

ON THE NOTION OF *DYNAMIS* IN ARISTOTLE'S EMBRYOLOGY

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О ПОНЯТИИ ДЮНАМИС В ЭМБРИОЛОГИИ АРИСТОТЕЛЯ Милана ТАСИЧ

ABSTRACT. Aristotle is a philosopher-naturalist, who explores the origin of life on the basis of nature (discovering and establishing his conceptual frameworks on the naturalist laws, subjects-bases and “the why”–causes – naturalist aetiology), and categorically not of the divine power (dualist approach), with all the spectrum of transcendent(al) forces. Consequently, the Aristotelian embryology is principally naturalist, in studying the laws of nature. Essentially, Aristotle realizes the Organicist approach – in scientific cognizing the phenomena and processes of the living world (Universe – Cosmos) and its entire inhabitants – the living beings (living subjects), with their inherent conception (origination), embryogenic development, and the individual self-dependent whole ontogenesis. We meet the challenge, therefore, to highlighting the importance of the Aristotelian authentic aetiology, stressing the significance of his physical (naturalist–organicist) causes: firstly his classical “four causes”, but likewise the Aristotelian κατά συμβεβηκός αιτίον (“resonance” cause) and other causes of the *dynamic* aetiology of the Stagirite. Another actual challenge is to restore the proper meaning of the key notions and terms in the Aristotelian aetiological framework.

We stress that the Aristotelian *dynamis* as inherent organic (functionalist) potencies and activities – is the key concept of his naturalism, under which Father of sciences explores phenomena and processes in both the inanimate and the living nature. Essentially, the Stagirite’s natural world is bipolar – of the co-existence and interchange of *active* and *passive* principles, and of their unity with the environment (surrounding world). Essentially the bipolarity, within the embryological context, can be expressed by the example of the synchronous activity of both active male factor and passive female factor. In our approach, the passive principle is treated as a certain “passive power” (*dynamis pathetice*), and which enters a consecutive relationship with the “active power” of the first principle, making so the properties of both agents to be transferred to a varying extent, all the way to those hereditary. All this reveals, from the Aristotelian organicist standpoint, two essential – dialectically opposite – principles, active and passive, male and female, which actualize the ontogenetic self-evolvement of a new living being through a complex interaction of dynamic naturalistic actions.

KEYWORDS: naturalism, *dynamis*, mover, cause, *symbebekos*, active, passive, dialectic.

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РЕЗЮМЕ. Аристотель – философ-натуралист, кто исследует происхождение жизни на основании природных (физических) причин; и кто обнаруживает и устанавливает свои концептуальные основания, исходя из действия естественных (физических) законов, существующих внутренних субстанций вещей и телеологических «почему»-причин – в целом, полагаясь на основания натуралистической этиологии); и что категорически не является божественной силой (дуалистический подход), со всем его спектром трансцендент(аль)ных сил. Следовательно, аристотелевская эмбриология является принципиально натуралистической, основанной на изучении законов природы. По существу, Аристотель реализует Органицистский подход в научном познании явлений и процессов живого мира (Вселенной – Космоса) и всех его обитателей – живых существ (живых субъектов) с их присущим зарождением (происхождением), эмбриогенным развитием и индивидуальной самостоятельностью на всем протяжении онтогенеза. Перед нами, поэтому, встает задача подчеркнуть важность подлинной этиологии Аристотеля, выделяя значение его физических (натуралистических – органицистских) причин: во-первых, его классических природных «четырёх причин», а также аристотелевской *κατά συμβεβηκός αἰτίον* (привходящей или «резонансной» причины), и других причин *динамической* этиологии Стагирита. Другая актуальная задача заключается в восстановлении правильного значения ключевых понятий и терминов в Аристотелевской этиологической системе.

