

The Myth of Darwin's Metaphor

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On 24th November 1859 Charles Darwin published a hurried summary of a theory he had been developing since his return to England in 1837 from a long South American voyage aboard H.M.S. 'Beagle'. This 'abstract', as he called it, turned out to be a 700-page book with the rather imposing title, *On the origin of species by means of natural selection or the preservation of favoured races in the struggle for life*. Then and since, Darwin's theory of evolution has been a source of periodic, often raging controversy, especially among Christians. Indeed whole organizations, equipped with research facilities and in-house journals, have come into being with the sole aim of demolishing the evolutionary edifice, and replacing it with 'scientific creationism'. Those involved in such an ambitious programme are duty-bound, I would have thought, to grapple with the technicalities of palaeontology, biogeography, biology, zoology and population genetics. In this paper, however, I do not intend to discuss any of these questions; rather I want to look in a more philosophical way at the idea of evolution in order to identify what I believe to be far more fundamental challenges to biblical Christianity. And I would hope, moreover, that the kind of approach which I am taking here will enable us, on the one hand, to be fair to Darwin and his project, and on the other, to distinguish central questions from peripheral ones.

Before turning directly to the Darwinian theory, I want to outline an important principle of interpretation which I intend to use throughout my investigation. At first sight it is unimpressively simple, almost a truism; 'nature is natural'. By this I mean that nature is not a person, does not have personality, and cannot exhibit characteristics of personhood. This implies, for example, that nature of itself cannot make decisions, strive towards an ambition, exhibit emotions, or experience pain. If this seems quite clear cut, indeed self-evident, it is worth remembering that we often tend to personify nature when we speak of it as teaching lessons, showing the way, or being raped. Of course we all know what we mean by such metaphorical expressions; but then again there are animists, pantheists, mystics, emergent evolutionists and perhaps process theologians who might be less happy with the way I have formulated my interpretative principle. John Muir, for example, a leading nineteenth century American propagandist of wilderness preservation, assured his readers that "Nature may heal and cheer and give

strength to body and soul alike",¹ while Frazer Darling, more recently, has called us back to "the truth of Zoroastrianism . . . that we are all of one stuff, difference is only in degree, and God can be conceived as being in all and of all, the sublime and divine immanence."² This propensity to imbue the natural order with personality, or indeed spirituality, has in fact a long history and can often be detected in the writings of those who spell 'Nature' with a capital 'N'. Nevertheless, I want to reject it and retain my principle for two reasons. Firstly the mystification of nature, as this tendency can be described, sharply conflicts with the biblical view of creation; and secondly, the rejection of all forms of nature mysticism was a prerequisite for the emergence of modern experimental science. In point of fact these two themes are closely related in the history of the West, and for this reason I want to resort briefly to the early post-Reformation period.

The question of why modern science, as we think of it today, first flourished in sixteenth century Europe and seventeenth century England has perplexed historians for generations. Not surprisingly they have put forward a host of possible explanations; some stress the navigating needs of a maritime nation and the recent availability of simple technology, others the structural transformation of society due to the growing strength of its manufacturing class, still others the repercussions of a Protestant 'ethic' or ethos wedded to the needs of a nascent capitalism.³ But there can be little doubt that much of the engine power behind the emergence of modern science sprang from the theological revolution of the Reformation. Without going into detail I think it can be said that the Reformers' rejection of the mediaeval tendency to mystify nature was a conceptual mainspring of experimental science. For them creator and creation could never be conflated: for the created order was separate in essence from God and yet dependent on Him for its ultimate being and inherent structure; in philosophical language God and His creation were contingently related. The implications for science were both plain and immediate. The natural world could, and should, be understood by observation; scientists no longer had to be closet theologians; nature operated according to laws imposed upon it by the Creator. In a sense therefore it was the secularization, or if you like 'de-deification' of nature, within the confines of a biblical cosmology, which gave impetus to the cultural experiment now known as the scientific enterprise. And this steadfast refusal to 'divinize' anything finite was a cornerstone in the scientific philosophy of such pioneers as Bacon, Newton and Boyle.⁴

The reason I have given this thumb-nail sketch of the rise of natural science is to demonstrate just how important the aphorism 'nature is natural' has been in its historical development. And, by implication, it suggests that the principle is a useful one for distinguishing between genuinely scientific theories about nature, and those rather more philosophically or ideologically inspired. So, as we now turn to look at Darwin's theory as a conceptual model for explaining natural history, and at the way it has been extended to other spheres, it will be useful to bear these more general points in mind.

