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Maria Kokoszyńska: Between the Lvov-Warsaw School and the Vienna Circle

Anna Brożek

Maria Kokoszyńska-Lutmanowa (1905–1981) was one of the most outstanding female representatives of the Lvov-Warsaw School. After achieving her PhD in philosophy under Kazimierz Twardowski's supervision, she was Kazimierz Ajdukiewicz's assistant. She was also influenced by Alfred Tarski whose results in semantics she analyzed and popularized. After World War II, she got the chair of logic in University of Wrocław and she organized studies in logic in this academic center.

In the 1930s, Kokoszyńska kept in contact with members of the Vienna Circle and became a kind of connecting factor between Polish logicians and the Viennese group. In Poland, she presented the views of members of the Vienna Circle. In Vienna, she emphasized the results of her Polish colleagues.

In the present paper, some of Kokoszyńska's results connected with the matters discussed in the Vienna Circle are presented, namely with the problem of metaphysics, the status of logic and the idea of unity of science.

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Maria Kokoszyńska: Between the Lvov-Warsaw School and the Vienna Circle

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1. Introductory Remarks

Maria Kokoszyńska was a Polish logician and philosopher of science, one of the female members of the Lvov-Warsaw School. Kokoszyńska may be called ‘an ambassador of the Vienna Circle in Poland’ and—maybe to a greater degree—an ‘ambassador of the Lvov-Warsaw School in Vienna’ (or, speaking more broadly, in Western Europe).¹ In Poland, she presented the views of the Vienna Circle (below ‘VC’), discussed its strong and weak points, and indicated points that are common to both analytic movements. In her papers presented abroad and published in *Erkenntnis*, she reported the results of her colleagues from the Lvov-Warsaw School (below ‘LWS’), emphasized that these results may significantly change the evaluation of the VC and that some of the problems discussed in the VC had already been analysed and resolved in Poland. She emphasized the importance of Tarski’s semantics and the ‘Polish’ vision of philosophy and metaphysics (which differed significantly from the ‘Viennese’ one).

Before going into detail regarding her analyses, let me present some facts about Kokoszyńska’s life and her personal connections with representatives of the LWS and of the VC.

¹Tałasiewicz wrote: ‘Kokoszyńska became one of the leading polemicists of the Lvov-Warsaw School engaged in the debate with logical positivism. She reviewed books and articles of Moritz Schlick and Carnap, Neurath, Hempel etc., kept track of the controversies among them and with the evolution of their standpoint’ (Tałasiewicz 2001, 130).

Maria Stanisława Kokoszyńska was born on the 6th of December, 1905, in Bóbrka near Lvov, and died on the 30th of June, 1981, in Wrocław. Between 1923 and 1928, she studied philosophy at the Jan Kazimierz University in Lvov under Kazimierz Twardowski, the founder of the LWS, and Kazimierz Ajdukiewicz, one of the main representatives of the School. She also participated in courses in philosophy by Roman Ingarden and in mathematics by Stefan Banach, Stanisław Ruziewicz and Hugo Steinhaus. She belonged to the third generation of the LWS, together with three other female philosophers: Daniela Tennerówna-Gromska, Izydora Dąbska and Seweryna Łuszczewska-Romahnowa.

Among the philosophers of the School that influenced her to the greatest degree were the aforementioned Twardowski, Ajdukiewicz and, from the thirties on, also Alfred Tarski. Twardowski was the supervisor of Kokoszyńska’s doctoral dissertation entitled *Nazwy ogólne i wieloznaczne* [General and ambiguous names], defended in 1928.² Her cooperation with Ajdukiewicz became closer in 1930 when she became his assistant (he was granted the chair of philosophy in Lvov in 1928).³ She was probably the first person that appreciated the philosophical significance of Tarski’s definition of truth for formal languages. She developed Tarski’s results in semantics and helped to popularize them.⁴

At the end of her studies, Kokoszyńska visited Cambridge and met Wittgenstein there. In the thirties, she was part of the

²Twardowski noted in his Diaries: ‘November, 22, 1927. In the morning, 2-hours rigorosum of Maria Kokoszyńska—excellent’ (Twardowski 1999, vol. 1, p. 334). ‘March, 24, 1928. In the morning, I promoted Maria Kokoszyńska’ (vol. 2, p. 18). In some biographical sketches of Kokoszyńska, Ajdukiewicz is wrongly indicated as the supervisor of her dissertation (cf. Feferman 1999; Tałasiewicz 2001).

³She was Ajdukiewicz’s assistant until 1933 or 1934 (see Jadacki 2002, 150).

⁴For instance, she helped to translate Tarski’s article on truth into German, working on it together with Popper (see Kokoszyńska 1935c). Since the role of Tarski in the further development of logic cannot be exaggerated, the role of Kokoszyńska is sometimes seen through the prism of being Tarski’s assistant. Here, I want to present her as an independent and original thinker.

group of members of the LWS which came into close contact with philosophers of the VC. In 1934, she took part in the 8th International Congress of Philosophy in Prague and in discussions of the pre-conference to the 1st International Congress for Unity of Science. Thanks to a scholarship, she spent five months in Vienna (from November 1934 to April 1935⁵) and four months in Paris (from May to September 1935; see [Kokoszyńska 1935a](#)). Two days after arriving in Vienna, she wrote to her Lvov mentors and colleagues:⁶

After arriving at the university the next day [22 November], I went to Schlick's lecture (he lectures on logic and the theory of cognition four hours a week). The lecture was a closed whole and concerned the problem of whether intuitive cognition exists and what it consists of. . . . I like the way he lectures. He speaks a little bit carelessly and unemotionally but clearly and with sense of humor. . . . Prof. Schlick, when I presented myself to him after the lecture, invited me for the first meeting of the Circle after over a year of a break

⁵About a month later, in January 1935, Alfred Tarski came to Vienna on a Rockefeller Fellowship. Since both Kokoszyńska and Tarski were Poles, they knew each other and had similar scientific and extrascientific interests (they both loved mountain climbing), they naturally spent a lot of time together. However, I am not sure whether these are enough arguments for suggesting that they had a love affair, as Feferman and Feferman do: 'Obviously something else was happening. Alfred and Maria were having a full-blown, completely open "affair" that everyone surely knew about, including her husband and his wife' ([Feferman and Feferman 1999](#), 90). At least, it is not true that 'she [Kokoszyńska] would go with him [Tarski] to Vienna in Winter and Spring of 1935'. Moreover, she went to Paris at the beginning of May and he at the end of August (see [Kokoszyńska 1935c](#)). By the way, spending time in the mountains was very popular among Polish philosophers in the interwar period. For instance, Twardowski went with his family every year to Poronin (near Zakopane) where he met with his students and friends. Leśniewski, Czeżowski and Ajdukiewicz were mountain climbers and they used to go to the mountains with their colleagues. One of Twardowski's favorite students, Bronisław Bandrowski, held trips in the Tatra Mountains, together with her sister and fiancée; during one of such trips he died falling into the abyss.

⁶[Kokoszyńska \(1934a\)](#). The letter, from 23 November, was addressed to Kazimierz Ajdukiewicz, Kazimierz Twardowski and other Lvov philosophers.

which took place the evening of the same day. Of course I attended this meeting.

In Kokoszyńska's letters to Twardowski, she reported this and subsequent meetings of the VC.⁷ She met there, among others, Egon Brunswik, Karl Menger and Friedrich Waismann. From the Prague meeting, she also kept in touch with Rudolf Carnap and, after the conference in Paris, with Otto Neurath.⁸

During her stay in Paris, in September 1935, Kokoszyńska participated in the 1st International Congresses for Unity of Science. In the following years, she also took part in the 2nd, 3rd and 4th congresses (successively in Copenhagen, Paris and Cambridge). At the latter, she presented the paper 'Bemerkungen über die Einheitswissenschaft'. She also met with representatives of the VC at the 9th International Congress of Philosophy in Paris (1936), for which she prepared the paper 'Sur les éléments métaphysiques et empiriques dans la science'.

