

Galen's terminology: the philosophical and symbolic meaning of "nerve"

Andrey P. Shcheglov

I.M. Sechenov First Moscow State Medical University, the Ministry of Health of the Russian Federation
8 Trubetskaya St., building 2, Moscow 119991, Russia

Abstract. This article analyzes the terminology of Galen; in particular, it deals with the philosophical and symbolic meaning of "nerve", which is often found in his works. It is demonstrated that the word "nerve" refers to thin filaments passing through the human body, providing it with the ability to move. For this reason, "nerves" can be defined as particular channels for the materialization of immaterial, potential "power". According to Galen, the structure of the nervous system in humans is analogous to the structure of the world, permeated by many threads, channels through which flows energy that controls the universe. The article not only examines the term "nerve" and the real object designated by the word, but also its metaphysical sense. Based on the author's analysis, the article attempts to find out the true meaning of the term and concept of "nerve", which indicates not only a purely medical phenomenon, but also another, immaterial dimension. Thus, the scope for the understanding of "nerve" widens: it is not only a conventional sign and a term, but also a symbol. In turn, viewing the term "nerve" as a symbol helps us to understand the essential identity of the speculative ideas of natural things. The "nerve" symbol contains an image (the term) and a real phenomenon, but is not limited to them, because it implies the presence of a certain sense, inseparably fused with the image and embodiment of the real, but they are not identical. The article identifies and substantiates the necessity for sharing methods of philosophical and linguistic analysis in the process of interpretation. On the basis of this research, the author proposes to distinguish between the meaning and significance of concepts designated by specific terms, and organize the next logical, interpretative chain – a "sign – meaning – value". Within the boundaries of this system, significance refers to the subject area correlated with a certain name (word), or term. Meaning refers to a certain point of view that helps to explore this subject area. In the case of the concept being studied, the established view is considered with the philosophical and symbolic meaning of the word "nerve", used in the writings of Galen.

Keywords: Galen, nerve, nature, action, energy, property, symbol, medicine

For quotation: *Shcheglov A.P. Galen's terminology: the philosophical and symbolic meaning of "nerve". History of Medicine. 2015. Vol. 2. № 4. P. 448–456.*

About the author

Andrey P. Shcheglov – Doctor of Philosophical Sciences, Professor at the Department of the History of Medicine, National History and Culturology, I.M. Sechenov First Moscow State Medical University (Moscow).
E-mail: staropomor@yandex.ru

It is not the case that each new stage in the history of science employs its own original terminology while abandoning the vocabulary of the past. For this reason, it is necessary to use terms from the past in their traditional senses whenever we are dealing with phenomena common in our own time or, as in our present case, classical medicine. As Einstein noted, "Nature has taught us that these words or concepts have only a limited range of applicability. And when we depart from this range we are left with abstract concepts and mathematical language¹ accessible only to specialists and which cannot be explicitly translated into simple, everyday language" [1, p. 13]. In order to understand

ancient terminology, we must appeal to a general philosophical-etymological method that can help us analyze any ancient text, including the philosophical and medical works of Galen, in a way that avoids the one-dimensional perspective where the past is defined exclusively in terms of our own modern understanding. It would be incorrect to consider Galen, for example, as only a primitive rationalist or as a certain kind of speculative philosopher producing abstract theories divorced from reality. In order to fully comprehend an ancient text it is not enough to merely understand the literal meaning of the text, and analytical interpretation is insufficient as well. Thus, the main goal of analysis requires an understanding of the hidden (μύστης) meaning of the text. In order to discover this meaning, it is necessary to divide the text into separate abstract moments and to further analyze each of these in order to later reunite them into a single whole. Only then can you uncover the common thread

¹ With regards to the present inquiry – a medical metalanguage.

that unites the various ideas in the analyzed text. The view that treats an ancient text as nothing more than the document immediately before one's eyes is misguided. This superficial view results in a shoddy and empty interpretation lacking any foundation in the actual text. A given idea is always more well-grounded and clear-cut, more real and complex, than the mere structure of words, sentences, syntax, and grammar of a document. By recognizing the difference between the sense (Sinn) and reference (Bedeutung) of a given term one can construct the following logical chain: sign – sense – reference. In this account, “reference” is understood as the particular thing associated with a given name (word) or term. “Sense” is the specific perspective from which a given subject is viewed. In our case, the perspective we are using is the philosophical-etymological concept of the word “nerve”².

