

JACQUES MARITAIN'S PROPOSAL ON EVOLUTION AND THE ORIGIN OF MAN: TOWARD A RENEWAL IN PHILOSOPHY OF NATURE

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We intend to present in this study the proposals of the French thomist philosopher Jacques Maritain, in one of his last writings: "Toward a thomistic idea of evolution"¹. In this writing he mainly examines the specific question of the origin of man. Since the task of presenting the thought of Maritain cannot be for us, 'maritainians', a merely passive or historical exercise, we will permit us at the end to briefly comment, prolong or replace in the actual context, some of his proposals. A previous version of this work was lectured at Blackfriars College in Oxford, U.K., on March the 5th 2009.

On Philosophy of Nature, World-Views and Collective Imaginary

In order to better understand the epistemological and the philosophical sense of Maritain's proposals it seems convenient to consider briefly the context in which a thomistic reflection on Philosophy of Nature is nowadays, not only pertinent but even necessary.

Philosophy of Nature is usually viewed in our times, as a strange kind of reflection. From one part, being already philosophical is not yet metaphysical, and from the other part, having necessarily to take into account empirical scientific discoveries, it is not at all an empiriological² scientific discipline. In positive formal terms it envisages, from an ontological perspective, the study of natural living and non-living beings, revealed to ourselves through empirical manifestations. These beings reveal themselves as intrinsically mutable, and as such they come to be and they perish, and they are also passible to accidental qualitative and quantitative changes in the course of their existence. Intrinsically complex, these natural beings reveal different levels of ontological composition: material and formal, substantial and accidental, potential and actual, and consequently with this complexity they are submitted to different forms of causal dependence: material, formal, efficient, final, exemplar, principal, instrumental and so on.

All this complex and elaborated notional tools were progressively developed

¹ MARITAIN J., Vers une idée thomiste de l'évolution, In: *Approches sans entraves, Ch. VI, Oeuvres Complètes de Jacques et Raïssa Maritain*, Volume XIII, Fribourg, Paris, 1992, pp. 573-648. The first publication of this writing was in *Nova et Vetera* (2) pp. 87-136, 1967 and it was the revised transcription of two seminars given by Maritain in Toulouse in January 1967, at the age of 84. English version 'Untrammelled Approaches' translated by BERNARD DOERING, Notre Dame, Indiana, 1997, pp. 85-131.

² We will follow the epistemological views and terminology proposed and justified by Jacques Maritain in 'The Degrees of Knowledge' and in 'The philosophy of Nature' Cf *Oeuvres Complètes de Jacques et Raïssa Maritain*, Fribourg, Paris, Vol. IV & V, 1982-1983.

through a long and laborious process by ancient Greek philosophers, from Tales to Aristotle and deepened later by myriads of philosophers. That outstanding conceptual philosophical outgrowth, from one part, and the observational facts and ancient scientific theories from the other, contributed to sketch the global cosmological picture that stemming from Anaximander and since then on, was constantly corrected and improved, by Greeks, Romans, Arabs and medieval Christians. That very complex and remarkably unitary and hierarchic cosmologic framework - with all its ads and variations - lasted in culture over two thousand years until the times of Copernicus. This philosophico-scientific world-view nourished in fact the collective imaginarium of hundreds of generations in the western culture.

The fall of the ancient general cosmological philosophico-scientific frame, and its replacement by a new one, grounded this time in the developments of the recently discovered physico-mathematical science, led also to the abandon of the old philosophical conceptualization of nature, as if the use of these concepts was no more valid, no more pertinent, or simply not interesting at all.

The complex ancient unitary picture of a varied hierarchy of beings, causally dependent, the ones upon the others, and all of them ordered under the universal causal influence of the First Being, was replaced in the times that followed the Galileo-Cartesian-Newtonian scientific revolution by mechanical models, derived imaginatively from the newly discovered physico-mathematical notions. The great 'cosmic clock model' (Clockmaker included) derived imaginatively from classical physics, influenced modern minds and culture and lasted less than three centuries until relativistic and quantum-mechanic physics rendered the scientific view of the world out of the reach of laypersons imaginative intuition.

As human beings, we are unable to live and to act as social beings, out of the background of a general world-view, and without trying to render this world-view compatible with the sensible intuition of the perceptible surroundings in which we act and survive as animal everyday. Being the current physical scientific world view formally unimaginable, it seems that our culture has turned to other kind of scientific notions in order to provide a global world-view that could find the possibility of an intuitive verification.

