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The Genesis of logic – Antiquity

Geneza logiki – starożytność

Abstract

Logic is one of the oldest sciences. The study of its origin is not only extremely interesting, but also important in the context of understanding its essence. Logic as a science arose in antiquity. Famous representatives of those times considered logic, pointing to its great importance and the ability to apply. Aristotle is considered to be the creator of logic as a scientific discipline. However, even before the activity of the Stagirite, other philosophers also dealt with logic.

In this article, it was decided to present the history of logic, covering the epoch of antiquity. The basic merits of individual representatives of this period were discussed, taking into account their deliberations on logic. The authors of the study do not, however, pretend to comprehensively present the views of ancient thinkers. It is not easy to describe in detail the positions and reflections on the logic of individual representatives of the antiquity in one article. Due to the limited framework of the study, the article briefly discusses the indicated topics.

Keywords: logic, formal logic, genesis of logic, logic in antiquity.

Streszczenie

Logika to jedna z najstarszych nauk. Badanie jej pochodzenia jest nie tylko niezwykle interesujące, ale także istotne w kontekście zrozumienia jej istoty. Logika jako nauka powstała w starożytności. Znani przedstawiciele tamtych czasów podejmowali rozważania nad logiką, wskazując na jej duże znaczenie i umiejętność stosowania. Za twórcę logiki jako dyscypliny

naukowej uznaje się Arystotelesa. Jednak jeszcze przed działalnością Stagiryty, logiką zajmowali się też inni filozofowie.

W niniejszym artykule postanowiono przedstawić historię logiki, obejmując epokę starożytności. Omówiono podstawowe zasługi poszczególnych przedstawicieli tego okresu, biorąc pod uwagę ich rozważania nad logiką. Autorzy opracowania nie pretendują jednak do kompleksowego zaprezentowania poglądów myślicieli czasów starożytności. Nie jest bowiem łatwo w jednym artykule szczegółowo opisać stanowiska i refleksje dotyczące logiki poszczególnych przedstawicieli epoki starożytności. Z uwagi na ograniczone ramy opracowania, w artykule w sposób zwięzły omówiono wskazaną tematykę.

Słowa kluczowe: logika, logika formalna, geneza logiki, logika w starożytności.

1. Introduction

There is no doubt that the considerations of logic and the study of its origins are both educative and interesting. It is very often the case that getting to know the genesis and origins of a given field of considerations results in a better understanding of its essence, but also of its relationship with other research disciplines. This is also probably the case with logic. So the point is not only to look at and understand Aristotle's views on logic. It is worth paying attention to its origins in order to understand the nature of logic[1].

At the beginning of deliberations on the genesis of logic, it is necessary to briefly indicate what it is. Logic is a scientific discipline, the subject of which is correct thinking and reasoning. The word "logic" comes from the Greek logos meaning reflection, thought, word. Nowadays, it is considered that logic analyzes language and research activities such as: reasoning, defining, classifying. The purpose of this analysis is to provide rules that would make the language itself, but also the research activities as effective as possible[2]. Formal logic, i.e. logic in the narrower sense of the word, is the study of the relationships that exist between the truth or falsity of certain sentences, taking into account their structure – structure, form[3]. Formal logic is a field of general logic, which is a set of disciplines with the formal side of language and cognition[4]. It is, in particular, the

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[1] D. Kowalski, *Pochodzenie logiki według Salamuchy*, „Studia z Filozofii Polskiej" 2015, ed. M. Rembierz, K. Śleziński, Vol. 10, Cieszyn–Kraków 2015, p. 61. As cited in: E. Żarnecka--Biały, *Historia logiki dawniejszej*, Kraków 1995, p. 23.

[2] W. Kosmowski, *Elementy logiki, retoryki i erystyki dla biegłych wydających ustną opinię na rozprawie*, „Psychiatria Polska" 2018, 52(5), p. 930. As cited in: W. Marciszewski (ed.), *Mała encyklopedia logiki*, ed. 2 with amendments, Wrocław–Warszawa–Kraków–Gdańsk–Łódź 1988.

[3] Z. Ziembiński, *Logika praktyczna*, wyd. XXV, Warszawa 2002, p. 10.