It is always easier to grasp the apparent, the outer and the corporeal, than it is to grasp the inner. Any degree of interpretation expands our understanding of a text, yet is not opposed to the value of other degrees of knowledge; such oppositions are merely superficial “antinomies” (ἀντινομία). In other words, as Einstein noted, it is necessary to consider a concept from the ancient world not only from a modern semantic system (present), to trace out not only a formal etymology but to try to understand the “hidden” sense (μύστης) of a given ancient concept.

The great Roman thinker Galen was not only a renowned doctor but an equally renowned philosopher. The successful combination of these two roles had unprecedented consequences. The Emperor Marcus Aurelius, whom Galen served as a personal physician, considered him “the only doctor-philosopher and the first among doctors” [3, p. 27]. Galen's theories dominated medicine for nearly 1500 years (lasting almost until the early modern era), longer than any other system in the history of science. Galen's philosophical output is no less significant; indeed, some thinkers believe that the fourth figure of Aristotle's syllogism was actually put forward by Galen [4, p. 34].

² The Russian word “nerv” (nerve) comes from the Latin “nervus” (tendon, muscle, nerve), and from the ancient Greek (νεῦρον, neuron, from the Proto-Indo-European *(s)neu). In Russian, “nerv” is a borrowing from the German “nerv” or the French “nerf” [2].

The current essay will not go into a detailed analysis of Galen's philosophical and medical theories³. Instead, we will focus on a particular feature of Galen's work: using the concept of “νεῦρον” (nerve), a concept frequently employed by Galen, we will attempt to show how purely medical (physical) concepts can be transformed into metaphysical entities, and vice versa. Galen's contribution to the study of the nervous system is beyond doubt. An outstanding anatomist, he described in detail the workings of the ganglia (nerve cell clusters) and studied all parts of the sympathetic nervous system. Following Hippocrates and Alcmaeon, Galen concluded that the seat of thought and sensation was the brain. His theory proposing the brain as the impetus of bodily motion has not lost its value even in our own time.

For our short work, it is important to keep in mind that Galen considered the nerves to be a fundamental and physical part of the human body; it is to the nerves that the body owes the very possibility of its motion. In other words, the nerves are the material basis of motion and sensation in the body. Galen notes, “without the nerves there is not a single part of the body, not a single movement that can be called voluntary, not a single sensation”⁴. To clarify this point Galen turns to Aristotle, who wrote in his treatise *De Anima*, “The animate is mostly differentiated from the inanimate, it seems, by two [characteristics] motion and sensation”⁵. Thus, according to Galen, the nerves are responsible for turning something which is in itself immobile (i.e. flesh and body) into something which can move freely and which has the power of sensation⁶. Galen, like Aristotle, believed that any immaterial potential for movement is inseparable from the physical nature of a living being and is realized via the body or its individual parts. Therefore, according to Galen, the “materialization” of immaterial forces of motion occurs in living flesh due to nerves. This is why Galen frequently uses the term “nerve” (νεῦρον) when speaking of the anatomical structure of the human body or when

³ For more on this see [5].

⁴ “On the Doctrines of Hippocrates and Plato” (V, V). See [6].

⁵ Aristotle. *De Anima*, 403b. Citation given in [7]. See [7, p. 375].

⁶ Aristotle, *De Anima*, 403b 25-30: “...supposing that that which is immobile cannot itself cause motion in another, they consider the soul to be something which can itself move” [7, p. 375].

describing the causes behind human diseases⁷. It is not enough to consider Galen's concept "nerve" in its narrow, medical, natural science sense; he was a philosopher and not just a doctor but a philosopher as well. It would be fruitful to try to uncover the symbolic and philosophical sense Galen associated with the term.

As a doctor and anatomist, Galen understood his main objective to be the use of philosophical concepts to examine the precarious and unstable state of the living organism, which is subject to disease and ailment, in order to discover in material form the underlying idea inherent in the human body, an idea which is not bound by time or by the finite. Galen, being a loyal follower of Plato, was trying to find within the imperfect body the ideal laws with which, when discovered, one could determine the perfect state of the human organism. Such a view is similar to the Christian understanding of the body, according to which corporeal perfection can be achieved through constant prayer and limitation of material excesses, as seen in the following: «*УМЫИ ТѢЛО, УЧИСТИ ДУХ, И ДУШУ МОЮ УС(ВЛ)ТИ*»⁸. Galen, like the Christian ascetics, struggled to find something real in the world of external, imperfect, apparent things. With this in mind, Galen's medical term "nerve" transports us from the physical to the metaphysical realm, both of which are linked together by a symbolic, ideal conception of things, in this case of the concept "nerve" (νεῦρον).

