

CLASSIC AND MODERN IN ROMANIAN SYLLOGISTIC

ABSTRACT

Knowledge in logic is necessary in order to argument ideas from various research fields. It is the reason why preoccupations for logic – an apparently rigid subject matter – are still of interest for anyone wishing to justify an act of culture or wishing to contribute to its perpetuation. Historians, linguists, theologians, mathematicians, people of culture could thus justify their research by using logic knowledge, especially the correct argumentation, the syllogism being probably one of the most frequently used logical form.

The main idea we have supported along this paper named *Classic and modern in Romanian syllogistic* is that studies on syllogistic within the logic research from our country have generated various important original contributions reaching the level of world exigencies. These contributions have shown that in any scientific field, therefore in logic, as well, nothing is definitive, but rather perfectible. Our expose has emphasized the fact that this preoccupation in more or less accentuated forms may be seen in all the stages of our cultural development. Researching the thematic of syllogistic in Romania we have noticed that there is no period of time, in which this interest is absent, since the preoccupation for syllogistic has always been constant, a genuine tradition in the studies of Romanian logicians. By conducting research on the first contributions in this field we have shown that the justification for the preoccupation for logic, an otherwise apparently rigid subject matter, but also for the ways of correct argumentation has been done from various perspectives, especially in the cultural, linguistic, historical or pedagogical approaches, intending among others to prove the Romanian continuity and the national unity. We have therefore shown the fact that for the incipient Romanian culture the preoccupation for logic is not accidental, but rather a necessity.

For the approach of this theme we have chosen to proceed on the one hand from a historical point of view, starting from the first research on logic from our country, and on the other hand from a methodological point of view, our entire research being structured on research directions, following the syllogistic models tackled by the Romanian logicians.

Whether we refer to the first preoccupations in the field of logics from our country, or to the most recent contributions in the field, we consider that this paper brings once more to attention the fact that our studies on syllogistic have always been of interest, generating important original contributions. Their emphasis, tightly connected to the conceptions of time, is the challenge of this paper.

As suggested by the title, our paper was structured in two main sections: one, in which classical syllogistic is analyzed and the other one, in which we refer to the contributions in the field of modern syllogistic. In either of these two sections we presented the main directions of syllogistic analysis.

Researching – in chapter I of the first section – the origins of syllogistic in our country, we have shown that even though later, the preoccupation for problems of logic, therefore for syllogism, as well, also appeared in the Romanian culture. Analyzing the origins of the syllogism in our country, we have shown that this form of logic – probably the most known of them all – has always been used as an instrument necessary in any argumentation. This issue is analyzed not only by Teophil Corydaleu and implicitly his disciples who travel to Moldova and Țara Românească, but also by Dimitrie Cantemir and then in the study of logic from the Court Academies from Iași and Bucharest. In what concerns their research in the field of logic we have analyzed this in the chapters named *Teophil Corydaleu and his influence on the education system in Țările Române*, respectively *Considerations on the logics of Dimitrie Cantemir*. The main objective was to show that following Aristotle's way, introduced to the Romanian culture along with Teophil Corydaleu, everybody analyzing the syllogism considered it an important instrument in knowledge.

We considered it a curiosity that within the Court Academies from Țările Române there were preoccupations for logic, this being a rather strict, abstract subject matter and apparently away from the first movements of an incipient culture, as the Romanian one at the time. It may seem even stranger still that around the year 1700 the ruler Dimitrie Cantemir expressed his intention not only to write a small treaty of logic, but even to translate it in Romanian. His paper written around 1700, having the title *Compendiolum universae logices institutiones* is the proof for his interest for logic and furthermore a proof that the preoccupations for this subject matter were not occasional, logic being a rather important component of Romanian culture, an indispensable instrument. With the help of logic one could submit correct, solid arguments, so as to facilitate one to support such ideas like national unity. Moreover, logic is tightly connected to grammar and the study of language. All these considerations may refer collectively to Dimitrie Cantemir's search for a methodological approach to facilitate his scientific investigations in all his fields of research and interest, which as we know were not few.

Dimitrie Cantemir and his entire works were in the horizon of Romanian thinking a spectacular, yet singular moment. The historical circumstances from the Romanian Principalities were not meant to cause and support an atmosphere favorable to philosophical reflection. Therefore, the direction opened by Cantemir, his way, in which he had shown himself to be so skillful and faithful, could not be continued.

