

REDUCTION, SUPERVENIENCE, EMERGENCE AND NATURALISTIC TRUTH: REDUCTIONISM, HOLISM AND THE DESCRIPTION OF HUMAN NATURE

CARLOS CASTRODEZA
Complutense University of Madrid (Spain)

ABSTRACT: Methodological reduction is often wrongly identified with ontological reduction. For any ontology has always existential problems of its own which are absent in a methodological approach. Emergence would also be problematic unless it is also contemplated methodologically. As any philosophical issue, the question of emergence-reduction is used from a naturalistic stance as a platform to promote personal ideals of survival. For example, Richard Dawkins would promote a Darwinially reduced world. On the contrary, Richard Lewontin for one would implement a holistic world essentially Kropotkian. In this context, a contentious term is that of replicator. But this term need not be either as reductive as Dawkins would have us believe nor as useless as Lewontin thinks. For again evolution by natural selection would always be defended naturalistically along one's own ideological tenets.

SUMMARY: The naturalistic interpretation of nature is always difficult to assess. In a naturalistic world there are no subjects in the sense of entities having intentions. It is contended that the question of reduction vs emergence is a pseudo-question when considered from a naturalistic viewpoint. From this viewpoint both notions should be treated methodologically and not ontologically. On this basis, the understanding of human nature is grounded on two would-be contradictory assessments. One the one hand, on the well known premise 'we are nothing else beyond the genes which promote our survival', Richard Dawkins, for example, would implement a radical Darwinian programme. On the other hand, Richard Lewontin for one would think that the interactive action of genes, environment and development (the triple helix) would not allow us to consider in any way a deterministic vision of human nature. It is contended that both scientifically based visions are implemented naturalistically in order to promote a personal vision of the world. For this personal vision would in principle promote one's own survival be it in a roundabout way. It is further argued in favour of a naturalistic perspective whereby Dawkins' and Lewontin's models can be met to a significant extent. This perspective is incardinated in the notion of free choice. For no matter how determined are organisms in their behaviour they can always choose what is seemingly good for them out of the alternatives offered by nature. Moreover the term 'replicator' is identified as somehow the conceptual 'villain' of the piece from the Lewontian camp. The term was introduced by Dawkins so as to give a firm basis to his reductive programme. However the term can be interpreted in a context much wider than Dawkins would have us believe. In fact, it can also have a holistic dimension. In this way all biological considerations of human nature based on either sociobiology proper or evolutionary psychology can be understood well beyond the reductive framework advocated by Dawkins. Notwithstanding all these interpretations, it is possible to use the process of natural selection to describe the world of the living in many drastically different ways. Again Lewontin's and Dawkins' visions of the evolutionary process would be at the two extremes of a rather wide hermeneutic spectrum. It is finally concluded that from a naturalistic perspective each interpretation would suit indeed the overall survival/reproductive strategy of his/her holder.

INTRODUCTION

It is difficult to spell out what is naturalistic truth¹. Let us say that it is truth in a very down to earth (colloquial) meaning where no real intentions enter the picture. Let reduction make an appearance. From the naturalistic viewpoint the meaning of reduction should be reasonably clear. Not so the meaning of emergence. By reduction it is simply meant that what we perceive is simplified to a point so that we can handle in practice whatever is the matter. Therefore no worry is taken about possible theoretical losses/gains in the reductive process. On the contrary, when something 'new' emerges out of more simple constituents there is a tendency to think that this something new appears (in the form of emerging properties) from nowhere as it were². This of course is never the case from the naturalistic perspective in question. Simply there are some latent properties which show themselves when we put the constituents together. We have chlorine and we have sodium, we put them together in the proper way and we have salt. No mystery there. The same happens with hydrogen, oxygen and water. And at the end of the line, so to speak, the same takes place with the neurons, the glia cells and the resulting consciousness in the brain.

