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Jan Łukasiewicz and His German Ally. A History of Łukasiewicz-Scholz Cooperation and Friendship

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Abstract:
The article presents interpersonal relations and mutual influences between German logician Heinrich Scholz and Polish scholars, first of all Jan Łukasiewicz. The background for presenting these relationships consists of reflections on the development of logic in Poland and various conceptions of how to apply logic to philosophical issues. Firstly, Jan Łukasiewicz's program of logicisation of philosophy and his search for allies is presented. Secondly, the forms of cooperation between Łukasiewicz and Scholz, as well as contacts between the latter and other Polish scholars are sketched. Finally, forms of Scholz's help to Polish friends during the tumultuous period of World War II are examined. The article provides also some reflections on the approach to logic in various European centers of analytic philosophy and historical comments on the continuity of philosophical and logical schools.
Keywords: Jan Łukasiewicz, Heinrich Scholz, history of logic, axiomatic metaphysics.

1. Introductory Remarks

In standard biographical articles on Henrich Scholz, there are hardly any mentions of his relations with Polish logicians and philosophers.[1] This is highly astounding since historical documents testify that the exchange of ideas between Scholz and Poles was intensive and mutually fruitful. Besides, there are numerous similarities between the program of applications of logic in philosophy applied in the environment of Jan Łukasiewicz and Scholz's approach to these issues. The Warsaw-Münster analogies and similarities are much more numerous and striking than the Warsaw-Vienna or Münster-Vienna ones.

Scholz is described by Łukasiewicz as a person "connected with the Warsaw Logistic School by bonds of collaboration and friendship." The present article aims to present the scale and forms of interactions and influences between the German logician and Polish scholars, in the first place Łukasiewicz, who found in the Scholz his "ally." The interactions and influences will be shown from the perspective of Łukasiewicz's program of "logicisation" of philosophy.

I start, in point 2, with some general remarks on how logic and its applications were viewed in the Lviv-Warsaw School (Lvov-Warsaw School); especially in light of the tension between Kazimierz Twardowski and Łukasiewicz's approaches to logic. Then, in point 3, I sketch Łukasiewicz's program and the testimonies of his search for cooperation. In point 4, the analogies and areas of cooperation between Scholz and Polish logicians will be characterized. In point 5, I present the interpersonal relationships between Scholz and Łukasiewicz, Twardowski, as well as other Polish philosophers and logicians. In point 6, I concentrate on the role that the initiated friendship played in the dramatic period of World War II. I end, in point 7, with recapitulation and some general remarks.

2. Twardowski, Łukasiewicz, and Logic

In Poland, the attitude towards logic and its application to philosophy in the first half of the 20th century was largely the result of the interaction between two great personalities: Twardowski and Łukasiewicz. The crucial impulse for the development of scientific philosophy and mathematical logic in Poland came at the turn of the 19th century from Lwów.[2] In this city, then a Polish city being a part of Austro-Hungary empire, the chair of philosophy was given to Kazimierz Twardowski. The last one was a Pole born and Vienna and a student of Franz Brentano, and he aimed to instill "the spirit of scientific philosophy" in Poland.

Twardowski's view of logic was a complicated matter. On one hand, he considered logic, as well as descriptive psychology, the basic philosophical discipline, the organon of all sciences, including philosophical disciplines. He also tracked the newest tendencies in logic, among others the origin and development of mathematical logic. In his approach to the theory of judgment, reasoning, and concepts, he refuted psychologism for the position that combined anti-psychologism with anti-platonism which makes him an original representative of his epoch.

On the other hand, Twardowski was highly suspicious of the (over)use of formal methods in logic. He considered logic as a science of correct thinking which is applied in sciences and everyday thinking and thus he was convinced that the application of any mechanical procedures could be dangerous in this matter. Twardowski expressed these reservations most strongly in his text "Symbolomania and Pragmatophobia" (Twardowski, 1921). Twardowski's pragmatic attitude towards logic and his anti-platonism was often taken, also by his students, as a latent attachment to psychologism.

For the origin and development of mathematical logic in Poland, Twardowski's teaching practices were maybe more important than his views. Already his first lecture in Lwów (1895/1896) concerned logic (in a rather traditional frame), and all his students had to take logical courses. In the academic year 1900/1901 he lectured on "new tendencies" in algebraic logic. Although his attitude towards the presented tendencies was critical, the content of these lectures made a strong impression on some of his students, among others on Łukasiewicz.

The future founder of many-valued logic was one of the earliest and most talented Twardowski's PhD students. The role of the teacher in Łukasiewicz's development was indispensable. It was Twardowski who encouraged him, initially a student of the Law Faculty, to move to philosophy, and to take up logical matters (induction/deduction distinction; analysis of the concept of cause). Łukasiewicz owned to Twardowski also first logical impulses, as well as inclinations to scholasticism and Aristotle[3]. At the same time, Łukasiewicz was not satisfied with the way Twardowski dealt with logical matters and gradually became fascinated by mathematical ways of dealing with logic. He had also (as happens with gifted students) a strong need to be independent of his teacher. Later he wrote: "Because I approached logic by taking into account the mathematical direction, I became completely independent of Twardowski" (Łukasiewicz, 2013, p. 67).

