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Religio-philosophical systems and their impact on the history of medicine

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The author offers a "religio-philosophical system" as an important factor, which played a determining role in the development of natural science and medicine in the pre-historic period (prior to the beginning of the Scientific Revolution of the XVII century). This approach allows us to analyze the history of medicine in the general context of the development of natural science in continuous correlation with the occurring sociocultural processes, which influence the way of thinking of the scholars and forming of their research program. It gives us an opportunity to study each of the historical periods of the development and accumulation of theoretical and practical knowledge in the field of medicine from the position of systematic approach. The significance of a specific religio-philosophical system from the point of view of the historical scientific research is defined by how it responds to the question about the cognition of the material world and human (as a part of this world) and the ability to acquire an evidence-based knowledge. On the example of medicine of the Ancient Egypt and Galen's heritage we indicate the importance of the "religio-philosophical system" for the development of the history of medicine during the pre-scientific period as a part of natural science.

Keywords: *history of natural science, history of medicine, religio-philosophical system, natural philosophy of Galen*

In recent decades, the trend towards highly specialized analysis has been dominating the field of the history of medicine. Moreover, it is characteristic for the history of the natural sciences in general, which of course, is easily explainable. For medical specialists engaged in historical study, events that directly affected the contemporary image of medical science and practice are top-priority interest. In contemporary Russian historiography, we find extensive studies dedicated to the history of surgery, cardiology, immunology, the establishment of medical education, etc. [1, 2]. Their chronological framework, for obvious reasons, covers the XIX – XX centuries. The events of earlier eras are mentioned extremely rarely. If the events of antiquity and the Middle Ages are the focus of the researcher, then as a rule, they are analyzed through the prism of a phenomenological approach, describing methods of healing one or another disease, or focusing on various historical medical figures.

This kind of approach leads to an examination of the history of medicine outside of the general context of the developments of natural science; the global social and cultural processes that have had a defining influence on the way scientists think and their research programs. A striking example of such an analysis is the description of the history of medicine of the XVI-XVII centuries, which excludes the general upheavals in natural sciences, the events of the Reformation and Counter-Reformation, and the developments of European cities and universities.

The purpose of this article is to try to highlight what is, in our opinion, one of the most important factors determining the development of medicine in particular and science in general, during the scientific revolution of the XVII century (and possibly later periods). We suggest calling this factor the "religious and philosophical system".

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What we have in mind is the following methodology: all knowledge is preconditioned. When speaking about any specific scientific discovery or formulation of general theoretical ideas in medicine (or, for example, in physics), we necessarily try to understand the anatomy of the researcher's thought, to understand how this or that idea appeared, how the scientific research of a specific scientist was performed. Of course, the answers to these questions are inconceivable without describing the individual. Reconstructing the biography of scientists, the details of their childhood education, information about the family and social environment are always the focus of historians of science. To put it simply, we try to answer the following question: "How did he or she come up with this discovery?" That question is immediately followed by this question: Why was it this person (and not someone else) at precisely this place and at this precise time (and not at some other time)?

Some time ago, Russian philosopher professor V.S. Stepin proposed the idea of the “world view” of a particular scientist. [6] Unfortunately, some of my colleagues understand this as a theoretical idea of one or another researcher concerning the subject of investigation [7]. In fact, the issue is much broader: it is the need for a comprehensive understanding of science as part of culture and society, the systemic factors that have shaped the personality of the scientist.

This is particularly clear when applied to the history of science of the XVII century. We understand the essence of the concept of “religious philosophical system” and its impact on the history of science, the following way: any doctor known in history is, more or less, a naturalist. A scientist, starting specific research defines specific goals and objectives. What guides him? Any scientist (II, V, XIII centuries etc.) sees the world through the prism of a certain natural philosophic (or general scientific) system of ideas. Up until to the XIX century, we could hardly find anything like a significant secular philosophical system. Each of them tried to develop their own system of understanding of the natural and supernatural, one way or another, using the definition of "God” to develop these understandings, trying to realize man's place in the world and his cognitive capabilities.

We emphasize that we are not talking about religion and its impact on science. The direct relationship between religion and science is a completely different topic. Many reputable scientists have written about this [8-15]. Our model is as follows. Any religion creates a system for understanding the world. This understanding serves as the basis for a certain system of beliefs (it can be tentatively called natural and philosophical). These views define the premises for the knowledge of natural science that guides specific researchers in the formation of their own picture of the world and in setting the goals and tasks of the scientific research. The ultimate significance of a specific religious philosophical system for the history of natural sciences is determined, in our opinion, by the way it answers questions about knowing the material world and the human being (as a part of this world), and the possibility of obtaining evidence-based knowledge. If the religious and philosophical system responds positively to this question, then the development of natural sciences within it is possible. If the answer is negative, natural sciences in a society where such a system prevails will not develop.

It seems that this is precisely what Norbert Wiener had in mind when he spoke of the need for an a priori of confidence by a scientist in cognition of the research object: I said that science was impossible without faith. By this, I do not mean that the faith upon which science depends is by nature religious or implies accepting some conventional religious dogmas; however, without the belief that nature is subject to laws, science cannot exist. It is impossible to prove that nature is subject to laws because otherwise, as we all know, the next moment the world would be like a game of croquet from Lewis Carroll’s book "Alice in Wonderland” [16].

We will use ancient Egyptian civilization as an example of a user of a religious philosophical system, which did not give an impulse to the systematic development of learning in natural sciences. Undoubtedly, it is of great cultural and historical significance. However, we will try to evaluate it from the point of view of the history of medicine.

