Anthropology and Reductionism

The future of Anthropology in the era of scientific reductionism

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Definition of 'reductionism'

In an article entitled "The Place of Anthropology in a Public Culture Reshaped by Bioreductivism" published in the 2004 February issue of *Anthropology News* (American Anthropological Association), Roger N. Lancaster e George Mason U. have underlined how 'biomithology' has permeated the American culture as never before. The new bioreductionism, today prevailing in the popular and academic culture, tries to reverse sophisticated cultural theories and substitute decades of empirical research on cultural variability with postulates about the existence of the "gene of monogamy", the "gene of good sleep" and other amenities. "*Big science (especially Biotechnology) is Big Business, thus Big News, which creates a Big Space for Bioreductive Narrative and Pseudo-Science"*. Reductionism, as it is known, is a type of investigation consolidated in all fields of knowledge: in the natural sciences, it sanctions the reduction of every phenomenon to physico-chemical laws; in the epistemological field, it states the traducibility of all scientific theories in basic observational arguments. The scientific reductionism could be considered as an exasperation of the Galilean scientific approach. A reductionist sees a complex system as nothing more than the sum of its parts, "reducing" the consideration to the single constituents; an anti-reductionist, on the contrary, believes that the whole is greater/different from the sum of the parts, hence there are 'holistic' properties that cannot be described in terms of pure and simple constituent elements. Here I will try to demonstrate the three main fallacies of reductionism.

The biological fallacy

According to Richard Lewontin (2002), one of the fathers of modern Genetics, what has influenced molecular biologists the most is a reverential attitude towards physics. Lewontin thinks that biologists are affected by a feeling that could be defined as envy of physics. Hence an inclination for the universal: science cannot be 'seriously' practiced if the universal aspects of the world are not understood. Biologists are convinced that the most interesting aspect of science is constituted by universals, and naturally the problem in biology is that universals do not exist: the genetic code is not universal, the laws of Mendel are not universal. The only universal concept is that all life comes from life. But why is the atomized approach not productive? Because, as explained by René Dubos (1980), in the most common and probably most important phenomena of life, the building blocks are so interdependent that they lose their characteristics, their meaning, and therefore their true essence, when they are separated

from the functional ensemble. The bioreductionistic approach is then misleading, because it is not able to confer the right weight to the interaction of the components of a complex system.
Ernst Mayr dedicates a chapter of his book The Growth of Biological Thought to the principle of "reductionism", where it is so explained: it is not possible to comprehend the "whole" until this has not been disassembled in its building blocks, these building blocks in other components and so forth, till the lowest hierarchic level. The first limitation of this model – Mayr states – is that the processes of the higher hierarchic level are often widely independent from those of the lower level. For example, the function of a joint can be understood without knowing the chemical structure of cartilage (which can anyway be replaced by a prosthesis). An analytic reductionism, when too strict, fails, because it does not give the proper weight to the interactions of the components in a complex system. A component, isolated from its context, inevitably has characteristics that are different from those it would have when in it is part of the ensemble, and it cannot reveal, when isolated, its contribution to the interactions. Hence, the reduction of biological phenomena to the laws of physical sciences has rarely, if ever, brought to an advancement in the understanding of life, as well pointed out by the emergent properties principle (in 1974 Karl Popper wrote that we live in an universe of emergent properties). In 1965 René Dubos wrote that in the most common and important phenomena of life, the building blocks are so interdependent that they lose their meaning and their essence when separated from the context. But reductionism is fallacious mainly because it confuses processes with concepts. Meiosis, gastrulation, predation are also chemical-physical processes, but they are mainly biological concepts that cannot be reduced to chemical-physical concepts. In the same way, every adapted structure is the result of a selection, but this also is a concept that cannot be expressed in chemical-physical terms. Therefore it can reasonably stated that if Darwin would have spent all his time in the laboratory he would have never been able to formulate the theory of natural selection.

The anthropological fallacy

According to Jonathan Marks (2003), the Human Genome Diversity Project has failed from the beginning because in the test-tubes containing blood of some endangered populations, there was no information about the skin colour, stature, eating habits, clothing habits or wedding rules. What can test tubes tell us about the adaptation to the surrounding environment of those populations? This project, began without anthropologists, has given rise to contradictions, the most evident of which is probably the following: in the 1st September 2005 issue of the scientific journal Nature an article was published on the meaning of the mapping of the chimpanzee's genome, while simultaneously, the international press (for example the Spanish newspaper El Mundo 2nd September 2005) reported a UN warning that the great apes – chimpanzee included – might disappear entirely within the next 25 years. Dedicating the majority of the economical resources to the reductionist research therefore has not prevented the object of the study from moving towards extinction! The scientific community does not seem to notice this contradiction and the rush for the accumulation of genetic data has continued uninterrupted. But exactly, what did these data yield?
Recently, John Maddox, previous editor of Nature, stated that there may be a danger in molecular biology, that is, the accumulation of data will increase so much beyond the

conceptual assimilation that the data will ultimately result in a hindrance. Maddox is worried that the excitement characteristic of all hunts might not leave enough time for reflection: there are funds for data production, but hardly any to stop and meditate. Accumulating data without reflecting on it, leads to the inevitable conclusion that: "I know everything, but I don't understand anything" or, as the philosopher Galimberti would say, one day we will know all there is to know about brain biochemistry, but we won't be able to speak to a schizophrenic. Furthermore, in an article entitled "The cultural wealth of nations" (2004), Mark Pagel and Ruth Mace demonstrated that while the overview of the human genome is based on homogeneity, that of human culture is based on heterogeneity, i.e. there is much more cultural than genetic difference. But the gap between funds available for the study of genetic diversity and those available for the study of cultural differences still remains enormous.