Darwin and Natural Selection

Charles Darwin, of course, did not invent evolution. Rather, since the time of the Greeks, the idea of a hierarchy linking the simplest inorganic phenomena to the most complex organisms has been a perennial theme in the Western tradition. For some this 'chain of being', as it is often called, was understood to be static, for others it took on a more dynamic character especially when temporalized, that is when spread out over time⁵. As far as the term 'evolution' is concerned, it was originally applied to the embryological development of the foetus and, perhaps for this reason, Darwin did not use the word until the fifth edition of his book. The issue is even more complicated by the fact that independent evolutionary theories were advanced in natural history by Lamarck and Chambers, in sociology by Spencer and Comte, and in prehistoric archaeology and cultural anthropology by men like Boucher de Perthes, Tylor, Maine and Morgan. Darwin's real contribution was that he put the theory of evolution on a new and imposing scale by specifying a *mechanism* by which the transmutation of species could be effected, namely natural selection.⁶ The idea was both grand and simple. Darwin showed how the multitude of living things in our world, so obviously and often beautifully adapted to their environments, could have come into being without recourse to direct divine interventions—in short, in a plain, causal, naturalistic way. His insight, I think, can be reduced to three simple propositions:

- 1. All creatures can, and often do, reproduce a large number of offspring;*
- 2. The sum total of organisms remains relatively constant, and this evidently means that many which are born fail to survive. Why?*
- 3. There is a struggle for existence and those better fitted to the environment survive.*

This then was Darwin's theory of natural selection, and it plainly implied that the characteristics of any organism which gave it selective advantage would be inherited by its offspring; given enough time, a new species would ultimately emerge. Indeed it was such a simple idea that Thomas Henry Huxley, Samuel Wilberforce's underrated adversary, was forced to concede how foolish it had been not to have thought of it before.

What Darwin had done, then, was to put forward a cogent theory of population change and, at least at the micro scale, his thesis was backed up with a massive array of empirical evidence which he had managed to marshal

into a coherent framework of analysis. Some however felt that if indeed the work was brilliant, it was, at the same time, brilliantly flawed. The signal lack of intermediate fossil forms in the palaeontological record, for example, seemed an embarrassing obstacle to Darwin's idea of species transformation. Darwin frankly conceded the point but hoped that future research would remove it. In fact this was only one of a number of scientific problems presented in the post-1859 era, by naturalists who had no particular religious axe to grind. Given the current state of knowledge about heredity, there was the difficulty that any new feature acquired by an organism would be 'swamped' within a few generations by being blended into the common stock. Then Darwin's assumption that the length of geological time available was almost limitless, was challenged by William Thomson (Lord Kelvin) and Fleeming Jenkin whose much shorter physical estimates for the age of the earth presented what Darwin himself confessed to be one of the gravest criticisms as yet advanced against his theory. In addition, despite the title of his book, Darwin's theory did not explain the origin of variations, much less species, at all; natural selection might well account for the survival of a new feature once it had been developed, but Darwin's repeated failure to explain why or how variations arose progressively led him in later editions of the *Origin* to resort to the older doctrine of the inheritance of acquired characteristics put forward by Lamarck. According to this theory organisms consciously adapt themselves to prevailing environmental conditions and pass the adaptation on to offspring; plainly this version had no need to resort to those inexplicable, 'chance' variations on which Darwin's original theory relied entirely.⁷ Finally, the rediscovery of Mendel's famous paper in 1900—the foundation of modern genetics—cast Darwinism in the shade for more than twenty years, for Mendel's demonstration that heredity was particulate (going in little 'jumps') seemed to run counter to the gradualism of classical Darwinism. Indeed the definitive synthesis of Darwinism with Mendelian arithmetic had to wait until the publication of works by R. A. Fisher, J. B. S. Haldane and Sewall Wright in the 1930s.⁸ But since then Neo-Darwinism, or the synthetic theory as it is sometimes called, has remained biological orthodoxy.