In order to understand this symbolic-philosophical construction, we must examine the semantic and symbolic meaning of the ancient Greek term "nerve" which, at first glance, carries an exclusively physical, medical connotation. In modern medicine, the term "nerve" refers to an encased structure consisting of a bundle of nerve fibers. As a doctor and natural scientist, Galen was perfectly aware that a "nerve" was primarily a tangible, physical "fiber". It is extremely important for us to bear in mind this ancient conception of

the nerve as a fiber. Galen believed the human body to be permeated by muscle fibers, tendons, and nerves. In its physical sense, the Greek word "νεῦρον" meant tendon (as in "τὰ ὀστέα καὶ νεῦρα καὶ σάρκα"⁹). The word "tendon" or "sinew" has been used to refer to the material from which thread and rope is made¹⁰. The understanding of thread and rope as something that entangles and binds carries an important symbolic connotation in a wide range of religious and philosophical traditions, including that of the ancient Greeks.

According to the Christian symbolic conception, thread is what binds the spiritual and material spheres of existence. A silver cord is said to connect the soul and the body [1, p. 45–46]. Thread also appears as a symbol of fertility, a divine seed fertilizing the earth as rain [11, p.117]. On the one hand, rope is associated with bondage, physically tying up its captives in knots, while on the other, a rope hanging in midair, stretching from heaven to earth, is a means by which man can reach the higher spiritual realms and in this case symbolizes his inner path to spiritual enlightenment.

Rope and thread, then, have a double meaning. They tie man together, ensuring his continuity and predestined fate, and put man face to face with natural inevitability. The point of connection is always expressed as a knot which, like a rope, has great significance in ancient symbolism¹¹. A bundled rope is symbolically associated with the image of a snake biting its own tail. Here we are reminded of the Biblical subject of the fall from grace: man's confinement to his bodily shell («*КОЖАННЫХЪ РИЗАХЪ*») was the result of the Biblical snake's seduction of the first man and woman. This crime binds Adam and Eve via snake-like knots to the physical world. But if the knot comes undone then the restraints lose their power, once the threads of existence have dissolved, man is free from his subordination in the natural order and no longer alienated from the ideal (spiritual) realm.

⁷ Although this issue has been dealt with in a number of Galen's writings, his work "De nervorum dissectione" is devoted exclusively to this issue. See [8].

⁸ "Wash my body, cleanse my soul, and sanctify my spirit". Triod, 11–12 centuries. Russian State Archive of Ancient Acts, F. 381, sheet. 23 ob. Triod (ancient Greek: "Τριώδιον," from ancient Greek "τρία" or three and "ὄδη" or song) is a liturgical book in the Orthodox Church, containing the services of Great Lent and the three preceding weeks.

⁹ "Bones, tendons, and flesh" (author's translation). See: Aristotle. *Metaphysics* 1035a. Plato also understands "nerve" in the sense of tendon (See: *Phaedo* 80d, 90a).

¹⁰ "And when the season of frost comes on, stitch together skins of firstling kids with ox-sinew, to put over your back and to keep off the rain." Hesiod. *Works and Days*, 543-545. Trans. V.V. Versaev [9, p. 67].

¹¹ The creation of pottery in the shape of coiled rope by the so-called Corded Ware cultures was the result of the abstract concept of the flexible cord. Rope is seen as a link between the material and the spiritual and vice versa.

In the Christian tradition, there is also a flexible existential thread, as in the “Heavenly Ladder”, spiritual tables, and “Ladder of Divine Ascent” (Κλίμαξ θείας ἀνόδου) of St. John of the Ladder (Ἰωάννης τῆς Κλίμακας), who also described the heavenly father as a doctor (ἰατρός). The rungs of the “Ladder”, like knots in the heavenly thread, gradually lead man to a higher spiritual state. This is the path followed by those with the desire to experience the unknown, to uncover the threads of life leading to knowledge, the path which determines man’s destiny. This is the path seen by Jacob in his dream (Sulam Yaakov), by which angels ascend to and descend from heaven¹².