Мы подчеркиваем, что Аристотелевская *δυναμис* означает неотъемлемую органическую (функционалистскую) потенцию и активность – и что это (*δυναμис*) понятие включает ключевую концепция его натурализма, в рамках которой «отец науки» исследует явления и процессы как в неживой, так и в живой природе. По сути, мир природы Стагирита является биполярным – сосуществования и обмена активными и пассивными принципами, а также их единства с окружающей средой (окружающим миром). Существенно, что биполярность, в рамках эмбриологического контекста, может быть выражена на примере одновременной деятельности активного мужского фактора и пассивного женского фактора. В нашем подходе пассивный принцип трактуется как некая «пассивная сила» (*Dynamis Pathetice*), которая вступает в последовательную связь с «активной силой» первого принципа, благодаря чему свойства обоих агентов передаются и сохраняются в разной степени, вплоть до наследственных. Все это раскрывает, с Аристотелевской органицистской точки зрения, два существенных – диалектически противоположных – принципа, активный и пассивный, мужской и женский, которые актуализируют онтогенетическое целостное саморазвитие нового живого существа через сложное взаимодействие динамических натуралистических действий.

КЛЮЧЕВЫЕ СЛОВА: натурализм, *δυναμис*, движущая сила, причина, *симбебикоус*, активный, пассивный, диалектический.

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Заключение

Introduction

Aristotle was a philosopher-naturalist, who interpreted the origin of life on the basis of nature itself. In his concept of epigenetics, he used the general principles of his metaphysics in interpreting the phenomena in the living world, also drawing conclusions based on observations and experience. We have in mind his idea, say, of the unmoved mover, or his basic starting point in the science of being, matter and form, i.e. learning about the four types of causes of everything that exists. We also consider the distinction he made between the three types of soul: vegetative, animal and rational, of which the first belongs only to plants, the second to plants and animals, and the third one to humans only. And when it comes to movement, he spoke about the *dynamis*, which through touch transmits movements from one body to another in the mode of automata, and thus matter, form, motion, and force are the key terms of his naturalism, through which he explains the phenomena and processes in both inanimate and living nature.

In addition, his observations and analytical reasoning led him to define other principles from the cause-effect relationship, one of which would be that small changes at the beginning – in the sense of an organ – can be “multiplied” to a large extent into a complex [Chapouthier 2013, pp. 201, 202, 203] system – an organism.

He also provided an analysis of what finds its place in the explanation of the development of embryos and the creation of new organs, since these are essentially different, because of this very diversity of movement at their basis – although they have the same initial “pulse” at conception [Tasić 2017, p. 517].

According to Aristotle, everything comes into existence as the result of an active and a passive principle, whereby, in the case of living beings, the first principle is the male seed, which through the sensual soul contained within it enables the form of what comes into being, and the second one, the female’s menstrual flow – its materiality. Thus, the male factor, as the effective cause, translates the form already potentially [Chapouthier 2018, pp. 423, 425, 427, etc.] contained in it into an actual state. The nature of this force is rather a “functional” [Khroutski 2010, pp. 21, 25, 26, 27, 28 etc.], than a substantial one, because it has the power, through the “pneuma” it contains to condition the movement of menstrual blood by means of its internal organization and spiritualization, and not its own materiality.

It must be said that the passive principle also has a certain “passive power” (*dynamis pathetike*), which enters into a successive relationship with the “active power” of the first principle, which in turn causes the attributes of both agents to be transferred to those which are inherited. Aristotle viewed this as a distinctively dialectical aspect [Duncombe, Novaes 2015; Chapouthier 2013, pp. 208, 209] of the development process, because the two opposite principles, both active and passive, male and female, through the complex interplay of action, now “rise” into a whole new being, which still holds the same contradictions within, each of which has the power of action, or the force of a different intensity. And what occurs is reflected in the physiological function of the genitalia.

1. The principles of Aristotle’s philosophy and the development of embryos

Historically, Aristotle’s work *On the Generation of Animals* is the first scientific work in the field of embryology. It was referenced both by philosophers like Thomas Aquinas, and biologists such as Charles Darwin and William Harvey, as well as many others. As we know, Aristotle, roughly speaking, interpreted all things teleologically, primarily in terms of the final causes belonging to them, i.e. what a certain thing is created for and what purpose it serves for as long as it exists. According to him, the final cause is only one of four types of causes which exist “by nature” (*κατά φύσιν*), while the other three types are material, formal and efficient. He refers to material cause as what something consists of, in terms of the substance it is made of, and the formal cause as what determines a particular thing and belongs only to it, what distinguishes it from all other things. The efficient cause is what, by acting on the matter of a thing, leads to a change in its form. But except these “classical” causes, Aristotle points out “resonance” causes (*κατά συμβεβηκός αἰτίων*) too [Khroutsky & Klimek 2018, p. 218; Tierney 2001, p. 2], within his Organicist system as a dynamic whole [Khroutski 2013, pp. 29, 31, 32 etc.; Khroutski 2016, p. 395]. This time, in an embryo, say, this material cause would be the female’s menstrual blood, and the efficient cause – the male’s seed.

