

Ancient medicine after Herophilus. Part 2. The natural philosophical foundations, theory and practice of the Methodic school doctors¹

Dmitry A. Balalykin

FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University)

8 Trubetskaya St., building 2, Moscow 119991, Russia

Institute of World History, Russian Academy of Sciences

32a Leninsky Prospekt, Moscow 119334, Russia

This article attempts to reconstruct the main phases of the history of the Methodic school doctors. Representatives of this medical school, just like the empirical doctors, rejected the teleological principle of the human body and the possibility of extrapolating data obtained from anatomical dissections to clinical practice. They also rejected the Hippocratic principle of the etiology and individual character of diseases. In the author's opinion, rejecting the study of the dead in the interest of learning about the living is related to the particularities of the "world map" of the Methodic doctors, the theoretical teaching basis of whom was natural philosophical atomism and whose clinical thinking was based on a symptomatic approach. The author of the article points out that we learned many concepts of the philosophy of atomism through the works of Aristotle as well. The atomistic world map helps make conclusions about the difference between a living and a dead body that are determined by the presence (or absence) of the movement of atoms. The Methodic doctors, guided by the world map based on atomistic natural philosophy, rejected the practical use of anatomic dissections and consequently, the necessity of conducting them. The Methodic doctors needed theories that would logically explain the phenomena they observed, while for rationalistic doctors theoretical medicine was a motive for experimental studies, whose results would become its foundation.

The productivity of natural philosophical trends in the history of medicine was determined by how much the methodology proposed by the doctors responded to the practical tasks of the art of healing. Critical understanding of the medical experience in ancient medical practice became possible thanks to the apodictic research method used by Galen. The integral theoretical-practical system he created became the historical boundary that separated Ancient Greek rational medicine from the rational medicine of the proto-scientific period (the 2th–16th centuries).

Keywords: *history of medicine, empirical doctors, rationalistic doctors, natural philosophy*

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About the author

Dmitry Alekseevich Balalykin – Doctor of Medical Sciences, Doctor of Historical Sciences, Professor, Chairman at the Department of the History of Medicine, National History and Culturology, FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University); Institute of World History RAS (Moscow). E-mail: shok@nmt.msk.ru

Introduction

Part 1 of this article presented a detailed analysis of the theory and practice of the school of the empiricist doctors, which emerged in the 3rd century BC, and shed light on the key aspects of the influence of the natural philosophy of

Early Stoicism on this school [1].² We now move on to attempt to reconstruct the history

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² Part 2 of this article was to have examined the influence of the main Stoic doctrines on the development of specific aspects of the theory and practice of the empiricist doctors. However, since the publication of Part 1, the third volume of the *Works of Galen* in Russian, containing the first translation into the language of the first five books of his treatise *On the Doctrines of Hippocrates and Plato*, has appeared. Our introduction to that volume relates the theory and practice of the empiricist doctors to the basic concepts of Stoic philosophy, and analyses the history of the school of the pneumatic doctors, whose views were an attempt at a compromise between Stoic natural philosophy and the ideas of the rationalist Hippocratics on medical practice [3].

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ORCID: 0000-0002-1813-8206

of the school of the Methodic doctors – the second-most important opponents of Galen (after the empiricist doctors). The theoretical basis of this school’s teaching was the natural philosophy of atomism.³ It should be noted that it was the later, Epicurean, version of atomism, rather than that of the founders of the philosophy, Leucippus and Democritus, that had a formative influence on the teaching of the Methodic doctors.⁴ This influence needs to be analysed and related to the specific medical theory and practice of the Methodic doctors. In addition, the Methodic doctors, like the empiricists, categorically rejected the notion of the natural teleology of the human body and the possibility of applying information obtained from anatomical dissections to clinical practice. For both, the difference between a living and a dead body was so fundamental that there was no value in studying a corpse in order to learn about the living. This attitude may have been a consequence of certain features of their worldview. Furthermore, the stark materialism of the atomic theory led the Methodic doctors to an even more consistent denial of the Hippocratic principle of aetiology and the individual nature of disease progression.

Characteristics of Epicurean atomism

Epicurus’s views are described in detail in many Russian and foreign studies of classical philosophy [6–10]. Aristotle provides an assessment of atomical philosophy (particularly that of Democritus). Of importance to attempts to reconstruct the history of classical medicine is his interest in its postulates of significance to understanding the processes of movement: “...no element arises from another element... The common body is a principle of all things, differing from part to part in size and in shape.”⁵ The atomists asserted that only “atoms and the void” were real, and, writes Aristotle, explained all qualitative change through these concepts: “...it is possible to construct alteration and coming-to-be with them, if one transposes the same by

‘turning’ and ‘intercontact’, as Democritus does. (His denial of the reality of colour is a corollary from this position; for, according to him, things get coloured by ‘turning’.)”⁶ This approach underplays the potential of true knowledge, and this, from the viewpoint of medicine, makes it impossible to describe the physiological changes taking place in the body. Democritus’s successor, the philosopher Epicurus, developed and added to his predecessor’s ideas. In analysing the subject matter of this article, it is interesting to consider Epicurus’s physics, in particular those aspects of it that influenced the development of medical thought. Valentin Asmus wrote, “The theoretical basis of Epicurus’s philosophy could only have been a materialism hostile to any religious mysticism and popular polytheism, while the philosopher himself had to stand up against the hostile proponents of supersensory knowledge. All these features made Epicurus’s philosophy an outstanding doctrine of the Ancient Greek Enlightenment. “Epicurus,” wrote Marx and Engels in *The German Ideology*, “was the true radical enlightener of antiquity; he openly attacked the ancient religion, and it was from him, too, that the atheism of the Romans, insofar as it existed, was derived. For this reason, too, Lucretius praised Epicurus as the hero who was the first to overthrow the gods and trample religion underfoot; for this reason among all church fathers... Epicurus has always had the reputation of being the atheist philosopher par excellence...”⁷ [7, p. 318–319]. Bertrand Russell wrote, “Epicurus was a materialist, but not a determinist ... The Epicureans contributed practically nothing to natural knowledge. They served a useful purpose by their protest against the increasing devotion of the later pagans to magic, astrology, and divination; but they remained, like their founder, dogmatic, limited, and without genuine interest in anything outside individual happiness”⁸ [9, p. 265–266]. This mechanistic understanding of the laws of matter rejected the notion of the natural

³ See, for example, [4].

⁴ For more details on this, see, for example, [3] and [5].

⁵ English translation taken from: Aristotle: “Physics”, p. 40, in *The Complete Works of Aristotle* (Revised Oxford Translation). Ed. Jonathan Barnes. Princeton University Press: Princeton, NJ, 2014.

⁶ English translation taken from: Aristotle: “On Generation and Corruption,” p. 6, in *The Complete Works of Aristotle*.

⁷ The translation from Marx and Engels is taken from <https://www.marxists.org/archive/marx/works/1845/german-ideology/ch03a.htm>.

⁸ English translation taken from *A History of Western Philosophy*, London: George Allen & Unwin Ltd, 1945, pp. 270.

teleology of living beings, and has been positively evaluated by many historians of philosophy of the second half of the 20th century, irrespective of their ideological positions. Clearly, historians of medicine can consider this viewpoint typical of the atomists.

In this context, Epicurus's ideas on the principles of knowledge and its criteria are of particular significance. Epicurus called this part of his philosophy the "canonic." He identified three criteria of truth: sensations, preconceptions, and feelings. By "sensations," Epicurus meant the sensory perception of objects, as well as "imaginative representations." He believed that the atomic structure of all physical objects meant that particles were continually streaming from their surfaces, retaining their images in doing so. These images entered the human sense organs and, stamped on them, created a sensation. This, however, was not the only way to obtain impressions of things. The images could linger in the air and enter the human body through its pores, bypassing the sense organs. The human body, like all other physical objects, was made up of a combination of atoms of different sizes and shapes, in constant motion, so that the whole human body was permeated by invisible pores, through which this motion took place. Accordingly, the images borne in the air could enter these pores and penetrate the body, where, combining, they created "individual presentations of things": "And whatever presentation we derive by direct contact, whether it be with the mind or with the sense-organs, be it shape that is presented or other properties, this shape as presented is the shape of the solid thing, and it is due either to a close coherence of the image as a whole or to a mere remnant of its parts."⁹

"Concepts" (also called "preconceptions" by Epicurus) arose on the basis of such phantasms, which should not be confused with logical presentations, such as those arising, according to the Stoics, in the form of a syllogism as a result of action of the hegemonikon after receiving information in the form of a cataleptic impression.

