

THE CONTRIBUTION OF ARISTOTLE'S THOUGHT TO THE HISTORY OF MEDICINE: AN ESSAY

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ВКЛАД АРИСТОТЕЛЕВСКОЙ ФИЛОСОФСКОЙ СИСТЕМЫ В ИСТОРИЮ РАЗВИТИЯ МЕДИЦИНЫ: ЭССЕ Пауло Нуно МАРТИНС

Abstract. This essay aims to describe the Aristotle's main ideas on the History of Medicine, such as the four elements, the biomedical theories, the four causes, the empirical researches on natural world.

Keywords: The four elements of Aristotle, Aristotle's thought on Medicine, the four causes of Aristotle, Aristotle's plan on empirical research.

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Резюме. Цель этого эссе – описать основные идеи Аристотеля по истории медицины, такие как четыре элемента, биомедицинские теории, четыре причины, эмпирические исследования мира природы.

Ключевые слова: Четыре элемента Аристотеля, Аристотель о медицине, четыре причины Аристотеля, план Аристотеля об эмпирических исследованиях.

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Заключение

Introduction

Aristotle [1] was a true researcher whose writings embraced many subjects: physics, metaphysics/philosophy, biology, zoology, logic, ethics, poetry, linguistic, politics, etc. In this regard, I have to mention that the Portuguese Pope John XXI (Pedro Hispano), who was a philosopher and physician of the Medieval Ages, wrote some works linked with the Aristotelian philosophy. For example, *Summulae Logicales* (Collection on logical issues) is a systematization of Aristotelian logic applied to some theological issues [2]. In general, the worldview of Aristotle is *Teleological* (from Greek *Telos* = end or purpose) in the sense that everything develops with a purpose in order to achieve the perfection or God. I have to add that Aristotle's thought is also *Organicist* because conceive the Nature and the Universe by analogy with an organism. This consists of matter (the body) and essence (the soul). On his *Second philosophy*, Aristotle argued that the Matter is characterized by four elements (earth, water, air and fire), while the Essence is related to the fifth element (ether). In this respect, on his *First philosophy*, Aristotle sought to study the first causes of all things, and proposed four causes, namely, the formal cause, the material cause, the efficient cause and the final cause. These views predominated during fourteen centuries.

The Aristotelian view was replaced by the Cartesian Mechanistic and Dualistic view of the Universe. Descartes argued that the body (*res extensa*) should be seen as a "machine" and completely distinguished from the soul (*res cogito*). This idea was supported by Newton, in his *Philosophiae Naturalis Principia Mathematica*, in the formulation of the Laws of Classical Physics [3].

In the 19th century, with Hegel, and in the 20th century, with August Bekker and the Berlin Academy, the study of Aristotle gained new prominence in several areas of knowledge [4]. So, this essay aims to show how some Aristotle's ideas might be useful to the study of the History of Medicine [5].

1. The contribution of Aristotle's thought to the history of Medicine: Part I

In the 5th century B.C., the philosopher Empedocles proposed the existence of four major elements (earth, fire, air and water) in order to explain the nature of

matter. In the 4th century B.C., the philosopher Aristotle took up this idea in order to contribute to the development of science, in particular Physics (which encompassed the Philosophy of mind and the Anatomy) or the *Second Philosophy* [6].

In terms of the History of Medicine, the idea of the existence of four elements was used by the physician Galen who associated them to the four humors of Hippocrates (Black Bile, Phlegm, Blood, Yellow Bile) to the study of the human body.

Thus, some contemporary physicians claim that in the Medieval Ages each human organ was related to the four humors of Hippocrates that were interconnected with the four elements of Aristotle. The balance between the four humors and the four elements would contribute to the good health of the patient [7].

2. The contribution of Aristotle's thought to the history of Medicine: Part II

The ideas referred to above remain unchanged until the 16th century, when Andreas Vesalius performed dissections on human cadavers. Meanwhile, the study of the human body was held alongside the study of the soul, and there have been several investigations on the relationship between the concepts of the soul and the body [8].

In this regard, I have to mention that Aristotle was the first to perform dissection (in animals, not in humans) in order to ground his biomedical theories. In fact, in his description of the heart, he referred to “three chambers” connected to the lung. He also located the heart as the seat of the soul because the nervous system was not yet formulated in the Middle Ages. Furthermore, through the observation of an embryo, he defended the heart beating as the first sign of life [9].