The basis for a new world view with its inevitable imaginative correlate has been searched in our times in supposedly scientific conceptualizations, provided mainly by Paleo-Cosmology and Paleontology. However, even if paleocosmological and paleontological narrative are entangled with natural scientific concepts, its formal epistemological nature is not strictly and properly scientific but historical³. The narrative and genetic nature of the paleontological discourse resembles more the Cosmogonic Myth in Plato's discourse of the Timaeus than the Ancient aristotelian philosophico-scientific Cosmologic view. Big-bang and evolution mechanistic theories operates in fact nowadays for millions of people as Cosmogonic myth.

World-views however are not philosophical neutral. As they intend to provide an intelligible framework in which to live intelligently as rational beings, they must provide – even implicitly -causal explanations. Most (if not all) scientifically based world-views, since the 17th century, are undeniably materialistic. In this sense the Cosmogonic

³ Cf. SERANI-MERLO A., BORJA F., CASTILLO A., CARREN˜O J.E., CORREA M, IRARRAZAVAL M., JADRESIN W., ORDON˜EZ M.P., PHILIPPI R., ROJAS C. Vision scientifique et probl`emes philosophiques surgis `a partir de la pal`eoanthropologie. Une perspective r`ealiste, *Recherches Philosophiques*, (4), 2008, pp. 157-174.

and Cosmologic platonic Myth in the Timaeus is in all respects much more philosophically rich than present Cosmogonic materialist narratives.

We do not have in present times a sound philosophico-scientific world-view from which a healthy collective *imaginarium* could be derived in order to recognize in our perceptible surroundings the signs or the symbols of non-perceptible metaphysical, cosmologic, anthropologic or ethical realities.

The thomistic tradition is rationally persuaded that the realist philosophical cosmological notions, laboriously elucidated by a *pleiade* of remarkable thinkers from early Greek philosophers to our times constitute an imperishable heritage that transcends particular and perishable scientifically based world-views. Maritain was persuaded the philosophical establishment of a general cosmologic world-view was an imprescriptible task for Philosophy of Nature, and he was aware that Cosmologic frameworks had to be permanently modified or rebuilt in keeping with scientific developments. It is in this context that Maritain's reflections on the origin of man make sense, and they constitute a quite rare and remarkable contribution to cosmologic philosophical thinking and eventually to the establishment of a more philosophically sane collective imaginary.

A thomasian starting point

Maritain opens his reflections reading and commenting two major texts of Thomas Aquinas, both from the *Summa Contra Gentiles*: Book IV ch.11 and Book III ch.22⁴.

In the first text Aquinas refers to the existence of degrees in the hierarchy of natures, focusing in their acting capacities and viewing how some things proceed or emanate from the activity of natural inanimate and natural living beings. In this text Aquinas even extends his consideration to beyond natural, to spiritual living creatures and to God himself. The second and more specific text (Book III ch. 22) refers to a hierarchy of forms and the order in which they generate one from the other, starting with prime matter and ending with intellectual human soul. The latter text merits to be quoted because of Maritain's constant reference to it.

...But since, as already stated, everything moved, as such, tends, as towards a divine likeness, to be perfect in itself; and since a thing is perfect in so far as it becomes actual: it follows that the intention of every thing that is in potentiality is to tend to actuality by way of movement. Consequently the more an act is posterior and perfect, the more is the appetite of matter inclined thereto. Therefore the appetite whereby matter seeks a form must tend towards the last and most perfect act to which matter can attain, as to the ultimate end of generation. Now certain grades are to be found in the acts of forms. For primary matter is in potentiality, first of all, to the elemental form. While under the elemental form, it is in potentiality to the form of a mixed body: wherefore elements are the matter of a mixed body. Considered as under the form of a mixed body, it is in potentiality to a vegetative soul: for the act of such a body is a soul. Again, the vegetative soul is in potentiality to the sensitive, and the sensitive to the intellective... Therefore the last end of all generation is the human soul, and to this does matter tend as its ultimate form. Consequently the elements are for the sake of the mixed body, the

⁴ See also *Summa Theologiae* 1 q.47 a.2 a text that is commented by Maritain in chapter 7 of *Untrammelled Approaches*, Note 17, pp.141.

mixed body for the sake of living things: and of these plants are for the sake of animals, and animals for the sake of man. Therefore man is the end of all generation. And whereas the same thing is the cause of generation and preservation of things, the order of the preservation of things is in keeping with the aforesaid order of their generation...

The 'appetite of matter' and general divine cosmic motions

Maritain will return once and again, to which Thomas refers as the tendency or 'appetite' of matter toward the ultimate degree of the whole order of generation. Appetite here is not to be considered in a psychic way, nor even in an active way, because first matter is merely passive; but instead as a constitutional 'openness' that in the whole demands to be actualized, not only by the normal operation of natural causes, but by God himself. God acting through a general cosmic - we could say - 'natural motion' and not through a metaphysical creative one, in order to generate and maintain the variety of natural creatures and to perfect them. All this considered as a part of a general cosmic movement that intrinsically and extrinsically pushes and guides natural beings in assimilating to God.