When it comes to conception, Aristotle starts from two principles in nature, which are at the core of every action and every change in general, namely the active one, as one that acts or moves and the passive – as the one being acted on or moved. In this case, the male principle would be active, and the female passive, whose “carriers”, as we said, are the seed and menstrual blood. The very forms of the genital organs, in his view, are the way they are because of the principles to which they conform. That is the dialectical aspect of the development process, according to Aristotle, because now the two opposite principles, both active and passive, male and female, through a complex interaction “rise” into the whole of a new being. And when answering the question as to whether the organs of the human body, as well as certain inherited factors are the consequence of particular “particles” in the seeds of male fluids, he rejects this presumption. As is well known, this idea – which originated in Pythagoras – was revived in the XVIII-th century, under the name “preformationism”, according to which each organism, in its miniature form, is already contained in its effective cause.

The three types of soul have the character of principles in his embryology, as well as in the science of living beings in general, which he terms the vegetative, sensitive and rational soul. The first kind of soul is the lowest and belongs to every living being (to plants, as well as to animals) from the very beginning, while the sensitive soul is that which makes animals different from plants, namely their ability to move and communicate with their environment. The third type, as the highest form, belongs only to human beings, distinguishing them from animals in terms of their ability to think and draw conclusions. This last type of soul enters the embryo “from the outside”, in male individuals forty days after conception, and in females, eighty days from that moment.

When Aristotle spoke about the embryonic development process, he referred to what he found in a hen egg, which was that the heart is formed first, and then the other internal organs, or first the anterior, and then the posterior parts of the body. It is in the very formation of bodily organs that Aristotle found confirmation for his teleological (finalist) interpretation of all processes in nature [Chapouthier 2010, pp. 93, 96, 97 etc.], and this time of living organisms too. Namely, that the organs are created, one after the other, based on the significance of the functions they perform in the body. In this way, he tacitly polemized against the views of those philosophers who considered that one organ, say, the heart can create all the other organs. Finally, when it comes to the inherited characteristics in fertility, Aristotle believed them to originate from the seed patterns in males, while the sex itself depends on a more or less regular process of fetal maturation in the female’s uterus. The sex is male in the first case, and female, in the second.

2. The concept of *dynamis*. On the “male” (active) and “female” (passive) principles

The notion of *dynamis* has more meanings in Aristotle, which cannot be expressed by only one term, so that most often this word is not translated. In Empedocles, say, it had the meaning of the simplest substances: earth, water, fire, and

air, which cannot be reduced to anything else, while Plato considered them to consist of geometric figures. [Plato 1929, 53c – 56c]. Aristotle in the *Parts of Animals* says that in each of these four elements there are a couple of opposing principles (*dynames*): in the fire – warm and dry, in the water – cold and humid, in the air – warm and humid and in the earth – cold and dry, whereas one of these properties is dominant in each of them: in the fire – warm, in the water – cold, in the air – moist and in the earth – dry. There is equilibrium of contrasts characterizing these four substances and no “power” or “force” that would be exercised over the body is recognized here. Here as *dynamis* could only be marked such a difference in the character, or in the nature of these primitive substances.

In Aristotle, both activity and passivity on the level of conception is interpreted as two aspects of the same notion of *dynamis*, when it is actualized in it. This driving force leads to a series of tiny movements in the embryo, which are all based on the principle: “the motion is produced by the motion”. In addition, the male seed as an efficient cause does not contain the form of the entire organism within itself, but only contributes to its continuous development. In terms of the efficient cause, Aristotle distinguishes between what is “original” as a cause within it and what “directly” stimulates development. On this occasion, he claimed that in the embryo itself, the existing (actual) movements stimulate new and different ones (as potential, and contained in it), which again has the character of a principle in Aristotle’s concept of epigenetics.