All of that led to a "logistic turn" which took place while Łukasiewicz was still in Lwów. The first impulses came from Twardowski's teaching as well as from the lecture of Russell's *Principles of Mathematics* (1903), through which Łukasiewicz got to know, among others, about

Frege's results. The culmination of this turning period was Łukasiewicz's book "O zasadzie sprzeczności u Arystotelesa" [On the Principle of Contradiction in Aristotle] [1910], which included an *Appendix* on mathematical logic. This book became strongly influential in the environment. First of all, Stanisław Leśniewski joined his enterprise. In 1915, Łukasiewicz became the chair of logic at the University of Warsaw, newly reopened thanks to the decision of the German occupation authorities. He was joined by two other Twardowski's doctoral students: Leśniewski and Tadeusz Kotarbiński. This "triumvirate" became the pillar of Warsaw School of Logic which soon brought fruits in excellent and original results in mathematical logic. A "purely formal" work was accompanied by studies in the history of logic, initiated with Łukasiewicz's work on Aristotle, and continued with his studies in stoic logic. For Łukasiewicz, it was important to demonstrate that the new mathematical logic is a "natural" continuation (and generalization) of the best ancient logical traditions.

Łukasiewicz's "independence" of Twardowski was however never full. Many facts may testify that Łukasiewicz took Twardowski's opinion regarding logic and its applications into account. The emphasis on an intuitive interpretation of logical systems became an often-noted feature of Polish logic. This is probably one more influence of Twardowski who expressed his reservations about considering logic to be playing with "meaningless" symbols. Searching for applications of mathematical logic in philosophical investigations could also be a kind of "dialogue" with the "old" professor. Łukasiewicz and Twardowski shared some additional metaphilosophical views, namely dissatisfaction with classical philosophy (in case of Łukasiewicz, mostly towards modern logic and philosophy, in case of Twardowski mostly towards 19th century speculative philosophical systems) combined with optimism, namely the belief that (at least some) philosophical problems are meaningful and generally may be solved. However, while Twardowski found the way of healing philosophy in descriptive psychology and conceptual investigations, Łukasiewicz became convinced that only mathematical logic provides "the method" of philosophy that finally would make progress in philosophy possible.

This is how the program of logicisation of philosophy was born.

3. Jan Łukasiewicz's "Call For the Method", and His Search For Allies

Łukasiewicz was convinced that mathematical logic may offer something very important for philosophy. But what exactly? Can it be applied, for instance, to solve classical philosophical problems, such as determinism, realism, or mind-body dependency?

Łukasiewicz ardently believed that logic may be applied to study such problems. He articulated his approach to philosophy most lucidly in 1927, during the 2nd Polish Philosophical Congress in Warsaw where he presented the lecture "For the Method in Philosophy" published a year later [1928].[4] The congress was perhaps the most important philosophical event in Poland in the interwar period and Łukasiewicz's opening talk made a strong impression on its participants.

The content of Łukasiewicz's "call" is as follows. He starts with a critical assessment of the existing philosophy. To make progress in this field, one has to start anew, "from scratch," "from the foundations." At first, the philosophical problems should be revised to find those that can be formulated precisely. In Łukasiewicz's view, such problems are, among others, the questions of classically understood metaphysics (in an Aristotelian manner) as the most comprehensive theory of reality. The subsequent phase involves the application of a deductive, axiomatic method to address the selected problems. This phase comprises several stages: (i) Selection of sentences serving as axioms, chosen for their intuitive clarity and certainty. (ii) Identification of primitive notions within these axioms, provided that their sense may be elucidated comprehensively through examples. (iii) Providing definitions for non-primitive notions. (iv) Constructing proofs for theses that are not axioms. Łukasiewicz adds that the axiomatic theories created in this way should be confronted with the data of intuition and the results of natural sciences, in order not to construct fictions.

Łukasiewicz added that realization for such a program is a work for generations and that the application of "the method" in philosophy is a collective endeavor. It was thus obvious that allies to

contribute to this collective work had to be found. Of course, he had some supporters of his program in his close environment. Among others, Leśniewski's systems, Ajdukiewicz's "semantic epistemology," Zygmunt Zawirski' axiomatic metaphysics, Alfred Tarski's semantic theory of truth, and, of course, his own three-valued logic, may be considered as a partial implementation of his program.

However, Łukasiewicz searched for allies also in other scientific centers. He refers to some results of this search in his 1929 paper "On the Significance and Needs of Mathematical Logic in Poland" [1929]. Firstly, he mentions Rudolf Carnap:

> When I visited Vienna in 1928, I learned from him [i.e., Schlick] that in the series of J. Springer's Company in Berlin, entitled *Schriften zur wissenschaftlichen Weltauffassung*, a book by an associate professor of Vienna University, R. Carnap, containing a critique of philosophy from the point of view of mathematical logic, will be issued soon. (Łukasiewicz, 1929b, p. 431)

Unfortunately, Carnap's idea of the relation of logic to philosophy, his "purely syntactic" (at that time) approach, and, last but not least, his negative attitude towards metaphysics, did not make him a serious co-operator of Łukasiewicz. The latter could learn Carnap's position in detail during Carnap's visit to Warsaw in 1930.[5] A few years later, Łukasiewicz pointed out the main metaphilosophical differences between Warsaw and "the Viennese":

> [Contrary to] the Viennese [...], [who] consider certain problems, such as causality or determinism, problems from the domain of language syntax, [...] [I consider them] metaphysical problems, which require an empirical solution. [The view] of the Viennese [is also incorrect] [...] on the relation of *a priori* sciences to reality. It is true that within every logical system, logical statements can be solved regardless of experience; however, with respect to application to reality, certain logical systems can prove better than others, and then it is experience that will determine which of these systems should be deemed right. (Łukasiewicz, 1936, p. 69)

Secondly, in the paper on the needs of mathematical logic, Łukasiewicz mentions the establishment of relations with Scholz which appeared to be long and fruitful.

