

The Pythagoreans' influence on medicine: a historical fact or problems of interpretation? Part 1

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The article deals with the influence of Pythagoreans' views on medicine. The authors clarify a point of view that has been developed in historiography, according to which during Antiquity there existed a medical school that was formed under the influence of Pythagorean philosophy. An interdisciplinary approach based on data that has reached us owing to the doxographic traditions of ancient authors who mentioned Pythagoreans, historiographical data on the history of Pythagorean teachings and its various aspects, as well as the research related to the reconstruction of the history and philosophy of ancient medicine, allow the authors to draw the following conclusions. Firstly, with respect to the history of medicine, it is necessary to study that part of the historiographic tradition within which the Pythagoreans' contribution to the development of ancient scientific thought is recognized (the concept of *mathēmata*). Secondly, we should recognize the importance of this part of the Pythagorean teaching for a comprehensive understanding of the formation processes for proto-scientific knowledge in general and medicine in particular. Thirdly, the emergence of an independent medical school based on the teachings of the Pythagoreans did not take place, so we can say that the emergence of ancient Greek rational medicine occurred precisely within the framework of early Ionian physics and the medical tradition of Kos and its influence on healing in the territory of the ancient Ecumene, including Magna Graecia. Finally, one can draw a conclusion about the priority of medical views over philosophical ones in the ancient intellectual tradition. Thus, the authors of the article substantiate two theses important for the history and philosophy of medicine: the lack of influence of the Pythagoreans on the formation and development of an independent medical school and the inaccuracy of the classification of some of the representatives of ancient medicine among the supporters of this medical tradition.

Keywords: *history of medicine, history of science, Pythagoreans, ancient philosophy, ancient Greek rational medicine*

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Introduction

Pythagoras and the school of thought he fathered are a notable phenomenon in the history of science. A significant number of scientific papers are devoted to the philosopher himself,

his teachings and his school,¹ and the sources are few enough to be well studied.² While in most of the studies of Graeco-Roman medicine English historical literature had to be employed

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¹ Firstly, these books directly describe the life of the great philosopher and his disciples (such as [1] and [2]). Secondly, there are numerous studies devoted to the history of philosophy and mathematics that treat Pythagoras and his teachings in a more general context (cf. [3], [4]).

² Cf. [5].

as there were almost no studies conducted by Russian scientists, the history of Pythagoras and his school has been addressed quite well by the classical Russian scholars [27–31]. Among others, L.Ya. Zhmud created a comparatively exhaustive analysis of the dominant historiographic sources of the second half of the 20th century, summarized several Western studies and significantly facilitated the research of the Pythagoreans [32].

It is universally acknowledged that the Pythagoreans have exerted a decisive influence on the history of medical sciences, and it is accepted as a fact that Alcmaeon was one of the Pythagoreans. Although we do not have grounds to state that Pythagoras and his school did indeed influence the rise of rational medicine in ancient Greece, it is generally accepted in the history of science that the Pythagoreans did affect the conception of scientific knowledge. In James Longrigg's footsteps, we define "rational ancient Greek medicine" as tradition within medical theory and practice that denied magic and occult approaches to disease curation and that explained the causes of disease, mechanisms of development and treatment principles by the natural physical and chemical factors [33, pp. 1–2].

Early Ionian physics is commonly regarded as a moment of inception of rational scientific knowledge. For a good reason Lloyd calls astronomy, mathematics, and medicine the oldest disciplines that developed on the basis of the early Ionian physics [34–36]. The possibility of explaining natural phenomena according to the interactions of the fundamental elements enabled the development of the theoretical models of Graeco-Roman medicine that explained disease through natural factors that could be studied in the course of an autopsy [37].

