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***TO TEACH CRITICAL THINKING AND CLEAR
SPEAKING. POSTULATES OF CRITICISM AND
CLARITY AND THE ISSUE OF SO-CALLED
GENERAL LOGIC***¹

SUMMARY: In the paper, I have presented a portrait of Jerzy Pelc as a teacher. He followed in the footsteps of Kazimierz Twardowski and his direct disciples and tried to develop his students' skills of critical thinking and clear speaking—the basics of good work in philosophy. These skills are connected with methodological postulates of criticism and precision which were shared by all the members of the Lvov-Warsaw School. Jerzy Pelc treated these postulates also as didactic postulates arising out of the conceptions of logical culture and general logic. In my article, I have sketched a general picture of the relation between logic and didactics, I have presented the aforementioned postulates, the concepts of logical culture and general logic and its curriculum.

KEYWORDS: critical thinking, the postulate of clarity, the postulate of justification, general logic, Jerzy Pelc, the Lvov-Warsaw School, the didactics of logic.

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Let me start with a digression. At the conference to commemorate Professor Jerzy Pelc, many speakers shared their memories of the Professor. One of the participants stressed in his talk that he remembered Pelc as a “true professor” from whom authority, seriousness and a certain old-fashionedness were emanating. It was manifested by the fact that Pelc was supposed to recommend before the exam that the students “knuckle down” [*przysiąść faldów* in Polish]. A phrase that is rare and memorable.

Pelc’s old-fashionedness seems to be unquestionable. Its traces can be seen in one of his recent texts, namely *Prostackopolski – dodaj do ulubionych* [Rude Polish—Add to Favorites], in which it manifests itself with regard to contemporary Polish language usage. However, in my opinion, in the expression “to knuckle down” we can hear another important trait of Professor—the awareness of the “intellectual debt” in his own masters convictions as well as the effort put into nurturing the memory of their legacy.

“To knuckle down” seems to me to be a non-accidental phrase. This is how Tadeusz Kotarbiński wrote about Kazimierz Twardowski:

Having found Poland a fallow field, overgrown with weeds, rolled up his sleeves and started pulling out the weeds and planting nutritious vegetables [...]. And he was forced to exterminate a flash in the pan, non-punctuality, unreliability in contracts, unsystematicism, the pursuit of what one is now most occupied with; and he forced them to knuckle down, to respect the organizational bond, to practice routines of various kinds, [to prepare] detailed papers, objective summaries... (Kotarbiński, 1936/1958, p. 897)

Anecdotally, one could say that Twardowski established a school of those who knuckle down. In the interview titled *Nauczyć krytycznego myślenia i jasnej mowy* [To Teach Critical Thinking and Clear Speaking] Pelc admitted he originated from this tradition. He replied to the statement that he attaches great importance to teaching work as follows:

It’s true. In my work on philosophy, I think you can see two stages. The first one is the twenty years of 1951–1971, when I worked in the Department of Logic of Tadeusz Kotarbiński, after he retired in 1956 or 1957, taken over by Janina Kotarbińska. The second stage took place from 1972, when I established the Logical Semiotics Department. [...] So I am a teacher. Of what subject? In the official lecture records—logical semiotics, formerly logic. But I want to be, above all, a teacher of good thinking and speaking. This is my main task: to teach people to think independently

and critically, to think correctly, and what comes with it—to speak and write clearly and correctly. I spare no effort doing it. Maybe partly because I want to spare myself the negative stimuli received from my surroundings: I am very annoyed by the lack of criticism, by the clumsiness of thought and language betraying the lack of logical culture and spiritual primitivism manifesting itself in the lack of culture of speaking. (Kobos, Pelc, 2008, p. 588–589)

In the next fragment, Pelc referred directly to Twardowski and his school:

So, there are running along parallel tracks both my scientific work, a sign of which is what I have written, and my teaching and educational work, a sign of which are perhaps the minds of some of my students shaped in some way. And since it is easier to shape the material that is not yet ripe, I particularly value classes with first-year students who are “undemoralized” intellectually by previous readings and other cognitive experiences. Here, I follow in the footsteps of Kazimierz Twardowski and his direct students. (Kobos, Pelc, 2008, pp. 588–589)