The purpose in this paper is to apply this global idea to the issue concerning the organism being tentatively reduced basically to its genetic constituents, especially when the organism at stake is man. This basic idea has been continuously expressed mostly in the past fifty years under the guise of the so called 'replicator' (Richard Dawkins' term). As it is well known by now, the at the time Oxonian ethologist R. Dawkins introduced the concept of selfish gene back in 1976. This selfish gene was in fact in many cases a replicator favoured/rejected by natural selection. The reason of this favouritism/rejection is that replicators are the only structures that would maintain their identity from one generation to the next. Thus a gene that keeps its chemical integrity from generation to generation is structurally a replicator – provided it does not mutate that is – and is functionally a replicator – provided there are alternative alleles which confer different survival values to the organism.

PSEUDO-PROBLEMS

a) *Dawkins vs Lewontin*

The first would be problem in the reduction-emergence context advocated is that when we have a complex organic structure it is never enough to reduce its emergence (appearance) to the genes particularly involved (pleiotropically many other genes may have had their effect). One reason is that this structure may pop out in other biochemical pathways. That is to say, more than with a matter of reduction we are dealing with a process of supervenience. For a complex structure may be reduced in most cases to different sets of constituents. A second reason is that there may be lots of epigenetic inheritance. And a third reason may concern the existence of random would-be inheritance.

¹ See for example *Pragmatic Naturalism and Realism*, edited by John R. Shook (Amherst, N.Y.: Prometheus Books, 2003).

² The present state of affairs is well represented in *The Re-Emergence of Emergence*, edited by P. Clayton and P. Davies (Oxford, Oxford University Press, 2006). See also 'Eliminating the mystery from the concept of emergence' by Brian R. Johnson. *Biology and Philosophy*, 25 (2010): 843-9.

For example synaptic connections in the brain may occur to a certain extent randomly. Equally, certain developmental pathways may be initiated on a random basis. But obviously all these reasons do not entail that the structure emerged somehow out of nowhere³ and is not dependent for its formation on any concrete basic substructures. Dawkins' basic point in many publications is that despite all this extra-genetic disturbances, genes, as replicators, may have *ceteris paribus* either positive or negative effects in which case a partial reduction is always possible.

Richard Lewontin, the well known Harvard expert in evolutionary theory, takes a position radically different from Dawkins. For Lewontin reduction is impossible because the interaction between genes, epigenetic material and random development make of the organism a global totality that cannot be broken even partially into its constituents in any additive way⁴.

To my mind Lewontin's radical attitude would make impossible for natural selection to have any action at all in general for no replicators could be singled out to that effect. In fact, Lewontin and others (Stephen Jay Gould, Richard Levins) think that the so called adaptationist programme is drastically overplayed⁵. For Lewontin it is difficult, perhaps impossible, to separate real selected structures in the organism from accompanying collateral effects. So that in the end natural selection as an explanatory device is rather void and nil.

Lewontin's point is well taken. But in practical terms our interest is always centred in particular cases. So that the old equation, one gene-one character may work here and there (this is in fact the crux of the 'genome project'). Likewise occurs when one refers to the more recent but also old equation one gene-one enzyme. The latter in the sense that the enzyme in question may be either irrelevant or not as far as survival is concerned. Seemingly, Dawkins overstates his case. However there is much more to it. For Dawkins' actual goal is to understand the basics of human behaviour. These basic tenets concern mostly selfishness and altruism but also violence, sexual drives, and all predispositions that make ourselves be what we are physically and intellectually, eliminating in the process all trace of free will as customarily understood.

The real underlying matter seems to me to be as follows. Dawkins in fact states that all human characteristics are at a deep down level genetic ones, being them modifiable either by the environment, epigenetic effects and/or random processes. In other words, his basic position is that genes ultimately rule the show as replicators. Although these replicators are being considered as structural items in the first place, and functional ones secondarily. Of course Dawkins thinks that we are where we are because natural selection has brought us that far. But in a sense this is irrelevant to Dawkins' real intentions. The main point is to legitimate scientifically (biologically) that we are what we are (vehicles driven by genes) because we can be nothing else. Naturally Dawkins wants perhaps to mild this somewhat harsh position by contending that the only manner to mend our 'bad' ways is by knowing what we actually are up to. But truly one cannot have the pie and eat it, either we are what we are or we are what we want to be and decide accordingly (our fate would have an extra-biological component, whatever that may mean).