⁹ English translation taken from Epicurus's "Letter to Herodotus", in Diogenes Laertius, *Lives of Eminent Philosophers* (tr. R.D. Hicks), London: William Heinemann, 1925, Vol. II, p. 579, 581.

Concepts in Epicurus's philosophy derive from the senses rather than logic. Sensation, being obvious, accurately reflects surrounding reality. Even imaginative representations are true in a way. They represent the combination of real images of things entering through the pores.

Furthermore, thinking about sensations may be extremely dangerous (or may lead to confusion): "Falsehood and error always depend upon the intrusion of opinion <when a fact awaits> confirmation or the absence of contradiction, which fact is afterwards frequently not confirmed <or even contradicted>... Error would not have occurred, if we had not experienced some other movement in ourselves, conjoined with, but distinct from, the perception of what is presented. And from this movement, if it be not confirmed or be contradicted, falsehood results; while, if it be confirmed or not contradicted, truth results."¹⁰ In other words, an attempt at a rational critical analysis of the sensory perception of the films of atoms flying through the air may lead, according to Epicurus, to false opinion. In medicine, applying an atomistic worldview meant ascribing particular significance to outward manifestations of disease. Like the empiricist physicists, the Methodic doctors, by virtue of the nature of their natural philosophical views, essentially saw it as their job to combat the symptoms of disease. By contrast, Hippocrates's views on pathogenesis and his concept of treating a disease by addressing its cause were gnoseologically alien to them. The ideas that the universe was eternal, and that matter could not arise out of nothing, were basic doctrines of atomism. The Platonic doctrine of the creation of the world and the teleology of living beings was incompatible with them.

Leucippus and Democritus believed that physical objects consisted of atoms (tiny indivisible particles) and the "void." Without allowing for the existence of the void, it would have been impossible to explain the motion of atoms. While accepting these ideas, Epicurus believed that atoms varied in weight and shape. He differed significantly from his predecessors in his interpretation of the nature of motion. For example, Democritus argued that

¹⁰ English translation taken from Diogenes Laertius, *Lives of Eminent Philosophers* (tr. R.D. Hicks), London: William Heinemann, 1925, Vol. II, p. 579, 581.

randomness did not exist (his physics was strictly deterministic), whereas Epicurus theorised that atoms could spontaneously swerve away from their linear trajectory. In swerving, atoms collided, and multiple collisions could result in conglomerations of atoms and the formation of physical structures. Epicurus's physics thus posited atoms and their intrinsic properties as first principles. Atoms were in constant motion, so it could be assumed that the physical bodies formed as a result of conglomerations of atoms were constantly on the point of collapse: the atoms within a body were still moving. This theory provides a physical explanation for the ageing process, death, and the decomposition of the human body. Naturally, some animals (e.g., humans) live longer than others (e.g., dogs). Furthermore, people live to different ages. The atomists explained this by arguing that the rate of decay differs because different atoms move at different speeds.

Epicurus saw the soul as a body resembling the wind and consisting of very fine particles dispersed throughout the human body (as a kind of body within a body). An Epicurean doctor thus had a systemic explanation of the sensitivity of parts of the body and how it was controlled. All natural philosophical systems class reason, the control of voluntary movement, and the control of sensory, passionate impulses as functions of the soul. However, their views on how the soul works and performs these functions differ significantly. How doctors from a particular school of medicine explained the nature of development of physiological processes depended on the specific features of their worldview, which, in turn, was based on various natural philosophical doctrines.¹¹ Sensation, Epicurus believed, was key to understanding: "For in the study of nature we must not conform to empty assumptions and arbitrary laws, but follow the promptings of the facts."¹²

This view gives rise to a method based on analogies, which allows for not just one correct explanation of an observable phenomenon but a

number of possible or likely explanations. Such multiple explanations cannot involve unnatural assumptions or contradictions with sensory information confirmed from experience.

According to William B. Jensen, "Epicurean atomism was predicated on five basic assumptions: a. There is an absolute lower limit to particle divisibility – i.e., true minimal particles called 'atoms' which are not only indivisible but also immutable and thus permanent. b. There is an interparticle void or vacuum. c. All interparticle interactions are due to collision followed by mechanical entanglement. d. The only fundamental atomic properties are size, shape, and motion – all others are secondary psychological responses to various atomic complexes. e. There is no dichotomy between mind and matter, thus implying that the soul is both material and mortal. Thus we see that Epicurean atomism was both materialistic and strongly reductionistic" [10, p. 1–2].¹³ Epicurus believed that atoms are morphologically diverse: he proposed the existence of tiny particles of various geometric shapes (round, square, polygonal, etc.). Perhaps this was one of the reasons why it was the Epicurean version of atomism that influenced doctors. If atoms came in multiple shapes, it was easy to imagine how the specific shapes of the organs and other parts of the body observed by doctors on a daily basis were formed from them. In addition, the notion that atoms were morphologically diverse made it easier to explain how strictures arose (as "jams" in the traffic of atoms through the pores).

A significant contribution to our understanding of the applied importance of Epicurus's philosophy was made by the well-known French academic Gilles Deleuze [14–16]. He shows that Epicurus's interpretation of the problem of atomic movement had important consequences for the theory of knowledge. Epicurus saw ideas (*eidōla*) as multiplicities of atoms, which are the objective elements of thought. In Epicureanism there was a certain continuity between perception and conception.

A description of the boundaries of compounds, or of the outlines of physical objects,

¹¹ For more details on these mechanisms in the Platonics and Stoics, see [5] and [13].

¹² English translation taken from Diogenes Laertius, *Lives of Eminent Philosophers* (tr. R.D. Hicks), London: William Heinemann, 1925, Vol. II, p. 579, 615.

¹³ Later, we will see that Epicurean reductionism had a significant influence on the worldview of the doctors adhering to atomistic natural philosophy.

must take into account the continuous nature of atomic motion. After all, such boundaries can be indeterminate, and “finer than the objects of which they are the outlines.” Epicurus describes the outlines as “*tupoi*”¹⁴; later, he uses the term “*eidôla*.” Michael James Bennett refers to *eidôla* as “homoschematic types” [17]. As such, *eidôla* are conceived as “films of very fine atoms that maintain for a relatively long time the schematic outline of whatever compound they were the edge of.” In solid compounds (e.g. the human body), atoms often collide and thus bunch together and are prevented from achieving their maximal speed. At the edges of bodies, atoms moving through the void encounter less resistance, so they can reach their maximal speed¹⁵ and quickly travel a significant distance. Epicurus claims that “both perceiving and thinking occur through the action of *eidôla* upon percipient beings: ‘it is when something from the external objects [i.e., an image] enters into us that we see and think about their shapes.’” Clearly, perception and conception, according to Epicurus, are derived from the action of *eidôla*. Accordingly, perceptions of *eidôla* are always true ideas, as *eidôla* are epistemologically primary. In contrast, claims (or reasoning) about what exists can be false: “Falsehood... or going-astray... always comes from an added opinion”. For Epicurus, “added opinions” always have a negative sense: at best, they add nothing to true perception; at worst, they distort it. After all, *eidôla*, in all their multiplicity, are primary truth-value bearers, and cannot be false. Epicurus corrects the ideas on the movement of atoms held by Democritus, who thought that atoms did not have an innate natural speed. Their motion, Democritus believed, is caused by the accelerations resulting from their collisions. Aristotle criticised Democritus’s lack of a logical explanation for these collisions for it was required to explain the reason for this interaction between atoms. Epicurus made two very important refinements to Democritus’s theory. (Essentially, he established the theory of atomic motion that would be applied in medicine.) First, he attributes weight to atoms, and describes to them natural motion, which can be impeded (rather than stimulated, as Democritus

thought) by other atoms as a result of collisions. Unimpeded, atoms move at an extremely fast natural speed (“as swiftly as thought”). Second, he believed that atoms can swerve, and that this explains their numerous collisions. Deleuze explains this concept as follows: “...we must conceive of an originary direction for each atom, as a synthesis which would give to the movement of the atom its initial direction, without which there would be no collision. This synthesis is necessarily accomplished in a time smaller than the minimum of continuous time. This is the *clinamen*” [16, p. 269]. The *clinamen*, writes Deleuze, is “the reciprocal determination which is produced ‘in a time smaller than the minimum of continuous time thinkable’.”¹⁶