We find that doctors are mentioned in sources as early as the period of the Old Kingdom; Homer praised Egyptian medicine. Medical mixtures established through empiricism and dedicated to different types of illnesses were recorded in prescriptions found on texts of papyrus. Fragments of Kuhansk papyrus related to obstetrics (description of early and late delivery), and veterinary medicine (poisonous flies on cattle, bull plague, and more) were preserved. A large medical collection from the times of the New Kingdom has survived to the present. For example, the Ebers Papyrus dates to the time of Amenhotep Pharaoh (XVIII Dynasty) and contains many prescriptions, a description of 22 vessels coming from the heart, and a number of practical medical ideas. It is replete with hymns and incantations, giving a clear picture of ancient Egyptian medicine as magical and devoid of an anatomical and physiological system. A doctor under this system is none other than a priest of the goddess Sekhmet. Brutsha Papyrus dated to the XIX Dynasty is older than Ebers papyrus by nearly 200 years. Nevertheless, by studying it, we see the same (in many instances coinciding) prescriptions and magical formulas. Hearst Papyrus focuses on information for surgeons, Minor Berlin Papyrus – on health issues for mothers, wet nurses, and children's diseases. All of them abound with spells and magic formulas [17, p.52].

The core of religious faith in ancient Egypt was the idea of the immortality of the soul and the need to preserve the physical body of the dead in order to ensure its wellbeing in the afterlife. Hence the need to preserve the body by embalming. Embalming techniques were perfected to the smallest detail and the technology achieved perfection. It is obvious that we are looking at a phenomenon of death autopsies conducted on a massive scale, performed during the course three thousand years! Especially surprising is the fact that, after this enormous amount of autopsies and embalming, conducted for over 2 thousand years, the ancient Egyptians did not leave any serious sources on human anatomy. This, in our opinion, indicates the systemic nature of epistemological failure. Neither thousands of years of medical observation (the profession existed during those years), using prescriptions, medicinal mixtures, nor tens of thousands (we can hardly be mistaken about the numbers) of autopsies conducted while embalming bodies, lead to the creation of any holistic anatomic and physiological system. There was not even a suggestion of such a system. Century after century, medicine existed as the priestly art of healing, amply equipped with magic. The basis of pathogenesis for all diseases was believed to be the influence of evil spirits and the primary principle for treatment was regular temple cult practices. It should of course be noted that a certain amount of useful data was accumulated.

For example, there was a high level of hygiene in ancient Egypt, both personal and general (Herodotus wrote about this admiringly). Another example remaining to present times is the amount of papyri containing interesting descriptions of several infectious diseases, such as schistosomiasis. Egyptians understood on an empirical level that bathing in a dirty pond could lead to several kinds of diseases. Nevertheless, the fact remains indisputable – despite enormous opportunities and timeframe for development, no serious anatomical and physiological system or theory of healing was created within the civilization of ancient Egypt. One may conclude, we believe, that this civilization had a religious philosophical system that completely excluded a positive answer to questions about the possibility of knowing nature and man. Furthermore, the social structure of a despotic society eliminated the appearance of conditions, which developed aspirations in social groups or an individuals to accumulate scientific knowledge. Despotic society together with a totalitarian pagan cult, distinguished by a crude fetishism, which penetrated into individual and public consciousness, turns out not to be the best environment for the emergence of science.

Quite a different picture is observed in Ancient Greece where, in the VI century BC, attempts at rational cognition were developing within the framework of early Ionic physics. The book by J. Longrigg has been of great interest to this writer [18]. It seems that he was the first in modern historiography to describe the development of Ancient Greek medicine as two divergent vectors: on the one hand, there was occult tem-

ple healing; on the other hand, there was rational knowledge, explaining the origin of diseases and methods of their treatment by natural causes. It was the second direction that led to contemporary medicine – through Galenism and the scientific revolutions of the XVII-XIX centuries.

In conversations with colleagues, this author has often come across two important objections: first, we are talking about civilizations separated by time (the more ancient Egyptian and more contemporary Greek); secondly, both civilizations are characterized by polytheistic, pagan types of religion; therefore, talk about different religious philosophical systems may be inappropriate. I will to try to respond to both of these objections.

Of course, the ancient Egyptian civilization is much older than the Greek one. However, the Sais Dynasty, the last blooming of state and culture, preceded the Persian conquest of Egypt. In this sense, the ancient Egypt of Pharaoh Psammetikh and the ancient Greece of Alcmaeon and Empedocles are contemporaries. Moreover, it seems perfectly logical to evaluate the developments of medicine in ancient Greek during the course of over almost 3.5 thousand years (I suggest beginning with the time of accession to the throne of Pharaoh Menes, and not even considering the period before the dynasties). Undoubtedly, we are dealing with an indigenous culture that has had a continuous cycle of development. It is quite natural to try to evaluate the dynamics of natural science and the potential to accumulate systems of anatomical physiological knowledge.

The second observation, concerning the pagan system of beliefs of ancient Greeks, is absolutely justified. However, here it is appropriate to emphasize the influence of religion on religious philosophical systems and not on its direct role in the development of scientific knowledge. The pagan cults of ancient Egypt and the religious atmosphere of the ancient Greek polis are entirely distinct from each other in terms of their impact on the intellectual activity of society.

We should point out another stipulation regarding the social and political characteristics of the state, which embody a particular civilization. Ancient Egypt is a classical type of Eastern despotism, the ancient Greek polis is a democracy with a high level of social, economic and consequently, intellectual competition. In this article, we will not be limited to the analysis of these factors. We simply state that we recognize their value and believe them to be extremely important.

