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Reflections of Dawkins' Blind Watchmaker

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Dallas Albert Willard (September 4, 1935 – May 8, 2013) was an American philosopher also known for his writings on Christian spiritual formation. Much of his work in philosophy was related to phenomenology, particularly the work of Edmund Husserl, many of whose writings he translated into English for the first time. He was longtime Professor of Philosophy at The University of Southern California, teaching at the school from 1965 until his death in 2013 and serving as the department chair from 1982 to 1985.

What logical relation, if any, does the theory of evolution have to the argument from the existence of order in the world of nature to the existence of a mind as causal source of (significant aspects of) the world of nature? Many have assumed that it has a very strong relation: one such that the truth of an evolutionary theory like the Darwin/Wallace theory effectively rules the traditional "design" or "teleological" arguments for the existence of God out of serious consideration. Those who assume this characteristically take the cases of order present in living organisms to be essential to any and every line of argument leading to an intellectual source of order in nature. Their idea seems to be that if living organisms of all the interesting types can be shown to have come about through a process not involving intellectual intervention appropriately similar to that present in the case of human artifacts, then there is no reason to accept the existence of an intellectual source of nature. Indeed, they really seem to think it is enough to show that such organisms could have come about by such a "natural" process, and that they are not required to show that in every (or any) case they actually did—obviously lightening their burden of proof, but also, I think, begging the question of God's existence in ways I shall try to clarify below. Clearly it does not follow from the fact, if it is one, that living organisms could—in some significant sense of "could"—have come about without more or less direct intellectual intervention, that in fact they did so come about. And it will be interesting to consider what further assumptions are needed to get that conclusion.

In my own view, living organisms simply have nothing essentially to do with the heart of arguments from order to God, and hence I regard theories of biological evolution as beside the point of "design" arguments for God's existence. Richard Dawkins, by contrast, seems to be one of those who regards this class of arguments to rest entirely upon the cases of living organisms. He comments that he "could not imagine being an atheist at any time before 1859, when Darwin's *Origin of Species* was published." (p. 5) But: "This book is written in the

conviction that our own existence once presented the greatest of all mysteries, but that it is a mystery no longer because it is solved. Darwin and Wallace solved it...,this deepest of problems,...The problem is that of complex design...,our own existence...,a spine-chilling mystery; and...a mystery with an eloquent solution which is within our grasp. More, I want to persuade the reader not just that Darwinian world-view happens to be true, but that it is the only known theory that could, in principle, solve the mystery of our existence....A good case can be made that Darwinism is true, not just on this planet, but all over the universe wherever life may be found." (ix - x)

Dawkins' discussion of "Why the evidence of evolution reveals a universe without design" (to borrow the language of the dust jacket) comes in two stages. First there is an argument that living organisms which have existed upon the earth all came from certain simpler living organisms by means of the process of natural selection without any involvement of conscious foresight or deliberate action. Natural selection is, according to Dawkins, "the blind watchmaker" (5, 37)—"blind because it does not see ahead, does not plan consequences, has no purpose in view" (21)—and this first stage of the argument is supposed to show that the watchmaker (really, the speciesmaker) is indeed blind. The second stage of the argument recognizes the fatal limitations of the first stage for the purposes of cosmic Darwinianism: namely, that natural selection presupposes a vast amount of order and some kind of life before it can do anything at all. Chapter 6, "Origins and Miracles," faces the difficult task of rendering plausible, not just a blind "watchmaker," but a blind watchmaker maker. (This would have been an honest title of his book.) Here Dawkins has recourse to what he himself calls "little flights of fancy" (155) about how minerals (clays) could share "with true life cycles the ability to initiate cumulative selection." (155) This is necessary because, as he admits, "we cannot escape the need to postulate a single-step chance event in the origin of cumulative selection itself." (140)

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Dawkins' task at this first stage is really rather easy. He attacks several weak arguments—e.g. what he calls "the argument from personal incredulity," which he attributes to Hugh Montefiore (37-41)—to the effect that current or similar species could not possibly have originated from vastly simpler life forms, and he discusses certain mistakes and alleged limitations of imagination that may prevent us from appreciating the possibility of biological evolution along Darwinian lines. The heart of his discussion here lies in his explanations of the cumulative character of species development. Living things, to speak generally, have "the quality of being statistically-improbable-in-a-direction-specified-without-hindsight..." (15) This, he continues, "is an important quality that needs a special effort of explanation. It is the quality that characterizes biological objects as opposed to the objects of physics." Thus it would be irrational, according to him, to suppose—with Peter Atkins, author of *The Creation*—that elephants and the

like are inevitable “Once molecules have learnt to compete and to create other molecules in their own image...” (Atkins words, quoted p. 14) What is required beyond the laws of physics is explanation in terms of cumulative selection, the “fundamental essence” of “Darwin’s way.” (15)