Before coming to the characterization of these relations, let us add that Łukasiewicz's "call for the method" was also answered during the next Polish Philosophical Congress which took place in Cracow eight years later, in 1936. In the announcement of this congress, the application of logic to philosophy was indicated as one of the main areas of interest. One of Cracow's contributions to this area is worth mentioning in the context of Łukasiewicz's Scholz relations. It was the meeting on applying logic to catholic theology and philosophy, later referred to as establishing the so-called Cracow Circle. To the group, founded under the patronage of Łukasiewicz, the following logicians and philosophes belonged: Józef M. Bocheński, Jan F. Drewnowski, rev. Jan Salamucha and Bolesław Sobociński. The objective of the group was to modernize Catholic theology and philosophy with the use of mathematical logic. Its members initiated applying logic to the analysis of theological concepts (such as the concept of analogy) and reconstructions of reasonings (such as proofs of God's existence). Unfortunately, World War II drastically finished the Circle's activity: rev. Salamucha died as a chaplain during the Warsaw Uprising in 1944, father Bocheński and Sobociński found themselves in exile, and Drewnowski, although he remained in Poland, did not undertake an academic career. Still, the Circle's ideas are developed today in the contemporary logic of religion and the analytic philosophy of God.

4. Scholz's "Response" to the Łukasiewicz's Call

The parallels in Łukasiewicz's and Scholz's biographies are striking. Both turned to mathematical logic as mature scholars. Both were disappointed by the state of contemporary philosophy and searched for "the method" for philosophical investigations. Both were fascinated by Aristotle, scholasticism, and great logicians such as Leibniz, Frege, and Russell. Both were interested in applying logic in metaphysics and the history of logic.

Scholz started as a theologian and philosopher of religion. After habilitating in theology and receiving PhD in philosophy, he was, in the years 1917-1919, a professor of philosophy of religion and systematic theology in Breslau; then from 1919 to 1928, he was a professor of philosophy in Kiel. In 1928, he moved to Münster where he worked first as a full professor of philosophy. In 1936 he started teaching logic and in 1943 he became the first German chair for mathematical logic. Scholz's logical "turn", which took place 15 years after Łukasiewicz's, was then much more striking and deep. The reason for the turn was probably his crisis of faith (his talk to Twardowski could suggest this, see below) and criticism towards traditional philosophy. Openly, as the reason for such a radical change of interests, Scholz indicated the contact with Russell-Whitehead's *Principia mathematica*, which became a certain illumination for him. The impulse was so strong that Scholz began his studies in mathematics and mathematical logic and soon, in the late 1920s, he became one of a few true specialists in this domain.[6]

Since Łukasiewicz actively searched for allies and since Scholz's position suited so well to the assumptions of Łukasiewicz's program, their cooperation was something natural. An additional factor was that both Łukasiewicz and Scholz were "born" educators and, therefore, both were able to cooperate effectively with other researchers in creative teams. However, when the cooperation was established?

For sure, the first contact took place before 1929. In particular, in his paper from 1929, already quoted above, Łukasiewicz referred to a letter he got from Scholz in the Summer of 1928:

> Professor of philosophy H. Scholz, who was recently active at the University of Kiel and is currently a professor at the University in Monastery in Westphalia, wrote to me in a letter dated August 13, 1928: "(I) would like to inform you..., that for the past five years, I have introduced axiomatics and logistics as a philosophical study subject here in Kiel, and therefore, I would like to request that you keep me informed about everything you publish in this field. Unlike almost all German university professors of philosophy, I am deeply and firmly convinced that the future of scientific philosophy will be found in these two areas, and for the time being, only in them." (Łukasiewicz, 1929, p. 431)

Was it the first Scholz's letter to Łukasiewicz? If yes, then what was the direct reason Scholz wrote it to Łukasiewicz? Is it possible that Scholz read Łukasiewicz's "Call for the Method" or rather he learned about Łukasiewicz's work from other sources, maybe from Moritz Schlick? Perhaps this riddle may be answered through further archival research.

Anyway, the connection was established and from that moment on, Łukasiewicz and Scholz exchanged their results and papers. Let us picture this cooperation by listing its published testimonies. In the paper "On the History of the Logic of Propositions" (1934), Łukasiewicz wrote:

> I rejoice in having found in H. Scholz, *Geschichte der Logik* (Berlin, 1931), p. 31, a supporter of this point of view [i.e. Łukasiewicz's interpretation of the Stoic dialectic ad a logic of propositions]. [...] In connexion with [...] [the] controversy between the Stoic and the Peripatetic schools, we are ultimately confronted with the question, whether the Stoics understood anything about the meaning in principle of their propositional logic, and, in particular, whether they were aware of having created a system of logic different from Aristotle's. Scholz believes that we must answer the first part of this question in