As we will see, Maritain in accordance to Thomas continually insist on the fact that in addition to the constant divine causal influence, - which maintains each and every creature in its being and permits natural beings to keep the constancy of their species -, there had been in past ages a 'superelevating', 'heightening' or 'superformative' general divine motion⁵ that was operating in the entire Cosmos regularly from the beginning.

The general divine 'superelevating' motion

This divine motion would have tended to oppose or supersede the general maintaining causality that tends to stabilize species, in such a way that both constancy in their form and 'trans-categorical' deviations would have been in a permanently unstable equilibrium, at least - thinks our author - still the human intellective soul was reached.

To illustrate, somehow, this dynamic and at times unstable equilibrium to which Maritain seems to refer, we could think for example in what paleontologists call the mammiferization process that suffered in parallel different lineages of terapsid reptiles around 300 million years ago. A diffuse movement which succeeded in only one or few of them. Or we could also consider the progressive supposed passage from reptiles to birds illustrated in the fossil record by *Archaeopteryx*.

Maritain argues, grounded on philosophical reasons, that after the emergence of human beings the general evolutionary movement of the Cosmos would have stopped. In this sense he cites two important French biologists - Jean Rostand and Albert Vandel - that coincide with him in this assertion, in their case evidently solely founded in biological empirical evidences. In his essay Maritain will principally focus on human evolution, and it is in this respect that, in our view, we can find his most elaborated, valid and original contributions. Many preliminary considerations and conceptual distinc-

⁵ We adopt the English translation 'superelevating' and 'superforming' made by Doering to render the sense of the french expressions 'surélevatrice' and 'surformatrice' which are in themselves also neologisms in French. Cf *Approches sans Entraves*. pp. 626-627.

tions are proposed by the French philosopher before entering in the core of the subject. We will mention a few of them.

The problem of species

In keeping with previous distinctions proposed by Maritain, notably in his major epistemological work, *'The degrees of knowledge'*⁶, he warns the reader of the complex meaning of the word 'species'. Maritain distinguishes '*ontological species*' which lies, for him, in the domain of the philosophical conceptualization, from the '*typological*' or '*empiriological*' species which lies in the domain of biology.

In fact, we could add, even in the empiriological domain the notion of species seems not to be univocal. The taxonomic unit for the paleontologist, for instance, is considered by some to be the '*phylum*'⁷, which is at the antipodes of the notion of 'variety' commonly used by field botanists, and is not either the same as the usual restrictive notion of species widely employed by Darwinists as 'a set of interbreeding individuals'. Indeed, this last meaning derives from a quite material regard which corresponds actually to the notion of 'lineage' and not properly to the usual and primary notion of species. Lineage refers to what materially unifies many individuals, rather than to a formal notion of species, meaning what formally differentiates or specifies a group of individuals from another.

Human species, animal species and pre-humans

A second remark by Maritain is that in philosophical terms there can be no intermediate ontological species between animal and man, or as Maritain's prefers, between the animal endowed with reason ('animal doué de raison')⁸ and the animal not endowed with reason ('animal non doué de raison'). Whether there is an animal endowed with reason, - even at a very primitive or early stage -, and in this case we are in front of man, or we have a mere animal not endowed with reason, - even if its sensibility could have reached the very highest degree -. In that sense a 'primitive man' is a man and not an animal. Certainly - he says - there is room for the existence of a 'human animality', in distinction to pure animality, but this generic coincidence in animality does not destroy the abyssal ontological difference between pure animal and man.

This distinction which seems for our author quite clear, generates however a paradox, or an 'aporia', whose solution looks not clear at all. In fact, from around two million years ago, paleontologists describe, - based on the fossil and archeological record -, the existence of different groups of hominian primates. These hominians display a distinctive behavior that many cultivated observers would not hesitate to recognize as intelligent. We could think today for example, to Homo Habilis, Homo Erectus and Neandethals, considering their quite elaborated handicraft and the regular employment of instruments. On the other hand, prestigious paleontologists, as in our days Ian Tat-

⁶ *Oeuvres Complètes de Jacques et Raïssa Maritain*, Fribourg, Paris, 1983.

⁷ As stated for example by zoologists Lucien Cuénot and Pierre-Paul Grassé. Cf. CUENOT L., *La Genèse des espèces animales*, Paris, 1932. GRASSE P-P. *L'évolution du vivant*, Paris, 1973.

⁸ J. MARITAIN, *Untramméed Approaches*, pp.118 ss.

tersall⁹ or Ives Coppens¹⁰ do not hesitate either, in affirming that the real threshold between animal and man situates at the level of the emergence of symbolic mental processing, i.e. at the level of Homo sapiens, some 150.000 years ago¹¹. What then are these hominian primates? Who are these beings that seem not yet to be humans, but that they already manifest humanly characters? In any case, - and without answering yet to the question - it is plain for Maritain that it would be better to refer to them as pre-humans than to call them by the equivocal term of 'primitive men'.