The main point about cumulative selection, of course, is that it avoids the gross implausibility of vast complexity emerging randomly (i.e. not involving rational foresight and intervention (308)) in one leap. Dawkins goes to great length to divorce himself from such “saltationism.” He believes that our incredulity about the blind watchmaker can be overcome “only if we stress that there was an extremely large number of steps along the way, and if each step is very tiny.” (249) “Mutation is random,” he holds, but “natural selection is the very opposite of random.” (41) Rather, the key to the appreciation of natural selection is recognition of the innumerable tiny random mutations gradually weeded by the environment to produce astonishingly complicated self-replicating systems. To illustrate, supposedly, how this might occur we are treated to a couple of the nowadays-mandatory trips through computerland—first to show how a “computer-monkey” might breed from a random sequence of letters, “WDLMNLT DTJBKWIRZREZLMQCO P,” to arrive at the Shakespearian line, “Methinks it is like a weasel.” The computer is programmed to duplicate the sequence, with a certain chance of random error, to scrutinize the mutant phrases when they occur, and to breed onward from “the one which, however slightly, most resembles the target phrase, METHINKS IT IS LIKE A WEASEL.” (47-48) The target phrase is realized in 64 generations. This is only to illustrate how cumulative selection works. Dawkins recognizes that in this case the selection is guided by a distant ideal form, and is thus unlike natural selection. But his calculation is that the same computer working at the same rate would come up with METHINKS IT IS LIKE A WEASEL in “about a million million million million million years” (49) if it always had to start from a purely random sequence and achieve the target in one move.

Another program, which Dawkins names “EVOLUTION,” involves a drawing action: “EVOLUTION basically consists of endless repetition of REPRODUCTION. In every generation, REPRODUCTION takes the genes that are supplied to it by the previous generation, and hands them on to the next generation but with minor random errors - mutations. A mutation simply consists in +1 or -1 being added to the value of a randomly chosen gene. This means that, as the generations go by, the total amount of genetic difference from the original ancestor can become very large, cumulatively, one small step at a time. But although the mutations are random, the cumulative change over the generations is not random.” (56) Graphically, the original ancestor is a single dot, with the (computerized) potentiality of branching to a “Y” or tree figure, and that again and again. Portraying only the “successful” product of each generation, we have figure 4 on p. 58. (Reproduced below.) Dawkins expected various tree shapes, but got, to his amazement, insect shapes instead. “I still cannot conceal from you my feeling of exultation as I first watched these exquisite creatures

emerging before my eyes. I distinctly heard the triumphal opening chords of “Also sprach Zarathustra” (the ‘2001 theme’) in my mind. I couldn’t eat, and that night ‘my’ insects swarmed behind my eyelids as I tried to sleep.” (60) (“How very moving,” one might say. But much of the book is frankly written in the “romance of science” genre.)

Such exercises are aimed at “ramming home the importance of gradual, step-by-step change.” (72) If the conclusion to be drawn is that current and extinct forms of life such as we are acquainted with here on planet earth could have come into existence through tiny modifications in reproduction of yet other, simpler life forms over unimaginably long periods of time, without intervention by a rational planner who is working toward a goal, then I can only insist that no such conclusion follows. The computer exercises are precisely the result of a rational planner. The more modest conclusion—that certain processes set up but not directly guided by rational intention at each step can, under conceivable circumstances, produce surprisingly ordered results—should no doubt be conceded. But this does not seem to me even to render it faintly probable that the astonishing complexity of living forms could have evolved from simple forms of the sort usually referred to—much less to lend evidence to the view that they actually did so evolve. Perhaps it helps us to imagine what it would have been for such evolution to have actually occurred.

When he comes, at the opening of chapter 4, to gather the results of his discussion of what can be achieved by gradual, small-step-by-small-step change, we are treated to nothing more than an assertion that living forms did evolve in the manner which the theory of natural selection indicates. He agrees that the human eye, for example, could not have arisen directly from no eye at all, but quite plausibly insists that it could have arisen directly from something, call it X, slightly different from itself. (77) Posing, next, the question, “Is there a continuous series of Xs connecting the modern human eye to a state with no eye at all?” (78)—(We should note that he does not ask: “Could there be...etc.?” but “Is there...etc?”)—he answers: “It seems to me clear that the answer has to be yes, provided only that we allow ourselves a sufficiently large series of Xs....[And] if 10,000 is not enough for you, allow yourself 100,000, and so on....We can’t give a precise answer to the number of generations that would be necessary. What we do know is that geological time is awfully long....Given, say, a hundred million Xs, we should be able to construct a plausible series of tiny gradations linking a human eye to just about anything!” (78) (Note how he avoids saying that we can find or establish an actual series of tiny gradations etc., for he know that this certainly cannot be done. So we are working with a construction, and even this will at best only make vague suggestions about the hundred million Xs.)