Deleuze’s description of the movement of *eidôla* (“as swiftly as thought”), illustrating his contention that Epicurus sees ideas as “multiplicities of atoms,” is very useful to historians of medicine [16, pp. 274–275]. Notably, understanding Epicurus’s belief that sensations are true makes it possible to explain the Methodic doctors’ focus on symptoms. For them, a doctor’s perception of the various outward manifestations of a disease equated to an understanding of its nature. This was entirely logical: an *eidôla* – an image of a patient suffering from a particular ailment – was perceived by an experienced doctor as an integral, cohesive impression. Within the Epicurean view of the material world, there was no reason to doubt that the disease symptoms detected by the doctor were also the disease itself. As such, contemplating internal processes hidden from sight was not appropriate, as it could lead to false added opinions. Therefore, there was no need for experimental research aimed at explaining disease development [16].

The atomistic worldview saw a clear difference between the living and the dead: the presence or absence of atomic motion. As all healthy and pathological processes in the body were determined by the nature of this motion, it made no sense to study the dead to learn about the living. Accordingly, the Methodic doctors, with their worldview based on atomistic natural

¹⁴ Literally “stamps”.

¹⁵ I.e., “as swiftly as possible”.

¹⁶ English translation taken from Gilles Deleuze, *Difference and Repetition* (tr. Paul Patton), London: Bloomsbury, 1994, p. 242

philosophy, believed that there was no practical benefit to anatomical dissection.

Previously, we discussed the effectiveness of the natural philosophical movements in the history of medicine that offered a methodology appropriate to the practical objectives of the art of healing [3]. The apodeictic method – which in classical medical practice took the form of a combination of anatomical dissections, a rational theory of general pathology, and clinical classification – was of particular significance [18]. Such classification involved a critical evaluation of doctoral experience. In medical practice, it was based on a combination of cataphatic and apophatic methods of analysis.¹⁷ Presenting the issue in this way seems all the more appropriate, as Galen's comprehensive theoretical and practical system itself marks a historical boundary separating the period when Greek rational medicine emerged from the rational medicine of the protoscientific period (the 2nd to 16th century). The natural philosophy of atomism did not allow for such approaches [5].

The Methodic school and the influence of atomism on the development of its teaching

In the 1st century BC, another major classical school of medicine emerged: that of the Methodic doctors.

It is generally believed that the first person to use atomistic natural philosophy to explain vital processes and the causes of diseases was Asclepiades of Bithynia. We do not know his exact dates, but most researchers believe that he was at the height of his popularity between 70 and 50 BC. Accordingly, Themison, his pupil, would have been in his prime in around 130 to 120 BC. The Methodic school of medicine takes its name from the basic idea of Asclepiades and his pupils that a doctor's task is to identify the most successful method of treatment for a specific illness, and to strictly follow it in future practice.

Roberto Polito believes that Asclepiades's views were significantly influenced by the ideas of Heraclides Ponticus [19]. Unfortunately, we know little about Heraclides. For a significant time, he was associated with Plato's Academy, of which he

was a prominent member. He was made acting head of the Academy when Plato went to Sicily, and lost narrowly to Xenocrates in the election for a new head of the Academy following Plato's death [19].

Historians believe that Heraclides was an adherent of atomism in its Epicurean version. But is there not a contradiction here: how could Heraclides have been both a supporter of Plato and a convinced materialist, who advanced atomistic natural philosophy? We cannot give a definite answer to this question. Here, finding the historical truth is made more difficult not only by the paucity of primary evidence, but also by the extremely contradictory views of modern researchers. For example, Roberto Polito, in attempting to support the incorrect theory that the representatives of the different schools of natural philosophy held identical views within the context of their influence of medicine, uses the curious term "geometrical atomism" with regard to Plato's ideas on the nature of matter.¹⁸ Plato, writes Polito, makes use of Empedocles's theory of four basic elements, but "Empedocles' elements are not primary, but themselves reducible to more basic principles, elementary triangles." Polito uses the term "corpuscles" to describe the structures made up of the geometrical figures of the four primary elements, which combine in different ways, thus forming physical objects. In using the term "geometrical atomism" with regard to Plato, he has in mind the fact that the geometrical figures of which Plato believed the basic elements took the form constituted very small particles. These ultimately made up physical objects, including the human body. Such speculative constructs can only confuse historians of medicine. It must be said that such multiple interpretations from different authors only complicate the search for the right answer. The researcher is left hostage to a presentist bias in favour of the natural philosophy of atomism, which was closer to the physics of the 17th to 19th centuries than rival schools of Ancient Greek physics.

However, these explanations are of little use in understanding how representatives of different classical schools of medicine thought –

¹⁷ The principles followed by Rufus of Ephesus and Galen in taking anamneses are an example of this. For more details, see [3].

¹⁸ It may be recalled that Plato used geometrical figures to describe the basic elements.

after all, what we have here is essentially a question of the terms describing the views of particular philosophers. What is important to us is that the atomistic doctrine posits two main theories: first, that the human body is made up of tiny indivisible particles (atoms), and, second, that those atoms are in constant, random motion. The specific features of how Democritus and Epicurus describe this motion are of secondary importance to historians of medicine. What is significant is the nature of their doctrine, which rejected a teleological (i.e., purpose-based) explanation of how the human body worked. Democritus asserts that atoms moved chaotically in different directions, forming physical bodies when colliding and bunching together. According to Epicurus, they are constantly falling, and, as they do so, they collide and can change their trajectory and bunch together to form physical bodies. Obviously, such nuances in the interpretation of atomism had little bearing on the development of medical thought. The principal difference in the Platonic and Aristotelian explanations of how physical bodies are formed is the idea that the movements of the tiny particles making up the human body have a purpose. For medicine, the most important aspect of atomism was the chaotic nature of this motion. In this context, praising the atomists for the “science” of their approach makes no sense. The mechanism and determinism inherent in their doctrine mean that in practice they eschewed the study of physiological processes. Some historians of philosophy claim that experimental practice was not an option at the time of Democritus and Epicurus [8]. However, such practice did exist in classical medicine (such as the anatomical dissections of Herophilus, who received a highly conventional philosophical education at the Academy and the Lyceum). Previously, we discussed how the empiricist doctors consciously avoided anatomical dissection [3]. The Methodic doctors, who avoided experimental practice in principle, did so just as deliberately: if the functions of the human body were not physiologically essential, experimentation was unnecessary. Their rejection of the teleological explanation of the workings of the human body meant that they had no need of anatomical experiments. Accordingly, the natural philosophy

of atomism, as the basis of the Methodic doctors’ worldview, also rendered the question of aetiology, different forms of pathogenesis, and, ultimately, the complex classification of diseases irrelevant. The founders of the Methodic school proposed that processes in the human body can be explained using three (and only three!) types of pathogenesis. First, diseases can result from breathing problems (i.e., impediments to the movement of atoms inside and outside the body). In a healthy body, atoms move in their natural way, albeit chaotically. With a disease caused by a change in breathing, the atoms’ shapes and movement change, allowing the condition in question to enter the body. The second way in which diseases can occur is as a result of obstruction of the internal pores – tiny channels invisible to the naked eye through which atoms move within the body. In a healthy person, atoms move freely through these pores within the body, but pathogens cause the pores to narrow, impeding the atoms’ circulation.¹⁹ The third cause of pathological processes, according to the Methodic doctors, is a combination of the first two, with breathing problems being combined with a narrowing of the pores. These explanations give rise to a number of questions, primarily with regard to how the atoms move. If atoms move chaotically in any case, how could the normal state of chaos in a healthy body be differentiated from the abnormal state in a sick body? Furthermore, medical practice called for specific ideas of pathogenetic processes that could be related to the clinical manifestations observed by doctors. In other words, how could these three simplistic types of pathogenesis describe the full range of diseases encountered by doctors in their everyday practice? Galen asked these questions when criticising the Methodic doctors’ ideas. He also stressed the need for therapeutic interventions to be based on the nature of the illness. Naturally, doing so using the three universal types of disease proposed by the Methodic doctors would have been impossible.

