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Polish mathematicians and mathematics
in World War I.
Part II. Russian Empire

Abstract

In the second part of our article we continue presentation of individual fates of Polish mathematicians (in a broad sense) and the formation of modern Polish mathematical community against the background of the events of World War I. In particular we focus on the situations of Polish mathematicians in the Russian Empire (including those affiliated with the University of Warsaw, reactivated by Germans, and the Warsaw Polytechnic, founded already by Russians) and other countries.

Polscy matematycy i polska matematyka w czasach I wojny światowej. Część II. Cesarstwo Rosyjskie

Abstrakt

W drugiej części artykułu kontynuujemy przedstawianie indywidualnych losów matematyków polskich (w szerokim sensie) oraz kształtowanie się nowoczesnego polskiego środowiska matematycznego na tle wydarzeń I wojny światowej. W szczególności skupiamy się na sytuacji matematyków polskich w Cesarstwie Rosyjskim (także tych związanych z reaktywowanym przez Niemców Uniwersytetem Warszawskim i utworzoną jeszcze przez Rosjan Politechniką Warszawską) i innych krajach.

Słowa kluczowe: *polskie środowisko matematyczne, I wojna światowa, Cesarstwo Rosyjskie, Towarzystwo Kursów Naukowych w Warszawie, Polskie Kolegium Uniwersyteckie w Kijowie, nauczanie akademickie poza tradycyjnymi instytucjami, Mathematics Subject Classification: 01A60, 01A70, 01A73, 01A74*

1. Introduction

This article extends the study of Polish mathematicians and mathematics in World War I done in Domoradzki, Stawiska 2018. As before, we do not use any clear-cut criteria here, either for "Polish mathematicians" or "Polish mathematics". Such criteria always seem inadequate (Tatarkiewicz 1998; Duda 2012), especially if applied to the years from 1795 until 1918, when there was no Poland on the political map of Europe. We already considered a number of men born in Galicia (or in the Polish Kingdom) and educated there, speaking Polish as one of their primary languages, including a few who were ethnically Jewish and one German. In this part we talk primarily about men and women from the Polish Kingdom, but also about individuals born in other lands of the Russian empire to Polish-speaking families. Finally, we consider some

who spent the war years in other countries, on either side of the conflict (Germany, France and Italy[1]) or neutral (Switzerland).

The Russian partition of Poland consisted of the Polish Kingdom and Annexed Territories. The Kingdom of Poland was created in 1815 by the decisions of the Congress of Vienna from the territories of the former Duchy of Warsaw. First connected by personal union with Russia, it was gradually politically integrated into the Russian Empire, finally losing the remnants of its autonomy in 1867 as a result of the January Uprising (1863–1864). Since 1874 the country was officially referred to as "the Vistula Country" (Kraj Nadwiślański; Privislinskij Kraj).[2] This was the territory that initiated the most struggles for national independence, but all these efforts were lost and the country was subject to severe repressions. Some of them affected education and culture. All public high schools conducted instruction in Russian and the Main School in Warsaw gave way to the Russian-language Imperial University and Polytechnic. The use of Polish in official communication was forbidden. The administration and courts were staffed by Russians. Poles often had to look for education and career opportunities elsewhere, and many of them established themselves in other places in the Russian Empire. But the end of the 19th century in the Kingdom brought an amazing development of unofficial education in Polish at all levels, including academic one.

Russia entered the war as part of Triple Entente. Few university students and faculty were drafted into the army (it was not usual); some volunteered.[3] Academic teaching and research could go on, affected not so much by military operations of World War I,[4] but rather by compul-

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[1] Italy was a member of the Triple Alliance with Germany and Austro-Hungary, but in May 1915 it revoked the alliance and entered the war on the side of the Allied Powers.

[2] The name of "the Kingdom of Poland" was never formally abolished. Rarely used, it was preserved in the statute book "Svod Zakonov Rossijskoi Imperii".

[3] In Russia, the number of citizens mobilized for WWI was 13 million men, or 7.4% of the male population, plus 5,000 – 6,000 women (Beckett 2001). On the other hand, some Polish subjects of the Empire volunteered into Polish Legions, on the Austro-Hungarian side (Kutrzeba 1988).