The period from the 4th to the 2nd century BC can be regarded as the period when classical (we will use this term interchangeably with the term Graeco-Roman) medicine came into being [38]. This process was finalized with the development of Galen of Pergamon's system that incorporated both theory and practice; it explained pathogenesis through the dynamical balance of the three physical tetrads or fundamental elements, essences and fluids. For historians of medicine, the "Hippocratic Corpus" is a unique source unsurpassed by anything available to historians

of astronomy or mathematics [39]. In it we find the data that allow us to infer the state of the medical art of the late 6th century BC and the philosophical ideas of the major schools of thought from the 6th to the 4th century BC that influenced the development of medical theory and practice. It is very common, at least within the current historiographic paradigm, to regard the Pythagorean school of thought as having exerted a decisive influence on medicine and also to assume that all the renowned doctors of Magna Graecia, in particular Alcmaeon, were Pythagoreans [32, p. 300; 40; 41]. However, in spite of the numerous publications devoted to this topic, it is far from being settled. Contemporary history of science considers that a "decisive influence" is exerted whenever a paradigm shapes the views of a scientist, the ways he perceives the world and thinks of it. Hence the views of Democedes, Alcmaeon and other famous doctors of Magna Graecia were, according to the views of many historians of medicine, heavily influenced by the Pythagorean paradigm.³ Making no attempt to deny that as adults they could have indeed belonged to the Pythagoreans, we will look at the importance of the Pythagorean philosophy for the development of ancient Greek medicine through a critical lens.

What do we know of Pythagoras's teachings?

It remains hard to grasp what exactly Pythagoras and his followers contributed to medical theory and practice and how exactly their school of thought influenced the development of the knowledge that constituted medical theory and practice.

At the most general level, one must ask which comes first – a system of natural philosophy that forms the way the scientist perceives the world or his medical practice? Historiography is dominated by the view that medical practice comes first: in the first place a Graeco-Roman doctor is a doctor, and philosophy comes second.

In the literature, there is a distinct separation between the myth of Pythagoras that was formed in historiography on the basis of the later works

³ Cf. [16, 18, 40, 41].

of the classical authors and the factual views of Pythagoras and his followers reconstructed from the sources that date no later than the 4th century BC.⁴ In the history of medicine there has always been a dissonance between the view that the Pythagoreans did influence the inception of medicine and the view that treats Pythagoras as a prophet and magician and the Pythagoreans as a sect. For example, the metempsychosis, the supposed transmigration of the soul, and multiple symbols are regarded as characteristic traits of the Pythagorean teachings.⁵ The first type of the symbols relates to the way certain phenomena manifest themselves,⁶ while the second explains “the core of things”.⁷ For us, however, the most interesting are the symbols of the third type, for they include the rules and limitations that guided the life of a Pythagorean. Let us imagine a doctor, a follower of Pythagoras, who, for his sole occupation, is to think about the etiology and pathogenesis, methods of treatment and so on. His worldview should assume autopsies to be a universal method of exploration. If, however, we think of him as first and foremost a Pythagorean, then he is assumed to be a strict

⁴ For more details, see: [32].

⁵ Diogenes Laertius describes these symbols: “The following were his watchwords or precepts: don’t stir the fire with a knife, don’t step over the beam of a balance, don’t sit down on your bushel, don’t eat your heart... when you go abroad don’t turn round at the frontier. This is what they meant. Don’t stir the fire with a knife: don’t stir the passions or the swelling pride of the great. Don’t step over the beam of a balance: don’t overstep the bounds of equity and justice. Don’t sit down on your bushel: have the same care of to-day and the future, a bushel being the day’s ration. By not eating your heart he meant not wasting your life in troubles and pains. By saying do not turn round when you go abroad, he meant to advise those who are departing this life not to set their hearts’ desire on living nor to be too much attracted by the pleasures of this life. The explanations of the rest are similar and would take too long to set out” [42, pp. 17–18].

⁶ To the question “What is the sea?” the answer is “Tears of Cronus”; to the question “What are the planets?” it is “Persephone’s dogs”; to the question “What is the sound made by hitting bronze?” it is “The voice of Daemon”, etc.