But I cannot see any good reason for agreeing with Dawkins that the answer “has to be” yes: that there in fact was a continuous series of Xs connecting the modern human eye to a state with no eye at all. Certainly Dawkins himself has not established as true, or even stated, premises that logically entail the “yes”

answer. I suspect that he is thinking as follows: “I have established that the human eye could have come about through such a series. There is no “better explanation” of how it came about than through such a series. Therefore there has to be such a series associated with the human eye.” But, as I suggested at the outset, it seems to me that such reasoning from “could” to “is” begs the question of God’s existence; for unless we know that God does not exist we could not know that there was no better possible explanation of how the eye came about than natural selection. Perfectly good explanations of how many things come about, e.g. books on blind watchmakers, are given in terms of the conscious states and actions of persons. Certainly it is incumbent upon those who wish to explain the origin of the eye in terms of the conscious states and actions of a cosmic personality to say something more than “God did it,” but even their failure to do this will not warrant us in accepting Dawkins’ reasoning. It would have to be shown that such explanations in terms of cosmic personality are impossible, do not “count” as scientific, or as explanations, or so forth.

On the other hand, I see no really convincing way to defend the view that the human eye or other complex manifestations of life absolutely could not evolve by natural selection.

The appeal to what can come about through multitudes of tiny steps over vast periods of time is difficult to turn aside decisively. However, the facts of plant and animal breeding by human beings seem to me to do much more than computer exercises and abstract argument to establish that some degree of evolution actually does occur. It is interesting that these facts simultaneously confirm an actual, and hence possible, role of conscious “design” in the transformation of living forms, at least within species. Strictly speaking, “artificial” selection (even if influenced by a god) is not structurally distinct from natural selection. The basic facts are the same. Humanity (or god) is merely one more predatory species in the environment, and in certain cases it plays a primary role in determining which organisms survive to propagate themselves. The fact that humans “like” some features of life forms better than others—possibly for pretty silly reasons sometimes—is inherently no different, as a factor in selection, from the fact that some birds prefer the taste of certain insects over that of others.

So, in short, I don’t think Dawkins (or anyone else I know of) has come remotely close to proving that all complex life forms actually have evolved without cosmic “design” from simpler life forms. Within the confines of a naturalistic ontology, “Darwinism” as a biological undoubtedly offers the “best explanation” now available for the origin of complex life forms—though not of life itself—on earth, and provides the most fruitful theoretical framework now available to research in the life sciences. By contrast, there exists nothing in the way of a precise theory of exactly what is supposed to go on if God takes a direct hand in the development of species. It is not clear what divine supervision would even mean for scientific research—which, I suspect, is one reason why the supernaturalist side experiences such strong temptation to just deny species development

altogether. So, for the sake of the argument, let us just grant that the Darwinian theory of natural selection, revised as may be required by more recent advances in the relevant sciences, is to be accepted as the correct account of the derivation of complex forms of life from simpler ones. WHAT FOLLOWS WITH REGARD TO THE INFERENCE OF A COSMIC INTELLIGENCE FROM ORDER IN THE PHYSICAL UNIVERSE?

The right answer seems to me to be: PRACTICALLY NOTHING AT ALL. At most, a few impressive examples of complex order are lost, and especially those involving adaptedness or teleology of parts functioning in relation to their respective wholes. But teleological order is only one type of order, and the "design" argument really has to do, in my opinion, with order as such, not just one (admittedly very striking) type of order.

No doubt many will be astonished at the suggestion that teleology in natural entities and processes has nothing essentially to do with the case for cosmic design. But I suspect that the way teleology has been introduced has only resulted in an incredible amount of confusion and arguing beside the point on both sides. Theists have, perhaps, brought this upon themselves by fixing solely upon such striking cases of order as the human eye or the degree of inclination of the earth's axis in relation to the possibility of life on the planet. But—especially since the emergence of evolutionary theory of the Darwinian type—they in so doing open themselves up to massive and sophisticated, even if sometimes logically misguided, 'rebuttals,' every case of which purports to show how these cases fixed upon by the theist at least could, with some degree of probability, have originated by a lawlike process from a pre-existing condition of the physical universe without assistance from what Dawkins smugly calls "a Great Spirit in the sky with a tidy mind and a sense of order" or "A blessed miracle of provident design." (43-44).