In the subchapter 1.3, named *The logic of Titu Maiorescu* I emphasized his contributions to the Romanian culture, in the field of logic, trying to show that his main accomplishment is the use for the first time in Romanian logic of the terminology that despite slight changes is still valid today. Unlike his predecessors, the representatives of the Transylvanian School (*Școala Ardeleană* in Romanian) – such as Samuil Micu, August Treboniu Laurian, Simion Bărnuțiu – Titu Maiorescu establishes the language of logic and analyses the problems in a style that may without exaggeration be considered „the style of Romanian logic”. It is also his undeniable accomplishment that in a period of turmoil and linguistic confusion, in which the language was still in search of its own identity, Titu Maiorescu managed to write a paper of logic, its importance being not necessarily the originality, but rather the clarity and brevity of the ideas, adequate to the cultural realities of the time, what generally may be referred to as Maiorescu style. We therefore consider that Dimitrie Cantemir’s ideal was achieved only in the 19th century by Titu Maiorescu, his preoccupations being a turning point in the Romanian culture, in general, but also in the field of logic, in particular.

We have analyzed in detail Maiorescu’s works of logic, emphasizing the fact that starting with him we may talk of the beginnings of a tradition in the Romanian logic. As already mentioned above, it is not the originality of ideas that make Maiorescu a reference point, since it is a known fact that he never intended this, considering that the cultural background of the time was not prepared to assimilate his original works and ideas. What determines his important place in Romanian logic is his decisive role for his followers, either as a professor, lecturer or simply as „an educator” and tutor, as he himself wanted to be.

One of the objectives of our research was to show that Titu Maiorescu was a personality of his time, a personality for his time. The analysis of the specific traits of the Romanian culture of the latter half of the 19th century is – from the point of view of reaching our objective – an extremely important aspect, which was therefore minutely analyzed in the first section of our paper.

By means of our research we shed light again on the works of Maiorescu, but also on the papers analyzing his logic works, which were probably unjustly ignored. We refer here to the study of Iosif Brucăr, the first commenter of Maiorescu’s *Logic*, who in 1940 had a complete analysis of this work. Having all the papers from the field of logic and analyzing in them the evolution of Titu Maiorescu’s logical thinking¹, Alexandru Surdu writes introductory studies for each of these papers, all part of the study *Logic Studies*. Of utmost importance for the analysis of Titu Maiorescu’s works, this study published in 1988 emphasizes aspects that had not been signaled so far.

¹ Here we refer to the works: *Elemente de logică pentru gimnazii / Elements of logic for gymnasium* (1858), *Prelegeri de logică / Logic lectures* (1863) and all the seven editions of the work *Logicii / Logic*, from the one in 1876, up to the edition „Brucăr” in 1940. The eighth and latest edition is the one from the year 1988, under the coordination of Alexandru Surdu.

A particularity of the preoccupations for logic in Romanian culture, which was insisted upon throughout this chapter, is that logic has always aroused interest not only among specialists, but also among cultural personalities, which is not the case of other philosophical subject matters. In our paper we have emphasized this aspect, insisting on the argumentation of Mihai Eminescu regarding the controversial issue of the originality of Titu Maiorescu's study. We have paid special attention to the correctness of Mihai Eminescu's argumentation from the articles, in which he debated against the person that used the pseudonym Dr. Zotu; in these articles Eminescu supported convincingly and, as mentioned above, with minutely selected arguments, the value of Maiorescu's work, showing that he may not be accused of plagiarism, and his work could not possibly be regarded as eclectic, as the writer of the incriminating articles considered. The argumentation of Mihai Eminescu is a proof that he was familiar with the field of logic and the contemporary research in the field.

This chapter of the paper dedicated to Titu Maiorescu is structured in four large parts. The first one contains information regarding Maiorescu's first preoccupations with logic and the possible influences when he started writing his first pages dedicated to the field of logic. The second part focuses on the main issues of syllogistic in the writings of Titu Maiorescu, whereas the third part analyses the most important interpretations on his logic works. The end of the chapter emphasizes the major role of Titu Maiorescu in the field of logic, that of creating a tradition, since he constantly showed his vocation of educator and tutor.

In each subchapter we attempted to emphasize the idea that even though Titu Maiorescu did not intend to write an original work, nonetheless he created the premises for original works in the Romanian culture. The novelty of this paper is actually to present the role of Titu Maiorescu, on the one hand in establishing the terminology in Romanian logic and on the other hand in supporting the importance of syllogism in knowledge, either directly by means of arguments, or indirectly by pushing the doors wide open towards research in this direction, the issue of the cognitive value of the syllogism being a constant preoccupation of Romanian logicians, who have brought important contributions to its clarification.

One of his preoccupations in this field was to support with clear arguments the role of the syllogism in knowledge, this being in fact the direction he opened within Romanian logic, followed afterwards by such thinkers as P.P. Negulescu, Constantin Rădulescu-Motru, Ion Petrovici, the rationalist direction, his followers focusing on this way.