⁷ The examples of symbols of the second kind: “What is the most just?” – “To offer a sacrifice”; “What is the wisest?” – “Medicine”; “What is the most beautiful?” – “Harmony”, etc.

follower of the rules⁸ that the scholars of the late classical period have ascribed to the Pythagorean teachings. Taken as a whole, these teachings are clearly esoteric and occult, totally incompatible with the views and epistemological approaches that served as a framework for solving the main problems faced by ancient Greek medicine.⁹

One approach is to regard as trustworthy those sources on the Pythagorean school that can be substantiated by the early Graeco-Roman sources, the ones that date no later than the 4th century BC.¹⁰ By the mid-4th century BC, the Pythagorean school had practically ceased to exist and all the later “Pythagorean” schools were nothing but developers of orphic teachings who were connected to Pythagoras by name only. Scholars of the Pythagorean heritage even have different names for them, calling the real disciples “Pythagoreans” and the later epigones “Neopythagoreans”. There was a tendency in the independent esoteric circles to gain their prominence through the speculative connection of their teachings to the secret teachings of Pythagoras that had been transmitted exclusively in the oral form. L.Ya. Zhmud criticizes these later myths about Pythagoras for a number of good reasons. He indicates that later classical authors described the Pythagoreans as a misanthropic sect of mathematicians and acousmatics. The facts, however, indicate that the Pythagoreans had a significant influence on the political life of Magna Graecia – first of all of Croton, Metapontum and Sybaris [12, 14]. Hence the lifestyle of the Pythagoreans should have corresponded to that accepted in a rich Greek city of the 6th and 5th centuries BC. It is hard to imagine that such a secluded society could have appeared in a Greek city of that time. Lloyd has very well demonstrated that the worldview of a Graeco-

⁸ For example, getting out of bed he must fold it and then flatten the place where he slept; he must put his right shoe on, and only then his left, etc. It was forbidden to eat mallow, which symbolizes the gravitation of the celestial to the earthly, or beans, as they stall spiritual growth and communication with good daemons.

⁹ It is obvious that an esoteric teaching, the adherents of which talk to animals and are convinced that one must first put on one’s right shoe and only then the left one, does not help create a worldview in which the apodictic method might be used.

¹⁰ For more details, see: [32].

Roman scientist was not exclusively formed by religious teachings but was also heavily influenced by the social practices of the ancient poleis [36]. What do we have remaining of the common views of Pythagoras's teachings? Quite a lot, actually: Pythagorean mathematics, music theory with its harmonious intervals, and foundations of acoustics, which were extremely important for science in general; we also should not forget the contributions that Pythagoras and the Pythagoreans made to astronomy. Pythagoras's number theory can be regarded as a first attempt to explain the phenomena of the surrounding world by means of mathematical language. As is universally accepted, the experimental approach and mathematical explanations of observed phenomena are the cornerstones of the methodology brought forth by the scientific revolution of the 17th century. *Mathēmata*, the metaphysics and symbolism of numbers, is often regarded as the most important Pythagorean notion", writes L.Ya. Zhmud, "as opposed to the ionic περί φύσεως ιστορία. However, an unbiased analysis of the classical tradition brings us to different conclusions. Natural knowledge and medicine played a defining role in the philosophy of the early Pythagoreans; physiology, embryology, and botany were of no less interest to them than to the Ionians. These natural sciences in their turn were largely brought forth by medical practice, which focused on the things that could help prevent and treat the diseases, such as diets, which were then understood as healthy lifestyle in general, medicinal plants, anatomy and physiology of the human organism and so on" [32, p. 300].

It seems very reasonable to connect the appearance of the mathematical methods of proto-science with Pythagoras and the Pythagoreans. However, from the perspective of the history of medicine the evidence of the significant attention that Pythagoras paid to the diets and to finding the best diet for the athletes is very interesting. It is confirmed also by the number of Olympic champions coming from Croton, many of whom, such as Milo of Croton and Astylos of Croton, are considered to have been Pythagoras's disciples or adepts. It is known, for example, that a Pythagorean Ikkos won the Pentathlon at the 476 BC Olympics and then became a renowned teacher of gymnastics.

