VARIA TURCICA
X

INDIVIDU ET SOCIÉTÉ

L'INFLUENCE D'ARISTOTE DANS LE MONDE MÉDITERRANÉEN

Actes du Colloque d'Istanbul
Palais de France, 5-9 janvier 1986

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INTRODUCTION

Le Séminaire International dont nous présentons ici les Actes a été comme un exercice dans l'art de se rencontrer entre personnes diverses et de faire, tout en respectant les différences, œuvre commune. Cet art est, selon nous, une qualité de vie typiquement méditerranéenne, et il possède son symbole propre dans la mosaïque.

La mosaïque — dans le sens spécifique du mot — est une invention des peuples méditerranéens. Cette technique qui consiste à faire un dessin avec de petits éléménts (souvent en forme de cube) de pierres naturelles, de terre cuite ou de verre, que l'on applique sur une surface solide avec un ciment ou un mastic, a atteint le maximum de son développement dans la période hellénistique et l'apogée de sa splendeur à l'époque byzantine. On trouve des mosaïques de la Syrie à l'Espagne, du Nord de l'Afrique aux Alpes. Le nom dérive de "muse" : une mosaïque est une œuvre qui est en relation avec les muses.

Ce qui caractérise une mosaïque, c'est le fait que les éléments formant le dessin et qui expriment les nuances de couleurs et d'ombres, sont juxtaposés et même opposés, pour former l'ensemble. On ne les réduit pas en poudre et on n'en fait pas une pâte uniforme, mais l'unité et le sens même de cette unité est constituée par la pluriformité dans laquelle chaque élément retient et conserve son "identité" : sa substance, sa forme, sa couleur.

Une autre caractéristique de la mosaïque, c'est qu'elle ne remplit pas l'espace (comme le ferait une statue, et dans un certain sens, un tableau, une peinture, qui occupe une place sur le mur), mais la mosaïque constitue plutôt l'espace et l'embellit. Ainsi, faire une mosaïque, c'est répéter l'acte du Créateur qui, en ordonnant et en ornant, a réalisé le cosmos. Notons que, en créant l'espace bien ordonné, la mosaïque prépare la place pour un autre qui habitera cet espace. Dans ce sens, la mosaïque est "modeste", n'est pas au centre, mais forme et embellit la scène, dans le sens originel du mot : scène veut dire "tente". Et comme la tente cosmique sépare les eaux qui sont au-dessus du firmament des eaux qui y sont en-dessous, de sorte que les eaux

inférieures puissent se rassembler, ainsi la mosaïque sépare l'habitation humaine des espaces extérieurs, et forme le domaine habitable.

Enfin, la mosaïque n'est pas le mur, mais, dans un sens, elle cache le mur, en créant de nouveaux espaces. Dans la basilique d'Aquileia, on marche sur les vagues, dans la chapelle royale de Palerme et dans l'église de Saint Marc à Venise on assite à toute l'histoire du salut, des absides romanes les saints nous regardent du ciel et à Monreale et Ravenne nous y sommes, presque, au ciel.

Dans l'*opus musivum,* nous distinguons ainsi quatre aspects, quatre caractéristiques, comme étant le symbole du monde des cultures méditerranéennes : 1) le nom se rapporte aux muses ; 2) la signification unitaire et l'unité significative de la mosaïque ne s'obtiennent pas grâce à une fusion des éléments comme dans un creuset, mais grâce à la juxtaposition et même à l'opposition des éléments ; 3) la mosaïque crée une habitation pour l'homme ; 4) la mosaïque invite à regarder au delà des limites de l'habitat humain, à dépasser les coordonnées du temps et de l'espace, ouvrant de nouvelles perspectives à la conscience humaine.

Pour voir l'analogie entre la mosaïque et l'œcumène des cultures méditerranéennes, il n'y a pas besoin de longs discours.

1) La référence aux muses ne rappelle pas seulement ces gracieuses figures qui ont été en honneur précisément sur les rivages de notre mer, mais la gracieuse gratuité qui est exprimée par la référence aux muses y est vivante encore de nos jours. Il suffit de mentionner ces deux autres mots dans lesquels le souvenir des muses vit encore : "musée" et "musique". Le musée est le temple dédié aux muses, l'espace digne des muses et des arts que celles-ci inspirent. Où pourrait-on trouver, en ce monde, une région aussi riche de trésors artistiques que le "monde méditerranéen" ? Quant à la musique, elle continue à être la force mystérieuse qui, de façon particulièrement riche et expressive dans la régon méditerranéenne soulève les corps dans la danse, les sentiments dans les chants, les esprits dans la prière.

2) En deuxième lieu, l'unité faite par la juxtaposition distinguée des éléments est ce qui est typique pour l'œcumène culturel de la Méditerranée. Nous laissons volontiers à d'autres civilisation l'épithète de *melting pot,* "creuset". Pour concevoir la communion entre les cultures méditerranéennes il faut s'inspirer du sous-titre d'un livre fameux de Maritain, *Distinguer pour unir.*

3) Troisièmement, l'espace ordonné et orné, l'habitat humain formé par la mosaïque exprime cette qualité méditerranéenne d'être un monde "humanisé", portant les empreintes de l'homme , transformé par lui, de façon

évidente. Et, en ce qui concerne l'œcumène culturel, il faut mentionner cet humanisme personnaliste et pluraliste, typique des cultures nées et développées en ces lieux.

4) Finalement, le dépassement des limitations du moment actuel n'est pas une caractéristique qui est venue s'ajouter aux cultures méditerranéennes, mais il est leur source et leur énergie portante, qui fait qu'elles se renouvellent continuellement et qu'elles peuvent aussi enrichir d'autres parties du monde.

Le colloque qui s'est tenu à Istanbul du 5 au 9 janvier 1986, organisé par la Conférence Permanente Méditerranéenne pour la Coopération Internationale en collaboration avec l'Institut Français d'Études Anatoliennes, mérite d'être comparé à une mosaïque.

Autour du thème "Individu et société. L'influence d'Aristote dans le monde méditerranéen", se sont réunis des philosophes et des économistes, des théologiens et des artistes, des historiens et des canonistes, représentant en même temps les trois grandes traditions monothéistes qui ont trouvé leur formulation dans l'aire méditerranéenne orientale.

Ce livre que nous avons la joie de présenter ici indique en quelque sorte la multiplicité des points de vue qui, guidés par la méthode et quelques idées de base du Stagyrite convergent vers une harmonie de significations qui, sans dissoudre les différences, exprime une unité. Ainsi le colloque a été un exercice de recherche et de dialogue dont nous espérons qu'il trouvera ses réalisations ultérieures dans le projet de collaboration interculturel issu de notre réunion.

Sous le titre d'"Organon", nous nous proposons d'organiser des séminaires interdisciplinaires sur la structure de pensée des civilisations méditerranéennes, sur les modes de vie de l'homme méditerranéen et sur sa création architecturale, artistique et technique.

Il est significatif que cette idée soit née dans une réunion inspirée par la pensée d'Aristote, maître de tant de penseurs et d'écoles qui ont modelé la civilisation et qui ont été les artisans de la convivence civique d'une grande partie de l'humanité.

Ary A. Roest Crollius, S.J.
Président de la Conférence Permanente Méditerranéenne pour la Coopération Internationale

Les ARCHIVES DE PHILOSOPHIE

sont l'organe de publication du département de philosophie de l'Université d'Istanbul. Ce département est le plus ancien en son genre en Turquie. Après le déclin de l'Empire ottoman et la proclamation de la République, l'Université d'Istanbul fut réformée. Dans ce contexte un grand nombre de savants allemands furent invités à partir de 1933. Parmi eux se trouvaient des philosophes de renom tels que Hans Reichenbach (1893-1953), un des pionniers du positivisme contemporain, les néo-kantistes Ernst von Aster (1980-1948) et Heiz Heimsoeth (1886-1975), et W. Kranz qui furent les instigateurs d'une tradition philosophico-scientifique européenne continentale se reflétant dans les *Archives de philosophie*. Depuis leur fondation en 1945 jusqu'à nos jours, les *Archives de philosophie* ont publié des articles originaux de philosophes allemands contemporains tels Hans Reichenbach, Ernst von Aster, Heinz Heimsoeth, W. Kranz, Nicolai Hartman (1982-1950), Erich Auerbach, Ernst Diez, Joachim Ritter, Freytag Löringhoff...