¹⁹ We may compare the flows of atoms to traffic: normally, the atoms permeate the whole human body as they flow unimpeded through the pores, but sometimes “jams” can occur, leading to any number of major pathological accumulations of atoms within the pores and their intersections.

The main achievement of Asclepiades, who was strongly influenced by the physical theories of Heraclides Ponticus and Epicurus, was undoubtedly in paving the way for a new direction in the medical thought of his day, which was soon to challenge the empiricists and rationalists. It was Asclepiades who was the first person to propose the theory (developed by his pupils) that diseases develop in three ways. With his natural philosophical views, he was critical of Hippocrates's humoral theory, and rejected the notion of natural teleology. However, he did not deny the importance of understanding causation: without this, the idea of choosing the best method to treat a specific illness would have made no sense. The problem was that causation, as Asclepiades and the other Methodic doctors saw it, could not be compared with causation in the teleological sense, as seen by a doctor adhering to the ideas of Plato and Hippocrates. The teleology of Plato and Aristotle was based on the idea that the functions of the living body are governed by internal laws. The reason physiological processes take place in the way they do is that they have an intrinsic purpose: they were designed by God in the best way possible for life. Aristotle focuses on the hierarchy and types of movement, but in fact these are merely details of the teleological understanding of the human body. Within the context of this worldview, the aetiology of the disease was seen as a natural factor impeding the normal performance of the functions of parts of the human body. Galen's theory built on this idea, and is key to differentiating between health and disease.

Asclepiades considered the empiricist doctors' belief in the inherent value of practical experience, which rendered medical theory unnecessary, to be senseless. He appreciated Hippocrates's works, but only as a practical guide to the art of healing. The inconsistencies in the individual books in the Hippocratic Corpus gave Asclepiades reason to be dismissive of his predecessors and critical of their incorrect interpretations of Hippocrates's ideas.

Asclepiades believed that the human body can be described in terms of the constant movement of atoms. On one hand, the atomists thought that atoms move chaotically and become entangled by chance; on the other

hand, the logic behind selecting the best treatment method assumed the existence of certain regularities, which doctors could detect through their practical work.

Asclepiades's logic was as follows: all physical objects, including the human body, consist of atoms, which can differ in shape and weight; the human body (like other bodies) is a combination of them, which is subject to objective laws. This does not mean that the functions of the body have a teleological purpose: they are the result of chance. The existence of such laws (as such) cannot be denied: it is clear that the body works in a particular way. People are born and die, drink, reproduce, and perform their bodily functions; a patient has a pulse, which changes when he falls ill and varies with different types of fever – all this can and needs to be observed. The issue for the Methodic doctors was that these processes are not predestined: they occur because of a random, though physically determined, combination of atoms. At the same time, Asclepiades and his followers accepted the notion that outward manifestations of disease (i.e. symptoms) could be used to help to get an idea of the processes taking place in the body, unseen by a doctor. Here, the Methodic doctors fundamentally differed from the empiricist doctors. Outward manifestations of disease were explained through an understanding of pathogenesis – in this sense, the Methodic doctors can also be said to represent “theoretical medicine.” This fact, combined with the paucity of sources on medicine in the Hellenistic period, sometimes makes it hard to decide which school of medicine a particular doctor belonged to. Another issue is that the theory of the Methodic doctors ruled out a pathogenetic²⁰ approach to a theory of health and disease. Evidently, the Methodic doctors ultimately made the same fundamental error as the empiricist doctors: they equated the complex of symptoms visible to a doctor with the disease itself. Previously, we highlighted the presence of elements of clinical thought and differential diagnosis in Galen's clinical practice [5]. This lay behind the capacity for explanation of Galen's system, which was based on the teachings of Plato and Hippocrates.

²⁰ The term “pathogenetic” in this context is used in its modern sense.

Methodism did not have this ability, but the limited therapeutic arsenal of the doctors meant that it made a significant impression with its common sense. Ultimately, patients want doctors to alleviate their suffering. Vivian Nutton writes that Asclepiades used the slogan “swiftly, safely, pleasantly” to describe his therapy. Its practical implementation was based on five principles:

1) diet, clearly developing ideas in the Hippocratic Corpus, and based on regulated intake of food and wine; 2) light, but strictly regular, exercise at home; 3) passive exercise supervised by a doctor, for patients unable to exercise independently (such activities were based on exercises on swings specially developed by Asclepiades, which remained popular with doctors up to the modern era); 4) massage; 5) regular bathing, for which different forms of passive exercise were also developed (in this sense, Asclepiades may be regarded as a genuine pioneer of the use hydrotherapy in rehabilitation) [4].

If we also take into account the fact that Asclepiades recommended listening to music and drinking wine to counter depression, warned against taking very cold baths, and said that recovering patients needed as much attention as those at the height of their illness, he seems to have been a reasonable and prudent doctor.

Modification of the teaching by Themison and Thessalus.

The theory and practice of the Methodic doctors in the 1st-2nd centuries AD: Galen’s criticism

Galen was contemptuous of the “third sect,” as he called the Methodic doctors. However, there was a serious competitive aspect to his contempt, and sometimes, depending on the patient’s social status, a “fight for survival”. Galen’s main rival in Rome in the 170s, Statilius Attalus, was a Methodic doctor. One of the foremost authorities on medicine of the time, Soranus of Ephesus, was also an adherent of the Methodic school [20]. One of the most popular works on medicine – forty-eight books on the “Aphorisms” of Hippocrates – was written by Julianus, of Alexandria, (c. 150), a pupil and follower of the well-known Methodic doctor Apollonius of Cyprus. His work is a comprehensive and cogent exposition of the doctrine of Methodism. Julianus’s work is also

of interest in that it incorporates the legacy of Hippocrates into the framework of Methodic teaching.²¹ Unlike the empiricist doctors, the Methodic doctors did not reject theoretical medicine: they put forward their own version of it, based on the natural philosophy of atomism. The followers of this school of medicine read the works of the great doctors of the past extremely carefully, and strove to borrow from them everything that they found useful and did not contradict the main elements of their teaching. In addition, the fact that the works of the Methodic doctors were written in two languages is of huge historical significance. The rationalist followers of Hippocrates and the empiricist doctors were mainly Greeks who had come to Rome. The principles of their teaching are set out in texts written in Greek by natives of continental Greece, its colonies, and the new cultural centres of the Hellenistic period. In contrast, the fundamental works most representative of the teaching of the Methodic school were written both in Greek and in Latin. For example, the treatise *On Acute and Chronic Diseases*, by Caelius Aurelianus, was written in Latin, even though its author lived in North Africa. Evidently, many of the Methodic doctors already associated their work with Rome. On the other hand, Greek, the language of science and culture at the time, was the main language of, for example, Soranus of Ephesus and Julianus of Alexandria. Another popular medical author of the 1st to 2nd centuries was the Methodic doctor Marcus Modius Asiaticus,²² whose professional expertise earned him the nickname “Champion of the Method” even while he was still alive. He received the agnomen Asiaticus – “the Asian” – because he lived and worked in Smyrna, a major city and rival to Ephesus for the status of cultural capital of Asia Minor [4].

Galen, in his *On the Sects*, provides a “genealogy” of the development of Methodism. The founder of the school, he says, was Themison

²¹ Asclepiades of Bithynia had an ambiguous attitude to the Hippocratic Corpus: on one hand, he rejected all the natural philosophical ideas of its authors, including the principle of the doctrine of aetiology, but, on the other hand, he considered Hippocrates an excellent doctor, and his works the most important source of information on the practical art of healing.

