

THE PLACE OF MAN IN NATURE EPISTEMOLOGICAL NOTES

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An image haunts western conscience, which dates back to Plato and neoplatonic philosophy; it has been taken over by the Christian tradition and is present in all scientific works, from Aristotle to modern times. That image is that of the ‘Great Chain of Beings’.¹

The metaphysical conviction which presides over that image is linked to the notion of creation as conveyed by the neoplatonic scheme of emanation. Such a vision of creation is based on the conviction that the Creator is supremely kind, and that it is in the nature of kindness to give itself away and to show its richness in a total way. Theologians have made a principle of it: *bonum diffusivum sui*: the good shines forth its own goodness. So, the world is made distinctive by its plenitude and, for that reason, all manners of beings are found in nature. Each creature is the realisation of a well-defined perfection: a limited perfection, but which is part of a whole, of a perfection which brings together all perfections and harmonizes them.

This conviction has given rise to an image, the image of the great chain of beings. According to that image, all beings are hierarchized into a scale: at the lower end, one finds the *materia prima*, or shapeless matter, followed by the material beings which have a form, organised into a hierarchy from the simplest to the more complex. Then come plants, then animals, again organised into a hierarchy according to their complexity and richness. Then comes mankind, followed by angels, or spiritual beings; the culminating point is reached with the perfect being, a purely spiritual entity. It may be important to underline the fact that, in this scheme, the steps are contiguous,² and that there are intermediate beings,

¹ See Arthur O. Lovejoy, *The great Chain of Being*, Cambridge, Harvard University Press, 1936 & 1964.

² In the *Sum against Gentiles*, Thomas Aquinas wrote: ‘if you look attentively, you will observe that there is a gradation in the diversity of beings. Above inanimate objects, are the plants. Above the latter, the animals, deprived of reason. Above them, intelligent substances. And at each stage, a diversity which makes some more perfect than others, so that the first of the beings at the bottom of the hierarchy is close to those at the top, and *vice versa*’ (*Contra Gentiles*, III, 97).

which belong to both levels,³ just as man participates of the riches of both matter and spirit.

This image falls within the province of a vision which modern science has challenged, because it is too simplistic. But the general scheme of thought has remained, by transforming the meaning of the image concerning the place of mankind in nature, since according to the image of the chain of beings, Man is both matter and spirit, at the top level of material beings, and at the bottom level of spiritual beings. In my paper, I shall use this image to discuss how today's science has reassessed the place of mankind in nature, chiefly because of the theory of evolution and neurosciences.

1. The Emergence of Mankind

From the end of the eighteenth century onward, the observation of a great multiplicity of different beings has prevented us from placing the species along one same line. It has been necessary to give up the idea of tracing a linear scale, where man would sit at the top, and propose another image which would assert the unity and the diversity of the living.

1.1. *The tree of the living*

For the inventory of the species getting ceaselessly richer and richer with the discovery of new species – in particular those coming from countries discovered and explored by Europeans – a new classification was needed.

Buffon had anticipated it, but it was Lamarck who realised it. Lamarck abandoned the linear series system. The wealth of observations was so great, that he had to imagine branchings. When he realised that there were huge differences between the vertebrate and the invertebrate, he separated them into two branches. He was then compelled to multiply the classes for the invertebrate. Starting with the two classes defined by Linnaeus (the insects and the worms), he came up with five classes in 1794 (mollusca, insects, worms,

³ G.W. Leibniz: 'Since the law of continuity requires that when the essential attributes of one being approximate those of another all the properties of the one must likewise gradually approximate those of the other, it is necessary that all the orders of natural beings form but a single chain, in which the various classes, like so many rings, are so closely linked one to another that it is impossible for the senses or the imagination to determine precisely the point at which one ends and the next begins – all the species which, so to say, lie near to or upon the borderlands being equivocal, and endowed with characters which might equally be assigned to either of the neighbouring species', quoted by Arthur O. Lovejoy, *The great Chain of Being*, p. 145.