So, what is the contribution of the female factor in the development of an embryo, is it as a substance and is this substance inert and passive, deprived of form, as in the case of matter in general? Or what are the relations of Aristotle’s notions of potential, actual, form, and concept by means of which he explains the development of an embryo in embryology? First of all it can be said that according to him, man’s seed contains a sensitive soul in itself, in an actualized form, making the movements of the seed “communicate” the form of a human being on the embryonic level. And as for the female factor, as the subject of change, it is not matter here of a thoroughly passive factor, but of its special nature, which possesses the power for a particular actualization when it comes into contact with the (male) seed, as an active principle. It is precisely of such a nature which in a potential form contains within itself all the parts (organs) of the living being in its development.

Reflecting on what the mover of the development of an embryo is, Aristotle determined that it is something inside itself rather than outside it, which of course is mediated by sperm, but has become an integral part of the organism. And providing an answer to the question of how this mover achieves this, he starts from the principle: “The reason of this is that, so far as the things formed by nature or by human art are concerned, the formation of that which is potentiality is brought about by that which is in actuality” [Aristotle, 1943, 734 a 30]. Such a moment in itself speaks about the dialectical process of embryonic development, when the male agent as the active principle “recognizes itself” in the female principle, as the passive one, thus enabling its action on it, and “transferring” its potentialities into the actuality of the female principle.

Therefore it is not the case that these two principles are “metaphysically” isolated as to their functions, i.e. the male as “positive” – otherwise compared with form, actuality and activity – and the female, as “negative” – associated with matter, potentiality and passivity. Or in his words:

But that is not all, for the male and the female are distinguished by a certain ability and inability. Male is that which is able to concoct, to cause, to take shape, and to discharge, semen possessing the “principle” of the “form”; and by “principle” I do not mean that sort of principle out of which, as out of matter, an offspring is formed belonging to the same kind as its parent, but I mean the *first motive principle*, whether it is able to act thus in itself or in something else. Female is that which receives the semen, but is unable to cause [Aristotle, 1943, IV 765 b 9].

In terms of their roles, it can still be said that “the male is that which has the power to generate in another, while the female is that which can generate in itself”. [Aristotle, 1943, 766 a 32]. And this, in his view, is what implies the difference not only in the sexual, but also in other bodily organs, which is not the case, say, in plants. Hence, Aristotle’s principles are, by themselves, two special powers, one *qua active* (male) and other *qua passive* (female), which lead to the movement in two different bodies, which are actualized when they “permeate” each other, which is in line with his definitions of terms in *Metaphysics*. Exactly, he says:

One kind of potentiality is the power of being affected; the principle in the patient itself which initiates a passive change in it by the action of some other thing, or of itself *qua* other. Another is a positive state of impassivity in respect of deterioration or destruction by something else or by itself *qua* something else; i.e. by a transformatory principle – for all these definitions contain the formula of the primary sense of potentiality. [Aristotle, *Metaphysics* 1046 a 19-28].

3. The nature of the *dynamis* is that of heat, of *pneuma*, or *eidos* that it carries within

But what is the nature of the *dynamis* of power and what are the forms of its acts and manifestations on the side of both of these principles? First, the notion of *dynamis* does not have only one single meaning in Aristotle, and is interpreted differently by Plato, Hippocrates, and other great thinkers. Namely, sometimes it signified those first (and tiny) materialities: earth, water, fire and air (like the word “stihia”), together with the properties: dry, cold, warm and humid, belonging to them. However, in none of them is any “power”, or “force” recognized as something that could produce a special effect in another, but the effect itself is rather a consequence of them as substances, or, better, of their natures.

Then, in *On the Generation of Animals*, we encounter the term “*dynamis* in the seed”, in the sense of what makes it possible to conceive, whose significance is close to the “life heat” or “the soul heat” and such like. One particular feature of this substance is that it can “stimulate” particular movements, is able to form an embryo

in the matter of the female's menstrual blood, appearing in this way as the transporter, or medium for the action of the *eidos* or form. In Aristotelian terms, it is the "power" of the substance, contained in its potential form, and is a concept expressed in the terms of hylemorphism. In order to link it to its contradiction, the notion of *adynamis* is related to the female principle. Let us also add the significance of the notion of the *pneuma* in conception, as the physical substance at the heart of the generative process, close to the "aether", the "fifth element", or the "star matter", whose role is directly to stimulate movement.