In relation to the History of Medicine, I have also to point out that in the Western medicine, for a long time, the study of body and soul were seen from opposite perspectives. For example, during the Middle Ages, the Church exercised a strong repression to the sexed body (being seen as sinful), valuing only the soul. In this regard, many of the diseases (for example, leprosy) were seen as a sin committed by the patient. However, Aristotle argued that balanced actions of human beings depended on both body and soul [10].

Meanwhile, in the 17th century, Descartes proposed the separation of the body (exclusive domain of science and medicine) and soul (exclusive domain of philosophy and religion) – the *paradigm of Western medicine (conventional medicine)* [11]. Since then, the human body has been treated as a “machine”. With the Industrial Revolution, the vision of the body had a more “free” perspective regarding the moral impositions of the Church. In the 19th century, with the Positivist philosophy, the body was seen as a mere instrument of study that should be considered only under the rational point of view.

However, in the 20th century, with the emergence of Psychology, the study of the mind was performed by several scholars. In this regard, Merleau-Ponty [12] has called into question the Cartesian perspective of separation of mind/soul and body.

Similarly, from the 18th century to the present day, some experiments carried out in the field of brain sciences have called into question the Cartesian Dualism and Mechanicism view of the world suggesting, on the contrary, that the mind and the

body are related between them [13]. In this regard, I have to mention that Aristotle considered the soul (form) and the body (matter) were made of bound substances [14], as I will explain in more detail in the next chapter that describes the four causes for the existence of things.

3. The contribution of Aristotle's thought to the history of Medicine: Part III

Aristotle also developed the *First philosophy* of things (which may be translated as *Metaphysics*) and proposed the existence of four causes [15] for the manifestation of something, such as health (or disease) in the human body. These four causes are:

- 1) Formal cause (the essence of the body) – the soul;
- 2) Material cause (the body) – the organs, muscles, bones, (all the constituents of the body);
- 3) Efficient cause (who originated the body) – the creators of the body;
- 4) Final cause (the purpose of the body) – the realization of the soul.

Aristotle argued that everything had a first cause, which could be identified, and that all had an end due to this cause first [16]. Thus, Aristotle claimed that all things were made both by form/essence, soul (psyche) and by matter (body) – theory known as *Hylomorphism*. In his work designated by *De anima* [17] Aristotle argued that the soul is the vital principle that animated all the bodies, such as plants, animals and humans. However, the soul to each of these beings was different. Only human beings had a soul with a nutritious, perceptive and rational aspect. In this regard, an important statement is that «εί δη τι κοινον ερι πασης ψυχής δει λεγειν, ειη αν εντελεχεια η πρώτη σώματος φυσικού οργανικον», i.e. Stagirite defines soul as «*the first entelecheia of a natural functional [instrumental] organ [body]*» or the body is the *organon* (instrument) of the soul. Furthermore, the contents of *De Anima* led to the elaboration of eight treatises, known by the Latin title *Parva Naturalia* [18].

Nowadays, the psychological processes call for formal and mental causes advocated by Aristotle. In fact, Aristotelian methodology provided the framework for scientific research. Aristotle had a worldview which was concrete and practical. For example, the eye of the body (material cause) having a soul (formal cause), it is manifested through the “vision” (final cause). The creators of the body are the progenitors (efficient cause).

4. The contribution of Aristotle's thought to the history of Medicine: Part IV

Aristotle also called for the systematic observation of the nature and so, he launched a plan of empirical investigation into the natural world, particularly in botany, zoology [19]. In this regard, I have to mention that the living and biological systems, such as the human being, are systems of self-organization which are interrelated and interdependent to each other, both physical, biological, social, psychological (and even spiritual) (described by «complexity theory» and «models of self-organization»).

For example, the biologists Maturana and Francisco Varela argue that biological systems after undergone through “critical points of instability” (linked to the so-called “revolutions” in society and/or “crises” of human self-consciousness), they generate a “more complex network” (the “Web of Life”) according to the new demands of society and mankind [20]. This worldview is in accordance with the *organicist view* of Aristotle that was referred above.

Conclusions

Nowadays, what remains to be done in contemporary society is concretize an Integrate vision of society (as proposed by Aristotle), as a synthesis of Materialism with Idealism so that it might be experiences a new cycle in the lives of human beings in contemporary society [21]. In this regard, there are some scientists who have proposed the application of new methodologies that might bring an improvement in the living conditions of human beings [22] through a change of behaviors [23] that might contribute to make the mankind (as a whole) happier (as advocated by Aristotle) [24].

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