There are undoubtedly more common features to be found connecting Pelc with Twardowski and his students. Pelc came to the conclusion (after “a sober and critical assessment of his capabilities”) that he would be more useful to the world if he organize the work of other researchers and publish their results rather than if he only published his own works (Pelc, 2015, p. 26). The famous Pelc short tests² were associated with the willingness to teach in an effective way, even if it was exposing the teacher to criticism from students and causing extra work for him (Pelc, 2015, pp. 28–29). A similar position was expressed by Twardowski (1926/2014, p. 47). The very idea of classes in logical semiotics (given for humanities faculties) arose out of the conviction, nourished, among others, by Kotarbiński, that classes in formal logic should be replaced with classes in general logic. The latter consists of semantics in a wider sense, i.e. semiot-

² Each tutorial given by Pelc began with a short test, during which students—divided into four groups—were to answer one question. Short tests were marked with plus or minus and their results were part of the final grade. A pass was obtained when the number of pluses was not less than the number of minuses. An exemplary task from a short test: “Formulate a definition by abstraction of watch accuracy”.

ics, together with elements of ontology, theory of knowledge, psychology, methodology of sciences, and thus pragmatics (Pelc, 2015, p. 10–11).

In this paper, I would like to discuss in more detail three elements from the general and complex picture of the connections between Pelc’s thoughts and those of Twardowski and his students, concerning above all the teaching of good intellectual work. These three elements are the postulates of critical thinking and clear speaking and the idea of classes in the so-called general logic. Not only did Pelc inherit these ideas but he also creatively developed and updated the views of his teachers.

TO TEACH CRITICAL THINKING AND CLEAR SPEAKING: THE POSTULATES OF CRITICISM AND CLARITY

The title of the interview with Pelc evokes two skills to be taught in general logic classes: the ability to think critically and express thoughts clearly in speech (and writing). It seems worth emphasizing that these goals are not accidental—they are supported by two methodological postulates of the members of the Lvov-Warsaw School (henceforth, LWS), i.e. the postulate of criticism and the postulate of clarity. Behind their methodological character lies the conviction that every valuable way of practicing science and philosophy must meet these criteria. It was these methodological framework postulates, not a substantive content which defined LWS:

The main characteristic of this School is in the formal-methodological domain: it is based on striving for the greatest possible precision and accuracy in thinking and expressing one’s thoughts as well as on the most exhaustive justification of what is said and the correctness of proof. (Twardowski, 1926/2014, pp. 47–48)

Pelc considered these postulates not only as methodological principles but also didactic ones.

POSTULATE OF CRITICISM

Ralph Johnson and Marcin Koszowy—in their article pointing to a logical culture as a common source of informal and pragmatic logic—formulated a thesis that the representatives of the LWS did not use the phrase “critical thinking” (Johnson, Koszowy, 2018, p. 200). This is a mistaken belief: not only did they use it, but there was a quite clear conception underlying it.

Nowadays, the notion of critical thinking is understood shakily and broadly, or at least more broadly than in the LWS. It generally refers to a form of practical logic, aimed at analyzing everyday arguments, and a wide range of skills and attitudes developed thanks to it (cf. Ennis, 1996). In the LWS, however, the postulate of criticism was related specifically to the justification of beliefs. It was also called a postulate of justification or a postulate of sufficient reason.

I think that the most complete picture of this postulate can be found in *Zarys logiki* [The Outline of Logic]: “In connection with the above comments concerning the justification of the claims, it is necessary to recall the so-called principle of sufficient reason (*principium rationis sufficientis*) which is usually mentioned in logic textbooks” (Ajdukiewicz, 1953, p. 68).³

Ajdukiewicz noted that this principle is ambiguous and one can find several definitions of it. In Leibniz’s view, it takes the form of a statement that “no situation can become a fact and no statement can be true without sufficient reason [indicating] why it is so, and not otherwise, although these reasons usually cannot be known to us”. According to a different approach, this principle is not a claim but a postulate not to act recklessly when formulating one’s views, but only to recognize sufficiently justified claims (Ajdukiewicz, 1953, p. 68).