But the rebutters, with almost no exceptions, quite conveniently manage to forget that evolution, whether cosmic or biological, cannot—logically cannot!—be a theory of ultimate origins of existence or order, precisely because its operations always presuppose the prior existence of certain entities with specific potential behaviors, as well as of an environment of some specific kind that operates upon those entities in some specifically ordered (law-governed) fashion, to determine which ones are allowed to survive and reproduce. Let us quite generally state: any sort of evolution of order of any kind will always presuppose pre-existing order and pre-existing entities governed by it. It follows as a simple matter of logic that not all order evolved. Given the physical world—and however much of evolution it may or may not contain—there is or was some order in it which did not evolve. However it may have originated (if it originated), that order did not evolve, for it was the condition of any evolution at all occurring. We come here upon a logically insurpassable limit to what evolution, however it may be understood, can accomplish.

We should pause to notice that the order from which, allegedly, cosmic or even biological evolution takes its rise must have been one of considerable power and complexity. Evolution is a specific type of process. While not itself a thing or state or event, it is an entity or has being—if indeed it did occur. It is not nothing, even if it is not a thing. It is a process. But it also did not itself evolve. That specific type of structure found in evolution did not itself come about through evolution, any more than, as Leibniz somewhere points out, the laws of mechanics were instituted by the laws of mechanics. Evolution is a certain type of order which, allegedly, when present in the relevant types of entities, leads, for example, to the marvelous display of living forms on earth—if the Darwinians are correct. Thus, in the progression of evolutionary development marvelous novelty emerges, and the more classical ideas of causation which held that this sort of thing could not happen, since the reality of the effect could not exceed that of the cause, were, supposedly, set aside on "scientific" grounds. But even if this is true, the order which is evolution, as a process of a certain type, must be accounted for, if at all, in terms other than evolution itself.

I think it is important to discuss this matter because partisans of evolution as a cosmic principle—and this, really (and not just a principle effecting the origin of biological species), is what concerns Dawkins—hold before us the image of being without any order at all as that from which being with order emerged. Thus we find Dawkins discussing the non-random arrangement of pebbles of various sizes on an ocean beach. Clearly the pebbles seem to be sorted and arranged. But, as he explains it, this "arranging was really done by the blind forces of physics, in this case the action of the waves. The waves....just energetically throw the pebbles around, and big pebbles and small pebbles respond differently to this treatment so they end up at different levels of the beach. a small amount of order has come out of disorder, and no mind planned it." (43) Here is an "order out of chaos" mysticism, which, I find, usually goes hand-in-hand, in would-be naturalistic cosmologies, with "big-bang mysticism." For the big-band mystic there was nothing and it exploded. Or, there was nothing and then an explosion that was an explosion of nothing. Thus providing in the first instant of the physical universe that true self-subsistent being (fitting precisely the definition of "substance" given at the opening of Spinoza's Ethics) which is treated with such disdain when creationists trot it out. The incantational phrase "a small amount of order has come out of disorder," used by Dawkins above, is of course only to mark the first of the innumerable "many tiny steps" through which the incomprehensibly vast order of the physical cosmos "has come out of disorder."

What are we to say to Dawkins' waves-and-pebbles case? After letting him enjoy a brief moment of triumph, we can only say to this highly-qualified scientist: "You gotta be kidding! No mind (directly, at least) planned it, but nothing whatsoever 'has come out of disorder' in this case." The interaction of the waves and pebbles in this case is a perfectly orderly process, even if our comprehension of that order can only be statistically expressed. Moreover, we know for sure that Dawkins himself knows this to be so. Is there here, then, only a slip of the pen,

perhaps overlooked because of something which the author can assume to be obvious? No, I don't think so. Rather, he is succumbing to the pull of his ultimate vision. He is in the grip of the romanticism of evolution as a sweeping ontological principle, essentially incorporating the mystical vision of an Urgrund of chaos and nothingness giving birth of itself to the physical universe. — Which is all very fine as an aesthetic approach to the cosmos, and appears to be vaguely comforting to some atheistic cosmologists, perhaps because of the great wonder of it all. (Carl Sagan says "billions and billions and billions..." in the same tone, and with the same glazed expression, that others chant of Krishna or Christ. The public television science series are often quite remarkable in the amount of ritualism they contain.) But it has nothing at all to do with "evidence of a universe without design."

We should keep in mind that we have a vast amount of experience of things, with relative degrees of order, coming into existence, and no one has every yet experienced anything, or has plausible empirical evidence of anything, coming into existence from nothing or from "something" with no order— which really means no nature, no character—at all. In this sense the emergence of something from nothing or from chaos has a probability of exactly zero relative to our data. Now it is true that probability, like "logic," can be interpreted in numerous ways. But it would be refreshing to hear the naturalistic cosmologist admit that all of our empirical evidence is against order emerging from disorder and something emerging from nothing, and to confess that his metaphysical necessity of such emergences rest on the assumption of a naturalistic world view, rather than proving such a view.