[4] For more, see S. Kamiński, *Elementy logiki formalnej* [in:] *Wprowadzenie do logiki*, M.A. Krąpiec, S, Kamiński, Z.J. Zdybicka, P. Jaroszyński, Lublin 1992, p. 459.

science of the relationship of logical follow-up. Especially in its modern form, formal logic is a science similar in many respects to mathematics. However, it is a more general science than mathematics[5]. From the point of view of the theory of logic, formal logic is the correct theory of reasoning[6].

In the development of logic, the following phases are indicated: antiquity, the Middle Ages and modernity, which are complemented by the stage of its modern development[7]. Logic as a science, i.e. theoretical and methodical inquiry in the context of reasoning and expressing thoughts, was initiated in ancient Greece[8]. The aforementioned Aristotle is considered to be the father of logic. It should be noted, however, that before Aristotle, logic was dealt with by eminent philosophers, including Socrates and Plato[9]. At the beginning of deliberations on the genesis of logic, it is worth mentioning that in the first period of the development of formal logic in the Greeks there were two logical theories. They were: Aristotle – logic of names and Stoic – logic of sentences, dialectics[10].

2. The genesis of logic – the pre-Aristotelian period

Before the writing of Aristotle's treatises of logic (which will be discussed later in this study), for at least two hundred years, reflection was made on the ability to reason, argue and argue correctly or seemingly correct. In the times before the beginning of Aristotle's activity, three areas can be distinguished, where the beginnings of considerations in the context of the reasoning process itself are visible. I am talking about: mathematics and theorem proving; dialectics (the art of convincing oneself, especially in discussions on philosophical and ethical topics); eristics and sophistry (conscious use of language in disputes and arguments)[11].

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[5] Z. Ziembiński, *Logika..., op.cit.*, p. 10.

[6] K. Trzęsicki, *Logika. Nauka i Sztuka*, Białystok 1996, p. 12.

[7] H. Machińska, *Zagadnienia wstępne* [in:] *Logika dla prawników*, ed. A. Malinowski, ed. 7, Warszawa 2012, p. 9. As cited in: W. Suchoń, *Wykłady o dziejach logiki dawniejszej*, Kraków 2001, p. 9.

[8] K. Trzęsicki, *Logika. Nauka..., op.cit.*, p. 11. H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 9. As cited in: W. Suchoń, *Wykłady..., op.cit.*, p. 9.

[9] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 9. As cited in: W. Suchoń, *Wykłady..., op.cit.*, p. 9.

[10] M. Majewski, *Logika nazw i logika zdań w traktacie Boecjusza*, „Studia Philosophiae Christianae" 1985, 21/1, p. 55.

[11] J. Maciaszek, *Znaki logiczne. Granice logiki oraz logiczność teorii i relacji wynikania*, Łódź 2003, p. 7–8.

In the pre-Aristotelian period, that is, in its early stages, logic developed mainly from dialectics. At that time, dialectics was understood as a set of necessary rules used in the art of discussion. Logic taught thinkers how to conduct their discussions effectively[12]. On the basis of dialectics, which was related to the broadly understood philosophical discourse, a reflection on arguing[13].

The phase of antiquity begins with Zeno of Elea (490–430 BCE), whose area of interest was linguistic speculation. He dealt with the search for truth, using verbal arguments[14]. Zenon of Elea is one of the most famous representatives of the Eleat school. He is considered the creator of dialectics. He commanded, inter alia, by a purely rational impossibility of any change, also taking into account movement. It is worth pointing to the so-called the Achilles paradox, perhaps the most famous paradox of Zeno of Elea. Zeno believed that in a situation where there was a race between Achilles and the turtle, which had started the race even a moment before Achilles, Achilles would lose. Zeno of Elea believed that if the turtle starts running first, then when Achilles starts running, it will be ahead of him. In order to overtake the turtle, Achilles will have to be where the turtle is when Achilles starts the race. Achilles will have to take some time to get to this point. Note that the turtle will continue to move away. Achilles must then run to the turtle again, which takes time again. The turtle's position will change again – forever. It is impossible for Achilles to ever be in the same place as a turtle. All the more, it cannot overtake him. Translating into modern language, Oktawian Nawrot points to the following example: a driving car worth several hundred thousand zlotys will never overtake a preschooler riding a scooter, who will be the first to start[15].

