

## A comment on "What it means to be 98% chimpanzee"

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*"from an evolutionary standpoint we are beginning to learn that the difference between men and monkeys comes down to a gene being switched on in a different place or for a longer period of time"*

To start my commentary I have taken this statement from "Le Scienze", the most widespread Italian divulgative magazine (Bellone, 1999). It is a very straightforward example of how the reductionistic view, besides its intrinsic fallacy and undoubted social impact, at the same time thwarts the knowledge that anthropologists, paleontologists and naturalists have acquired after years of research. Topics such as human adaptation, evolution, ethology and cultural environment appear to be almost pathetic in their uselessness when compared with genetics, which has now replaced creationism and Darwinism by controlling also the origins of man. That obscure statement, however, is not confined to the mere creation of a gross misunderstanding, but it leads to thinking that man directly descended from the ape without passing through intermediate forms, disguising - in the name of Science with a capital S - the efforts of generations of researchers. The announcements of scientific reductivism have had considerable effects on research as well as on society, and it is for this reason that the editorial published in the February issue of the *Anthropology Newsletter* (American Anthropological Association) has been dedicated to the danger posed by the reshaping action of bioreductivism on scientific thinking (Lancaster & Mason 2004). Back in 1995 Dorothy Nelkin and M. Susan Lindee published a well documented book entitled *DNA Mystique. The Gene as a Cultural Icon: The social Power of Scientific Information*, where genes were described as the modern cultural icon capable of transcending the biological aspects, to digress into the complex territory of collective subconscious.

An important contribution to the debate on scientific reductivism is provided by the book "What it means to be 98% chimpanzee", where the American anthropologist Jonathan Marks addresses these and other axioms of "folk knowledge", which we thought belonged to the past already. Jonathan Marks' book is the perfect answer to an atomised approach to reality, which becomes unproductive when applied to complex systems. Here, I discuss four points raised by Marks: *The Human Genome Diversity Project, The power of numbers, Race and Culture and, finally, Processes and concepts.*

### The Human Genome Diversity Project

The author retraces the first steps taken by Genetics (at the time, Eugenetics, that is a "scientific" means with the aim of "improving" humanity by eliminating the weak, sick and ugly ducklings) and after meticulously underlining the ambiguity of the racial classifications reaches the definition of the "true" results of the human genome project, which one of the fathers of genetics, Richard Lewontin, defined as the product of a dream and of an illusion (Lewontin R., 2002, *It Ain't Necessarily So: The Dream of the Human Genome and Other Illusions*, New York: New York Review of Books, 2000). Jonathan Marks says it loud and clear: the Human Genome Diversity Project failed even before starting, because anthropologists were involved too late, only after the train had taken off. Nobody had realized that in the test tubes which should have "saved" the hereditary inheritance of endangered populations there was no information on their language, their material culture, their diet, their height and diseases. The reductivist view of man - which has definitely separated the scientific culture from the humanistic one - has influenced in a deterministic way the vision of the world, giving rise to the false

opinion that everything can be predicted: however the gene for ageing, for homosexuality, for intelligence are ambiguous extrapolations which do not take into consideration the fact that genetics is so complex that at the moment it cannot offer any certain prediction.

### The power of numbers

Coming back to man and the chimp, even Linnaeus knew of their similarity, Marks says: what is new? The number is new: 98%. But what does this number mean? Because Marks suggests that genetics is not at all able to quantify this similarity. Let's take the brain as an example: "where a human skull contains approximately 1400 cubic centimeters of brain, a chimp is lucky to have one third of that. Is that 67% different?" (page 23). According to this reasoning, 98% is nothing more than the degree of purity of common bath soap (98% Ivory soap). Furthermore, since in nature all multi-cellular organisms are related to one another, would it be fair to say that man is 25% dandelion? If it is so, then it is only from a genetic point of view. Side by side these statements, suspicion arises that the project to study human nature "without the confusing overlay of culture" (page 176) might still be happening, and that the separation of the two cultures – scientific and humanistic – or, to use an obsolete description, between the "two sisters", exact sciences and natural sciences, is as clear cut as ever. Scientific reductionism is an epistemological stance which tends to reduce, that is, to re-formulate theories, concepts and languages of a discipline translating them into a different discipline, assumed as fundamental. A reductionist believes a complex system to be nothing else than the sum of its parts, and therefore the system will be evaluated only after it has been broken down into its single components. This kind of analysis is spreading throughout all areas of human knowledge: in biological sciences, the most drastic critique to reductionism can be found in pieces of writing by Ernst Mayr, and in particular in these words: "Extreme analytical reductionism is a failure because it cannot give proper weight to the interaction of components of a complex system". (E. Mayr, 1982, *The Growth of Biological Thought*. The Belknap Press of Harvard University Press, Cambridge, p. 61). Invariably, an

isolated component exhibits different characteristics from those of the same component when part of a system, nor is it capable of manifesting, when isolated, its contribution to interactions.

What is more worrying however, is that reductionism, in addition to being a more or less useful investigating method, might be transformed into a full-blown cultural model, which with disruptive force might hit our social life causing an unacceptable gap between the various research fields and obstructing with its hegemony the interaction between disciplines, a necessary tool to solve the great problems of our time. Jonathan Marks proposes the overcoming of historical borders between disciplines, since hyper-specialisation, the subdivision of an object of study in isolated parts, hinders the global view (since the global is broken down) as well as the essential view (which dissolves, since it can be broken no further).