TÜRK FELSEFE DERNEĞİ

ASSOCIATION TURQUE
DE PHILOSOPHIE

Necatibey C., 8/9, Sıhhiye/ANKARA

Teoman DURALI

ARISTOTLE'S THOUGHTS CONCERNING THE PROBLEM OF THE LIVING BEINGS AND THEIR EVOLUTION*

God and nature create nothing that has not its use.[1]

The human being... is the only living thing that stands upright, and this is because his nature and essence is divine.[2]

Charles Darwin on Aristotle:

From quotations which I had seen, I had a high notion of Aristotle's merits, but I had not the most remote notion what a wonderful man he was. Linnaeus and Cuvier have been my two gods, though in very different ways, but they were merely schoolboys to old Aristotle.[3]

SYNOPSIS

Long before *evolution* became something of a catchword, Aristotle spoke about it mainly in two of his works — i.e. *History of Animals* and *Parts of Animals* — within a factual framework, and not within a conceptual one, as it has usually been the case in modern times.

*Acknowledgement : To the extent that this paper is comprehensible, I owe a strong note of thanks to Professor Dr. Wim J. van der Steen (Department of Biology, the Free University, Amsterdam) and to Mr. Aydın Dağpınar (Ankara). In addition, I wish to thank Professor Dr. Louis Baeck (the Catholic University, Louvain, Belgium) for his stimulating suggestions on Aristotle's developmentarian attitude versus the modern evolutionary model.

[1] Aristotle : *On the Heavens*, I, 5, 271a (33).

[2] Aristotle : *Parts of Animals*, IV, 10, 486a (25).

[3] Charles Darwin to William Ogle, on the publication of his translation of the *Parts of Animals* in 1882 q.v. : Frontispiece of the *Parts of Animals*, Peck's translation.

In this paper I consider the intellectual prerequisites that enabled Aristotle to elaborate his system of philosophy-science, the first of its kind in history, and then his views on the origin and development of individuals and species. At last I touch on the question why he left off the subject of transformation, and never took it up in works like *Physics* and *Metaphysics* where he elaborated his system and brought it to fruition.

This paper covers the subsequent sections :

I. INTELLECTUAL CIRCUMSTANCES WHEREIN THE ARISTOTELIAN THOUGHT UNFOLDED

A. The Becoming - Being Discrepancy

Nowadays we are more or less inclined to suppose that any current of thought which has become fashionable is a product of our epoch. It is, however, a long-known fact that there is nothing beneath the sun which

might be qualified as brand-new or completely original. On the other hand material and mental entities are subject to a constant process of alteration. In the long run the changing feature of an item is, in a certain sense, its evolution. So, it is not difficult to grasp that the conception of evolution itself has also undergone an evolution within the framework of inquiries concerning the living things. We take it for granted that research on evolution started in the late XVIIIth century and gained momentum with Charles Darwin's epoch-making views. He however was not the first to constate the mutability of nature in general, and of its biotic sphere in particular. Throughout the history of philosophy-science eminent minds have pondered on alterations at the level of individuals, and transformations at that of species.

Anaximander of Millet later Xenophanes of Colophon, Anaxagoras of Clazomenae and Empedocles of Acragas were the first thinkers to speak about the origin of life and the probable causes of its various forms in a more or less unmystified manner. The suggestion that man somehow arose from the earth or evolved from other animals is often encountered. Anaximander seems to have held that the first manifestations of animal life was in the sea, that changes of structure occured as the animals moved to dryland, and that man thus evolved from the fish.[4]

Xenophanes argues that the dryland is recurrently mingled with the sea and then with the passage of time, separated from moisture. He puts forth such proofs as these : shells are found far inland and even in mountains ; in the quarries of Syracuse imprints of a fish and of seaweed have been found, and in Paros is the imprint of a small fry deep in the stone, and in Malta flat slabs bear the impressions of all sorts of fish. He says that the imprint was made ages ago when everything had been covered with mud, which then dried in it.

In this world of the Antique Aegean Civilization — especially at the *Classical period*[5] of it — we are confronted with a handful of remarkable personalities displaying an amazing degree of sense of wonder. They tried to

[4]Q.v. : R. Morris, Cohen and I. E. Drabkin, *Source Book in Greek Science*, p. 395.

[5]The Classical period of the Antique Aegean Civilization — the focus of which is Periclean Athens (479-323 BCE) — extends approximately from 500 to 200 BCE. Instead of Ancient, I prefer the qualifier Antique for distinguishing the Aegean Civilization, comprising mainly the Minoan, Mycenaean, Lydian, Phrygian, Ionian, Laconian, Attic, Macedonian, Thracian and Sicilian cultures, differed from all other Ancient civilizations — the Mediterranean, Egyptian, Mesopotamian, Anatolian, Iranian, Central Asian, Indian, Chinese and the rest — due to the fact that it was to be the birthplace of philosophy-science and, as a consequence of this, of technology. In the other mentioned Ancient civilizations we come across important traditions of wisdom, but not systems of philosophy-science proper.

sound out their cultural as well as natural surrounding, above all expecting straightforward answers for their questions usually in terms of physical reality. Their eager inquiry into the mysteries of nature and the universe was peculiar to the master minds of the Aegean world in Antiquity.

About the Vth century BCE the influence of the Aegean Civilization could be felt almost all over the Mediterranean region. At this time, Athens began to rise to prominence in all matters of culture within the Mediterranean world. Artists, rhetoricians, men of learning ; in short, everybody who held a high esteem of his personal capacities, flocked into Athens. With its manner of conducting affairs, way of living, style of treating its native citizens and aliens, and finally with its particular outlook, the then Athens could be compared to a certain degree to North West Europe and its transatlantic continuation in North America of the Modern Age.

Athens, was of course, not the only and isolated case of intellectual enlightenment in the middle of a crude and desolate cultural environment. There were, indeed, some other notable centres like Miletus, Ephesus, Smyrna, Sardis in Western Anatolia, Mytilene in Lesbos and the Cos island in the Aegean Sea, Byzantium in Thrace, Stagira in Macedonia, Sicily. The city-state of Syracuse was no doubt a genuine rival to Athens in economy, cultural wealth and military power. Like Miletus of Ionia, Syracuse could also be qualified as a brooding-place of some of the outstanding minds Antiquity bestowed on mankind.

Kenneth Dover tells us that a visitor to the Syracusan quarries not beset, as the Athenian prisoners were, by sickness, pain and starvation, had enough spare time to notice that the limestone was full of fossils.

> In the days before the timescale of the history of living beings on Earth was understood [Dover goes on saying] there were three ways in which people could react to the sight of — for example — a fossil fish. They could say, "Isn't it funny, that bit of rock looks just like a fish !", and turn their thoughts back to the day's concerns. Or, "A miracle! God has put a fish in the rock !" Or they could say, "Well, now, I wonder..." A certain Xenophanes, some time in the late 500 BCE, said to himself, "I wonder ...", and drew the conclusion that the distribution of land and water had not always been what it was in his time ; every so often, he suggested, they had combined to form a world of mud, then separated out again, and fossils were the imprints retained by mud which had become solid ...
>
> ...Xenophanes continued the old tradition of speculation about the universe, but he also anticipated the moral preoccupations of Socrates and Plato. What binds these two lines of thought together is inquiry into the nature of God...[6]

[6]Kenneth Dover, *The Greeks*, pp. 46-47.