He became a coach and a doctor, and authored a book on the importance of proper diet in training athletes. However, even on the question of diets, there are significant differences in both the sources and the historiography. Aristoxenus indicated that the Pythagoreans employed bread and honey to cleanse and strengthen their bodies. On the basis of this fact it is often concluded that Pythagoreans were vegetarians. There is, however, another tradition that considers Pythagoras as having introduced a meat-based diet to the preparation of the athletes. Some authors indicate the connection between the dietology manuscripts of the "Hippocratic corpus" and the evidence concerning the Pythagorean approaches to diets [44, 45]. However, the dietology of the "Hippocratic corpus" is largely based on practical evidence accumulated by many generations. We shall consider, on the contrary, the knowledge of later times, when antagonistic Empiric and Methodic schools of medical thought were formed in the classical world. In spite of the significant difference that existed between them concerning the roots of diseases, as well as in their preferred methods of treatment, they agreed very well in terms of diet.

On the doctors commonly regarded as Pythagoreans

We know the names of the doctors that were considered members of the Pythagorean School.¹¹

Philolaus of Croton was a well-known disciple of Pythagoras and one of the most influential Pythagoreans after their founder died. In the second half of the 5th century BC, when the Pythagoreans were persecuted in the largest cities of Southern Italy, such as Croton and Metapontum, Philolaus found temporary refuge in Thebes and continued his work there after his exile from Croton. According to Longrigg, Philolaus largely shared Alcmaeon's views on medical theory and practice. Hence the question, was Alcmaeon of Croton a Pythagorean, as considered by most of the researchers, or a scientist whose views were formed under the influence of the medical schools of Kos and Knidos?

¹¹ Further, we will try to summarize the most trustworthy evidence.

Another prominent Croton Pythagorean was Democedes,¹² son of Calliphon, who in his turn is regarded as Pythagoras's disciple. Democedes followed in his father's footsteps and became a renowned doctor at a young age. He had his private practice and then continued as a doctor employed at the island of Aegina;¹³ in Athens, he later became a doctor to Polycrates of Samos. Polycrates was killed by Oroetus, the Persian governor of Sardis, and hence along with the other foreigners of Polycrates's circle Democedes was enslaved. Soon, in spite of his social status of a slave, Democedes became a popular doctor in Sardis. Soon after Oroetus was assassinated by the order of Darius, the great Democedes, along with the other slaves, was captured by the Persians. At the court of the Persian king, Egyptians were regarded as skilled doctors, and hence they were called when Darius sprained his ankle having jumped from a horse's back. However, their treatment, writes Herodotus, was so rough that it only brought more pain to the king. Having learned that there was a Greek doctor among the captives, Darius sent for him. "When *Darius* turned the case over to him and *Democedes* applied Greek remedies and used gentleness instead of the Egyptians' violence, he enabled him to sleep and in a short time had him well, although *Darius* had had no hope of regaining the use of his foot".¹⁴ Soon after, Democedes cured Atossa, the wife of Darius, who had a breast ulcer. Democedes became a court physician; he was given a large house and granted the right to eat at the king's table.¹⁵ In spite of his high social status Democedes was not content with his life in Persia. Democedes enjoyed the full trust of the king and arranged that he be sent to the Greek shores. The king agreed, but made Democedes promise to return. Having reached Croton, however, Democedes refused to go back and asked his fellow citizens to protect

him from his travel-mates, Darius's servants. The people of Croton helped him and protected him from Darius's people, who tried to seize him as a slave, and made the Persians flee.¹⁶ Having married a daughter of the athlete Milo of Croton, he joined the Pythagoreans and sided with them during the Cylonian Affair.¹⁷

The story of Democedes indicates that it is not accurate to unquestioningly assign him to the Pythagorean ranks. No doubt he was sympathetic to the main ideas of Pythagoras and he was among those close to the immediate disciples of the great scholar. All this is, however, of secondary importance; what truly is important is whether Democedes's outlook on medicine, his professional approach, was formed under the influence of the Pythagorean teachings. To answer this question we will try to reconstruct the order of events.