In 1932, she married Roman Lutman, a lawyer, historian and journalist.⁹ From this moment on, she used the name Kokoszyńska-Lutmanowa, Lutman or Lutman-Kokoszyńska. Kokoszyńska and her husband spent most of the years 1936–39 and 1945–47 in Katowice (Upper Silesia).¹⁰ However, she spent World War II in Lvov, working as a secretary in a local insurance company. In 1947, she and her husband moved to Wrocław (Lower Silesia). The same year, she habilitated at Poz-

⁷[Rojszczak \(1998\)](#) expresses the opinion that Kokoszyńska's attendance at the VC meetings in fact started the philosophical influence of the VC on the LWS.

⁸They probably met in the congress in Prague (September 1934) for the first time (see [Carnap 1908–1935](#), 1169).

⁹In the letter to Twardowski, she informs him that she decided with her husband that she will work independently for her maintenance; see [Kokoszyńska 1935b](#). This attitude at that time was not common in Poland.

¹⁰In 1928–30, Roman Lutman took part in the work of the Sejm Śląski [Silesian Parliament] in Katowice. Then he was appointed secretary of the Instytut Bałtycki [Baltic Institute] in Toruń. In 1934 he came back to Katowice and got the position of director of the Instytut Śląski [Silesian Institute].

nań University on the basis of the thesis *W sprawie względności i bezwzględności prawdy* [*On the relativity and absoluteness of truth*]. The following year, she started to work at Wrocław University. She was invited there by Henryk Mehlberg who was the chair of logic in Wrocław for a short time (he emigrated to Canada in 1949). She became an ordinary professor in 1951. From 1950 to 1976, Kokoszyńska held the Chair of Logic and Methodology of Science in Wrocław; in fact she organized teaching and research in logic and the philosophy of science in this academic center. During 1951–54, she was the dean of the Faculty of Philosophy, and during 1955–58, she was the vice-chancellor of the University.

Out of five scholars who prepared doctoral dissertations under the supervision of Kokoszyńska, three are of international reputation. These are Tadeusz Kubiński (PhD 1952), Witold A. Pogorzelski (PhD 1960) and Ryszard Wójcicki (PhD 1962).

2. The Lvov-Warsaw School and the Vienna Circle

Of these two groups—the LWS and the VC—the first is much less known. That is why I feel obliged to generally characterize the school and its relations with its Viennese partner.¹¹

The LWS is the greatest Polish school of philosophy (so far) and an important branch of analytic philosophy. It came into existence in Lvov, after Kazimierz Twardowski, a student of Franz Brentano, came there from Vienna in 1895. It was Twardowski's personality and charisma which made the rise of the School possible; another fact was that he had many talented students who developed his ideas in many directions. Over 20 of Twar-

dowski's students later became full professors (of philosophy and other disciplines). Their influence on Polish philosophy and humanities cannot be overestimated. The school originated in Lvov. In 1915, when the Polish university was reopened in Warsaw, Jan Łukasiewicz, one of Twardowski's students and a brilliant logician, was appointed to the chair of logic. Soon, other members of the school joined him in Warsaw: Kazimierz Kotarbiński (philosophy), Stanisław Leśniewski (logic), Władysław Tatarkiewicz (history of philosophy), Władysław Witwicki (psychology). In this way, two cities, Lvov and Warsaw, became the school's center. However, the LWS spread into other scientific centers as well: Twardowski's students—and students of his students—worked also in Cracow (Zygmunt Zawirski), Poznań (Kazimierz Ajdukiewicz), and Vilna (Tadeusz Czeżowski) and, after the World War II, also in Łódź, Toruń and Wrocław.

A philosophical school is usually characterized by some shared views. This is not the case with the LWS. Members of the School were very varied from the point of view of philosophical positions, as well as with respect to political convictions, attitudes towards religion, nationality, etc. They counted among them nominalists and realists, priests and atheists, socialists and conservatives, Poles, Ukrainians and Jews. Another characteristic feature of the school is the relatively large amount of talented and original female thinkers. These were, among others, Izydora Dąmbska, Daniela Tennerówna-Gromska, Janina Kotarbińska, Janina Hosiasson-Lindebaumowa, Maria Kokoszyńska-Lutmanowa and Seweryna Łuszczewska-Rohmanowa.

So, what—besides the common roots in Lvov and Twardowski as a mentor—was the reason for calling such a group 'a school'? The reason was that all members of this group shared a methodological position. This position may be characterized, most generally, by two postulates: the postulate of precision and the postulate of justification.¹² These postulates sound like elements

¹¹Recent monographs on the LWS in English are Brożek, Chybińska, Jadacki and Woleński (2015), Coniglione, Poli and Woleński (1993), Jadacki (2009), Kijania-Placek and Woleński (1998), Woleński (1989a) and Murawski (2014). A monograph on the relationship between the LWS and the VC is Szaniawski (1989). An interesting notice of the differences between the two groups is Nagel (1936).

¹²The LWS did not provide any manifest similar to that of the VC. However,

of any good work in science. But members of the school took them extremely seriously and carried them into many branches of philosophy.

It is not always stressed¹³ that the School, out of the philosophical trunk, had two branches: the psychological and the logical. (The logical is much better known, since Polish logicians have influenced logic broadly; the output of psychologists has had a much less international dimension.) The psychological branch had its origin in Twardowski's approach to philosophy which was Brentanian in spirit. Despite the fact that Twardowski rejected psychologism in the metaphysical meaning of the word, he remained a psychologist in the methodological sense: he was convinced that psychology and logic were basic branches of philosophy and that philosophy consisted in analyzing the content of consciousness. This conviction was accompanied by a postulate to treat philosophy as a strict science in which every thesis should be justified.

The logical branch of the LWS was initiated by Jan Łukasiewicz, who, fascinated by the results of formal logic, proposed the program of making philosophy an axiomatized science. Studies in logic as such initiated by Łukasiewicz bore fruits in the origin of the Polish School of Logic which is a part of the LWS. However, members of the LWS also applied logic to many branches of philosophy: the methodology of sciences, metaphysics, epistemology and ethics.

Kokoszyńska belonged to the logical branch of the LWS, however she held philosophers from the psychological branch in high regard, especially Twardowski, whose results she expressed through the use of modernized, logical tools.

there are some important papers in which these methodological postulates are expressed. These are [Twardowski \(1904, 1919\)](#), [Łukasiewicz \(1912\)](#), and [Ajdukiewicz \(1935\)](#).

¹³The psychological branch of the school is omitted both in encyclopedic entries, for instance [Woleński \(2015\)](#), and monographs (including monographs listed in note 11).

Kokoszyńska's analyses of the ideas which appeared in the works of Schlick, Carnap and Neurath are good testimonies of differences between the VC and the LWS. Before going into some detailed analyses, let me provide a general comparison of the two groups.

Let us start with the period of their activity. Various dates of the beginning of the VC are mentioned in the literature but usually it is claimed that the circle *sensu stricto* was formed in 1924;¹⁴ the manifesto, *Wissenschaftliche Weltauffassung: Der Wiener Kreis (The Scientific Conception of the World)*, was published in 1929. In 1924, the LWS had already existed for almost 30 years: the 1920s and 1930s were its blooming phase.

Schlick's tragic death in 1936 is commonly considered to be the end of the VC; thus the VC 'lived' about twelve years. The LWS has a much longer history. Even according the most 'ascetic' historical view, the LWS persisted up to the beginning of World War II; thus the LWS lived over forty years. Speaking ironically, the only similarity was here that the main cause of decomposition of these two intellectual groups was the outbreak of World War II.

The LWS also had many more members than the VC: there were a dozen or so (the number oscillates around 15 people) members of the VC; there were several dozen members of the LWS. (One may add that among representatives of the VC only one or two were women¹⁵ whereas in the LWS there were a dozen or so; see [Simons 2017](#).)

¹⁴Take the following passage as an example: 'The Vienna Circle was a group of scientifically trained philosophers and philosophically interested scientists who met under the (nominal) leadership of Moritz Schlick for often weekly discussions of problems in the philosophy of science during academic terms in the years from 1924 to 1936' ([Uebel 2016](#)).

¹⁵Neurath's wife, Olga Hahn-Neurath, and Rose Rand are mentioned here. One may stress here that Rose Rand was born in Lvov and that her PhD concerned the philosophy of a member of the LWS, namely of Tadeusz Kotarbiński.

Let us now come to the main ideas of these two groups.

