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The detail's horizon

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The interesting observations proposed by Andrea Drusini as a commentary on the Jonathan Mark's book "*What it means to be 98% chimpanzee*" move off the theme of man evolution that can not be a mere genetic fact, while it is primarily a cultural fact. Drusini remarks focus mainly on the contrast between "an atomized approach to the reality" (which is descriptive of a cultural model where the reductionist vision of science comes to coincide with "the Science") and an holistic view, for which the study of a complex system can not be considered accomplished by the sole analysis of its constituents one by one, but it must include a more comprehensive "biocultural approach". The conclusion drawn by Drusini ("the disjunctive thought will never be able to remove the unsustainable problem of the human complexity") is extremely suitable and call to mind a quote by Schrodinger that allows me to introduce a few general considerations on the same theme that I wish to propose without entering, at least for the moment, in the actually very interesting field of evolution (and evolutionism).

Schrodinger wrote: "It appears obvious and evident, nevertheless it has to be told: the isolated knowledges obtained by a group of specialists in a restricted domain do not have any value by themselves, but only in their synthesis with all other knowledges, only since they, in this synthesis, really contributed in someway in answering to the question: who are we?". Noteworthy, this consideration of the famous last century Austrian physic, a father of the modern physics, lays upon an obviousness and an evidence that perhaps today are not so obvious and evident any more.

In our time, whatever scientist who wishes to begin the journey of research in any field of science (i.e. biology) has to investigate a very restricted domain, whose boundaries are very well defined and extremely specialistic. This is due to different factors among which are the last century spectacular advances in all scientific fields, even in biology, and the core of the scientific method that the scientist uses in his daily work. Generally, scientists have a very deep understanding and professional competence in a very restricted research subject such as, for instance, a virus DNA polymerase. However, they are not very much acquainted with other research topics which are still biologically very close to their own subjects, for instance other viral enzymes such as the proteases, and they know almost nothing about other research issues which, even though they may be biologically linked to their studies, are a little more further from them, for instance several other cellular processes which are well involved in the expression of the functions of the viral polymerases (this kind of examples can be clearly multiplied indefinitely). This is due to the fact that, often, the knowledge reached on each single restricted topic have grown enormously in the last decades. In fact, just on the DNA polymerase of a single virus (i.e. HIV) there have been published thousands of papers on the international scientific journals. As a consequence, the scientist who wants to investigate today this enzyme has to know what has been discovered on it until now. However, simply the knowing and the understanding the details of what other people have discovered (and published) on this enzyme require to the scientist a time commitment who is measured in weeks and months, and not just in hours and days. Hence, it is not reasonable to require that a single scientist could know in a such detailed way a very high number of research subjects. On the other hand, it is exactly the scientific method to impose that each experiment done by a scientist would be an attempt to obtain from the reality the most direct and unambiguous answer to a clear cut specific question. The more univocal will be the answer that the test will allow to have, the best designed would have been the experiment. Consequently, the high competences on a very restricted domain of science is an obligatory requirement to appro-

priately define the experimental conditions in which a scientist must operate and, therefore, they are indispensable to carry out a rigorous scientific research activity. Then, it is virtually impossible to escape from the very impressive restriction of the research subjects (whatever they would be). This restriction is implied in some way with the high level understanding of the reality that we have already reached and the scientist does not usually recognize the need of answering, somehow also through his restricted investigation, to the question: who are we?

It is worth to note, though, that there is another aspect of the Schrodinger statement which is certainly evident even today. The specific research developed in the restricted domain (i.e. the HIV DNA polymerase), in fact, reveals its value in comparison (and synthesis) with other fields of science which are linked to it and which have themselves a similar high level of specialization. To stay to the HIV DNA polymerase example, the other fields could be the epidemiology of the viral infection, the natural history of the infection, the mechanisms of viral cytopathogenicity, the immune reaction of the infected patient, the therapies that are now available, the drug resistance mechanisms and so on. The more relevant is a specific research in comparison to the other fields of knowledge, the higher is its value.

The Schrodinger assertion, however, suggests also other implications which draw the attention to a more global vision of the scientific problem and to a wider horizon with which to look at it. It seems to call to a reason for the search of knowledge which can not be justified by the sole "utilitarian" features, which are nevertheless extremely important since science and technology have improved, and will improve, so much the mankind life. Supporting the need for a wider horizon in the scientist daily work, the mathematician Henri Poincarè said: "The scientist does not study nature because it is useful. He studies it because he takes pleasure from it, and he takes pleasure from it because nature is beautiful. If nature would not be beautiful it would not be worth to know it". Possibly, this is the awareness from which, implicitly, Schrodinger moved off when he referred to an obviousness and an evidence that, however, today perhaps are not any more. In fact, on one side it is possibly to note that the majority – if not all – of the youths who are fascinated by the knowledge of nature and decide to engage the studies needed to become scientists, are moved exactly from a curiosity to understand how things really are. Not only in the restricted and specialistic detail of a DNA polymerase (certainly there is often an intriguing particular interest), but in a wider and a more unitary view which is proper of the human dimension (and which is the reason that lies below the excitement for the particular): a man who searches is a man who seeks, that is a man who asks to reality to reveal its mystery. On the other side, precisely these questions, that are indeed the most interesting and authentic, are often put aside by the social-cultural contemporary environment which considers them almost irrelevant. These questions, however, lie hidden such as a karst river in the scientist life who, if he keeps his more original attitude, sooner or later sees them to emerge again in his life (as a matter of fact, older scientists who write popular scientific books and synthetically try to give a reason of what they have learned in their research life treat these themes). Once these questions have reemerged, they bring the scientist to desire to make a closer examination of topics that are outside his specific scientific ground. So, he desires to break through those well delimited boundaries with which he dealt for years and to begin, with the consciousness that life gave him at his age, the enterprise of a knowledge and a reflection which may have an humanly wider horizon. Unfortunately, this enterprise rarely really starts. In fact, almost all the time the scientist – pushed by the atmosphere he lives in – ends to think that his work does not deal with the development of these reflections. Actually, on the contrary, he often considers that their development could have a negative rebound on his profession, since the time needed to widen these knowledge should inevitably be taken away from the time for new competitive studies to be published in international scientific journals (as a matter of fact, the only ones that are commonly considered to be "scientific", with all the consequences that we well know).

Two final considerations. First, even though there is generally little awareness of the seeking dynamic described by Schrodinger and Poincarè, actually it is probably not extraneous to the scien-

tist daily work. It is possible to notice, in fact, that many of the most important discoveries made in science (we can think to the findings made by Maxwell, Mendel, Einstein, Watson and Crick and many others) have been obtained under the impulse of a genuine and original dynamism of curiosity, of the pleasure for knowledge, of a wide interrogation of nature so that it could reveal its secrets. All these attitudes introduce a particular taste and a wider horizon in the daily way in which the scientist operates. It is possible, then, to risk the hypothesis that it is exactly the presence of this wider horizon (which it is proper of a non reductionist scientist) that, differently inspiring and moving the knowing subject, comes to affect also the modalities through which the scientist investigates the specific detail of the reality. Secondly, it is possible to wish an higher diffusion of national and international scientific journals that might be places where, according to the scientifically accepted standards, scientists could propose reflections and discussions on these themes. In this way, the dwelling upon these arguments could be considered as a possible, or even normal, "evolution" of the journey (also professional) of a scientist.

References

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