Particular problems posed by emergence of the human species

A third preliminary consideration is still necessary for our author. Maritain has already spoken about a general directive divine motion constantly operating in the entire Cosmos. We confess that it is not always perfectly clear for us what exactly is Maritain talking about. Sometimes he refers to it as if it was the general metaphysical creative power of God that maintains beings in their actual existence, sometimes it seems to refer to the general cosmic influence of God as a Prime Mover or even as the General Exemplary Cause.

Anyhow it is clear that reasoning in that way Maritain is but prolonging a long philosophical tradition whose origins can be traced so far as the intuitions behind the notion of 'To théon' in Xenophanes, the conception of the 'Nous' in Anaxagoras and of the 'Demiurge' in the Timaeus of Plato; not to say the very elaborated ideas of Aquinas in the treatise of the creation and of the government of the world. It is also plain for Maritain that the inclusion of the divine motion in cosmos does not exclude at all the real causal autonomy and sufficiency of natural beings in their own domain. Horses are sufficient causes of their progeny as every natural being is a sufficient cause of its proper effects in their domain. Natural beings however, are not total causes of their effects. In fact they are in need of a constellation of natural pre-conditions in order to operate autonomously in their proper domain. So natural causal autonomy is not at all total or absolute, but only relative; relative to the domain in which natural beings operate by their own powers.

So, in addition to their own natural powers, Maritain, - following Aquinas -, supports the necessity for a General Divine 'Physical' Motion explaining the variety, the order and the operation of natural beings in the whole Cosmos. This is what Maritain refers to, I think, as the General Divine Motion that sustains the whole dynamism of Nature. Maritain advocates that even this General Divine Motion that suffices to explain the general dynamism of nature and that would give reason of the maintenance of the individuals of each species in their type, is nonetheless insufficient to explain the active part in the actualization of the appetite of matter toward higher and higher forms. The French philosopher maintains then the existence of a super-elevating or superformative component somehow included in - but distinguished from - the General Divine Motion that sustains the whole dynamism of Nature in its diversity and its operation. This super-elevating general cause would then ultimately render reason of the general evolution of living beings toward higher and more perfect forms.

⁹ I. TATTERSALL, *The monkey in the mirror: essays on the science that makes us human*, Oxford, 2002.

¹⁰ I. COPPENS, P. PICQ, *Aux origines de l'humanité*, Vol 1 et 2, Paris, 2001.

¹¹ P. MELLARS, *Why did modern human populations disperse from Africa ca. 60.000 years ago? A new model*, 103, 2006, pp. 9381-9386.

Nevertheless, our philosopher is conscious that human nature poses some particularly special problems to general laws; general natural laws, which are however strictly valid for all the rest of natural beings. Indeed, human intellect and human will - it could be said - are not natural. Not natural at least in the restricted physical Aristotelian sense of mutable material beings. Immaterial as they are human intellect and human will are not in the potency of prime matter, and so there are no proportionate causes in nature capable to completely actualize a human form that roots immaterial capacities. In technical terms, human form, being mainly - although not totally - immaterial, is not educible from the potency of prime matter.

To the difference of horses, human parents are not sufficient causes of their children. Aquinas somehow brutally says that dogs are more parents of their puppies than men of their children. In this sense, human generation transcends the category of animal reproduction. Human generation is much more creative than reproductive; it is in fact - and more precisely - *pro-creative*. Human parents are then neither *re-producers* nor *creators*; they are '*procreators*'. Human procreation then is not completely in the natural powers of human beings. So, it is plain to common sense intuition and to philosophy, that the effect that follows from what human parents do, largely transcends the mere reach of their natural capacities. In this sense it could be said that human procreation is endowed with a sort of 'natural sacredness'. The conclusion is that God participates immediately in the generation of every human being not by a miraculous but by a *regular* and *natural* intervention. He is the sole proportionate cause for the coming to be of immaterial subsistent realities, the poorest of them being men. The coming to be of persons in the universe, human or angelical, is indeed, the personal affair of God himself.

Consequently, in the already generated man, human intellect and will, constantly exert a sort of heightening influence over the rest of the natural capacities of man. Even if in man there will always be an absolute generic disproportion between sensible and intellectual power, in every concrete man, these natural and over-natural capacities are disposed - each to the other - in such a way that they operate synergically as a unique substantial individual. All powers are then substantially united in their roots. Being the one and the same, the one who eats and sleep, who perceives and feels, and who thinks and loves. This would be impossible if the human form would not be at the same time a soul and an immaterial actuality. Being not a mere soul neither a pure spirit, the human form undividedly animates a body and reflects upon her. Indeed, human spiritual soul, is really a quite strange way to be a soul and a strange way to be a spirit.