Ancient philosophy, starting with the VI century BC and up to the beginning of the new Christian civilization, proposed several different systems of natural philosophy, which sometimes provided directly opposite answers to question concerning the knowability of the material world. The objective of the present article is an analysis of the religious and philosophical systems and their importance in the history of medicine. Furthermore, it seems to us that it is not a simple matter when applied to ancient Greek culture. In the VI – IV centuries BC, the development of rational knowledge began to develop in medicine. These events have been widely covered in historiography. We will not reproduce well-known facts; it is enough to recall the brilliant books by V. Natton, J. Longrigg and others. [18, 19]. We want to draw your attention to something else. In the historical period of medicine before Galen, in our opinion, there were evident crises caused by an insufficiency in the methods of knowledge; they were overcome through the potential of religious philosophical systems.

The first crisis was Greek medicine before the appearance of the "Hippocratic Corpus". We will not delve into discussions about Hippocrates as a historic figure or the eclectic nature of the Corpus, etc. These are well known. We will discuss Hippocrates as the author of the "Corpus" named after him in contemporary scientific literature. The second crisis was the state of ancient medicine in the period directly preceding the activities of Galen. The actual appearance of Galen's anatomical and physiological system allowed this crisis to be overcome, creating a strong foundation for the further development of medicine. By introducing the primacy of experience and practical knowledge into medicine, Hippocrates created a revolution of sorts. He decisively affirms the primacy of the empirical method of knowledge as the basis for the development of medicine. The pre-Hippocratic crisis seems to be a manifestation of the

general crisis in natural philosophy. Essentially, the discussion between Hippocrates and his opponents is a discussion about method as the basis of obtaining truth, evidentiary knowledge that allows for the production of theoretical generalizations based on verified facts. However, the Hippocratic approach to medicine, sometimes called the "Hippocratic system", did not become dominant in the years that followed. Filistion, who in the opinion of V. Natton taught Plato medicine, is characterized as an anti-Hippocratic [19]. Furthermore, the palette of philosophical schools in Greece was quite broad at the time. A natural question arises: did all these schools influence medicine in the same way (if influenced at all)? There were 600 years between Hippocrates and Galen, during which different medical schools competed with one another, sometimes having diametrically opposite positions with respect to the methods of knowledge.

The system of Galen is unique in the history of natural science [20-22]. Having been formed in the beginning of the III century, it acquired a dominant position surprisingly fast. Here, I would like to make an important methodological stipulation. The expressions “scientific theory” and “scientific knowledge" are not entirely appropriate with respect to the times; we are, of course, talking about the pre-scientific stage in the development of natural science, a proto-science. In addition to these stipulations introducing all of the necessary semantic and conceptual limitations, for purposes of brevity, we will apply the concepts, “scientifically practical system” and the “theory of rational knowledge” to the ideas of Galen. This seems appropriate; particularly since the view that medicine and medical education were specializations having both scientific and practical components, developed and evolved during the VI–XVI centuries, from Alexandria to Padua, within the framework of the ideas of Galen.

The triumph of Galenism is truly a fact without precedent in the history of science. G. Ferngren, who believes that Galen's system had gained a leading position by the middle of the III century, wittily describes the remaining opponents of Galen as “post-Galen sects” [9]. V. Natton takes a more cautious attitude, indicating that there was a longer time frame for Galenism to became the acknowledged foundation of medicine, up to 150 years after the death of Galen [19]. In addition, V. Natton draws attention to the strong influence of methodologist in the territories of the Western Roman Empire over a long period (up to the V century). From our point of view, whether it took 50 or 150 years for Galenism to achieve victory is not so important. We focus on other figures: the teaching of Galen maintained a leading position at least until the XVII century (1500 years), and did not lose its relevance until the beginning of the XIX century. It is well known that K. Kyun's publication of the works of Galen were addressed primarily to medical practitioners, not historians, and had a practical purpose.

The next milestone after Hippocrates in the development of medicine came from the Alexandria School in III BC. The most prominent of its representatives, whose works are noted by all historians of medicine, were Gerefil and Erasistratus. Often their names are followed by commas, with the description the contribution of each of them made to the advancement of medical knowledge. However, we note that in Galen’s assessment of their work, he profusely complimented Gerefil but rather rarely praises Erasistratus. Negative views about Erasietratus, concerning several medical issues, are abundant in Galen’s work, “On the affected parts” [23]. There are many works of Galen still in existence, fewer in volume but very important, which deal with the works of Erasietratus and his later supporters (for example, “On dissection of the veins of followers of Erasistratus living in Rome"). Because Galenism was the basis for medical development over a long period of time, we must understand this criticism by Galen correctly. He speaks plainly. He believes that natural philosophy was the basis for the numerous errors of Erasistratus, his followers and contemporaries. That basis was atomism, the teachings put forth by Leucippus, and expounded on by Democritus. They were well know at the time of Galen in its later versions as the natural philosophy of Epicurus. Galen’s opinion about its opponents was very clear. The doctrine of atomism suggests that matter is composed of randomly moving primary elements. Furthermore, practical studies of

anatomy and physiology of humans and animals show a surprising appropriateness of their instrument and function. A similar feasibility would be unobtainable if matter were not arranged according to certain clear rules. The chaotic movement of atoms is not subject to any rules, excluding the rational arrangement of matter. Conclusive and reliable explanations of the anatomical and physiological processes were not possible according to atomism. In the final analysis, the atomist natural philosophy of Democritus and Epicurus espouses the ultimate unknowability of the material world and man.