If we consider Croton to be Democedes's home town and Democedes himself a physician of the Croton medical school, then we have to assume that he learned his trade in Croton under the guidance of one of the prominent physicians of the elder generation. He was invited to Samos, to the court of Polycrates, whose tyranny Pythagoras had fled a while before. At that time medicine was not a trade to be learned in a year or two; thus, in order to be invited to Polycrates's court Democedes must have already been a successful and well-known physician. By the time Pythagoras moved to Croton, Democedes would have already grown up to be a professional and become an experienced doctor, implying both intellectual maturity and a well-established worldview. Hence there was no time for Democedes to have become a disciple of Pythagoras. Democedes returned to Croton in his middle age; he could have joined the Pythagoreans out of personal sympathies with Pythagoras or his teachings. His father-in-law, Milo of Croton, was most probably a disciple of Pythagoras's teaching and a member of his inner circle. However, the numerous supporters of the statement that Pythagoreanism influenced medicine in Magna Graecia continue to claim that local medical schools of thought were formed

¹² One of the sources on Democedes – Herodotus's treatise (Histories, III, 125, 130–137) [46]. Systematized information on Democedes can be found in [32, pp. 108, 301].

¹³ Herodotus indicates that already during his first year at Aegina Democedes had "surpassed all the local doctors in his mastery" (Histories, III, 131) [46].

¹⁴ Herodotus. Histories, III, 130 [46].

¹⁵ In the Histories of Herodotus, we read: "...and wanted to crucify them for they were worse than a Hellenic doctor" (III, 132) [46].

¹⁶ More details on Democedes can be found in Herodotus, Histories, 136 [46].

¹⁷ Iamblichus indicates the same (see: Iamblichus. De vita Pythagorica liber [47]).

under the influence of Pythagorean philosophy! For Democedes's example to support the case, he should have trained as a doctor under the influence of the basic Pythagorean principles, and for that we do not find support in the facts we have about his life.

L.Ya. Zhmud reasonably criticizes the idea that Pythagoras had earned his fame immediately upon arrival in Croton: it could not possibly have happened due to the socio-cultural norms of the ancient Greek poleis. Their citizens treated newcomers with considerable distrust. And Pythagoras definitely was a newcomer, having left his home island of Samos and fled to Croton at an already mature age. Much more probable is the hypothesis that Pythagoras gained respect and influence little by little, as his disciples took more and more of the leading positions in the city. In the end, there was a backlash in the form of persecution of the Pythagoreans. Most importantly, Democedes could not have possibly matured as a physician under the influence of Pythagorean philosophy.

At the time he was serving Polycrates, Democedes was between thirty and thirty-five years old [32, p. 108].¹⁸ Polycrates died around the year 522; hence Democedes could have served him for two years at about that time. Pythagoras moved to Croton only in 530 BC. Comparing the dates, we are left with two possible conclusions. The first is that the historiographic tradition depicting Democedes as a Pythagorean physician is correct, making Democedes a perfect example of the influence of Pythagorean ideas on ancient Greek medicine. Then we have to accept that within some seven or eight years Democedes had learned the art of medicine founded on the Pythagorean philosophy, gained a large number of patients whom he had successfully treated, gained his fame all over the Graeco-Roman world (for why else would have Polycrates invited him to his court?), managed to work for a while at the island of Aegina and moved to Samos, where he continued his successful career. This chain of events does not sound possible. The second possibility, though, is that historiographic tradition is wrong and Democedes is to be regarded as a successful physician who joined