³ On the basis, for instance, of a quantum phenomenology pertaining to the Penrose-Hameroff thesis.

⁴ See in this respect his *The Triple Helix: Gene, Organism and Environment* (Harvard University Press, 2000).

⁵ See for instance the classic paper by S. J. GOULD and R. C. LEWONTIN (1979), «The spandrels of San Marco and the Panglossian paradigm: A critique of the adaptationist programme», *Proceedings of the Royal Society of London B* 205 (1161): 581-598.

Lewontin would not have any of that. For him Dawkins' ideas are fatalistic to the point of trying to justify scientifically what ethically and politically is unacceptable. Lewontin therefore pulls out his own scientific justification for wanting of a better world to come. Lewontin's tool is that all reductionism entails a hopeless way of understanding things⁶.

As noticed, both alternative positions use the scientific platform to convey their own ground beliefs in respect to human nature, the one being degrading to a point (Dawkins)⁷ and the other uplifting (Lewontin) as well to a certain extent. However, the naturalistic perspective here adopted is on Dawkins' side because Lewontin emerging expectations come indeed from nowhere (they are nor predictable in any way, save for the mysterious quantum phenomenology afore mentioned).

In any event both attitudes can be reconciled though. In effect, as Dawkins asserts, from a naturalistic perspective we are determined. However like most organisms we can choose what is better for us. If we offer a dog several alternative dietary intakes simultaneously, one with raw meat, another with cooked meat, another with vegetables, yet another with pancakes; we know for sure what the dog will go for (choose in fact). The same happens with us humans with the difference that we can picture a more distant future in our minds that a dog could so that our possible choices may go further indeed. In this sense we are not as strictly determined as Dawkins would have us believe, though not as free as Lewontin would consider us to be either. At any rate Lewontin sort of special human freedom would be meaningless because freedom always implies a choice. And not only us but, as just stated, any organism will choose what is more appetizing according to his/its own needs⁸.

b) *What is really a replicator?*

The second would be problem in the reduction-emergence context concerns the nature of the replicator. The point is that the replicator is not necessarily a gene. It may be a whole chromosome (like de Y-chromosome in many higher organisms). It may even be a whole organism resulting for instance from some form of parthenogenetic (apomictic) reproductive system. It may even be a population, a deme, a species. It all depends on whether the characteristics contemplated are reproduced from generation to generation without alteration so that natural selection can properly operate on them. The only outcome is that reduction/supervenience to genes does not apply in these cases, because in practice no gain is obtained in the process. Of course if we have a macro-replicator, let us say a Y-chromosome, we can always try to identify the effective part within it. But as far as natural selection is concerned the identification will be pointless for the only

⁶ See for example one of Lewontin's classics *Biology as Ideology: The Doctrine of DNA* (New York: Harper Collins, 1993).

⁷ A bed companion to Dawkins in this area is the well known chemist Peter Atkins (see, for example, his relatively recent *Four Laws that Drive the Universe*, Oxford: Oxford University Press, 2007), also should be mentioned in this respect the physicist Nobel laureate Steven Weinberg (see his very recent *Lake Views: This World and the Universe*, The Belknap Press of Harvard University Press, 2010) and the same goes for the philosopher of science devotee of Dawkins Daniel Dennett and his *Darwin's Dangerous Idea: Evolution and the Meanings of Life* (Simon & Schuster, 1996).

⁸ Lewontin's marxist attitude is well attuned to the tenets of humanistic philosophy of biology typified for instance by Heidegger's heir Hans Jonas (see for instance his *Organismus und Freiheit. Ansätze zu einer philosophischen Biologie*, Göttingen: Vandenhoeck & Ruprecht, 1973). In fact Lewontin's main scientific mentor the Russian born and educated Theodosius Donzhansky has a similar attitude although from a Christian perspective (see his *The Biology of Ultimate Concern*, New York: New American Library, 1967).

reason that its acting is on whole chromosomes (Y-chromosomes). The same goes of course in what concerns maternal inheritance because the group of genes in the cytoplasmic organelles are inherited in bulk from the mother line. At the other end of the spectrum the replicator may be simply a part of a gene that again maintains its integrity from generation to generation.