Remarkably enough, Xenophanes, as far as we know at present, was the first thinker in recorded history to conceiv the idea of a single God, and to offer strong reason to support his position. His reasoning provides a considerable degree of tenacity and therefore cannot easily be refuted. It runs as follows : *Aethiopians have gods with snup noses and black hair, Thracians have gods with grey eyes and red hair.*[7] Then, he continues his assertion :

> But if oxen — and horses — and lions had hands or could draw with hands and create works of art like those made by men, horses would draw pictures of gods like horses, and axen of gods like oxen, and they would make the bodies — of their gods — in accordance with the form that each species itself possesses.[8]

B.The Fact - Faith Discrepancy

Since human beings, unlike other living things, lack to a great extent inborn automatic mechanisms which serve as driving forces, they are left with no option but to find out their way with the help of self-designed guide-tackles, generally known as "beliefs".[9] Human beings perceive, but do not respond automatically to the effects they receive. Every human perception has two sources : the world of experience, and the mind which arranges, and thence shapes what is encountered. Our mind shapes every perceived item according to the previously encounted perceptions, and the thereupon formed impressions, images and notions. The perceived item is, thus, worked up into impressions, images, notions and finally into concepts in conformity with the previous experiences already elaborated by mental schemes. Consequently impressions, images, notions and concepts are not the mechanical results of a mere biotic machinery ; on the contrary, they are the products of man's mental efforts. Each of these products is a belief, which when transposed to the factual world, takes on the form of an action. So, it is evident that actions are movements expressing our beliefs. Furthermore, the broad network woven out of interconnected beliefs is man's other environment, Culture which runs parallel to the biotic one. This network, which encompasses all sides and aspects of human life, depends on a number of basic beliefs. These are generally known as faiths. They are, so to say, unreasoned and unaltarable

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[7]Xenophanes (XVI), q.v. : Kathleen Freeman, *Ancilla to the Pre-Socratic Philosophers*, p. 22.

[8]Xenophanes (XV), q.v. : *Idem.*

9The opinion that the human being, as a member both of the *biosphere* and *Culture*, occupies a position unique among living things is far from being free of controversies. An example of the opposite view can be seen in the statement of Wim J. van der Steen and Bart Voorzanger, *Sociobiology in Perspective*, p. 25. *Human beings, besides being human, are obviously animals. So biology rightfully belongs to the sciences that cover the study of man...*

values which one can either whole-heartedly accept or reject. In case a set of faiths is rejected, then, the entire order of beliefs, attached to that set, collapse. This is the reason why no single, one-dimensional and homogeneous culture embraces the whole humanity. The commun feature of all cultures, however, is that each of them possesses a set of faiths or a credo of principles as foundation. In due course, firmer and ever more enticing sets of faith have evolved. So are to be considered Xenophanes' assertions concerning God. He tried hard to dissociate God from all sorts of possible associates, and to tie all principles, by which we can explain everything, material as well as spiritual, taking part in the universe, to the creed in the Supreme Being. Each being and process whether actual or potential will henceforth be measured against and judged by this Omnipotent-Omnipresent-Omniscient-Supreme Being which transcends every perceivable and imaginable feature, being, event or process. He is unique, unequal, unprecedented, dissimilar and unimitable. hence, even though, He is, of course, rejectable, refusable, He cannot be refuted.

C. The All-Embracing Principle

The shift from idolatry to the faith in a transcendent Supreme Being paved the way for a tight and consistent system of beliefs, and raised abstract and rational thinking considerably.

Idolatry, consisting of the most colourful folk tales and myths, reflected people's fancy beliefs of gods permanently in all sorts of activities. Thus we are told by Xenophanes that both *Homer* and *Hesiod* have attributed to the gods all the things which are shameful and a reproach among mankind : theft, adultery, and mutual deception.[10]

The popular mind believes, or better, again in Xenophanes' own words,

> ...mortals believe the gods to be created by birth, and to have their own — *mortals* — raiment, voice and body.[11]

> Truly, gods have not revealed to mortals all things from the beginning ; but mortals by long seeking discover what is better.[12]

Thus the *seeking* and *reasoning* mind may find out step by step the hidden aspects of the universe. But for setting out on such a long and arduous journey we need a strong, reliable and an overlooking springboard. Xenophanes indicates this "springboard" in an unwavering voice to be the

[10] q.v. : Xenophanes (XI), *op cit.*, p. 22.

[11] Xenophanes (XIV), q.v. : *Idem.*

[12] Xenophanes (XVIII), q.v. : *Idem.*

...one God, among gods and men the greatest, not at all like mortals in body or in mind.[13]

> He sees as a whole, thinks as a whole and hears as a whole.[14] But without toil He sets everything in motion, by the thought of His mind.[15]
>
> And He always remains in the same place, not moving at all, nor is it fitting for Him to change His position at different times.[16]

Hereafter a solid foundation, on which a consistent structure could be built, had been obtained. Since there was the necessary steadfast basis, irreducible to any further one, and the resolute will to learn, the desire for knowledge, so the unique, unprecedented event could take its start from now on : to inquire into and thereby to uncover methodically and coherently the unknown. Notice, how clearly Heracleitus of Ephesus expresses us this fact : *Men who love wisdom must be inquirers into very many things indeed.*[17] Inquiry, however, does not proceed on its own. It needs, first of all a firm basis and a methodology consisting of testable and verifiable components. That is to say, we are not entitled to use any verbal or material element we find on our way toward the end of our inquiry. It must fit into the logical framework of our inquiry and it ought to be testable and verifiable by others. This, of course, is not a condition which binds us in the course of our daily lives. Therefore the person who lives from day to day and has nothing to do with inquiry *...is apt*, in Heracleitus' words *to be in a flutter at every word (logos).*[18] In the tide of inquiry we strive towards a consciously composed coherent order within which there is no room for unwarrantable and randomly gathered elements. Only acquired results within such an order are transmittable, and thus verifiable by other researchers. Consequently, again this kind of an order is the necessary condition for communication. Heracleitus tells us this in his own phraseology : *To those who are awake, there is one ordered universe common — to all —,whereas in sleep each man turns away — from this world — to one of his own.*[19] Furthermore the building blocks of —*i.e.* the "beliefs" that make up — an Order are the necessary valuations, the "measures" in reference to which we carry out all our mental and material activities. Without these "measures" not only philosophico-scientific investigations were to become impossible, but our whole culture and

[13]Xenophanes (XXIII), q.v. : p. 23.

[14]Xenophanes (XXIV), q.v. : *op cit.*, p. 23.

[15]Xenophanes (XXV), q.v. : *Idem.*

[16]Xenophanes (XXVI), q.v. : *Idem.*

[17]Heracleitus (XXXV), q.v. : Kathleen Freeman, *Ancilla to the-Socratic Philosophers*, p. 27.

[18]Heracleitus (LXXXVII), q.v. : *op cit.*, p. 30.

[19]Heracleitus (LXXXIX), q.v. : *Idem.*

therewith our humanness would collapse. This is the very reason why Heracleitus reveres *Measure : The sun will not transgress his measures ; otherwise the Furies, ministers of Justice, will find him out.*[20] Here we can see that the sun, as a life bestowing might, symbolizes for Heracleitus an important guide mark in charting the physical features of the universe. It is, however, subjected to something far more substantial, far more decisive : Justice. Even as the source of light and heat and as a heavenly body the sun is not exempt of alteration. Like everything else it underlies the guidance and control of Justice which has no counterpart in the world of matters.

To recognize the fact or existence of change in the physical world does still not mean to adhere to relativism, so long as the reason and the sense of material things and processes are sought in an immaterial sphere. Ontological relativity is the relation of each event or process to another or others in terms of space and time. Relativism, on the other hand, is a doctrine promulgating that, whatever its power of comprisal, embodiment and abstraction might be, no notion, no concept is in a state to assume the role of a principle or an axiom of absolute validity, with which every event and process in the material realm can be explained and evaluated. In case, however, we deny the mutability of the components of which the material universe is composed, we, then, refuse to acknowledge the processive quality of things and events. This may eventually push us towards a dogmatism.

It is difficult to blend a conception of a world, submitted to a ceaseless process, and full of haphazard events and things, with a rigidly built-up, motionless, static view about the cosmos. In the Antique Aegean world, which is generally accepted as the cradle of the Occidental philosophico-scientific civilizations, two outstanding thinkers have tried hard to overcome this obstacle. One of them was Heracleitus. Beside Parmenides, he was the first to ask genuine metaphysical questions. Such questions indeed led to philosophy-science's problem-treasury in subsequent ages.

