, demands as well a thorough critical comparison of them with the organized bodies of the present creation, as also an accurate investigation of their different localities, and their geognostical relations. The first important and instructive result which is immediately derived from this two-fold consideration is, that the lapidifications are of extremely unequal antiquity; many, as the still fresh *Salmo arcticus* of the west coast of Greenland, which is, so to speak, merely mummified in the thin clayish-marl beds, is only of yesterday or the day before, in comparison with the thoroughly strange and puzzling impressions of unknown plants which are found in the grau-wacke strata of the Harz on the borders of the Gangberg in the depths of the earth, and which belong to the very oldest evidences of an organized creation on our planet. A wider examination of these differently made fossils, and of their equally various sort of condition, brings us to a closer conclusion as to the oldest history of the body of this earth, and upon the sort and consequences of the numerous catastrophes it has gone through, and through which its crust has acquired its present appearance, which has been built out of such great convulsions. It is therefore my opinion, that the petrifactions may be arranged off-hand, according to their different antiquity, most easily in three principal divisions. First, those whose complete similarity with still existing representatives, as well as the positions they are found in, prove that they must be comparatively the most recent; secondly, those far older, which have not indeed similar but still more or less allied analogues to them in the present creation, although in climates very distant from those which contain such fossil remains; finally, in the third place, the very oldest of all, consisting for the most part of creatures completely unknown, the records of a perfectly strange creation which has been completely destroyed. These three divisions may to a certain extent be compared to the three epochs in the oldest profane writings of an historical, heroic, and mythical period.

The first of these divisions comprises, therefore, the relatively most modern lapidifications, those namely which seem to have been occasioned by partial local revolutions since the last general catastrophe which our planet suffered; and consequently, nothing but those whose representatives are still in existence, and which are closely allied to the fossil remains in the same country. Amongst them I reckon the uncommonly clear casts and remains from all six classes of the animal kingdom, and the numerous kinds of plants which are to be found in, and have made famous, the stinking slate-quarries at Oeningen on the Bodensee. When I travelled in that country I made a collection of them, and I have seen still more in other collections; but amongst all, which I have myself been able to examine accurately, I have unfortunately found nothing exotic, nothing which might not be referred either unmistakeably, or at all events with the greatest probability, to the fauna and flora of that present country and its waters.

To the second of these principal divisions belong fossils of quite another sort and far higher origin; namely, the now innumerable elephants, rhinoceroses, and other now tropical creatures found in this country, which most probably must have been once naturalized here, as is particularly demonstrated by the enormously large dens of huge species of bears in the famous summits of the Harz, the Fichtelberg, in the Thuringian forest and on the Carpathians. Everything goes to show that those bears came alive into those caves, and found their graves there. But there are also found in these caves with them bones and teeth of beasts of prey, like the lions and hyænas of the present earth, of which I have specimens, from most of the dens mentioned, in my collection. Consequently, according to all probability that species of bears was also a tropical one, just as bears still live in many of the tropical zones of the old world; and as those bears and lions are found in positions where it would be difficult for them to have been floated in by any current after death, so this seems very unlikely to have happened either to the elephants or rhinoceroses. Especially when it is considered that quite little flocks of many of these

have been found together, as the five individual hippopotami on the hither Harz, whose fossil remains have been determined and described with a master's hand by our meritorious Hollmann; and that of others, as of the two elephants from Tonna, mentioned above, the complete skeletons have been dug out, &c. And finally, all this derives a new importance from another geological phenomenon, which according to my conviction belongs to a similar division, and must be joined in close connection with it; I mean the remains of tropical animals in certain limestones. Thus in the calcareous strata of Pappenheim there have been found amongst so many other tropical creatures a kind of Molluscan[1] water-flea, and the still articulated arm bones of a species of bat, very much like the flying-dog, and all these so well preserved, even up to the most delicate Indian star-fishes, so clear and in such perfection, that no notion can remain of any transport of them through a general flood from the southern hemisphere here. On the contrary, it is quite clear that those elephants, rhinoceroses, and hyæna-like animals must once have been just as these water-fleas, star-fishes, &c., domesticated in our latitudes, until through some cause which we cannot now determine with any certainty, a total alteration of the climate took place, which occasioned the destruction of the then living generation of those tropical creatures, as of many other genera and species of organized bodies which existed along with them, of which in the present creation no exactly similar, to say nothing of specifically like, representatives are to be found: as the unknown of Ohio among great land-animals, and amongst the marine-animals in the Pappenheim slate-quarries, so many altogether strange species of crabs, the singular hard-armed medusa head, and many others.

This revolution, which seems to have been merely climatic, must be distinguished from those earlier and much more forcible ones, from which we must date the petrifactions of the *third*

---

[1] [The *Pterodactylus*, a reptile; and since the time of Blumenbach, the *Archæopteryx macrurus*, a longtailed bird. Ed.]

division, the oldest of all. In those the firm crust of the earth itself suffered such powerful shocks, that the floors of the previous seas of the primeval world began to cover high mountains with their still uninjured shells; and on the other hand, the previous vegetation of the land was buried deep under the present surface of the sea. It is at once observed that these destructive catastrophes themselves were again of more than one sort, and were very far from happening all at the same time; although it is scarcely possible at present to determine with any certainty the chronological arrangement of the successive periods in which they happened, to say nothing of the causes of them.

