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# CONTRIBUTIONS TO NATURAL HISTORY,

BY

## J. F. BLUMENBACH.

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## PART THE FIRST.

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### 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,

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[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

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[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

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[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].

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[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

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[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.

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[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.

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[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