As stated above, Heracleitus admits the fact of ongoing change, and this we can clearly see in his famous passage : *In the river, we both step and do not step, we are and we are not.*[21] Being an integral part of nature, our corporeal side is also submitted to continuous alteration. But there is still something which transcends this corporeality, and there by our ever altering features : the affirmation, "I am". This affirmation of "my" 'being'[22] stands

[20]Heracleitus (LCIV), q.v. : *op cit.*, p. 31.

[21]Heracleitus (XIXL a), q.v. : *op cit.*, p. 28.

[22]I have always wondered if Parmenides and Heracleitus had not written in an Indo-European language, like Ancient Greek, how they could possibly have managed to lay the foundation stone of ontology-science. For instance, in Turkish, which is not an Indo-European language, you will hardly find a linguistic form corresponding to the infinitive "to be", and its eventually substantivized derivative "being".

in contraposition to "my" own incessant "becoming" as well as that which surrounds "me". The whole physical reality "flows". But if we cling to this "steady flow" and take it as the sole Reality, we shall never be entitled to make any statement concerning our own selves and the phenomena around us. Even in order to grasp the "flow" of "becoming" in and around us, we need something that does not change. "Being" is that something. The extreme multiformity of the universe is the product of the steady "flow", that is, of the "becoming". However, this state of affairs, according to Heracleitus, does not reveal to us genuine Reality. The great multiformity we see in nature, reflects to us a glimpse of the enormous wealth of shape and colour Reality has in store. The one who holds on to the essential principle, will be saved of getting drowned in the torrent of the changing features of nature. Heracleitus expresses this point in the following way : *When you have listened not to me but to the Law* (Logos), *it is wise to agree that all things are one*[23].

Heracleitus, like Xenophanes, takes it for granted that both the unswerving order of the outside world — which runs according to the material principle, "fire" — and the rules of the concatenation of thoughts — which obey the *Logos* — depend on the harmony established by God. Since mind works alongside the physical world order, he who has grasped the right manner of thinking will also be able to understand what he comes to see and eventually to observe. In other words, if we can link up our thoughts with each other in the manner *Logos* expects us to do, then, we shall be capable of discovering the hidden connexions between events occurring out in the physical realm. Hence when we start to look at the multiplicity of things and happenings from Logos' unitary point of view, we will come to see that there is homogeneity underlying all steadily mutating heterogeneity. Heracleitus says:

> If we speak with intelligence, we must base our strength on that which is common to all, as the city on the Law (*Nomos*), and even more strongly. For all human laws are nourished by One,[24] which is divine. For it governes as far as it will, and is sufficient for all, and more than enough.[25]

Heracleitus' God, we are told by Daniel Babut, *is the "ever-living fire" on which the eternal and immutable world order depends. In other words, it is an immanent principle, found in all things, whose aspects and appellations vary as much as the manifestations in the World.*[26] So let us look at Heracleitus' own statement about the subject-matter :

[23]Heracleitus (I.), q.v. : *op cit.*, p. 28.

[24]Due to their distinctive meanings I have capitalized some of the words appearing in the translations.

[25]Heracleitus (CXIV), q.v. : *op cit.*, p. 32.

[26]Daniel Babut, *La Religion des Philosophes Grecs*, pp. 29-30, translated from French by me (T. Duralı).

> God is day-night, winter-summer, war-peace, satiety-famine. But the changes like "fire" which when it mingles with the smoke of incense, is named according to each man's pleasure[27].

The above-mentioned unitary unique Principle, however, according to Daniel Babut, is a transcendent Being ; *because the world-forming fire is merely a minimal part of the universal heavenly fire*[28].

Moreover in Heracleitus' vocabulary, "the heavenly One" connotes "God", the formative and reregulative power, from whom all the multiformity of the phenomenal world springs and to whom it eventually returns revolving the strifes, frictions and dissonances between its components. Heracleitus conveys this state of strife between the phenomena in a rather figurative manner : *War is both king of all and father of all, and it has revealed some as gods*[29]*, others as men*[30]*, some it has made slaves, others free*[31].

Just as Empedocles will tell us at a later date, Heracleitus speaks about a constant merciless struggle that lashes out in the universe, and finally rages itself to a standstill at the Divine (*theion*) level. One should know says Heracleitus, that war is general — universal — and jurisdiction is strife, and everything comes about by way of strife and necessity[32]. But at last the relentless, furious storm will die down in the heavenly Haven which combines all the contrary forces, supra : fragment : LXXVII. This "Haven", more overtly expressed, God represents, accordingly, Being in its totality. As humans, nonetheless, we perceive this Being just from a certain point in time and space coordinates. Consequently we conceive and determine this unitary and total Being partially. Every time we change our position, we come across a new aspect in regard of Being. The more we experience and try harder physically as well as mentally, the more we are apt to find out about those innumerable parts of Being which remain still uncovered. In connexion with this subject-matter Heracleitus tells us that *which is wise is one : to understand the purpose which steers all things through all things*[33]. *Then, he leads us to the conclusion that men who love wisdom must be inquirers into very many things indeed*[34].

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[27]Heracleitus (LXXVII), q.v. : *op cit.*, p. 29.

[28]Daniel Babut : *op. cit.*, p. 30, my translation (T. Durali).

[29]Heracleitus probably intends to say "extraordinary heros".

[30] "ordinary men" -T. Durali.

[31]Heracleitus (LIII), q.v. : *op. cit.*, p. 28.

[32]Heracleitus (LXXX), q.v. : *op. cit.*, p. 30.

[33]Heracleitus (XLI), q.v. : *op. cit.*, p. 27.

[34]Heracleitus (XXXV), q.v. : Idem. N.B. Heracleitus is, as far as we know at present, the first to determine and to use the term "love of Wisdom", that is to say, "φιλο-σοφια", philosophy" proper, q.v. : Eduard Zeller, *Outlines of the History of Greek Philosophy*, p. 23.

So we see that in order to comprehend what is going on, we must get to terms with the Law (*Nomos*) of the outside world, through the Law (*Logos*) on which each of us depends. But since we are, only partly able to comprehend the Law of the outside world via our own Law, so, we ought to learn about ourself and the Law which reigns over us and forms us. This is the reason why wise men in olden days preached incessantly the motto which later came to be formulated in the watchphrase : "Know thyself !"[35] It is first of all through "my" own reason that "I" become aware of the perenni order which "I" recognize to be universal after having come into contact with other rational beings, with human beings, and observed physical events happening in sequences. In this way "I conceive" that "my" "inner" order has its counterpart in the "outside" world. Therefore if "I acquire" a more profond understanding of the underlying Law (*Logos*) of "my" mind, I shall be able rationally to interpret the ongoing events outside "myself". This was the manner eventually adopted by Aristotle when he tried to unriddle nature. In doing so, he was principally following the line drawn by a certain tradition of thought : namely, the Xenophanean-Heraclitean-Parmenidean-Socratic-Platonic tradition. He, of course, was more than a dull, devoted follower, an adept of this line. He can solely be regarded as the culmination of the Classical period of the Antique Aegean thought. With him, philosophy, of which Heracleitus[36] and Parmenides might be considered as the forerunner, assumed an altogether new outlook.

II. THE EMERGENCE OF PHILOSOPHY-SCIENCE
From Speculative To Non-speculative Metaphysics

Accordingly philosophy sorts from the speculative era and begins to investigate nature closely. What particularly distinguishes the trend, extending from Xenophanes and Heracleitus to the Sophists and Socrates, deriving then its classical form from Aristotle, and carried on further by Theophrastus and Galen, is the state of complete fusion of philosophy and science — thence the great tradition of *philosophy-science* in the *Occidental civilization.*[37]

[35]Q.v. : Eduard Zeller *op. cit.*, pp. 18 and 19.

[36]The Period from Thales up to Heracleitus and Parmenides could be regarded as transition from *constructions of wisdom* to philosophy. And philosophy, in turn was for the first time systematized by Plato.

[37]The Community of occidental civilizations comprise mainly the *Antique Aegean*, the *Mediaeval Judeo-Christian* as well as *Islamic*, and finally the *Modern European civilizations*. This Community has sprouted out of a common "seed", the *mesopotamian* primeval civilization. Then it has been enriched and built out by the *Monotheistic* and *Revelational Religions* originating from West Asia — or, the East Mediterranean—, and with the emergence of *philosophy-science* at the Classical period of the Antique Aegean civilization, later bearing its fruit, the *technology*.