echinodermata, and polyps); then, in 1809, he was able to produce 10 classes. In 1815, in the introduction to his *Natural History of Invertebrate Animals*, Lamarck deepened his approach to the march of nature. He proposed a general distribution of animals according to their nervous systems, and at the same time a phylogenetic presentation where branchings and gaps are numerous. A linear image was quite out of the question. But there remained, of the idea of the great chain of beings, a gradual vision of nature, according to which the complexity of the organisation is on the increase, but opening into different branchings, according to criteria which are specific to each branch of the reconstituted arborescence. Thus, an entirely new vision of nature appeared, excluding two elements of the old vision: the hierarchisation, and the eminent place occupied by the human being in the world of the living.

For a long time it had been habitual to place mankind at the top of the modified tree. But things changed in the 20th century. This top position was challenged. As a matter of fact, the general outline of the tree makes it necessary to define a criterion for all the serialized elements. The classification may be done according to different factors: a greater aptitude for survival, a better ability to adapt, fecundity, sociability, numerous offspring, longevity... According to whether such or such a criterion has been chosen, the outline will be different. The resulting hierarchy has a different profile. What seemed to be first comes second. It follows that it is relativized. What applies to the usual forms of taxonomy becomes a prevailing factor where genes and their expression are concerned. In this new classification, the place of man varies in accordance with the chosen criterion. Scientific thought was faced with a new anthropological requirement, where the decisions concerning the place of mankind became the touchstone by which all the options chosen in the course of the research were revealed.

So, modern anthropology was born in the shade of palaeontology, concerned with noting the constituent elements of mankind. The quest for what is the essence of man remains the major challenge for thought, and on this point, an important change has occurred in these last few years. Studies in human palaeontology have brought a brilliant confirmation of Charles Darwin's conclusions in *The Descent of Man*, and confirmed the legitimacy of an approach to man within the framework of evolutionary thought. The multiplication of discoveries, however, has been marked by a situation which must be mentioned: it is paradoxical, because it leads the way for both certitudes and interrogations.

1.2. *A problematical arborescence*

In the best part of the 20th century, a theory progressively emerged. A compelling certainty was reached concerning the emergence of mankind.

There have been numerous discoveries of fossils in Western Africa. Their classification has obtained a certain amount of consensus among the scientific community, who agreed to recognize its value in tracing the prehistorical past of the modern man. It became acceptable to draw a genealogical tree starting in the African Rift; in this diverging development, the scientific books placed the separation between the human world, and the world of monkeys. History offered a certain coherence, when it spoke of *homo habilis* and *homo erectus*, following a large family of Australopithecii.

In the light of such views, anthropology has continued classification according to the criteria established by Linnaeus.⁴ Works on human palaeontology marked out populations from specimens, joining to the word 'homo' adjectives often related to the places where the remains had been found: *homo sapiens*, *homo neanderthalis*, *homo heidelbergensis*, *homo antecessor*, *homo ergaster*, *homo habilis*, *homo rudolfensis*...

However, the outline of a continued arborescence remained uncertain. The most prudent scholars contented themselves with tracing lines in the forms of segments, in a tentative approach to a tree, without pronouncing themselves on the branchings. A sign of such a tension between two elements appears in the use of the words used for the classification of historical stages. One speaks of hominoids, hominids and the terms don't have the same meaning with different authors. One still stumbles on difficulties, when fossils are discovered which we don't know how to integrate into a lineage: such is the case of *Kenyanthropus platyops*, which is a singularity. It is then safer to keep to a classification which only speaks of *homo habilis*, *homo erectus*, *homo neanderthalis* and *homo sapiens*, in a presentation which accepts to be minimal.⁵

It is the same with the ancestors of the *homo* kind, in the classification of Australopithecii. When speaking of the australopithecus, we use qualifying adjuncts borrowed from the fossil world or from their morphological characteristics: *australopithecus habilis*, *australopithecus garhi*, *australopithecus rudolfensis*, *australopithecus bahrelghazali*, *australopithecus anamensis*, *australopithecus afarensis*. The dividing line is blurred, because in such an enumeration, one same qualifier (*habilis*, *rudolfensis*) is attributed to the *homo* genre and to the *australopithecus* genre. Same thing earlier in time when one finds 'ancestors' to

⁴ It is a general principle. See Guillaume Lecointre et Hervé Le Guyader, *Classification phylogénétique du vivant*, Paris, Berlin, 2001.