The philosophic fallacy

In his recent book, the French intellectualist Edgar Morin (Morin E., 2000) quotes a sentence of the physicist A. Lichnerowitz which maintained that our current universities are moulding throughout the world a much too great proportion of specialists in pre-determined disciplines, and therefore artificially limited, while the vast majority of human activities requires people capable of a broader approach and a science capable of overcoming the historical borders between disciplines. Edgar Morin and others before him, such as Ludwig von Bertalanffy, had the courage to claim that the super-specialisation, the compartmentalisation, the splitting of knowledge has certainly brought about more knowledge and explanations, but with it, it brought also ignorance and blindness. It is in fact obvious that hyper-specialisation – where the object of study is reduced to an aspect or a part of the whole – prevents us from seeing the global picture (which is in fact reduced to particles) but also the essential (which dissolves, as it can be broken down no further). However, our teaching system responds to this logic: since the beginning we are taught to separate objects from their environments, to separate disciplines, disassociate problems instead of connecting them. Why?

This question can be answered only by he who is considered today one of the main European philosophers: Emanuele Severino. Quoting Bacon, Severino reminds us that scientia est potentia, and that the maximum power (scientific, economic, etc.) can be achieved when matter is subdivided in smaller parts, as it is there that the scientific superpower of the future lies (as in physics). However – he adds – today faith in the becoming – the boundless faith in biotechnologies and genetics – hides the real problems of today and the comprehension of complex facts. Furthermore, since progress lies in the future, and we live in the present, we will never reach it. The great separation between scientific and humanistic culture, which took place in the XIX century and was further aggravated in the XX, leads to serious consequences for both. Notwithstanding the great progress made by science, there is not sufficient consideration devoted to man, to human existence, to its destiny and the destiny of science itself. So, for lack of knowledge, the European countries are completely defenceless in the encounter or in the fight between cultures which gives rise to many conflicts every day.

Science – Severino asserts – is specialisation, and technique is "gradualistic" engineering – that is, it is in turn a specialised action which faces gradually, and therefore separately,

the tasks of the action – precisely because science and technique take up isolated parts of reality as the object of their research and manipulation. The world to which science and technology appeal to is a juxtaposition of isolated parts.

The new world which every man faces today is in itself, due to the philosophical thought of our time, a juxtaposition of separated parts; it is in itself, as a result of that particular thought, something "naturally" shattered. The technological action, which more than others can be focussed in an isolated part – and for this specific isolation acquires more power – is destined to become a global attitude, that is, universal. According to Severino then, globalisation is the globalisation of shattering and Nature is by now the shattering of every nature. Technique, spreading throughout the planet, increases the power of man, and produces a pliable world where every part is isolated from the others. This is where the inevitable shattering originates: the decline of the Western world is the consequence of this loss of centre. The reductionist science states that "in the future" we will find cures to all diseases. However, if we live in the present time, we will never be able to see that future, and there is the risk that this "faith in what might become" will neglect the real problems of the present and obscure the comprehension of the complex facts.

Furthermore, if the "truth" which the reductionist scientists are looking for is still far from becoming real, it means that right now they are working in a "non truth", but those who work in the non truth cannot possibly find the truth. And what is anyway the truth? By logic, that which is fundamental is in itself unknowable, otherwise it would not be fundamental.

Plato and the measures of man

When we think of the Galilean principle "science is measure", so dear to scientific reductionism, Plato's beautiful distinction between métron and métrion, comes to mind, where:

- métron is a measurement obtained when approaching the object from the outside;
- métrion represents that which is "suitable", in the sense of an internal measure for any living being, which is in itself, not measurable. Such "internal mismeasure", which confronts itself with parameters of science even to good purpose, but which never really fits in, is without a doubt for everyone the "mismeasure" of the our own personal pathology, but also a unique and privileged point for our being, for the subject, for man: but which man?

In fact - Miguel de Unamuno (1913) says– there is yet another thing which can be called a man, the subject of many more or less scientific digressions: the unfledged biped of the palaeontologic legend, Aristotle's' "zoòn politikòn", Rousseau's social contractor, the homo oeconomicus described in the School of Manchester, Linnaeus' homo sapiens and, we might add, the reductionist man. But this is a man which does not belong to this nor that place, nor this or that era, a man without sex nor country, all in all, a non-man.

The man of Anthropology is a different man, made of genes, but especially made of flesh and bone: a laughing man, a man who can cry, who lives but especially a man that dies, at the same time subject and object of every philosophy: and it is precisely in this sense that Anthropology becomes a discipline of complexity, at the edge of the human experience.

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