> the negative. For the second part of the question we have at our disposal two hitherto little-noticed accounts. (Łukasiewicz, 1934, p. 77)

In the paper on equivalent calculus (1937), Łukasiewicz states that the term "deductively equivalent" he owes "to the [...] paper of [Hans] Hermes and Scholz." Also in the "philosophical" paper on Descartes, Łukasiewicz mentions that it was Scholz who realized the "hidden" inference in the famous "I think, therefore I am" (Łukasiewicz, 1938).[7] Another mention appears in the paper on the problem of the foundations of mathematics Łukasiewicz 1941).[8]

Let us now list Scholz's mentions of Łukasiewicz. He described Łukasiewicz as "a leading Polish logistician," and calls him a "revered and dear friend from Warsaw" ("*verehrt liebe Warschauer Freunde*"). He considered Łukasiewicz's paper on Chrysippos logic from 1934 as "the most beautiful twenty pages from the history of logic." Scholz also emphasized the significance of Łukasiewicz's results in many-valued logic: "Łukasiewicz was the first to attempt to construct a system of such three-valued propositional logic, and he succeeded! Through years of painstaking work, this system has now been developed to meet all the demands placed on such a system today" (Scholz, 1938, pp. 262–263).

Scholz's statements about other Polish logicians and philosophers were also full of praise – this mainly concerned representative of the Lvov-Warsaw School, including Kazimierz Ajdukiewicz (with his "great interpretation of modalities"), Maria Kokoszyńska (with her "excellent study on absolute truth") and Tarski.[9]

Last but not least, let us mention Scholz's enthusiastic reaction to the program of the Cracow Circle. Scholz, a former theologian, and supporter of rationalization of beliefs, wrote about the day of establishing the Cracow Circle (Die Mathematische Logik und die Metaphysic. *Philosophische Jahrbuch der Gorres Gessellschaft*):

> In my judgment, September 26, 1936, is a day that deserves to be recorded in the annals of Neoscholastic philosophy. On September 26, following the Third Polish Philosophers' Congress in Cracow, a group of Polish Neoscholastics convened to discuss, under the leadership of K. Michalski and with the participation of J. Lukasiewicz, the extent to which Neoscholastic philosophy should embrace this new logic. The result of this meeting is now available in a separate book, spanning nearly 200 pages, titled *Myśl katolicka wobec logiki współczesnej* [Catholic Thought and Modern Logic], *Studia Gnesiensia* XV, Poznan 1937. (Scholz, 1938, p. 264)

Scholz even revealed that he learned Polish to follow the Polish works in this domain: "I have learned Polish to follow the works of Polish logicians written in the native language. So, I am somewhat better situated with this book than most German philosophers" (Scholz, 1938, p. 264).

At that time, Scholz got in touch with father Bocheński whose books he read and recommended.[10]

Here are the main points of these (often mutual) inspirations, not counting detailed solutions.[11] Firstly, the postulate of the use of analytic methods in philosophy, including metaphysics, and aiming at giving the philosophical theories a form of interpreted axiomatic-deductive form. Secondly, the a requirement to use clear and intelligible language in philosophical investigation. Thirdly, referring to the best philosophical traditions and interpreting the history of logic and philosophy through the prism of the newest results. It is evident that the pro-philosophical, and in particular pro-metaphysical attitude distinguished Warsaw-Münster Alliance from the anti-metaphysically oriented Viennese. Another matter is that the differences in this attitude toward metaphysics mainly arose from the fact that the concept of metaphysics was differently handled in these environments, as noted already by Kokoszyńska.

Scientific inspiration is only one sphere of Warsaw-Münster influence. Another, not less important, was the didactic sphere. The phenomenon of the Warsaw School (uniting young people interested in logic and philosophy) was something striking for all who visited Poland at that time,

including Ernest Nagel, Carl Menger, and Carnap. Scholz stated openly that Institut für Mathematische Logik und Grundlagenforschung was founded by him "*nach dem Warschauer Vorbild*" (see the next point). His initiative was similar to an idea brought forward by Twardowski at the University of Lwów at the end of the 19th century and it was identical to the plan that Łukasiewicz undertook when he obtained chair of philosophy at the University of Warsaw in 1915.

5. Interpersonal Relations

Interpersonal relations, in the form of meetings and correspondence, provided important impulses for the development of the mentioned cooperation. In the context of Scholz-Łukasiewicz contacts, these relations have particular meaning.

However, let us start with the first direct contact which took place in the 1930s.

Scholz visited Poland twice. The first visit took place in 1932 when he gave lectures both in Warsaw and Lwów. In Warsaw, on October 18th, Scholz delivered the lecture "Die moderne Prädikatenlogik als die erste exakte Darstellung der aristotelischen Ontologie" at the 370th meeting of the Warsaw Philosophical Society. From Warsaw, he went to Lwów where Kazimierz Twardowski was still active although retired. Thanks to Twardowski's diaries, we know some details on that visit.