⁵ See Eric Crubezy, José Braga, Georges Larrouy, *Anthropobiologie: Évolution humaine*, Paris, Elsevier-Masson, 2008.

australopithecini *ardipithecus ramidus* and also *paranthropus*. Here again, one stumbles on diverging interpretations.

This multiplication of viewpoints does not allow one to draw a continued genealogy with any amount of certainty. When it is done, the arborescence can take on several forms. It has now become habitual to draw segments which do not intersect. The use of parallel segments allows a view of contemporaneous populations, without marking the diverging points of the arborescence.

And yet, in scientific works, one still keeps trying to find a lineage of some sort: the debate aroused by the famous fossil named ‘Toumai’ is exemplary. The controversy about this ancestor which shows diverging characteristics proves that faithfulness to the founding principles of biology (*natura non facit saltum*) invites one to look for an essential point for the origins, in a science whose precariousness must be acknowledged.

1.3. A creative tension

It is important, in order to clarify this discussion, to note that whatever divergences exist, they result from the methods of analysis. First comes the morphological approach, resting on the structure of the bones which have been discovered and the anatomical characteristics which they enable one to infer. But fossils are disparate, incomplete, and raise problems of dating and interpretation. This is why another method soon imposed itself. It rests on molecular biology, since the genome in its linear sequence of nucleotides composing the DNA gives access to the totality of information on our biological heritage. Molecular data give access to a genealogical structure based on DNAm (mitochondrial DNA). The genealogical study is then more precise and allows one to assert the unity of the *homo* genre with certainty for the closer periods in history (200,000 years backwards). But it is impossible to go further back. The genealogical tree of the modern man (*homo sapiens* or *homo sapiens sapiens*) is thus very difficult to outline.

From the presentation of this debate, there remains the fact that this way of placing mankind on the great tree of the living shows a conflict between two elements which are the key to the problem of deciding what the essence of man is.⁶ Namely, on the one hand, to underline the insertion of

⁶The philosophical aspect of the question has been addressed by Jean-Marie Schaeffer, in *La Fin de l'exception humaine, nrf-essais*, Paris, Gallimard, 2007, and by Jean-Michel Maldamé, En quête du propre de l'homme, *Revue Thomiste*, Toulouse, 2009, n. 2, pp. 253-307.

mankind into the world of the living and, on the other, to show its irreducible originality towards the other forms of superior animals. It is quite clear, in fact, that mankind forms a specific ensemble. If it has roots in the animal world, and a real parenthood with the animals which are closer to it, it is also related to the history of life.

Not to stop at this abrupt observation, while remaining within the framework of the theory of evolution, it seems useful to pay attention to a phenomenon which Charles Darwin had already paid attention to. In the *Descent of Man*, Darwin remarked that the movement of evolution was not the same among humans, and among the animals that were the closer to them. As a matter of fact, human evolution implies a way of assuming the evolutive constraints which results in their displacement. Of course, mankind does not suppress them. But it can displace them as a counterbalancing effect. This is possible because of the plasticity of the laws of biology, and therefore funds the notion of culture.

2. Neurosciences

Darwin's remark rested on the observation of comportment. It has been given a scientific basis through another route, that of the investigation of the brain, which represents another great adventure of the scientific mind throughout the 20th century. From this point of view, the contribution of the neurosciences is not only medical or biological, it also plays an essential part in anthropology and allows a better understanding of the place of mankind in the world of the living.