The common feature of the LWS was—let us stress it once again—a methodological attitude. Some elements of this attitude, such as making use of logical tools and respect for the results of empirical sciences, were also present in the philosophy of the VC. However, no material theses accepted in the VC¹⁶ were accepted in Poland. Views of the members of the LWS were diversified, but these words of Polish philosophers—from the middle thirties—speak for themselves:

There are in Poland no absolute adherents of the Vienna Circle. I do not know any Polish philosopher who would have assimilated the material theses of the Vienna Circle. The affinity between some Polish philosophers and the Vienna Circle consists in the similarity of the fundamental methodological attitude and the affinity of the problems analyzed. (Ajdukiewicz 1935, 151)

Professor Ajdukiewicz was right, writing about logistic anti-irrationalism in Poland; he wrote that he did not know any Polish philosopher who would accept the material theses of the Vienna Circle as his own. We are, it seems, too sober to do so. (Łukasiewicz 1936, 233)

Among the most important ‘material’ differences between the two groups, the attitude towards language, physicalism and the status of metaphysics are listed (cf. Woleński 1989a, 296–301). Despite these differences, there is no doubt that both groups influenced each other. In 1930, Tarski gave three lectures in Vienna. The same year Carnap visited Warsaw. He then wrote in his autobiography:

In private discussions I talked especially with Tarski, Leśniewski and Kotarbiński. . . . Tadeusz Kotarbiński’s ideas were related to our physicalism. . . . Both Leśniewski and Kotarbiński had worked

¹⁶I am, of course, aware that speaking of ‘material theses of the VC’ (as a whole) is a simplification. Members of the VC differed in many respects and their positions evolved. However, the ‘Manifesto’ (1929) was signed jointly by Hahn, Neurath and Carnap and it was not only of a methodological character.

for many years on semantical problems. I expressed my regret that this comprehensive research work. . . was inaccessible to us and to most philosophers in the world, because it was published only in the Polish language, and I pointed out the need for an international language, especially for science. I found that the Polish philosophers had done a great deal of thoroughgoing and fruitful work in the field of logic and its applications to foundation problems, in particular the foundation of mathematics, and in the theory of knowledge and the general theory of language, the results of which were almost unknown to philosophers in other countries. I left Warsaw grateful for many stimulating suggestions and the fruitful exchange of ideas which I had enjoyed. (Carnap 1963, 30)

Both groups participated in the congresses ‘for unified science’ organized by the VC; in particular, Polish logicians and philosophers participated in meetings in Prague (1935) and Copenhagen (1936). Moreover, young members of the LWS visited Vienna thanks to scholarships and participated in Schlick’s seminars.¹⁷ One of them was Maria Kokoszyńska.

3. Kokoszyńska’s Work

Kokoszyńska was interested in the theory of language and in the methodology of science. In the area of semantics, she provided an interesting analysis of sentential functions, of the concept of analyticity and of the concept of truth. She is known for appreciating the philosophical significance of Tarski’s semantic results early on. In the area of the methodology of science, she concentrated on the distinction between deductive and non-deductive sciences, the idea of the unity of the sciences, and on the status of metaphysics.¹⁸

¹⁷One of them was another female representative of the LWS, Izydora Dąmbska. Later, she discussed with Carnap and suggestively argued that the assumption of similarity of sensual impressions is not a necessary assumption of science. See Dąmbska (2016).

¹⁸Her most important works are listed in [the references section](#).

Below, I concentrate on those elements of her views that directly refer to the problems discussed in Vienna and show the differences between the VC and the LWS.¹⁹ Kokoszyńska referred to the works of Carnap, Neurath and Schlick, noting differences between them, aware that the VC was not an ideological unity. Most often, she discussed Carnap's approaches to the problems discussed in Vienna.

I will start from Kokoszyńska's analysis of the relations between metaphysics and science. Generally speaking, Kokoszyńska claimed that a specific attitude of the VC towards metaphysics is connected with a particular understanding of metaphysics which is not the only possible understanding of this discipline.

Secondly, I will reconstruct Kokoszyńska's criticism of the conception of philosophy understood as the logic of science. She argues that the logic of science cannot be limited to syntax.

Finally, I will reconstruct Kokoszyńska's views on the problem of the unity of science. Kokoszyńska provided a detailed analysis of this vaguely formulated issue (distinguishing, among others, descriptive and normative aspects of it) and indicated some methodological difficulties connected with the idea of unity in this context.

4. Kokoszyńska on Metaphysics and Science²⁰

Rejection of metaphysics as a set of senseless sentences is one of the most characteristic elements of the VC's program. Among sources of this anti-metaphysical attitude, there are Ernst Mach's positivism and a specific interpretation of Wittgenstein's *Tractatus*. The most characteristic manifestation of the VC's atti-

¹⁹I omit other areas of her interests, such as the concept of analyticity, the concept of deduction, the concept of truth, etc., which deserve a separate analysis.

²⁰Kokoszyńska presents her analyses of this problem in Kokoszyńska (1937a) and (1938a).

tude towards metaphysics is probably Carnap's paper 'Überwindung der Metaphysik durch logische Analyse der Sprache' (1931). Carnap's thesis is that 'logical analysis reveals the alleged statements of metaphysics to be pseudo-sentences' (61). A pseudo-sentence is a sequence of words that looks similar to sentences *sensu stricto* but is in fact meaningless: it does not express any proposition. There are, according to Carnap, two possible sources of the lack of meaning of pseudo-sentences. Firstly, one of the words of the sequence may be meaningless. Secondly, even if all words in the sequence are meaningful, the sentence may be meaningless because it violates the rules of logical syntax, that is, it has been formulated in a counter-syntactical way.

Let us recap Carnap's characteristics of the meaningfulness of words:

Let "a" be any word and "S(a)" the elementary sentence in which it occurs. Then the sufficient and necessary condition for "a" being meaningful may be given by each of the following formulations, which ultimately say the same thing:

1. The *empirical criteria* for a are known;
2. It has been stipulated from what protocol sentences "S(a)" is *deducible*;
3. The *truth-conditions* for "S(a)" are fixed;
4. The method of *verification* of "S(a)" is known.

(Carnap 1931/1957, 64–65)

Words that do not fulfill these (equivalent, at least according to Carnap) conditions are meaningless. Carnap gives some examples of such words that appear in metaphysical treatises: 'principle' (in its metaphysical sense), 'God' (in its theological sense), 'the Idea', 'the Absolute', 'the essence', etc. Pseudo-sentences containing similar words occur often in metaphysical treatises but do not have empirical content. Thus, they do not belong to the meaningful language of science.

Carnap's examples of meaningfulness of the second kind are, for instance, 'Caesar is a prime number' and Heidegger's famous 'Das Nichts nichtet'.

Kokoszyńska refers in her papers to the first kind of ‘meaninglessness’ in the Carnapian sense since she focuses on the empirical content of sentences. By the way, one of Kokoszyńska’s mentors, Twardowski (1894), anticipated Carnap’s analysis of the term ‘nothing’ (Twardowski’s analysis had, of course, nothing to do with Heidegger; see [van der Schaar 2017](#).)

Kokoszyńska (1937b, 1938a) starts the analysis of the status of metaphysical sentences from a classification of sentences with respect to three factors. She distinguishes (a) determined and undetermined sentences, (b) analytic and synthetic sentences, and finally (c) confirmable and non-confirmable sentences. She characterizes these types of sentences as follows.

In order to accept or refute *determined* (strictly speaking: language-determined) sentences, it is sufficient to compare them with accepted rules of language.²¹ It is not so in the case of *undetermined* sentences. The logical value of *analytic* sentences does not depend on the content of extralogical terms occurring in them. This is so in the case of *synthetic* sentences. *Confirmable* sentences are observational sentences or sentences which follow from observational sentences or entail them. Non-confirmable sentences do not have such a connection to observation.

When we cross these classifications, we get 8 classes of sentences: (1) determined, analytical, confirmable; (2) determined, analytical, non-confirmable; (3) determined, synthetic, confirmable; (4) determined, synthetic, non-confirmable; (5) undetermined, analytical, confirmable; (6) undetermined, analytical, non-confirmable; (7) undetermined, synthetic, confirmable; (8) undetermined, synthetic, non-confirmable.