At the earliest stages of this trend there is still no distinction between speculation and empirical research.

> Astronomy and mathematics as well as all branches of natural knowledge, and in the beginning even medicine, were all included in the scope of philosophy, the last named science being the first to detach itself as a practical τέχνη. Only ἱστορίη, the combination of history and geography, as practised by the Ionic logographers and Herodotus, stands, apart, and even here the dividing line is not always sharply drawn. Ionic philosophy in its first representatives, considered from a methodolical point of view, is pure dogmatism[38].

With Aristotle *philosophy* attains the particular stage where it starts to develop the *sciences*, its so-called "feelers". Through the sciences, indeed, philosophy reaches out to the phenomenal real. Thus Aristotle can be regarded as the founding father of philosophy—science, and the first known thinker to define the confines in the philosophico-scientific conception. His way of thinking and researching was not solely determined by the aforestated line. He, no doubt, was also to some extent influenced by the other two thought currents, which differed in almost all respects from the one that came down from Xenophanes, through Heracleitus and Socrates to Plato. Although the other mentioned currents stood rather for dissimilar world views, they at least shared the conception of a nature and of a world devoid of sanctity and of any form of determinateness. They categorically refused all kinds of mystifications of man and the whole nature, which in fact appealed to the popular mind.

Aristotle took over from the *Sophists* the liability towards doubt and questioning ; from the Atomists the keenness to look with closer attention at nature and to describe natural events with a sober language — one that is dispassionate and free from subjective elements. Aristotle set up the science of logic, leaning on the art of arguing known as dialectics.The dialectical manner of thinking makes its first appearance in Heracleitus' conception about the universe, which posits that everything results from the interactions of opposites. Afterwards, in the Sophists', and under their influences in Socrates' cases we see dialectics as a method of argumentation. Beside the Sophists, Aristotle was substantially influenced by the Atomists whom some of our modern tendentious historians of philosophy-science like so much to brand as the precursors of Materialism. On the basis of this heritage, Aristotle set out to devise the methodology, purpose and conception of the philosophico-scientific endeavour. In his ingeniously contrived enormous philosophico-scientific system, sciences, each of them dealing with a definite section of reality, are supposed to gather the so-called "raw material" from the physical and social environments. This "raw material" is worked up into

[38]Eduard Zeller, *Op. cit.*, p. 24.

knowledge through theoretical operations in the non-speculative metaphysical kernel of a philosophico-scientific system. In this way we obtain general pictures about the various parts of the physical realm. Aristote says:

> In every kind of theoretical investigation and every way of teaching, whether the more noble or the more ignoble, there appears to be two notions of proficiency: the one is called science while the other is a sort of skill, or education[39].

Furthermore, in establishing coherent connexions between theories, corresponding to related domains, we acquire an all-comprising structure, called system. And to underpin a system is indeed the task of metaphysics[40]. This, however, is not a unitary, not a compact fabric. Metaphysics comprises, in fact, two opposite structures : *the speculative* and *non-speculative metaphysics*. This distinction I have designed following suit to Immanuel Kant's outstanding finding according to which questions expecting logically as well as empirically warrantable answers give rise to *transcendental structures*, whereas those not entitled to await justifiable replies bring about transcendent constructions. The latter ones are the causes of *antinomies*[41]. Antinomic answers are, in turn, the sources of both various sorts of dogmatisms, and relativisms, which eventually may end up in nihilisms.

III. THE BOUNDS OF CHANGE

A. In Search of Changelessness

From all that I have told until now, it will be understood that Aristotle, in his time, was confronted chiefly with thre lines of thought currents :

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[39]Aristotle, *Parts of Animals*, I, 1, 639a (1-4) ; q.v. : Thomas Kiernan, *Aristotle Dictionary*, p. 438.

[40]"Metaphysics... the most general and fundamental of studies... its method will be non-empirical, or *a priori*, not because, like transcendent metaphysics it claims to be concerned with a realm of object inaccessible to experience, but because it is concerned with the conceptual structure which is presupposed in all empirical inquiries. This kind of investigation Kant sometimes calls "transcendental", as distinct from "transcendent"... P. F. Strawson, *The Bounds Sense*, p. 18.

[41]"The transcendental antithetic is in fact an investigation of the antinomy of pure reason, its cause and its results. If we apply our reason, not only to objects of experience, in order to make use of the principles of the understanding, but venture to extend beyond the limit of experience, there arise rationalizing or sophistical propositions, which can neither hope for confirmation nor need fear refutation from experience. Every one of them is not only in itself free from contradiction, but can point to conditions of its necessity in the nature of reason itself, only that, unfortunately, its opposite can produce equally valid and necessary grounds for its support", Immanuel Kant, *Critique of Pure Reason*, B 449, p. 340.

— the one accepting a supernatural source for all events, material as well as spiritual, accordingly a necessary universal order wherein everything moves from a certain starting point towards a definite end ;
— the other that refuses any source, to say nothing of a supernatural one ; processes mechanically concatenated incessantly go on ; "becoming" is a beginningless as well as an endless "flux" ;
— lastly that particular thought current which rejects, not only any notion of source and purpose, but also the order considered to prevail throughout the universe.

The thinkers of the first main current can be further classified as being the adherents of one or the other of the two "sub-currents" :

— the Parmenidean-Platonic line where the phenomenal world is either not considered at all or is only accepted as an epiphenomenon of the ideal-spiritual realm ;
— the Heraclitean tradition within which the phenomenal world enjoys full consideration, in spite of the fact that through *Logos* the Heavenly Almightiness exerts the basic formative and purpose-indicating power.

Aristotle sided with the Heraclitean trend in the study of nature. He was aspiring to learn why and how this ceaseless alteration, this relentless coming-to-be and passing-away happened. Moreover, he wanted to reach beyond change. Indeed our study of the physical environment and culture should involve some constant factors. Constancy, according to Aristotle, first and foremost characterizes the pure forms of our thought that underly any investigation. Furthermore, our capacity of investigation, intuition and finally reasoning enables us to comprehend our "Self" regarded as the sole instrument with which we can set out for investigations.

First of all the Universe has to be an ordered unity. This is partly the basic faith upon which Aristotle's system of philosophy-science reposes and partly the outcome of his thorough-going observations.

The order of every class of being, reflects in its final analysis the world"s perpetual harmony which in turn is based on the infinite oneness of the shaper and prime mover of the Universe[42]. Change, alteration and even

[42]In Aristotle's view the logical and ontological structures run exactly parallel. Both are submitted to the same *universal order*. Therefore any knowledge that we work out within our logical 'machinery', and the source of which is the empirical data we receive, must reflect us that particular fact or phenomenom to which it corresponds. A specific logical construction, that is, a theory, if founded on a certain fact, will yield the sort of knowledge about whose truth we need not to question any more. Thus Aristotle tells us in

transformation are not excluded from Aristotle"s world picture, contrary to what generally his much later-day commentators believed and made us believe. These changes, however, do by no means occur haphazardly and mechanically. This is in fact the crucial point, which is almost always overlooked and missed. There is no logical condition that compels us to place the notion of *change* on the same footing as randomness. Moreover, if *necessity* is scientifically indemonstrable, so must be the case with *randomness*. Indeed, in both cases we are confronted with a question of faith.

B. From Becoming (Coming-To -Be) Towards Evolution

Aristotle's system is the turning point in the passage from speculative to non-speculative metaphysics, the basis of scientific endeavour. Besides, we witness in his investigations on the living things the advent of the problem of evolution in its proper sense, that is, the process where in interspecific transformations take place. In his studies on the living things, evolution develops into a distinctive feature of the problem of becoming. Here we

the *Generation of Animals*, III, 10, 760b (30) :

> ...This, then, appears to the state of affairs with regard to the generation of bees, so far as theory can take us, supplemented by what are thought to be the facts about their behaviour. But the facts have not been sufficiently ascertained; and if at any future time they are ascertained then credence must be given to the direct evidence of the senses more than to theories and to theories too provided that the results which they show agree with what is observed.