²² Russian historians make no mention of him.

of Laodicea, “taking his cue from the rational Asclepiades”. The “sect” (as Galen calls the Methodic school) was completed by Thessalus of Tralles, who was followed by the doctors Mnaseas and Dionysius. It is worth noting that Themison was born in Laodicea. This town is first mentioned as a centre of medical education practice in connection with the well-known doctors Zeuxis and Alexander Philalethes, both of whom practised in the 1st century BC. Heinrich von Staden calls them “Herophileans”, and links them to the expansion of medical learning from Alexandria to Asia Minor [21, p. 460]. However, the fact that doctors made use of Herophilos’s teaching about the pulse in their practice is not enough to call them Herophileans. Furthermore, historically, the medical tradition in Asia Minor developed much earlier than in Alexandria: Kos, Knidos, Ephesus and Miletus were already centres of medical learning in the 5th century BC. The fact that Herophilos’s sphygmological ideas, which had important practical significance even outside the context of the influence of any natural philosophical views on medicine, were widely adopted by the doctors of Asia Minor should not surprise us. The doctors of Laodicea might be called followers of Herophilos had they, for example, performed anatomical dissections and written theoretical works about it. As they did not, the spread of Herophilos’s ideas about the pulse may be regarded as part of the normal exchange of knowledge between doctors in the Eastern Mediterranean. At the same time, we do know that there was an important centre of learning in Laodicea from the 1st century BC to the 1st century AD, for it was founded by Zeuxis and developed by Alexander Philalethes. The well-known geographer Strabo (64 BC – 23 AD) mentions both leaders of the Laodicean school as his contemporaries. Here, “school” means a centre for the development of medical learning, in both an administrative and a geographical sense. We know that Alexander Philalethes studied under Asclepiades of Bithynia and followed his teacher in many ways. For example, he viewed general pathology in terms of the notion of “pores” – numerous invisible channels that can only be imagined, running throughout the human body. Although Alexander Philalethes devoted particular attention to the pulse theory, seeing great practical benefit in it,

he was not necessarily a rationalist Herophilean. He denied that digestion could be explained through the concept of internal heat, believing that food in the stomach simply disintegrated and turned into juice. Alexander regarded blood as a simple homogeneous substance, in contrast to the Aristotelian tradition. He also believed that semen is a derivative of blood.²³ All this, except for his theory on the nature of semen,²⁴ is reason to regard him as a representative of the Methodic school. Another reason for describing Alexander Philalethes as a Methodic doctor is his *On Gynecology*, comprising at least two books. Since the time of Hippocrates, doctors had been interested in whether health problems specific to women, which are fundamentally different from general medical conditions in their origin, can be considered a separate group. Alexander recognised that doctors did indeed encounter such specific conditions; the problems associated with birth and obstetrics, the need to treat vaginal discharges, and so on, could not be denied. However, he did not regard “women’s health problems” as a special branch of medicine. Such an approach was also characteristic of the Methodic doctors.

Our sources do not state directly that Themison studied under Zeuxis or Alexander Philalethes. Were documentary evidence that they worked together to be found, it would be striking proof that the Methodic school already held a dominant position by the end of the 1st century BC. In the absence of such evidence, the existence of a link between Themison and the leaders of Laodicean medicine remains only a hypothesis.

An interesting figure in the history of medicine in the 1st century AD is Aristoxenus (a pupil of Alexander Philalethes), who is also associated with Laodicea. Like many of his colleagues, Aristoxenus wrote a book. Titled *On Herophilos and his School*, it was more critical than doxographical. Aristoxenus criticises practically all the Herophileans – Bacchius, Zeno, Chrysermus, Apollonius Mys and Heraclides of Erythrae. Galen was able to

²³ In his treatise *On the Seed*, he calls semen “the foam of blood.”

²⁴ Epicurus thought that semen was derived from all parts of the body. This exception is of little importance: at various times, even convinced Hippocratic doctors shared the pangenetic theory of sperm formation.

read the complete text of Aristoxenus's works, and is rather sceptical of him in his works on the nature and clinical significance of the pulse. Essentially, Galen criticises Aristoxenus for his tendency to over-theorise, commenting that he "wants to give a definition in a dialectical manner but does not himself observe the laws of dialectic" [19, p. 561]. Aristoxenus believed that it is necessary to understand the essence of definitions before addressing the clinical significance of a problem. In his view, there are two types of definition: "proper", or "substantial", and "conceptual," or "subjective" ("descriptive outlines"). It may be suggested that behind this division lies a criticism of the definitions of the pulse proposed by Herophilos and his many supporters.

Another well-known pupil of Alexander Philalethes was Demosthenes, who also bore the epithet "Philalethes".²⁵ Demosthenes Philalethes practised in the mid-1st century AD, indicating that the Laodicean centre was an established school of medicine then. Here, "school" implies a prolonged existence and maintenance of an educational tradition in a specific geographic area, through the transfer of knowledge from teacher to pupil (in this sense, historians speak of the Kos, Knidos and Croton schools of medicine). Demosthenes Philalethes made a fundamental contribution to the development of ophthalmology. His works in the field influenced the views of Rufus of Ephesus and Galen. His written legacy has enjoyed rare historical good fortune: it has been well preserved and reproduced in many later sources. Both Aëtius of Amida (fl. 6th century) and Paul of Aegina (fl. 7th century) borrowed from the Laodicean physician. Demosthenes's works were published in Latin relatively early. Max Wellmann believed that they were translated into the language in the late 4th century by Vindicianus (a friend of Saint Augustine), and were well known in this form in Western Europe in the 10th to 13th centuries. In addition, Demosthenes had a keen interest in pulse theory (which was popular with doctors of the time): he wrote a work on the subject in three volumes. To all appearances, he followed his teacher, Alexander Philalethes, in his interpretation of the theory.

²⁵ "Philalethes" literally means "lover of truth".

Other well-known specialists generally regarded by historians as Methodic doctors include Laecanius Arius of Tarsus, Julius Bassus, Niceratus, Petronius Musa, Diodotus, Sextius Niger and Dioscorides, author of a major work on pharmacology, which remained relevant up to the Renaissance [4].

Each leader of the Methodic school, naturally, introduced something new, slightly modifying its characteristic features. We can assume that the basic doctrine of these three types of pathogenesis was proposed by Asclepiades of Bithynia, and, possibly, one of the Laodiceans – Zeuxis or Alexander Philalethes. Clearly, neither Asclepiades nor his successors (Themison and Thessalus) were interested in anatomical dissections. This is another argument in support of our previous explanation of why the Alexandrian practice of dissection was not developed in the post-Herophilean age. It was not so much a matter of religious prohibitions: as we saw earlier, the empiricist doctors saw no value for learning in dissection. As a result of their natural philosophical beliefs, their worldview, the Methodic doctors would have regarded anatomical research in the same way: with indifference or hostility.

The doctors of the period, in principle, had an idea of the workings of the human body; they had the writings of Herophilos available to them. Not everyone, however, valued anatomy: a doctor believing that physiological processes were the result of the random motion of invisible atoms would have rejected in principle teleological explanations of healthy and pathological processes. The atomists might have thought that there was some logic to this randomness, but only of a mechanistic sort. Thus there was no intrinsic purpose to the functions of the part of the body and no need for experimental study of them. This attitude lay behind the theoretical ideas of Themison, who significantly added to the basic doctrine of the Methodic school [4, 22].

Themison believed that to be successful, a doctor needed to provide effective medical assistance. Common sense led him to deny the need for nosological classifications, irrespective of how many illnesses there were and what they were called, if the scope for providing appropriate assistance to the patient depended on the doctor's limited therapeutic options. Doctors needed to assess the symptoms of suffering carefully:

they needed to understand of what exactly the patient needed to be cured. At the same time, there was no point in contemplating the hidden causes or mechanisms of development of the illness, as doing so would not help to improve the treatment. Meanwhile, the empiricist doctors rejected all theory, preferring to draw on similar cases from past practical experience. This reliance on past experience, believed Themison, was not enough; after all, it was clear that some diseases shared common features, while others differed significantly. Based on his observation, Themison proposed the concept of “commonalities,” according to which general features of the progression of the disease were to be identified from a large number of observations of individual clinical cases [4]. Accordingly, all diseases were divided into groups based on such commonalities. A classification of diseases based on observations of “commonality,” rather than on any pathogenetic logic, emerged. This determined the principles of therapy: specific therapeutic interventions were related to commonalities of diseases. As with the empiricist doctors, the basic clinical approach was symptomatic treatment.