Some of the distinguished classes are empty, in particular classes (2), (4), (5) and (6), since all determined sentences are

²¹Kokoszyńska accepted the conception of language in which it is composed of (1) a set of expressions and (2) a set of rules of forming complex expressions and of transforming one expression into another. She might also have had in mind Ajdukiewicz’s conception of meaning ([Ajdukiewicz 1934](#)).

confirmable and all undetermined sentences are synthetic. It may sound surprising that Kokoszyńska states that language-determined sentences, namely axioms of a given language and their negations, are confirmable. Let us repeat that confirmable sentences follow from observable sentences or entail them. Determined sentences are confirmable, since axioms follow from any observational sentence (or from an infinite set of such sentences) and any observational sentence (or infinite set of such sentences) follows from negations of axioms. This is because axioms follow already from the empty class of sentences (and from observational sentences, in consequence), while the negations of axioms entail all sentences (observational sentences included).²²

Undetermined sentences which are confirmable have a so-called empirical content. The case is different for undetermined sentences which are not confirmable: they have no empirical content and no connection to experience. No finite set of observational sentences follow from them and they do not follow from any finite set of sentences.

Classes (1), (3), (7) and (8) are not empty. What sentences do they include?

The class (1) includes axioms (accepted without proofs), theorems (sentences which follow from axioms), and contradictions. These sentences are determined, analytic and confirmable. The class (3) contains, for instance, laws of movement in classical mechanics and definitions through postulates occurring in natural sciences. Kokoszyńska called them ‘synthetic *a priori* sentences’²³ (but she emphasized that she uses this term in a sense

²²For instance, the sentence ‘Kokoszyńska was a philosopher or Kokoszyńska was not a philosopher’, which is a substitution of a tautology and belongs to determined sentences, following from any observational sentence. On the other hand, the sentence ‘Some philosophers of the LWS were women’ is entailed only by some sentences, like ‘Kokoszyńska was a woman (and member of the LWS)’, but not, for instance, by the sentence ‘Kotarbiński was a man (and member of the LWS)’.

²³It seems to be surprising that laws of mechanics may be interpreted as *a*

different from the Kantian one). The class (3) differs from the class (1) in that in order to accept or refute a sentence of the class (3) one has to understand extralogical terms. The class (7) includes sentences which are observational sentences, their inductive generalizations and hypotheses which have empirically verifiable consequences. They are undetermined, synthetic and confirmable. The class (8) is composed of sentences called by Carnap 'pseudo-sentences'. They are undetermined, synthetic but non-confirmable—they can be neither accepted nor refuted on the basis of the rules of language and they have no connection to experience.

Sentences of metaphysics are often considered to be different from sentences of other disciplines. Kokoszyńska asks what the ground of this difference is and notices that various answers are given to this question.

A. The first possible answer is that metaphysics is composed of sentences of class (7). In this approach, from a methodological point of view, sentences of metaphysics are confirmable as much as sentences of every empirical science. The only difference is that metaphysical sentences are much more general. Kokoszyńska indicates Zygmunt Zawirski, a member of the LWS, as a representative of metaphysics so understood. According to him, metaphysical sentences are generalizations of sentences formulated in particular sciences.

B. Secondly, it is claimed that metaphysics is composed of sentences of type (1) and (3), namely of determined sentences. Metaphysics understood in such a way is either a branch of logic or a separate domain with its own primitive terms and specific axioms. Metaphysical sentences have in such a situation the character of axioms and their consequences. Kokoszyńska emphasizes that this is the conception of metaphysics proposed

priori sentences. However, in the spirit of conventionalism, one may say that some laws of physics are treated as principles which are in fact not sensitive to falsification and are sometimes interpreted as definitions.

by Jan Salamucha, Jan Franciszek Drewnowski and Józef Maria Bocheński (from the so-called Cracow Circle, CC; for details see [Bocheński 1989](#)). These philosophers tried to give the form of axiomatic systems to some parts of traditional metaphysics.

C. Finally, according to members of the VC, metaphysics is composed of sentences of class (8). According to them, metaphysics as a set of non-confirmable sentences is devoid of (empirical) sense and—as a consequence—not interesting from a theoretical point of view. Such sentences are called by them 'pseudo-sentences'.

Kokoszyńska did not give any particular examples of metaphysical sentences of the types (A), (B) and (C). Let us try to analyse some examples of our own.

Concerning (A). Let us assume that in physics, there exists a law stating that every physical event has a cause, and in psychology there exists a law stating that every psychological event (act) has a cause. One may generalize these two statements into a more general hypothesis: 'Every event has a cause'. As a generalization of scientific laws, such a sentence is a good example of a sentence belonging to metaphysics of the type (A).

Concerning (B). Let us assume now that one wants to prove a thesis that there exists the First Mover. In order to do that, one may interpret it in a certain logical calculus and look for some axioms (which seem obvious) and definitions, from which this thesis may be drawn by the use of rules of transformation accepted in this calculus. This is what members of the CC did with some theses of classical metaphysics. By this procedure, metaphysical sentences like 'There exists the First Mover' become determined sentences, based on some language conventions.

Concerning (C). Let us take the thesis 'Things in themselves are unknowable' as an example. Let us assume that this thesis has no empirical content: it may not be inferred from any finite set of observational sentences and no finite set of observational sentences follows from it. Let us also assume that this thesis

may not be proved on the basis of axioms and definitions of our language. In this case, the analysed thesis is undetermined and non-confirmable and it belongs to the metaphysics of the type (C).

Now, is metaphysics in the senses (A), (B) and (C) a science? According to Kokoszyńska, there are no reasons for the claim that metaphysics understood as (A) or (B) is not a science. Metaphysical sentences understood as (A) are confirmable (and falsifiable) just as sentences of empirical science are. The only difference is that they are very general, usually accessible empirical data confirm more than one metaphysical hypothesis, and it is not possible to choose between them using rational criteria. Metaphysical sentences understood as (B) also have their place in science: their logical value is guaranteed by appropriate conventions (axioms accepted unconditionally and definitions of some terms, the logical calculus used as a basis for the proof). Only metaphysics understood as (C) may not be counted among the sciences. In this respect, Kokoszyńska agrees with members of the VC. But she stresses that this is not the only possible view of metaphysics.

Moreover, in Kokoszyńska's opinion, the VC's thesis that metaphysical sentences are non-confirmable may be interpreted in two ways: as a tautology (stating that non-confirmable sentences are non-confirmable) or as a postulate to construct an ideal language in which it is impossible to formulate non-confirmable sentences. She adds that the possibility of formulating non-confirmable sentences may be eliminated from language only by an arbitrary decision.

Kokoszyńska supplements these analyses with some comments on scientific methods and with an original view of science. According to her, there are only two justified methods of accepting theses in science: the method of aprioristic proof and the empiricist method. In practice, scientists often make use of other methods, first of all the dogmatic method which consists in

accepting certain theses with no regard to experience and with no regard to any premises and also not providing these theses with a determined character. Metaphysics in method consists just in dogmatism of various kinds. And there is no place for such a metaphysics in science.

According to Kokoszyńska, the view of science proposed in the VC is too restrictive. She proposes her own vision which is much less restricted and reflects well the tendencies occurring in the LWS. This is her proposal:

[Science] is limited with respect to the methods used to justify theses but it is not limited with respect to the variety of concepts and terms which may be used in it. Such a definition of science may seem to be dangerous, because it does not make any limits for conceptual obscurity in science. But this danger becomes less strong when we notice that this definition foresees strict rules in accepting anything as scientific truth. For this conception speaks the fact that it provides the researcher with some kind of freedom which is necessary to make a progress in science. (Kokoszyńska 1938a, 24)

Generally, Kokoszyńska's analyses are correct. She rightly paid attention to the fact that the Carnapian understanding of metaphysics is not the only one possible. Carnap was, of course, aware that other senses of the term 'metaphysics' exist, in particular that it is sometimes understood as a generalization of the results of various sciences.²⁴ He limits his analyses to metaphysics understood as attempting to say something beyond experience. When one accepts such a terminological convention, his claim

²⁴In a remark to the English translation of his paper, Carnap wrote:

This term ["metaphysics"] is used in this paper, as usually in Europe, for the field of alleged knowledge of the essence of things which transcends the realm of empirically founded, inductive, science. Metaphysics in this sense includes systems like those of Fichte, Schelling, Hegel, Bergson, Heidegger. But it does not include endeavors towards a synthesis and generalization of the results of the various sciences. (Carnap 1931/1957, 80–81)

that this kind of metaphysics does not say something based on experience in fact looks like a tautology. What Kokoszyńska tried to show was that the anti-metaphysical campaign of the VC was not so destructive to traditional metaphysics as it may seem. She indicates at least two ways of practicing metaphysics that should be accepted as fulfilling the criteria of science.

