

Evolution, Information and the Mystery of the Human Mind

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The evolutionary model of Dawkins

Richard Dawkins describes natural selection as an automatic and blind process that, on the one hand, is not accidental but, on the other hand, is not geared towards any higher developmental goal. If this process can be attributed to the role of a watchmaker in nature, then that of a "blind watchmaker" – hence the title of his book (1).

In this book, Dawkins seeks to correct a common misconception of biological evolution according to which, for example, the organisation of DNA sequences is considered a mere product of chance. Instead of achieving the goal in a single practically impossible "jump by chance", he describes how he *"breaks up the improbability into small, handy parts and thus outwits the chance; he goes to the back of the mountain of improbability and crawls up the gentle slopes, one million-year-inch after the other."*

This image demonstrated by Dawkins in a computer simulation that develops the words of Shakespeare "METHINKS IT IS LIKE A WEASEL" in just 43 steps – consisting of random mutations and selection of useful changes (selection).

The probability of generating this sentence directly as a unique "jump by chance" is $1/27^{28}$ or about $1/10^{40}$. Therefore, a direct "jump by chance" can't explain the generation of this sentence.



Fig. 1 A "jump by chance" to the height H of the mountain of improbability is practically impossible.

By contrast, the rise in many individual steps (indicated on the "gentle slope" on the left) consisting of chance and selection seems to be easily possible.

Dawkins now explains how his computer model easily handles the problem: It starts with a random selection of 28 letters (Generation 1). The computer then checks which letters match the target sentence. These are recorded and the remainder randomly chosen (Generation 2).

This process leads to the goal after only 43 steps – consisting of chance and subsequent selection.

Generation 1: WDLMNLT DTJBKWIRZREZLMQCO P

Generation 2: WDLTMNLT DTJBWIRZREZLMQCO P

Generation 20: MELDINLS IT ISWPRKE Z WECSEL

Generation 40: METHINKS IT IS LIKE I WEASEL

Generation 43: METHINKS IT IS LIKE A WEASEL

However, in Dawkins' model, the required sentence must first be entered into the computer. Moreover, the comparison with the target is certainly not comparable to a blind natural process. These problems were also recognized by Dawkins, he writes:

Although the monkey/Shakespeare model is useful for explaining the distinction between single-step selection and cumulative selection, it is misleading in important ways. One of these is that, in each generation of selective 'breeding', the mutant 'progeny' phrases were judged according to the criterion of resemblance to a distant ideal target, the phrase METHINKS IT IS LIKE A WEASEL. Life isn't like that. Evolution has no long-term goal. There is no long-distance target, no final perfection to serve as a criterion for selection, although human vanity cherishes the absurd notion that our species is the final goal of evolution. In real life, the criterion for selection is always short-term, either simple survival or, more generally, reproductive success (1, p.50).

In his book "The God Delusion" (2), Dawkins attempts to refute the argument of irreducible complexity. As an example, he does not use Behe's mouse trap (3) but a rather unusual combination lock:

Another favourite metaphor for extreme improbability is the combination lock on a bank vault. Theoretically, a bank robber could get lucky and hit upon the right combination of numbers by chance. In practice, the bank's combination lock is designed with enough improbability to make this tantamount to impossible - almost as unlikely as Fred Hoyle's Boeing 747. But imagine a badly designed combination lock that gave out little hints progressively- the equivalent of the 'getting warmer' of children playing Hunt the Slipper. Suppose that when each one of the dials approaches its correct setting, the vault door opens another chink, and a dribble of money trickles out. The burglar would home in on the jackpot in no time (2).

Here, Dawkins seeks to argue away the proven existence of irreducible complexity in nature and to replace it with gradual adaptation to adverse environmental conditions. An example of the latter is the resistance development of bacteria to a new antibiotic.

In technology, a method of gradual adaptation has been successfully applied. It is the "evolutionary strategy" developed by Rechenberg. He demonstrated in 1964 how with this method the flow resistance of a complex system can be minimized by using blind natural processes. The parameters of the system are changed randomly at each "evolutionary step" with subsequent determination of the flow resistance. If the change leads to an increase in the resistance, it will be reversed by the program control, whereas if the resistance is reduced it will be retained and used as a starting point for the next "evolutionary step". Rechenberg (4) was able to prove that this method is the fastest way to the optimum for systems with many degrees of freedom. This "evolution strategy" is now being used successfully in technical optimization problems. For this reason, the conditions and limits of the procedure are well known.