One of the most interesting parts of the book has to do with the power of numbers, which in the science of heredity has acquired an increasing symbolic value. One of the examples cited by Marks involves the genetics of homosexuality. The author refers to a research published in 1991 by "Science" on the difference in the hypothalamic structure of homosexual versus heterosexual males. The problem of the fallacy of this research is that "the brain grows and develops according to the interaction with the experiences of the person. Brains are not reliable surrogates for studying genes", states the author (page 114). Another study published in 1993 by Science found an association between a small segment in chromosome X (called Xq28) and male homosexuality. However, when asked "how much" homosexuality did they think they could really account for with this new research, the answer was: 5%. Conclusions of the author: there is no other science, a part from behavioural genetics, where it is possible to leave 95% of a phenomenon unexplained (and still end up in the front page). The power of numbers can be explained in various ways, a further example can be found in a genetic counselling centre. It is well known that 3 to 5% of babies present congenital defects: this is the so called "basic risk" for any pregnant woman. The risk of heart malformations in neonates is defined by genetic counsels as 0.5%. Reasoning according to this logic, the probability of breaking a femur while getting out of the show-

er is equal to 5%: therefore, having a shower is a risk. The question then is: what kind of service did the genetic counsel offer the woman?

“Technology, blood, and percentages - all sounding very much like science is supposed to” (pag. 65). Maybe this sentence holds the key that might help us understand what is the true force of reductivism, what makes it dominant regardless of the results obtained: science is measure, according to the Galilean principle. But is it really so? Lord Kelvin, famous for having deduced the temperature of the Earth, used to say: “*When you can measure what you are speaking about and express it in numbers, you know something about it.*” In reality, from the temperature of the Earth, Lord Kelvin deduced that it could not have been much older than some hundreds of thousands of years, while modern astrophysical calculations later set such age to 4.5 billion years. This demonstrates that even when a measurement has been “*actually*” taken, it is possible that we might still not know enough about it. In 1927, scientists stated that the number of human chromosomes was 48. For the following thirty years, scientific books had 48 as the official number of human chromosomes (the count had been performed several times). With the development of new cytogenetic techniques, in 1956 it was discovered that the human chromosomes were in fact 46 and not 48. Not very long ago it was believed that the total number of human genes was approximately 300.000. Recently, the number has been reduced to approximately 30.000. In all these cases, scientists have accepted an accurate count instead of a correct count, and their scientific statements were therefore accurate, influential, and false. And all that scientists did – adds Marks – was to count. It is amazing how sometimes for the public opinion numbers can count more than words and how sophisticated techniques can count more than common sense. However, this humble timidity towards the so-called exact sciences is justified by the fact that they are those which, in a manner subjugated by economical imperatives, can produce the higher power (*scientia est potentia*, Bacon used to say).

## Race and Culture

“Conceptions of what scientific rationalities

should govern modern lives are invariably strongly culture-bound” Marks says (page 277). “Race” has always been considered a natural category, it is a well known fact: Marks can trace this concept back to cultural categories. “Teaching that racial categories lack biological validity can be as much of a challenge as teaching that the earth goes around the sun must have been in the seventeenth century” says the author (page 51). Unlike other scientists, it must be said that Marks is not at all indulgent with his predecessor anthropologists, especially with the supporters of the “pure race”: but he does not spare his thoughts even for geneticists. For example, as the Russian haematologist describes “he could distinguish the bloods of different races, notably Poles, Korean, Russians, and Jews. And if that were not enough, the blood test could even distinguish the blood of homosexuals from that of heterosexuals” (page 64). In the end, even Hooton realised that “socio-political categories such as “Jew”, “Russian” and “Polish” were constructions of human history and simply couldn’t be distinguishable by the properties of blood” (pages 64-65).

## Processes and concepts

One last observation that arises after reading this authoritative book, is that regarding the confusion between *processes* and *concepts* which is typical of scientific reductivism. Meiosis, gastrulation, predation are also chemical-physical processes, however these are mainly biological concepts and cannot be reduced to chemical-physical *concepts*. In the same way, every adapted structure represents the result of a selection, but even this is a *concept* which cannot be expressed in chemical-physical terms. According to Mayr, the reduction of biological phenomena to laws of physical sciences has rarely, if at all, led to advancement in the understanding of the phenomena of life: reductivism – with which a scientist is victim of the “devouring essence of calculation”, as Heidegger used to say – looks for the “truth” of human nature there, where it is unattainable. If it is true that man shares with animals its biological nature, then we should say that what is more “biological” – sex, birth, death - is part of a human being even in the most *culture* steeped one. Proof

is that our most essential biological activities such as eating, drinking, mating have always been linked to prohibition, values, symbols, rituals, that is, to elements which are truly and specifically *cultural*. On the other hand, our most typical cultural activities – dance, meditation, playing, singing – activate mechanisms of the body and the brain, mechanisms which all share a *biological* basis. In fact, while the animal, as Rousseau used to say, driven safely by nature is “perfect in a single shot”, from birth, man improves continuously throughout life, thanks to its culture.

The biocultural approach to the human problem is obviously anthropological, since the holistic view is typical of Anthropology and of other human sciences: it is for this reason that anthropologists are defined as “specialists of the generic”.

This is, to me, the essential message of this book: the separation between scientific and humanistic culture, outlined in the XIX century and worsened in the XX, it has led to serious consequences for both cultures, since as a consequence of this process the natural entities (the universe, nature, life, death and the human being itself) on which the great questions of

man we based have been broken. François Jacob observed that the most important contribution to knowledge in the XX century was “the knowledge of the limits of knowledge”. Thoughts that isolate, disjointed thought, will never be able to divide (or remove) the unbearable problem of human complexity. As Plato used to say, “if you can see the whole you are a philosopher, if not, not”.

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