

## Difficulties of the Theory of Natural Selection

St George Jackson Mivart

150 years ago today, Charles Darwin's seminal work, *On the Origin of Species* was published. *Thinking Faith* offers a unique example of the initial reaction to Darwin's ideas with an extract from one of the most prolific early commentators on evolutionary theory, Catholic layman St George Jackson Mivart. Originally published in Jesuit journal *The Month* in 1869, this critique scrutinises the principle of natural selection, but sees its potential to impact on future thinking, including theological discourse.

[We need hardly say that the following interesting remarks on Mr Darwin's theory as to the origin of species are not meant to discuss the question on theological grounds. The writer assumes the hypothesis that the theory in question does not of necessity contradict either the doctrine of Creation, or the Scriptural accounts which bear upon the fact of creation. This being so, the theory may be discussed without reference to its advocates. Some of these may certainly not have spoken in a Catholic manner either as to Creation or the Scriptural narrative. But the theory need not be involved in the fault of its supporters. It is too often the case that the students of physical phenomena are prone to think that the generalisations at which they have arrived are such as to raise difficulties against received doctrines or interpretations of Scripture, and to use their discoveries as weapons against religion. Their great prevailing fault is their defect of logic. The best and most intelligent critics among men of their own class have often remarked on this, and it is evident to the whole world in the notorious fact of the rapidity with which theories based on premature generalisations have constantly to be abandoned before the force of subsequent discoveries. Akin to this want of precise logic is the impetuosity with which hastily formed theories based upon observations of indisputable though exaggerated value are forced into collision

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with the venerable truths of faith. We do not now inquire whether the advocates of the theory of Natural Selection have not committed many faults of this last kind. But this question need not here be discussed, and it may fairly be put aside for the moment for the sake of examining the theory on its own ground, and testing its competency to explain the whole of the phenomena which it ought to explain. This is the best way of arriving at a proper

estimate of its value, and it enables us gratefully to welcome whatever is of importance in the observations on which it is grounded, and to see their true bearing upon the advance of natural sciences. The theory may then be found to add greatly to our knowledge, without in any way conflicting with what is certain and incontrovertible.]

Mr Darwin's theory of 'Natural Selection' is perhaps the most interesting theory, in relation to natural science, which has been promulgated during the present century. Remarkable indeed is the way in which it groups together such a vast series of biological<sup>1</sup> facts, and even paradoxes, which it appears more or less clearly to explain. By this theory of 'Natural Selection' light is thrown on the more singular facts relating to the geographical distribution of animals and plants: for example, on the resemblance between the past and present inhabitants of different

parts of the earth's surface, creatures closely allied to kangaroos having existed in the Australian region, where alone kangaroos are now found; and sloths and armadillos living now only in South America where also we find the remains of extinct forms nearly related to them. Such coincidences are numerous. Again, it serves to explain the circumstance that often in adjacent islands we find animals closely resembling, and appearing to represent, each other; while if certain of these islands show signs (by depth of surrounding sea or what not) of more ancient separation, the animals inhabiting them exhibit a corresponding divergence.<sup>2</sup> 'Rudimentary structures' also receive an explanation by means of this theory. These structures are parts which are apparently functionless and useless where they occur, but which represent similar parts of large size and functional importance in other animals. Examples of such 'rudimentary structures' are the foetal teeth of whales and of the front part of the jaw of ruminating quadrupeds. These are minute in size and never cut the gum, but are reabsorbed without ever coming into use, while no other teeth represent them in the adult condition of those animals. The mammary glands of all the male animals, and the minute wing-bones of the New Zealand apteryx, are other examples. Again, the curious fact that animals of very different form and habit (as, for example, the whale and the bat, or again the butterfly and the shrimp) are yet constructed on essentially similar type is also readily explicable by 'Natural Selection.' That remarkable series of changes which animals undergo before they attain their adult condition, which is called their process of development, and in which they more or less closely resemble the early stages of the same process in other animals, has also great light thrown on it from the same source. The singularly complex resemblances borne by every adult animal and plant to a certain number of other animals and plants finds its solution in a similar manner. Finally, by this theory – and as yet by this alone – can any explanation be given of that extraordinary phenomenon termed *mimicry*. Mimicry is a close and striking, yet superficial resemblance borne by some animal or plant to some other very distinct animal or plant. The 'walking leaf' (an insect belonging to the grasshopper order) is a well known but most striking incidence of the assumption by an animal of the appearance of a vegetable structure, and the bee, fly, spider and orchid are familiar examples of a converse resemblance.

