

Logic and the History of the Origin of the Science of Logic

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Annotation: The review examines the state of disciplines that have developed at the intersection of philosophy and logic: philosophy of logic, which reveals philosophical questions raised by the development of logic (the nature of logic, psychologism in logic, etc.); philosophical logic as a discipline in which the modern logical apparatus is used to clarify and solve traditional philosophical problems (problems of time, norms, etc.); logical philosophy, which reflects the influence of ideas of modern logic on philosophy. The experience of analytical philosophy as a philosophical trend of the twentieth century, most closely associated with logic, is also revealed. The review includes works by both foreign and domestic philosophers and logicians.

Key words: Informal logic, logic, formal logic, communication space, theoretical justification of logic, image of logic, practical rationality.

Logic as a science originated in connection with rhetoric (the study of eloquence) in Ancient Greece and Ancient India. There, oratorical competitions with large crowds of spectators were very popular. The earliest mention of logical problems can be found in the works of Parmenides of Elea, born around 540 BC, and Heraclitus of Ephesus, who lived approximately between 530 and 470 BC. Logic in the sense of a science can only be discussed since the time of Aristotle. The logic founded by Aristotle is usually called formal. This name was given to it because it arose and developed as a science of the forms of thinking.

Initially, logic arose and developed within philosophy as a single science that united the entire set of people's ideas about the world around them and man himself, his thinking. At the same time, initially the laws and forms of correct thinking were studied within the boundaries of oratory, as one of the means of influencing people's minds, convincing them of the expediency of a certain behavior. This was the case in Ancient India, Ancient China, Ancient Greece, Ancient Rome, and also medieval Russia. However, in the art of eloquence, the logical aspect still appears as subordinate, since logical techniques serve not so much the goal of achieving truth as the goal of convincing the audience. Logic as an independent science began to form in India, China, and Greece long before our era. At the initial stages of its development in Ancient India, much attention was paid to the theory of inference, which was identified with proof. In Ancient China, most logical theories were scattered across various treatises devoted to issues of philosophy, ethics, politics, and natural science. They emphasized such logical problems as the theory of names, the theory of proposition, the theory of reasoning, and the laws of thinking.

Initially, logic arose and developed as a part of philosophy. The word "philosophy" comes from two Greek words "philo" and "sophos", "love" and "science" respectively. Thus, "philosophy" literally means "love of science". Philosophy is a science that unites all human knowledge about the surrounding world, the features of human consciousness and the laws of being.

Logic, the science of acceptable methods of reasoning. The word "Logic" in its modern use is polysemantic, although not as rich in semantic shades as the ancient Greek *lógos*, from which it comes.

Three main aspects are associated with the concept of Logic:

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- ontological - "Logic of things", i.e. the necessary connection of the phenomena of the objective world (Democritus); in the early stages of development, logical knowledge was ontological in nature, i.e. the laws of thinking were equated with the laws of being.
- epistemological — "Logic of knowledge", i.e. the necessary connection of concepts by means of which "essence and truth" are known (Plato);
- demonstrative (proof-based), or properly logical — "Logic of proofs and refutations", i.e. the necessary connection of judgments (statements) in reasoning (inferences), the forced persuasiveness ("general significance") of which follows only from the form of this connection, regardless of whether these judgments express "essence and truth" or not (Aristotle).

Modern Logic is the historical successor of traditional Logic and, in a sense, its direct continuation. But unlike traditional Logic, modern Logic is characterized by the construction of various kinds of formalized theories of logical reasoning - the so-called logical "formalisms" or logical calculi, which make it possible to make logical reasoning the subject of strict analysis and thereby more fully describe their properties. The reflection of logical thinking in logical calculi led to a more adequate expression of the idea of "logos" as the unity of language and thought than was the case in antiquity and in all eras preceding the 20th century; in modern Logic this expression is so obvious that, based on various "formalisms", it is sometimes necessary to speak of various "styles of logical thinking".

This is another opportunity to realize that logic is a very rich, still rapidly developing scientific discipline. It has had and still has many old unexplained problems, which you can approach even from purely historical interests. And new problems and tasks constantly arise in it, which increasingly intersect with other sciences and even technologies: mathematics, psychology, artificial intelligence, etc. We will also be able to form a rough idea of what place the logical theories studied in our course occupy in the general history of logic. Therefore, we will try to give a very brief overview of how logic developed in different historical eras. Of course, this overview does not pretend to be exhaustive. We will definitely have to skip even important names and ideas. But we will try to clearly trace the main line of development of logical science.

With the development of information technology and computer science, formal logic has come to play a key role in the creation of computer algorithms and artificial intelligence. Many logical systems are studied and applied in modern sciences and technologies.

It is important to note that the development of logical systems is not limited to classical logic. In the 20th century, many alternative logics were developed, such as intuitionistic logic, modal logic, non-standard logics and many others. They provide different ways of considering reasoning and inference, which expands the possibilities for studying various aspects of logic and its application in different areas.

With the development of information technology, formal logic has found new applications in the field of computer science. The creation of software systems, computer programming languages and artificial intelligence requires precise and formalized methods of logical inference. In this context, formal logical systems such as predicate calculus and Boolean algebra have become an integral part of modern information technology.

Interest in logic also persists in philosophy, where logical methods are used to analyze and formalize philosophical concepts. Logical arguments and inferences help philosophers structure their ideas and create clearer and more analytical philosophical works. Thus, the history of the development of logical systems is the history of the search for precision and clarity in reasoning and argumentation. Logic remains an important tool for philosophy, science, technology, and many other fields of knowledge, contributing to the development of human thinking and intellectual progress.

In conclusion, the history of the development of logical systems is rich and varied. From the ancient works of Aristotle to modern formal logical systems, logic plays an important role in philosophy, science, and technology, contributing to the development of rational thinking and methods of scientific research.



The changes that have occurred both in analytical philosophy itself and in logic have led to a change in the nature of their connection. The problems of the relationship between ontology and logic, epistemology and logic have come to the fore. The decisive role in the analysis of ontological and epistemological problems belongs to the methods of logical semantics and logical pragmatics. The conclusion that the problems of formalization have receded into the background remains true. But the method of constructing formalized languages remains the main one in both semantics and pragmatics. An important place in analytical philosophy is occupied by the analysis of traditional philosophical problems by methods of non-classical logic. Already in the post-positivist movement, attention was drawn to the active role of man in cognition, to the social nature, to the value aspects of cognition. Problems of scientific creativity were posed, heuristic aspects of thinking were developed. The post-analytical stage grows precisely as a criticism of the previous stage and thus it is still connected with it. In the positive part of its program, the postanalytical stage puts forward new aspects of research, primarily the problems of understanding, the subjectivity of knowledge.

The specificity of this stage is that analytical philosophy no longer isolates itself from other philosophical trends, but, on the contrary, actively uses the ideas of hermeneutics, phenomenism, pragmatism, transcendentalism and other modern philosophical trends in its research. Time will tell how logic will be involved in this.

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