In Hellenistic mythology, thread signifies deliverance, freedom and escape from captivity. Ariadne (Ἀριάδνη) gives Theseus a ball of thread so that he can find his way back out of the dark and murky labyrinth deep underground. It is interesting to note that the snake, a chthonic being, was a symbol of Ariadne who, in turn, was devoted to the Earth goddess. Thus, Theseus’s deliverance from the earthly depths of the underworld signifies man’s liberation from his bodily shackles and the kingdom of darkness where the Minotaur reigns¹³. Simply having a ball of thread in the form of a ray of sunlight allows one to illuminate the surrounding darkness and escape from the cave into the light of day [12, 13; 14, p. 302–309]. Those who remain captives in the physical world perish, wandering about in the darkness, never to find their way out. They do not have the thread of life, which is the axis of the world, the link between heaven and earth, the ladder to heaven.

A knotted rope or scourge was the instrument of the Hellenistic goddess of retribution Nemesis

¹² “And he dreamed, and behold a ladder set up on the earth, and the top of it reached to heaven: and behold the angels of God ascending and descending on it. And, behold, the Lord stood above it, and said, I am the Lord God of Abraham thy father, and the God of Isaac: the land whereon thou liest, to thee will I give it, and to thy seed; And thy seed shall be as the dust of the earth, and thou shalt spread abroad to the west, and to the east, and to the north, and to the south: and in thee and in thy seed shall all the families of the earth be blessed. And, behold, I am with thee, and will keep thee in all places whither thou goest, and will bring thee again into this land; for I will not leave thee, until I have done that which I have spoken to thee of. And Jacob awaked out of his sleep, and he said, Surely, the Lord is in this place; and I knew it not. (Genesis 28:12-16). KJV.

¹³ Μῖνώταυρος – a creature with the body of a man and the head of a bull.

(Νέμεσις), symbolizing, along with a set of scales, control over people’s conduct and punishment. In the Middle Ages, penitents carried a rope tied around their neck as a sign of humility and repentance [10, p. 57]. Thread also symbolizes fate. In ancient Greek mythology, the Fates determine the destiny of each person. One’s life, in the form of a fine thread, is entirely in the hands of these goddesses. The first, Clotho (Κλωθώ, or “spinner”), was the Fate who spun the thread of life. The second, Lachesis (Λάχεσις, or “allotter”), measured out the thread allotted to any mortal (also determining the direction of one’s “thread” of life, including the twists and turns of fate). The third, Atropos (Ἄτροπος, or “unturnable”, i.e. the inevitable, ineluctable fate (death) awaiting all men), was the Fate who cut the thread of life. Birth and death are under the special protection of the Fates. They determine a person’s lifespan and the moment of his death, ensuring that a person does not outlive his allotted time.

In Hellenistic cosmology, the universe is held together as a single whole by essential threads: when, at the end of time, these threads are broken, the world will fall apart completely. These threads are visible only to a select few. However, the connecting threads exist not only in the universe of laws and unity (“macrocosm”), but to no less a degree in the spiritual universe or “microcosm”, and are perhaps more widespread here than in the visible universe. Inexplicably, these threads, binding all of existence and present in the human body and soul, have an invisible spiritual aspect and a visible material aspect. The spiritual connections permeating matter are responsible for the semantic roots of such familiar Latin concepts as “religio”¹⁴ and the verb “religare”, meaning “connect”, “weave”, “hitch”, from which are derived the words for “tenderness” and “veneration”. The connection with the Supreme Principle brings about the highest moral concepts like “conscience”, i.e. that which “corresponds to the highest word”, Logos.

The entire visible universe is woven from threads that symbolically represent the fate of the human soul, itself woven by higher powers from the same threads, thus, binding it to the rest of the universe. These are the divine channels through which all of existence acquires its reality. They are

¹⁴ From the word “religare” we get the word “religiya” (religion).

the divine ties uniting every living thing into a single unity. It is through these ties that the objective, personified Divine Power penetrates the dark and indistinguishable substance. According to ancient Sumerian myths about creation, the physical body (σάρξ) comes into being “when your word breaks forth upon the land, the trees and grass will grow” [16, p. 534]. All creation contains the wisdom of the Divine Word: “Неодержимую держаши превысрпнюю на въздоуѣ водѣ и глоубины овоздаваюци и морѣ възставаюци в(ож)на мѡдрѡстѣ”¹⁵.

Thus, “nerve” (νεῦρον) is symbolically transformed from a physical, material object to a metaphysical entity. However, the physical becomes the metaphysical not only by means of imagery and symbolism. As we have already seen, the “physical” meaning of the word νεῦρον is “rope” or “thread”. Made from fibrous plant material or the intestines and sinews of animals, “νεῦρα” were necessary for sewing clothes from animal skins, making bows and slings, moving heavy objects, equipping boats with anchors, tying up prisoners, and harnessing domesticated animals. Another meaning of the word “νεῦρον” is bowstring, which lends it another association — the ability to gather force and then to move that force in a given direction. With the appropriate amount of tension, a bowstring can fire an arrow that can hit even a small target hardly visible from a distance.