Finally, Ajdukiewicz stated:

The principle of sufficient reason, understood as a postulate demanding justification for all our convictions, is no different at all from the postulate of criticism, which, while demanding critical thinking from us, only demands that we should not give anything recklessly, but that we should believe only in what has been duly justified by other people or by ourselves. (Ajdukiewicz, 1953, p. 69)

Critical thinking, therefore, is to not accept beliefs for which we do not have sufficient justification. We break the postulate of critical thinking contained in the principle of sufficient reason by recklessly giving faith to other people’s words and by the influence our feelings and desires have on our beliefs. Ajdukiewicz concludes:

³ This principle was discussed by Twardowski in his *Zasadnicze pojęcia dydaktyki i logiki: do użytku w seminariach nauczycielskich i w nauce prywatnej* [Basic Concepts of Didactics and Logic] (Twardowski, 1901a, p. 23).

We have listed above some of the factors that most often lead us to lend uncritical credence to unjustified beliefs and thus lead to a violation of the principle of sufficient reason. Paying attention to these factors and recalling the postulate of critical thinking contained in the principle of sufficient reason should make us more resistant to their influence. (Ajdukiewicz, 1953, pp. 70–72)

It is worth stressing that the postulate of criticism—as a postulate of sufficient reason—was not proclaimed only on the grounds of the LWS but was characteristic of many rationalistic (or anti-irrationalistic and sceptical) philosophical traditions. It is also the basis of scientific thinking. However, this principle itself requires critical consideration because, as we have seen, it adopts various formulations, such as “everything has its cause” and “do not attribute to your convictions a degree of certainty higher than their justification allows”. Its recognition also requires the threat of scepticism to be resisted: are we able to point out sufficient reasons for all of our beliefs? What is justification of beliefs, what is its gradationality? Regardless of the sceptical doubts, among the various characteristics of critical thinking this one seems to be most deeply rooted in philosophical reflection.⁴

POSTULATE OF CLARITY

Władysław Witwicki once formulated an opinion about Twardowski, in which he emphasized his ability to clearly present even the most difficult topics:

Suddenly there were incredible rumors that one could understand everything they discussed and listened to during those lectures and tutorials. There is no daydreaming and jargon of the initiated. Every word is explained and one always know what it is about, even if it is about difficult and unpopular issues. This attracted more and more crowds to his lectures. Some people attended Twardowski’s lectures because they were curious whether it was possible at all to understand philosophical issues without being an expert. Both the former and the latter turned out to be possible because both were real. (Witwicki, 1938/1982, pp. 269–270)

⁴ *Zarys logiki* is not the only place where Ajdukiewicz evoked and characterized the postulate of criticism, see for example (Ajdukiewicz, 2013, p. 49).

The quote concerns Twardowski, but without difficulty it could be related to Pelc and the style of his classes—especially his seminars. The postulate of clarity underlying this style of giving classes also has a deeply philosophical and long provenance. On the ground of the LWS its sources and power of influence we can find in Twardowski’s attitude and works. He already considered the topic of the clarity of ideas in his doctoral dissertation *Idea a percepcja* [Idea and Perception] (1892), but this issue is generally associated with his influential paper *O jasnym i niejasnym stylu filozoficznym* [On the Clear and Unclear Philosophical Style] (1919) which some take as Twardowski’s manifesto. In this article he indicated that the ambiguity of speech is closely linked to the ambiguity of thoughts; he also noted that:

Well, if the above remarks are correct, they free us largely from the obligation to break our minds about what a philosophical author who writes in an unclear style actually thinks. Guessing his thoughts only then will present a thing worthy of effort if, from elsewhere, we have acquired the conviction that he thinks clearly, so that the ambiguity of style comes in a given case from the contamination of the text or from the haste in writing the work. (Twardowski, 1919, p. 205)

In this article Twardowski raised the requirement he set himself in his didactic work to the rank of a methodological principle or one of the principles of hermeneutics (understood as an art of interpreting texts).⁵ As one of the first students of the founder of the LWS, Jan Łukasiewicz, wrote in his diary:

The main thing I owe to Twardowski is not logical or philosophical knowledge, nor accuracy of thinking, but the ability to clearly arrange and present even the most difficult issues and views. Twardowski had this ability to a high degree and I tried to see how it can be done. Thanks to the fact that Twardowski was able to think clearly and speak clearly, he was an excellent teacher and had so many students. (Łukasiewicz, 1949/2009/2010, p. 361)

Then, Łukasiewicz contrasted the clarity of thinking with its accuracy and added: “However, I did not learn the accuracy of thinking from

⁵ Pelc returned to these topics, among others, in *Język współczesnej humanistyki* [Language of Modern Humanities] (Pelc, 2000).

Twardowski. What it means to think strictly I only learned from Leśniewski in Warsaw” (Łukasiewicz, 1949/2009/2010, p. 361).

In the LWS, the postulates and concepts of clarity, precision or accuracy—with regard to the verbal expression of thought—were generally considered equivalent (Przełęcki, 1998). Of course, the problem of the clarity of ideas (representations, concepts, etc.) is rooted in philosophy at least as strongly as the principle of sufficient reason. Its origins can easily be traced back to Descartes or Locke or even Plato and Socrates.

CONCEPTION OF CRITICAL THINKING— GENERAL LOGIC—SCHOOL LOGIC...

The conception of general logic was created on the basis of two aforementioned postulates. Undoubtedly, it can be seen as an equivalent of contemporary conceptions of critical thinking but the range of similarities and motivations behind both approaches are so rich and diverse that they deserve to be developed in more detail.

First of all, I think it is worth highlighting an important fact. The conception of general logic was not a margin for deliberations undertaken by the members of the LWS. Quite the contrary, it was the foundation stone of the LWS and inspired many deliberations undertaken especially by Twardowski, Kotarbiński, Ajdukiewicz and Czeżowski. The importance attributed to general logic was strongly connected with the conviction that teaching plays a major role and it is necessary to promote logical culture.

The conception of general logic in the LWS was shaped by German-language logic textbooks: they inspired scientific research of Twardowski and Łukasiewicz. As it seems, Höfler’s textbook was particularly important in this respect. The conception of general logic was then greatly influenced by the discussion on the value of traditional, philosophical logic and fast-developing mathematical logic. However, this conception was being permanently formed in relation to teaching and didactics.

LOGIC AND DIDACTICS

Twardowski treated logic as an auxiliary science of didactics. He defined the former as a science about the truthfulness of judgments and justified its connection with didactics as follows: Didactics teaches how a teacher should act when, on the one hand, he gives a student infor-

mation and, on the other, trains his intellectual abilities. According to Twardowski, to possess knowledge about an object is as much as to be able to make true judgments about it. And the training of intellectual abilities is making a student capable of expressing true judgments on his own. The transfer of possessed knowledge, just like training a student's intellectual independence, is connected with the ability to make true judgments. Twardowski draws the conclusion that "if you want to teach well, you also need to familiarize yourself with logic"—especially its subject because it is the truthfulness of judgements (Twardowski, 1901a, p. 12).

The relationship between didactics and logic was also explicated by Ajdukiewicz but he did it slightly differently from Twardowski. Ajdukiewicz pointed out that one of the branches of logic is the methodology of science. It is a theory of science and deals with, among other things, activities that make up science, such as defining, justifying claims, proving, solving problems, experimenting and explaining facts.

Didactics is a theory of teaching. In Ajdukiewicz's opinion, one of the most important subjects of teaching are precisely sciences understood as activities (not products). Methodology is, therefore, the science of subjects of teaching and as such provides the foundation for didactics. The relationship between logic (methodology) and didactics has practical consequences:

In order to be a good teacher, i.e. to teach students effectively, it is not enough to be able to perform activities being a subject of teaching efficiently by oneself, one must also have a theoretical knowledge of these activities, one must know their theory. (Ajdukiewicz, 1934, p. 5)

Although Twardowski and Ajdukiewicz start with slightly different assumptions, they reach a similar conclusion: in order to teach efficiently, one has to know the theory of the subject of teaching, regardless of whether we assume that consists of true claims or sciences understood as activities. It seems that Twardowski in his approach put emphasis on sciences as results (sets of true claims), while Ajdukiewicz—on sciences as activities. These are complementary views, not contradictory ones.