The natural philosophy of Galen is diametrically opposed to the conclusion that the material world is not eternal and was created by a higher being – God (sometimes Galen uses this expression, often in the Platonic sense of the word Demiurge). The basis of creation was well-defined rational laws of functionality. There is one law of creation for all the living. With this position, Galen aroused a tremendous amount of interest in anatomy; man was the supreme being, the crowning act of the Demiurge. Galen's view of the world suggests the possibility for obtaining evidentiary information and conclusive knowledge of the anatomical and physiological processes. Moreover, its system is distinguishable by its openness and internal dynamics. Probably, this is one of the reasons why Galenism dominated for so long. The potential longevity of a scientific paradigm is directly dependent on its ability to support the process of accumulation of new knowledge. It remains useful as long as it is able to make this part of the system. As soon as any critical amount of evidentiary facts accumulate which do not fit into the old system of theories, the grounds for scientific revolution begin to stir. Take the XVII century crisis in Galenism as an example. B. Harvey, who discovered the closed circulatory system, refuted ideas about Haematopoiesis liver function. The evidence obtained by B. Harvey, M. Malpighi and others, was so well founded and yet apparently contradicted the anatomical and physiological system of Galen that it naturally called for its critique and rethinking. In contrast, the works of A. Vesalius, despite their importance, fit within the scope of Galenism. A. Vesalius significantly clarified many ideas about the composition of the human body. Of course, it included more dissections of the anatomy and therefore, had more accumulated information. A. Vesalius sometimes criticized Galen and sometimes complimented him, but the methodology of his analysis did not change. First, there was no difference between normal and pathological anatomy (this drew the attention of Francis Bacon in the "Novum Organum" criticizing modern medicine). Second, A. Vesalius and Galen both saw comparative anatomy as an important part of cognition. He, like many preceding generations before him, began his lessons by dissecting the anatomy of animals. It could not be otherwise; he was brought up on Aristotle. The author has rarely ever seen, in the historiography, comprehensive efforts to explain such long held and dominant views of Galenism. Meanwhile, our concept of a religious philosophical system can logically explain this position.

The potential of Galen's system is defined by the principle of teleology, which is the basis of his views on man. In this case, we use the term "teleology" in the classical sense, for its "practical function". It is about looking at the makeup of animals and people as being practical in relation to the function they perform. However, this principle has another side. It determines the potential use of the system of investigation (referred to above as the ability to allow the governing paradigm to take in and absorb new facts). A teleological view of the anatomy of man provides a deep conviction of the extreme importance of every detail, known and unknown. It constantly stimulates researchers to new observations and research. On the one hand, the human organism is knowable; on the other hand, doctors are never satisfied with the amount of knowledge they have and try to expand it.

That is why, when reading the works of Galen, the level of irritation the great doctor experienced because of his opponents, the followers of the methodology of Erasietratus, becomes clear. Within the framework of the natural philosophy of atomism, the world is unknowable. This is why those methodologists were always satisfied with their knowledge; they did not sense its incompleteness. Asclepiades, or his followers,

could waive off important empirical observations if observable facts did not fit into their abstract theoretical construction. Within the framework of their world view, there were no factors disciplining scientific research, the operation of objective laws of matter established by the Creator, that needed to be known with the help of credible methods. Within the framework of matter as an eternal collection of chaotic moving atoms, anything is possible. The subjective fantasies of nature philosophers and doctors had no limit.

This is why Galen focused on the views expressed by Plato, particularly the concept of the psychosomatic unity of man. What was written about this in "Timaeus", Galen turns into a well developed theory in the works "On the Diagnosis and Cure of the Soul's Passion" and "On the Diagnosis and Cure of Delusions of Every Soul"[19, 24, 25]. It should be clear to any historian of medicine that without the appropriate evaluation of the soul, the body and their interactions, there could be no integrated approach to the diagnosis and treatment illness. Furthermore, his understandings of human passions, spiritual diseases and their impact on diseases of the body, surprising coincide with the writings of early Christian authors on these matters. In our opinion, without the knowledge of these sources and their critical analysis, it would be impossible to explain the reasons for such a complementary perceptions of Galenism by the Christian tradition.

Galen as a thinker, of course, inherited the classical Hellenic education [26-28]. V. Nutton mentions an interesting fact: in the XIV–XV centuries, there were discussions in Western Europe about how Galen belonged to Christianity [19]. Of course, this assumption cannot be considered historically reliable. It is enough to read just a few of Galen's texts, to notice that his rhetoric abounds in Greco Roman style and references to numerous pagan gods. Nevertheless, the fact that there was such discussions is very revealing. The manner of thinking and direction of Galen's thoughts were undoubtedly attractive to Christian authors. However, understanding and appreciating this is impossible without a comparative assessment of the natural and philosophical views Galen and Christian authors of the II–IV centuries.

Therefore, we focus on the insurmountable difficulties that occur with a narrow approach to the history of medicine. By viewing Galan as only as a physician and his legacy as being just a part of practical anatomical and clinical work, it is impossible to properly assess a very great physician or to explain the historical significance and meaning of his teachings.

Actually, Galen himself calls for a multidisciplinary approach: "To know the nature of the body, the varieties of illnesses and to understand medicine, the doctor must exercise in logic. To be well versed in these studies, he should turn away from money and lead a moderate lifestyle, Furthermore, he should have all the knowledge of philosophy, logic, physics and ethics" (quoted in [29]).

Galen provides an example of the complementarity nature of the developments in natural philosophy and medicine. Two of his more important (and greater in volume) works are named "On the Usefulness of the Parts of the Body" and "On the Doctrines of Plato and Hippocrates". In the first, Galen proposes a comprehensive view of the anatomy of the human body, while constantly referring the reader to the second treatise. Galen was a Platonic philosopher, guided by principles of the importance of practical knowledge of the living – nature and man, based on the rationalist reformers of natural philosophy – Plato and Hippocrates [30, 31].