The application of the evolution strategy presupposes the existence of a parameter by which optimization can be reached step-by-step – in Rechenberg's original example this was the flow resistance. For the purpose of "minimizing flow resistance," the model tests all possible randomly-varied shapes, eventually leading to the previously unknown, optimal shape.

In biology, evolutionary strategy may explain gradual changes of organs, but it also shows the limits of evolution by random changes and blind selection. In principle, no real existing

combination lock can be opened with this method. – The problem of irreducible complexity remains unresolved. The assumed breaking up of improbability into small handy parts proves to be an illusion, as does the climbing of the mountain of improbability (see Fig.2).

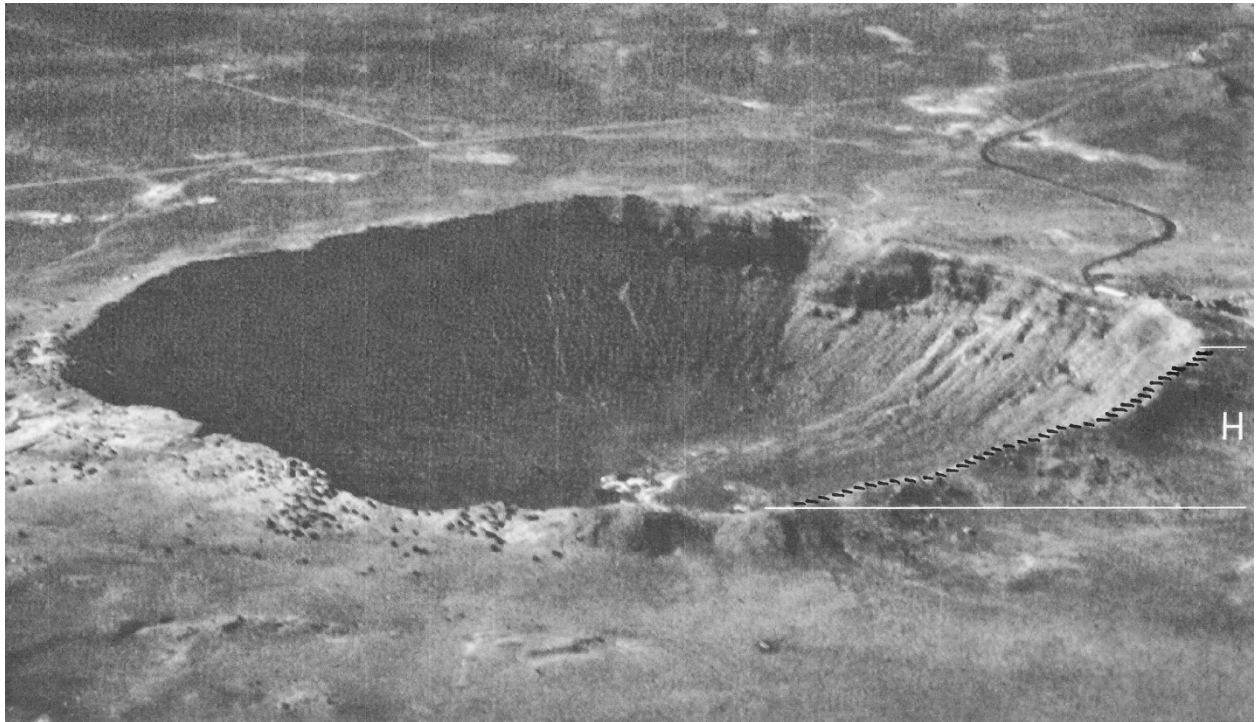


Fig. 2 The "Mountain of Improbability" (Fig. 1) is in reality a photograph of the Barringer Crater in Arizona, USA, turned around 180°. Climbing the mountain stepwise is an illusion – the path indicated leads along the crater rim at a constant height. Equally illusory is the solution proposed by Dawkins to the problem of language or DNA generation by naturalistic processes.

Many observers, viewing Fig. 1, are unable to recognize the image of a crater rotated around 180°, even after having read the explanation of Fig. 2. This is due to the program control of our visual perception. This program includes the presupposition that light always shines from above. When the crater photo was taken, the light fell from top left. If you want to see the upside-down crater picture when viewing Fig. 1, the fixed programming must be overridden by a deliberate correction. Hardly anybody is capable of doing that.