Socrates (469–399 BCE) dealt with the problem of definition. He became the forerunner of this trend in the development of logic. He created concepts through definitions. He was a precursor of the principles of elimination inference. The definition was created by means of successive approximations. The philosopher's method was based on building tables of examples. One of the tables contained features of the "thing being defined", while the other – features that did not belong to the "given thing". The creation of definitions taking into account the features of the two tables was possible thanks to the comparison of the entries on them. The definition could turn out to be either too broad or too narrow. In the case of the first – it was narrowed down. A new trait was added to the set of traits on the second

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[12] R. Szprync, *Natura logiki w ujęciu Józefa Marii Bocheńskiego*, „Studia Włocławskie" 2017, Vol. 19, p. 495.

[13] J. Maciaszek, *Znaki logiczne...*, *op.cit.*, p. 9.

[14] H. Machińska, *Zagadnienia wstępne...*, *op.cit.*, p. 9.

[15] O. Nawrot, *Wprowadzenie do logiki dla prawników*, Warszawa 2007, p. 13.

board. When the definition turned out to be too narrow, some features were removed from the first table[16]. Even though Socrates did not distinguish between inductive theorems and definitions, he was considered to be the precursor of induction[17].

Another philosopher that cannot be ignored when discussing the genesis of logic is Plato (427–347 BCE). He is considered to be the founder of the concept of deductive reasoning as the basis of reasoning in mathematics. He also used inductive reasoning. He distinguished them from the definition associated with intuition. However, it is Aristotle who is considered to be the founder of the theory of induction. Plato laid the foundations for logical division. The philosopher's area of interest also included the problems of relations of superiority and opposition[18].

3. Aristotle – the creator of logic as a scientific discipline

Aristotle of Stagira (384–322 BCE) is considered to be the creator of logic as a scientific discipline[19]. He exerted the greatest influence on the development of logic up to the modern era[20]. Logic was his most significant contribution to the history of our mental culture[21]. The philosopher's merits for logic were so significant that in the 18th century Immanuel Kant (1724–1804) decided that legally nothing could be added to it[22]. The following treatises are among the works of Aristotle[23]: *Categories* (referring to names), *On expressing oneself* (concerning sentences), *First analytics and Second analytics* (concerning inference and proof respectively), *Topics* (concerning public affairs), *On sophistic evidence* (refuting evidence and classifying errors). These works have been collected under the common title *Organon* (Tool)[24]. The philosopher explicitly gave himself priority and concluded that no one had worked systematically before him on issues that now belong to logic. He pointed this out in the last chapter of his treatise *On sophistic evidence*[25].

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[16] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 9. As cited in: T. Czeżowski, *Logika. Podręcznik dla studiujących nauki filozoficzne*, Warszawa 1949, s. 207.

[17] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 10.

[18] *Ibidem*.

[19] J. Maciaszek, *Znaki logiczne..., op.cit.,* p. 7.

[20] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 10.

[21] H. Izdebski, *Historia myśli politycznej i prawnej*, wyd. 5, Warszawa 2013, p. 14.

[22] K. Trzęsicki, *Logika. Nauka..., op.cit.*, p. 11. See also Z. Tworak, *Logika wobec myślenia*, „Nowa Krytyka" 1996, No. 7, p. 74.

[23] See M. Sadowski, *Arystoteles, zw. Stagirytą* [w:] *Leksykon myślicieli politycznych i prawnych*, ed. E. Kundera, M. Maciejewski, ed. 3, Warszawa 2009, p. 3.

[24] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 10.

[25] J. Maciaszek, *Znaki logiczne..., op.cit.,* p. 7. As cited in: *O dowodach sofistycznych* 183b–184b [in:] *Arystoteles działa wszystkie* t. I, przekład Kazimierza Leśniaka.