However, what is even more complex is the definition of *dynamis* in the work *Metaphysics*, where Aristotle says that a) *dynamis* is the principle (or source) of motion or change, which is a) either within a thing and differs from that which undergoes changes, b) or in the very thing, which is not subjected to the changes themselves. Thus, it can be said that Aristotle is inclined towards abandoning the "materialistic" and "substantialist" interpretation of this term in favor of an "organizationalist" and "functionalist" understanding. This would denote its power only to condition the movement of menstrual blood, as a substance, occurring as the transporter of movement, and not contributing to its materiality in the emerging embryo; thus appearing both as its active and formal cause. Or in his own words:

In a similar way to this, Nature acting in the male of semen-emitting animals uses the semen as a tool, as something that has movement in actuality; just as when objects are being produced by any art the tools are in movement, because the movement which belongs to the art is, in a way, situated in them. Males, then, that emit semen contribute to generation in the manner described. Those which emit no semen, males into which the female inserts one of its parts, may be compared to a craftsman who has his material brought to him. Males of this sort are so weak that Nature is unable to accomplish anything at all through intermediaries: indeed, their movements are only just strong enough ... [Aristotle, 1943, 730 b 19].

To be more precise, the power of semen to communicate the movement of matter to menstrual blood lies in its ability to inform and ensoul the embryo, by means of its internal organization, and precisely because that power, by its very nature, is in itself immaterial. Aristotle says: "The semen is a compound of *pneuma* and water (*pneuma* being hot air); and that is why it is fluid in its nature; it is made of water" [Aristotle, 1943, 736 a]. It is the *pneuma* that facilitates fertility, while the water element evaporates, "this substance being analogous to the element which belongs to the stars" [Aristotle, 1943, 765 b 35]. And ultimately all this is owed to the nutritive power of the blood in the body, because the body weakens in its absence.

Hence, the power of *dynamis* is at the basis of the conception of a given gender, as well as at the transmission of certain features through inheritance, so that when, say, the power of the semen is greater than the power of menstrual blood, the sex of the offspring is male. Or, in the words of Aristotle: "Faculty (*dynamis*), as applied to each instance, I use in the following sense: the generative parent is not merely male, but in addition a male with certain characteristics, e.g., Coriscus or Socrates, and it is

not merely Coriscus, but in addition a human being”. [Aristotle, 1943, 767 *b* 23-26]. And in that way not only would the characteristics of the parents be inherited, but also those of their ancestors. And when he discussed it in *Metaphysics*, Aristotle was to express himself in a similar way, for instance, saying that Socrates as a procreator is not only a human being, but a man and not only a man, but also one who has certain distinct qualities.

4. The “passive power” of the female principle: the action that undergoes processes, and acts autonomously

Finally, what did Aristotle have to say about the female principle in the reproduction process, which, according to him, is material and passive? First of all, it can be fully understood in correlation with the male principle, and secondly, that it contains all the parts of both sexes in potential form. However, it cannot lead them to full realization, because it lacks the soul-*pneuma*, as an organizational principle, which Aristotle attributes only to the male principle. The female principle is passive in that it is only able to take action on itself, and not because it is inert. It does not contain the source of movement within itself, but thanks to its “passive power” (*dynamis pathetike*) it yields to it, since both active and passive power are potentialities for movement, for change. But since their actions are often opposite and can overcome one another, the active power of the male principle may fail to convey some of the features of the male sex, when the passive power of the female principle “outbalances” it.

For, Aristotle says:

The agent in its turn gets acted upon by that upon which it acts (e.g., a thing which cuts gets blunted by the thing which is cut, and a thing which heats gets cooled by the thing which is heated, and, generally, any motive agent, except the ‘prime mover’, gets moved somehow itself in return, e.g., that which pushes gets pushed somehow in return, and that which squeezes gets squeezed in return; *sometimes the extent to which it gets acted upon is greater than that to which it is acting* (...). The reason why that which is acted upon departs from type and does not get mastered is either deficient potency in the concocting and motive agent, or the bulk and coldness of that which is being concocted and articulated”. [Aristotle, 1943, 768 *b* 15-27].