Over against this challenge we point out that the force, the power to convince, which most people seem to feel in the face of the existing physical order surrounding us undoubtedly comes, not from mere lack of ability to imagine the "many tiny steps," as Dawkins suggests, but from the simple fact that we all have vast experience, and even lots of quite direct, first-hand experience, of order entering the physical world from minds: from our mind as well as the minds of others. Not as if the physical world were totally disordered before our plan or "design" surfaced there. Of course it is not. We have no experience of ex nihilo creation. But, to return to Paley's classical example of finding a watch in the wilderness, we clearly know that the order in the watch first presented itself to the human mind without being present in physical reality; and we also know that only because it did so did it later emerge within the physical world. We know that locomotives, bridges, and a huge number of other things exist in the physical world because the "design" for them previously existed in a mind. Some person designed them. Only the kind of skepticism that gives philosophy a deservedly bad name can suggest otherwise. That is why, if we stepped on an apparently uninhibited planet and discovered what, to all appearance, was a branch of the May Company or Sears—or even an empty coke bottle or a McDonald's hamburger wrapper—it would be flatly irrational, and maybe psychologically impossible, in the light of our experience, to believe that they came into existence

without a design and a mind 'containing' that design. The extension of this conclusion to cover eyes, DNA structures and solar systems is of course a major one—largely because we know, also on the basis of experience, that their proximate origins are from other things of their kind, or at least from law-dictated antecedents. But ultimate origins cannot be of this type, for obvious reasons, and the only other type of origin we know of involves the powers of the mind.

This, surely, is why David Hume, in the "Introduction" to his *The Natural History of Religion*, states that "The whole frame of nature bespeaks an intelligent author; and no rational enquirer can, after serious reflection, suspend his belief a moment with regard to the primary principles of genuine Theism and Religion." And he puts in the mouth of Philo, at the end of his *Dialogues Concerning Natural Religion*, the somewhat more modestly formulated conclusion "That the cause or causes of order in the universe probably bear some remote analogy to human intelligence." Now I am aware of the carefully weighted meaning which Hume assigned to these words, and, indeed, I accept them in that meaning as an adequate formulation of what we can get out of the "design" argument. But it is necessary at the same time to insist that he really did mean what he really did say in these two passages. (I take "Philo" to speak for Hume.) His further views, to the effect that the world offers no rational support for the full-blown God of Christian theism, do not diminish this one bit. And the essence of the argument back of his views is totally unaffected by anything Darwin had to say.

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We have to credit Dawkins with being pretty clear about all of this. Contrary to what the some of his statements and the overall character of the book might lead us to expect, he acknowledges "what seems to be a paradox." (140) "The replication processes that we know seem to need complicated machinery to work. In the presence of a relicase 'machine tool', fragments of RNA will evolve, repeatedly and convergently, towards the same endpoint, an endpoint whose 'probability' seems vanishingly small until you reflect on the power of cumulative selection. But we have to assist this cumulative selection to get started....Cumulative selection can manufacture complexity while single-step selection cannot. But cumulative selection cannot work unless there is some minimal machinery of replication and replicator power, and the only machinery of replication that we know seems too complicated to have come into existence by means of anything less than many generations of cumulative selection! Some people see this as a fundamental flaw in the whole theory of the blind watchmaker. They see it as the ultimate proof that there must originally have been a designer, not a blind watchmaker but a far-sighted supernatural watchmaker." (140, 141) Obviously Dawkins cannot accept this. But what will he put in its place? What blind processes will he propose to produce the type of self-reproducing entity and structured environment that will make natural selection possible? (He simply ignores the problem of the environment's origin.).

First he takes a few maladroit swipes at the idea of a Creator: "...this is a transparently feeble argument, indeed it is obviously self-defeating....Any God capable of intelligently designing something as complex as the DNA/protein replicating machine must have been at least as complex and organized as that machine itself....To explain the origin of the DNA/protein machine by invoking a supernatural Designer is to explain precisely nothing, for it leaves unexplained the origin of the Designer. You have to say something like 'God was always there', and if you allow yourself that kind of lazy way out, you might as well just say 'DNA was always there, or 'Life was always there', and be done with it." (141, cf. 316)

Our reply is twofold: First, if coming to rest on something unexplained refutes a position, then he should immediately surrender his idea of order out of non-order, of charactered entities and events emerging from characterless ___(?)__s. To say that order emerged from disorder is not to explain anything, but, like invocation of the big-bang, is to draw a line at where explanations are to stop. That fact is what marks both order- from-disorder and bang-from-nothing as myths in the standard sense. The job of myths is to stop the "why" line; and that is all that these myths of naturalistic cosmology do. So God is in as good a position as order from non-order or explosions of nothing. As C. S. Lewis once wrote: "An egg which came from no bird is no more 'natural' than a bird which had existed from all eternity." (*God in the Dock*, p. 211) We can chide Dawkins and his naturalistic cohorts with taking "the lazy way out" by invoking order from non-order and explosions from nothing.