There are, I think, two important implications to be drawn from this brief historical sketch. First, it is now plain that Darwin, for all his undisputed influence, did not sweep all before him. There were many uncertainties and ambiguities in his thesis with the result that many rival versions of the theory were subsequently put forward, notably, Neo-Lamarckism, the mutation theory, saltatory evolution, and orthogenesis. Indeed, the ambivalent state of evolution theory in the early part of this century is nowhere more obvious than in D'Arcy Wentworth Thompson's celebrated classic *On growth and form* published in 1917. Second, the lack of an intervening evolutionary consensus undermines the triumphalist image of a powerful monolithic

science conquering an intellectually impoverished Christianity. The old metaphor of a 'warfare' between science and religion is no longer an adequate tool for interpreting the great Victorian debate. A revisionist model is clearly needed for, as Robert Young has conclusively shown, the leading architects of the evolutionary theory, far from being anti-theistic or atheistic, were deeply concerned to reconcile God, man, and the natural order.⁹

Evolution as Metaphor

Reflecting on Darwin's theory of natural selection and its extension to the interpretation of society, I think a strong case can be made for seeing it as a grand metaphor. Before turning expressly to Darwin's metaphor, however, it is worth having a brief glance at the nature of scientific understanding in general, and scientific model-building in particular. One of the chief tools which the scientist uses in his research is the construction of theoretical models. In his endeavour to come to grips with some aspect of reality hitherto unexplained, the researcher looks around for some broadly similar process which he does understand, and then tries to interpret the problem under investigation in the light of this information. He constructs a sort of picture to represent what he understands to be the nature of the processes at work, and then, following the normal procedures of scientific analysis, he tests his model against the real world to determine how successful it is. Basically he uses, we could say, an analogy or a metaphor.¹⁰ And this metaphor or model becomes a kind of screen or lens through which the subject is viewed; some aspects are ignored while others are emphasised or organised in specific ways. As Ian Barbour puts it, a scientific model "is a symbolic representation of selected aspects of the behaviour of a complex system for particular purposes. It is an imaginative tool for ordering experience, rather than a description of the world."¹¹ Good examples of this are the model of the atom as a miniature orbital system—the sub-atomic particles, it is conjectured, behave *as if* they are a tiny solar system, or the wave-particle theory of light according to which light exhibits both wave and particle-like characteristics. Now, it is because of this *comparative* process underlying scientific thinking, that some philosophers have argued that science is erected on metaphors—on systematically developed metaphors. They claim that their use is quite fundamental to science, and that the only question that can be asked is whether the metaphor in question has explanatory value. Further, they suggest that a good model or metaphor is one that is open-ended enough to allow for the exploration of additional similarities between the systems in question.

There can be little doubt that scientists do inescapably resort to metaphorical thinking in their creation of theoretical models, and that good metaphors have very rich explanatory power. Nevertheless there are drawbacks in the use of scientific metaphors, and perhaps the greatest danger

is that the scientist can forget that his model is only a *representation* of reality, and not reality itself. Take the model 'man is a machine' for instance. Doubtless there are many ways in which man behaves like a very sophisticated machine; his brain, some tell us, works in many respects like a computer, his nervous system can be studied in cybernetic terms, his genetic make-up is often depicted in the language of engineering technology. But it must not be forgotten that these are only pictures, and that man is not really a machine. The philosopher Turbayne puts this rather well when he writes that the use of a metaphor involves the pretence that something is the case when, literally speaking, it is not the case. And he goes on:

