

**ARISTOTLE**  
**THE PHILOSOPHER FOR ALL SCIENCES**

The present day is an important milestone for our University. It is with great pleasure and satisfaction that we celebrate the official opening of the "Interdisciplinary Centre for Aristotle Studies", which was established by the Senate on the 6<sup>th</sup> of July 2011, upon proposal by the Rector's Council, which approved the proposal by the Rector of Aristotle University, Professor John Mylopoulos. We all recognize that he was the one who conceived the idea for the creation of this Centre, as soon as he took office. He thus made real the idea, which has matured over the years, that Aristotle University must acknowledge the close bond that connects it with Aristotle, as well as the enormous importance of the Stageirite, with regard both to its continued influence on human thought for a period of 2,500 years, and to the amazing range of topics dealt with by him; topics covering all major branches of philosophy, extending though in an impressive way into the basic areas of science, as well.

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It is this latter aspect of his work, which is the least known and has at the same time been treated in an unfair way for many centuries, that I will attempt to shed light on today. That is, the relationship of Aristotle to science and the deep conceptual connection linking Aristotle's philosophy with contemporary scientific thought. I will, thus, try to show, very briefly, why Aristotle, the Macedonian philosopher –student of Plato and teacher of Alexander the Great— who was born in Stageira of Chalkidiki in 384 BC., can rightly be considered, among other things, as the "greatest philosopher for all sciences."

I will, therefore, refer to that part of Aristotle's work that is called, in one name, Aristotelian Natural Philosophy and includes besides the treatise entitled *Physics* (*Φυσικά*), many other equally important treatises, such as *On the heavens* (*Περὶ οὐρανοῦ*), *On Generation and corruption* (*Περὶ γενέσεως και φθορᾶς*) and *Meteorology* (*Μετεωρολογικά*), as well as his biological and psychological works. An excellent material is offered here, in order to study in depth the relation of Aristotle to science and scientific thought, where we can, in my opinion, distinguish three fundamental points of contribution made by the Stageirite.

The first is, that Aristotle has laid the foundations of the main branches of science. The second, that he has provided the basis for the contemporary field of Philosophy of Science, as he deals with issues, such as those concerning the scientific method, the principles and foundations of knowledge, and the notions of causality, time, space, movement, infinity, continuity etc. Finally, the third point,

which is in my opinion the most impressive, is that he offers the ontological categories necessary today for understanding the new discoveries in the fields of Physics, Cosmology, Biology, Psychology, to mention only some of them.

As for the Stageirite's scientific work, it is worth mentioning the wealth of his observations in the areas of Astronomy, Meteorology, Physics and Psychology as well as in what we call today Cognitive Science. Moreover, his studies on living organisms allow us to characterize him as the father of Biology and as the most important biologist of antiquity.

It should be noted, that the work of Aristotle does not only have value for the very detailed descriptions of the entire physical and biological realm, but also, and mainly, for the classifications, which were the basis for the science of Taxonomy. Aristotelian classification is based on a hierarchical scale of living beings, known as the *scala naturae*, where we start from lower forms of plants and arrive at the superior species, that is man (see, *History of Animals, Περί τὰ ζῷα ἱστορίαι* 490b 16-20). It thus offers all the material needed for an evolutionary theory, to which however Aristotle never advanced.

Let us now turn to the second point of contribution of Aristotle's natural philosophy, that which refers to the relationship of the Stageirite to Philosophy of Science. It is worth noting here the fact that knowing, *ἐπίστασθαι* (see, *Posterior Analytics* 71a 21-33), for Aristotle, is understanding. Moreover, he develops a very interesting theory of causality, unique in the history of philosophy and science, since he defines four causes: the *material*, the *formal*, the *efficient* and the *final*.

In the Aristotelian model of the physical world, the ontological pair of *matter* (*ὕλη*) and *form* (*μορφή*) plays a central role. The latter is, so to speak, the "internal nature of a thing expressed in its definition, in the diagram of its structure". Thus, *matter* and *form* and the corresponding ontological pair of *potential* (*ἐν δυνάμει*) and *actual being* (*ἐν ἐνεργείᾳ*) are the main pillars of Aristotle's theory about the natural world. Put in simple terms, reality for Aristotle, is not restricted to the things we get to know by the senses, the things that make up the actual world –the only reality according to the positivists. Beyond and behind these things, there is a part of physical reality, which is in a state of potentiality, i.e. which has not passed into existence, yet, but encloses within itself the potentiality (tendency) for its future realization. And it is interesting to know, that the current trend of scientific realism is progressively taking all the more seriously this aspect of reality, as a response to questions concerning the reality of the non-observable and theoretical entities, which

were raised as a result of the new developments in Quantum Physics and Physics of Elementary Particles.