2.1. The neurosciences

What we know about the brain is the result of a considerable progress in our ability to explore cerebral activities. In the first place came the discovery and the observation of the neuron, that singular cell of the human body. Then came the time of the exploration of functions, made possible through a better knowledge of networks, with the understanding of the connexions and interactions first between cells, then between networks. It was the foundation of the neurosciences strictly speaking, as a science that unified various disciplines.

In the early days, neurosciences have taken into account the study of comportment. Then, neuro imagery has given access to the observation of the life of the brain, doing away with the simplistic side of the early conclusions. It allows us, today, to follow the activity of the observed subject, and thus to link his cerebral condition to his activity. That was a considerable

progress. As a matter of fact, medical studies, in the beginning, were conducted starting from the examination of lesions and perturbations in movements, language and the expression of thought. The means of observation allow the scrutiny of subjects in their normal activity, and permit to establish series where observations make sense towards the establishing of a general anthropology.

2.2. *The evolution of the brain*

Neurosciences make it possible to understand that the processes of evolution elsewhere observed result in the apparition of a circular structure. In fact, evolution takes place through the commitment of the living to the world where they are supposed to act for survival. Such a commitment is a safeguard for patrimony, and at the same time a redeployment of aptitudes. Selection is then, in a certain way, canalised and even orientated. What is valid for life in general is also valid for mankind, whose plasticity makes it possible to develop the fundamental elements of the relation to the world, to others, to oneself.

The knowledge of the brain shows how its development progresses according to a particular mode of evolution. Such a particularity lies in the importance of the action which the subject does on himself. The concept of reflexion can here be used in its primary sense, that of a mirror. By acting upon himself, the human being becomes himself. He carries latent aptitudes from the sphere of the possible into that of reality.⁷

The judgment passed on this point is, more than for the other elements of the history of life, a retrospective one. It is in the light of the present aptitudes of mankind that mankind judges the history which has led to its present state. One then considers that the field of the possible, and therefore the contingency of situations and the random nature of events, have been actualized, and fall within the scope of a certain continuity. In this retrospective perspective, the development of the brain and its internal structuring make it possible for the human being to be in the world in an original manner; a manner which is reinforced in places which concern the proper nature of man. The concept of neoteny or juvenilisation makes it possible to locate it. This scientific concept acknowledges the fact that, at his birth, the little human child lacks the necessary aptitudes to survival, and that this is linked to a certain immaturity, by comparison with the animals that are

⁷ See John L. Bradshaw, *Human Evolution. A Neuropsychological Perspective*, Taylor Francis Group, 1997.

closer to him, like the chimpanzee, who is immediately capable of acting for his survival. Such a deficiency is in fact an advantage, as it allows a development which is the fruit of a prolonged education, where the associative cortex is being structured.

Evolutive neurosciences thus show how the human brain has specified itself, diversified and complexified itself.⁸ The studies made on language and gestural communication prove it. The language has its roots in specific zones of the brain. It implies a strict hierarchisation. Linked to the possibility of language is a possibility of conscience linked to intelligence. In the scientific approach, intelligence is the ability to solve new problems. This very general definition makes it possible to incorporate different definitions. It bridges the gap between ethology and anthropology.

2.3. *A science of mind?*

A side effect of the neurosciences has been to introduce into the field of science elements which traditionally belong to philosophy, anthropology or psychology: emotions, imagination, consciousness and the unconscious... Successful research has made it possible for us to speak of the elaboration of a spiritual science, giving to the word 'spiritual' the adversative meaning which it has in ordinary language to name observable behaviours. But to speak of 'spiritual science' has a strange ring to ears that have been used to acknowledge the transcendence of the human in relation to the animal world. The debate has entered the world of philosophy.⁹

What is at stake, then, is to know whether the expression 'science of mind or spirit' is accurate, or not. The question is an epistemological one, because the question is to know what the nature is, of the 'reduction' produced by the inscription of the study of human activity through the scientific method. It is indispensable, as a matter of fact, to introduce a distinction between the reductionism of the scientific method and systematic reductionism. The former contents itself with presiding over the scientific activity properly speaking, whereas the latter is a metaphysical option facing the human specificity.

