Review: From Bacteria to Bach

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Daniel Dennett, From Bacteria to Bach. How the mind evolves. Cortina publisher, 2018. Original title From Bacteria to Bach and Back.

This is Dennett's thesis: our organism is a biological computational machine capable of collecting data from the environment and processing it according to the stimuli picked up by the senses. So far, nothing special, since such a process can also be subscribed to by the supporters of the 'intelligent design' theory, the one that contemplates a god overseeing man's evolution after providing the appropriate initial impetus.

For the old-fashioned creationist and the proponent of intelligent design, there is a special quality in man, whether called soul or otherwise, capable not only of enabling him to develop complex thoughts, but also to imagine the future, interact with nature, and imagine things that are not yet there.

For the materialist, there is no need to invoke a soul or a special intangible quality: everything that we have evolved to realise in ourselves and in relation to nature is perfectly explainable by the configurations that countless material elements have assumed over billions of years, starting with the first atoms grouped into the first molecules constituting the first living beings. We are matter informed by the primitive configurations of atoms and interactions between atoms, configurations that are not random but determined by the incessant relationship between elements in nature. Dennett therefore makes the theory of 'intelligent design' his own, attributing it not to a god but to a nature that continually relates its elements as if it were devoting itself full-time to research with a portentous R&D office. And the office is portentous not because it can show us some miracle but because it works with simple elements, as there is nothing else to achieve complexity.

The first living organisms a little more complex than a virus 'already know what to do' based on elementary information, and this Dennett calls *'competence without comprehension'*. This fact is perpetuated for a long time until relations between living beings produce language. From that 'moment', evolution differentiates species between those that communicate knowledge incrementally and those that stop at competence without comprehension: that is, apart from minor differences, between us and the rest of the animal kingdom.

The argument becomes provocative: competence without comprehension is also that of an automated elevator since the functions of the old elevator attendant are performed by an electromechanical device. To the extent that certain functions are evolutionarily acquired, we have the basic dynamic that explains the complexity of the most informed living organisms. Once language becomes established, the evolutionary cycle proceeds exponentially. At this point, evolution becomes so fast that its purely biological aspect takes a back seat. 'Memes' take over, parts of speech that become 'viral' and that, like genes, participate in the differentiation of the primate homo.

Competence without comprehension, represented by the immense base of the biological mass on our planet, leads to the conclusion that there is a very close invariance between inanimate and animate. All living beings, none excluded, 'function' in the same way: they respond to a stimulus by modifying their behaviour. All adaptations involving Darwinian selection, especially since they are connected to language as a transmitter of information, are the consequence of primordial 'expert systems' that solve problems without 'comprehending' them (from the automatic lift that optimises rides, to the supercomputer that manages an immense production-distribution system like a large supermarket). Today, there are machines capable of synthesising with marvellous efficiency the solution of problems with infinite variables using neural network simulations, i.e. artificial intelligence programs. These machines and programs are not particularly 'intelligent', but they achieve better and more reliable results than those of the human brain by distributing intelligence at a capillary level, applying an 'identity card' to every single 'atom' of the system (the indivisible part that can be labelled with a code) and following its movements.

The elevator with its electronic relays is like a simple Turing machine (read, write, delete, move); a complex system such as Walmart, with millions of goods being moved billions of times, is a complex but analogous system. The computational capacity of our brain has, through evolution, attained such great power that it has exported its nature to the outside world by implementing it in machines. Now, Dennett tells us that the study of biological evolution, including intelligence (consciousness) is certainly something physical, so that, as in physics, such a study can be followed from the past to the present-future (from amoeba to homo) or, indifferently, from the future-present to the past. This sort of inverse theory of evolution tells us two things:

> 1) if we look at the evolution of unicellular organisms, we see that they have increased in complexity from a competence without elementary understanding, at the level of there-is-or-not, one-zero, yes-no;

2) if we look at how beings evolved by proceeding backwards in time, i.e. by removing complexity from our present models, we see that our organism retains imprints of past evolution, such as a genetic code exaggeratedly complex compared to needs, parts of the brain with some unused neurons, neurons present in the abdomen, etc.

Analysing the entire cycle of our evolution, we find precursor and successor elements at every point in the trajectory, except in language. And here Dennett addresses the least convincing part of his admittedly materialistically acceptable evolutionary theory of 'mind'. We do not know how language evolved, but in analysing fossil languages that have survived in isolated places, we do not find passages that somehow indicate their evolution from the simple to the complex, as is the case with writing, for example. Dennett tries to get around this by attributing the lack of a proto-language to the speed of 'cultural' evolution in comparison to the slowness of biological evolution. We have repeatedly noted this aspect, which is real, but we have always put it in relation to collective production, whereas the author privileges, in long digressions, Dawkins' meme theory. There is a problem: the meme can be anything from a piece of information as a means of production to the air of a song. If we talk about the evolution of memes, we need to co-evolve the information-language with the development of the hand and brain linked in production. It is by handling conceived and produced objects that language becomes indispensable at some point. It is eventually from that level that the mind also develops.