His natural philosophical system determines the direction of scientific and practical research, and vice versa, extensive empirically obtained data refines the natural philosophical views of Galen. Epicurean polemics dealing with the nature of matter play a significant role in the natural philosophical works of Galen. According to the former, matter is composed of indivisible particles of small indivisible parts – "atoms", which are in constant motion. Motion is the most important thing and they believed that it was chaos occurring by chance. The polemics around this theory accompanied the development of naturalism at all of its pre-scientific stages, through to the scientific revolution of the XVII century. From time to time, this polemic exacerbated then quieted. In the II-III centuries, it was distinguished by its

exceptional intensity. For naturalists, such a theory was totally unacceptable. This explains why it was sharply criticized by Galen and other representatives of the natural sciences. Explanations of the chaotic chance motions of atoms essentially meant that there was no scientific explanation. This led directly to the notion of the unknowability of the material world, which was completely unsatisfactory to practicing scientists (doctors, physicists, engineers, and others). Successful cognitive activity could be conducted only based on religious philosophical systems that positively responded to the question of the knowability of nature, the human organism and its parts.

Beginning in the II century, an important part of the general palette of the discussions on natural philosophy in various schools of Alexandria became the opinions of Christian philosophers. Specifically, the Catechetical School of Alexandria made defining contributions by synergizing ancient philosophy and Christian theology. This is widely known and well described in the historiographical process, the beginning of which is usually associated with the work of St. Clement "Stromata". However, this process, as applied to general theoretical doctrines, has hardly been investigated in relation to the natural philosophical views of early Alexandrian Christian schools of divinity. Were the practical issues of the philosophy natural sciences the focus of the first generation fathers of the Church of Alexandria?

Currently, this important question has not been satisfactorily answered by specialized literature dedicated to the history of science in general and the history of medicine in particular.

An accurate understanding of this issue is difficult due to the paucity of surviving sources. In our opinion, it may be beneficial to use new and previously unused, Russian academic sources for scholarly works.

Probative evidence on the views of the Catechetical School of Alexandria concerning the issues of natural philosophy are found in the writings of St. Dionysius the Great (III century) [32].

The scientific sources introduced by us provide confirmation that the topical issues of the natural philosophy of those times were under the scrutiny of the strongest representative of early Christian thought. We found negative opinion about Erasietrata, the prominent representative of the school. Asclepiades openly spoke out about the didaskalos of Alexandria as part of the general criticism of Epicurean atomists.

Of interest to us in this case are the works of Dionysius of Alexandria, (LlLOVliOLO<; АЛЕsavбрЕtЩ, юvбшо<; 6 МtУш) providing excerpts from his work "On Nature". Seven rather significant fragments of this work survived to our time; however, they are only in the 14th book of the extensive research of Eusebius Kessarisky, entitled "Preparations for the Gospel" (Praeparatio Evangelica VII 19 ,: XIV 23- 27) [32].

In principle, the work of St. Dionysius of Alexandria "0n nature" is a brilliant refutation of the Epicurean philosophical system about indivisible parts (atoms). The belief in the integrity of the universe, held by St. Dionysius the Great, is noteworthy. He cited the "wisest of the Greeks, such as Plato and Pythagoras...." [32]. St. Dionysius identifies himself with a specific school of ancient Greek philosophy, immediately emphasizing its acceptability to Christian thought. This reflects the general course of the school of Alexander, established by St. Clement. Dionysius the Great immediately understood the essence of the dispute between the Platonic model of the universe and Christian natural philosophical thought on the one hand, and Leucippus, Democritus and Epicurus on the other. One emphasized the wholeness and creationist character of the universe; the other "was eager to divide the wholeness of the essence and suggested that the universe is infinite and not the product of creation" [17]. As a consequence, St. Dionysius moved toward the characteristics of Epicurean atomism. According to him, atoms are the small, countless and indestructible body that "in an empty, undefined, enormous space accidentally collide in a vacuum and in a disorderly motion, intertwine with one another". From there, with all certainty, is their final union to a plurality of random forms (material formations) and the possible infinite production of new worlds from these random forms. It was a very logical conclusion. In fact, if masses of randomly moving atoms form into individual objects, what prevents these objects, in turn, from form-

ing into entire worlds? Therefore, if according to Democritus and Epicurus this movement were random and chaotic, such worlds would arise in endless quantities. It was precisely this point of view on the attraction of matter that long tested the minds of many representatives of the neo-Platonic school of philosophy, and at various stages in the history of science it was intricately intertwined with the occult. Furthermore, there was a difference of opinion about the size of atoms, the indivisible particles. Democritus believed that atoms could be very large and Epicurus believed that atoms were very small; however, the difference of opinion was "insignificant". St. Dionysius correctly noted this insignificance in relation to formation. Whether a particle is large or small, random movement does not allow for a reasonable explanation of the laws of nature and leads to the idea of an infinite set of arbitrarily forming and existing worlds. A note of St. Dionysius provides "but Heraclitus is said to have called them bodies, and the doctor Asclepiades inherited this name" directing our attention to the involvement of great doctors in the polemics of natural philosophy. The Alexandrian didaskalos briefly mentions Asclepiades to demonstrate this fact, the wide spread controversy in natural philosophy.

Meanwhile, for us, medical historians, this note is a source for establishing important discussion about our specialization. We look at another important source, the works of Galen, "On the Usefulness of the Parts of the Body" [23].