One must, however, introduce at this stage a critical remark on the process. In fact, the study of the nervous system may be at fault and makes the mistake inherent to any specialized research: namely, to take into con-

⁸ See François Clarac & Jean-Pierre Ternaux, *Encyclopédie historique des neurosciences. Du neurone à l'émergence de la pensée*, Bruxelles, de Boeck, 2008.

⁹ See *Philosophie de l'esprit*, t. I: *Psychologie du sens commun et sciences de l'esprit*, t. II: *Problèmes et perspectives*, Textes clés de philosophie de l'esprit, Paris, Vrin, 2003.

sideration the part under scrutiny, and ignore the totality of the living being. Such a reproach has often been made – alas with reason – where medical treatments are concerned and bioethics reminds us that it is a person who must be taken care of, not a case, a function or an organ. Our concern with the brain, which is necessary for the improvement of science, must therefore be envisaged in a strictly philosophical perspective.

3. The anthropological question

Recent scientific discoveries tend to prove that mankind is perfectly integrated into the world of the living. We therefore think that the first lesson which must be drawn from what science has brought us, is to do away with the dualist vision of the human being.

3.1. *Doing away with dualism*

The research which has been done in the neurosciences shows the difficulties and the inadequacies of the spiritualist tradition which, emblematically, ever since Descartes, follows a dualist way.¹⁰ It draws a line between the body and the soul, which are pronounced of a different nature: the former is purely material and governed by mechanical laws, according to the metaphor of the mechanical animal; the latter is immaterial, purely spiritual. Such a vision of the dualist tradition, thus characterized, is probably exaggerated; but this presentation enables one to understand why it does not account for what we know of life. This obviously means a liberation for the mind, which can concern itself with the living and proceed with an approach which is not situated at the only level of analysis...

But this rupture with the philosophical tradition, which is more subtle and profound than its detractors claim, should not be an excuse for going to the opposite extreme: reductionism and monism. Reductionism is easy to denounce: it explains away the whole by its constituent parts. The human being is considered from the sole point of view of chemistry. It is important to be aware of the unity of the living.

3.2. *The dynamic unity of the human being*

The present state of knowledge concerning the neurosciences enables us to give a more accurate representation of them. I shall use the word ‘integrated

¹⁰ See Antonio Damasio, *Descartes' Error: Emotion, Reason and the Human Brain*, Putnam books, 1994; *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain*, Harcourt, 2003.

tion' to describe it. The word signifies that elements which can exist elsewhere are captured and integrated into a system. Because of the unity of such a system, the elements are situated at the level of organisation; their own development is regulated for the welfare of the whole. Integration makes it possible for one element to realise what it is. But since it is associated to others, it produces a greater effect than it would if isolated, or placed in a different context.

The unity of the system comes first and foremost. The perception is not that of analysis, but of a systemic vision. Resorting to it means expressing a philosophical option, the option which favours unity rather than analysis. Such an option respects the development of scientific knowledge, as is shown by the emergence of the so-called *evo-devo* theory to account for the theory of evolution.

Going back to the original image of the arborescence and in accordance with the spirit of the phylogenetic classification of the living, it appears that evolution is not static, but dynamic. The central principle is that any living being is animated by a dynamic force which drives him forward towards accessing its perfection – *conatus essendi* as the philosophers say.

As far as our question concerning 'the place of man in nature' is concerned, it may help to come back to the theme mentioned at the beginning with the image of the scale of beings, which has become the tree of beings. In such a presentation, there is a continuity between the degrees of living beings. The present vision shows that such a continuity is still considered as fundamental. It is the foundation of scientific work, even if the results invite us to change our way at looking at this continuity.

