
SCIENCE & THEOLOGY AND THE DIALOGUE AMONG CULTURES: TEILHARD DE CHARDIN, HANS JONAS, BIOLOGY AND ENVIRONMENTAL ETHICS[†]

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Abstract

We briefly compare two thinkers of the XX century, the Roman Catholic, Jesuit and palaeontologist Pierre Teilhard de Chardin and the German, Jewish philosopher Hans Jonas. From these two different viewpoint we obtain the same message: the new theology must develop the concepts of historicity, evolution, responsibility, and the engagement of human spirit for the safeguard of Nature.

Keywords: Teilhard de Chardin, Jonas, Vavilov, environmental ethics

1. Science &Theology

Interactions between Science and Theology are old as humankind. At his/her very beginning humankind looked around and started the first scientific enterprise, which was that of the description of nature. And the first result was that the universe was describable with the tools of humankind reason. There was a rationality in the organisation of the Universe which asked for a rational approach for its origin; this was one of the starting point of Theology because the rationality was the mark of the presence of a rationality external to the Universe itself: that of a divine organiser. And here started the relationships between Science and Theology [1].

The novelty of these last years is that the topic is now a true academic discipline. Curiously one of the oldest disciplines in humankind history gets only recently its academic visibility [2]!

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Science & Theology is the name of a new discipline [3]. In these last years came out the consciousness that this is a new and autonomous field of research and it has to be indicated with a new name: Science & Theology. Of course, as just stated, the problems involved are old as humankind. In our vision, Science & Theology is a discipline that studies Nature from a scientific point of view to compare it with the God revelation, to have new hints for a better understanding of God's design.

The best development of the topic is its discovery as an instrument of dialogue among different Christian denominations, different religions and different cultures.

As a matter of fact, while Science is anyway and all over the world the result of western researches, on the contrary, the intellectual richness of Theology, Philosophy and Ethics are more pluralistic and developed by different components of human family in different ways and with different approaches. For these reasons confronting the various cultures with the two main topics of Science, the knowledge of nature and the care of nature are a potent tool for dialogue.

In these perspectives we develop a confront between two thinkers of the XX century, the Roman Catholic, Jesuit and palaeontologist Pierre Teilhard de Chardin and the German, Jewish philosopher Hans Jonas.

2. Teilhard de Chardin

2.1. Teilhard's research program

Pierre Teilhard de Chardin was one of the authors who proposed ways to reconcile Christian Theology and evolution. In his writing it is clear the proposal of evolution as a *moving towards* complexity and consciousness and towards the thinking creature. Humankind was not any more the lucky result of life lottery, but the necessary or at least probably result of the *moving towards* of matter and life [4].

To find, in fossil records the experimental proofs of this *moving towards*, he underlined all the limits of a reductionistic approach and proposed Biology as the science of complexity. In the forties, in China, he developed a new science, Geobiology intended as the science investigating evolution at the Biosphere level. Biosphere was intended as a whole evolving object. In these perspectives he actually did an attempt to apply to evolutionary Biology the Galileian epistemological instruments [5]. Galileo considered a task for experimental science to describe Nature thank to general laws, which were written in the language of mathematics. Teilhard developing this approach considered the investigation of evolution at the level of the Biosphere the only way to describe the general laws responsible for the *moving towards* complexity and consciousness. And this *moving towards* was clearly described by his works on fossil records.

As a matter of fact his approach is based on a new model of interaction between Science and Theology where also some inputs derived by Theology are taken into consideration in organizing a scientific theory.

To find a way to give a better explication about his method we will refer to the XX century epistemologist Imre Lakatos. According to Imre Lakatos, a scientific theory or, using his definition, a scientific research program is a complex object constituted by two parts. The main part is the central core, presenting all those aspects of the research program that cannot be removed: their removal will have as a result the collapse of the program. Side by side to the central core there is the so-called protective belt, which indicate the research path to be followed in order to protect the central core.