But, second, there is a certain advantage to God over DNA or Life. DNA (life) really is known to be dependent upon other things and to "come from," to have its coming into existence dependent upon, previously existent things of determinate types. Dawkins not only admits this but insists upon it. At least we can say that God is supposed to be of a nature which is unlike this. This is not to establish his existence. But it does make clear that we may not "as well just say 'DNA was always there', or 'Life was always there', and be done with it." God is not the kind of being which DNA is known to be, and Dawkins has done nothing to show that all beings—hence God too—must be like DNA in the relevant respects. Once again in this book we are treated to bald assertions of metaphysical prejudice, not the carefully prepared statements of the scientist at work.

And when we come to the positive side, to the theory of exactly how the necessary conditions for the occurrence of natural selection were blindly brought into place, what are we offered? We are first offered an account of "What is the largest single event of sheer naked coincidence, sheer unadulterated miraculous luck, that we are allowed to get away with in our theories, and still say that we have a satisfactory explanation of life." (141) His answer is as follows: Given that there are a hundred billion billion planets in the universe where life might occur, and that it has occurred on one, the earth, "Let us put an upper limit of 1 in 100

billion billion for the maximum amount of luck that this argument entitles us to assume." (144) The probability that a typical planet will spontaneously generate a self-replicating molecule may be very small, but then the planet can take its time about it. If each of the planets lasts as long as the earth, "that gives us about a billion billion billion planet-years to play with." His conclusion is: "That will do nicely! A miracle is translated into practical politics by a multiplication sum." (145) We can, he thinks, "allow ourselves the luxury" of introducing into our theory of life's origin, of assuming to actually have occurred, any event the odds against which "...do not exceed 100 billion billion to one....This allowance may seem large. It is probably ample to accommodate the spontaneous arising of DNA or RNA." (146)

With these "assurances" in his pocket, he now proceeds to sketch out a "relatively probable" way in which cumulative selection might have got its start. He admits that this is "speculation," but then "we can hope for nothing more than speculation when the events we are talking about took place four billion years ago...in a world that must have been radically different from that which we know today." (147) Setting aside, for this book, the "primeval soup" theory of life's spontaneous origination, he sets out from Cairns-Smith's view that the DNA/protein machinery came into existence as a result of "many generations of cumulative selection, based upon some quite different replicating entities." (148) "Organic chemistry is the chemistry of one particular element, carbon....The essential property of carbon atoms that makes them so suitable for life and for industrial synthetics, is that they join together to form a limitless repertoire of different kinds of very large molecules. Another element that has some of these same properties is silicon....Cairns-Smith believes that the original life on this planet was based on self-replicating inorganic crystals such as silicates. If this is true, organic replicators, and eventually DNA, must later have taken over or usurped the role." (149)

But how is this supposed to have come about? Briefly, crystals are presented as a kind of scaffolding which could hold the parts of the earliest life forms together until all parts were in place and the form could take off on its own: "DNA and protein are two pillars of a stable and elegant arch, which persists once all of its parts simultaneously exist. It is hard to imagine it arising by any step-by-step process unless [there was] some earlier scaffolding [that] has completely disappeared. That scaffolding must itself have been built by an earlier form of cumulative selection, at whose nature we can only guess. But it must have been based upon replicating entities with power over their own future." (149-150) We will spare the details of the "guess" at this point, but the idea is that crystals grow, replicate and, through flaws, "mutate." Sometimes crystals spontaneously start to form in solutions. They may also be "seeded" by particles that break off of crystals. (150-152) But can they influence their own survival (and hence propagation) by qualities they possess? Do they have "power"? (153)

Another "little flight of fancy" comes to the rescue. Clays (like mud and rocks) are

made of crystals. “Clays are made from chemical building blocks such as silicic acid and metal ions, which are in solution in rivers and streams, having been dissolved—’weathered’—out of rocks further upstream. If conditions are right they crystallize out of solution again downstream, forming clays....Whether or not a particular type of clay crystal is allowed to build up depends, among other things, upon the rate and pattern of flow of the stream. But deposits of clay can also influence the flow of the stream....by inadvertently changing the level, shape and texture of the ground through which the water is flowing.” (153-154) “Successful” clays will generate streams that flow in a way favorable to their own type of formation. They may also “infect” distant streams through wind-blown particles, and then take them over for predominant formation of clays of the same type. The “mutation” process would of course be going on all the time.