Like the rationalist doctors, and unlike the empiricist physicians, the Methodic doctors may be regarded as adherents of theoretical medicine. However, Themison understood this theory differently from the rationalists, for whom (with the clearest examples being Herophilos and Galen) it served as an inspiration to engage in experimental studies, and was informed by their results. (It was within this framework that medicine emerged as a science.) The Methodic doctors sought theory that logically explained the phenomena they observed. The speculative nature of this theory was not a problem for them, as there was no need to verify it through experiments.

Themison identified three basic categories of disease, based on their type of pathogenesis (“stricture”, “looseness”, or a mixed state). At issue here, of course, were different types of impediment to the free movement of atoms through the pores running through the human body.

Diseases arising from “stricture” are caused by the pores becoming too narrow for atoms to pass through them. It may be recalled that the Epicurean version of atomism envisaged the existence of atoms of all kinds of shapes and sizes within the human body. Diseases arising

from “looseness” are caused by a change in the configuration of the pores, affecting the circulation of atoms (body tissue thus becoming “loosened”). Both cases lead to the same outcome: the pores become blocked with an accumulation of atoms, resulting in swellings, oedemas, etc. These accumulations can be compared to the formation of thrombi in the vascular system. “Mixed-type” diseases arise from a combination of stricture and tissue looseness. It is not hard to see that Themison’s pathogenetic theory differed little from the views of Asclepiades. It could not have been otherwise: both were atomists, and the differences in their opinions on practical work were relatively unimportant.

Themison also divided diseases into the acute and the chronic, the former being associated more with “stricture,” and the latter with “looseness.” This mechanical explanation holds that a stricture can appear suddenly within a single pore, whereas it takes time for a state of tissue looseness, involving multiple pores, to develop.

Themison believed that there are three stages to the progression of a disease: its initial development, when the symptoms increase; a middle period, when the symptoms remain constant; and a final stage, with the agony of death, should the disease prove fatal, or a sharp decrease in the intensity of the symptoms, should the patient get better.

We can clearly see how logical Themison’s theory of the “commonalities” of diseases appears in light of the Epicurean method of analogy. The basic principle of this school is obvious: successful treatment was based on a tried-and-tested method. This method, applied after the symptoms observed by the doctor had been compared with the classification of commonalities, lay at the heart of the Methodic doctrine.

An extremely important innovation introduced by Themison was the concept of the *diatritos* – a three-day phase in the course of a disease. It is likely that Themison’s concept of the *diatritos* was a development of Hippocrates’s idea of crisis, which the latter based on observations of the progression of fevers. Later, Galen reinterpreted the concept of the crisis as an indication of the best time for therapeutic intervention.²⁶ Themison’s idea was

²⁶ For more details, see [23].

that the course of an illness is marked by certain changes every three days. By understanding them, a doctor can address the symptoms of the disease more effectively using the remedies available. There is a clear link between the idea of the *diatritos* and the pathogenetic concepts of “stricture” and “looseness.” An acute disease caused by stricture of the pores can after three days either start to resolve or enter a more prolonged phase as individual strictures build up to create looseness in a particular part of the body.

The widespread use of fasting during the first *diatritos* infuriated Galen. This treatment method appears to have been quite popular with the Methodic doctors of his day. To give Galen his due, his criticism was not unfounded: he always backed up his arguments with examples from practical experience. For example, in one of his works Galen writes the following about the Methodic doctors: “In addition to these patients, these enemies of phlebotomy were busy conducting to her death in the same way a fourth woman whose menstrual catharsis had been suppressed for a long time. They kept her without food, particularly for the first three days; for, it is true, she had a continuous fever as well. On the fourth day they gave her a minute quantity of slops; then on the fifth day they again ordered fasting. At this point, in a violent paroxysm, she sprang up delirious and rushed out of doors shrieking, so that those present could hardly restrain her. Nature, however, saved this woman at least, by pouring out blood copiously from her nostrils” [23, p. 428–429].²⁷

In a number of his works, Galen calls the Methodic doctors of his time “Erasistrateans,” “followers of Erasistratus,” etc., as if it goes without saying. However, we are not aware of any contemporary academic work in which, on the basis either of quotations or of an interpretation of the sources, Erasistratus is described as a supporter of atomism. Evidently, Galen knew more about him than academics today do. At the same time, this issue deserves careful study: were it to be proven that Erasistratus was an

atomist, this would mean a significant change of emphasis in our interpretation of the legacy of the Alexandrian medicine of the 3rd century BC. Galen regarded many of the treatment methods used by the Methodic doctors as inherited from Erasistratus. Elsewhere, he writes, “Straton was convinced of the benefits of fasting, advanced by Erasistratus, in the treatment of any disease. This can be clearly seen from the contemporary comments of those who considered opening veins equivalent to fasting” [24, p. 433–434].

Galen reserved his strongest criticism for the use of fasting in the acute phase of an illness. First, it artificially weakened the patient, and in certain cases could be contraindicated. Second, the Methodic doctors resorted to it when, in Galen’s view, an urgent surgical remedy, in the form of a phlebotomy, was required: “For even if it is true that an amelioration of the disease follows when the veins are emptied by fasting, we shall nevertheless omit it, for this reason: that it is far better for those who have once evacuated the excess to avoid fasting, which causes much distress to patients and brings sleeplessness and vexation, to say nothing of disturbances of the stomach and corruption of the humours in it, and sometimes even suppression of urine”²⁸ [24, p. 434].

The Methodic doctors prescribed fasting rather than performing a phlebotomy, wasting valuable time during which their patients might have been saved (as in cases of apoplexy). Bearing in mind their ideas on pathogenesis, however, the approach used by the Methodic doctors made sense. Apoplexy, for example, could be interpreted as looseness of the brain tissue as a result of strictures. The doctor’s task would therefore have been to “normalise the movement of atoms through the pores” of the affected part of the body. Within the framework of Themison’s theory, this could have been achieved by reducing the number of atoms in the body. (The human body lost atoms via urine, faeces and sweat.) Atoms entered the body through food, so fasting during the first *diatritos* was prescribed to solve this problem.

Another method of countering looseness, popular with the Methodic doctors, was the

²⁷ English translation taken from: Galen, “On Venesection against the Erasistrateans at Rome”, quoted in Peter Brain’s *Galen on Bloodletting*, Cambridge: Cambridge University Press, 1986, p. 40.

²⁸ English translation taken from Galen, “On Venesection against the Erasistrateans at Rome,” quoted in P. Brain, *op. cit.*, p. 44.

use of tight bandages. The idea was that the pressure on the part of the body with too many atoms would make the atoms move to a healthy part where there were fewer of them. A tight bandage applied to a relatively large part of the body, thought the Methodic doctors, “drove” excess blood to another part of the body, thereby resolving the problem of how to redistribute the “excess” atoms. This treatment approach also outraged Galen: “We say that bandaging organs will not help in getting rid of excess blood without opening veins... Erasistratus spoke very vaguely: ‘the dressing should be wool, and cover all the organs except the armpits and groin’. In this case, we can only speculate about which [patient] this applies to and whose blood can be displaced in the body in this manner. Maybe this is not always possible and dressing should not be used on the organs? But is this not just what we have already said about what Erasistratus wrote, and which you are now also saying? Can it really be true that someone whose forearms, shins and hands are inflamed with hypervolemia needs to have blood removed, while others simply need their organs bandaged?” [24, p. 454–455]. Galen was particularly angered by the use of the Methodic doctors’ favourite treatment approach (fasting and bandages) for acute illnesses, when neglecting phlebotomy in favour of bandages was most dangerous to the patient’s life.

Thus, the Methodic doctrine, positing the existence of certain universal features in all diseases, was established by the mid-1st century. According to Don Todman, those features could be divided into three groups: 1) excess pressure in parts of the body; 2) excess weakness of parts of the body; and 3) and a combination of the two. These three groups of outward features can be compared to the three universal types of pathogenesis according to Themison (stricture, looseness, and a combination of stricture and looseness), as well as to the three universal types of aetiology according to Asclepiades of Bithynia [20]. What is important is that, without rejecting medical theory, they nevertheless concluded that there was no point in studying anatomy and physiology.

