

## Раздел 2.8

### **PHENOMENON OF SCIENTIFIC SCHOOL: ANTIQUITY TRADITIONS AND MODERNITY**

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We are interested in the process of emergence of scientific schools is advisable to start with the history of the origin and activity of philosophical, medical and natural science schools of antiquity. This raises a whole set of questions: to what extent the right to speak of science in ancient times? Can we consider schools that have arisen during the period, scientific?

There are two points of view on the question of whether, when it became a science. More widely believed that science emerged at the turn of the XV–XVII centuries, as part of the natural sciences. As you know, the beginning of modern natural science dates from the time of creation of heliocentric Copernican system of astronomy (the first half of the XVII century).

Another concept comes from the fact that science has emerged in antiquity. We will adhere to the standpoint according to which in antiquity science, or at least the rudiments of scientific knowledge existed.

Known researchers History of Science (P.P. Gaidenko, A.I. Rakitov) believe that the emergence of a new physics was held on the basis of the mathematics that originated in ancient times, that representatives of the Orphic-Pythagorean school first put forward the idea of a circular or spiral motion of celestial orbits stars, an idea on which subsequently as a source of his concept referred to Copernicus. In the opinion of the famous physicist Heisenberg, from the ancient tradition of Western thought it inherited the ability to raise questions of principle, possess powerful intellectual instrument – the ability to handle any problem in principle, i.e., seek to streamline the experience of the mosaic.

If we define a scientific school as a collective form of generation and transmission of knowledge and cognitive traditions, due to the level of development of science and culture in a certain era, it is possible to assume that the main features of scientific schools took place in all the cultural traditions from antiquity.

The value of the antique period for all subsequent science lies in the fact that the intellectual space of the ancient Greek philosophical and medical schools matured beginning of the methodological principles and assumptions that produced not only the creation of the first scientific theories, but also patterns of interpersonal relationships in science.

R. Collins enter the history of the origins of the Greek schools in the context of the intellectual changes, in turn, dependent on large-scale shifts in the political, economic and spiritual life [3].

The most important external conditions for the emergence of schools were democratic revolution, political reform, literacy, undermining religious practices. This allowed the intellectual community (secular intellectuals) to address new topics and competition standards, to new spaces of argument, methods of presentation of the results to the public. The first personal line of continuity through the generations are beginning to emerge from one leader (sage) to another.

Secular intellectuals – community engaged protophilosophy themes, poetry (poet Alcman – the end of the 600-s BC), organize disparate myths describing the origin of the cosmos through the genealogy of the gods.

The semantics of the concept of "school" in today's perception of paradox. Translated from the Greek (σχολη/schole) – leisure. The period of emergence of the first Greek schools (about 600 BC) coincided with the time when the spirit is freed from the care of the daily needs and create works of noble leisure – arts and sciences. Under the conditions of the emancipation of individuals in many areas of public life began to appear people who can bring in and develop the knowledge, previously used randomly for all sorts of practical purposes. Near such outstanding people as some kind of center were established scientists circles, in which there was a total assistance of the kind of school of communication and school traditions, passed down from generation to generation. During this leisure-minded – of Labor, was delivering intellectual pleasure – born ideas and principles, the system and method, which later was the main content of school concept in its modern interpretation. Ancient Greek science – understanding of the world is a free mind.

In the context of ancient Greece in the individual sphere of knowledge possessed of spiritual independence. This moment proved fundamental to

the creation of the first scientific schools. The very style of life of the Greeks gave birth to their learning style. Free Greek citizens (especially, Athens) most of the time spent on all sorts of public events, appreciated live chat, word. Conversation, debate and dialogue have become major research methods of philosophical, political, and moral issues. Of course, one should not overestimate the rational side of the ancient science. According to F.H. Cassidy, what the Greeks called philosophy, is a special type of thinking is not reducible to any science, myth, or religion. It is rather the combination and that, and another, and the third. "Philosophy – writes F.H. Cassidy – so different from the religion that it can't exist without freedom of criticism and struggle of opinions, it is deeply hostile to dogmatism and intolerance "[2, p. 111].

According, R. Collins, philosophical essence of creativity is not the genius of individuals, but of structural rearrangements. School of thought, rooted in intergenerational continuity of network lines, are better able to reproduce itself, as they are based on organizations with the material property and the bureaucratic hierarchy [3, p. 154]. First organized by the school in Greece was the Pythagorean Brotherhood, which is a secret society with its own ranks or grades, and religious practices. In addition, the school had its own property (buildings, forts), political influence, relied on the local aristocracy, filling up at its expense their ranks. However, according to K. Huffman, what is called the Pythagorean tradition, emerged due to the attractive way of life, based on the charisma of Pythagoras, to its impact on students as a teacher of life (see [11]).