Galen decidedly influences the views of epicurean philosophers and the students of Asclepiades: "Now is not the time to avoid silence about judgments on this matter, according to several of those who share the opinions of Epicurean philosophy and the Asclepiades-doctors, but it is worth carefully studying their speech and indicate how they are mistaken" [23, p. 83]. Through a comparative analysis of the views on natural philosophy held by Galen and the thoughts of St. Dionysius the Great, we note surprising similarities in logic and reasoning. In addition to the views on the wholeness of creation, they are united by a teleological approach, ideas about the practicality and manner of creation: "In the same way a ship is built, the keel does not lay itself and the mast does to set itself amid ship, and each of the other wooden parts of the vessel do not occupy any accidental position. The carpenter unites them as necessary." [23]. Further, we turn to living nature: "And the most perennial are animals and plants. As they say, the most perennial among the animals are birds such as eagles, ravens and phoenixes. Among land animals, they are deer, elephants and snakes; among the water animals there are the whales. Among the trees – palms, oaks and persea [genus Egyptian tree]. It has been established that there are fourteen perennial species of trees. How each flower sheds its petals at the appropriate time, and a plant and animal soon die, having a short and quick life. Human life is like that. The Holy Scriptures speak of this, "Man born of woman is of few days" (Job 14.1) [23]. Galen speaks of the practicality and manner of creation, using one or another logic, but he widely illustrates it with concrete experimental examples: "There is not a single craftsman among those who with the help of bolts fasten beams or among those working with stone who ever managed to so accurately fit hollows to entering steps, as did the successful whirlwind of atoms with respect to the roots of the teeth. It knows, I think, even though it had no reason, that wider hollows would make a weaker bond for the teeth and if narrower, they would not allow the roots of the teeth to reach their very foundations. Moreover, those strong ligaments hold the teeth in hollows, mainly at the base where the nerves are fastened; is that not a remarkable phenomenon? It would be even more remarkable if this were a matter of chance rather than workmanship. However, here is an even more miraculous phenomenon. Even if we prescribe to the atoms of Epicurus or to molecules of Asclepiades the above-mentioned fortune, we nevertheless refrain from recognizing this and we will argue that the correctness of teeth is probably more a matter of guiding justification than fortunate motion. The fact that the lower teeth exactly coincide with the top, despite the fact that the jaws are not the same, is proof of this higher justification. And if there is a match between the right and left teeth of one side and the hollows on one side and the hollows of another side including roots with roots, nerves with nerves, ligaments

with ligaments , arteries with arteries, veins with veins, what could convince me that it is a matter of chance rather than craftsmanship? The fact that the number of both are identical on the right and on the left side of every jaw, is this also not an indication of justification? Nevertheless, we shall prescribe even this to those fortunate moving atoms, according to those philosophers, as being by chance but seemingly performing each case more thoughtfully than Epicurus and Asclepiades. After all, one must admire other aspects of atoms and the fact that its not only people but also animals that have back molars and front incisors. That for one species this whirlwind was quite favorable is still acceptable, but that it should be equally successful in all species indicates reason and reflection" [32, p. 385-386].

We note that we have an example of the empirical method of proof which accepts only those observations obtained through experiments. "As soon as the supporters of Asclepiades confront any difficulty, they immediately assume that nature created something useless. Supporters of Erasistratus, however, ceaselessly praise it because it does nothing that is useless. Nevertheless, they did not pursue this goal and did not try to prove that this praise is truly justified for each organ. On the contrary, they gladly stay quiet and omit much of the structure of parts. On this question, what was written in "On natural ability" is sufficient. For the moment, I only hope that all readers of this work remember that it is not worth omitting any single part because of laziness, but based on our example, to carefully investigate the genus of this substance, make up, and connections; also investigate its continuance (apophyseis), attachment (emphyseis), value or insignificance of each of them, their number, proportions, positions. Finally, if every part contains an explanation of its functions that is consistent with each other, then we must recognize that. However, if it seems somehow unimportant or mistaken, consider it suspicious and do not pay any more attention to it. This was our method too; we investigated for an extended period, then we subjected for review everything that others said about each organ. What we found in relation to explicit facts was considered to be more reliable [17, pp. 202].

How coincidental were the concurrences shown by us? Were they confirmed by in-depth analysis of the philosophical foundations of the particular theory of Galen? How to explain the unity we detected between the logic of Christian philosophers and Platonist doctors, one following the other after discourse of just over half a century between them?

The presence or absence of such a tradition means two completely different views concerning the important question: where there any natural philosophical views in early Christian theology before St. Augustine? A negative response means a random (or subjective) character, a positive one means the philosophies of Aristotle are part of the traditions of St. Augustine. Through the prism of this viewpoint, the dominant anatomical and physiological system of Galen in the Eastern Roman Empire and Western Europe up to the XVI century is subjective and largely random in character. This is precisely how the greatest Soviet medical explained it. A positive answer about early Christian natural philosophy means something quite different: proof of epistemological and ontological laws, in synergy with religion and science in Western Europe, led to the scientific revolution of the XVII century.

Another important question arising in the context of our text is the relevance of Christian natural philosophy to medicine. In historiography, a popular view of Christianity in the II–III centuries is that in was a marginal religion, held together by a lower social stratum. Doctors in the Roman Empire were a privileged social group. This has been well studied in contemporary western historiography by leading historians of science. In view of the importance of this issue for our writing, we briefly mention the results of research conducted by American colleagues. Primarily, we refer to the work of a major American historian G. Ferngren, professor at Oregon State University (USA) [8, 9]. In his works, one of which is named – "Did early Christian become doctors?" (presented at the Third Congress Convention of Medical Historians in 2009), he points out an interesting fact: the proportion of Christians in the medical class of society in the II–III centuries was

greater than in any other privileged professional group [9].