We have now come to one of the most important meanings of the word “nerve” — its associations with “strength”, “hardiness”, and “might”. A sharp reader might call our attention to the fact that the ancient Greek word for strength is “δύναμις” (dynamis)¹⁶. However, the word “δύναμις” means strength in the sense of “power” or “potency”, as in the ability or capacity to wield hidden forces. This property exists in potentiality but not in actuality¹⁷ (τὸ δυνάμει ὄν, ἐντελεχείᾳ μὴ ὄν). For its part, “νεῦρον” is at the same time “muscle”, “tendon”, and “nerve”, and only in

a figurative sense is it “might” and “strength”. In other words, “nerve” is embodied action (νεῦρα τῶν πραγμάτων). It is a kind of strength connected to the material world, giving bodily form to the theoretical, mysterious force that is in the essence of things, like “δύναμις”. Thus, the “nerve” is not only a conductor of power but is itself a form of materialized power, a physical entity located in the outer world (ad extra), bearing all the burdens of the natural world, the pains and difficulties inherent to the physical. It is worth remembering, as we have mentioned, that for all its outer, physical, materiality, “νεῦρον” is also associated with the metaphysical and with the highest absolute principles.

We have considered the meaning of the concept of “nerves” (νεῦρα) as vital threads connecting the image of the body and the image of the immaterial idea of this body. Now we will attempt to explain the subtle process of how the material “bundle of nerves” in the human body can be transformed into something transcendental, i.e. we will examine the “νεῦρα” from a metaphysical point of view. According to the most widely accepted definition in modern medicine, nerves are “anatomical structures in the form of bundles composed mainly of nerve fibers, providing a connection between the central nervous system and innervated organs, blood vessels, and the skin” [17], i.e. that which is responsible for motion in all tissues of the human body, a kind of power embodied by nerve fibers.

Two concepts are important for us here: “thread” and “fabric”. Thread is what fabric is made of, its foundation. In our case, we are talking about bodily fabric woven from and permeated by nerves, i.e. biological tissue. This kind of tissue is driven by the nervous system. In the Old Russian Triodion, in one of the theotokions (Θεοτοκίον, i.e. a hymn to the Mother of God), the creation of the flesh of the Christ Child is presented using an analogy to weaving: “вѣ чреѣтѣ твоємѣ плѣтъ сѣистѣка сѣ”¹⁸ (“in Your womb [Mary’s] flesh is woven”¹⁹). In the third century,

¹⁵ “Only you, Divine Wisdom, can contain all of the waters above (the heavens), restrain the depths of the sea and keep them within their borders”. Triod. Russian State Archive of Ancient Acts, F. 381, sheet 23 ob). Author’s translation.

¹⁶ For example, “bodily power” (αἱ τοῦ σώματος δυνάμεις) or “the law has insurmountable power” ὁ νόμος ἀναγκαστικὴν ἔχει δύναμιν). See Aristotle. The Nicomachean Ethics, 1180a.

¹⁷ See Aristotle. Metaphysics, 1072a 5.

¹⁸ Triod. Russian State Archive of Ancient Acts, f. 381, sheet 25 ob.

¹⁹ The Virgin was one of the maidens who wove the veil for the Temple of Jerusalem (apocryphal Protoevangelium of James 10.2). During Christ’s death this veil was torn (Matthew 27:51). The Temple veil was identified by the Apostle Paul with the flesh of Christ.

Tertullian described the human body as a fabric to which the human soul and body were fastened (“carnis animaeque texturam”) [18, p. 570]. The Torah describes an ancient ritual in which priests performing a rite would mimic the hand motions of a weaver, interweaving the visible and the invisible [19, p. 1504–1505].

A comparison of the biological function of “nerves” and their penetration throughout the substance of the human body with the symbolic and philosophical conception of the “human fabric” (including that of Christ himself) as being composed of woven fibers (νεῦρα), immediately makes clear to the modern reader the etymology of Galen’s term “νεῦρον” (nerve). This concept is only prima facie purely material. Galen describes the network of nerves not only as a doctor but as a philosopher. In his works we can clearly see that he regarded “nerve activity” as more than a purely material fact. The power of nerves is a material effect of one of the most important features of the human body, the flexible natural sinews designed to carry the weight of the body and withstand bodily tension and exertion. The name of these features was transferred to the exertion itself, simultaneously physical and invisibly, imperceptibly immaterial, with the capacity to automatically transform itself from the physical to the metaphysical: “nerves” are the cause of every bodily movement of the human body, of motion, of compulsion, of every physical change in space.