In the traditional vision, continuity was a sign of perfection, a scale where very specific natures were inscribed. Now the evolutionist paradigm which presides over the scientific thought invites a consideration which is not at the level of essences, but at the level of an element which is essential to life. Life is indeed characterized by functions (food, growth, reproduction...). But also by a tension, which is an invitation to fully realise one's potentialities. What is potential tends to realisation. On the great tree of the living, divergence is the result of this urge to develop potential riches. This is true for human beings. The notion of *exaptation*, first introduced by Stephen Gould and often used since, accounts for it.¹¹ When a decisive mutation is about to take place, potentialities already inscribed in the genome can operate. Arborescence is thus understood as an internal dynamism of the liv-

¹¹ See Stephen Jay Gould, *The Structure of Evolutionary Theory*, Cambridge, Harvard University Press, 2002.

ing. Any living being is tensely concentrated on realising the rich potentialities which are in him. He tends to realise what in him is 'potential' (a word which is preferable to 'virtual'). To grow is the distinctive characteristic of the living. But the notion of growth is not only valid for individuals: it also concerns the tree of the living where the rich forms of life multiply.

Such a vision of life enlightens the understanding of the place of man in nature. Its unity is part of the force which has been at work ever since the beginning. This unity is fundamental, but it is not the only element for anthropology.

3.3. The recognition of alterity

Mankind is regarded by scholars as a new issue, because a human being is capable of language, in the full sense of the word. The human language generates access to alterity, in other words to the recognition of the other. The human being stands face to face with nature. Such a situation comes up with language, in the widest sense of the word. The ability to designate is the proper condition of man; ethologists have observed that a little child points his finger, which animals cannot do – except if they have been trained to do so. Alterity is made even more obvious when the language is articulate, and when words are associated with the real world, not only singular objects, but classes of objects, acts that link, gestures that relate them to human activity. A human being is then in a situation of irreducible alterity. The psychological process of recognising others in the human world is inscribed in such a perspective of the discovery of nature. In the realm of mankind, the relation is different; empathy does not suffice; a new stage is necessary, where the dynamics of life assert themselves: which means the establishment of a social connexion on a basis of transcendence. This dimension is traditional and is part of universal culture. It appears clearly in historical times; it is also patently obvious where art displays itself in the forms that we know; it can also be observed in the fabrication of a tool which is not limited to its immediate use, since a tool looks forward to the future, the anticipation of the future taking place in similar circumstances.

Conclusion

The development of science is not limited to a few scholarly pieces of information locked up in a specialized field. It is an invitation to found a new anthropology. It is an invitation to revise a certain number of founding principles of all cultures, since what is concerned here is mankind and the quest of the essence of man.

The philosopher who reads contemporary scientific journals discovers with glee that the problems posed by the expansion of science are quite traditional. Aristotle's ideas, like the ideas of the stoic philosophers on the human body, are quite in favour at the present time. What is under discussion here, is the stature of man, his manual capacity, his ability to imagine, to have representations and to take part in a social organisation. The place of man in nature nonetheless takes a new outlook. It has a twofold aspect.

The former can be described as the notion of precariousness. The history of life shows that there is no absolute necessity or determinism in its development. Phenomena occur at random; results are never ensured definitively. The greatness of the human being results from his richness, which makes him vulnerable.

Secondly, the greatness of the human being does not lie with the notion of strength, but with the ability to recognize the existence of others. Such an ability can be observed in four areas. First, the relation to nature and the biological and physical environment; then, the relation to other human beings in society, and in interpersonal relationships; moreover, in the relation to oneself, what is at work here is the reflexion on action and the meaning of action. To these three elements one must add a type of relation which reaches beyond immediate perceptions: a relation to a being whose action accounts for the origin and the end of human existence. Such a transcendence operates through various channels: the channel of science should be put aside on this subject, but it leads to a new philosophical approach, where the unity and the dynamism of the human being are recognized.