The properties are thus determined by transmissions through the female element in conception.

Consequently, the external agent also appears as a cause of the organism in generation, although it is not a sufficient reason for it. The other causes are located in each of the embryonic parts, which, as unmovable movers, are capable of moving, without being moved themselves. They do this in a similar way to automation, with one part being driven by another in turn, where the first part is in contact with the initial mover. In this way, the first mover, in a certain sense, appears to be a sufficient cause to build up parts of the organism in development, firstly because it is facilitated by the potentiality of that moment, and secondly by the particularities and ways in

which all of the internal movements in the embryo contribute to it, which are dependent on the *dynamis*. Thus the notion of *dynamis* occurs here to fill the gap which exists between the remote first mover and the inner movements, which are produced one after another by parts of the embryo.

Now one of the embryo's parts is able to enlarge and multiply what it has received from the mover, as well as to direct the development in another direction. Or according to Aristotle:

All parts of the embryo already exist potentially in the material, and so once the principle of movement has been imparted to them they develop in a chain one after another, as in the case of the automatic puppets. When some of the natural philosophers say that like is brought to like, this must be understood, not in the sense that parts are moved as changing place, but that they stay where they are and the movement is a change of quality (such as softness, hardness, color and the other differences of the homogeneous parts); thus they become in actuality what they previously were in potentially [Aristotle, 1943, 741 *b* 15].

Therefore the *dynamis* is a specific force able to “gather” other forces and enable them to act further. Aristotle thus refutes that one body part contains in itself the essence of the whole organism and that one part, say the heart, is able to create another part, say the liver. Furthermore, he ascribes to the heart alone the power of a constant stimulus to movement in the embryo, which is entwined within it, in accordance with the certain dynamism it follows.

According to Aristotle, the vegetative soul in the female factor takes part in the formation of the organism, but it is not completely able to build it, because only the male factor can mediate the sensitive soul into the developing organism. This is the case with parts of the body such as the face, arm, and tissue, etc. In addition to the sensitive soul, the male factor also contributes to the formation of organs in different species, while the vegetative soul is the factor belonging to the female participant in conception. The latter is the source of all movements in the embryo, which successively, one after the other, lead to the formation of all bodily organs.

And as the products of our hands are not made by the tools themselves, but by the movements of such tools, the movement is exactly what leads to changes in the embryo. The vegetative soul uses hot and cold as its tools, whereby its movements and the principle of these movements are almost the same. This nutritive soul is a force, which as an active factor in development is greater in the later stages of development. The causes set movements in motion, not being moved themselves, because of the way they are, or due to their location in a certain place. The soul is an unmoved mover. The power of *dynamis* is evident in small movements, but it is also present in multiple, especially directed movements towards the achievement of particularly complex parts of an organism and its characteristics.

Let us say that the very antithesis of the two principles of *dynamis*–*adynamia* is closely related to the physiological characteristics of males and females, as a degree

of the combination of blood residues that serve as a efficient factor (male semen) and matter (menstrual blood in the female) during the generative process.

Conclusion

When it comes to conception, Aristotle described through the (complex) term *dynamis* rather a certain power, able to “assemble” the other powers in the embryo and thus enable them to work creatively. It refers to two classes of actions: those that are “by nature” (κατά φύσιν) and those “incidental” (κατά συμβεβηκός αιτίον), which are executed over matter (ὕλη), making it pass from form to form, along the line of development. This development is not predetermined, but dynamic – organicist and functionalist in nature – which follows the laws of a particular dialectical logic, depending on the environmental conditions. Then, when, for example, the opposites of two entities do not cancel each other out, they “enter” a complex relationship between the interaction of their parts on the path of synthesis and the emergence of something new.