What is of interest in our work on Teilhard de Chardin epistemological project is that, according to Lakatos, the central core is not only based on the result of observations and experiments. There is also a clearly metaphysical section. It is the section of the central core based on the religious and philosophical feeling of the scientist. In the central core so far there is also room for the reception of some problems posed by Theology to Science and this is well evident in Teilhard's scientific research program. In his case from the side of theology there is some necessity for humankind in the economy of the Universe and this necessity asked for a careful investigation for parallelism and canalisation in evolution. This was the heuristic section of the research program bringing as a result the description of all those examples where separated evolutive branches presented similar results. And the main of these results was the evolution towards an increasing of the size of the brain described in different branches of Mammals and Vertebrates groups.

2.2. A research program for the dialogue

The hypothesis of parallelism and canalisation of evolution is discussed by many authors. One of them is of peculiar interest because he is one of the main Russian geneticist and the relationships between his works and that of Teilhard de Chardin open a dialogue perspective with Russian culture. This dialogue we have previously underlined with other authors [6].

This author is Nicolaj Ivanovic Vavilov. He was a biologist and a geneticist who spent his entire academic career in Russia and from the twenties he carried out a theoretical and experimental apparatus in order to investigate parallelism in evolutionary biology.

He was born in Moscow in 1887 and he took his degree in the agricultural Institute. He was enrolled as director of the applied botanical Department in 1920 and finally he was the director of the genetics Institute in Saint Petersburg from 1930 to 1940.

Unfortunately, neither his scientific reputation neither his merits obtained thank to his applied researches saved him from the persecution against Russian geneticists suggested to the Russian dictator J. Stalin by T.D. Lysenko. Vavilov died in the Saratov prison in the year 1943 [7].

His main contribution to evolutionary biology was the theory of the areas of origin of cultivated plants. On the basis of material collected in numerous scientific expeditions, he reached to the conclusions that it was possible to localise the areas of origins of cultivated plants there where the wild varieties reached the maximum of adaptability thanks to a high level of biodiversity. Clearly it is an application of the evolutive theories of adaptation and biodiversity to the research of the origins of cultivated plants in order to find the places of higher biodiversity considered as pool of biogenetic diversity.

Side by side there is another contribution to the evolutionary theories we wish to underline and it is that related to the presence of parallelisms in evolution of animals and plants [8]. Here the relationships with Teilhard de Chardin theories are fascinating.

The interests of N.J. Vavilov are clearly applied to the genetics of crops: before the creation of new varieties thanks to inbreeding, it is of great importance to know better what it is present in nature. To do so it is necessary to reintroduce ordering criteria and to investigate regularities present in polymorphisms. This is the starting point of his work on the law of homologous series in variations, which will be published in 1922 by the Journal of Genetic [9, 10].

Vavilov started from Darwin who underlined the presence of regularities in variation, but he considered these variations of not of primary interest in evolutionary theories. On the contrary, for Vavilov these regularities were the main characteristics of evolution and this was the point he had in common with Teilhard de Chardin, who discussed this point with his palaeontologist colleague G.G. Simpson. As a matter of fact in Simpson, linked to the philosophical vision of radical Darwinists reported in his books, canalisations and parallelisms as one of the many aspects of evolution and not among the most important ones. On the contrary Teilhard de Chardin considered these aspects as the main characteristics of evolution and the only way to give the exact meaning to the moving towards complexity and consciousness.

The same is true also for Vavilov: parallelisms were so evident and important that he was able to make previsions - studying the characteristics of the species of one genus he presented the possibility to foresee the characteristics of the species of a near genus. And the reason was the fact that evolution was mainly a phenomenon of parallelism. So he wrote: "So far as we know, this kind of variation is not 'occasional' as Darwin supposed it to be, *but quite general.*" [8]

And then Vavilov is able to enunciate the laws of parallel evolution: "(...) *we may conclude that, in general, closely allied Linnean species are characterized by similar and parallel series of varieties; and, as a rule, the nearer these Linneons are genetically, the more precise is the similarity of morphological and physiological variability. Genetically nearly related Linneons have consequently similar series of hereditary variations.*" [8]

And the second law:

“(..) the second rule or law in polymorphism, as sequences to the first one, is that not only genetically closely related Linnean species, but also closely allied genera, display similarity in their series of phenotypical, as well as genotypical, variability.” [8]

The final result, based on the observations of a large number of plants and also on a critical revision of literature on fungi and animals is the proposal of a general system of evolution which allow to reconstruct the form and characteristic of a species according to its position in the system, something like the periodical table of elements of Mendeleev.