Birds, butterflies, and even fish, seem to have in certain instances a similarly striking external semblance to birds, butterflies and fish of altogether distinct kinds.

Not only are all these diverse facts strung together, as it were, by the theory in question; not only does it explain the development of the complex instincts of the beaver, the cuckoo, the bee, and the ant, the song of the birds, the perfume of flowers, and the brilliant clothing of some of each; but it serves as a basis of future research and of inference from the known to the unknown. It guides the investigator to the discovery of new facts which, when ascertained, it seems also able to co-ordinate.<sup>3</sup> Nay, 'Natural Selection' seems capable of application not only to the building up of the smallest and most insignificant organisms, but even of extension beyond the biological domain altogether, so as possibly to have relation to the stable equilibrium of the solar system itself and even of the whole sidereal universe.

Thus, whether this theory be true or false, all lovers of natural science should, on account of its practical utility, acknowledge a deep debt of gratitude to Messrs. Darwin and Wallace. With regard to the former gentleman (with whose name, on account of the noble self-abnegation of Mr. Wallace, the theory is, in general, exclusively associated) his friends may heartily congratulate him on the fact that he is one of the few exceptions to the rule respecting the non-appreciation of a prophet in his own country. It would be difficult to name another living labourer in the field of physical science who has excited an interest so widespread, and given rise to so much praise and animadversion, gathering round him, as he has done, a chorus of more or less completely acquiescing disciples, themselves masters in science and each the representative of a crowd of enthusiastic followers. But other causes have concurred to produce this interest in the theory besides the way in which it harmonises with biological facts. The latter could only be appreciated by men of science, while this theory, so novel and so startling, has found a cloud of advocates and opponents beyond and outside the scientific world.

In the first place, it was inevitable that a great crowd of half-educated men and shallow thinkers should accept with eagerness the theory of 'Natural

Selection', on account of a certain characteristic it has in common with other theories, which should not be mentioned in the same breath with it except, as now, with the accompaniment of protest and apology. We refer to its remarkable simplicity, and the ready way in which phenomena the most complex appear to be explained by a cause for the comprehension of which laborious and preserving efforts are not required, but which may be represented by the simple phrase 'survival of the fittest.'<sup>4</sup>

It is in great measure owing to this, and to a belief that it is yet easier and more simple than it is, that Darwinism, however imperfectly understood, has become a subject for general conversation in the way it has done, and has been able thus widely to increase a certain knowledge of biological matters; and this excitement of interest in quarters where otherwise it would have been entirely wanting, is an additional motive for gratitude on the part of naturalists to the authors of the new theory. At the same time it must be admitted that a similar 'simplicity' – the apparently easy explanation of complex and difficult facts – also constitutes the charm of such matters as hydropathy, homeopathy, and phrenology, in the eyes of the unlearned or half-educated public. It is indeed, *the* charm of all those seeming 'short cuts' to knowledge by which the labour of mastering scientific details is spared to those who yet believe that without such labour they can attain all the most valuable results of scientific research. It is not, of course, for a moment meant to imply that its 'simplicity' tells in any way against 'Natural Selection,' but only that the possession of that quality is a strong reason for the wide and somewhat hasty acceptance of the theory, whether it be true or not.