Now, what concerns the universe's shaper and prime mover Himself, here elliptically rendered, Aristotle reveals the following points :

> ...God is always in that good state in which we sometimes are, this compels our wonder; and if in a better this compels it yet more. And God is in a better state. And life also belongs to God ; for the actuality of thought is life, and God is that actuality; and God's self-dependent actuality is life most good and eternal. We say therefore that God is a living being, eternal, most good, so that life and duration continuous and eternal belong to God; for this *is* God.
>
> It is clear... that there is a substance which is eternal and unmovable and separate from sensible things. If has been shown also that this substance cannot have any magnitude, but is without parts and indivisible for it produces movement through infinite time, but nothing finite has infinite power... But it has also been shown that it is impassive and unalterable; for all the other changes are posterior to change of place.
>
> ...The first principle or primary being is not movable either in itself or accidentally, but produces the primary eternal and single movement. But since that which is moved must be moved by something, and the first mover must be in itself unmovable, and eternal movement must be produced by something eternal and a single movement by a single thing, and since we see that besides the simple spatial movement of the universe, which we say the first and unmovable substance produces, there are other spatial movements — those of the planets — which are eternal — for a body which moves in a circle is eternal and unresting; we have proved these points in the physical treatises (*cf.*: *Physics*, viii, 8, 9 ; De Caelo, i, 2, ii, 3-8), each of these movements also must be caused by a substance both unmovable in itself and eternal, Aristotle *Metaphysics*, 11, 8, 1072 b (25,30,35) ; 1073 a (5,10,15,20,25,30,35).

already come across the impacts, yet hardly noticeable, exerted by the Sophists and the Atomists alike, according to whom matter possesses weight, density and hardness, but is primordially inanimated. Aristotle does not take any more for granted that the universe, at least in its appearance, is filled only with enlivened things. He, indeed, finds himself in a more or less dubious situation. Even if in his time the opinion was getting ever more widespread that something of a hiatus between the spiritual (*ψυχή*: spiritual being) and the material (*τὸ σόμα*: material being) existed, which effectively separated the animated (*ἔμψυχος*) from the inanimate (*ἄψυχος*), and ultimately the "understanding living being" (*ζῷον νοητόν*) from the "perceiving living thing" (*ζῷον αἰσθητικόν*), the assumption of a connexion between these two principal spheres of being had not been given up altogether. Basically the universe itself was still accepted as an animated being by the majority. Accordingly everything is imbued with soul. More explicitly expressed, every actualizing thing assumes a certain shape, and this is a *spiritual* (*pneuma* : spirit) activity. Before and above all comes the distinction between *form* and *matter*, which is present throughout the world: where something else as being more perfect, the defining and effecting, the former is called the formed or the real, and the latter the *potential* or the *unformed*. Hence when matter assumes its own form, we speak, according to Aristotle, of becoming (coming-to-be). So each *potential* (*δυνάμει ὄν*) *becomes* (*γίγνεται*) a *real ἐνεργείᾳ ὄν*).

The relation of form to matter yields the concept of motion (*ἡ κίνησις*) or, what is nearly the same, *change* (*μεταβολή*) to which everything in the world that contains matter is subject[43]. *Motion*, in Aristotle's view, is therefore, *the fulfilment of what exists potentially, in so far as it exist potentially...; of what can be increased and its opposite what can be decreased...; of what can come to be and can pass away...; of what can be carried along, locomotion.*[44] Taking, at least, merely our Earth into account, and leaving his controversial speculations about the celestial bodies aside, for Aristotle there is an incessant passage from the formless matter, the potential towards the formed matter, the real. Furthermore the formed matter makes up the sensible substance, the *singular being*, the *individual* which basically is apt, nay, bound to change. Because each power that has reached the perfect formal stage it expects to attain, will thence eventually assume the role of being a power, a potential to be actualized, to become reality. Thus each being possesses a polarity in itself: its reality (*ἐνέργεια*) as well as its potentiality (*δύναμις*). No being on Earth is either pure potentiality or absolute reality. In other words, each real thing bears within itself the seeds for a certain forthcoming new real thing. Expressed in a different manner, each real thing is in fact the potential of the real thing to which it is to give

[43]*Cf.*, Eduard Zeller, *op. cit.*, p. 176.

[44]Aristotle : *Physics*, III, 201a, (10).

birth. Therefore each forthcoming actualization is determined by its forthbringing reality[45]. While we onlookers cannot discern the determinations -gnosiological indeterminableness — of the forthcoming real thing in its potential stage, it, in fact, is determined — for it is factually there — by its forthbringing reality, that is, in its potential stage — *ontological determinedness*.[46] Since we onlookers are outsiders and therefore unable to pin down the determinations of a forthcoming real thing right in the bosom of its forthbringing real thing, how can we say that the forthcoming real thing is already determined by its forthbringing real thing? Indeed by contemplating the particular events we arrive at something of a universal order from where, then, we can draw analogies for the comprehension of sensible substances which are the only real things. As a matter of fact, *of all things* says Aristotle, *there is order, and every time and life are measured by a period; except that all are not measured by the period, but some things by a less and others by a greater*[47].

The *living* in distinction to the *non-living* is the being endowed with an "awoken soul", the "life-principle" which forms its relevant tool, the body. Since *soul* is the first *entelechy, body* is the tool (*organon*) by which the *formative-principle* (the soul) gets actualized. Therefore the living thing is — with a present-day term — an "organism" — soul's organized body ; again in other words: the body organized by the soul[48]. Such a body, for fulfilling its various specific life-functions, possesses "secondary tools", the organs. Since the soul is found in everything,[49] thence it remains only a question of whether it is asleep or awake: *In the life of the soul there are sleep and awakening*[50]. As a result of the foregoing assertion it becomes clear that the living and the non-living share a *substratum*. To think the other way round would, as a matter of fact, contradict the Aristotelian logic

[45]Aristotle, *On Generation and Corruption*, II, 4, 331 b (35-36) : *Those elements which are changed from one into one, are generated from one thing being corrupted; but those which are changed from more than one thing corrupted.*

[46] Aristotle, *On Interpretation*, IX, 18 b (35); 19 a (5) :

> ...it is manifest that the circumstances are not influenced by the fact of an affirmation or denial on the part of anyone. For events will not take place or fail to take place because it was stated that they would or would not take place, nor is this any more the case if the prediction dates back ten thousand years or any other space of time wherefore, if through all time, the nature of things was so constituted that a prediction about an event was true, then through all time it was necessary that that prediction about an event was true, then through all time it was necessary that that prediction should find fulfilment; and with regard to all events, circumstances have always been such that their occurence is a matter of necessity. For that which someone has said truly that it will be, cannot fail to take place; and of that which takes place, it was always true to say thit it would be.

[47]Aristotle, *On Generation and Corruption*, II, 11, 336 b (12-14).

[48]*Cf.* Aristotle, *Parts of the Animals*, I, 27, 43 a (25-35).

[49]*Cf.* Aristotle, *On the Soul*, III, 8, 431 b (20).

[50]Aristotle, *On the Soul*, II, I, 412 a (25).

according to which the emergence of a thing from something totally dissimilar is impossible. Necessarily, the soul says Aristotle, cannot be substance, except as from of a natural body that has life potentially[51]. Thus any natural body, whose soul awakes, is turned from an *inanimated* -in modern terms, from an "inorganic" — thing into an *animated* —"organic"— being. Once a group of beings are *vitalized* — have their souls "awoken"— then, they will go uninterruptedly on producing beings of their kind. Even if crossing from one group with a certain outlook — shape —, way of feeding, of reproduction and locomotion over to another one is ever possible, it is still out of question that a whole group of living beings may fall back to its primordial state of inanimateness. The single being, the individual, on the other hand, wanes away, thus disintegrates[52] when its *life-principle*, the soul is snuffed out.