CONCEPT OF LOGICAL CULTURE

Logic does not only has the function of a meta-science, providing the teacher with knowledge about the subject of their teaching. Logic itself is

a subject of teaching therefore, we can talk about some expected learning outcomes of logic.

This fact was pointed out by Twardowski in his article *O wykształcenie logiczne* [For Logical Education]. He noted that every educated person should get a general historical, mathematical, grammatical and... logical education. Education consists in the fact that one has acquired a certain amount of knowledge and mastered a certain set of skills:

We will not ascribe general logical education to a person who does not know basic logical concepts or is not able to reason correctly, just as we will not ascribe general grammar education to someone who does not know what an adjective is or who does not know how to pronounce correctly, or as we will not ascribe general mathematical education to someone who does not know what a function is or who does not know how to solve a simple first-degree equation with one unknown.

So it is not unreasonable for a man who could rightly be ascribed a general logical education to demand, for example, that he should know what syllogism is, or in his arguments he does not violate the postulate of logical consequence, at least not too blatantly. (Twardowski, 1920, p. 65)

The lack of a logical education not only has theoretical consequences but also practical ones. Pointing out logical errors—e.g. in the use of the term “syllogism”—is not only the result of a pedantic quest for precision but is also a sign of concern for the consequences of the practical application of thought.

The concept of logical education metamorphosed over time into the concept of logical culture (Czeżowski, 1954; Ajdukiewicz, 1959; Kottarbiński, 1970). Having a logical culture translates into thinking and speaking logically what in Ajdukiewicz’s view means the clarity of expression and correctness of inference, as these skills are components of logical culture:

Perhaps the most important component of logical culture is the care for the factual precision of verbal expressions and thoughts expressed by them. [...] The second important component of logical correctness is the factual order and order of our verbal statements and thoughts. The third component of logical correctness is the rational attitude towards statements that are considered true, i.e., criticism. [...] The last component of logical culture worthy of consideration is consistency in thinking, as well as, to some extent, consistency in action. Consistency in thinking is manifested by one

who, as long as he accepts a certain claim, is also ready to accept its logical consequences. (Ajdukiewicz, 1959/2006, pp. 324–327)

Logical culture is not just the result of logic classes, it should be shaped in the lessons of all subjects. Logic classes should systematize the knowledge and skills acquired in other classes:

In the lessons of all subjects, it should be ensured that students develop a logical culture, and in particular that they develop an addiction to think and speak logically correctly. However, teachers of all subjects must also take care of the theoretical component of logical culture. Therefore, all opportunities should be used to familiarize students with the basic theorems and concepts of logic by referring to specific teaching material. Lessons of logic, to which a small number of hours is devoted at school, should rather gather the sowing thrown at lessons of other subjects, they should recall, supplement and systematize the notions and theorems of logic learned in the past. (Ajdukiewicz, 1959/2006, p. 322)

This recommendation is in line with the vision of a teacher as someone who has mastered sufficient logic knowledge and skills.

Kotarbiński characterized the scope of logical culture in an interesting way. He indicated that a high school graduate could be expected to master the vocabulary of philosophical logic: “What a high school graduate should achieve as a form of logical culture can be characterized as mastering the vocabulary of philosophical logic” (Kotarbiński, 1970/2003, p. 623). This is, of course, a goal defined as minimal, emphasizing the theoretical aspect of logical culture. It is no coincidence, however, that Kotarbiński points to the vocabulary of philosophical logic—it underlines the tool-like nature of logical concepts, but also presupposes the existence of a certain opposition between philosophical and mathematical logic.