Just as often, however, the pretence has been dropped, either by the pretenders or by their followers. There is a difference between using a metaphor and taking it literally, between using a model and mistaking it for the thing modelled. The one is to make believe that something is the case; the other is to believe that it is. The one is to use a disguise or a mask for illustrative or explanatory purposes; the other is to mistake the mask for the face . . . After the disguise or mask has been worn for a considerable time it tends to blend with the face, and it becomes extremely difficult to 'see through' it . . . It is not necessarily a confusion to treat items belonging to one sort in the idioms appropriate to another . . . On the other hand it is a confusion to present the items of one sort in the idioms of another—without awareness . . . It is to mistake, for example, the theory for the fact, the procedure for the process, the myth for history, the model for the thing, and the metaphor for the face of literal truth.¹²

When we turn to Darwin's work it is not surprising that both the strengths and weaknesses of metaphorical thinking are clearly to be found. A moment's reflection on Robert Young's pertinent question "does Nature select?" suggests that there is a metaphor hiding somewhere in the idea of natural selection itself.¹³ The basic strategy Darwin had adopted for unravelling the species question was to demonstrate that species were ephemeral rather than permanent. His intense, indeed life-long, study of domesticated animal breeding (particularly of pigeons) soon convinced him that new variations could easily be produced under the control of a breeder. If this process could be applied more generally in nature, then the variations which fitted organisms to their environments might be explained without recourse to the interventions of a heavenly, purposeful Creator. What Darwin did, therefore, was to look at nature *as if* it were a breeder; in other words, to develop an analogy between the breeder's selective activity and natural selection. The metaphor certainly did provide a potent model for interpreting population change and, so long as Darwin could remember that he was comparing an *artificial* process with a *natural* one (thereby building an anthropomorphic element into nature's workings), it had great explanatory potential. In a sense, the problem was to maintain the valuable metaphor and yet not sacrifice the principle that 'nature is natural'. Darwin, in fact, seems to have detected this tendency in his own thinking, and he therefore felt it necessary to add the following paragraph in the third edition of his book:

*It has been said that I speak of natural selection as an active power or Deity; but who objects to an author speaking of the attraction of gravity as ruling the movements of the planets? Every one knows what is meant and is implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to avoid personifying the word Nature; but I mean by Nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us. With a little familiarity such superficial objections will be forgotten.*¹⁴

Despite this disclaimer, however, Darwin soon began to slip away from the metaphorical basis of his model. By absolutizing the analogy, it readily became apparent that, in many ways, he had transferred the attributes of Divine Providence to nature and its laws. Writing to his American confidant, the botanist Asa Gray, for example, he confirmed: "I think it can be shown that there is such an unerring power at work in *Natural Selection* (the title of my book), which selects exclusively for the good of each organic being."¹⁵ Thus, on many occasions, the *Origin of Species* displays rank anthropomorphism. The following extracts should suffice to illustrate what I mean.

*We have seen that man by selection can certainly produce great results, and can adapt organic beings to his own uses through the accumulation of slight but useful variations given to him by the hand of Nature. But Natural Selection, as we shall hereafter see, is a power incessantly ready for action, and is as immeasurably superior to man's feeble efforts, as the works of Nature are to those of Art*¹⁶.

*It may be said that natural selection is daily and hourly scrutinising, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life.*¹⁷

By now it is apparent that a careless use of the metaphor of natural selection soon leads to the subversion of our interpretative principle, 'nature is natural'. And it is a short step to elevating evolutionism into a cosmic worldview in which the processes of natural selection are regarded as a fully creative agency comparable to, even identified with, Divine creativity. At this level, the theory of evolution has assumed metaphysical status far beyond its original purpose of interpreting the laws of organic succession.

If Darwin ultimately equivocated over the selection metaphor, he was rather more careful about his second metaphor—the struggle for survival. One or two initial points of clarification are needed. First of all, the term 'the survival of the fittest' was not originally Darwin's formulation; it was coined by the sociologist Herbert Spencer who had been writing about social evolution (for example in his *Social Statics* of 1851) long before Darwin made available his carefully elaborated theory. Then, the survival of the fittest really only meant the survival of the fitter—that is, the survival of those individuals or species more likely to leave offspring. There was, therefore, no idea of perfect adaptation to the natural milieu, but merely relatively superior

or inferior fittedness to the prevailing conditions. Finally, the idea of the survival of the fittest is really a tautology; it means little more than the survival of whatever survives for, by definition, in Darwin's theory, whatever survives is better fitted for survival than competitors.¹⁸