Consequently, the genesis, and then the succeeding life history of a particular living group depends upon the development of the souls of its constituting individuals. So we see according to Aristotle that a living group comes to be, then proceeds through an interplay of innumerable factors related in varying degrees to each of the living things forming that particular group or assembly. Each being encloses its own formative power. The same is true for the living group. Because like individuals, groups made up of these bear their purposes within themselves. It is in the course of their life history that the individual's as well as the species' innate purposes sprout: this process is known as DEVELOPMENT Before turning our attention upon its connotations, let us first take up the etymological basis of it briefly. The word development derives from two Latin components: namely, *dis-* and volopar. When these are put together they form the infinitive *disvolopar* (or, *disvolupar*) which means to unwrap, disentangle, rid free. Hence *development* has the subsequent connotations which are relevant to the present study:

1- A gradual unfolding, a bringing into fuller view; a fuller disclosure or working out of the details of anything, as a plan, a scheme... That in which the fuller unfolding is embodied or realized;
2- ...bringing out from a latent or elementary condition; the production of a natural force energy, or new form of matter;
3- the growth and unfolding of what is in the germ...;
4- gradual advancement through progressive stages, growth from within[53].

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[51]Aristotle, *On the Soul*, II, 1, 412 a (20) q.v., Thomas Kieman, *Aristotle Dictionary* p. 460.

[52]*Cf*... Ludwig von Bertalanffy, *Problems of Life*, p. 125 (footnote); also for the definition of the "individual", ref. F. J. J. Buytendijk, *Mens en Dier*, p. 49.

[53]"Develop" and "development" in *Oxford English Dictionary*, column: 280, p. 707, vol. I.

Thus it is clear that in the Aristotelian sense, both the alterations of individual living beings and transformations occuring between groups of living things are developmental processes. Consequently, seen from the phenomenal angle Aristotle's world of living things is not static; it is mobile. This conception of mobility, nonetheless, does not imply inconstancy, and is not void of meaning, causal necessity, and purposive directiveness. Here resides in fact the chief unconformity between the views of the *developmentarian manner*[54] of alteration and transformation, put forward by *Aristotle*, thenceforth followed and supported by almost all the ancient students of the living things, and the *evolutionary method* of investigating the biotic sphere, applied by most of the contemporary biologists from especially Charles Darwin's epoch-making formulation of the principle of "*natural selection*,[55] onwards.

[54]According to the developmentarian view:

> there are always horses because horses tend to beget horses. This happens so regularly because in these cases the efficient, formal and final causes are one. The efficient cause of a horse is the essence if its male parent; its formal cause is this same essence embodied in itself; and its final cause is again its essence, since the individuals of species naturally strive to realize as perfectly as they can the essence of their species.
>
> It was this combination of factors which led Aristotle to argue against organic evolution. It should have led him to argue against spontaneous generation as well... David L. Hull, *The Metaphysics of Evolution*, p. 317.

Contrary to development, evolution in our time rejects any conception of *directionism* or *entelechy*. It is not a drive towards definite morphological ends by immaterial *forces* or *life-principles*. Furthermore, seen from a universal standpoint, it is not a wholesale progressive change towards sublime goals. Theodosius Dobzhansky says :

> Evolution involves alterations of the genetype, the hereditary endowment, of evolving species. Modifications of the phenotype, owing to environmentally induced changes in the manifestation of the genotype, are obviously important in evolution. Indeed, what survives or dies, reproduces or remains childless is only indirectly conditioned by the genotype, through its enteractions with the environments moulding the phenotype. Nevertheless, without genotypic change the subsequent generations start from the same old base, and phenotypic changes can be reversed by return to the old environments. Fixity of the changes requires a genetic foundation. Any theory of evolution must, therefore, provide an account of the origin of genetic changes. At present we know two types of genetic changes, mutation and recombination of genetic materials. Theodosius Dobzhansky, *Chance and Creativity in Evolution*, pp. 312-313.

[55]Since Aristotle refused categorically any suggestion of fortuitousness, he, of course, is not expected to tolerate an idea which would even hint at *natural selection*. According to this principle, in nature — or more generally, in the universe — there in this context to Heracleitus' passage about the universal struggle at page ? of this paper. Where "struggle", "strife", reigns, there is no order, no necessity, *Chaos*. In Aristotle's view, however, the universe is an ordered whole, — *Cosmos* — , subjected to and administered by the eternal Law of Reason (*Logos*). This is why Aristotle attacks vehemently Empedocles' consideration about the coming-to-be, and the development of the living things :

> Where, then, everything turned out as it would have if it were happening for a purpose, there the creatures survived, being accidentlly compounded in a suitable way; but where this did not happen, the creatures perished and are still, as Empedocles says of his "man-faced ox-progeny", Aristotle, *Physics*, II, 8,

Now, let us have a look at the passage in *History of Animals* where Aristotle tries to explain the genesis and the further development of the living things :

> Nature proceeds little by little from things lifeless to animal life in such a way that it is impossible to determine the exact line of demarcation, nor on which side thereof an intermediate form should lie. Thus, next after lifeless things in the upward scale comes the plant, and of plants one will differ from another as to its amount of apparent vitality ; and, in a word, the whole genus of plants, whilst it is devoid of life as compared with an animal, is endowed with life as compared with other corporeal entities. Indeed as we just remarked, there is observed in plants a continuous scale of ascent towards the animal. So, in the sea, there are certain objects concerning which one would be at a loss to determine whether they be animal or vegetable. For instance, certain of these objects are fairly rooted, and in several cases perish if detached ; thus the pinna is rooted to a particular spot, and the solen (or razorshell) cannot survive withdrawal from its burrow. Indeed, broadly speaking, the entire genus of testaceans have a resemblance to vegetables, if they be contrasted with such animals as are capable of progression.
>
> In regard to sensibility, some animals give no indication whatsoever of it, whilst others indicate it but indistinctly. Further, the substance of some of these intermediate creatures is fleshlike, as is the case with the so-called tethya (or ascidians) and the acalephæ (or sea-anemones); but the sponge is in every respect like a vegetable. And so throughout the entire animal scale there is a graduated differentiation in amount of vitality and in capacity for motion.
>
> A similar statement holds good with regard to habits of life. Thus of plants that spring from seed the one function seems to be the

198 b (30); also q.v.: G. S. Kirk and J. E. Raven, *The Presocratic Philosophers*, paragraph. 447, p. 337.

In connexion with Aristotle's rejection of any sort of idea concerning "natural selection", "fight for existence", "survival of the fittest" and the like, Marjorie Grene makes the following statement :

> Aristotle presents his concept of "that for the sake of which" as guide to the study of nature in opposition to the thinking of Empedocles, who would elicit the phenomena of the living world, without ordered ends, out of a combination of chance and necessity. At one stage in cosmic history, Empedocles imagines, there were heads and trunks and limbis rolling about the world. Those that happened to come together in a viable combination survived; the others perished. This was a very crude theory of natural selection, to be sure, but a theory of natural selection, nevertheless. Aristotle as a practising biologist objected: ox-headed man progeny and vine-bearing olives, such as Empedocles envisages in his transitory world, are an absurdity. What we *always* have in nature is the ordered passage to a definite endpoint: man to man, cattle to cattle, grape to grape, olive to olive. Only where there are such functioning ordered series does the study of life begin, Marjorie Grene, *Aristotle and Modern Biology*, p. 82.

reproduction of their own particular species, and the species of action with certain animals is similarly limited. The faculty of reproduction, then, is common to all alike. If sensibility be superadded, then their lives will differ from one another in respect to sexual intercourse through the varying amount of pleasure derived therefrom, and also in regard to modes of parturition and ways of rearing their young. Some animals, like plants, simply procreate their own species at definite seasons; other animals busy themselves also in procuring food for their young, and after they are reared quit them and have no further dealings with them; other animals are more intelligent and endowed with memory, and they live with their offspring for a longer period and on a more social footing.

The life of animals, then, may be divided into two acts : procreation and feeding ; for on these two acts all their interests and life concentrate. Their food depends chiefly on the substance of which they are severally constituted ; for the source of their growth in all cases will be this substance. And whatsoever is in conformity with nature is pleasant, and all animals pursue pleasure in keeping with their nature[56].