the Pythagoreans at an already mature age after returning to Croton. This version does not contradict the established facts, but precludes the possibility that Democedes's medical views were formed under the Pythagorean philosophy and hence that he can be regarded as a "Pythagorean physician". More appropriate, in our opinion, is to call him "a physician and a Pythagorean". As we study closely the events of Democedes's biography we cannot accept anymore the possibility that his outlook as a doctor was formed under the Pythagorean influence. Democedes as a prime example of Pythagorean influence on Greek medicine disappears and instead we see an intellectual who joined the Pythagoreans at a mature age. For historians of medicine, when looking at the most prominent of the classical philosophy schools, the most important question is whether the philosophy affected the formation of the medical theory and practice of the time. When we take a closer look at those who are commonly considered as "Pythagorean physicians", this latter statement becomes dubious.

However, should we assume that Democedes joined the Pythagoreans upon his return to Croton, the picture becomes coherent. He was a well-known physician, a hero of the city of Croton protected from the Persians by his fellow citizens. As an adult he became enthusiastic about Pythagoras's ideas and later, when the Pythagoreans were being persecuted, he tried to protect them. However, it is impossible to consider him a representative of some particular Pythagorean school of medical thought. According to our data, Democedes was a well-known representative of Ionian medicine who became inspired by Pythagorean ideas later in life. His methods of healing, including his individual approach to treatment and gentle surgical methods, follow the traditions of Kos.¹⁹

Several other physicians commonly regarded as Pythagoreans include Ikkos of Tarentum, an athlete, who after the conclusion of his career in sports became a physician and a teacher of gymnastics; Milo and Astilus of Croton, both Olympic athletes, who followed the same route; and Hippo, who wrote two manuscripts on

¹⁸ Herodotus speaks of Democedes in this context (cf: Herodotus. *Histories*, 125, 129, 130–137) [46].

¹⁹ J. Jouanna mentions the gentle approach to surgery of trauma as one of the main principles of Hippocratic medicine [48].

natural philosophy that were devoted, among other things, to the causes of diseases (Philolaus mentioned both of the books is his own entitled “On Nature”).

Hippo, as a natural philosopher, tried to reduce everything to one single principle, that of the foundational role of the fluids. L.Ya. Zhmud notes: “Instead of the balance of a multitude of different ‘qualities’ and its disturbances due to both internal and external factors that were postulated by Alcmaeon’s theory we deal with the so-called ‘normal state’ of fluids and its change due to cold and heat. As ὑγρότης Hippo understood, most probably the element common to all the bodily fluids, which in turn depended on the foods consumed” [32, p. 311]. We can only partially accept such a treatment of Hippo’s teachings. In the developing theory of pathogenesis, the role of cold and warm foods was not as important as that of a fundamental category – an overall influence of external heat and cold. In Hippo’s teachings we find many commonalities with those of Thales of Miletus, in particular, his treatment of water as a fundamental element. It was to this characteristic trait of the Ionian tradition that the physicians of Kos put forward the external fluids (their warmth or cold) and the internal fluids (their balance or imbalance) as the main reasons for the development of diseases. Philolaus treated the problem in a similar manner, talking of the three types of internal fluids – blood, bile, and phlegm.

One source preserves the evidence that Hippo considered fluids as the basis of life for all living beings. “Hippo of Croton thinks that we contain natural fluids, due to which we can feel, be healthy and live in general. When this fluid is in its natural state the living creature is alive; when it evaporates, the creature stops feeling anything and dies. Old people look dry and are not capable of feeling, because they lack fluids. Similarly, the soles of our feet look dry and are not sensitive because they are devoid of fluids. <In one of his books he takes only this into account not going into further details>. However, in another book* he states that the aforementioned fluid changes under the influence of excessive heat or cold and this leads to diseases. <***>. According to his words fluid can change, becoming more watery or drier, more viscous or thinner, or it can change in some other way as well. Thus he explains the