Now the final flight of fancy: Just suppose that “Some lineages of crystals might happen to catalyse the synthesis of new substances that assist in their passage down the ‘generations’....Cairns-Smith believes that organic molecules were prominent among non-replicating ‘tools’ of his inorganic crystalline replicators. Organic molecules frequently are used in the commercial inorganic chemical industry because of their effects on the flow of fluids, and on the break-up or growth of inorganic particles: just the sorts of effects, in short, that could have influenced the ‘success’ of lineages of replicating crystals.” (156) This “close association that can exist between organic chemical synthesis and clay surfaces....is...a bonus for the theory that clay replicators synthesized organic molecules and used them for their own purposes.” (157) Then the 1 in 100 billion billion chance event occurred. From the proteins, sugars and RNA-like nucleic acids there arose a self-replicating structure: “RNA, or something like it, was around for a long time before it became self-replicating. When it finally did become self-replicating, this was a device evolved by the mineral crystal ‘genes’ to improve the efficiency of manufacture of the RNA (or similar molecule). But, once a new self-replicating molecule had come into existence, a new kind of cumulative selection could get going....The original mineral replicators were cast aside like worn-out scaffolding, and all modern life evolved from a relatively recent common ancestor, with a single, uniform genetic system and a largely uniform biochemistry.” (157)

This completes the story of “the kind of way in which it must have happened.” (166) Dawkins candidly asks: “Do you find both Cairns-Smith’s clay theory, and the more orthodox organic primeval soup theory, wildly improbable? Does it sound to you as though it would need a miracle to make randomly jostling atoms join together into a self-replicating molecule? Well, at times it does to me too.” (158, cf 162) However, that’s okay. “A miracle is something that happens, but which is exceedingly surprising.” (159) We should not be put off by how surprising the miracle of the leap to DNA is, for “we can calculate our way into regions of miraculous improbability far greater than we can imagine as plausible.” (160) “Our own subjective judgement of what seems like a good bet is irrelevant to what is actually a good bet.” (162) “Our brains have been built by natural

selection" (162) in such a way that "Our own subjective judgement about the plausibility of a theory of the origin of life is likely to be wrong by a factor of a hundred million." (163) Here as so often throughout the book, the author indicates that it is really our limited imaginations, tied to our short lifespan, which prevent us from accepting his theories. He claims that a long-lived 'alien' would find the emergence of life once per aeon "less of a miracle than a golf hole-in-one seems to us." (163) What that is supposed to imply is unclear.

So what, exactly, are the calculations that are supposed to help ease the pain to our imagination of accepting Dawkins' theory of the origin of natural selection, the 'blind watchmaker'? What Dawkins does is to get us to imagine (no less!) a "spectrum" of probabilities. At one end we have events like rolling a double six with a pair of dice, where the probability is 1 in 36. At or well toward the other end is the probability of four players at bridge each receiving a complete suit of cards, which he calculates to be 2,236,197,406,895,366,368,301,559,999 to 1. Between the double six and the perfect deal at bridge is a range of more or less improbable events that do sometimes happen. Now: "Go back to our mental picture of a graduated scale of improbable events with its benchmark coincidences of bridge hands and dice throws. On this graduated scale of dealions and microdealions, mark the following three new points. Probability of life arising on a planet (in, say, a billion years), if we assume that life arises at a rate of about once per solar system. Probability of life arising on a planet if life arises at a rate of about once per galaxy. Probability of life on a randomly selected planet if life arose only once in the universe." The actual probability of life originating (in some such manner as hypothesized above) "probably lies somewhere between the extremes represented" for a planet at once per solar system and at once per universe. (164) These then are the "calculations" that are supposed to carry us against the tide of our "imagination" or "subjective judgment" to acceptance of the view that life forms actually did emerge on earth in some such way as fancied above. "We still don't know exactly how natural selection began on Earth. This chapter has had the modest aim of explaining only the kind of way in which it must have happened." (165-166).

QED?

The remainder of the book is of no significance for the issues decisive in arguing for a universe without design. But what are we to say about the argument for the blind watchmaker maker?

First of all, I have no hesitation in allowing that there may be a very small chance—something on the order of Dawkins' "miracle"—of DNA molecules originating from inorganic materials. Possibly there are describable events which are even less likely than that miracle. In this sense, life could—that is, it is at least not logically impossible that it should—have originated from inorganic order and processes. That is, at least, more probable than some logically possible

events. On the other hand, I am not sure that the difference between, say, the improbability of the perfect deal at bridge and that of the leap to life from non-living substance is one which should make any difference in what we should believe. Probability itself (not the mere “mathematics” of it), and its interrelationships with belief and rational belief—not to mention true belief—are, it seems to me, not the sorts of thing to be invoked to show that some sort of event really could have occurred when the odds against it are as great as those conceded here.

But the probability of life occurring as Dawkins says is really not the issue anyway. As the passages just quoted, along with many others, indicate, he takes himself to have shown that life must have originated from inorganic substances alone. And without this the entire point of his book is lost. But even if he has shown that it could have so originated, he has not shown that it did, much less that it must. He needs to establish that his suggested way is the only way in which life could have originated. But to do that he must assume that his naturalistic cosmology, which, supposedly, he is trying to support, is true. In short, he must beg the question.