Teilhard worked on animals and his best example is the description of parallelisms in the mole rates of Chinese Pleistocene. Followed along long times and large spaces separated branches presented the same characteristics: the increasing in size, the development of rootless teeth and the fusion of cervical vertebrae. And this was a splendid example in animals of homologous series.

We are dealing with the same conceptual plan: in evolution are present regularities similar to those of the periodical table of elements.

Teilhard de Chardin conclusions were the definition of the law of complexity and consciousness and the scientific explanation of humankind place in nature as a result of this law. The presence of a general ‘moving towards’, in evolution of course doesn’t stop with the emergence of humankind. The synthesis of Teilhard de Chardin links the evolution bringing to life and humankind to the history of the humankind itself, an history of alliance, of redemption and salvation. The apparent crisis brought by the evolutionary theories is now resolved in this general picture of the ‘moving towards’.

Curiously, the perspective of moving towards was recovered also by another Russian geneticist: Theodosius Dobzhansky. He moved in the United States, developing the aspects of evolutionary genetics and he was one of the authors who gave rise to the so-called ‘modern synthesis’. He was careful to separate the philosophical and experimental results of evolutionary inquiries, but in a letter to the historical and philosopher E. Green he at least wrote: *“You say you do not understand where I stand. Let me remove all doubts about this. I am a Christian, hence I stand with my good friend Birch, and you, and Teilhard (...). It is hard to go much beyond these weeping statements, but let me try. You and I will agree that the world is not a ‘devil’s vaudeville’ (Dostoyevsky’s words), but it is meaningful. Evolution (cosmic + biological + human) is going towards something, we hope some city of God”.* [11]

2.3. Science meets Theology

Finally the 'moving towards' will go on and will have a final task, the convergence of humankind towards the Omega point, the moment of the second incoming of Christ. For this reason, to allow the 'moving towards' of humankind there is the necessity of the care of the habitat where this 'moving towards' will take place and environmental ethics will be, after Teilhard de Chardin, one of the main topics of moral theology.

But what kind of care? And again Teilhard de Chardin works are useful: to avoid the reductionistic approach he proposed a theory of the Biosphere, as the only way to have a full understanding of the evolutionary mechanisms. And the theory of the Biosphere was recently recovered and developed by Lovelock in the so called Gaia hypothesis where the main aspect of evolution is the active action of livings in order to maintain the stability of those parameters which allow the survival of the Biosphere itself. At this point we have new ideas in order to suggest to the Christian the reason for a moral action toward the environment. From Teilhard de Chardin works there is the necessity to continue the 'moving towards' of the humankind on this Earth. The result will be a new humanity prepared for the second incoming of Christ. Moreover, again thanks to a development of Teilhard de Chardin scientific program, the theory of the Biosphere the instruments for the path toward the final task are proposed: *the necessity of maintaining Biosphere stability* [12]. Only working inside the Biosphere and maintaining its stability it will be possible to build the Earth in *Christo Jesu* as Teilhard wrote. But the problem of Biosphere stability and the relative acting is a matter of environmental ethics. And a fruitful investigative research program could be that to develop again Teilhard de Chardin's concept of the Noosphere and the possibility of linking the two spheres with a symbiotic relationship.

Teilhard de Chardin gave to Christians good theological reasons to develop environmental ethics and the scientific background in order of the ethical acting [13].

Again the moving towards is coming out from the Russian perspective. Of course Vavilov was linked to Teilhard by the interpretation of experimental observation, while Dobzhansky by the common statement that evolution was a moving towards the city of God: but again Teilhard de Chardin is the man of the dialogue. The theory of the Biosphere and the Noosphere are also related to Vladimir Vernadskij and then it is a contact point with the more general vision of the Biosphere developed by Lovelock.