I, now, come to the third, and most exciting, in my opinion, point of contribution of Aristotle's Philosophy of Nature. It should be remembered here that the mechanistic-deterministic model for the physical world, that was based on the development of science from the Renaissance onwards, culminating in Newtonian physics, was in total disagreement with the dynamic model of Aristotle's Natural Philosophy.

However, today, with the impressive new discoveries in areas, such as Quantum Physics and Physics of Elementary Particles, it becomes obvious that, in order to be able to understand the structure and character of the natural world, we need new categories and conceptual schemes, which point to Aristotle. To be more specific, let me refer to a fundamental concept of physics, that of matter, for which Aristotle developed an extremely interesting and original theory, 2,500 years ago. He argued that beneath the level of the sensible material world, there is a deeper and fundamental dimension of matter. This he called "*prime matter*" (*πρώτη ὕλη*) and defined it as "*the ultimate substratum of all change*" (see, *Physics* 192a 32-34). Prime matter for Aristotle *lacks all determinations* (see, *Metaphysics* 1029a17-20, 24-6), is *formless*, outside space and time, and has only a *potential "existence"* (see, *Metaphysics* 1045b18-20)

It is precisely this particularly controversial Aristotelian approach towards matter, that allows us, in my opinion, to elucidate some surprising analogies that one can find in the corresponding picture of matter as it emerges from within the world of contemporary Physics.

Indeed, when one crosses the threshold of the quantum world, the various sub-atomic "particles" no longer have the properties traditionally attributed to matter, since they are not the solid, clearly defined, stable 'building blocks' of Newtonian atomic theory. Instead, they have an unstable and ephemeral "existence", as a continuous transition from a potential to an actual, in Aristotelian terms, state takes place.

An amazing material is therefore available, so that we can give life to Aristotle's ontological categories and demonstrate their timeless and timely character. The benefit, however, is not only that. The reading of Aristotle's philosophy in the light of modern science enables us to build the conceptual bridges necessary for the reconnection of scientific thought to philosophical reflection, and use the conceptual tools for a deeper understanding of the wondrous discoveries of

contemporary science. Aristotle, thus, becomes not only the “philosopher for all sciences”, but also the founder of interdisciplinary thought. This was exactly the idea on which the establishment of the "Interdisciplinary Centre for Aristotle Studies" was based.

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Our goal, therefore, is to study Aristotle’s work from an interdisciplinary perspective and promote it, on an international scale, in areas covering traditional branches of Philosophy such as Logic, Metaphysics, Political and Moral philosophy, Rhetoric, as well as areas related to many scientific fields, such as Humanities, Law and Political Science, Physical and Mathematical Sciences, Biology, Health Sciences and even Technological Sciences. This, moreover, is what comprises the innovative character of the Centre, making it unique in Greece, as well as on an international scale

It is our ambition that the "Interdisciplinary Centre for Aristotle Studies" becomes a pole of attraction and a point of reference for all Aristotle scholars worldwide, as well as for students of Aristotle philosophy who are interested in studying all aspects of his thought. And this is because it has the unique privilege not only of operating in the country where Aristotle was born, but more specifically at Aristotle University that bears his name and is located a breath’s distance away from Stageira, the birthplace of the Macedonian philosopher and from Mieza, the place of his teachings with Alexander as his student.

More importantly, though, because Aristotle is the universal philosopher who is an essential part of our cultural heritage, which is also the heritage of the entire civilized world. His influence, moreover, continues to be present, – having left indelible marks on Byzantine scholarly tradition, on the Arab world, and on the Medieval thought of Europe – in the intellectual evolution of contemporary Western civilization.

It is, therefore, a work which is worth studying in order to make known – avoiding superfluous historical, local and national correlations – the universality, the timelessness and timeliness of his thought. Especially today, in the painful circumstances that have arisen for our country, such endeavours may be perhaps the only lighthouse that our country has – the lighthouse that will send a light of optimism and hope to our youth, who are experiencing hard times. But also perhaps the only opportunity to send a message to the world that is watching the developments, unfortunately with a look that is not at all flattering for modern Greece, that there exists today the other Greece, as well. The Greece of intellect and of culture.

Thank you.