But there is more to it because the replicator may just be a pattern that keeps its identity from generation to generation. This pattern may not be necessarily reducible in the sense that it may just supervene on different sets of distinct elements. In that case, possibly the most realistic one, in practice the question of reduction-emergence is just no more relevant.

Nonetheless, an important would be side question remains. For, firstly, sociobiology, then Dawkins' replicator naïve thesis, and thirdly evolutionary psychology, often reduce fairly complex behavioural patterns to a very simple genetic basis. The problem of reduction appears often then to be too simplistic especially in the cases put forward by evolutionary psychology⁹. The issue indeed defies credibility when complex human behavioural patterns are reduced/supervened to very few genes/molecular replicators¹⁰. For example, following one of Dawkins' more basic contentions, selfishness is said to be promoted by natural selection as if we were dealing with sort of a simple Mendelian gene. To prove his point Dawkins assumes that a gene (replicator) for altruism would never compete successfully with a gene for selfishness (replicator). It is this way of expressing the matter which appears too simplistic indeed. The simplification at bay vanishes though when instead of expressing the process in terms of genes it is done in terms of patterns ('second order' replicators).

The ground question of course remains unanswered. For substituting genes with patterns would not make the naturalistic approach more logically palatable. For again the main thesis is to prove that selfishness is in fact promoted by natural selection. To be sure pure selfishness would never work as such¹¹. It has always to be a calculated selfishness which is customarily called reciprocal altruism (Robert Trivers' expression). Furthermore between relatives we have the so called kin-selection (William Donald Hamilton's and John Maynard Smith's expression) whereby selfishness would be even more controlled in the sense that we do not find strictly speaking competition between different 'genes'. And even in the case that the organisms at stake are not strictly genetically related there may be a symbiosis between them making some sort of altruism more viable because open competition, however calculated, would be detrimental to both parties.

In other words, in the end in Lewontin's line of thought we are impeded to understand our world in a practical down to earth way. In the end replicators rule the show indeed. Our lives are not complex to the point of being mystical (be it in a theological/quantum/Marxist manner). On the contrary we are moved like any other organism by our aim to survive as long as possible, and our consciousness is just an organic feature which for the time being may be helpful in this survival and reproductive venture.

⁹ See D. Buller's negative assessment in his *Adapting Minds: Evolutionary Psychology and the Persistent Quest for Human Nature* (Cambridge, MA: MIT Press, 2005) and R. RICHARDSON, *Evolutionary Psychology as Maladapted Psychology* (Cambridge, MA: MIT Press, 2007).

¹⁰ G. MARCUS, *The Birth of the Mind: How a tiny number of genes creates the complexities of human thought* (New York: Basic Books, 2004).

¹¹ See C. CASTRODEZA, *La Darwinización del Mundo* (Barcelona: Herder, 2009).

Carlos Castrodeza: *Academic interests*

His area of research for the past thirty years has focused on Darwin and Darwinism so as the ultimate consequences of the theory of natural selection. Specifically his thought deals with bioethical problems ethologically considered, and on scientific problems and ideologies based on a naturalistic perspective. His trilogy **Biology's Deep Ways** *Razón biológica* (Biological Reason, Minerva, Madrid, 1999, soon to be reprinted), *Nihilismo y supervivencia* (Nihilism and Survival, Trotta, Madrid, 2007) and *La darwinización del mundo* (The Darwinization of the World, Herder, Barcelona, 2009) intends to show how little practical control we have over our future despite our profound preoccupation for things past, and how we act and hope for the best on the basis of our experience which seemingly is not very much to go by de to our bioanthropological basic predispositions.

Department of Logic and Philosophy of Science
Faculty of Philosophy
Complutense University
castrode@filos.cum.es

CARLOS CASTRODEZA