Aristotle generates and substantiates the naturalist laws of development (of coming to be and passing away) in the organic and inorganic world – differing from the formal-logical laws (which are also attributed to him), and that would also respect logics with more values, not being restricted to only those two. Today we know that there is no single logic, which would govern any thinking, but that logic is the result of a process of the individual’s adaptation to the conditions of the environment. From this point of view, Aristotle’s concept of κατά συμβεβηκός αιτίον offers the possibility of interpreting the living and non-living world as a complex and dynamic system, which encompasses different polyvalent degrees of truth (probability, certainty and so on) [Кудрин, Хруцкий 2017].

Otherwise, the very nature of *dynamis*, according to him, is close to the nature of heat, *pneuma*, or soul, but also to aether, as the “fifth element”, that is, “astral matter”, while everything in nature arises as the result of one active and one passive principle. In the case of living beings, the active principle would be the male seed, and the passive the female’s menstrual blood, when the female principle is not completely inert, but has the power (*dynamis pathetike*) to act on what acts upon it, thus “freeing” through it all the potentialities it contains, in the form of parts of the organism in development.

References

- Aristotle (1907). *De Anima*. Ed. by R. D. Hicks. Cambridge: Cambridge University Press.
- Aristotle. (1943). *Generation of Animals*. Cambridge Harvard University Press, Cambridge.
- Aristotle. (1957). *Physics*, ed. by P. H. Wicksteed and F. M. Cornford, Loeb classical library, Harvard University Press.
- Aristotle. (1965). *History of Animals*. Harvard University Press, Cambridge.

- Aristotle. (2009). *On the Parts of Animals*. The Internet Classics Archive by Daniel C. Stevenson, Web Atomics.
- Aristotle. *Metaphysics*. Perseus Digital Library <http://www.perseus.tufts.edu>
- Chapouthier, G. (2010). “Reflections on the Consequences of Biocosmology in Modern Biology,” *Biocosmology – Neo-Aristotelism* Vol.1, No.1, pp. 92–98.
- Chapouthier, G. (2013). “Biocosmology And Biology – Their Fruitful Collaboration,” *Biocosmology – Neo-Aristotelism* Vol.3, No.2, pp. 201–211.
- Chapouthier, G. (2018). “Aristotelian Entelechy and Modern Biology,” *Biocosmology – Neo-Aristotelism* Vol. 8, Nos. 3&4, pp. 421–430.
- Duncombe, M., D. Novaes, C. (2015). “Dialectic and Logic in Aristotle and his tradition,” *History and Philosophy of Logic* Vol. 3, No 1, pp. 1–8.
- Khroutski, K.S. (2013). “Forming an evolutionary vector to the Aristotelian pole of scientific Organicism (Biocosmology),” *Biocosmology – Neo-Aristotelism* Vol. 3, No.1, pp. 28–51.
- Khroutski, K.S. (2016). “Aristotle’s Biocosmology – Teleological Functionalist Naturalism – As The Type Of Rationality,” *Biocosmology – Neo-Aristotelism* Vol. 6, No. 1, pp. 20–40.
- Khroutski, K.S. (2016). “Reinstating Aristotle’s Comprehensive Organonkosmology And The Genuine Language Of His Organicist Naturalism Archetype,” *Biocosmology – Neo-Aristotelism* Vol. 6, Nos. 3&4, pp. 394–413.
- Khroutski, K. & Klimek, R. (2018). “Biocosmological Definition of information and its naturalist causative significance, approaching to evolve the World Information University (WIU),” *Biocosmology – Neo-Aristotelism* Vol. 8, No. 2, pp. 203–261.
- Plato. (1929). *Timaeus*. Harvard university Press, Cambridge.
- Tasić, M. (2017). “On The Classification of Animals According to Biological Functions, after Aristotle,” *Biocosmology – Neo-Aristotelism* Vol. 7, Nos. 3&4, pp. 513–523.
- Tierney, R. (2001). *On the Senses of Symbebekos in Aristotle*. Oxford Studies in Ancient Philosophy, vol. XXI, Winter. Oxford University Press, Oxford.
- Кудрин, В.Б., Хруцкий, К.С. (2017). “Трехзначная Логика И Троичная Информатика Н.П. Брусенцова: Их Аристотелевские Основания (Three-valued logic and ternary informatics of N.P. Brusentsov: their Aristotelian foundations),” *Biocosmology – Neo-Aristotelism* Vol. 7, Nos. 3&4, pp. 337–388.