reasons for all the diseases, but how the diseases appear he does not indicate”.²⁰ Let us also note that the language of the scientific treatise of the Croton physicians is the Ionian dialect. All these factors notwithstanding, the formation of rational medical theory and practice having occurred later in Croton than in the area of Miletus poses the question, whether the medical tradition of Magna Graecia was secondary to that of Ionian medical tradition. We should also remember that the second center of medical knowledge after Croton was the Sicilian city of Akragas, where Akron and Empedocles lived and worked, and which was inhabited by immigrants from Rhodes. And it is Rhodes that is considered to be the third center of activity, after Kos and Knidos, of one of the branches of the Asclepiad family. There was no written evidence left of the Rhodes medical school; could it be because the physicians emigrated from there to Akragas?

Hermippus calls Calliphon of Croton, the father of Democedes, a disciple of Pythagoras [32, pp. 300–301]. This evidence, however, cannot be taken as reliable, as we have already seen that even Democedes himself had no time to learn the art of medicine from Pythagoras. By the time Pythagoras moved to Croton, Calliphon was obviously of a very mature age and on his formation as a physician Pythagoras could not have possibly exerted any influence. He could of course have followed in Pythagoras’s footsteps, but only in the fields of ethics, politics, astronomy, or music. Just as with Democedes, Calliphon by the time of Pythagoras’s arrival was already a renowned doctor and hence we cannot connect his formation as a physician with Pythagorean philosophy. Longrigg points out that Calliphon could have belonged to the Knidos branch of the Asclepiads and hence he was nothing but a normal physician belonging to a rationalist medical school of Knidos, which was based on early Ionian physics.²¹

²⁰ See: Anonymi Londinensis Iatrica, XI [49, p. 53]. Translated by Z.A. Barzakh.

²¹ An interesting confirmation of the given conclusions on the decisive influence of Ionic medicine on the doctors of Magna Graecia, and the secondary importance of the Pythagorean philosophy itself, we find in a Byzantine source, “Suda”, in which Calliphon, the father of Democedes, is called a priest of Asclepius of Knidos. This indicates his relation to the medical profession, and as there

For historians of medicine, it is important to understand the value of the conception of mathematical theory in ancient Greece, which was based on a set of axioms.²² In the following construction of the scientific conclusions the main role was taken by deduction as a form of logical thinking. Those were not just formal rhetorical conclusions which were only bending the reality. On the contrary, deduction was considered a way of reaching non-contradictory conclusions. It was necessary to look for correct axiomatic statements, on the basis of which it was possible to reach theorems that could be correct for any numeric relations. The development of mathematics and its inclusion in the widely accepted curriculum allowed epistemologic foundations to be built and significantly affected the development of medical theory. Theoretical notions elaborated by the Pythagoreans could be used to analyze the symptoms of any disease observed by a

was at this time an active temple of Asclepius on Knidos, we can conclude that he moved there being already a mature professional and only as such joined the disciples of Pythagoras.

²² As S.Ya. Lurie notes, “logical and consecutive system of proof is an entirely independent merit of the Greek genius” [50, p. 45].

physician. It is characteristic, therefore, that some of the ideas of Croton physicians, such as those of Alcmaeon, resemble the ideas of the Hippocratic Corpus, which establishes a system and generalizes many individual cases.

There are therefore very good reasons not to overestimate the value of the Pythagorean philosophy for the history of medicine: it clearly was not a cornerstone paradigm for the first generations of the ancient Greek physicians of the rational school. A completely different matter is its ability to influence the members of the medical community on a more general level. Such an influence did exist, and it was connected with the already-mentioned *mathēmata* described by numerous historians of science. The attempt to describe natural phenomena with the help of mathematics proved to be successful (for example, analogies from geometry with the help of which Plato describes the movement of primary elements, as well as the attempt to describe it in terms of mathematics,²³ etc.).²⁴

²³ For more details, see: [51].

²⁴ The second part of this article will be published in a forthcoming issue of the journal *History of Medicine*.

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