The second chapter of the first part analyzes in turn the contributions brought by the followers of the Maiorescu tradition. P.P. Negulescu followed the professional and philosophical ideal imposed by Maiorescu, being nonetheless part of the rationalist direction and bringing his contribution to the consolidation and development of Maiorescu's spirit in the Romanian culture. Ion Petrovici adopted

the same thinking style and perspective as Titu Maiorescu. But, through his research, he showed the possibility of expanding traditional logic, thus bringing original elements, through which he contributed to the development of logic at the beginning of the 20th century. This is actually a difference from Maiorescu: whereas Maiorescu did not have the ambition of novelty and wanted nothing more than to familiarize the reader with the aspects of the time, Petrovici minutely analyzed certain themes, thus marking a progress not only in comparison to Maiorescu's works and lectures, but also when compared to the research of his time. Ion Petrovici managed to surpass his teacher, contributing to a great extent to the progress of Romanian logic, analyzing new problems, such as the ones concerning singular sentences, problematic sentences and polysyllogisms. These are three directions he developed in three studies, all part of the volume *Problems of Logic*, published in 1911. In these studies, after a thorough and competent analysis, Ion Petrovici reaches original conclusions, thus showing new ways to expand these issues.

As it has already been mentioned, this paper is structured in two sections. In the second section we refer to what is called modern syllogistic. Basically, it is the language of logic that changes, thus creating various models of syllogistic, all with the purpose of presenting as faithfully as possible the syllogistic projected against the symbolic logic. Following these models we have structured this section of the paper in four chapters, in each of these showing the contribution of Romanian logicians in one or more directions.

Reassessing syllogistic from the perspective of the achievements of modern logic began in our culture somewhat later. Even though the general trend was to support the value of syllogism against those who criticized it severely, this did not imply stubbornly maintaining the traditional direction of Maiorescu. Romanian logicians managed to distance themselves from the two extreme positions and thus make a lucid evaluation, restoring the syllogism its proper meaning, without however considering it the supreme model. One cannot possibly deny the historical significance of Aristotle's syllogistic, which from the point of view of modern logic was considered a scientific theory, chronologically speaking being in fact the first chapter of scientific logic.

We began our analysis by presenting the logical and philosophical controversies on syllogism, structured under the chapter named *Critical direction*. The topic of the value of syllogism, present in Romanian logic – echo of its presence in world logic – was the objective of our preoccupations. Following the critical analysis on syllogistic, we presented the controversies generated by this logical form. One of the objectives of this paper is to show that within the research in the field of logic from our country, syllogistic has always been a constant preoccupation, supported by the faith in the value of syllogism. The main issue of the cognitive value of the syllogism has been deeply analyzed so far, Romanian logicians, starting with Titu Maiorescu, having brought important contributions to clarify this aspect.

Following the dialectic structure of affirmation, denial and reaffirmation of the value of syllogism, we supported by means of personal observations the hypothesis, according to which the syllogism has a well determined role in knowledge. In our research we did not oppose to syllogism any other type of reasoning, since our purpose was not to emphasize its value by comparison. In our opinion stating that the syllogism and subsequently the deduction have a *far* greater role than the induction would be bias towards the unique method. There is no unique method in any science whatsoever. On the contrary, each method has its own role, equally important in the various stages of founding a science.

Our research emphasized the fact that the issue of the cognitive value of the syllogism has always generated important contributions from Romanian thinkers. Researching the controversies in the value of syllogism allowed us a personal interpretation on the way in which John Stuart Mill analyzed the syllogism and its value. We thus reached the conclusion that in the case of Mill, unlike the skeptics, there is no lack of trust whatsoever in human knowledge, especially in the inferential one. He would however always place a greater importance on induction in the cognitive process. In his view, the role of the syllogism encompasses the fact that by means of syllogism, inductions may be established once and for all. Furthermore, we emphasized in our paper that according to Mill the syllogism is useful as means of checking reasons, since he considered that the way in which we may express any reason is in fact an induction from particular to general, followed by a syllogistic deduction from the general form of particular facts.

By presenting the critical voices against the syllogism, as well as the counterarguments supporting its cognitive value, we have thus emphasized that this aspect has always had an important place in the preoccupations for logic. Still maintaining the general specific of our paper referring to Romanian syllogistic, we have nonetheless insisted upon emphasizing the fact that this issue was equally important in the preoccupations for logic from our country.