ROLE OF MATHEMATICAL LOGIC

Undoubtedly, the LWS contributed greatly to the development of the world’s mathematical logic. Some of the most famous representatives of the LWS are logicians such as Jan Łukasiewicz, Stanisław Leśniewski and Alfred Tarski. While the scientific value of mathematical logic and its discoveries is not in the least controversial, the subject of discussion in the LWS was what kind of logic should be taught in order to ensure general logical education and logical culture.

An interesting discussion on this matter developed at the turn of 1924 and 1925. Jan Łukasiewicz in his talk entitled *Why Are We Not Satisfied With Philosophical Logic?* presented on December 15, 1924 at the Polish Psychological Society stated:

According to the speaker, philosophers as such are not sufficiently qualified to practice logic; in order to practice this science to its benefit, one should stand on a strong foundation of scientific deductive methods, which can be assimilated by studying mathematics. In philosophical logic there is a hopeless impotence of thought. This impotence has had a fatal impact on the whole of modern philosophy and on many scientific disciplines. This logic not only does not teach good thinking but also creates harmful thinking habits. Therefore, it should disappear as soon as possible, especially from school teaching, and its place should be taken by mathematical logic. (Łukasiewicz, 1925, pp. 25a–25b)

After a few weeks—on January 12, 1925—Kotarbiński presented a counter-argument to many of Łukasiewicz’s points:

The speaker, fully recognizing the revolutionary role and the excellent advantages of mathematical logic, especially in comparison with traditional formal deductive logic, tried to demonstrate that mathematical logic, partly due to its current stage of development, partly due to its proper character, leaves fallow whole areas of issues belonging to logic in the wider sense. (Kotarbiński, 1925a, pp. 25a–25b)

Kotarbiński described general logic—i.e. logic in the wider sense—also as “logic in the school sense”. He noted that in curricula it has assigned the role of science about science to. He also indicated what issues should be included in its scope:

Logic, understood in such a way, should include the issues of the psychological techniques of mental work, general didactics, historical methodology (research on the ways how scientific disciplines are created and developed), analysis of the concepts which are really operating in scientific disciplines (building a historical dictionary of scientific terms), analysis of the semantic aspects of language, theory of knowledge, and finally the logic of induction together with the theory of experiment. (Kotarbiński, 1925a, pp. 25a–25b)

Some of them may seem surprising—they are even foreign bodies in the tissue of logic.

Kotarbiński developed his remarks in the article titled *Logika dla nauczycieli a logika matematyczna* [Logic for Teachers and Mathematical Logic]. He pointed out, among others, the discrepancy between how logic is understood on one hand, by its “progressive” representative and on the other hand, by a man outside the discipline. The former—contrary to the latter—does not consider logic to be a science that would have thinking (even scientific) or correct thinking as its subject. Logic is not a part of psychology, it does not teach thinking because it is not a practical science, but a theoretical one. Kotarbiński indicates, however, that the answer to the question “what is logic” is not easy:

Therefore what is [logic]? The answer is difficult but it is certain and unshakeable that it is the basic branch of mathematics; due to a misunderstanding and only as a result of a flawed tradition it belongs to the so-called philosophical sciences. So, we have a special kind of mathematics instead of a kind of epistemology. (Kotarbiński, 1925b/2003, p. 578)

Some see the difference between logic as mathematics (formal logic, “logistics”—as it used to be said in 1920s and 1930s in Poland) and logic as epistemology (philosophical, general, school logic...) as the difference between good and bad logic:

A stylish, so to speak, logistician sees two “logics” around him: one “philosophical”, that is bad, the other “mathematical”, that is good. [...] Since, therefore, logistics is the only true logic and the only good logic, it should reign exclusively in all establishments entrusted to logic. This conclusion, which may never be said, in all its brightness, is taken from words and deeds. (Kotarbiński, 1925b/2003, p. 579)

The expression “stylish logistician” refers in this case to Leśniewski. He used to say that the discipline he practices is called *logika* [logic] stressed on the antepenultimate syllable. In contrast *logika* as the name of philosophical logic practiced by Kotarbiński should be accented on the penultimate syllable (incorrectly in Polish, but often used in colloquial language).