Aristotle emphasized that it was his merit that he moved from the practical ability to discuss and argue to learning about the correct forms of discussion and argumentation. Such a transition was fully accomplished in *The Analysts*, the first treatise in history to be devoted to formal logic. There, the philosopher formulated the first formalized system of logic – syllogistics[26]. Starygita's syllogic was a logic related to a certain type of real knowledge. The philosopher separated logic from metaphysics. However, he adjusted the formal discipline to the understanding of science resulting from his philosophical views[27]. According to his views, scientific knowledge should refer to the general properties of individual objects, as well as the relationships between them[28]. Hence, according to Aristotle, the main element of logic is not the sentence, but the predicate. He narrowed the scope of sentences to those in which there are two predicates, while the scope of indirect inference – to various forms of categorical syllogism. According to the philosopher, affirmative and negative sentences are equal depictions of reality. When they represent a real picture of connections or separations, they are real. It is undoubtedly the merit of Aristotle to formulate certain laws of propositional logic. However, due to the tool treatment of logic, it was not possible to develop a logical system in which the sentence would be the basic element[29]. It is worth adding at this point that it was in the pre-Aristotelian period[30] ontology had no common ground with logic because it was itself a theory of what exists in reality. The initiation of the first serious chapter in the history of mutual relations between ontology and logic took place only with the advent of Aristotle[31]. Aristotle created at least two different logics. It is about the earlier logic contained in the *Topics* and the logic contained in the *First Analysts*. The first was the art of thinking and the technology of discussion, while the second was limited to sentences of the type "B is A" and was built of laws where there were name variables in the formulation[32]. Father Józef Maria Bocheński mentioned the basic differences that exist between the two logics of Aristotle. He

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[26] J. Maciaszek, *Znaki logiczne...*, *op.cit.*, p. 7.

[27] S. Kiczuk, *Logika a inne dziedziny wiedzy*, „Roczniki Filozoficzne" 1981 (Vol. 1), Vol. XXIX, p. 16.

[28] *Ibidem*. See also W. Biegański, *Czem jest logika?*, *Odbitka ze sprawozdań z posiedzeń Towarzystwa Naukowego Warszawskiego. Wydział Nauk Antropologicznych, Społecznych, Historyi i Filozofii. posiedzenie z dnia 6 maja 1910 k.* R. III, z. 6, Warszawa 1910, s. 121. From the website: https://rcin.org.pl/Content/15950/WA004_2479_P11683_Bieganski-Czem-jest_o.pdf [access: 9.11.2021].

[29] S. Kiczuk, *Logika a inne…*, *op.cit.*, p. 16–17.

[30] R. Szprync, *Natura logiki...*, *op.cit.*, p. 495.

[31] See *ibidem*, p. 495–496.

[32] *Ibidem*, p. 496. As cited in: S. Kiczuk, *Przedmiot logiki formalnej w ujęciu Józefa M. Bocheńskiego*, RF, 46–47(1998–1999), Vol. 1, p. 72; T. Kotarbiński, *Wykłady z dziejów logiki*, Warszawa 1985, p. 8.

pointed out that the logic described in the Topics is built of rules, not sentences. Which means that it is constructed only from guidelines relating to how you can or should be effective. Rules do not fall under the category of truth and falsehood. It is only agreed whether they are right, efficient or not. Continuing the description of logic emerging from the indicated work, it should be noted that it was written here in a natural language and contains a lot of multiple structures from colloquial language. Taking into account another dissertation of the Stagirite, namely Analysts first, it should be pointed out that in this case the logic was built from laws. Thus, it contains statements stating what is that qualify as true or false. This logic is completely axiomatized formal logic. It is limited to "B is A" sentences with quantifiers and negations[33]. Although Aristotle's syllogistics is a theory of deductive reasoning, it has little to do with classical logical calculus that arose in later times. This was due to the selection of issues that depended on philosophy[34].

In his writings, Aristotle made general conditions that logic must fulfill: logic is the science of correct reasoning; logic deals only with correct reasoning taking into account their form; logic is interested in reasoning "about everything", and not only about a specific fragment of reality – so logic is to some extent characterized by its universality. It should be noted that the distinguished conditions are not limited to syllogistics only[35].

Aristotle, first of all, presented the rules of inference and proving. In addition to the deductive method proper to Plato, he described the inductive method that provided knowledge[36].