5. The Status of Logic

Members of the VC considered philosophy to be a logic of science, namely a theory of expressions used in scientific languages and relations between them. Is philosophy so understood a scientific discipline, is it a part of science? If yes, what are its theses and methods?

Kokoszyńska mentions that in the beginning of the development of the VC, this question was answered negatively. In particular, Schlick denied that the philosophy practised by him was a science: it aimed at an explanation of scientific theses but it cannot be expressed in a system of such theses. The situation changed after Carnap published his *Die logische Syntax der Sprache*. Kokoszyńska wrote:

The turning point was Carnap's *Die logische Syntax der Sprache*, referring to the works of Hilbert as well as some Polish logicians, in particular of Ajdukiewicz, Leśniewski, Łukasiewicz and Tarski. Carnap tried to justify the thesis that the logic of knowledge has a certain right to be called a science and that theses of logic may aspire to the status of scientific claims: science, to which all logic of knowledge, and the whole of philosophy in the sense of the Vienna Circle, may be reduced, is—according to Carnap—the theory of scientific language, called by him a logical syntax of language. (Kokoszyńska 1937a, 153)

Kokoszyńska presents Carnap's idea of a formal language, pointing out the fact that this conception meets with difficulties when it comes to the concept of truth. She writes: 'Generally semantic concepts obstruct here' (Kokoszyńska 1937a, 156). In

Kokoszyńska's opinion, the concepts of truth, reference, etc., are satisfactorily explicated by Tarski. She emphasized that Tarski's semantic results (which are, as Kokoszyńska emphasized, older than Carnap's book) are an important complement to Carnap's results.

Summarizing, Kokoszyńska writes:

In the light of these comments, the question 'Is the logic of knowledge a science?', which was interesting for members of the VC, has to be resolved positively. However, it should be stressed that it is impossible to reduce the whole of logic to the logical syntax of language, which was, according to Carnap, a purely formal science. (Kokoszyńska 1937a, 156)

It must be stressed that 'purely formal' means here 'non-interpreted'. The point is that besides syntactic problems, according to Kokoszyńska, the logic of knowledge should include also the (formalized) theory of semantic issues. Further development of logic in the 20th century showed that Kokoszyńska was right here.

6. Unified Science²⁵

The idea of the unity of science was one of the most important parts of the program of the VC and was present in the VC from the very beginning. It was Neurath and Carnap who stressed its importance to the greatest degree. Neurath focused on it from the perspective of the social sciences. This interest later evolved into the idea of an encyclopaedia of unified science. Carnap, on the other hand, tried to clarify the issue and provide formal tools to make its realisation possible.

The idea of the unity of science appeared also in the VC's manifesto:

We have characterised the *scientific world-conception* essentially by two features. First it is *empiricist and positivist*: there is knowledge

²⁵This issue is analyzed by Kokoszyńska in (1937a), (1938b) and (1973a).

only from experience, which rests on what is immediately given. This sets the limits for the content of legitimate science. *Second*, the scientific world-conception is marked by application of a certain method, namely *logical analysis*. The aim of scientific effort is to reach the goal, unified science, by applying logical analysis to the empirical material. Since the meaning of every statement of science must be statable by reduction to a statement about the given, likewise the meaning of any concept, whatever branch of science it may belong to, must be statable by step-wise reduction to other concepts, down to the concepts of the lowest level which refer directly to the given. If such an analysis were carried through for all concepts, they would thus be ordered into a reductive system, a 'constitutive system'. Investigations towards such a constitutive system, the 'constitutive theory', thus form the framework within which logical analysis is applied by the scientific world-conception. (Hahn, Neurath and Carnap 1929, 309)

The unity of science is here presented as the goal of the group. The passage also expresses the belief that science may and should be unified. It seems that, at least at the beginning, members of the VC believed that science may attain terminological, methodological and theoretical unity.

Kokoszyńska noticed that the concept of unity of science appeared in investigations of the VC very often but it was never satisfactorily explicated.²⁶ She proposed an explication of the idea of unity of science and presented her reservations to this idea.

She noticed that this idea has two parts: positive and negative. The negative one is once more a consequence of the VC's view of metaphysics:

The denial of cognition in the area of metaphysics, which is proposed in the Vienna Circle, consists not in considering metaphysi-

²⁶Kokoszyńska noticed it in 1938 but it remained true afterward. After World War II, the discussion on the unity of science had new directions: 'The characteristic feature of the new view of unity was the ideas of consensus and subsequently . . . cross-fertilization. These ideas were instantiated in the emphasis on scientific operations (operationalism) and the creation of war-boosted cross-disciplines' (Cat 2013).

cal statements false but considering them senseless. . . . Philosophy in the traditional sense of the world, which is identified with metaphysics, is a set of apparent sentences which only appear to refer to something and predicate something, in fact they are not sentences at all. 'There are not sentences outside science'—this is how the negative aspect of the idea of unity of science may be expressed in formal language. (Kokoszyńska 1937a, 160)

The positive aspect of the idea of the unity of science has, again, many different shades. Firstly, it was formulated as a claim that all sciences have in fact the same object and that this object is *de facto* explored by the same methods:

Objects of different sciences are of the same kind. . . . The method applied is also the same: one infers theorems by some simple sentences of an empirical character. History which ultimately refers to its sources does not differ in this respect from physics. (Kokoszyńska 1937a, 159)

In Kokoszyńska's opinion, the thesis that all sciences have the same object is paradoxical. However, she admits that the positive aspect of the idea of the unity of science also has a different, formal formulation:

There is one language such that all scientific terms belonging to it may be defined by terms of this language and all sentences of science may be translated into it.

Every scientific sentence may be expressed by a certain logical or empirical sentence in one and the same language but despite these sentences there are not expressions which may pretend to be true or false. (Kokoszyńska 1937a, 159)

Carnap was convinced that the language of physics is such a universal language.²⁷

²⁷Let us mention that according to Tadeusz Kotarbiński (1929), reistic language fulfils such a function—that is why Carnap saw in reism an idea 'related to physicalism' (see quotation above). According to semantic reism, proposed by Kotarbiński, a sentence is meaningful if the only names occurring in it are

Let us now come to Kokoszyńska's criticism of the idea of the unity of sciences. She points to the fact that it is not certain whether the theses of the VC should be understood as theses concerning the existing language or as a 'masked decision that no expressions, except for scientific ones, will be treated as sentences'. Kokoszyńska writes explicitly: 'If this thesis is to be understood as a thesis about the existing language, it certainly would be revealed to be false' (Kokoszyńska 1937a, 162). So, as a charitable interpreter, Kokoszyńska proposes to treat the idea as a postulate. However, as a postulate, the idea of the unity of science is not a thesis and may not be discussed with respect to its logical value.

A positive thesis of the unity of science should be, according to Kokoszyńska, treated as a claim concerning the existing language, since:

By claiming that all scientific knowledge may be expressed only by empirical and logical sentences in one language, logical positivists pretend to refer to factually occurring dependencies between scientific concepts and theses. (Kokoszyńska 1937a, 162)

According to Kokoszyńska, the question of whether all scientific concepts are explicable on the ground of physics is by no means resolved, so the thesis of the VC may only be understood as a hypothesis, an anticipation of future results.

Kokoszyńska was convinced that the most doubtful element of the idea of the unity of science is the claim that all scientific sentences may be expressed in only one language. That such a claim is false was easily shown already by semantic analyses

names of things (such sentences are reistic sentences) or it may be paraphrased into such a sentence. Names of abstracta (properties, relations, processes, states of affairs etc.) are called 'onomatoids' and are not allowed in reistic language. For instance, the sentence 'The redness of this rose is intense', in which an onomatoid 'redness' occurs, is meaningful only because it may be paraphrased into 'This rose is intensively red'. One of the main methodological problems of reism is the problem of justification of a determined paraphrase.

proposed in the LWS: in order to define even the simplest semantic concepts, one needs a *metalanguage* which is something different from the object language.