APPENDIX III. To p. 292.

On the so-called Objects of Design.

Few scientific theories have been supported and opposed with such incredible prejudices on the one side and on the other, as those about the objects of design of the Creator. With many indeed, who contested this point, it was merely a question of words, whether one ought to speak of design or utility. Others considered the whole question of final causes as entirely useless; and Bacon's *bon-mot* is well known, who compared it to a prudent virgin, who weds heaven, and consequently produces nothing for the world. The great thinker would however have come to a different conclusion if he had been reminded out of the literature of physiology and natural history, what completeness in these important sciences and what useful results to mankind the search into the final purposes of nature has produced. But certainly the teleologists have laid themselves wonderfully open by anxiously catching at those things, and have also used great force to them, because they have thought themselves obliged to demonstrate clearly the aim and object of every disposition of nature, especially in the organic creation. Thus the otherwise praiseworthy anatomist Spigel declares that the reason why in man that part on which he sits has been so visibly more

developed than in any other animal is, that people may have a more convenient position in which to apply themselves to higher thoughts[1]. So the physico-theologians thought they had found a perforated disk in a bee-like insect on the front feet of the males, and were not behindhand in demonstrating the use and object of this structure. Wise nature had done this, they said, in order that the pollen of the flower might percolate through the creature, and in that way the fructification of plants be provided for; and from that hour it was immediately called the sieve-bee (*Sphex cribraria*). It is very creditable to a clergyman, Göze of Quedlinburg, who has in every way won great renown in natural history, that he has refuted this mistake out of nature herself, and has shown that the disks on the feet of these insects are not penetrated; and consequently this wise object which was with good intentions attributed to the Creator will not stand.

Others, sometimes, on the contrary, have doubted the reality of any arrangement in nature for the very reason that they cannot find in it any design of the Creator. When I pointed out to my never-to-be-forgotten friend Camper, that, in nature, contrary to every common opinion, the tadpoles of the pipa of Surinam were regularly tailed, he was disposed at first to consider[2] the instance I showed him as an unnatural monstrosity, because he could not understand of what use this fin-tail could be to these little creatures who sit nestled on the back of their mothers. Others, again, have swept the whole road quite clean, and completely denied all design in the creation. Not many years ago a distinguished member of the then Academy of Sciences of Paris

---

[1] "Man alone of all animals sits comfortably, because he has larger fleshy buttocks, and these were given him as a support and a cushion, so that when his stomach was full, he could sit without inconvenience, and apply his mind more readily to reflection upon divine matters."—"There was however a respectable English clergyman of another opinion, who amongst other suggestions as to the delicate and particular propriety of conduct which should be observed in church, used to urge very zealously that the psalms should be sung standing, because it was impossible they could come right from the heart in a sitting posture:" see *Remarks on the Public Service of the Church, with some Directions for our Behaviour there, highly proper to be understood by People of all Ranks and Ages*, Lond. 1768, 8vo.

[2] *Comment. Soc. Reg. Scient. Götting.*, T. IX. p. 119.

declared that it was as ridiculous to suppose that the eye was made to see with[1], as to assert that stones were appointed for the purpose of breaking a man's head. This however, please God, will scarcely be satisfactory to any one who has ever had the opportunity of comparing the interior structure of any animal which is remarkable for striking singularities in its mode of life and functions, and can in this way persuade himself from nature itself most incontrovertibly of this pre-established harmony, as it may easily be called, between the purposed structure of creatures and their mode of life. It would be difficult for anyone who is well acquainted with the natural history of the mole or the seal, and will consider with some little reflection the skeleton and muscular system of the former, and the peculiarities of the circulation and the organs of sense of the latter, to allow himself seriously to utter such an expression as the one mentioned above. The hundredfold proofs which may be deduced from comparative anatomy deprive the weak superficialities of some ancient sophists, who supposed that the animal structure was not ordained for its functions, but that the occupations of animals were only the mere consequence of their organization, of the last shadow of speciousness. Thus the production of so many mere temporary organs which only exist in the animal economy for transitory and extremely limited purposes, and which all the same are as good as those which are most durable in all the rest of the structure of those animals in which they are found, are wonderfully adapted to their mode of life. Thus, to produce only one instance of the kind, in the hedgehog, which rolls itself up in defence with such great muscular power, even the unborn fœtuses are completely furnished with one of these powerful springs, most accurately arranged, but which is afterwards in its way an after-birth[2] quite anomalously deformed, thick, and solid, under which the tender immature creature rests

[1] Thus said Lucretius long ago:

"Lumina ne facias oculorum clara creata
Prospicere ut possimus," &c.

[2] I have given representations of this highly remarkable part in my *Handbuch der vergleichenden Anatomie*, Tab. 8.

as under a shield, in order to be as completely as possible protected, on any powerful constriction of the pregnant mother, against the dangerous consequences of that strong grasp from which its abdomen and entrails might thereby suffer.