Similarly, the mental recognition of logical consequences is significantly influenced by our imprint or by our prerequisites of thinking. From my own experience, I know how hard it is to deliberately override the prerequisites of thinking familiar from childhood. However, the ability to do so is a crucial prerequisite for being able to test another prerequisite of thinking – another paradigm. For me, it is an open question whether Richard Dawkins is able and willing to at least temporarily override his naturalistic paradigm to compare it to a more comprehensive paradigm.

The mystery of the human mind.

To illustrate this problem and the need for the proposed comparison of paradigms, a quote from Sir John Eccles (Nobel Laureate Physiology / Medicine, 1963) may be helpful. He writes (5):

"I maintain that the human mystery is incredibly demeaned by scientific reductionism, with its claim in promissory materialism to account eventually for all of the spiritual world in terms of patterns of neuronal activity. This belief must be classed as a superstition ... we have to recognize that we are spiritual beings with souls existing in a spiritual world as well as material beings with bodies and brains existing in a material world."

This view may well be considered as superstition by supporters of the materialistic "Identity Theory of Mind" and probably also by Richard Dawkins. But which paradigm is in line with reality, for instance with the following report published in the prestigious British medical journal Lancet (6)?

"During a night shift an ambulance brings in a 44-year-old cyanotic, comatose man into the coronary care unit. He had been found about an hour before in a meadow by passers-by. After admission, he receives artificial respiration without intubation, while heart massage and defibrillation are also applied. When we want to intubate the patient, he turns out to have dentures in his mouth. I remove these upper dentures and put them onto the 'crash car'. Meanwhile, we continue extensive CPR ([cardiopulmonary resuscitation](#)). After about an hour and a half the patient has sufficient heart rhythm and blood pressure, but he is still ventilated and intubated, and he is still comatose. He is transferred to the intensive care unit to continue the necessary artificial respiration. Only after more than a week do I meet again with the patient, who is by now back on the cardiac ward. I distribute his medication. The moment he sees me he says: 'Oh, that nurse knows where my dentures are'. I am very surprised. Then he elucidates: 'Yes, you were there when I was brought into hospital and you took my dentures out of my mouth and put them onto that car, it had all these bottles on it and there was this sliding drawer underneath and there you put my teeth.' I was especially amazed because I remembered this happening while the man was in deep coma and in the process of CPR. When I asked further, it appeared the man had seen himself lying in bed, that he had perceived from above how nurses and doctors had been busy with CPR. He was also able to describe correctly and in detail the small room in which he had been resuscitated as well as the appearance of those present like myself. At the time that he observed the situation he had been very much afraid that we would stop CPR and that he would die. And it is true that we had been very negative about the patient's prognosis due to his very poor medical condition when admitted. The patient tells me that he desperately and unsuccessfully tried to make it clear to us that he was still alive and that we should continue CPR..."

Reports of this kind were once considered untrustworthy and were concealed. In the meantime, however, the zeitgeist has changed in such a way that this side of reality is also taken note of and published in a scientific journal, even though it obviously contradicts naturalistic thinking.

In contrast to naturalism, the reality described here fits perfectly into the dualistic worldview that Popper and Eccles have explained in their book, "The Self and His Brain" (7). This work is an example of a remarkable collaboration between an agnostic and a Christian. Popper described himself as an agnostic, rejecting what he considered to be arrogant atheism as well as Jewish and Christian beliefs.

Eccles wrote (5, p.237):

"Since materialist solutions fail to account for our experienced uniqueness, I am constrained to attribute the uniqueness of the Self or Soul to a supernatural spiritual creation. To give the explanation in theological terms: each Soul is a new Divine creation which is implanted into the growing foetus at some time between conception and birth."

Reductionists have not yet given up hope of someday finding a naturalistic explanation – both for the currently inexplicable properties of the "self-conscious mind" (7) and for a useful, naturalistic model for generating language or DNA. However, in critical consideration of this hope, it must be remembered that millions of years necessary to climb the mountain of improbability ... "one million-year-inch after another" are no longer an alibi for empirical scrutiny; the duration of a succession of generations can be shortened by a factor of 1/1 000 000 000 or more in a computer model. So where is the computer model for the naturalistic generation of cumulative selection that can produce language? Dawkins himself called his monkey / Shakespearean model ... *misleading on important points*.