On the first day of his visit, Scholz gave the lecture "Über analytische und synthetische Sätze" at the 320th meeting of the Polish Philosophical Society. Twardowski reported this day as follows:

> October 25, 1932. Professor Scholz visited us for lunch. He shared his difficult life experiences. As a result of these experiences, he lost his faith, which he had mainly practiced in the field of philosophy of religion. He turned to logistics as something entirely abstract, far from troubling issues. However, his broader philosophical interests remained. This was evident in his lecture in the evening at the Polish Philosophical Society, titled "On Analytic and Synthetic Propositions." In the afternoon, Scholz stayed with us until four o'clock, and in the evening, when I went to the society's meeting, I picked him up at George's Hotel. There were many people present. I welcomed Scholz with a short speech in German, pointing out that the study of logistics in Poland began in Lwów. The lecture was well-structured, clear, and concise, delivered very effectively, lasting an hour and almost three-quarters. (Twardowski, 1997, p. 248)

Let us stress some important elements of this note. Firstly, it seems that Scholz talked with Twardowski on his private matters, including the reasons for the crisis of his faith. This had to be interesting to Twardowski whose attitude towards the church was very complicated (he was not an orthodox Catholic but believed in a personal God). Interesting enough to mention it in the diary.

Secondly, it is worth emphasizing Twardowski's high estimation of Scholz's lectures. It is not usual; Twardowski was rather a severe reviewer of the presented talks. The series of epithets as "well-structured, clear, and concise, delivered very effectively" was something exceptional.

Thirdly, Twardowski emphasized in his introduction to Scholz's lecture that the systematic study of logic by Polish scholars began in Lwów, adding at the same time that the author of the first Polish work in the field of mathematical logic was Stanisław Piątkiewicz, a teacher from Przemyśl. It is significant that in his speech Twardowski expressed his awareness of the fact that exactly he was the initiator of this systematic research in the field of mathematical logic in Poland at the end of 19th century. The exposure of this fact was probably related to the fact that in the early 1920s his relations with Łukasiewicz "warmed up," and at the end of his life, Twardowski's reservations about the use of mathematical logic in philosophical research significantly decreased – or even disappeared. In the 1930s, Twardowski accepted the existence of the "logistic direction" in his school and even encouraged this kind of research. Scholz and his philosophical work could play a certain role in this change in Twardowski's attitude.

Anyway, Scholz's first lecture made such a great positive impression on the listeners that he was asked (possibly spontaneously?) to repeat in Lwów his Warsaw lecture the next day. Once again, let us rely on Twardowski's notes from October 26th:

> October 26, 1932. At seven o'clock, Scholz gave his second lecture. One could say the same about it as about yesterday's lecture, but with the added remark that it was even more beautiful. He spoke on "Modern Predicate Logic as the First Exact Representation of Aristotelian Ontology." After the lecture, [Roman] Ingarden and Kazik [*scil.* Kazimierz Ajdukiewicz] joined the discussion. The knowledge of Aristotle and the interpretation of certain concepts in his metaphysics were truly fascinating. The lecture made a strong impression on everyone, as could be observed. After the discussion, I bid farewell to Scholz with a few heartfelt words, thanking him for the intellectual feast he had provided us. (Twardowski, 1997, p. 248)[12]

The second visit of Scholz in Warsaw took place in 1938 already after Twardowski died and only a tear before Hitler's troops attacked Poland. Then the main reason for this second Warsaw trip was that Łukasiewicz got a doctorate *honoris causa* from the University of Münster; the diploma of honorary doctorate was taken from Münster by Scholz as a certain gift for Łukasiewicz for his 60th birthday. At a meeting of the Warsaw Scientific Society, Scholz gave a lecture, this time entitled "Sprechen und Denken. Ein Bericht über neue Gemainsame Ziele der Polnischen und der Deutschen Grundlagenforschung."

It is worth quoting larger fragments from this lecture, delivered by Scholz in the "demented times":

> It gives me great joy that at this moment and in this place I can refer to something that is very close to my heart, namely the bond that connects us with our Polish – and especially Warsaw – friends. This bond was established through research that, in a new and proper sense of the word, can be described as foundation research [*Grundlagenforschung*]. It can be described as foundation research because it attempts to achieve ultimate clarity [of our claims]. [...]
>
> When we talk about these things, we cannot forget about the school that brought them to life: [that is about] [...] the Warsaw School; among its representatives [apart from Professor Łukasiewicz and Professor Leśniewski] I must also mention Professor Tarski with his fundamental works on the methodology of deductive sciences, and especially with his work formulating a consistent concept of truth for these sciences. [...]
>
> In Warsaw, what we had been working on in Münster since 1928 (since 1935 as the "Münster Group") was accomplished [...]. [Namely, it was shown] that philosophical problems can [...] be solved by applying mathematical methods – and with a success that is not possible today using any other method. [...] The fact that we can now conduct this type of research, at this level, with this sense of form and content, is essentially [...] the work and merit of [our Warsaw friends].
>
> It is unthinkable that we would be without the Warsaw model – without the personal impressions and memories that I took with me from my first stay in Warsaw in October 1932, without the series of signals that have run from Warsaw to Münster since then, and without what, above all, all my noble friend, Professor Łukasiewicz, personally told me – they could have made such progress. During this period, he visited Münster three times, and I cannot truly comprehend what, thanks to these visits, I and all of us experienced in the most beautiful sense of the word. (Scholz, 1939, pp. 2, 5, 5, 29)

Even if we take into consideration that it was a speech prepared for the special occasion and thus is to some degree exaggerated, in the light of these words, the scope of the influences and inspirations taken from Warsaw by Scholz and his "Münster group" has to be viewed as enormous.