For his modern day successors, as indeed for Darwin himself, the idea of struggle is not to be understood—as Tennyson seems to have thought—as 'Nature red in tooth and claw'. Rather, it is a question of some members of a population being in some way better adapted to their environment than competitors, and in every case, better adapted in terms of leaving more descendants. Thus Darwin's 'struggle for survival' is less a *literal* than a *metaphorical* one. As he himself wrote in the *Origin*:

*I should premise that I use the term Struggle for Existence in a large and metaphorical sense including dependence of one being on another, and including (which is more important) not only the life of the individual, but success in leaving progeny.*¹⁹

This metaphorical qualification is important in the present context, for some Christians have balked at Darwin's theory because of the apparent brutality of the mechanism. But, while some of Darwin's followers were doubtless less restrained in their use of the idea of struggle, Darwin clearly intended it as a theory of relative reproductive success. The well-known instance of what is often known as the Midlands Moth—first studied by Kettlewell—in which the environmental change associated with the Industrial Revolution was accompanied by the relative reproductive success of a mutant variety of the butterfly, would seem to be precisely the sort of process Darwin had in mind.

There is one other evolutionary metaphor which I feel ought to be mentioned. In the decades following the publication of the *Origin*, it became very fashionable to apply evolutionary theories drawn from biology, to the study of society. Certainly, as Burrow has clearly shown,²⁰ early Victorian social theory in the pre-Darwinian period, had been evolutionary in the sense that various schemes of social development had already been elaborated. Darwin's theory was soon used to reinforce an already thriving tradition of social evolutionism.²¹ Central to most of these social theories was the metaphor that 'society is an organism'—that such qualities as the growth, structure, and function of organisms parallel more or less closely social processes. The following extract from Herbert Spencer shows just how similar social and organic behaviour was thought to be.

*We commonly enough compare a nation to a living organism. We speak of 'the body politic' of the functions of its several parts, of its growth, and of its diseases, as though it were a creature. But we usually employ these expressions as metaphors, little suspecting how close is the analogy, and how far it will bear carrying out. So completely, however, is a society organised upon the same system as an individual being, that we may almost say there is something more than analogy between them.*²²

Naturally, there were many ways of 'biologizing' the study of society. Spencer's version of Social Darwinism, for example, could be used to justify the cut-throat ethics of late nineteenth century capitalism by stressing the need

for the free play of market forces to parallel the 'struggle' for survival in the natural world. On the other hand, some schemes, notably those drawn from the Lamarckian version, could support late Victorian optimism by suggesting that social intervention could combat poverty, ignorance and disease. Again, no doubt, there are interesting ways in which society may be said to behave like an organism; but if the past is anything to go by, theories of social evolution were almost invariably used to reaffirm class, racial, or national interests. Eugenic control, Germanic jingoism, and Western imperialism have all claimed to be supported by the findings of science. And with the resurgence of interest in the interplay between biology and sociology in the form of sociobiology, it is worth reemphasising that the relationships between social and organic processes are metaphorical rather than literal, indirect rather than direct.

From what I have said I hope it is clear that I am not questioning the wisdom of employing metaphors for understanding biological or social processes. Indeed the question is not whether we *ought* to think metaphorically about such matters, but rather, since we inevitably *do* use metaphors in scientific and, for that matter, everyday discourse, how they can be turned to conceptual advantage. My complaint is that the metaphorical status of evolutionary models can be easily forgotten, and that this invariably leads in the direction of an all-embracing philosophy in which every aspect of reality is subsumed under the rubric of evolution. And it is to these 'mythic' dimensions of evolution that I now want to turn.