This immaterial power (or ability, capacity – δύναμις), found in veins and nerves, might be called the “life force” through which the human body acquires the capacity for motion. Any ability is a relationship (ἐν τῷ πρὸς τι) – for Galen it is the connection between the material and immaterial. Their joint capacity and internal ability are the primary cause of activity (functioning, ἐνεργία) which in turn produce actions (ἔργον). A cause is always a relation to something (the creation and manifestation of something). In our case, the cause is “nerves” which, accordingly, are related only to that which they produce, or in other words, their effects, i.e. bodily motion and the vital functions of human life. If we are unaware of the essence of a certain cause, then we can call it only some general ability (capacity); but if there is a cause of this ability (power), then there arises something related (ἢ αἰτία πρὸς τι) to this cause and there

appears a particular result of the cause, i.e. a thing with its own proper functions.

From Galen’s perspective, the human nervous system is highly efficient; it is not a random and chaotic arrangement of parts but rather the result of essential, natural laws. It is through this system that man is connected to the surrounding world. Galen bases this idea on the structure of the nerves itself, a network covering the entire human body. To give a clear example of this idea, he appeals, like Plato, to the image of a net in the water²⁰.

Both Plato and Galen conceived of the internal structure of the human body to be a complex network of interlacing tendons, joints, veins, and arteries which conducted the life force and nutrients throughout the body, as well as nerves – cells and fibers ensuring the transfer of information and instructions from the brain and spinal cord to the various organs of the body. This web of vital channels crisscrossing the human body is compared to a fishing net in Plato’s *Timaeus*. However, there is a significant difference in the interpretation of this image between Plato and his equally renowned follower. For Plato, the fishing net is only a theoretical image with metaphorical and metaphysical connotations. For Galen, the structure of a fishing net is an entirely accurate way of describing the human body. According to Galen, the human body is covered by a network of intertwined, interrelated, and interdependent channels which serve as conduits of motion and which resemble the complex and finely-knit structure of a net used in the water for fishing [21].

The metaphor of the net helps us understand the exact type of connection between the intersections of organic tissue and the process of transmission and retention of physical elements. The living body according to Plato and Galen is not an independent, solid, stable, physical entity; it is a small network permeated by the surrounding natural universe. At the same time, the body is a part of this universe and is arranged in accordance with its laws. Passing through the infinitesimal mesh of the body, the universe (summa rerum) leaves behind what is necessary for the body and carries out whatever is superfluous. This kind of structure should convince us that the essence of a living organism

²⁰ See Plato, *Timaeus*, 78b3. This dialogue is referenced in [20], translated by S.S. Averintev.

is not the sum of its parts in the way that a wholly physical being is essentially nothing more than its parts. Thus, anybody considered only as physical is always limited by the natural order. Hence, a living (not purely physical) organism exists, as it were, between two important boundaries. On the one hand, its existence is determined by the laws of the natural universe and, on the other hand, by the organism itself as a phenomenon comprising both metaphysical permanence and physical disintegration.

When the net is used as a symbol of the living organism, we are faced with an image of a general two-dimensional material with pores through which the physical world can flow. Each point of intersection signifies a point of passage between different physical states. Also, these points represent a sign of transformation in an organism's hierarchy from one physical state to another. The net itself is an undulating, constantly moving fabric upon which are spread an array of indestructible metaphysical points of intersection. A living organism, like a net, expands and contracts, folds and unfolds to become infinitely small or infinitely large.

The natural world which penetrates the living organism is reminiscent of the primary element of the water, from which we get the Platonic image of the body as a net located in water. The physical substance, the force coursing through the living organism, is invisible, colorless, fluid and formless, yet it also takes on the form of whatever vessel it happens to be in. It is able to expand and contract in this form. The natural essence of a living organism, which is arranged from a series of irreducible intersections, forms the living body in which the heterogeneous and the opposite are united. There is no boundary between the two non-identical entities. The net, with its intersections, holds in the flow of the physical environment which enters the organism. Thanks to the net, this flow of heterogeneous elements is contained within the same space, changing only its shape. This physical flow does not have a rigid structure and does not maintain its shape by itself, but the net-like lattice of the organism carries the essential knowledge of what is necessary for the organism to acquire what it needs. Thus, the body becomes very receptive to the surrounding environment and is endowed with the capacity to move about in a constantly changing and

fluid space. The net secures within it a variety of diverse and heterogeneous materials, maintaining them and bringing them into connections with each other such that, when these connections are interrupted, the various parts cease functioning and the material returns to its natural (inanimate) independent state. This is the kind of aggregation of elements which Plato attributes to the Demiurge: "He weaved out of air and fire a veil of mesh-work like unto a fish wheel"²¹.