Beside the issue of the value of syllogism, among other preoccupations in Romanian logic and issues of contemporary syllogistic one could also mention: the issue of axiomatization in the works of Grigore C. Moisil, the issue of natural modeling, functional by means of the research conducted by Petre Botezatu and Gheorghe Enescu, the issues of the extensions of syllogistic in the works of Florea Țuțugan and Petre Botezatu.

We notice here that the language of logic determines various models of syllogistic, among which the axiomatization seems to be the best model, since it covers the entire field of syllogistic, without requiring the intervention of additional suppositions. What we attempted to do in this paper was to present axiomatization systems of syllogistic, such as the one suggested by Grigore C. Moisil.

Always being in search for information, Moisil tackles again the issue of syllogistic, of axiomatization, developing it and bringing original contributions to this field of activity. He starts from the research of Lukasiewicz, but even though he was truly fascinated by the contributions of the Polish logician, Moisil never remained a mere epigone, but used his creative force to open new directions in this field.

Among all the possible directions for successful research in any field, Moisil chose for the field of logic either to solve old issues using new methods, or to analyze new issues, trying to solve them by appealing to new methods. Aristotle's syllogistic is one of the old issues analyzed using new methods. Moisil makes the distinction between „classical logic” and „non-classical” or „non-Chrysippian” logic. By „classical logic” he does not understand traditional logic, but the calculation of sentences from Russell's *Principia Mathematica*, placed in opposition to Lukasiewicz's or Lewis' calculation of sentences, i.e. the „non-classical” one. The originality brought by the Romanian logician is the fact that he applies these calculations to one another, trying to extend or comprise them. His procedure is the formalist one. He constantly makes use of axiomatic means. Even though it remained unfortunately a preoccupation of his youth, Moisil brought significant contributions to reformulating syllogistic using the terms of mathematical logic. It is precisely why we wanted to shed light on the research of Grigore C. Moisil in the field of syllogistic. We consider that this deserves special attention, not only because of its intrinsic value, but also because the results obtained by Moisil were acknowledged and praised in Western modern logic.

The directions of his research are three, each being analyzed in part in the subchapter dedicated to his logical and mathematical research: the axiomatization of classical syllogistic; the theory of polysyllogism; the stochastic syllogism.

What we have noticed throughout the entire analysis of Moisil's syllogistic is the fact that by analyzing the symbolic logical models, he uses all symbolic means: the algebra of logic, the logic of predicates, the logic of classes, the logic of relations and the logic of sentences. Beyond the analysis proper we may easily notice his permanent preoccupation with generalization, as well as the constant use of the algebra method in logic.

The syllogistic, according to the traditional model of interpretation, is part of the logic of classes. Modern research however has surpassed this interpretation. What facilitated this new direction is the fact that modern logic contributed not only with a new technical apparatus, but also with a new perspective in the methodology of scientific research. Thus one may notice the more fruitful method of the investigation by models.

Syllogistic is not only part of the model of classes. The syllogistic sentences and inferences should be reduced to relations among terms, since building relational models of syllogistic is undoubtedly a remarkable progress. It is in fact the achievement of the Romanian logician Florea Țuțușan and the German logician Albert Menne, who working independently, perfected this direction, making use of a method that allowed the maximum exploitation of the available information from syllogistic inferences. In the third chapter of the second section of the paper – *The direction of the logic of relations* – we presented the relational model of Florea Țuțușan, insisting on the main novelties and contributions he had brought to the field of syllogistic. We thus made reference to the fact that the Romanian logician established some valid syllogistic ways, others than those of the classical logic, by a method that guarantees not only the rigorous validity of these ways, but also of their integral enumeration, thus proving that some of the most important laws of syllogism, belonging to classical logic, are not generally valid and were never demonstrated by classical logic with the necessary rigor, formulation and demonstration of all laws of syllogism, which may be applied to all valid syllogistic ways.

Considering that his purpose was only to extend, and not reform classical logic, we placed Florea Țuțușan's contribution within the important research from Romanian logic. His conception is not new, but the Romanian logician perfected it by bringing extremely important arguments and conducting thorough and systematic research.

All these contributions to the Romanian logic analyzed in this paper emphasize the idea that one of its traits is the fact that it has always been open to the latest discoveries in the field. And sometimes it was also open towards the apparent dead end of general logic. One may thus notice that on the one hand current mathematical logic distances from the normal course of natural thinking, yet on the other hand one should not give up on the rigor of modern logic. The desire for a „natural logic”, closer to the structure and course of natural thinking, which may be reached giving up neither the mathematical modeling of the logical language, nor the conceptual exposure with the help of natural language, is thus noticeable. This tendency towards natural logic may be classified in two directions: the syntactic – natural one and the semantic – natural one.