What Aristotle and Aquinas did not know

Thomas Aquinas was conscious of the peculiar character of human beings as quite 'unnatural-natural' beings and as quite imperfect spiritual creatures. Sign of this was his very complex and nuanced intellectual view on human generation. Aristotle before him lucidly perceived the *aporia*, but humbly receded at the threshold of the mystery. What Aristotle and Aquinas completely ignored however was the successive and progressive coming to be of the material universe in terms of species, all along the immenseness of cosmic ages: of the living species in general, and of the human species in particular. The 'historicity' of species and of the cosmos as a whole can be considered a genuine novel philosophical fact.¹²

¹² Even if in philosophical terms, the correct statement of this fact is not at all deprived of uncertainties.

Jacques Maritain, on his own, conscious as he used to be of the enormous development of physical, biological and human positive sciences in our times, is ready to endorse the validity of what might be properly called the paleontological fact of evolution. He is certainly at the antipodes of philosophical evolutionism such as it is plainly stated for example by Spencer, or more implicitly in the undeniably poetically inspired - but philosophically ambiguous - works of Teilhard de Chardin. Maritain isn't either a Darwinist, whose theory of the origin of species by means of natural selection he considers to be: "pitifully extrinsic" ('pitoyablement extrinsèque').

Toward a thomistic idea of evolution

Maritain is convinced that the philosophical principles of Thomism are in capacity to give a much more valid and reasonable theoretical general explanation of the origin of species and the origin of man than a merely materialistic Darwinian one. It is not the case for Maritain to deny the geniality of Darwin as a field naturalist, he does not even mention this question, what Maritain criticizes however in Darwin and his followers is not the naturalist but 'the philosopher in spite of him'. It suffices for Maritain to add, to the thomsonian view, the temporal perspective in the origin of living species, for having a proper philosophical explanation. The text Maritain cites from the *Summa Theologiae* is worth citing:

Formal distinction always requires inequality, because as the Philosopher says (Metaph. viii, 10), the forms of things are like numbers in which species vary by addition or subtraction of unity. Hence in natural things species seem to be arranged in degrees; as the mixed things are more perfect than the elements, and plants than minerals, and animals than plants, and men than other animals; and in each of these one species is more perfect than others. Therefore, as the divine wisdom is the cause of the distinction of things for the sake of the perfection of the universe, so it is the cause of inequality. For the universe would not be perfect if only one grade of goodness were found in things.

The eventual validity of the philosophical principles of Thomism for the intellectual exam of the question of the origin of species and man, however, do not relieve the realist philosopher of the responsibility and the task to show precisely the way in which those principles must be applied.

In a very schematic way we would say that Maritain envisages the analysis in three steps. First of all he considers the emergence of a particularly developed family of primates. We could say today 'the hominian primates', that appeared somewhere in between *Orrorin tugenensis* and *Australopithecus anamensis*, some 5 or 6 million years ago, and which separates our lineage from that of actual gorillas, chimpanzees and bonobos¹³. The last hominians represented in the fossil record by the wide and heterogeneous group of *Australopithecini* would have lived until about 2 million years ago.

¹³ We refer for this data to the excellent collective work by Ives Coppens and Pascal Picq cited in reference 10. We have examined with more details this topic from a biophilosophical point of view, in SERANI-MERLO *et al.*, *Vision scientifique et problèmes philosophiques surgis à partir de la paléanthropologie. Une perspective réaliste. Recherches Philosophiques*, 4, 2008, pp. 157-174 and in SERANI ET AL. *En los orígenes de la humanidad, una mirada científica y filosófica*, Intus Legere 3, 1, 2009, pp. 123-141.

Secondly, the moment characterized by the emergence from hominians of a new kind of primates, beings that Maritain - from a philosophical perspective - would call 'pre-humans', and that palaeontologists would call nowadays the gender homo or 'the hominians'. They would have lived from about 2.5 million years ago to quite recently, around 40.000 years ago, as Neanderthal and *Homo floresiensis* seem to have reached.

Thirdly and finally, the emergence of man, *Homo sapiens*, which palaeontologist would call archaic forms of *Homo sapiens*, and that presumably appeared in Africa about 100.000 years ago, or even earlier. *Cro Magnon* man, being only the better known or the most 'mediatic' tribu pertaining to this group to which we also belong.