Fish wheels, fishing baskets, fishing nets, and dragnets are all objects which have a checker-work or honeycomb mesh of interconnected nodes. Due to their net-like structure, such objects can serve as a symbol of any number of trapping activities. The structure of a living organism is also a complex network of interconnections which transcends its basic constitution of temporal parts to become a living organism maintaining its individual identity from birth to death. Its net-like arrangement establishes not only physical relationships but relationships not bound by physical borders, a structure which connects the visible and the invisible, uniting them into a single paradoxical whole no longer subject to time. On the other hand, a net can also be likened to a fabric, a universal symbol of order in which everything is connected. Due to its radial construction, spreading out in all directions and uniting distant parts, a net is a symbol of the cosmic order; it symbolizes the natural and supernatural powers of possession and retention, thereby representing a kind of fabric or substance of being. Its main property is the capacity to connect and unify into a single entity, to retain and also to remove, while its dissolution results in the release of inner forces or substances.

Plato attributes this net-like design of biological organisms to the Demiurge: "The network he took and spread over the newly-formed animal in the following manner". Galen emphasized that Plato's "net" is a metaphor, a metaphysical image to help us understand the fundamental structure of the living body. He writes, "the lofty 'netting' he mentions does not exist in itself, but, taking it as such, we should see a relation to the structure of living beings" [22, p. 773].

²¹ Plato. *Timaeus*, 78b3s78b4s [20].

At first glance, a net appears to be a completely harmless object, full of holes and held together by thin fibers. However, this object is also able to completely limit the movement of anything trapped within. It is an object which obeys the laws of inanimate nature and also possesses their blind power, held back, as it were, by the complex web of interconnections to form a living organism. Thus, the living body, unprotected, unstable, held together only by a few knots, is able to face the external natural world, a domain which is entirely hostile to it. At the same time, the organism's internal constitution is also like the metaphysical net described by Plato in the *Timaeus* and by Galen in his commentary on it as the inside of a fishing trap: "In order to elucidate what a fishing net is, we must first understand that it is enclosed within external walls, inside of which there is another net, but smaller in size. This inner net has the exact shape of the outer, larger net. The trap is a chamber made of interconnecting threads. The smaller net inside the larger net has the same foundation and is connected to it by more threads. The opening of the smaller net does not share the same location with the opening of the larger one and is slightly lower, almost at the lower wall. There can be two smaller, identical nets, both located within the larger one already described. In order to better understand the structure of the trap you must imagine an elongated knit basket completely closed on one end and narrow at the other with a small opening. Inside the larger basket there is a smaller basket with an even smaller opening. Thus, the trap has two openings for fish: one in the bigger and one in the smaller. Fish swim through the larger opening and, swimming further, enter the opening of the smaller basket. In this way the

fish are divided: the bigger ones remain in the larger basket while the smaller ones go into the smaller basket. Plato called these openings in the nets "cavities" (ἐγκύρτια) [22, p. 770].

Any organic grouping of channels, pathways and connecting lines spreading throughout an organism by means of which a particular cause is able to bring about a given effect, can be called a network. The nervous system can also be thought of symbolically as a network or textile. It is generally accepted that nerves are a special kind of tissue – nerve tissue – made up of nerve cells and nerve fibers. The former comprise the biological neural network and the latter are the conductors of nerve impulses. Without venturing further into medical and biological problematics, it can be said with certainty that, regardless of our modern understanding, these concepts are what are referred to by Galen's terms (borrowed from Plato) "net" and "fabric", the philosophical meanings of which we have tried to uncover in our short essay.

We can sum up our conclusions in the following way. The philosophical-etymological method allows for a different way of understanding the meanings of such concepts as "life force", "strength", "net", "node", and "bodily tissue" included in the term "νεῦρον". They yield a semantic content which is quite different from meanings arrived at by the other methods and are more than purely rational semantic accounts, which frees us from an exclusively sensory, one-dimensional preconception of these terms. We examined not only Galen's use of the word "nerve" and the material object referred to by it but also the metaphysical idea associated with it. In our view, a proper understanding of the meaning of this term and the concept "nerve" can only be found at the intersection of these accounts.