No one doubts that the human mind can produce language. But the hope of producing language through purely naturalistic processes seems to me just as hopeless as the search for a perpetuum mobile. Although there is no proof in the mathematical sense that a perpetuum mobile is impossible, no informed person will bother to read the long descriptions of such constructs that are still filed today with patent offices. In order to be able to understand this comparison we have to look more closely at the nature of information.

The importance of information in the physical world

At the moment our understanding of information is still in its infancy, as we can see from the following quotations from Weizsaecker (8):

Today, therefore, one begins to get used to the fact that information must be understood as a third thing different from matter and consciousness.

Here, in addition to information, consciousness – in the sense of Eccles – is understood as something fundamentally different from matter. It is obvious that this dualistic view of body and mind is consistent with the Lancet Report, as stated above.

Weizsaecker goes on to explain information:

What one has discovered is an old truth in a new place. It is the Platonic Eidos, the Aristotelian form, so clothed that even a person of the twentieth century can sense something of them. ... The thesis: "Matter is form" means that the elementary particles are to be built from primordial alternatives. The thesis "mass is information" means that information is the number of original alternatives that come in a situation. The thesis: "Energy is information" means that everything which applies to mass applies as well to energy.

If mass and energy are traceable to information in the deepest sense, then this information must also have a conservation law as well as mass and energy (compare my article: Information in Bible and in Science). Of course, this does not apply to any information, but in this case the number of original alternatives that come up in a situation.

An application of Weizsaecker's concept of information on coded information such as language leads to the following conclusion: The laws of conservation of mass and energy are based on experience. Similarly, our experience teaches us that information in the form of language, although generated by the human mind, has never been generated by naturalistic processes. But because today there are still "inventors" who believe they have found the one exception to the empirical law of energy conservation, there are still corresponding patent applications today. When will the "inventors" of pure naturalistic language or DNA production be put on an equal footing with the "inventors" of a perpetuum mobile?

In addition to Weizsaecker, other leading physicists are convinced of the fundamental importance of information. Wheeler (9) coined the phrase "It from bit" and explained it as follows:

"It from bit symbolizes the idea that every item of the physical world has at bottom – at a very deep bottom, in most instances – an immaterial source and explanation; that what we call reality arises in the last analysis from the posing of yes-no questions and the registered of equipment-evoked responses; in short, that things physical are information-theoretic in origin."

Zeilinger (10) also expressed the conviction that information is the very basis of physics, pointing to the biblical root of this ancient wisdom, citing the beginning of the Gospel of John: *In the beginning was the Word.*

What he means by that, he explained in an interview with Spectrum of Science (11):

I am convinced that information is the fundamental concept of our world. It determines what can be said, but also what can be reality. ... In quantum physics – at least in certain situations – I believe that information is the primary thing: what can be said ...

For these outstanding scientists, therefore, information is the primary, the beginning and the deepest foundation of all phenomena of the physical world. (Compare also (12)). By contrast, Richard Dawkins believes in naturalistic explanations of the origin of coded information such as language and DNA.

In the same interview, Zeilinger was also asked the Gretchen question: "How do you hold it with the religion?" Zeilinger answered among other things:

... Any conflict between religion and science is a misunderstanding in my view. The discussion on evolution versus creationism is intellectually frightening – both that represented by fundamentalist religionists, especially in the US, and partly by scientists; the book by Richard Dawkins, "The God Delusion," is so simplistic! ...

A little later he noticed:

I like Einstein's position that God is the principle from which the laws of nature come – though I can well imagine a God who can intervene in the world today .

Spectrum: ... what Einstein did not believe.

Zeilinger: Yes, as far as I know, Einstein only assigned God a role at the beginning.

Spektrum: According to him, God has started this great movement, but does not intervene in the process, perhaps because of a prayer.

Zeilinger: At least I know that the world is not a clockwork. Quantum mechanics teaches us that every clockwork picture is wrong ... The world is not a clockwork. May one worry about the theological consequences.

From these quotes of outstanding scientists, we can draw the following conclusion: The hope for a model able to generate coded information such as language and DNA solely through naturalistic processes is based on a worldview which is in conflict to physics and to observed properties of the human mind.

Richard Dawkins and with him the naturalists should therefore ask themselves whether for them a paradigm shift is now overdue.

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