Evolution as Myth

I must emphasise from the outset that I am using the word 'myth' in a slightly technical sense. By myth, I do not simply mean 'a widespread but false idea' or a fictional story about how the world began. What I mean by myth, rather, is an all-encompassing system of belief which provides individuals and cultural groups with an explanation for the structure of reality and gives meaning to human experience. As Jacques Ellul puts it, a myth "explains a situation and a purpose whenever reason is unable to do so, and that characteristic has scarcely changed from the archaic myth to the modern myth."²³ My argument here is that the idea of evolution can be, and often has been, elevated to the level of a cosmic myth—a world-view which purports to provide, for example, guidelines for ethics and a coherent account of reality. Evolutionism, as I will call this 'myth', is of course quite logically distinct from evolution as a theory of population change, but it does arise, I want to suggest, from the abuse of the metaphors we have been discussing.

One of the basic functions of any 'myth' is to provide its adherents with principles for social and moral behaviour. By over-extending the survival metaphor, some evolutionists have seen in their theory a dogmatic creed which permits them to discriminate good from evil. In simple terms the 'good' is identified as whatever pertains to survival; and by a piece of skilful philosophising, such 'useless' qualities as love, co-operation, and self-sacrifice can be explained by regarding the group rather than the individual as the

fundamental unit of selection. This is because, for example, gregarious animals who co-operate with each other have greater survival potential than more individualistic organisms. The idea that principles for human ethics can be derived from the theory of natural selection, however, seems faulty for several reasons. Firstly, it involves a circular argument; the good is whatever leads to survival, because whatever leads to survival is good. And this, in fact, results in the moral impasse inherent in Alexander Pope's telling witticism:

*And, spite of pride, in erring reason's spite,
One truth is clear, "Whatever is right, is RIGHT."*²⁴

Secondly, evolutionary ethics depends on a highly questionable transfer from description to prescription or, to use C. S. Lewis's terminology, from the indicative mood to the imperative mood. This problem of moving from what *is* the case to what *ought* to be the case is particularly evident in Waddington's *The ethical animal*. Thus, what it is to be an ethical animal is plainly not explained by the fact that we have developed by mutation and natural selection. At the very most, evolution can only be "a description", to quote Donald MacKay, "of the mechanism by which species showing moral behaviour have come into being",²⁵ rather than a code by which moral choices can be governed. Ethics, I would have thought, has little to do with the origin of the creatures who adopt ethical stances. If nature is natural, transcendent values can never be derived from within the system of nature itself; indeed as one Marxist writer has pointed out, attempts to naturalise values in this way have usually been little more than a biologicistic justification for current values and the existing economic order.

The humanistic celebration of what may be called evolutionary progressivism demonstrates another mythic dimension of Darwin's selection metaphor. By expanding his theory into a broad philosophy of history, evolution becomes the guarantor of social progress. Now may I say immediately that Darwin's own writings show little assurance of inevitable progress, whether biological or social; one of Darwin's major contributions, in fact, was to establish an evolutionary theory quite independent of earlier progressivist versions. Once again, however, his followers have been less restrained, and some have seen in the evolutionary process an internal purpose or 'telos' which is moving towards some cosmic goal. Perhaps this is most conspicuous in the speculations of the geneticist Theodosius Dobzhansky; for him "Selection is a fully creative agency just like the composition of a poem or a symphony."²⁶ "Nonsense!" retorts the philosopher Marjorie Grene recognizing the personification of nature. As an explanatory account of organic change, Darwin's theory has clearly great force. But to compare the selective processes in nature with, say, the composition of Milton's *Paradise Lost* or Beethoven's *Eroica* is to get into what she calls "a dreadful muddle". Selection, being thoroughly opportunistic on every occasion we are told, explains the survival of whatever survives; but as Professor Grene points out, it cannot at the same time (and as a purely natural process) be creative in the sense of contriving to move towards a goal in anything like the way an artist's imaginative creativity lies behind the

creation of a great work of art.²⁷ Now if you see evidences of purpose, creativity, or design in nature, I have no objection to you identifying them there. From a Christian perspective it would be very odd indeed if traces of a Creator's handiwork were totally absent from His creation. But in this instance, purpose is based on a particular religious belief, and is not dependent on personifying, even deifying, a natural process by imbuing it with creative capacity. At any rate it is far from clear just what evolutionary progress might mean; for some it is greater environmental independence, for others an increase of information or higher specialisation. And these specifications are inevitably derived by looking backwards from the current perspective and assuming that the present represents the furthest progress along some undefined scale of values.