Applicants for intellectual attention of pre-Socratic time were the three-resistant schools: in atomists, the Pythagoreans, and healers.

After 400 years, the intellectual community to discover schools as an institutional structure that can be created specifically for the model of the Pythagorean.

Plato's Academy (hereinafter – Academy) was similar to the Pythagorean school, organizational resembled religious brotherhood with the property transferred, with broad intellectual contacts with the appointment σχολάρχης/sholarh (teacher). Chains "teacher – student" can be traced back to 50 BC not only in the Academy, and the Stoics and the Epicureans. But it was also a public high school where students have made money for tuition. At the same time created a different type of school, competing with the philosophical, which have developed skills in the field of rhetoric, medicine, natural sciences, which have gained sustainable institutional forms. Medical schools were carriers of certain philosophical positions and activities of rhetoricians intersected with Aristotle's school. Eudoxus's

school in Cyzicus. renowned as a school of mathematics and astronomy, but there was also a full-fledged philosophical school, promoting the ideas of Plato.

In the event of school to a certain extent, he realized the idea of ancient philosophy of the sage. In the early works of K. Marx noted: "Greek philosophy begins with seven wisemen, to which belongs to Thales, and it ends with the first attempt to express in terms of the image of the sage. The beginning and end have sage. Center – Socrates – the same "[8, p. 130]. And further: "The Greek philosopher has demiurge, his world – this is the world that thrives under the natural sun Substance" [8, p. 131]. The substance, which is carried by the wise men, that determines their morality, their right to be attributed to the legislature, the creators of the political and spiritual life. Italian explorer of ancient philosophy J. Real believes that the philosophy of Greek schools was a philosophy that sought to teach the art of living, and therefore it is obvious predominance of ethics over logic and physics "This explains why all the founders of the schools be like the gods of their adherents. They – the secular saints of faith, embodied perfect life paradigm "[9, p. 154].

The appearance of the teacher, who is credited with the quality of being almost supernatural, typical for medicine. Ancient medicine was medicine schools, among which the most striking was the school of Hippocrates, Herophilus, Galen. In his treatise "On the favorable behavior of" Hippocrates argued that the doctor – philosopher. Yes, and a little, in fact, the difference between wisdom and medicine, and all that there is for wisdom, it's all there and in medicine.

Thus, the idea of ancient philosophy has been implemented in medical schools that sage should not only develop the power of the mind, but also the moral principle that only if certain moral perfection possible higher knowledge.

On a material of Greek schools, it is already possible to trace the type of school the dependence on cognitive orientation thinkers. The main idea of the theoretical or conceptual scheme of school affects the shape of the community, its social and moral existence. Marx noted that "the Ionian natural philosophers were a phenomenon as isolated as that form the elements of nature, in which they tried to understand the universe," as a form of organization of the Pythagorean school was "in the middle between complete isolation conscious ... and trusting in immersion moral reality "[8, p. 132]. Similarly, in various forms of Greek philosophy it contains in embryo, in the nascent state, almost all later modes of outlook, the ancient school are fraught with the inverse images of the later forms of collective

action in science. Miletus School (Thales, Anaximander, and Anaximenes) was a school – direction, movement, because philosophers were part of it, were contemporaries and fellow citizens, and, in modern terms, adhered to a research program.

Not all schools have been esoteric, closed, which was the work of the mystically painted. There were public schools of the samples with a strong training orientation, educational function, such as Socrates school. In conversations with the closest disciples of Socrates strengthened point instruction, admonition, ie. A purely educational and instructional techniques. Domestic researchers of Socrates (V.F, Asmus, F. H. Cassidy, V.S. Heresyants) noted that he encouraged in his students curiosity. If he was ignorant of any questions, send students to knowledgeable. Socrates warned his disciples against omniscience, which is not conducive to the assimilation of the depth required for the practice. Unlike the Sophists, he did not take money for teaching, presenting the most selfless attitude to truth and his disciples.

For the school of Socrates and his followers, especially Plato, it has been characterized by a combination of the principle of freedom of creative continuity. J.A. Condorcet wrote that the school "... have the advantage that they are united by ties of free creativity of people who want to penetrate the secrets of nature. If the opinion of the teacher there too often enjoyed a reputation, he had only to belong to the mind "[4, p. 61–62].