4. Stoic logic and the Megara school of speakers. Porphyry tree

The next stage that needs to be discussed is Stoic logic[37]. The Stoics were direct heirs of the division of logic presented by Aristotle. At first, they supported the position that logic is the art of argumentation. Later, using propositional logic, they also developed the primary form of formal logic. Besides, Fr. Rafał Szprync, pointing to the position of father Bocheński, states that, according to father, the Stoics developed the first, consistent theory concerning the subject of formal logic[38]. Sentences were the area of interest of the Stoics. Chryisipus of Soloy

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[33] R. Szprync, *Natura logiki...*, *op.cit.*, p. 496.
[34] S. Kiczuk, *Logika a inne…*, *op.cit.*, p. 17.
[35] J. Maciaszek, *Znaki logiczne...*, *op.cit.*, p. 11.
[36] H. Izdebski, *Historia myśli politycznej...*, *op.cit.*, p. 14.
[37] H. Machińska, *Zagadnienia wstępne…*, *op.cit.*, p. 11.
[38] R. Szprync, *Natura logiki...*, *op cit.*, p. 497.

(279–208 BCE), a representative of Stoic logic, laid the foundations of the assumptive system. He was the author of many works in the field of logic, to which Sixtus Empiricus (c. 150 BCE) later referred in his works. The merit of the Stoics was the creation of the foundations of propositional logic. The term "logic" was used by the Stoics in the context of the science of the sign. At that time, logic was considered, along with ethics and physics, as a science that was part of philosophy[39].

The Megara school of speakers played an important role in the development of logic[40], founded by Euclid. Representatives of the so-called the Megarean schools enjoyed the achievements of the eleates in dialectics. The aims of the Megarian school, however, were not lofty. It became known because of its pejorative understanding of eristics, i.e. the ability to conduct disputes and win them regardless of the side of the truth[41]. Megara's school of speakers also became famous for analyzing known paradoxes[42]. Representatives of this school formulated several logical paradoxes. In this way, they wanted to show how an extremely important weapon in a dispute can be "iron" reasoning – even when, from the ethical point of view, its goal and the arguments presented are assessed as negative. The most famous paradox is the so-called the liar's paradox, formulated by Eubulides[43] (disciple of Euclid). The content of the paradox is: "is he telling the truth, who says that what he says is false?"[44]. Initially, this paradox related to the inhabitants of Crete. It was commonly believed that the Cretans were liars. Apparently, it was impossible for a Cretan to ever say something truthful. If a resident of Crete confessed that he was lying, this statement, like any other, would have to be a lie. If the answer "I lie" were a lie, the truth would have to be the opposite. This means that a resident of Crete would point out the truth. so his statement would have to be true, and therefore it would be true that he lied. If, however, a Cretan, saying "I lie", would lie, the truth would have to be the opposite – so he would be pointing to the truth. And so on forever. A more optimistic Eubulides paradox relates to the impossibility of baldness[45] – "how much hair do you need to not be bald?"[46]. Another example of the paradox is the "cuckold" paradox: "You haven't

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[39] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 11–12.

[40] *Ibidem*, p. 12.

[41] O. Nawrot, *Wprowadzenie do logiki..., op.cit.*, p. 13.

[42] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 12.

[43] O. Nawrot, *Wprowadzenie do logiki..., op.cit.*, p. 13.

[44] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 12. As cited in: T. Kotarbiński, *Wykłady z dziejów..., op.cit.*, p. 40.

[45] O. Nawrot, *Wprowadzenie do logiki..., op.cit.*, p. 14.

[46] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 12. As cited in: T. Kotarbiński, *Wykłady z dziejów..., op.cit.*, p. 40. For more, see O. Nawrot, *Wprowadzenie do logiki..., op.cit.*, p. 14.

lost your horns, and you haven't lost something, you have it, so you have horns"[47]. The paradoxes showed the lack of differentiation in the levels of language, the identification of names that cannot be treated identically. Moreover, they indicated problems related to the identification of designates[48].

The Stoics and representatives of the Megarian school discussed the implication. It is defined as a conditional sentence in which the predecessor must be false in case the successor is false. Philo of Megara was considered to be the precursor of the modern understanding of "implication". He believed that the implication would always be true, with one exception – when the antecedent is true and the successor is false[49].