Abraham Goldstein slightly refines this interpretation of the Methodic doctrine. According to him, it envisaged three states:

“(1) an excessively dry, tense and stringent state (status strictus); (2) an excessively fluid, relaxed, atonic state (status laxus); and (3) a condition involving both types of abnormality (status mixtus)” [25, p. 538].

The next leader of the Methodic school was Thessalus, a native of Tralles, a wealthy city in Asia Minor renowned for its wool. Galen made reference to this fact when scornfully describing Thessalus as “the son of a wool carder.” With this nickname, Galen highlighted the ignorance of Thessalus, who claimed that one could learn medicine in six months before perfecting one’s art in practice. Whether Thessalus actually thought this, we do not know. It may be that Galen was thus mocking another of his opinions (such as his panegyric on the Methodic doctrine, which was apparently so logical that it made it possible to master the profession of doctor quickly). Galen was generally hostile towards Thessalus, and made numerous sarcastic remarks about him. In his *On the Sects*, he satirically describes Themison’s horror on meeting Thessalus and seeing what the latter has done to the Methodic school. Here, Galen mocks Thessalus’s development of Themison’s theory of commonalities. Unfortunately, Galen’s works remain one of the main sources of information on the Methodic doctors. We will attempt to gain an understanding of Thessalus’s medical views while ignoring Galen’s attitude to his opponents.

The first important aspect of Thessalus’s teaching was his refinement of the theory of “commonalities”, which he subdivided and made more specific. The principle underlying this subdivision is that diseases treatable with dietetic methods are assigned to one “commonality,” and conditions requiring surgery to another. The “commonality” of surgical problems is subdivided into the external (e.g., a splinter, which can be treated by extraction) and the internal. The latter, in turn, are subdivided into those of a change of place (e.g., a sprain or fracture), which can be cured by repositioning (i.e., by putting the relevant part of the body back in its place); those of excess (tumours or excrescences), which have to be removed to reduce the relevant part of the body to its normal size and those of insufficiency (fistula or ulcers), which the doctor has to repair (i.e. increase the

relevant part of the body to its normal size). A fifth surgical commonality deals with wounds through which poison enters the body (e.g., a prick from a poisonous plant or a snake bite). Thessalus called this commonality prophylactic surgery; evidently, he clearly understood the need to prevent poison from entering the body, and to surgically clean the wound.

Thessalus subdivided dietetic commonalities into two groups: active and passive. The active include illnesses associated with excessive, sometimes pathological, excretions (here, the diet therapy was not only corrective, but also compensatory). The passive includes illnesses requiring only a correction of diet, using the usual methods of fasting or avoiding particular types of food.

The second important addition made by Thessalus to the teaching of the Methodic doctors is the notion of *metasyknisis* – the idea that the state of the pores in the human body can be affected by particular treatment methods (if diseases are caused by strictures or blockages of pores, it is a doctor's job to correct this). The Methodic doctors believed that an acute disease transforms into a chronic one through an increase in pore blockages in line with the level of severity and the size of the part of the body affected by the pathological process; thus, an individual stricture transforms into general looseness. Therefore, for a therapeutic intervention to lead to an improvement in the patient's health, the strictures in the pores have to be eliminated, by changing the size and configuration of the pores. It is also necessary to reduce the number of atoms accumulating in the region of the strictures, by removing this "thrombus." Atoms are tiny units of matter, and how many there are of them in the human body is determined by the amount ingested with food every day. Food is the source of the material replacing the part of the body losing atoms via excretion every day. Reducing the number of different types of atoms entering the body with food is simple: the patient has to fast for the first three days of the illness (the initial *diatritos*). For the second three days (the next *diatritos*), the opposite approach is taken.

Galen was scornful of this idea: he considered it senseless to first starve patients for no reason, and then to stuff them with food.

However, there was some sense to Thessalus's thinking: a treatment approach needs to be flexible, and a doctor needs to react to changes in a patient's condition, changing the therapeutic approach if necessary. Some doctors considering themselves followers of Hippocrates might have continued with their prescriptions for no good reason. We can surmise that between the 1st century BC and the 1st century AD there were works by Methodic doctors on this issue. It is no coincidence that during this period the supporters of rational medicine were disdainfully labelled "dogmatics". Following the examples of Karl Sudhoff and Theodor Meyer-Steinig, this nickname was used to describe the followers of Hippocrates up to the end of the twentieth century.

It may be suggested that the nickname "dogmatics", which stuck to the rationalist doctors after their opponents had given it to them, was no accident. Consider the concept of the crisis of a disease found in the texts of the Hippocratic Corpus, and Galen's modification of it [23]. The modern meaning of this concept is the "peak" of a disease – i.e., the period when the pathogenetic processes that determine the nature of the disease reach their height. Appropriate therapy brings a turning point, and the patient starts to recover. Hippocrates understands a "crisis" to be a kind of bifurcation, following which the course of the disease can alter significantly, not only in terms of an improvement or deterioration in the patient's condition, but also with regard to complications of the observable clinical picture. In other words, the disease changes. Today we can talk not only of convalescence or agony, but also of comorbidity. Hippocrates, of course, did not have such broad assessment options, so his theory of crises appears in his works as a kind of "road map": observation of a patient in a state of crisis can confirm a diagnosis and satisfy a doctor that the clinical decisions already made were correct. Naturally, Hippocrates was well aware that a state of crisis could also reveal the opposite: that the diagnosis was incorrect and the therapy useless. However, a desire not to go too deeply into this issue can be sensed in the Corpus texts. Hippocrates's works in general are rather didactic, stressing a "read this and learn the right way to do things" approach.

It could not have been otherwise: differential diagnosis, and the concepts of primary and concomitant illnesses, comorbidity, etc., did not appear in clinical medicine until much later. It should be stated that an element of clinical interpretation is present in the Hippocratic Corpus. The principles of the teaching were established by highly educated professionals with a critical mindset, but used by ordinary doctors who were not always well trained. Historians of medicine need to be aware that the principle of consistent application of a treatment regimen (even if chosen based on a Hippocratic desire to affect the course of the disease) could be adhered to too keenly by some doctors. A doctor blindly sticking to a regimen and unwilling to pay heed to any deterioration in the patient's health deserved to be called a "dogmatic". Clearly, such dogmatism, sanctified by its connection with Hippocrates and indifferent to developments in actual clinical cases, also made Themison and Thessalus a target for criticism.

At the same time, Galen clearly had good reason to criticise the Methodic doctors. We have seen how their clinical thought was based on a symptomatic approach, which linked them to the empirical physicians, despite the Methodic doctors' positive attitude to theoretical medicine. The problem was that the natural philosophy of atomism, when applied to specific aspects of physiology and pathophysiology, produced theory that was entirely speculative. As a result, attempts at classification based on this theory were useless in terms of developing a pathogenetically based approach to treatment. Galen was highly dissatisfied with this, and devoted the full force of his exceptional talent to an attempt to understand disease in terms of aetiology and pathogenesis. This attempt led to his interpretation of the crisis: for Galen, it was ultimately the moment when therapeutic intervention was most effective. Galen's understanding of the nature of a crisis is entirely Hippocratic: it is a sort of bifurcation in the course of a disease, a point after which everything can change. However, he brilliantly conjectured that this bifurcation depends on the development of the pathogenetic mechanism of the disease. Thus, Galen believed, doctors need to observe their patients' state of health

carefully, and to employ the necessary remedies. However, the most effective and potent remedies need to be applied right at the moment of crisis: any earlier would be too soon for them to have the desired effect; any later would be useless. Galen intuitively understood that complex, interdependent processes take place within the body, and that therapeutic interventions need to target them. Galen sought to fulfill as best as possible Hippocrates's aim of curing by affecting the cause of the disease. Thessalus and Themison sought to counter symptoms, an aim that, in Galen's view, put the Methodic doctors on a par with the empiricist physicians: both fought the consequence, not the cause, ultimately adhering to symptomatic therapy.