On December 20th, a ceremony took place at the German Embassy in Warsaw, where Hans von Moltke, the Reich ambassador in Poland, consigned the scroll of *honoris causa* doctor of the University of Münster to Łukasiewicz. Łukasiewicz recollected these events as follows:

> Professor Scholz and the dean of the Faculty of Natural Sciences in Münster, Professor [Adolf] Kratzer, appeared at our apartment in Sewerynów. They brought with them the honorary doctorate diploma in philosophy from the University of Münster. This diploma was awarded to me on the eve of my birthday at the German Embassy. Ambassador Moltke, with whom we were on friendly terms, hosted a breakfast, attended by guests from Münster and embassy members, as well as many of my colleagues from the University, including Rector [Włodzimierz] Antoniewicz, Professor [Tadeusz] Zieliński, [Stefan] Pieńkowski, [Stefan] Mazurkiewicz, [Adam] Krokiewicz, Leśniewski, [Czesław] Białobrzeski, and others. Also present was the director of the scientific fund, Stanisław Michalski. Professor Scholz delivered a beautiful speech in which he emphasized the debt of Münster's logical school to Warsaw. (Łukasiewicz, 2013, pp. 37–38)

It would seem that this cooperation will continue and become something fruitful in the future. Unfortunately, the "big (political) history" made things different.

6. The Strength of Friendship

Let us now recall the tragic events in the life of Jan Łukasiewicz between 1939 and 1945 and the role Scholz played by trying to rescue him from fatal conditions.[13]

In September 1939, during the Polish defense against Hitler, Łukasiewicz lost all his belongings, including his library and manuscripts. Due to German bombs, all his belongings went into ashes. Together with his wife, between 1939 and 1944, Łukasiewicz lived in the provisional house of professors. Since the university was closed, Łukasiewicz worked in the "neutral" Warsaw City Archives[14] (mainly as a translator). Since Łukasiewicz's salary was very low and there was a shortage of food in the city, Scholz tried to help Łukasiewicz financially. He also wanted to help him to find better work in German administration but this proposal had to be refuted by Łukasiewicz since working directly for the occupiers was unacceptable for the Poles.

In the years 1939-1944, Łukasiewicz, as well as other Polish philosophers and logicians, was also involved in secret teaching. Any form of education in Polish language on an over-primary level was strictly forbidden in Poland occupied by the Germans as Poles in the Nazi's plan were to serve as workers for the "higher race". The involvement in the Polish secret university, as well as in all other forms of underground resistant movement, was punishable by the death penalty. Still, the Polish professors fulfilled their teaching duties, convinced that the preservation of the Polish culture and continuity of collective scientific work is worth even risking life. Worth mentioning, among talented "underground" students there were two later renowned logicians: Helena Rasiowa and Andrzej Grzegorczyk.

After Hitler started to lose the war to Stalin, it became obvious in Warsaw that the city would be taken, sooner or later, by the Red Army. And this was what Łukasiewicz, an anticommunist and former minister in Ignacy Paderewski's government, was afraid of even more than German occupation. In the letters to Scholz, he also mentions that many members of his wife's family were deported by Bolsheviks to Siberia and some of them already died.

Łukasiewicz decided to escape Warsaw already in 1943. Scholz actively took part in this plan by helping him with getting permission at first to Beeskov by Berlin and then to Münster. Łukasiewicz reported:

> We wanted to go to Switzerland and Professor Scholz has already arranged the matter with Professor [Ferdinand] Gonseth in Zurich. But it was impossible to get German

> authorities' permission to go to Switzerland. It was easier to get the permission to the "Reich" as the "Reich" began at that time only a fiew miles west of Warsaw. On the ground of such a permission, on July 18, 1944, we went by train to Münster hoping that our friend would be able to help us to go further. But two days later, on July 20, the bomb-plot against Hitler broke out, and crossing the border became impossible for us. (Łukasiewicz, 2013, p. 13)

What an irony that Łukasiewicz who managed to escape from Warsaw before the Warsaw Uprising, got into the heaviest bombing of Allies against Hitler. Instead of in the ruins of Warsaw, Łukasiewicz spent the end of 1944 in the ruins of Münster, before he was rescued by von Kempski, a German of Polish origin and Scholz's colleague.[15] Although Łukasiewicz could not realize his plan to go to Switzerland, after some changes of places, he managed to find luckily a scholarly position in Dublin.[16] As an anti-communist, he could not come back to Poland hidden under the Iron Curtain.

Scholz's help for Łukasiewicz was only one of many manifestations of his true friendship with the Poles. These are some other examples. In November 1939, almost all professors of Jagiellonian University were arrested by Germans and sent to concentration camps. One of the imprisoned professors was rev. Salamucha, a catholic priest, a student of Łukasiewicz, and a member of Cracow Circle. As already mentioned, thanks to Scholz's interventions by the German authorities, Salamucha was released from prison. Scholz also played a certain role in keeping Tarski's contact with family. He helped Tarski to communicate from the USA with his wife and children who stayed in Poland. He also saved Bocheński's manuscripts during the war.[17]

Scholz's active help to Polish friends during the war had serious consequences for him. To actively help them, he had to get in touch with the Nazi government. After his interventions, he got a "reprimand" from the Minister of Science. He was also twice visited by the Gestapo. On the other hand, Scholz was attacked for publishing in the regime newspaper *Das Reich*. After the war, in the correspondence with Evert Beth, he explained his acts for these two reasons: help for Polish friends, and the will to preserve the institutions and research in Münster.