About the same subject Aristotle speaks anew in his *Parts of Animals :*

The Ascidians differ very little in their nature from plants, but they are more akin to animals than the sponges are, which are completely plants. Nature passes in a continuous gradation from lifeless things to animals, and on the way there are living things which are not actually animals, with the result that one class is so close to the next that the difference seems infinitesimal. Now a sponge, as I said just now, is in all respects like a plant: it lives only while it is growing on to some thing, and when it is pulled off it dies. What are called Holothuria and Sea-lungs and other similar sea-animals differ only slightly from the sponges in being unattached. They have no power of sensation, but they live just as if they were plants unattached to the soil. Even among land-plants such instances exist: living and growing either on other plants or quite unattached: for example, the plant found on Parnassus, sometimes called the Epipetron (Rockplant). If you hang this up on the pegs it will keep alive for a considerable time. Sometimes it is doubtful whether these Ascidians and any other such group of creatures ought to be classed as plants or as animals : In so far as they live only by growing on to some other object they approach the status of a plant ; but yet they have some fleshy substance and therefore probably are capable of sensation of a kind[57].

[56]Aristotle, *History of Animals,* VIII, 1, 588 b (5, 10, 15, 20, 25, 25, 30) ; 589 a (5).
[57]Aristotle, *Parts of Animals*, IV, 5, 681 a (10, 15, 20, 25).

So Aristotle, has, without leaving any trace of doubt mentioned the crossing from the still-not-living over to the living thing, and the various passages from one group of living things[58] to another. Thus we are presented with ample evidence that he was well aware of *"biological transformation"* which could be seen as something of a prelude to the conception of *evolution*. Nevertheless we have to bear steadily in mind, as it has already been indicated for so many times that it is a grave mistake to confound Aristotle's not yet well established and sufficiently defined conception concerning "biological transformation" with the limpidly asserted and formulated hypothesis of "evolution" which emerged as a result of thoroughgoing researches, and tough, even quite often rough debates towards the second half of the nineteenth-century.

According to Aristotle, even at the level of the individual, change never happens haphazardly or just for the sake of change. Every alteration is a

[58]Every process, in Aristotle's view, is predetermined and strives towards an end which is the completion of the being in process. The individual being's change from *potentiality* to *actuality* is, so to say, its career from budding up to flourishment. Here the first stage still waits to be completed, while the latter is already accomplished. But every accomplishment is again a step in the direction of new completion. While the completion of individuals is the best stage of their unfolding existence — that is, when they are ripe enough to reproduce —, there is no completion or *best* stage to be said about a natural species, a natural group. Because every natural species is good in its own right so long as it brings forth individuals capable of reproducing.

A "natural group" is a class of individual beings which are able to interbreed successfully, but not able to crossbreed with organisms of other groups. Aristotle says :

...While that which is not eternal admits of being and not-being and of acquiring a share both in the better and in the worse; also, soul is better than body, and a thing which has soul in it is better than one which has not, in virtue of that soul; and being is better than not-being, and living than not-living. These are the causes on account of which generation of animals takes place, because since the nature of a class of this sort is unable to be eternal, that which comes into being is eternal in the manner that is open to it. Now it is impossible for it to be so *numerically*, since the being of things is to be found in the particular, and if it really were, so then it would be eternal; it is, open to it to be so specifically. That is why there is always a class of men, of animals, of plants; and since the principle of these is 'the male' and 'the female', it will surely be for the sake of generation that "the male" and "the female" are present in the individuals which are male and female. And as the proximate motive cause, to which belong the *logos* and the Form, is better and more divine in its nature than the Matter... The male... comes together with the female and mingles with it for the business of generation, because this is something that concerns both of them. Aristotle, *Generation of Animals*, II, 1, 731 b (25, 30, 35); 732 a (5).

For Aristotle *species* does not represent a concrete sensible entity; on the contrary it is a supersensible substance, solely conceivable, by our understanding. Hence there is no transsubstantiation at this non-material abstract level of being, here, beings in process, that is, beings from their potential state towards actualization, are not found. Evidently, then, only this level of being can be treated philosophico-scientifically. In Aristotle's view the *non-speculative metaphysical domain* of *philosophy-science* takes the permanent necessary universal, and not the "following-away" particular sensible substance into account, for there could be no knowledge of things he asserts, *which were in a state of flux*. Aristotle, *Metaphysics*, XII, 4, 1078 b (16).

means leading towards a definite end. Furthermore, unexpected abrupt changes almost never happen in nature except the *spontaneous generation*, a rare case by means of that the primeval living things emerged from non-living ones (q.v.: "soul's awakening") and for which Aristotle could not find any tenable explanation. In Aristotle's foregoing passage (q.v.: "Notices": 58) we notice his effort to explain that the individual living thing possesses, so to speak, two faces, or rather two aspects: on the one side, as a form-receiver from its group, its species, it covers on its own a certain stretch of time from *birth* to *death* — the living thing's individual life-span — on the other, it is the formative agent of its offspring — the living thing's species-life. Thus the living thing, while in its individual status, is bound to die; in its species status, transcends mortality. That the individual, with its species-status, be, so to say, immortal, is rather far from providing a sufficient logical proof for the fixity of species. It is a fact that Aristotle, seen from the angle of the present-day philosophy-science, treated most details and crudely.[59] Nonetheless it seems quite improbable that Aristotle, an illustrious mind in philosophy-science as he was, could have drawn such a resolute conclusion out of such a flimsy set of premises. There must have been something beyond mere philosophico-scientific considerations which had thenceforth urged him to subscribe to the doctrine of the fixity of species, and to deny

[59]Even though Aristotle had undeniably inherited a great wealth of materials and informations from his contemporaries as well as from past scholars, he possessed no ready-at-hand model, and no precursory on which he could lean while building up his far-reaching, prolific, system. So he can, in accordance with what has already been hinted at, rightly be accepted as the founding father of philosophy-science. Interestingly enough, Aristotle was well aware of the exceptional position with all its virtues and vices, he had assumed in history. The subsequent passage excerpted from his *On Sophistical Refutations* demonstrates this awareness quite vividly :

> ...in the case of all discoveries the results of previous labours that have been handed down from others have been advanced bit by bit by those who have taken them on, whereas the original discoveries generally make an advance that is small at first though much more useful that the development which later springs out of them. For it may be that in everything, as the saying is, springs out of them. for it may be that in everything, as the saying is, "the first start is the main part": and for this reason also it is the most difficult; for in proportion as it is most potent in its influence, so it is smallest in its compass and therefore most difficult to see: whereas when this is once discovered, it is easier to add and develop the remainder in connexion with it. This is in fact what has happened in regard to rhetorical speeches and to practically all the other arts: for those who discovered the begining of them in all only a little way, whereas the celebrities of to-day are the heirs — so to speak — of a long succession of men who have advanced them bit by bit, and so have developped them to their present form... Moreover on the subject of reasoning we had nothing else of an earlier date to speak of at all, but were kept at work for a long time in experimental researches. If, then, it seems to you after inspection that, such being the situation as it existed at the start, our investigation is in a satisfactory contidion compared with the other inquiries that have been developed by tradition, there must remain for all of you, or for our student, the task of extending us your pardon for the shortcomings of the inquiry, and for the discoveries thereof your warm thanks. Aristotle, *On Sophistical Refutations*, XXXIV, 183 b (20, 25, 30, 35); 184 a (5); 184 b (5).

any possibility of transformations and alterations above individual level, although he had pinpointed the fact of biological transformation, and expressed it clearly, as we have just seen, in his works concerning inquiries on living things.

IV. CONCLUSION

The Bioscience - Bioethics Discrepancy

We can surely talk in greater lenght and breadth as to why Aristotle resolutely declined to continue to take into account, and then eventually put special emphasis on the idea of interspecific transformation. However a sufficiently demonstrable, and thus verifiable conclusion seems almost out of reach for us.

Now, I think there are considerations other than certain purely theoretical ones, which might have prevented Aristotle of elaborating further what he had already established in regard to interspecific transformations, and so anticipating something of a hypothesis about evolution. In spite of his insistence that science should not look for anything but knowledge, Aristotle could not after all wipe of his deep-rooted piety which certainly was keeping on nourishing the substratum of his philosophy-science-system. And this piety, I am convinced, could not have allowed Aristotle, to believe that the universe, and everything in it, we human beings included, was a notorious "Dicer"s casual play".

T. D.

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