The emergence of higher primates

For the first of these stages, - say the emergence of superior or hominian primates -, Maritain thinks it suffices the causal influence operating in the maintenance of living species. These natural powers would include on the one hand the general divine motion for the maintenance of the dynamism of Nature, and on the other hand, the general superelevating or superforming divine motion that operates in all living species inclining them to actualize the appetite of prime matter toward upper forms of actualization. This ascending movement that influence certain individuals or groups of individuals to transgress the limits of their species, is for Maritain - as we have said, what explains evolution in general and that according to him, would be no more acting nowadays.

The ontological status of pre-humans and their transformation

For the second stage of this ascending movement Maritain proposes what in my view is his most original philosophical hypothesis. Maritain thinks that even if the emergence of the human species in general, and of every man in particular, are very unique events, the emergence of the human species might have respected the general rules generally operating in nature. And what we see in nature is that at every level of natural transformation we are confronted to gradual processes. That means that in nature mutations are preceded by changes that approach a certain threshold, and that they are succeeded by changes that progressively drift apart. To glose and to explain Maritain's thought we could remember the old Latin adage '*Natura non facit saltus*' and also the Neo-Platonic dictum that in Nature superior forms from inferior degrees con-found with inferior forms from higher degrees. Of course this rule is sometimes not followed, but these exceptions are exactly what we refer as an unnatural, a violent, a morbid or a monstrous occurrence. The passage then from hominians to homo sapiens supposes a huge amount of anatomical and behavioural transformations; transformations that at first glance it seems impossible to conceive that Nature could have done through jumps or saltations, as Darwinian evolutionists authors like Stephen Jay Gould and Nils Eldridge actually propose. Prime matter, reminds us Maritain, in agreement with Aristotle and Aquinas, has to attain its last disposition (*ultima dispositio*) in order to compel or to urge the arrival of the new form, being the actual form at that moment, no longer proportionate to the actual dispositions of matter. Maritain thinks that paleontological data are in agreement with these principles.

In fact, that is what the fossil record seems to show. From the *Australopithecus* to *Homo habilis*, and from *Homo habilis* to *Homo erectus* and man, the pace of transformations

remarkably accelerate, producing an enormous increasing in some specific anatomical traits, most notably in the rate of development of the higher nervous system. In the reduced paleontological time space of about three million years, for example, the cranial volume passes from about 500 cc. in *Australopithecus* to more than 1500 cc. in *Homo sapiens*. This increase in size is, of course, but an external sign of the immense and complex inner reorganization of the central nervous system.

These directed transformations - according to our author - slowly dispose prime matter to the reception of the human intellectual form. Sign of this is the acquisition of those humanly behavioural traits that palaeontologists describe for instance in *Homo habilis*, *Paranthropus*, *Homo erectus* and *Homo rudolphensis*, up to the latest forms of Neanderthal, and which include the use of instruments, the construction of shelters, the use of fire, organized ways of hunting and even the burial of deaths. These human behavioural achievements produced by not yet human beings, could be understood according to Maritain thought, in the light of animal instinctual behaviour. Birds for instance do 'intelligent choices' when constructing a nest, and so do bees when they communicate to others - through their 'dance' - such complex elements as distance, direction, quality and amount of food.

For this 'humanization' movement however, neither the general divine motion that sustains natural dynamism, nor the general heightening divine motion that explains general evolution suffices. In fact, a specific and temporary divine motion would be required in order to 'prepare' the arrival of a human intellectual soul. This motion could manifest differently in different groups of prehumans, even in some lineages that will not finally attain formal humanity as for example could be the case for *Homo floresiensis* or *Neanderthals*.

Humans finally

It is only after this slow but nonetheless progressive action, liable to all kinds of favourable and unfavourable circumstances, that matter could be sufficiently disposed to receive a human intellectual soul; a human soul that in order to be created or pro-created in every singular stance requires a creative divine act. This is the third and final step in this ascending movement. This point that in philosophical terms, is for the thomistic tradition quite undisputed in terms of principles, is in concrete or historical terms open to all kind of discussions¹⁴. Monogenism or polygenism, is in this respect but one of the multiple questions that arise and that we will probably never satisfactorily resolve. At least it is epistemologically clear that historical singular events, even if they pertain to natural history, seem to be out of the reach of scientific judgements.

Concluding remarks

Still here we have tried to present as clearly as possible the views of a contemporary thomist philosopher with interest and competence in biological and scientific matters. Sometimes, for illustrating purposes, we have gone a step further. Our aim has been always to clarify and not to distort the genuine thought of the author. In this last part of

¹⁴ See for example our study on the human embryo in the thomist tradition: A. SERANI, *L'embryon humain, sa vie et son âme, une perspective biophilosophique*, 79, 2004, pp. 89-103.

the work we will try to briefly expose some few of the multiple reflections that this text of Maritain evokes.