Within the analysis of the direction of natural logic from the fourth chapter of the second section we had in view the two models: the syntactic – natural and the semantic – natural one, also considering the contributions of some logicians, such as Gheorghe Enescu, Petru Ioan and Petre Botezatu.

When one gets closer to the natural character within the method of developing the system, one may talk of the syntactic – natural tendency. It is the tendency to emphasize transformation rules and not axioms. Natural deduction, as alternative to the axiomatic method, implies giving up on axioms

and building the deductive system only based on inference rules. In our paper we made reference to the remarkable contributions of Gheorghe Enescu and Petru Ioan.

Gheorghe Enescu perceived syllogistic as a system of natural deduction. We have emphasized the fact that in his syllogistic formalism, deductive rules are not syllogistic theses, but mechanic operating rules.

As it has already been mentioned, natural syntactic models are based on the purity of the deductive method, without the need for calculations specific to the logic of sentences, especially the material implication that may lead to paradox. Such an original solution is proposed by Petru Ioan. In his 1973 study *The structure of syllogism* he presents from another perspective the distinction made by Jan Lukasiewicz between the Aristotelic syllogism and the stoic syllogism, considering that these are „compatible and interdependent”, being in fact connected to the relation between the logic law and the corresponding reasoning rule, their association being done within the sentence calculation.

Within the natural semantic model, Petre Botezatu does a thorough analysis of the relation between mathematical logic and formal mathematical logic. According to the author's conclusions, classic logic has imperfections, which cannot be removed by mathematization, because mathematical logic in its turn also has imperfections. Therefore, one feels the need for a formal logic by „combining the method of informalized complex research of classic logic with the axiomatized deductive exposure of mathematical logic” so as to reach „a complete theory of logical forms”. In this respect Petre Botezatu comes up with the natural operational logic.

Botezatu's purpose is to theorize as adequately as possible the logical operations that make up the thinking. As mentioned above, he starts from the intention to develop a theory of reason capable to encompass, to classify and explain all possible forms of reasoning. The core of this theory is the notion of structure of the objects of thinking. Therefore the purpose is setting these objects of thinking, which is regarded by the author himself as „a step of Mendeleev in formal logic”. Starting from this purpose he develops the operational syllogistic, a field in which he brings his most important contributions. In our paper we have insisted on the aspects that differentiate this logic from the modern systems, i.e. the preoccupation for it to reflect as adequately as possible the natural way of thinking. Moreover, transitive and constructive logical operations clarify certain aspects of thinking unknown up to that point.

Petre Botezatu is part of what we called expansion of classical syllogistic, since he showed the important role of exclusive sentences and by this, he defined the logical functions of syllogistic figures. He considers that the logic of exclusive sentences is very important within syllogistic and notices the fact that this type of logic was granted far less importance in comparison to the logic with negative terms. Unlike sentences with negative terms, exclusive sentences are important not only in

day-to-day, but also in scientific language. With the help of such sentences one may express the necessary and sufficient conditions, the definitions, the identifications etc.

Also analyzing this contribution of the Romanian logician, we have showed that by making up syllogistic with exclusive sentences, Petre Botezatu actually defines an important part of syllogistic, this being a Romanian priority in the world.

The conclusion of the research of modern syllogistic is that the interest for syllogism in this period has not only determined the preoccupation to present the problems it raises, but has also facilitated the appearance of new problems and original solutions, upon which this paper has focused by mentioning some of the important contributions, such as: the contribution of Ion Petrovici regarding the syllogistic with singular terms, polysyllogism and problematic syllogism, the theory of stochastic syllogism proposed by Grigore C. Moisil, the syllogism with negative terms of Florea Țuțugan, the natural syntactic model of Gheorghe Enescu, the semantic – natural model of Petre Botezatu. Through these accomplishments their authors have brought their contribution to the study of some new aspects of syllogism, sometimes discovered afterwards by researchers from other countries (the case of stochastic syllogistic), other times discovered in our country at the same time with the foreign research (the case of the relational model of Florea Țuțugan).

Without having the intention of exaggeration and supporting the idea based on the research conducted, we have stated in our chapter of *Conclusions* that some investigations of Romanian researches in the field actually anticipated the world researches, in fact opening the way to some new problems and thus providing new solutions. As a conclusion of the entire paper, syllogistic has always been a constant preoccupation of Romanian logicians, from the first research in the field up to nowadays, sometimes marking original contributions and permanent dialogue with universal research. Future research may focus on the evolution of this form of reasoning in extremely actual fields of logic, such as the fuzzy logic or the paraconsistent logic, fields in which Romanian contributions exist and are currently in full development.