An interesting medical scientist from Tubingen, K. Schultz created a list containing the names of Christian doctors in the first century. Although emphasizing the extreme lack of data sources and the secrete nature of worship of many Christians during the period of persecution, he mentions 90 Christians doctors in the period of the Roman Empire of the II-IV centuries. In comparison, the sources mention 27 Christian bakers during this period. The famous American sociologist Professor R. Stark believes that the total number of Christians in the Roman Empire at the end of the II century amounted to 217 thousand people [12]. Apparently, Christian doctors mentioned in the civil legal documents or martyrologies, which became the basis of analysis for K. Schultz and G. Ferngren, acquired wide personal renown, otherwise they would not have been written about. This renown may be related to their professional popularity or martyred ends (which resulted in the preservation of their names in Christian sources on martyrs). It seems obvious to us that these names are only the visible tip of the "social iceberg" of the Christian communities of that period.

From an understanding of the act of creation of the world according to certain laws, it is possible to draw conclusions about the functionality of creation and its future functions. Therefore, teleological principles are directly involved in science. A detailed understanding of this, and even the character of the argumentation of the great Alexandrian, directly coincides with Plato, Hippocrates, Aristotle and Galen on the natural sciences (it matches their reasoning and a few have exact characteristics). The question would be entirely different concerning methods of knowledge in the natural sciences along the epistemological development line of Democritus, Epicurus – Asclepiades [17, 33].

At different stages of the development of natural science, from Galen to Descartes, there was a noted antiscientific character of this explanation of the motion of matter. In essence, it signified the absence of any explanation, naturally leading to the conclusion about the absence of laws about the functioning living world, which could be perceived and studied. Representations of Levkippa – Democritus – Epicurus about the make up of the living boiled down to some mechanical natural necessity having a totally random character [34].

The actual process of the origin of living things, in their opinion, is represented as the mechanics of atoms initially in their inherent motion and coming into contact with each other, experiencing pressure and collisions. In this way, the matter came to a random union and division leading to creation and death of individual matter. It denied any purpose to structure and function of the organisms; the world was a matter of chance (aut6J.tatov).

According to Epicurus, the atoms differ primarily by their type; their existence is countless. The inherent motion of flight in empty space, in and of itself, without any order, meeting several similar atoms, leads to their accumulation. Because of pressure and accumulation, there is a swirling movement attracting all of the large masses of matter from the surrounding space. Thus, things form from atoms and constantly evolve multiple worlds and eternal processes of life, in which individual worlds appear and again disappear for purely mechanical reason.

Through practical use of this theory in medicine, scientist came to the conclusion that atoms of the soul are distributed over all of the body. They also suggested that atoms of the soul of various sizes and movements unite to various parts of the body, spreading various functions to various parts of the body. Thoughts are in the brain, perception in various sensory organs, strong spiritual excitement is in the heart, sensual desire in the liver.

This view of the anatomy and physiology of man completely ruled out an understanding of the body through the prism of anatomical and physiological theory on a basis that would make it possible to build a scientific understanding of the theory of health and disease. This is why Galen so strongly criticized the theory of Epicurus and the doctors who believed in it.

Denying any applicability to the world, the atomic theory of Epicurus, according St. Diony-

sius, is not able to explain the multiplicity of matter. The difference between apparent things such as the sun, moon and starts – the unseen, such as gods, daemons, souls – the natural such as eagles, elephants, fig trees, oak trees, could not have occurred from atoms, identical in substance and differing only in size and shape. It is impossible to assume that such differences in the essence of things, such as eternal bodies, gods, and people, plants and animals, were formed from the same atoms in a random manner. Even if we assume that, the reason for the differences and the permanence of the body is contained in the placement and strength of atomic union, the need for a rational Ruler and Master, the "wise shepherd or caretaker" remains. [30].

The most interesting thing for medical historians is the attempt by Dionysius of Alexandria to prove this by using the makeup of human nature. He points out that, in the creation of man there is nothing that is unnecessary or useless. All parts of the human body have their purpose, supporting life or in any event its adornment.

The practical construction of the human body could not have happened from the random linking of atoms. This is even more applicable to the soul, reason, and language, which could not have appeared from soulless, senseless and speechless atoms.

We note one of the primary works of Galen, "On the Usefulness of the Parts of the Body" [23]. We see a surprising coincidence in logic and character of argumentation between Galen and St. Dionysius. Their views are based on the principle of creation, its harmony and functional practicality. It determines the teleological nature of the medical system of Galen and his followers up to the XVI century.

The essence of the pre-Galen crisis in medicine is in the field of methodology and the criteria used to know the material world [12, 17, 35]. In medicine, it conflicts with the various currents of scientific thought and it lacks a unifying dominant theory of anatomy and physiology. These are the comments of the well know doctor and philosopher A. K. Tselsom, "Medicine is divided into three parts: one treats the life style, the other uses drugs, and the third uses surgery. The first track was named by the Greeks as dietary, the second was pharmacological, the third surgical.

Since of the three parts of medicine it is the most difficult and the most well-known, the one which is involved in treating sickness (life style), it will be treated first.

The first burning conflict was that one side declared the need for experiments only and the other believed that experiments are insufficient if there is no knowledge of the rules of the composition of the body and the phenomena of nature. Therefore, it was necessary to establish precisely what would promote both sides in order to make it easier for us to contrast them with our opinion.

Those (doctors) who represent medicine built on abstract principles argued that there was a need for knowledge of the following data: the hidden causes of the disease, then the natural functions (organism) and finally, knowledge of the internal organs. Underlying causes are those with whose help they can know what elements make up our body, contributing to health or illness.