As a neurologist and former neurobiologist we are quite accustomed to read in neurobiological textbooks and review magazines statements such as the following. *“The great challenge for neuroscience in years to come is to give a precise account of how the brain produces the mind”*. This sentence which in fact expresses an enormity is read everyday by multitude of intelligent university students that do not express the smaller intellectual startle to this kind of dogmatic assertion. In fact that assertion, which is expressed as an axiom, is in fact a conclusion. Nobody seems to consider the fact that there is no single experimental evidence published in any serious scientific journal that could be taken as a strict formal positive scientific evidence that organic nervous structures as such strictly and sufficiently produces something that could be called ‘mind’. Mind is not an empiriological concept, so an empiriological science such as neurobiology has no means to generate empiriological scientific statements about it, and no empiriological methods or instruments to adequately grasp its reality in the perceptible world. This impossibility does not question the real existence of mind. In fact its existence is presupposed by neurobiology, but neurobiology is unable to prove its existence. And what is the case for mind, is also the case for life, knowledge, feeling and many other concepts that are not objects of empiriological science but whose existence is presupposed by it. Statements such as ‘the brain creates the mind’, which are conclusions and not axioms, are indeed not the conclusion of a strict empiriological scientific reasoning but the conclusion of a philosophical reasoning; even if it is philosophically wrong. This, which is valid for neurobiology and for the scientific and not scientific literature that we generate around it, is in our times analogously valid to general cosmological views.

We receive implicitly in our formal education, as if it was a scientific central dogma: *“In the beginning it was matter, and from matter all emerged”*. It seems as if putting an amount of matter infinitely small and an explosion sufficiently great all things anyhow might be finally explained. This is what in rigorous philosophical terms could be called an imaginative or ‘mythic’ view. Modern western culture nowadays has managed to maintain in the great mass of population, and under the cover of a sophisticated scientific ‘imaginarium’, the same magic mentality that has been in all times the appanage of non reflective people. These considerations, that would certainly merit long justifications and that we express now in such a rude manner, could perhaps be useful for us in trying to value the intellectual weight of Maritain’s proposition about evolution in general and of the origin of man in particular.

Etienne Gilson¹⁵, Jacques Maritain¹⁶, Edwin Burt¹⁷ and in our days Hans Jonas¹⁸ and many other scholars, have clearly shown how in the seventeenth century the development of experimental science, entailed, as a side effect, an intellectual rupture in our integrated worldview. These authors show well, how the felicitous event of modern science development was importantly overshadowed by the rupture of an integrated view of the world. Theology, Philosophy and Natural Science, - now clearly distinguished from one another from an epistemological point of view -, could have continue to share in modern times the unity that Theology and Philoso-

¹⁵ E. GILSON, *The Unity of Philosophical Experience*, Charles Scribner’s Sons, 1964.

¹⁶ J. MARITAIN, *La philosophie de la nature*, Paris, 1935.

¹⁷ E. BURTT, *The metaphysical foundations of modern physical science*. Doubleday, New York, 1932.

¹⁸ H. JONAS, *The Phenomenon of Life: toward a philosophical biology*, Chicago, 1966.

phy had hardly worked to obtain, and that at least in some higher moments of the middle ages they had magnificently attained. Science which in God is simple, for us humans is plural. The search for the simple unique truth diversifies in man due to the complexity of creation and the feebleness of our mind. But what cannot be embraced otherwise but by multiple roads, is called upon to be unified by a common openness of spirit and a community of motivation.

The hypertrophy of the new scientific paradigm conduced first to an epistemological monism and then to a metaphysical monism. Being modern empirical science the sole rational paradigm, 'sciences' became 'Science' and the different approaches to reality were subsumed under the only legitimate protocol: the unique monolithic scientific method. This accomplishment characteristically illustrated by René Descartes in his 'Discours de la Méthode' is at the basis of the contemporary epistemological and metaphysical closure of the physical world. As Hans Jonas has shown, modern materialism, actually dominating our worldview, is the product of decomposition of Cartesian dualism. What in Descartes mind was not yet a complete rupture between mind and body, nature and freedom, God and the world; was installed culturally and philosophically quite soon afterwards, due to the intrinsic deficiencies of such a precarious dualist conception.¹⁹

Modern materialism, according to Jonas, is quite different to classical pre-Socratic materialism, which can be considered as a sort of prolegomenon in the development of philosophical thinking. Being modern materialism a product of decomposition of a dualist view, modern materialism has assumed the task to explain what the spiritualist extinguished branch of dualism pretended to do. Matter must then explain life, conscience, freedom, spirituality and God, which was what the spiritual side of dualism was due to explain. That's why contemporary materialist view of the world not only pretends a materialist epistemological closure, but also it pretends materialism to be universally explanatory. This last trait is particularly evident in the contradictory appeal of materialism, as a last explanatory resort, to 'emerging' properties. These quite curious material properties like life, conscience, freedom and so on 'emerge' from matter without any physical energy wastage, and not being in any way predetermined or precontained in any known physical property, and in any known physical way. As Jonas ironically points out it is as a blocked highway in the road of energy. Emerging properties emerge in fact from dogmatic voluntarism, in which the causal and explanatory dependence of irreducible realities from inorganic matter is affirmed only for the sake of the coherence of the system.