Kotarbiński emphasized that he does not want to defend philosophical logic, in particular he was aware that the adjective “philosophical” is a source of confusion and hinders communication. He also emphasized the practical character of the discussion on different understandings of logic

and the distinction between two types of logic. As a result, he came up with another term, i.e. “pedagogical logic”:

And the problem is of a practical nature and concerns the way of organizing an academic teaching work, intended for use by teachers. We ask what domains of issues among those discussed today or in the past under the aegis of “logic” or those related to them by the very development of the subject are not included in the curriculum of current logistics, although they require the inclusion in the curriculum of pedagogical logic. When we use this word, we mean logic as a subject of studies and obligatory exams for candidates for the teaching profession, especially candidates for teachers of “philosophical propaedeutics”. (Kotarbiński, 1925b/2003, p. 579)

These “objections” to mathematical logic as the basis of logical culture may be surprising as the LWS became famous for its results in formal logic. In his memoirs, Witwicki described Kotarbiński as a bear on Leśniewski’s chain, remaining under his great influence (Witwicki, 1920/2016, pp. 74–76). Without resolving this issue, it should be noted that in the regard of pedagogical logic Kotarbiński was against Leśniewski and his authority. The objections to mathematical logic were not of a passing or accidental nature: Kotarbiński addressed this issue in a series of articles (1925b/2003; 1951a/2003; 1951b/2003; 1955; 1956; 1964/2003; 1967), as did Twardowski (1901b/2013; 1921) and Ajdukiewicz (1951).

GENERAL, SCHOOL AND PEDAGOGICAL LOGIC...

It is not difficult to notice that the leading representatives of the LWS were the authors of numerous introductions to philosophy and logic. In particular, the textbooks of logic were the subject of meticulous interest and studies in the LWS, and their role definitely went beyond the nature envisaged for these publications. Jacek Jadacki in his review of *Logika pragmatyczna* [Pragmatic Logic]—one of several textbooks by Ajdukiewicz—noted that Ajdukiewicz’s students developed the comments contained in the footnotes of that textbook to the proportions of scientific dissertations (Jadacki, 1994, p. 18).

Pelc wrote many times about the role and value of Kotarbiński’s textbook (1929/1990)—about its influence not only on him, but on a whole generation. During his classes he often referred to fragments from his masters’ textbooks. Moreover, his reflections on metaphor were inspired by Ajdukiewicz’s remarks from *Zarys logiki* [The Outline of Logic].

Similar themes can be found in the biography of Twardowski. For example, Twardowski's habilitation was—as Twardowski himself claimed—a development of one of the footnotes of Höfler's *Logic* (Twardowski, 1894/1965, p. 4), this textbook also influenced Łukasiewicz (he appreciated its value, despite the psychological nature of the work: see Łukasiewicz, 1906/1961, p. 59). In 1901 Twardowski wrote a textbook of logic which on the one hand, referred to textbooks of philosophical logic (by Höfler, Stöckland and to some extent by Mill), but on the other hand, undoubtedly influenced the textbooks by Kotarbiński and Ajdukiewicz. The authors were aware of the need to overcome the flaws of traditional and philosophical logic textbooks and to rethink the issues raised in them, thus they were not papers on old and well-known things but works of a synthetic, scientific and original nature (what is perhaps particularly noticeable in the case of Kotarbiński's textbook containing a treatise on reism).

Even a superficial review of the textbooks by Twardowski, Kotarbiński, Ajdukiewicz and Czeżowski allows one to see the common core of the issues constituting the conception of general logic. These are the issues of contemporary semiotics (e.g. semantic functions of expressions, definitions, linguistic defects), epistemology (e.g. presentations, concepts, judgments), formal logic (e.g. laws of logic, logical relations between propositions, structure and properties of deductive systems) and the outline of the general methodology of sciences, e.g. division of kinds of reasoning, inductive and deductive methods, division of sciences. Of course, different studies focus on different aspects and treat certain issues in a more extensive way.

However, in addition to this common core, which has established itself as the stable scope of many textbooks of logic, we will find in the textbooks issues that do not belong to it. Particularly noteworthy, I think, is the theory of measurement and the basics of statistics in *Logika pragmatyczna*—as an advanced approach to inductive methods. In the script of Kotarbiński's *Logika dla prawników* [Logic for Lawyers] one can find elements of eristic. In Twardowski's textbook—didactic issues, concerning, for example, types of lesson flows.

