

Vestiges of the Natural History of Creation

AND

Other Evolutionary Writings

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ROBERT CHAMBERS in July 1844;
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the generative process is, by the simple mode of cropping down, kept up for a whole year beyond its usual term. The type is thus allowed to advance, and what was oats becomes rye.

The idea, then, which I form of the progress of organic life upon the globe—and the hypothesis is applicable to all similar theatres of vital being—is, *that the simplest and most primitive type, under a law to which that of like-production is subordinate, gave birth to the type next above it, that this again produced the next higher, and so on to the very highest, the stages of advance being in all cases very small—namely, from one species only to another; so that the phenomenon has always been of a simple and modest character. Whether the whole of any species was at once translated forward, or only a few parents were employed to give birth to the new type, must remain undetermined; but, supposing that the former was the case, we must presume that the moves along the line or lines were simultaneous, so that the place vacated by one species was immediately taken by the next in succession, and so on back to the first, for the supply of which the formation of a new germinal vesicle out of inorganic matter was alone necessary. Thus, the production of new forms, as shewn in*

the pages of the geological record, has never been anything more than a new stage of progress in gestation, an event as simply natural, and attended as little by any circumstances of a wonderful or startling kind, as the silent advance of an ordinary mother from one week to another of her pregnancy. Yet, be it remembered, the whole phenomena are, in another point of view, wonders of the highest kind, for in each of them we have to trace the effect of an Almighty Will which had arranged the whole in such harmony with external physical circumstances, that both were developed in parallel steps—and probably this development upon our planet is but a sample of what has taken place, through the same cause, in all the other countless theatres of being which are suspended in space.

This may be the proper place at which to introduce the preceding illustrations in a form calculated to bring them more forcibly before the mind of the reader. The following table was suggested to me, in consequence of seeing the scale of animated nature presented in Dr. Fletcher's Rudiments of Physiology. Taking that scale as its basis, it shews the wonderful parity observed in the progress of creation, as presented to our observation in the succession of fossils, and also in the

fetal progress of one of the principal human organs.* This scale, it may be remarked, was not made up with a view to support such an hypothesis as the present, nor with any apparent regard to the history of fossils, but merely to express the appearance of advancement in the orders of the Cuvierian system, assuming, as the criterion of that advancement, "an increase in the number and extent of the manifestations of life, or of the relations which an organized being bears to the external world." Excepting in the relative situation of the annelida and a few of the mammal orders, the parity is

* "It is a fact of the highest interest and moment that as the brain of every tribe of animals appears to pass, during its development, in succession through the types of all those below it, so the brain of man passes through the types of those of every tribe in the creation. It represents, accordingly, before the second month of utero-gestation, that of an avertebrated animal; at the second month, that of an osseous fish; at the third, that of a turtle; at the fourth, that of a bird; at the fifth, that of one of the rodentia; at the sixth, that of one of the ruminantia; at the seventh, that of one of the digitigrada; at the eighth, that of one of the quadrumana; till at length, at the ninth, it compasses the brain of Man! It is hardly necessary to say, that all this is only an approximation to the truth; since neither is the brain of all osseous fishes, of all turtles, of all birds, nor of all the species of any one of the above order of mammals, by any means precisely the same, nor does the brain of the human fetus at any time precisely resemble, perhaps, that of any individual whatever among the lower animals. Nevertheless, it may be said to represent, at each of the above-mentioned periods, the aggregate, as it were,

perfect; nor may even these small discrepancies appear when the order of fossils shall have been further investigated, or a more correct scale shall have been formed. Meanwhile, it is a wonderful evidence in favour of our hypothesis, that a scale formed so arbitrarily should coincide to such a nearness with our present knowledge of the succession of animal forms upon earth, and also that both of these series should harmonize so well with the view given by modern physiologists of the embryotic progress of one of the organs of the highest order of animals.

of the brains of each of the tribes stated; consisting as it does, about the second month, chiefly of the mesial parts of the cerebellum, the corpora quadrigemina, thalami optici, rudiments of the hemispheres of the cerebrum and corpora striata; and receiving in succession, at the third, the rudiments of the lobes of the cerebrum; at the fourth, those of the fornix, corpus callosum, and septum lucidum; at the fifth, the tubor annulare, and so forth; the posterior lobes of the cerebrum increasing from before to behind, so as to cover the thalami optici about the fourth month, the corpora quadrigemina about the sixth, and the cerebellum about the seventh. This, then, is another example of an increase in the complexity of an organ succeeding its centralization; as if Nature, having first piled up her materials in one spot, delighted afterwards to employ her abundance, not so much in enlarging old parts as in forming new ones upon the old foundations, and thus adding to the complexity of a fabric, the rudimental structure of which is in all animals equally simple."—*Fletcher's Rudiments of Physiology.*

SCALE OF ANIMAL KINGDOM.