In the context of this materialist ideological background and its associated *imaginarium*, a reflection as that which Maritain proposes to us about cosmic and human evolution, can comprehensively appear to contemporary 'ears' as absolutely eccentric. An in fact it is. It is not at the centre of the explanatory ways promoted and dictated by an ideologically biased way of giving final explanations about nature.

Jacques Maritain proposal derives not from a nostalgic dream anchored in revoluted theological or philosophical ideas, but from a largely reflected proposition for a modern, renovated but philosophically consistent Philosophy of Nature. For Maritain it corresponds to neatly distinguish the empiriological sciences of nature from Philosophy of Nature. Both formal regards sharing - what Jean of saint Thomas would call - the

¹⁹ H. JONAS, *The Phenomenon of Life: toward a philosophical biology*, Chicago, 1966, Fourth Essay, 'To move and to feel: On the animal soul', Appendix: 'Materialism, determinism and the mind', pp.127-134.

first degree of abstraction, but distinguishing themselves by their way of conceptualizing and judging and from the manner in which they verify the validity of their judgements. Empirical sciences ultimately verifying their judgements in perceptual and measurable phenomena, while Philosophy of Nature verifying their own in the ontological intelligible concepts and principles.

For Maritain is not the case to confound Philosophy of Nature with a Metaphysics of Nature, even if both formal regards can and must have a fruitful dialogue. On the other hand Maritain considers that Philosophy has the right to think directly about natural realities without an absolutely necessary passage through empiriological sciences. In reality, both the empirical and the philosophical regard stem from spontaneous human experience and they always remain in a very profound sense, measured by it. Common sense is neither science nor philosophy, and what we usually call common sense must be certainly purified, clarified and sometimes corrected but in any case radically devaluated or suppressed. Doing so both science and philosophy are condemned to unreality.

In a Philosophy of Nature perspective then, natural beings conceptualized as such, and not as sensible cumuli of atoms, are complex in their being and they are dependent in their being. In short they are caused. Complex as they are, natural beings are also complexly caused, and the philosopher has not the right to stop in his search for the origins in face of inconsistent epistemological barriers. Epistemological boundaries do exist and must be respected formally, but concrete reality is longer and wider than formal limits.

The natural philosopher has the right and the duty to go ahead in his quest, and not to stop until ultimate causes are not reached. The natural philosopher - as such - does not formally reach God as the Acts of the Acts, and the Supreme Being, the '*Esse per se subsistens*'. That's the proper task of the metaphysician. The natural philosopher as a human person in quest for the truth, can certainly plunge in the supreme oceans of metaphysical thought, but as a natural philosopher is not due to. The natural philosopher as a Christian also can, and even must, advance in the quest for a personal encounter with the God of Isaac, Abraham and Jacob, and his Philosophy of Nature will certainly contribute to enrich this supernatural experience. This being true, it does not allow himself to transform Philosophy of Nature in a Christian apologetic discourse. We must be grateful to epistemology for giving us these distinctions. However, the natural philosopher is not forbidden about referring to God as the prime mover, the general cause for the origin of diversity in nature, the source of the over formative motion that renders evolution intelligible and so on, if reason demands it. The natural philosopher must not feel restraint by supposed epistemological closures that would hinder him to go ahead in the search of ultimate questions.

Empiriological sciences themselves, which are wonderfully open to reality in the infinitely great and in the infinitely small, are certainly epistemologically closed, and their way of conceptualizing impedes themselves to attain God in itself in any formal way. That's true. That's the reason why empiriological scientist's, who are men and women, besides and before being scientists, must receive in their complete education a certain idea of the complexity and integrity of human knowledge. Scientists when they are genuine scientists are eager searchers of the truth, and they must not be deprived of contemplating the wonder and the beauty of the integrity and the unity of knowledge. In transforming our scientists in monothematic experts we are putting at risk their

humanity and we are exposing the community to dangerous extrapolations.

Evolution has been a very sensible topic since 1859 to nowadays, and this is not at all fortuitous. The origin of species touched to the quest for ultimate origins, and so directly or indirectly it touched to the ultimate cause. The box of Pandora that was open was no less than the question of God and his rights of authorship upon the work of his hands. Studying with perseverance and humility, and leaving aside ignorance and prejudice, the day will come, in which a renewed and brighter light will be projected over our cultural understanding of God's masterpiece. That day philosophical insights such as that of Maritain on human evolution will be rightfully appreciated.