These elements, since less obvious, may require specific justification to be accepted as logical issues and its role should be defined, but in fact, any issue that does not belong to formal logic may require such justification from a certain point of view. It is worth noting that some of these elements belong to the legacy of traditional logic, e.g. eristic. The issues concerning the functions of natural language are rooted in Aristotle's *Organon* (Kotarbiński, 1967; 1925b/2003, p. 581) and the issues of induc-

tion—and statistics—go back to Francis Bacon's *Novum Organum* (Ajdukiewicz, 1965). Kotarbiński postulated that the issues of the dynamics of development of science and the history of scientific concepts should be included in the scope of general logic (Kotarbiński, 1951b/2003, p. 591).

The presence of didactic issues is explained by the fact that textbooks of logic were addressed mainly to teachers. However, these issues also belong to a wider group of praxeological issues. The representatives of the LWS—especially Kotarbiński—postulated the inclusion of general principles of good work in logic in a broad sense (Kotarbiński, 1951b/2003, p. 591), as well as practical advice, e.g. mnemonics (Kotarbiński, 1925b/2003, p. 582; 1964a/2003, p. 617) and focusing techniques (Kotarbiński, 1964a/2003, p. 617).

Another range of issues concerned psychological research on human irrationality (conditions increasing the risk of making a logical error; Ajdukiewicz, 1951/2006, pp. 135–136). It is significant that in his recommendations, Ajdukiewicz went far beyond the scope of logic (especially formal, but also traditional). He recommended e.g. a pre-war Stanisław Rudniański's book *Technologia pracy umysłowej* [Technology of Mental Work] to be used in logic lessons (Ajdukiewicz, 1955, p. 269).

The conception of general logic as an interdisciplinary, heterogeneous and at times probably incoherent subject emerges from these observations:

It is up to logicians to give a picture of the world of science in its fundamental lines. And finally, they have the right and duty to place his own science in this world, to take a stand in disputes over its subject, method and closer or looser connection with certain other sciences. Logic as a school subject, a product of long historical development, will then reveal all the diversity of its subjects. For how different are its semantic, purely formal and methodological problems, how different are its recommendations, demanding correctness of speech, from the point of view of accuracy and clarity of speech, and other recommendations, e.g. concerning the preparation of an experiment or so-called mental work technique! It is not a uniform theoretical discipline and should not aim for such uniformity. It is supposed to make one more efficient in mental work, with a particular emphasis on reasoning, i.e., considerations justifying one's claims, and should do so through the realizations of various types. (Kotarbiński, 1964a/2003, p. 615)

CONCLUSION

The classes given by Professor Pelc undoubtedly corresponded to the broad conception of general logic. He tried to be a teacher of thinking and good work—not only in philosophy, but in humanities in general. He achieved this goal not only through the selection of subjects, high expectations and requirements, various ways of testing students' knowledge, but also by setting a good example. He shared many things not through lectures or readings, but by directly guiding the efforts of students—especially efforts to prepare the end of year written assignment. The process of preparing the paper was instructive—e.g. consulting the subsequent stages of essay writing—but also the expectations, e.g. that the work should be accompanied by an abstract and keywords in one of the congressional languages.

Professor Pelc became known and remains in memory as an outstanding researcher, creator of contemporary Polish semiotics, organizer and educator. In this article, I tried to show that the latter role puts him in one line with the eminent representatives of the LSW, as they shared a common concern for the education of the students' logical culture, fulfilment of the postulates of clarity and criticism, and preference for logic in a broad sense. As I have presented, the conception of general logic was not narrowed to formal logic, but it constituted a truly interdisciplinary field including, among others, elements of epistemology, psychology, praxeology. In fact, it could be seen as a contemporary *trivium*.

Finally, I would like to express my deep conviction that the conception of general logic deserves to be rediscovered and reconstructed and its history to be written down. But more importantly, this conception deserves to be creatively developed.

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