(The numbers indicate orders.)

ORDER OF ANIMALS IN

ASCENDING SERIES OF ROCKS.

1 Gneiss and Mica Slate system

FETAL HUMAN BRAIN

RESEMBLES, IN

RADIATA (1, 2, 3, 4, 5)	Zoophyta	} 2 Clay Slate and Grawacke system	} 1st month, that of an avertebrated animal;	
	Polyparia			
MOLLUSCA (6, 7, 8, 9, 10, 11)	Conchifera	} 3 Silurian system	} 2nd month, that of a fish;	
	Double-shelled Mollusks			
ARTICULATA	Annélida (12, 13, 14)	} 4 Old Red Sandstone	} 3rd month, that of a turtle;	
	Crustacea (15, 16, 17, 18, 19, 20)			
	Arachnida & Insecta (21-31)			
	Pisces (32, 33, 34, 35, 36)			
VERTEBRATA	Reptilia (37, 38, 39, 40)	} 5 Carboniferous formation	} 4th month, that of a bird;	
	Aves (41, 42, 43, 44, 45, 46)			
		Piscine Saurians (ichthyosaurus, &c.)	} 7 Oolite	} 5th month, that of a rodent;
		Pterodactyles		
		Crocodyles	} 8 Cretaceous formation	} 6th month, that of a ruminant;
		Tortoises		
		Batrachians	} 9 Lower Eocene	} 7th month, that of a digitigrade animal;
		Birds		
		Cetacea	} 10 Miocene	} 8th month, that of the quadrumanus;
		Ruminantia (Bone of a marsupial animal)		
	Pachydermata	} 11 Pliocene	} 9th month, attains full human character.	
	Edentata			
	Rodentia	} 12 Superficial deposits		
	Marsupialia			
	Mammalia			

The reader has seen physical conditions several times referred to, as to be presumed to have in some way governed the progress of the development of the zoological circle. This language may seem vague, and, it may be asked,—can any particular physical condition be adduced as likely to have affected development? To this it may be answered, that air and light are probably amongst the principal agencies of this kind which operated in educing the various forms of being. Light is found to be essential to the development of the individual embryo. When tadpoles were placed in a perforated box, and that box sunk in the Seine, light being the only condition thus abstracted, they grew to a great size in their original form, but did not pass through the usual metamorphose which brings them to their mature state as frogs. The proteus, an animal of the frog kind, inhabiting the subterraneous waters of Carniola, and which never acquires perfect lungs so as to become a land animal, is presumed to be an example of arrested development, from the same cause. When, in connexion with these facts, we learn that human mothers living in dark and close cells under ground,—that is to say, with an inadequate provision of air and light,—are found to

produce an unusual proportion of defective children,* we can appreciate the important effects of both these physical conditions in ordinary reproduction. Now there is nothing to forbid the supposition that the earth has been at different stages of its career under different conditions, as to both air and light. On the contrary, we have seen reason for supposing that the proportion of carbonic acid gas (the element fatal to animal life) was larger at the time of the carboniferous formation than it afterwards became. We have also seen that astronomers regard the zodiacal light as a residuum of matter enveloping the sun, and which was probably at one time denser than it is now. Here we have the indications of causes for a progress in the purification of the atmosphere and in the diffusion of light during the earlier ages of the earth's history, with which the progress of organic life may have been conformable. An accession to the proportion of oxygen, and the effulgence of the central luminary, may have been the immediate prompting cause of all those advances from

* Some poor people having taken up their abode in the cells under the fortifications of Lisle, the proportion of defective infants produced by them became so great, that it was deemed necessary to issue an order commanding these cells to be shut up.

species to species which we have seen, upon other grounds, to be necessarily supposed as having taken place. And causes of the like nature may well be supposed to operate on other spheres of being, as well as on this. I do not indeed present these ideas as furnishing the true explanation of the progress of organic creation; they are merely thrown out as hints towards the formation of a just hypothesis, the completion of which is only to be looked for when some considerable advances shall have been made in the amount and character of our stock of knowledge.