REFERENCES

1. Einstein A., Infeld L. *Evoljutsiya fiziki (The evolution of physics)*. Moscow: Izdatel'stvo Akademii nauk SSSR, 1965. [in Russian]
2. Fasmer M. *Etimologicheskij slovar' russkogo yazyka*. V 4 t. (*Russian Etymological dictionary*). In 4 volumes). Vol. 3. Moscow: ACT, 2009. [in Russian]
3. Rocca J. *Galen on the Brain: Anatomical Knowledge and Physiological Speculation in the Second Century AD* (Studies in Ancient Medicine). 2005.
4. De Lacy P. *Galen's Platonism*. American Journal of Philosophy. 1972; 93: 27–39.
5. Balalykin D.A., Shcheglov A.P., Shok N.P. *Galen: vrach i filosof (Galen: Physician and Philosopher)*. Moscow: Vest, 2014. [in Russian]
6. De placitis Hippocratis et Platonis. In: Galen. *On the doctrines of Hippocrates and Plato*. Ed. P. De Lacy [Corpus medicorum Graecorum. Vol. 5.4.1.2, pts. 1-2. Berlin: Akademie-Verlag, 1978]: 1:65–358; 2:360–608.

7. Aristotle. *O dushe*. V kn.: Sochineniya v 4 t. (*On the soul*. In: Works in 4 volumes). Vol. 1. Moscow: Mysl, 1983: 369–450. [in Russian]
8. De nervorum dissectione. In: *Claudii Galeni Opera Omnia*. Ed. C.G. Kühn. Vol. 2. Leipzig: Knobloch, 1821 (repr. Hildesheim: Olms, 1964): 831–856.
9. Hesiod. *Raboty i dni*. Zemledeľ'cheskaya poema (*Works and days*. A farmer's poem). Moscow: Nedra, 1927. [in Russian]
10. Ferguson G. *Sighs and Symbols in Christian Art*. London, 1955.
11. Burland C.A. *The Magical Arts*. London, 1966.
12. Marini A.M. *Il mito di Arianna*. Atene e Roma. 1932; 1–2: 60–97.
13. Marini A.M. *Il mito di Arianna*. Atene e Roma. 1932; 3–4: 121–142.
14. Buxton R. *Kritskiy Eros, ili strannye sud'by Ariadny*. V kn.: Russkaya antropologicheskaya shkola. Trudy (*Cretan love: the complicated fates of Ariadne*. [In Russian] Anthropological School. Proceedings). Iss. 1. Moscow: RGGU, 2004: 302–309. [in Russian]
15. Losev A.F. *Moyry*. V kn.: Mify narodov mira. V 2 tomakh (*Mora*. In: Myths of the world. In 2 volumes). Vol. 2. Moscow, 1992: 169. [in Russian]
16. Dijk J. van. *Gott nach sumerischen Texten*. In: Reallexicon der Assyriologie. 3. Bd. Berlin, 1969.
17. *Malaya meditsinskaya entsiklopediya (Small Medical Encyclopedia)*. Moscow: Malaya meditsinskaya entsiklopediya, 1991–1996. [in Russian]
18. Tertullianus. *Resurrectione carnis*. In: Q. Septimii Florentis Tertulliani Opera omnia. Wirceburgi, 1781 (MDCCLXXXI); 527–613.
19. *Lexikon zur Bibel*. Hrsg. von F. Rienecker. Wuppertal, 1969.
20. Plato. *Timey*. V kn.: Platon. Sobranie sochineniy v 4 t. (*Timaeus*. In: Plato. Collected Works in 4 volumes). Vol. 3. Moscow: Mysl, 1994: 421–515. [in Russian]
21. Balalykin D.A. *Platon o meditsine (Plato's view on medicine)*. Philosophy, methodology and history of science. 2015; 1(1): 113–148. [in Russian]
21. Galen. *Fragmenty komentariya k «Timeyu» Platona*. V kn.: Galen. Sochineniya II. Pod red. D.A. Balalykina (*Fragments of the commentary to "Timaeus" Plato*. In: Galen. Works. Vol. II. Ed. D.A. Balalykin). Moscow: Prakticheskaya meditsina, 2015; 759–781. [in Russian]

About the author

Andrey Petrovich Shcheglov – Doctor of Philosophical Sciences, Professor at the Department of the History of Medicine, National History and Culturology, I.M. Sechenov First Moscow State Medical University, Moscow (Russia).