When the advocates of evolutionism begin to wax lyrical about their claims to have found an axiom for ethics or a warranty for social progress, they need to be reminded that their theory has now assumed mythic proportions. No less is this the case with those who maintain that everything in this world can be reduced to its material constitution or genetic formula—to a 'fortuitous concourse of atoms' as Draper put it during that infamous Oxford debate at the British Association in 1860. This evolutionary materialism is perhaps at its plainest in G. G. Simpson's assertion that 'Man is the result of a purposeless and materialistic process that did not have him in mind. He was not planned.'²⁸ Such an uncompromisingly reductionist faith in the omnipotence of random variation is, bluntly, a metaphysical belief falsely paraded as scientific fact. I cannot think of any normal scientific technique by which such a confessional claim could be tested. Moreover, one does not have to have any religious convictions to defend in order to find this line of argument unsatisfactory. To believe that man can be reduced to purely materialist dimensions, to nothing but psychological or physiological dimensions, is akin to the claim that all that can be said about this page of print is that it is a series of black marks on a white paper background. Of course, there is a sense in which this article is just that; but to say that it is nothing but that is to ignore the different levels at which any phenomenon can be studied. By analogy, to say that the evolution of something—how it came into being and developed over time—is the only question that can be asked of it, is to build an over-extended empire on a very narrow foundation. This is not to say that evolution theory is a bad theory of what it does set out to explain; rather it is to suggest that the evolutionary dimension (or the genetic, or physiological, or psychological) is only one element in any explanation, and that the whole is more than the sum of the parts. And therefore I cannot but have a great deal of sympathy with E. F. Schumacher's rhetorical observation:

If the great Cosmos is seen as nothing but a chaos of particles without purpose or meaning, so man must be seen as nothing but a chaos of particles without purpose or meaning—a sensitive chaos, indeed, capable of suffering pain, anguish and despair, but a chaos all the same . . . a rather unfortunate cosmic accident of no consequence whatsoever.²⁹

Conclusion

From what I have said, I think it is evident that the theory of evolution is a rather elastic concept which can be expanded or contracted to account for just about anything across the whole spectrum of reality. As a calculus for quantifying differential reproductive success, I personally do not see anything in it intrinsically hostile to Christian belief. Even its resort to natural explanations of organic adaptation by reference to the laws of variation seems to me to provide an acceptable explanation of phenomena complementary to, rather than incompatible with, the biblical view of a contingent creation. After all the Bible itself accommodates both 'naturalistic' and 'supernaturalistic' explanations of the same event, as in the Red Sea episode during the Exodus where both a strong east wind and Divine Providence are invoked as 'causes'. Provided, therefore, that we maintain the limitations of those tricky, if fruitful, metaphors, restrict natural selection to a description of the mechanism of organic change, and reject evolutionism's mythic manifesto, the theory can offer, so far as I can see, no threat to Christian belief.

The various attempts by 'creationists' to erode the theory of evolution by chipping away at its account of biological development may have some validity; but such efforts cannot of themselves challenge evolutionism as a macro-philosophy. The truth of Christian theism as against evolutionary naturalism can never be established by describing gaps in the fossil record, the statistical incredulities in genetic variation, the ambiguities in dating techniques, the ideological commitments of evolutionists, or evidence for catastrophic geological upheavals. Frankly I do not believe the issue can be reduced to Christian Creationism versus Neo-Darwinism, not least because a variety of secular alternatives have recently been forthcoming. What I do feel is that the myths inherent in the metaphors need to be exposed for what they are, and that Christians should be working for the reinstatement of those transcendent values which have their source in God Himself, the Creator and Sustainer of the universe.