But to go further towards the city of God, we need to confront Teilhard with a more general ethical perspective and here is our proposal of Teilhard de Chardin and Jonas links, the proposal for a common basis for a common shared ethics. In this case the dialogue is with the Jews tradition and more extensively to all the non-Christian philosophy

3. Hans Jonas

Hans Jonas was the author who shows the importance that Science should highly consider ethical and philosophical aspects. In this way, Science can compare itself with Theology and Philosophy. In particular, he developed a philosophy of biology very far from the reductionistic approach of the XX century and where Biology recovered its importance as the science of the life and death and of the task of livings.

3.1. The philosophy of nature

In *The Phenomenon of Life*, Jonas says that dualism between matter and mind had to be overcome. Jonas's philosophy of nature is based on the issue that the organic, even in its lowest forms, prefigures minds and that mind even in its highest, reaches remains part of the organic. Without recognizing the rootedness of mind in the organic process of the brain, and of the composition of brain from chemical elements and of physical interactions, we would fail to take on board the lessons of modern science. But equally, if we do not see that the autonomy of mind is in some identifiable way prefigured, or prepared for, in properties pertaining to organic being as such, we will fail to understand the specificity of animate as opposed to inanimate matter. Is just this that the dualism of Descartes, according to whom matter as no other property than physical extension and mind no physical property at all, fails to recognize [14].

Jonas vindicates the essential specificity of organic being as something irreducible to the physicalist assumptions of a materialist metaphysics that interprets all being in terms derived from the properties of inorganic matter. So he overcomes the mechanistic vision of Descartes and Darwin. Jonas's philosophy of life is based on the theory of organism, to whose he attributes, even in its most primitive forms, the germ of properties that normally we recognize only in its higher, more differentiated and chronologically more recent types. He identifies the specificity of organic being in terms of its freedom with regard to the material of which it is composed, and metabolism as the process by which, through the constant ingestion of material, the organism maintains itself in being. According to Jonas, metabolism is the unifying mark of life itself, and, as such, the specific difference that essentially distinguishes animate from inanimate matter. Metabolism, Jonas claims, is the first form of ontological freedom and the unifying specific difference of life. The animate matter is vital because the identity of the organism, unlike that of the inert physical body, is essentially independent of the sameness of the material of which it is composed. More than this, its continuing identity, its persisting form as living as opposed to dead matter, depends precisely on the ceaseless change of material content achieved through metabolism. It is just this feature that Jonas describes as the innate freedom of the organism. Thought it is very far from the sense of freedom that we associate with human existence, yet there too, in the relationship

between man and the environment, we recognize the co-presence of nonidentity and dependence that is a universal feature of the phenomenon of life.

The phenomenon of metabolism, in which foreign material is absorbed into the identity of the animate body, is enough to ensure that even in a world governed only by the chance and natural selection, the element of teleology does not entirely disappear. Purposefulness is not a feature of human life alone; it is a common property of animate beings that quite unconsciously seeks to survive and preserve themselves.

3.2. The ethic dimension

Then he posed the problem of the ontological foundations of environmental ethics, with the proposal of the necessity of saving the habitat of the thinking creature. Thought is an ontological novelty in the Universe and it has to be preserved. Man is a value in himself; it is the peak of the evolution of nature towards the increasing of complexity. For this reason it is to be preserved also for the future generations, the room for the thinking creature as a richness of the Universe.

In his main book 'The imperative of responsibility' Jonas observes that the new ethics is based on the ascertainment that the power of modern technology has decisively changed the dimensional range of possible human actions, extending the consequences of our decisions spatially, temporally and even ontologically into regions that previously lay beyond human control. An ethic of responsibility is based on a rational appreciation of the intrinsic risks of the power of science and technology. Our practical applications have to be guided by the 'precautionary principle' that is founded on the 'heuristic of fear'. By this Jonas means that we should educate ourselves to imagine always what may be the worst consequences of what we do in the pursuit of technological innovation [15].

The Jonas's position about technological and scientific knowledge is far from a defence of the 'back to nature' (like Rousseau or, more recently, L. Klages), while rests his recognition of the intrinsic technological character of man's being in the world. The only nature that man has been able to inhabit is nature as changed and modified by culture; and culture even in its most primitive Stone Age forms, has always made use of and depended on technology. Homo sapiens is homo faber: while others animals must adapt to their environment, man survive by adapting the environment to their requirements.