Worth mentioning that both Scholz and Łukasiewicz – became the subject of unfair accusations repeated till today by some historians of logic and philosophy: accusations of pro-Nazism and anti-Semitism of both great thinkers. As for Scholz, it is important to mention three testimonies: of Łukasiewicz, of Kotarbiński, and Henryk Hiż (a pupil of the first two). Łukasiewicz wrote in a letter from 1947 to Bocheński on Scholz: "He is an exceptionally good and honest German. During the war, he saved us as he could; he got the late Salamucha out from Dachau; he pled even for Jews. [...] He has never been a Hitlerian. Still, in the autumn of 44, he deprecated Hitlerians" (Łukasiewicz, 1988, p. 522). In 1965, Kotarbiński, in the "Foreword to the Polish edition" of *Geschichte der Logik*, wrote about Scholz:

> He was [...] a proven friend of the Polish logical community. He gave numerous proofs of this, not only by spreading favorable opinions about its achievements in Germany, but also by helping his Polish colleagues in various ways in bad times. At the same time, he firmly and indignantly distanced himself from racial prejudices. In general, he left behind the memory of a man with an ethical attitude deserving of deep respect. (Scholz, 1965, p. 6)

At last, in 2000, Hiż described the following incident that speaks for itself:

> Around 1937, Scholz visited Warsaw. They were difficult years. The German Embassy hosted a reception. Invited Kotarbiński refused to come and apologized personally to Scholz, who understood his reasoning. At this party (or maybe another time, due to the honorary doctorate for Łukasiewicz) was Władysław Witwicki and his wife. As they came up in line to Ambassador von Moltke, he said loudly to his wife: "No shake hands

> with this lady; she is a Jew". [After this event,] Scholz visited Tarski. He said at the beginning of the visit: "I come to show that there are still decent Germans." (Hiż, 2000, p. 58)

As for Łukasiewicz, three facts should be mentioned that determine his actual attitude to these matters. Firstly, when he was the rector of the University of Warsaw, he firmly (and effectively) opposed the demands of some student groups to introduce a *numerus clausus* for students of Jewish origin. This is confirmed by his official speeches and the testimony of his doctoral student, Maria Ossowska. Secondly, in his scientific environment, there were many Poles of Jewish descent. It is no coincidence that the authorized script of his lectures on *Elements of Mathematical Logic* was prepared by Mojżesz Presburger; Łukasiewicz's MA student was Mordechaj Wajsberg; a special place was occupied by Tarski, co-author, doctoral student, assistant and later docent (with the obvious patronage of Łukasiewicz). Thirdly, Łukasiewicz was among those who supported (unfortunately unsuccessfully) in favor of granting Tarski the vacant chair of logic at the University of Lwów. As we can see, the practice of insinuations is not a recent invention.

7. Closing Remarks

Sometimes the relationships between thinkers and their thoughts can be considered regardless of any personal connections between them. However, in the case of Jan Łukasiewicz and Heinrich Scholz, their friendship, subjected to the most severe trials, was an extremely important context for their scholarly exchange. The cited sources make evident that Jan Łukasiewicz found in Scholz a true ally in realizing his program of "logicization" of philosophy, which involves applying mathematical logic where it can contribute to a better framing or sometimes resolution of classical philosophical problems, including metaphysical ones. It is also evident that in the school established by Łukasiewicz in Warsaw, as well as in the broader phenomenon represented by the Lvov-Warsaw School founded by Twardowski, Scholz found a model worthy of emulation within his environment. The development of the relationship established in 1928 and evolving over the decade through collaboration and friendship was hindered by dramatic historical events. Heinrich Scholz excellently fulfilled the role of a true friend who does not abandon others in need, doing everything possible to save their lives and the results of their work.

Let us note, in the end, that for both Scholz and Łukasiewicz the possibility of scientific and didactic work was something essential, worth the greatest sacrifice, and at the same time something that sustained them through life. This is vividly and beautifully demonstrated by remarks about the latest logical results appended to their wartime correspondence.[18]

Scholz managed to maintain the center for mathematical and logical research established in Münster "*nach dem Warschauer Vorbild* ", and this institution continues to exist to this day. The Warsaw center, due to World War II, was destroyed and did not regain its pre-war glory, although research in the Lvov-Warsaw School tradition was in some forms continued by those who survived and remained in Poland, to the extent permitted by the post-war communist authorities. The fact that logical and philosophical research was continued in Warsaw and Münster is yet another factor that distinguishes these centers from Vienna. There, scientific philosophy did not regain favor for a long time after the war.