In the second place, it was inevitable that a theory appearing to have important relations with questions of the last importance and interest to man, that is, with questions of religious belief, should call up an army of assailants and defenders. Nor have the supporters of the theory much reason to blame the more or less unskilful and hasty attacks of adversaries, seeing that those attacks have been in part, if not mainly, due to the unskilful and perverted advocacy of the cause on the part of some of its adherents. If the *odium theologicum* has inspired some of the former, it is undeniable that the *odium anti-theologicum* has possessed not a few of the latter. When we recollect the

warmth with which what he thought was Darwinism was advocated by such a writer as Vogt, one cause for his zeal was not far to seek – a zeal, by the way, certainly not 'according to knowledge', for few conceptions could have been more conflicting with true Darwinism than the theory he formerly maintained, but has now abandoned, viz., that the men of the Old World were descended from African and Asiatic apes, while, similarly, the American apes were the progenitors of the human beings of the New World. The cause of the palpable error in a too-eager disciple was not, we hope, anxiety to snatch all or any arms possibly available against Christianity, but the style of the author cannot but make us fear it, for he is a writer whose offensiveness is so gross that it is only surpassed by his amazing shallowness.

It is easy to complain of the one-sidedness of many of those who oppose Darwinism in the interest of orthodoxy; but hardly, if at all, less patent is the intolerance and narrow-mindedness of some of those who advocate it, avowedly or covertly, in the interests of heterodoxy. This hastiness of rejection or acceptance determined by ulterior consequences believed to attach to 'Natural Selection,' is unfortunately in part to be accounted for by some expressions and a certain tone to be found in Mr Darwin's writings. That his expressions are not always to be construed literally is manifest. The way in which he speaks figuratively of 'purpose,' for example, and 'design,' has occasioned, from the Duke of Argyll and others, criticisms which fail to tell against the theory, because such expressions are in Mr Darwin's writings merely figurative. It may be hoped that a similar looseness of expression will account for passages of a directly opposite tendency, but it is nevertheless impossible to acquit Mr. Darwin of considerable rashness in appearing to oppose ideas which he gives no clear evidence of having ever understood. He is far from being alone in this, and probably merely assumes and reiterates, without much consideration, assertions and positions previously assumed by others. It has been the practise of too many first to misrepresent their adversary's view, and then elaborately refute it, in fact to erect a doll incapable of self-defence, and then, with a flourish of trumpets and many vigorous strokes, to overthrow the helpless dummy they had previously raised. Thus many who more or less distinctly oppose Theism in the interests, as they believe, of physical science, represent, amongst other things, a gross and narrow

anthropomorphism as the necessary consequence of views opposed to those which they themselves advocate.

It is just in this way that Mr. Darwin assumes that the idea of 'creation' necessitates a belief in interference with, or dispensation of, natural laws, and that 'creation' must be accompanied by arbitrary or unorderly phenomena. None but the crudest conceptions are placed by him to the credit of supporters of the dogma of creation, and it is constantly asserted that they must offer 'creative fiats' as explanation of physical phenomena, and be guilty of numerous absurdities. Mr. Darwin and others like him may be excused if they have not devoted much time to the study of Christian philosophy. But why assume as an undoubted fact that in that philosophy there is a necessary conflict between two such ideas as 'creation' and 'evolution?' Are there no Christian thinkers who accept both? We are not now speaking of theological questions, but we may say this much – that there are many as well versed in theology as Mr Darwin in his own department of natural knowledge who would not be disturbed by witnessing the demonstration of his theory, and who are not affected at the idea even of what is called spontaneous generation and others like it, simply because they conceive that the possibility of such phenomena had been provided for in the old philosophy centuries before Darwin, or even before Bacon, and that, should all possibilities even become realised facts they would take their place in the system without even disturbing its order, far less marring its harmony.

To return, however, to Mr Darwin's theory of 'Natural Selection.' Whatever may have hitherto been the amount of acceptance it has met with, all anticipated that the appearance of his large and careful work on *Animals and Plants Under Domestication*, could not but yet further increase that acceptance. We must, however, confess that we are now not without doubt as to how far such anticipations will be realised. The new book seems to us to add but little in support of the theory, and to leave most, if not all, its difficulties exactly where they were, while as to the hypothesis of 'Pangenesi's'<sup>5</sup> it appears to us to be a question whether it may not be found rather to encumber than to support the theory it was intended to subserve. However, the work in question treats only of domestic animals, and probably the next

instalment will address itself more vigorously and directly to the difficulties which seem to us yet to bar the way to a complete acceptance of the doctrine.