Naturally, Galen thought Thessalus's *diatritos* theory absurd. The idea that the course of any disease could be divided into three-day cycles, at the end of which one could reliably assess whether the treatment was appropriate or needed correcting, contradicted the very essence of Galen's understanding of the nature of health and disease. And what if a crisis took place on the night between the fourth and fifth days? By Thessalus's logic, such developments meant nothing, and doctors had to wait until the end of the second three-day cycle in order to get an accurate picture. But what if, after a crisis at the start of the fifth day, the onset of agony occurred on the sixth? Knowing that Thessalus's guidelines meant missed opportunities must have infuriated Galen: his descriptions of meetings at which he argued with the Methodists are full of such emotion.

Our sources do not explain why Thessalus chose a three-day cycle. It may be that the roots of this idea too can be found in his worldview. Here, we may consider the categories of stricture and looseness in the atomic description of the universal atomistic accounts of pathogenesis. It may be that three days was the time taken in such accounts for the parts of the body with blocked pores to change their state – the *metasyknisis* that was one of the foundations of his theory. It may be that the mechanistic explanations of the movement of atoms in the human body in some way led Thessalus to the idea of the *diatritos*, rather than some other division of time.

Conclusions

Historians of medicine should bear in mind that any systematic criticism in specialist literature always (or almost always) has its reasons: one needs to analyse the sources very carefully in order to identify them. Medicine is a particular specialist field. No doctors want to be their own or their patients' enemies; all seek to cure their patients quickly, painlessly, and effectively. There was no great danger of unscrupulousness or fact-juggling in disputes on an abstract philosophical topic (although, perhaps, there was danger of a fist fight with angry opponents). The main issue in any serious medical discussion is that of life and death. Philinus of Kos, Asclepiades of Bithynia, Apollonius Mys, and other doctors practising during the period "from Herophilus to Galen" were respected people, experienced physicians who spent thousands of hours in contemplation at the bedsides of the seriously ill. Their writings are an attempt based on extensive personal experience to understand and find the best ways to help their patients. Historians of medicine need

first to understand whose views had the greatest influence on the future development of medicine, and have a direct gnoseological link with modern science. Second, they need to understand why some doctors followed this example, while others did not. Here, we can see a kind of chain running through the history of medicine, from Alcmaeon to Hippocrates to Herophilus to Galen to the scientific revolution of the 17th to 19th centuries. [1, 13]. In saying this, it must be added that the development of the schools of both the empiricist and Methodic doctors was a kind of historical dead end, a fruitless branch on the tree of the history of medicine. On the other hand, while there are solid epistemological grounds for this view, it is no reason for us to dismiss the experience of our ancient colleagues who went down the wrong track. Our objective, therefore, has been to examine the practical ideas of each school of medicine in conjunction with their natural philosophical platform. Without doing so, it is impossible to understand why the doctors of the past acted as they did and not otherwise, or to reconstruct their mentality and worldview.

REFERENCES

- Balalykin D.A. *Antichnaya meditsina posle Gerofila. Chast' 1* [Ancient medicine after Herophilus. Part 1]. *Istoriya meditsiny* [History of Medicine]. 2016; 3(1): 5–19. (in Russian)
- Galen. *Sochineniya* [Works]. Vol. 3. Ed. D.A. Balalykin. Moscow: Prakticheskaya meditsina, 2016. 560 p. (in Russian)
- Balalykin D.A. *Issledovatel'skiy metod Galena*. V kn.: Galen. *Sochineniya* [Galen's research method. In: Galen. Compositions]. Vol. 3 Ed. D.A. Balalykin. Moscow: Prakticheskaya meditsina, 2016. P. 5–119. (in Russian)
- Nutton V. *Ancient Medicine*. London and New York: Routledge, 2013. 504 p.
- Balalykin D.A., Shcheglov A.P., Shok N.P. *Galen: vrach i filosof* [Galen: Physician and Philosopher]. Moscow: Vest, 2014. 416 p. (in Russian)
- Gaidenko P.P. *Istoriya grecheskoy filosofii v ee svyazi s naukoj* [The history of Greek philosophy in its relation to science]. Moscow: Universitetskaya kniga, 2000. 320 p. (in Russian)
- Asmus V.F. *Antichnaya filosofiya* [Ancient philosophy]. 4th ed. Moscow: Vysshaya shkola, 2009. 406 p. (in Russian)
- Sokolov V.V. *Antichnaya filosofiya* [Ancient philosophy]. Moscow: Znanie, 1958. 47 p. (in Russian)
- Russell B. *Istoriya zapadnoy filosofii* [History of Western philosophy]. Vol. 1. Moscow: Mif, 1993. 512 p. (in Russian)
- Jensen W.B. *Four Centuries of atomic theory*. An Overview. *Atoms in Chemistry*. Department of Chemistry. University of Cincinnati, 2010. Ch. 2. P. 1–12.
- Aristotle. *Sochineniya v chetyrekh tomakh* (Works in 4 volumes). Vol. 3. Moscow: Mysl, 1981. 614 p. (in Russian)
- Lucretius. *O prirode veshchey*: v 2 t. [On the Nature of Things: in 2 vols.]. Ed. F.A. Petrovskiy. Vol. 2. Moscow: Izdatel'stvo AN SSSR, 1947. 718 p. (in Russian)
- Balalykin D.A. *Meditsina Galena: traditsiya Gippokrata i ratsional'nost' antichnoy naturfilosofii* [Galen's medicine: the Hippocratic tradition and rationality of ancient natural philosophy]. V kn.: Galen. *Sochineniya* [In: Galen. Works]. Vol. 2. Moscow: Prakticheskaya meditsina, 2015. P. 5–106. (in Russian)
- Deleuze G. *Difference and Repetition*. Trans. P. Patton. New York: Columbia University Press, 1994. 350 p.
- Deleuze G. *Lucrece et le naturalisme*. Les Études philosophiques. Presses Universitaires de France. 1961; 1: 19–29. (in French)

16. Deleuze G. *The Logic of Sence*. Trans. M. Lester and C. Stivale. New York: Coiumbia University Press, 1990. 393 p.
17. Bennett M.J. *Deleuze and Epicurean Philosophy: Atomic Speed and Swerve Speed*. Journal of French and Francophone Philosophy. 2013; 2(XXI): 131–157.
18. Balalykin D.A., Shok N.P. *Apodikticheskiy metod v traditsii drevnegrecheskoy ratsional'noy meditsiny: Gippokrat, Aristotel, Galen [The apodictic method in the tradition of ancient Greek rational medicine: Hippocrates, Aristotle, Galen]*. Istoriya meditsiny [History of Medicine]. 2016; 3(4): 462–478. (in Russian)
19. Polito R. *Asclepiades of Bithynia and Heraclides Ponticus: medical Platonism?* In: Aristotle, Plato and Pythagoreanism in the First Century BC: New Directions for Philosophy. Ed. Malcolm Schofield. Cambridge University Press, 2013. P. 118–138.
20. Todman D. *Soranus of Ephesus (AD 98-138) and the Methodist sect*. Journal of Medical Biography. 2008; 16 (1): 51.
21. von Staden H. *Herophilus: The Art of Medicine in Early Alexandria*. 666 p.
22. Longrigg J. *Greek Rational Medicine: Philosophy and Medicine from Alcmaeon to the Alexandrians*. London: Routledge, 1993. 296 p.
23. Galen. *Sochineniya [Compositions]*. Vol. 3. Ed. D.A. Balalykin. Moscow: Prakticheskaya meditsina, 2016. 560 p. (in Russian)
24. Galen. *O vskrytii ven, protiv posledovateley Erasistrata [Bloodletting, against Erasistratus]*. In: Galen. *Sochineniya [Galen. Works]*. Ed. D.A. Balalykin. Vol. 1. Moscow: Vest, 2014. P. 426–462. (in Russian)
25. Goldstein A. *The Moral Psychiatry of Imperial Rome as Practiced by Soranus of Ephesus*. Psychiatric Quarterly. 1969; 43(1): 535–554.
26. Meyer-Steineg T., Sudhoff K. *Istoriya meditsiny [History of medicine]*. Moscow: Gosudarstvennoe izdatel'stvo, 1925. 463 p. (in Russian)

About the author

Dmitry Alekseevich Balalykin – Doctor of Medical Sciences, Doctor of Historical Sciences, Professor, Chairman at the Department of the History of Medicine, National History and Culturology, FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University); Institute of World History RAS (Moscow).