They were convinced that those who did not know the origins of illnesses could not know how to treat them. According to them, there could be no doubt that the methods of treatment differed. One treatment for an illness could be for a loss or deficiency in one of the four elements. Another treatment if any illness was associated with the condition of the fluids, as Gerofil believed, another if the illness was associated with air, as Hippocrates taught. It would again be a different one if the blood were penetrating into those vessels (arteries) intended for air and thus provoking inflammation. This was the opinion Erasistratus. The Greeks called this phlegmon, an inflammation producing an effect, which occurs during fevers. Finally, the treatment should be different if little bodies were penetrating orifices invisible to the eye, stuck and blocking the tracts, as Asclepiades provides.

According to them, one truly cures only if there were no errors concerning the source of the illness. They do not deny that experiments are necessary; however, they assert that one can experiment only from general ideas based on reason" [36, p. 90-91].

A. K. Tselsom writes that by the mid II century, there were divisions concerning various

schools that occasional had directly contradicting opposite views about the basis of pathology, generating a serious crisis in medicine. Ultimately, it was about the absence of a unified governing theoretical practical system to form the basis of medical knowledge.

It was precisely this crisis that Galen overcame by relying on a natural philosophical argument. The term Galenism is recognized in the history of science as his leading anatomical and physiological system of medicine; his students and followers played an active role in confirming the leading role of this system.

Because of this, the works of Galen are one of the most important sources dealing with the history of natural science. With their help, we can definitively talk about the natural philosophical theoretical foundations and practices of Asclepiades and his followers, from the perspective of the atomism of Democritus and its Epicurean version. Moreover, Galen draws a direct connection between the false theoretical base and its practical medical inconsistencies. This is further proof of the mutual impact of natural and philosophical theory and medical practice. Galen expresses his opinion directly: "In fact, if Asclepiades, in addition to the strong suspicion that he brought upon himself, was unable to explain the other points in the same successful manner he had done in one case, had he not been so stupid as to be caught in complete ignorance of the results obtained through anatomical dissection, I would not lose time trying to refute him. Instead, I would have stuck, as I had from the very beginning, to my firm decision to leave unchallenged all of the erroneous beliefs. However, now that certain defenders of such false opinions take pride in things they should be ashamed of, I consider it necessary to refute their arguments in order to prevent an even greater number of people from being deceived. The refutation, as mentioned above, is double, one based on anatomy, the other on conclusions of logic. It is entirely clear that wise Asclepiades did not know about either of them; he did not know that the arteries differ from veins not only in thickness but also in the number and the firmness of the membrane and localization of the fiber." [23, p. 241]. Asclepiades knew none of this, and if he did know, he could not find the purpose, and he was the one who thought everything started from atoms and space." [23, p. 242].

Prominent contemporary English historian of science V. Natton, studying the development of medicine in the I – II centuries, points to an undeniable interrelationship between the religious philosophical views of doctors of those times and their approach to medical practice. Carefully analyzing the approach to scientific discussions of those times, V. Natton points to the emphasis doctors gave to finding theoretical grounds for their knowledge [19]. That discussion had little practical sense, since the methods of healing at different schools hardly differed from one another. Many scholars of the works of Galen, such as G. Sarton, O. Temkin, J. Henkinson, and others, wrote about this in the second half of the 20th century.

It was not by chance that Galen returned to the works of Plato and Hippocrates. In the first place, he considered himself a supporter of the philosophical views of Plato and of the traditional medical theory and practices of Hippocrates. However, he placed Hippocrates above Plato, relying on his questions of practical knowledge, the theoretical understanding contained in the works of outstanding doctor philosophers, and the natural philosophical views of Hippocrates based on empirical healing. For Galen, this was extremely important: he believed that the conflict of theorists and practical men in contemporary medicine could be resolved with the help of that methodology.

Secondly, it was Plato and Hippocrates, the authors of the rational revolution, who resolved the issues of further development of natural science during the crisis of ancient science, five hundred years before Galen. Like them, Galen became a revolutionary rationalist by using his anatomical and physiological system during the crisis in natural science in the II century. As noted, stagnation which led to the crisis of those times was characteristic not only for medicine, but above all, for philosophy. Contemporary science historian F. de Lasy pointed out that Galen profoundly disagreed with the then prevailing interpretations of Plato's philosophy [23, p. 241].

The phenomenon of neo-Platonism, essentially depriving students of Platonism any cognitive positivism, was mentioned by historians of science in connection with the way early Christian thinkers perceived ancient philosophical heritage. In any case (not repeating the detailed analysis provided by F. de Lasy), we can definitely confirm that Galen did not accept contemporary Stoic and neo-Platonic ideas, firmly believing in the possibility and necessity of knowing the nature of things. In medical practice, Galen also defended the principle of rational thought and gave priority to the accumulation empirical data. Galen highly regarded the natural sciences and often quoted them (he was in essence a true believer). He saw nature as a system of the best decision of the Demiurges; the creation of the universe. In his work "On the doctrines of Plato and Hippocrates", he draws an analogy between logical rationally created objects and the internal practical anatomy and physiology of living organisms.

Thus, we have tried to show the importance of the concept "religious philosophical systems" proposed by us using concrete examples from the history of medicine in the pre-scientific period. The historical destiny of Galenism, in our opinion, is a vivid illustration of the need to use such a methodology. Otherwise, it is impossible to explain the favorable perception of Galen's views within the framework of the completely new cultural historical reality found in Europe in the beginning of the IV century – Christian civilization. We are confident that Galen and his practical theoretical views are not the only examples of this kind and invite the readers of our journal to join the discussion on these issues.

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