School of pupil Plato – Aristotle, the famous Lyceum, it is possible with a certain degree of conditionality considered the prototype of the modern research institute. Based on the philosophical method, Aristotle embraced the study of not only a lot of science but also applied this method to poetry, rhetoric. Lyceum Students have already had an idea of specialization, teachers engaged in the application of the method to the specific areas of knowledge. The first attempt to understand the functions of the founder of the school and students-followers, the desire expedient was characteristic of the Aristotelian school, according to their ability to organize the participation in the research process. Aristotle himself recognized that the highest level of science is the wisdom: "...we assume that the wise, as far as possible, knows everything, even though he has no knowledge of each subject separately ... We believe that the more wise in every science, the one who is more accurate and more able to learn to identify the causes. The wise should not receive instructions, and to instruct, and it should obey the other, – and he was – one who is less wise" [1, p. 67].

In this passage mentioned not only for the traditional celebration of the ancient philosophy of the sage, but has already formed an idea of the

criteria to be met by a scientist standing in the school section. It should be competent, accurate, able to teach, suggest an idea and give it a method of research. In Aristotle's school for the first time observed the division of labor between the scientific head of the school and students – implementing his plans. Polish logician J. Lukasiewicz notes that in the field of logic "...Aristotle did not have time to dwell on all the new discoveries that he made, he suggested to his pupil Theophrastus continue this work" [6, p. 66].

In the ancient schools of the founders and leaders of the theory is not always represented by one person. Some historians of philosophy (A. Makovelsky, T. Gomperz, D. Laertius) believes that the head of the Ionian school should not be considered Thales and Anaximander. The place occupied by Anaximander in the history of scientific thought, it follows, firstly, from the fact that he "can be called the creator of the first system of philosophy", and secondly, it belongs to the first attempt is quite natural world explanation based on a mechanical principle [7, pp. 5–6, 25].

How long live the school? An example of Plato's and Aristotle's school, as well as the Epicurean and Stoic against the backdrop of historically marginalized myriad schools supports the idea of their longevity and fruitfulness. These four schools dominated the intellectual life of Greece for two centuries All Athenian schools experienced change after 100 BC due to external shocks – the Roman conquest. After the 50 BC no longer continuously existing schools of philosophy as the organizations with property and owned by teachers – creators real doctrines. Formal schools were replaced by personal relationships between philosophers apprenticeship Informal networks were the result of doctrinal and organizational shift in the history of Greek schools. It was the most movement than school movement lifestyle (Skeptics, Cynics) who rejected the practice of formal training followers. For example, the skepticism was not so much the epistemological argument of how much life style but adding lineages informal to formal schools only reinforces the common model. They did even more intense competition for intellectual space.

Thus, the historical and cultural fabric of the occurrence and activity of the ancient schools provides examples of origin characteristics, designating at the origin of the formation of this form of collective research and extant. Among them is the mandatory presence of the teacher, the generator of constructive ideas, with whose persona is associated most productive period of school activities and by whom a person is identified by its name (Socrates school, school of Pythagoras, Aristotle's school). In philosophical and medical schools of antiquity laid the beginning of the ethical standards

that characterize the cognitive activity, both in terms of subject-object, and interpersonal relationships (Hippocrates school). School of Socrates and Aristotle gives examples of origin of the educational methods, the division of labor within the school traditions respectively abilities of its members. These features, as well as the skills of intellectual communication that took place in the ancient schools, make this period in the development of knowledge important in terms of determining the genesis of scientific schools as a special form of joint activity in science.

From antiquity to the present day scientific school is a model of such relations in the research community, which is carried out not only the process of acquiring knowledge, but also the process of "production" and "reproduction" the researchers themselves.

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Scientific school is historically the first form of joint activities in science and characterizes these activities on the part of its subjects among themselves. The genesis of scientific schools is expedient to carry on with the ancient period, as represented by the ancient Greek philosophical and medical schools start matured methodological orientations, which are prepared not only to the establishment of the first scientific theories, but also patterns of interpersonal relationships in science. Varying the time, the scientific school has retained features that distinguish it from other forms of collective research work: the existence of relations "teacher – student", "the founder – the followers of" informal interpersonal communication, taking care of the preparation of the scientific change. The backbone factor of scientific school is the personality of its creator, the driving idea and a research program on the general subject matter, as well as defining the style of the activities, traditions and moral atmosphere.

Despite the ambiguity of the concept of scientific school it until today reflects two inseparable functions of science. The school involves learning creativity, without which there can't be continuity in the development of knowledge. This function is intrinsically linked with another function – research, since learning is possible only during the production of new knowledge, and has not reached the reproduction. Therefore, a school of science – it is always a collective creativity. The school is a necessary component of normal development of science: it cultivates scientific talent and determines the direction of research.

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