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Notes

1. See, for instance, the entry in *Stanford Encyclopaedia* only mentions Scholz's financial support for Łukasiewicz during WW2 – see: (Peckhaus, 2022). However, various aspects of Łukasiewicz-Scholz relations are partially presented in (Besler, 2021) and (Besler, 2022), (Besler et al., 2024), (Jadacki, 2005), (Molendijk, 2023), and (Schmidt Am Busch & Wehmeier, 2007).
2. The city in question, presently Lviv, the capital of Western part of independent Ukraine, had a very turbulent history in the last 120 years, and was a part of four different countries. When I refer to the previous period of the city's existence, namely first decades of the 20th century, I use Polish term "Lwów". In the name of the School, founded in this city by Kazimierz Twardowski, I use the term "Lvov-Warsaw School," since this version is used in all standards English entries and books on this intellectual group.
3. Łukasiewicz wrote to Twardowski in 1905: "This *interest in scholasticism* and Aristotle which you, Professor, managed to evoke with your lectures on the *history of ancient and medieval philosophy*, the esteem and affinity you expressed towards the scholastics, various fragments of your works […], and primarily, this *truly scholastic moment in disputing and reasoning* due to which I received my training in logic, all resulted in a dramatic change in my philosophical views, that can, however, be explained genetically, as the change was impacted by the environment, which celebrates the tangible, and was due to sustained work on my issues, where I believe I managed to obtain many new and important results. I was aided by the fact that Brentano was a Dominican and had written a monograph on Aristotle" (Łukasiewicz, 1998, p. 470). Italics mine, AB.
4. English translation of this talk is included as an appendix to (Brożek, 2022).
5. Detais of Carnap's visit are presented in (Brożek, 2021).
6. It seems that Scholz became interested in modern logic due to his teaching duties. It is known that he lectured an introductory course in logic 1920/1921 based on "traditional" Jevons' handbook. Possibly he discovered *Principia mathematica* while looking for new sources for his lectures. See
7. "These critical words do not come from me. They were already uttered six years ago in the German journal *Kantstudien* (vol. 36, 1931) by Professor Heinrich Scholz from Monastery in Westphalia, one of the advocates of scientific philosophy based on contemporary logic, and he had connections of cooperation and friendship with the Warsaw School of Logic" (Łukasiewicz, 1938, p. 372).
8. "We must be most grateful to Mr Heyting for undertaking, in 1930, to formalize the propositional calculus in the spirit of intuitionism. He succeeded in constructing a system of axioms for the intuitionistic propositional calculus. I shall not discuss these axioms here, but I shall present here a result I obtained in May of this year following a suggestion of my respected friend, Professor Scholz of Münster, which will make it easier to compare ordinary and intuitionistic propositional logic" (Łukasiewicz, 1941, p. 281).
9. A review of Scholz's statements about them can be found in (Jadacki, 2005). In this article, are also quoted opinions by representatives of the Lvov-Warsaw School (beyond Łukasiewicz and Twardowski himself) about Scholz – among others, opinions by Ajdukiewicz and Tadeusz Czeżowski.
10. "In the few months that have passed between the drafting and the publication of this work, the logician from the Dominican order, J.M. Bochenski, working at the Collegium Angelicum in Rome, has released two books that must still be mentioned here. I'll begin with the most recently published, an introduction to the new formalized logic written in Italian: *Nove lezioni di Logica simbolica*, Roma 1938, Angelicum, 183 pages. A few weeks earlier, as a gift from the author, the second book came into my hands: "Z histori logiki zdań modalnych" [From the History of the Logic of Modal Propositions], Lwów 1938, Wydawnictwo Oo. Dominikanów, 145 pages. The first real history of the theory of modalized statements from Aristotle to William of Ockham! […] Four significant figures emerge from the ranks in a manner that we previously knew nothing about: Aristotle, Theophrastus, Albertus Magnus, and William of Ockham. They appear with all their humanity in a peculiar magnitude that is not exaggerated when one wants to capture it with the words of the poet: "Stay a while; you are so beautiful!" (Scholz, 1938, p. 290).
11. See also (Jadacki, 2005, pp. 100–102).
12. There are three more entries on Scholz in Twardowski's *Diary*: (i) "October 12, 1932. "At noon – urgent correspondence, including [a letter] to Prof. Scholz in Münster, who promised to come to Lwów with a lecture at the invitation of the Polish Philosophical Society." (ii) "October 27, 1932. At noon, I went to the hotel to pick up Scholz, and from there, I went with Kazik [Ajdukiewicz] to the train station to see off our guest. Ingarden was also at the

station." (iii) "March 27, 1934. In the afternoon, I wrote a letter to Scholz." See respectively: (Twardowski, 1997, pp. 246, 248–249, 334).

13. See also (Schmidt Am Busch & Wehmeier, 2007) who tells the story of Scholz's help form Łukasiewicz through the prism of the correspondence and unpublished memories of von Kempski. Here, I focus more on the Polish sources.
14. See (Łukasiewicz, 1956).
15. The dramatic adventures of Łukasiewicz and his wife was described by Łukasiewicz in his *Curriculum Vitae* (1956), his Memories (2015), as well as in (Jadacki, 2005) and (Jadacki & Kinsella, 2022).
16. Łukasiewicz described his way from Germany, through Belgium to Ireland in (Łukasiewicz, 1956).
17. The help Scholz provided to Łukasiewicz during the war was recently described in detail and with the use unpublished documents in (Schmidt & Wehmeier, 2007). Incidentally, the fact mentioned by the authors that Łukasiewicz did not write from emigration to his Polish colleagues in the country after the war for fear of exposing them to harassment from the communist authorities was described *expressis verbis* by Łukasiewicz himself in his letter from 1947 to Father Bocheński: "I haven't heard anything from Warsaw so far; I do not write to anyone myself, because I do not want to endanger anyone. I have not even written to Father Michalski in Cracow, because I am afraid of harming him" (Łukasiewicz, 1998, p. 521).
18. See (Besler et al., 2024).