These [semantic] concepts, or in particular problems and theorems in which these concepts occur, are by no means a part of our knowledge. Whichever language we take, we are not able to express problems concerning this language in this language without falling into contradiction. The conviction of the possibility of closing of all science in one language has to be considered false. (Kokoszyńska 1937a, 163)

Summarizing, Kokoszyńska writes that the positive thesis of supporters of the unity of science in the first interpretation has to be treated as unjustified, and in the second interpretation as simply false.

Kokoszyńska's analysis of the slogan 'unity of science' was based mainly on Carnap's papers. In discussion with Kokoszyńska, Neurath (1938) noted that her interpretation of this idea is not the only one and that it is also not the most important one. According to him, by the use of the expression 'unity of science', members of the VC tried to show reducibility connections between sciences. It is well known that Neurath's interpretation of the idea of unity of science was different from Carnap's and that also Carnap's position evolved from the postulate of the unity of science to the analysis of the problem of reduction (of one science to another; see Creath 1996).

How should we evaluate Kokoszyńska's analysis? On the one hand, she is obviously right that when we want to speak about an object-science *O-S*, we should use a metalanguage; thus our statements concerning statements of *O-S* should create a certain meta-science *M-S* with respect to *O-S*. Of course, this *M-S* can be neither a proper part of *O-S*, nor identical with *O-S*. On the other hand, I am convinced that the intention of the members of the VC was to construct one object-science, and they would probably agree that for such a unified object-science we need a

separate (probably singular?) meta-science. What is interesting, the idea of the unity of science gradually lost its central place in investigations of the members of the VC, and they changed its originally radical meaning.²⁸

7. Final Remarks

Analysis of Kokoszyńska's works serves as evidence of the fact that she was a typical representative of the LWS. She starts her paper with precise conceptual distinctions, proposes logical analyses of the discussed problems and analyses different formulations of the investigated theses in order to find the most adequate one. She makes use of the results of formal logic, semantics and methodology. She reconstructs and develops the results of the other representatives of the School, such as Twardowski's refutation of relativism and his classification of sciences, Ajdukiewicz's theory of meaning and analyticity, Tarski's conception of truth for formal languages, Hosiasson's conception of induction, etc.

Her papers are not numerous but do represent the highest methodological standards, and show her command of formal tools as well as her ability to see the essence of problems.

Kokoszyńska's papers also show her deep familiarity with the philosophy of the VC, and that of Carnap in particular. Natural questions arise here: (1) Did Carnap and other philosophers of the VC know Kokoszyńska's results? (2) Could she have influenced members of the VC to some degree?

There is some evidence for a positive answer to question (1). Firstly, Kokoszyńska presented her papers at symposia in which Carnap and other members of the VC took part. For instance,

²⁸In the sixties, Carnap made a distinctive reinterpretation of the idea: 'The thesis about the unity of science, sustained by me and Neurath . . . aimed to the refutation of a division of empirical science into natural and social sciences . . . , the division based on a dualistic metaphysics which dominated in Germany of that time' (Carnap 1963, 34).

in 1936 she presented her views in the section *L'unité de la science* which also included papers from Carnap, Reichenbach, Rougier, Schlick, Jampoler and Fisher. Secondly, three papers of Kokoszyńska were published in Carnap's journal, *Erkenntnis*. Thirdly, Kokoszyńska corresponded with Carnap and Neurath on problems of their interests.

The answer to question (2) may only be an object of conjecture. However, there are some facts that may support a positive answer. The first fact is that Neurath, under the influence of discussion with Kokoszyńska, expressed his own conception of truth in a more precise way than he did before (see Mancosu 2008). The second fact is that Carnap was gradually changing his position: he accepted the area of semantics as a domain of science and softened his criticism of metaphysics. Kokoszyńska's argumentation could be one of the impulses of this evolution. Let me quote a passage from one of Carnap's letters (from 19 June 1935)²⁹ which is a testimony of Carnap's esteem for Kokoszyńska and his gradual inclination towards accepting her (and Tarski's) position:

Mr. TARSKI gave me your manuscript 'About the concept of absolute truth' in Vienna and I have read it with interest. I would consider it very suitable if you would present this essay, or at least its main idea, at the Paris Congress. It may then be published in the proceedings of the Congress. If it is not the case, I would like to publish the essay in *Erkenntnis*.³⁰

In general, I want to say that I agree with your remarks on the whole. Some points could still be discussed. But generally, our views are more similar than it seemed. After I have read and seen some proofs of Tarski in which he presented a correct and full definition of the concept of truth, I agree with you that terms such as 'true' and related ones are scientifically sound.

²⁹The letter was originally written in German.

³⁰It was published in *Erkenntnis*. In Paris, Kokoszyńska presented another paper, 'Syntax, Semantik und Wissenschaftslogik.'

My own and other people's earlier scepticism with respect to these terms was historically grounded, as no definition was known, which would be formally correct and avoided antinomies. The theory which uses these terms, the semantics in Tarski's sense, seems to me to be an important domain of science. I think it is a great merit of Tarski that he has opened this new territory. Whether we want to include semantics within the logic of science, is a matter of terminological utility, on which I do not have any fixed opinion. Maybe it would be emotionally closer to me, if only purely logical propositions (i.e. those without descriptive signs) would belong to the logic of science. In this case, one would consider semantics as a part of the theory of knowledge but not as a part of the logic of science. But I will also accept another language convention.

World War II and the events that preceded and followed it had a decisive influence on the history of the LWS. Tarski went to the USA just before the outbreak of the war but many members of the LWS were killed, and others lost their property or scientific output. In 1944 Warsaw was completely destroyed by the Nazi Germans during the Warsaw Uprising. As a result of the Yalta Conference, Lvov became a part of the Soviet Union. Thus, the LWS lost its two important centers. Moreover, for many years, the only official philosophy in Poland was Marxism-Leninism and philosophers of the School were essentially allowed only to teach ideologically neutral logic.

What about Kokoszyńska's career? The upside of the story is that after World War II, thanks to the help of Ajdukiewicz, she received the habilitation and a few years later, the chair of logic in Wrocław (German name: Breslau), a Silesian city incorporated, as a result of the decision of the Big Three (Churchill, Roosevelt and Stalin), into the territory of the Republic of Poland. The downside is that, working behind the iron curtain, for many years she was in fact cut off from direct international cooperation.

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References

A. Kokoszyńska's works cited in this paper

- 1932. 'Z semantyki funkcji zdaniowych [On the Semantics of Propositional Functions].' *Księga Pamiątkowa Polskiego Towarzystwa Filozoficznego we Lwowie*, 12 Feb. 1904 – 12 Feb. 1929, pp. 312-313. Lwów: PTF.
- 1934a. Letter to Kazimierz Ajdukiewicz, Kazimierz Twardowski et al., 23 November 1934, Kazimierz Twardowski's Archives, Warsaw. Sign. Akt-K-02-1-16-004.
- 1934b. Letter to Kazimierz Twardowski, 14 December 1934, Kazimierz Twardowski's Archives, Warsaw, Sign. Akt-K-02-1-16-006.
- 1935a. Letter to Kazimierz Twardowski, 18 June 1935, Kazimierz Twardowski's Archives, Warsaw, Sign. Akt-K-02-1-16-012.
- 1935b. Letter to Kazimierz Twardowski, 22 July 1935, Kazimierz Twardowski's Archives, Warsaw, Sign. Akt-K-02-1-16-014.
- 1935c. Letter to Kazimierz Twardowski, 22 August 1935, Kazimierz Twardowski's Archives, Warsaw, Sign. Akt-K-02-1-16-018.