3.3. A glance to Jonas's theological reflections

The properties of goodness of Nature and the duty for humankind to preserve the environmental are not a function of faith in a supernatural God, envisaged as the author of Creation, but are knowable to reason alone. The objective validity of an ethics of responsibility is not a teaching of revelation but a rational apprehension of the way the world is: the philosophy of Jonas grounds

an imperative of responsibility without recourse to faith. The process that Jonas describes in his philosophy of organism is a process of ever increasing differentiation of life forms but one which is governed by contingency alone. It is apprehensible to reason but is not itself a rational process embodying an overall purpose or a rationally intelligible developmental idea. Reason is a contingent property of man alone, and man is product of the intelligible (because we can reconstruct, a posteriori, the causal chain) but purposelens history of life.

There is a role for Theology?

Jonas argues that a renewed theology can be reconciled both with the challenge of a secular history devoid of providential consolation and with the best evidence of the contemporary physical science of nature. In *The Concept of God after Auschwitz*, Jonas sacrifices the omnipotence of God: man is alone. This vision is coherent with the Jonas's conception of science, too [16].

In fact, he studies the Bultmann's position about the relation between Science and Theology, observing that Bultmann was deeply impressed with the self-sufficiency of the modern scientific account of the world in terms of its immanent causality against which the miraculous supernatural possibility of divine intervention can not permitted to transgress. Jonas position starts to focalise the limits of what our knowledge of causality may seem to imply. Jonas observes that our scientific knowledge of the immanent causality of the world order is not a knowledge of a completely determined causal system in which one already achieved causally determined situation must necessarily imply a single determined outcome. But these limits are even intrinsic to natural phenomena, and they don't only depend by our knowledge. The complexity, the evolutionary of natural processes, especially the biological ones, are free: only in retrospect does one situation appears necessarily to derive from that which pre-existed it. These considerations show the possibility of a space for faith. The fact that the world order is not univocally determined, allows at least the possibility of an intervention of God. The believing that such intervention have really happened, is a matter of faith; but contrary to what Bultmann seems to have assumed, there is nothing in our knowledge of the world and in the nature itself that precludes the possibility of faith that such miracles are indeed possible in a causally determined world.

The Theology is compatibles with Science. But if miracles are philosophically possible, believing in it is a fact of faith that Jonas seems to make but cannot compel his readers to accept. Then, the Jonas's theology implies the sacrifice the doctrine of divine omnipotence that has traditionally formed part of Jewish and Christian orthodoxy alike. This is the price he must to pay to reconcile not only Science and Theology, but even the Holocaust and the Jewish religion.

Here, in essence, is Jonas's theology of creation, as an originally divine act by which God sets the world in being and gives to man the capacity to freely serve or to deny his beneficent purpose. The core of Jonas's theology is that in the so-called the world into being, God puts at risk not his own existence but the fulfilment of his purpose in granting to creation a portion of the autonomy that is originally his own. This implicates a heavy responsibility on man as the being in whom this autonomy is henceforth most fully vested, with all the risks that this entails.

4. Conclusions: the knowledge of nature and its care as a potent tool for dialogue

Biology as the science of complexity and the attention to environmental ethics are the main contact point of these two eminent thinkers of the XX centuries. In this way environmental ethics is a main topic of moral philosophy and the complexity is the main model for a renewed philosophy of nature.

Now day one of the main theme for Philosophy of Science is the relation between the predictability and the ethical control of the technologic manipulations. The Christian approach of Teilhard the Chardin and the Jewish one of Jonas can offer valid contributions to the study of nature and to construct an ethical responsibility. The science of complexity and a renewed philosophy of nature change the classical image of the creation as model (the unchanging idea or *rationes seminales*), as beginning to which the human being look at with a great desire. Theology, thanks to a dialogue with the Science, is preparing a new religious vision of the creation as Waiting, Hope and Fulfilment.

Teilhard's and Jonas's message is that the new theology for the contemporary science has to develop the categories of historicity, evolution, responsibility, the engagement of human spirit for the safeguard (protection) of Nature.

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