As we have hinted, we are here going to admit the notion of organic and other evolution, but at the same time to suppose that new forms of animals and plants (new species, genera, etc.,) have from time to time been evolved from preceding animals and plants, not by the action of 'Natural Selection' *alone*, but by that of certain laws, at present unknown, acting partly through powers and tendencies existing in each organism, partly through influences exerted on each by surrounding agencies, organic and inorganic, terrestrial and cosmical, among which the 'survival of the fittest' plays a certain but subordinate part.

The theory of 'Natural Selection' may (though it need not) be taken in such a way as to lead men to regard the present organic world as formed, so to speak, *accidentally*, beautiful and wonderful as is confessedly the hap-hazard result. A similar character attaches to the view advocated by Mr Herbert Spencer, who however agrees with us in relegating 'Natural Selection' to a subordinate *rôle*. We are convinced, on the other hand, that the whole organic world arises and goes forward in an harmonious development similar to that which displays itself in the growth and action of each separate organism, and that each such separate organism is the expression of powers and tendencies not to be accounted for by 'Natural Selection' alone, or even by that together with merely the influence of surrounding conditions.

The difficulties which appear to us to oppose themselves to the reception of 'Natural Selection,' have in all probability been already considered by Mr Darwin, nevertheless it may not be altogether useless to enumerate them, and we are sure so candid and careful a naturalist as the author of the theory in question, will feel obliged by a suggestion of all the doubts and difficulties which can be brought against it.

What we have now to bring forward may be summed up as follows:-

1. That though potent to explain the maintenance or further extension of favourable variations, the theory fails to account for the conservation and development of the first beginnings of such.

2. That on the theory of 'Natural Selection' it is all but impossible, such are the probabilities against it, that identical structures should have arisen independently. Yet many structures undeniably exist which to all appearance must have so arisen.
3. That there are grounds for thinking that specific differences may be developed suddenly instead of gradually.
4. That the causes of variability in domestic animals have not been proved to be of the same nature as those acting upon wild species.
5. That there is more reason to believe that species have definite though very different limits to their variability, than that all are capable of indefinite variation.
6. That some recent zoological and anatomical discoveries tend rather to diminish than to multiply the evidence in favour of minute and gradual modification.
7. That certain fossil transitional forms are absent which might have been expected to be present.
8. The great extent of geographical change required during the existence of the present fauna forms another objection.
9. That the objection drawn from the physiological difference between 'species' and 'races' still exists unrefuted.
10. That the phenomena of revision still present a difficulty which has by no means been overcome.
11. That even if the origin of species by 'Natural Selection' were proved, yet other phenomena not less remarkable would still remain unexplained, and that the explanation of such may possibly be at the same time the key to specific origination.

*This extract was taken from 'Difficulties of the Theory of Natural Selection', The Month, Volume XI, July 1869, pp. 35-53.*

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<sup>1</sup> Biology is the science of life. It contains zoology, or the science of animals, and botany, or that of plants.

<sup>2</sup> For very interesting examples see Wallace's *Malay Archipelago*, lately published

<sup>3</sup> See Muller's work, *Fur Darwin*, lately translated into English. Mr Wallace also predicts the discovery in Madagascar, of a hawk-moth with a certain length of proboscis, from the existence of a peculiarly elongated flower. See *Journal of Natural Science*

<sup>4</sup> 'Natural Selection' is happily so termed by Mr Herbert Spencer in his *Principles of Biology*

<sup>5</sup> 'Pangenesis' is the name of a new theory promulgated by Mr Darwin. It proposes to account for various facts, such as the occasional reproduction by individuals of lost parts, the development in offspring of parental and ancestral characters, etc., by the possession by every creature of countless indefinitely minute atoms termed 'gemmules,' which are supposed to be in constant circulation about the body.