When discussing the genesis of logic, it is impossible to ignore Porphyry's merits in this respect (ca. 233–305 CE). His works were of great importance in the context of the development of logic. Porphyry dealt with, for example, classifications. Created the so-called Porphyry tree[50]. He was the first to deal with the creation of structural diagrams of the existential hierarchy in logical terms. He framed Aristotle's categories in a tree-shaped diagram. Thus, he laid the foundations for modern taxonomy. The philosopher, in order to show the relations in a given hierarchy between individual elements, used a graphic notation here. The use of such a provision was a breakthrough. It is worth pointing out that this method is still used in many areas today. The formulation of such a diagram enables easier analysis of the considered mechanism or phenomenon. Adding new elements or reducing them can become really easier when you have some kind of "graph" of existing relationships[51].

5. Conclusion

Logic belongs to one of the oldest sciences. Its origins date back to ancient Greece[52]. From at least Aristotle, logic was considered to be a tool – *an organon* – of philosophy, and it was, as a tool, developed. Only the nineteenth century brought some changes. Logic began to become independent by delineating its

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[47] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 12. As cited in: W. Suchoń, *Wykłady..., op.cit.*, p. 41.

[48] H. Machińska, *Zagadnienia wstępne..., op.cit.*, p. 12.

[49] *Ibidem*.

[50] *Ibidem*.

[51] A. Fedyniuk, *Od dziejów komputacji do reprezentacji wiedzy*, „Kogniwistyka i Media w Edukacji" 2016, No. 2, p. 96. See also D.R. Sobota, *Drzewo filozofii. Przyczynki do metafizyki dendrycznej*, „Filo-Sifija", No. 31 (2015/4/1), p. 26–27.

[52] K. Trzęsicki, *Logika. Nauka..., op.cit.*, p. 13, 11.

own research areas. It was becoming an independent tool and was developing more and more rapidly[53]. Logic, in the classical sense, is not a philosophy. However, it is impossible to philosophize without it[54]. Philosophy has always needed logic as a tool. For philosophy uses to a large extent abstraction and speculation. Therefore, it needs particularly efficient rules of inference[55]. Taking into account logical disciplines, logic in the strictest sense is formal logic[56]. Stanisław Kiczuk points to the observation of Stanisław Kamiński – namely that it is formal logic that is the most frequent subject of considerations in the philosophy of logic. There, first of all, an attempt is made to obtain an answer to the question related to how to ontically define the object of formal logic, what it concerns[57].

Returning to the issue of the appearance of logic in ancient Greece, it is worth mentioning that historians of ideas are looking for reasons why philosophy and science were created there. The development of science and philosophy has led to inquiries into their tool, i.e. logic. Logic probably developed in Greece due to "fertile ground". Well, the democratic system in Greek cities was conducive to the art of discussing, as well as correct reasoning and effective argumentation. These values have also been noticed by theoreticians of American democracy. As an example, we should cite the observation of Thomas Jefferson, who recognized that in a democratic state, where citizens are not led by force but by persuasion and right, the method of reasoning comes to the fore. In modern times, when the world is ruled more and more democratically (therefore it uses the Greek invention – democracy), you need to know logic (as already mentioned, also the Greek invention)[58].

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[53] M. Heller, *Teoria kategorii, logika i filozofia*, „Filozofia Nauki" 2016, year XXIV, No. 2(94), p. 5.

[54] P. Jaroszyński, *Przedmowa* [in:] *Wprowadzenie do logiki*, M.A. Krąpiec, S, Kamiński, Z.J. Zdybicka, P. Jaroszyński, Lublin 1992, p. 10.

[55] S. Kiczuk, *Uwagi o przedmiocie logiki formalnej*, „Roczniki Filozoficzne", Vol. XLIII, Vol. 1 – 1995, p. 46. As cited in: S. Kamiński, *Logika współczesna a filozofia*, „Roczniki Filozoficzne", 9(1961), Vol. 1, p. 55.

[56] S. Kiczuk, *Uwagi o przedmiocie…*, *op.cit.*, p. 47.

[57] S. Kiczuk, *Uwagi o przedmiocie…*, *op.cit.*, p. 47. As cited in: S. Kamiński, *op.cit.*, p. 57–58.

[58] K. Trzęsicki, *op.cit.*, p. 11–12.

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