- 1936a. 'Logiczna składnia języka, semantyka i logika wiedzy [Logical Syntax of Language, Semantics and Logic of Knowledge].' *Przegląd Filozoficzny* 39: 38–49.
- 1936b. 'Syntax, Semantik und Wissenschaftslogik.' *Actes du Congrès International de Philosophie Scientifique* 3: 9–14.
- 1936c. 'Über den absoluten Wahrheitsbegriff und einige andere semantische Begriffe.' *Erkenntnis* 6: 143–65.
- 1937a. 'Filozofia nauki w Kole Wiedeńskim [Philosophy of Science in the Vienna Circle].' *Kwartalnik Filozoficzny* 13: 151–65, 181–94.
- 1937b. 'Sur les éléments métaphysiques et empiriques dans la science.' In *Travaux du IX^{ème} Congrès International de Philosophie. Congrès Descartes* vol. 4, pp. 108–17. Paris: Hermann et Cie.
- 1938a. 'W sprawie walki z metafizyką [On a Fight Against Metaphysics].' *Przegląd Filozoficzny* 41: 9–24.
- 1938b. 'Bemerkungen über der Einheitswissenschaft.' *Erkenntnis* 7: 325–35.
- 1948a. 'What Means "Relativity of Truth"?' *Studia Philosophica* 3: 167–76.
1951. 'A Refutation of the Relativism of Truth.' *Studia Philosophica* 4, 93–149.
- 1957a. 'O dobrej i złej indukcji [On Good and Bad Induction].' *Studia Logica* 5: 43–70. (Includes a summary in English.)
- 1960a. 'O stosowalności metody dedukcyjnej w naukach niededukcyjnych [On the Applicability of the Deductive Method in Non-Deductive Sciences].' *Sprawozdania Wrocławskiego Towarzystwa Naukowego, Series A, vol. XV*: 45–49.
1962. 'O dwojakim rozumieniu uzasadniania dedukcyjnego [Two Concepts of Deductive Justification].' *Studia Logica* 13: 177–96.
- 1963a. 'O dedukcji [On Deduction].' *Studia Filozoficzne* 1: 77–86. (Includes a summary in English.)

- 1967a. 'W sprawie różnicy między naukami dedukcyjnymi a niededukcyjnymi [On the Issue of the Difference between Deductive and Non-Deductive Sciences].' In *Fragmety filozoficzne*, 3rd series, edited by Tadeusz Czeżowski et al., pp. 43–74. Warsaw: Państwowe Wydawnictwo Naukowe (PWN).
- 1967b. 'W sprawie koncepcji nauk dedukcyjnych [About the Conception of Deductive Sciences].' *Studia Filozoficzne* 1: 57–63.
1969. 'Znaczenie syntaktyczne i znaczenie semantyczne wyrażen językowych [Syntactic and Semantic Meanings of Language Expressions].' In *Rozprawy filozoficzne*, pp. 143–75. Toruń: Prace Wydziału Filologiczno-Filozoficznego TNT.
- 1973a. 'Metodologiczne problemy integracji nauk [Methodological Problems of Integration of Sciences].' *Studia Filozoficzne* 4: 47–56.

B. Other works by Kokoszyńska published in English, French, and German

- 1948b. 'On a Certain Condition of Semantic Theory of Knowledge.' In *Przełęcki and Wójcicki (1977)*, pp. 189–99. Summary: 'On a Certain Condition of a Semantical Theory of Science.' In *Proceedings of the 10th International Congress of Philosophy* (Amsterdam, 11–18 August 1948), vol. I, fasc. II, pp. 773–75. Amsterdam: North-Holland Publishing Company, 1949.
- 1957b. 'Criticism of Some Views on the Relationship Between Logic and Dialectics.' *Studia Filozoficzne. The Summaries of the Articles. Vols. I–III*, pp. 41–43. Warsaw: PWN.
- 1960b. 'Deduction as a Method of Proof.' In *Atti del XII Congresso Internazionale di Filozofia* (Venice, 12–18 September 1958), vol. V., *Lògica, gnoseologia, filozofia della scienza, filozofia del liguaggio*, pp. 271–78. Florence: Sansoni Editore.

1963b. 'On Deduction.' In *The Foundations of Statements and Decisions*, edited by Kazimierz Ajdukiewicz, pp. 205–10. Warsaw: PWN, 1965.

1967c. 'A Conception of the Deductive Sciences.' *Analele Universității București*. Series: *Acta Logica X*: 105–12. Revised and supplemented version: *Studia Filozoficzne*. Selected articles, vol. IV, pp. 111–17. Warsaw: PWN, 1970.

1967d. 'On the Difference Between Deductive and Non-Deductive Science.' In *Przełęcki and Wójcicki (1977)*, pp. 201–31.

1968. 'Kazimierz Ajdukiewicz.' In *Contemporary Philosophy: A Survey*, vol. I, edited by Raymond Klibansky, *Logic and Philosophy of Mathematics*, pp. 202–08. Florence: La Nuova Italia Editrice.

1973b. 'Toward a General Theory of Definition.' *Abstracts of the XVth World Congress of Philosophy* (Varna, 17–22 September 1973), abstract no. 640. Varna.

1976. 'Definitionen in engeren und weiteren Sinne.' *Deutsche Zeitschrift für Philosophie* 14: 1478–93.

Kokoszyńska published also many reviews in *The Journal of Symbolic Logic* (1937–1939, 1946, 1948, 1975) and *Studia Logica* (1958, 1960, 1970). For a full bibliography of her works see Jan Zygmunt, 'Bibliografia prac naukowych Marii Kokoszyńskiej-Lutmanowej [Bibliography of Maria Kokoszyńska-Lutmanowa's Scientific Works].' *Filozofia Nauki* 12: 155–56.

C. Other works cited in this paper

Ajdukiewicz, Kazimierz, 1934. 'Sprache und Sinn.' *Erkenntnis* 4: 100–38.

———, 1935. 'Der logistische Antiirrationalismus in Polen.' *Erkenntnis* 5: 151–64.

Blegvad, Mogens, 1989. 'Warsaw, Vienna, Copenhagen.' In *Szaniawski (1989)*, pp. 1–8.

Bocheński, Józef Maria, 1989. 'Cracow Circle.' In *Szaniawski (1989)*, pp. 9–18.

Brożek, Anna, Alicja Chybińska, Jacek Jadacki, and Jan Woleński, eds., 2015. *Tradition of the Lvov-Warsaw School: Ideas and Continuations*. Leiden and Boston: Brill–Rodopi.

Brożek, Anna, Friedrich Stadler and Jan Woleński, eds., 2017. *The Significance of the Lvov-Warsaw School in European Culture*. Vienna Circle Yearbook, Springer (forthcoming).

Cat, Jordi, 2013. 'The Unity of Science.' *The Stanford Encyclopedia of Philosophy*, <https://plato.stanford.edu/entries/scientific-unity/>, accessed 19 January 2017.

Carnap, Rudolf, 1908–1935. *Diaries*. Transcribed by Brigitta Arden and Brigitte Parakenings. https://homepage.univie.ac.at/christian.damboeck/carnap_diaries_2015-2018/diaries_1908-1935_transcriptions_2015.pdf, accessed 19 January 2017.

———, 1931. 'Überwindung der Metaphysik durch logische Analyse der Sprache.' *Erkenntnis* 2: 219–41. English translation with additional notes: 'The Elimination of Metaphysics Through Logical Analysis of Language', translated by A. Pap. In *Logical Positivism*, edited by A. J. Ayer, pp. 60–81. New York: The Free Press, 1959.

———, 1935. Letter to Maria Kokoszyńska from 19 June 1935. University of Pittsburgh Libraries, Special Collections Departments, Sign. 088-57-16.

———, 1963. 'Intellectual Autobiography.' In *The Philosophy of Rudolf Carnap*, edited by P. A. Schilpp, pp. 3–86. La Salle: Open Court.

Coniglione, Francesco, Robert Poli, and Jan Woleński, eds., 1993. *Polish Scientific Philosophy. The Lvov-Warsaw School*. Amsterdam: Rodopi.