NOTES

1. Quoted in Roderick Nash, *Wilderness and the American Mind* (New Haven, 1967), p. 165.
2. Quoted in John Passmore, *Man's Responsibility for Nature* (London, 1974), p.173.
3. The literature concerning this episode in the history of science is vast, but see Christopher Hill, *Intellectual Origins of the English Revolution* (London, 1965); Charles Webster (ed.) *The Intellectual Revolution of the Seventeenth Century* (London, 1974); Richard S. Westfall, *Science and Religion in Seventeenth Century England* (New Haven, 1958).
4. See R. Hooykaas, *Religion and the Rise of Modern Science* (Edinburgh, 1972); Ian G. Barbour, *Issues in Science and Religion* (New York, 1966).
5. A useful introduction to the general idea of evolution is T. A. Goudge, "Evolutionism", in Philip P. Wiener, (ed.) *Dictionary of the History of Ideas* (New York, 1973), Vol. 2. pp. 174-89.
6. See Loren Eiseley, *Darwin's Century. Evolution and the Men Who Discovered It* (New York, 1958); Michael Ruse, *The Darwinian Revolution. Science Red in Tooth and Claw* (Chicago, 1979).

7. See P. J. Vorzimmer, *Charles Darwin: The Years of Controversy* (London, 1972); David L. Hull, *Darwin and His Critics* (Cambridge, Mass., 1973).
8. The standard history is W. B. Provine, *The Origins of Theoretical Population Genetics* (Chicago, 1973).
9. See Robert M. Young, "The Impact of Darwin on Conventional Thought", in Anthony Symondson (ed.), *The Victorian Crisis of Faith* (London, 1970).
10. For philosophical introductions to metaphor in science see Max Black, *Models and Metaphors: Studies in Language and Philosophy* (Ithaca, 1962); Mary B. Hesse, *Models and Analogies in Science* (Indiana, 1966).
11. Ian G. Barbour, *Myths, Models and Paradigms: The Nature of Scientific and Religious Language* (London, 1974), p.6.
12. C. M. Turbayne, *The Myth of Metaphor* (New Haven, 2nd ed., 1970), pp.3-4.
13. Robert M. Young, "Darwin's Metaphor: Does Nature Select?", *The Monist*, Vol. 55, (1971), pp. 442-503.
14. For ease of referencing I will refer throughout to the version edited by Morse Peckham, *The Origin of Species by Charles Darwin. A Variorum Text* (Philadelphia, 1959). This extract is on p. 165.
15. Francis Darwin (ed.), *The Life and Letters of Charles Darwin* (London, 1887), Vol. 2, p.125.
16. *The Origin*, p. 145.
17. *Ibid.*, pp. 168-69. This is the rendering of the first edition and it is significant that in the second edition he modified it to read: "It may metaphorically be said that natural selection . . ."
18. It is interesting to note that in the aftermath of the major environmental upheavals at the end of the Permian period, so few organisms survived (a mere four per cent) that, according to the Harvard palaeontologist Stephen J. Gould, the principle might be better expressed as the survival of the luckiest.
19. *The Origin*, p. 146.
20. J. W. Burrow, *Evolution and Society. A Study in Victorian Social Theory* (Cambridge, 1966).
21. Among the most important works on this topic are Richard Hofstadter, *Social Darwinism in American Thought* (Boston, 1944); Greta Jones, *Social Darwinism in English Thought: The Interaction between Biological and Social Theory* (Sussex, 1980).
22. H. Spencer, *Social Statics; or, The Conditions Essential to Human Happiness Specified and the First of Them Developed* (London, 1851), p. 448.
23. Jacques Ellul, *The New Demons* (Oxford, 1975), pp. 93-94.
24. Alexander Pope, *An Essay on Man*, I, lines 293-94 reprinted in *The Poems of Alexander Pope* edited by John Butt (London, 1963).
25. Donald MacKay, *The Clockwork Image. A Christian Perspective on Science* (London, 1974), p. 20.
26. Th. Dobzhansky, "Evolution as a Creative Process", *Proceedings of the Ninth International Congress of Genetics*, (1954), pp. 435-38.
27. Marjorie Grene, A Philosopher Looks at Evolution, Open University Radio Lecture for the Course on Science and Belief from Copernicus to Darwin.
28. G. G. Simpson, *The Meaning of Evolution* (New Haven, 1949).
29. E. F. Schumacher, *A Guide for the Perplexed* (London, 1977), p.48.