Further, as Dawkins himself admits, the degree of complexity prior to the supposed origin of life is of awesome dimensions. “All those calculations about packing the New Testament into the DNA of a single bacterium could be done just as impressively for almost any crystal....You could ... pack several New Testaments into a mineral crystal the size of a pin’s head.” (152) And of course we are to account for an entire physical universe and all of the order and complexity that would be involved in it. Here Dawkins is plainly letting himself off the hook by relying on the “order out of chaos” myth. That alone keeps him from asking what made the maker of the blind watchmaker possible, just as he, rightly, asked what made the blind watchmaker possible. The entire structure of the argument in the book for Cosmic Darwinism and a completely naturalized cosmology depends upon him ultimately making sense of the transition from a state of being (or is it nothing) which has no order at all in it to one which has enough order to give rise to more order. The creationist does not have this hurdle to leap—whatever else her troubles may be. And she in addition is able to refer to the manifold verified cases of order entering the physical world from human minds as providing a forceful suggestion of what it might be like (with many details missing, to be sure, and certain important differences) for the physical world itself to emerge from a mind. There is no comparable suggestion available to Dawkins. Even “billions and billions and billions” of “tiny random steps” won’t help without some character, some order or structure, pre-existing in that from which they proceed. Only the presupposed naturalistic ontology can force one to accept the emergence of order from no-order—or from “nothing,” which amounts to the same, since all that exists has a character and therewith an order. The naturalist must take that, or opt for a self-occurrent and hence in some measure self-subsistent first ‘natural’ event or state with order built in, since the real series of causes back of any given event, past or present, is completed and so cannot

be infinite.

Dawkins says that “The one thing that makes evolution such a neat theory is that it explains how organized complexity can arise out of primeval simplicity.” (p. 316) I hope it is now clear that it does no such thing and logically cannot do it. “Evolution” understood as Darwinian natural selection, Dawkins’ “blind watchmaker,” does fairly well, among the competing theories, given the presupposition of self-replicating, mutating entities in a vastly complex environment. But Dawkins constantly and illegitimately attempts to carry the basic plausibility of the theory of natural selection, properly restricted, over to the conclusion that “organized complexity can arise out of primeval simplicity.” However, his crystals and their “organic” tools are very far from “primeval simplicity,” and neither natural selection nor any other theory in existence provides an account of how they arose out of “primeval simplicity”—whatever that is. His story about the crystals and DNA has an air of respectable theory about it only because of its surface similarity to the theory of natural selection in the authentic Darwinian sense. By bending the structure of natural selection back on the conditions of its own origin as a real process, Dawkins in effect proposes that the blind watchmaker made himself. Most of the book is merely a diversion from this central difficulty, an ignoratio elenchi with regard to its basic conclusion, which is a completely naturalized cosmology. As a result, when he says, “The basic idea of *The Blind Watchmaker* is that we don’t need to postulate a designer in order to understand life, or anything else in the universe” (147; my italics), he has a “basic idea” that is nothing more that just bald assertion. The book gives nothing that could pass for a reason for this claim, as distinct from a pretty plausible account—perhaps the most plausible account at present—of how the living species now identifiable came from past species, whatever their ultimate origins. He likes to associate himself with Darwin and Darwinism in biology. But, so far as I can tell, Darwin never made the cosmological claims which are the whole point of Dawkins’ book, and he never suggested that his research and theory gave any support to the cosmological claims.

Dawkins’ work here is not in the line of Darwin, but of metaphysical speculation which attempts to hitch its wagon to Darwin’s star. His soul-mates are people like Ernst Haeckel and Herbert Spencer—to mention only two of the more respectable from a logically pretty grubby bunch. When he writes a book like the present one he is not functioning as a scientist. If he were, he should incorporate his “findings” into the most advanced textbooks in the field and see how they fare as representations of established knowledge. He complains that “the true, Darwinian explanation of our own existence is still, remarkably, not a routine part of the curriculum of a general education.” (4) Then by all means let him enter the academic arena and present his views about the watchmaker as established knowledge. He should not reserve his views for infliction upon a largely helpless public whom his scientific credentials and elaborate rhetorical devices will overwhelm and make incapable of any accurate assessment of argument. When he writes books like *The Blind Watchmaker* he is just a naturalist metaphysician,

trying to cozy up to the scientists and blend into their company in such a way that his true colors will not be noticed. He takes the liberty to dress down what he calls “redneck creationism” (252), but unfortunately there are rednecks on the side of “Darwinianism” as well. He is one of the most outstanding.

Notes

Richard Dawkins, *The Blind Watchmaker*, New York, W. W. Norton, 1986, xvi + 332 pp. Dawkins has taught at Berkeley and is lecturer in animal behavior in New College, Oxford.