- Creath, Richard, 1996. 'Unity of Science.' In *The Disunity of Science: Boundaries, Contexts, and Power*, edited by Peter Galison and David J. Stump, pp. 158–69. Stanford: Stanford University Press.
- Dąbmska, Izydora, 2016. *Knowledge, Language and Silence*. Leiden and Boston: Brill–Rodopi.
- Feferman, Anita Burdman, 1999. 'How the Unity of Science Saved Alfred Tarski.' In *Alfred Tarski and the Vienna Circle*, edited by Jan Woleński and Eckehart Köhler, pp. 43–52. Dordrecht: Kluwer.
- Feferman, Anita Burdman and Solomon Feferman, 2004. *Alfred Tarski: Life and Logic*. Cambridge: Cambridge University Press.
- Hahn, Hans, Otto Neurath and Rudolf Carnap, 1929. *Wissenschaftliche Weltauffassung: Der Wiener Kreis*. Vienna: Verlag. English translation in *Empiricism and Sociology*, edited by M. Neurath and R. S. Cohen, pp. 299–318. Dordrecht and Boston: D. Reidel.
- Jadacki, Jacek, 2002. Introduction to Maria Kokoszyńska, 'Co to znaczy "relatywność prawdy"? [What Means "Relativity of Truth"?].' *Filozofia Nauki* 3: 149–58.
- , 2009. *Polish Analytical Philosophy*. Warsaw: Wydawnictwo Naukowe Semper.
- Kijania-Placek, Katarzyna and Jan Woleński, eds., 1998. *The Lvov-Warsaw School and Contemporary Philosophy*. Dordrecht, Boston and London: Kluwer.
- Kotarbiński, Tadeusz, 1929. *Elementy teorii poznania, logiki formalnej i metodologii nauk*. Lwów: Ossolineum. Published in English as: *Gnology: The Scientific Approach to the Theory of Knowledge*, trans. by O. Wojtasiewicz. Oxford: Pergamon Press, 1966.
- Łukasiewicz, Jan, 1912. 'O twórczości w nauce [On creativity in science].' In *Księga pamiątkowa ku uczczeniu 250-tej rocznicy założenia Uniwersytetu Lwowskiego przez króla Jana Kazimierza r. 1661*, vol. 1. Lwów: Uniwersytet Lwowski.
- , 1936. 'Logistyka a filozofia [Logistic and Philosophy].' *Przegląd Filozoficzny* 39: 115–31.
- Murawski, Roman, 2014. *The Philosophy of Mathematics and Logic in the 1920s and 1930s in Poland*. Basel: Birkhäuser.
- Nagel, Ernest, 1936. 'Impressions and Appraisals of Analytic Philosophy in Europe.' *Journal of Philosophy* 33: 5–24.
- Neurath, Otto, 1938. 'Zu den Vorträgen von Black, Kokoszyńska, Williams.' *Erkenntnis* 7: 371–74.
- Przełęcki, Marian and Ryszard Wójcicki, eds., 1977. *Twenty-Five Years of Logical Methodology in Poland*. Warsaw and Dordrecht: PWN–Reidel.
- Rojszczak, Artur, 1998. Truth-bearers from Twardowski to Tarski. In [Kijania-Placek and Woleński \(1998\)](#), pp. 73–84.
- Simons, Peter, 2017. 'Logical Philosophy, Anti-Irrationalism, and Gender Equality: Three Positives of the Lvov-Warsaw Enlightenment.' In [Brożek, Stadler and Woleński \(2017\)](#).
- Szaniawski, Klemens, ed., 1989. *The Vienna Circle and the Lvov-Warsaw School*. Dordrecht, Boston and London: Kluwer.
- Suchmiel, Jadwiga, 2000. *Działalność naukowa kobiet w Uniwersytecie we Lwowie do roku 1939*. Częstochowa: Wydawnictwo WSP.
- Tałasiewicz, Mieszko, 2001. 'Maria Kokoszyńska-Lutmanowa: Methodology, Semantics, Truth.' In *Polish Philosophers of Science and Nature in the 20th century*, edited by Władysław Krajewski, pp. 129–33. Amsterdam and New York: Rodopi.
- Twardowski, Kazimierz, 1904. 'Przemówienie na otwarciu Polskiego Towarzystwa Filozoficznego we Lwowie [Speech at the Opening of the Polish Philosophical Society in Lvov].' *Przegląd Filozoficzny* 7: 239–43.
- , 1919. 'O jasnym i niejasnym stylu filozoficznym [On Clear and Unclear Philosophical Style].' *Ruch Filozoficzny* 5: 25–27. English translation in *On Actions, Products and Other Topics in Philosophy*, edited by Johannes Brandl and Jan Woleński, pp. 257–59. Amsterdam and Atlanta: Rodopi, 1998.

- , 1999. *Dzienniki [Diaries]*, vols. 1–2, edited by Ryszard Jadczyk. Toruń: Adam Marszałek
- Uebel, Thomas, 2016. ‘Vienna Circle.’ *The Stanford Encyclopedia of Philosophy*, <https://plato.stanford.edu/entries/vienna-circle/>, accessed 19 January 2017.
- van der Schaar, Maria, 2015. *Kazimierz Twardowski: A Grammar for Philosophy*. Leiden and Boston: Brill–Rodopi.
- , 2017. ‘Metaphysics and the Logical Analysis of “Nothing”.’ In Brożek, Stadler and Woleński (2017).
- Woleński, Jan, 1989a. *Logic and Philosophy in the Lvov-Warsaw School*. Dordrecht, Boston and London: Kluwer.
- , 1989b. ‘The Lvov-Warsaw School and the Vienna Circle.’ In Szaniawski (1989), pp. 443–53.
- , 2015. ‘Lvov-Warsaw School.’ *The Stanford Encyclopedia of Philosophy*, <https://plato.stanford.edu/entries/lvov-warsaw/>, accessed 19 January 2017.
- Wohlstetter, Albert, 1940. Reviews of Maria Kokoszyńska, ‘Bemerkungen über die Einheitswissenschaft’, Otto Neurath, ‘Zu den Vorträgen von Black, Kokoszyńska, Williams’, and Arne Naess, ‘Zum Vortrag von Kokoszyńska über Einheitswissenschaft’. *The Journal of Symbolic Logic* 5: 24–25.

D. Other works addressing Kokoszyńska

- Betti, Arianna, 2008. ‘Polish Axiomatics and Its Truth: On Tarski’s Leśniewskian Background and the Ajdukiewicz Connection.’ In Patterson (2008), pp. 44–71.
- Gumański, Leon, 1999. *To Be or Not to Be? Is That the Question? – and Other Studies in Ontology, Epistemology and Logic*. Amsterdam and Atlanta: Rodopi.
- Hempel, C. G., 1949. Review of Maria Kokoszyńska, ‘On a Certain Condition of a Semantical Theory of Science.’ *The Journal of Symbolic Logic* 14: 247–48.
- , 1953. Review of Maria Kokoszyńska, ‘What Means “Relativity of Truth”?’ and ‘A Refutation of the Relativism of Truth.’ *The Journal of Symbolic Logic* 18: 170–71.
- , 2000. *Selected Philosophical Essays*. Cambridge: Cambridge University Press.
- Mancosu, Paul, 2008. ‘Tarski, Neurath and Kokoszyńska on the Semantic Conception of Truth’. In Patterson (2008), pp. 192–224.
- McFarland, Andrew, Joanna McFarland, and James T. Smith, eds. 2014. *Alfred Tarski. Early Work in Poland – Geometry and Teaching*. New York: Birkhäuser.
- Mehlberg, Henryk (1938). Review of Maria Kokoszyńska, ‘Über den absoluten Wahrheitsbegriff und einige andere semantische Begriffe’, ‘Logiczna składnia języka, semantyka i logika wiedzy [Logical Syntax of Language, Semantics and the Logic of Knowledge].’ *The Journal of Symbolic Logic* 3: 45.
- Patterson, Douglas, ed., 2008. *New Essays on Tarski and Philosophy*. Oxford: Oxford University Press.
- Peregrin, Jaroslav, ed., 1999. *Truth and Its Nature (if Any)*. Dordrecht: Kluwer.
- Popper, Karl, 2005. *Unended Quest: An Intellectual Autobiography*. London and New York: Routledge.
- Smith, Barry, 1971. Review of Maria Kokoszyńska, ‘Deduction as a Method of Proof.’ *The Journal of Symbolic Logic* 36: 551.
- Sobociński, Bolesław, 1950. Review of Maria Kokoszyńska, ‘O pewnym warunku semantycznej teorii wiedzy [On a Certain Condition of Semantic Theory of Knowledge].’ *The Journal of Symbolic Logic* 15: 281.
- Szumilewicz-Lachman, Irena, 1994. *Zygmunt Zawirski: His Life and Work – With Selected Writings on Time, Logic & the Methodology of Science*. Dordrecht, Boston and London: Kluwer.
- Uebel, Thomas E., 1992. *Overcoming Logical Positivism from Within: The Emergence of Neurath’s Naturalism in the Vienna Circle’s Protocol Sentence Debate*. Amsterdam and Atlanta: Rodopi.