Early in this century, M. Lamarck, a naturalist of the highest character, suggested an hypothesis of organic progress which deservedly incurred much ridicule, although it contained a glimmer of the truth. He surmised, and endeavoured, with a great deal of ingenuity, to prove, that one being advanced in the course of generations to another, in consequence merely of its experience of wants calling for the exercise of its faculties in a particular direction, by which exercise new developments of organs took place, ending in variations sufficient to constitute a new species. Thus he thought that a bird would be driven by necessity to seek its food in the water, and that, in its

efforts to swim, the outstretching of its claws would lead to the expansion of the intermediate membranes, and it would thus become web-footed. Now it is possible that wants and the exercise of faculties have entered in some manner into the production of the phenomena which we have been considering; but certainly not in the way suggested by Lamarck, whose whole notion is obviously so inadequate to account for the rise of the organic kingdoms, that we only can place it with pity among the follies of the wise. Had the laws of organic development been known in his time, his theory might have been of a more imposing kind. It is upon these that the present hypothesis is mainly founded. I take existing natural means, and shew them to have been capable of producing all the existing organisms, with the simple and easily conceivable aid of a higher generative law, which we perhaps still see operating upon a limited scale. I also go beyond the French philosopher to a very important point, the original Divine conception of all the forms of being which these natural laws were only instruments in working out and realizing. The actuality of such a conception I hold to be strikingly demonstrated by the discoveries of Macleay, Vigers, and Swainson, with re-

spect to the affinities and analogies of animal (and by implication vegetable) organisms.* Such a regularity in the *structure*, as we may call it, of the *classification of animals*, as is shewn in their systems, is totally irreconcilable with the idea of form going on to form merely as needs and wishes in the animals themselves dictated. Had such been the case, all would have been irregular, as things arbitrary necessarily are. But, lo, the whole plan of being is as symmetrical as the plan of a house, or the laying out of an old-fashioned garden! This must needs have been devised and arranged for beforehand. And what a preconception or forethought have we here! Let us only for a moment consider how various are the external physical conditions in which animals live—climate, soil, temperature, land, water, air—the peculiarities of food, and the various ways in which it is to be sought; the peculiar circumstances in which the business of reproduction and the care-taking of the young are to be attended to—all these required to be taken into account, and thousands of animals were to be formed suitable in organization and mental character for the concerns they were to have with

* These affinities and analogies are explained in the next chapter.

these various conditions and circumstances—here a tooth fitted for crushing nuts; there a claw fitted to serve as a hook for suspension; here to repress teeth and develop a bony net-work instead; there to arrange for a bronchial apparatus, to last only for a certain brief time; and all these animals were to be schemed out, each as a part of a great range, which was on the whole to be rigidly regular: let us, I say, only consider these things, and we shall see that the decreeing of laws to bring the whole about was an act involving such a degree of wisdom and device as we only can attribute, adoringly, to the one Eternal and Unchangeable. It may be asked, how does this reflection comport with that timid philosophy which would have us to draw back from the investigation of God's works, lest the knowledge of them should make us undervalue his greatness and forget his paternal character? Does it not rather appear that our ideas of the Deity can only be worthy of him in the ratio in which we advance in a knowledge of his works and ways; and that the acquisition of this knowledge is consequently an available means of our growing in a genuine reverence for him!

But the idea that any of the lower animals have been concerned in any way with the origin of

man—is not this degrading? Degrading is a term, expressive of a notion of the human mind, and the human mind is liable to prejudices which prevent its notions from being invariably correct. Were we acquainted for the first time with the circumstances attending the production of an individual of our race, we might equally think them degrading, and be eager to deny them, and exclude them from the admitted truths of nature. Knowing this fact familiarly and beyond contradiction, a healthy and natural mind finds no difficulty in regarding it complacently. Creative Providence has been pleased to order that it should be so, and it must therefore be submitted to. Now the idea as to the progress of organic creation, if we become satisfied of its truth, ought to be received precisely in this spirit. It has pleased Providence to arrange that one species should give birth to another, until the second highest gave birth to man, who is the very highest: be it so, it is our part to admire and to submit. The very faintest notion of there being anything ridiculous or degrading in the theory—how absurd does it appear, when we remember that every individual amongst us actually passes through the characters of the insect, the fish, and reptile, (to speak nothing of others,) before he

is permitted to breathe the breath of life! But such notions are mere emanations of false pride and ignorant prejudice. He who conceives them little reflects that they, in reality, involve the principle of a contempt for the works and ways of God, For it may be asked, if He, as appears, has chosen to employ inferior organisms as a generative medium for the production of higher ones, even including ourselves, what right have we, his humble creatures, to find fault? There is, also, in this prejudice, an element of unkindness towards the lower animals, which is utterly out of place. These creatures are all of them part products of the Almighty Conception, as well as ourselves. All of them display wondrous evidences of his wisdom and benevolence. All of them have had assigned to them by their Great Father a part in the drama of the organic world, as well as ourselves. Why should they be held in such contempt? Let us regard them in a proper spirit, as parts of the grand plan, instead of contemplating them in the light of frivolous prejudices, and we shall be altogether at a loss to see how there should be any degradation in the idea of our race having been genealogically connected with them.