[4] After 1917 educational activities inside Russian territories were disrupted by two revolutions and the civil war that ensued, as well as by the fighting for independent Ukraine, which created multiple short-lived Ukrainian states (Demidov 2015; Yekelchyk 2007).

sory evacuations,[5] travel restrictions, food and raw materials shortages. Even enemy aliens interned in the Empire could participate in scholarly activities under special circumstances (as did Wacław Sierpiński). New Polish academic institutions were organized (University of Warsaw, Warsaw Polytechnic, Polish University College in Kiev). Polish mathematical societies were established in Moscow and Kiev and talks were given. Monographs and textbooks appeared, journals were published (*Wiadomości Matematyczne*, *Prace Matematyczno-Fizyczne*, *Wektor*) or planned (*Fundamenta Mathematicae*, launched in 1920). Mathematicians were aided by physicists, astronomers, engineers and philosophers who in the circumstances of the war engaged in teaching mathematics at the academic level or in the activities of learned societies (this is why our definition of a "mathematician" here is somewhat broad). On the other hand, some mathematicians (Stanisław Leśniewski, Zygmunt Janiszewski) extended their activity to teaching at a high-school or elementary level when and where the need arose. A few also engaged themselves outside of mathematics and education: in political activities (Wiktor Staniewicz) or writing on cultural and religious Jewish themes (Chaim Müntz).

Did any of the scholars mentioned in this article or its previous part contribute their specific knowledge to the war effort in the years 1914–1918? It does not seem so, at least not directly. Leon Lichtenstein worked for the Siemens company in Berlin, which did support the German military effort, but he dealt with electric cables, not weapons or anything primarily associated with combat. His work, however, was deemed important enough to earn him German citizenship in the early days of the war.[6] No other mathematicians mentioned in our articles had ties to industry or institutions of war research. The military service in general did not call for higher mathematical skills, although basic knowledge of mathematics and engineering was required sometimes. Eustachy

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[5] The Russians evacuated about 130 industrial enterprises and 200 educational institutions – their personnel, equipment etc. – from the Polish Kingdom and part of Eastern Galicia, over 600 thousand people in total.

[6] His fate contrasts with that of Chaim Müntz, another Russian-born German-educated Polish-Jewish mathematician (known for the celebrated Müntz-Szasz theorem), who, despite being a serious researcher, educator and thinker, lost his job at a school in Hessen during the war.

Żyliński had to learn several engineering subjects in his officer's training in the Russian army in order to become an instructor to future officers. Stanisława Liliental (later Nikodymowa) taught basic mathematics[7] to Polish army recruits while on leave from her studies at the Warsaw University. Edward Stamm (see Domoradzki, Stawiska 2018 and the references therein) served in the Austrian army as a radiotelegraphist, officially translating cablegrams from French, English and Italian, but unofficially might have been involved in deciphering (we have no direct evidence of this, but in 1921 he published a treaty "On application of logic to the cipher theory" [O zastosowaniu logiki do teorii szyfrów]).

While we cannot find substantial evidence of anybody's research being directed by war needs, we can point out several instances of mathematical interests being influenced by war-related circumstances. The most notable cases are those of Stefan Banach,[8] Bronisław Knaster and Kazimierz Kuratowski. All had to interrupt their studies because of the war – Banach and Kuratowski in engineering, Knaster in medicine – but they found opportunities for pursuing mathematics and later became pillars of Lwów and Warsaw mathematical schools. Another interesting case is that of Tadeusz Banachiewicz, an astronomer working in Dorpat, who oriented his research in a theoretical direction after the instruments from his observatory were evacuated deeper inside the Russian Empire. We count him here because the interest in computational methods he developed at that time allowed him later to make some lasting contributions to mathematics (however, already in 1909 he published a paper concerning a problem in number theory). There were other cases of changing interests, but none of them suggestive of switching from pure mathematics to war-inspired applications. However, for Poland the war extended beyond November 11, 1918. The reborn state had to defend itself against the competing interests of its neighbors.

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[7] We were not able to find a curriculum of these courses. According to Aubin, Goldstein 2014, such training was also offered in other armies and included distance measurement and elements of ballistics. Popular texts were *Soldaten-Mathematik* by Alexander Wittig (Leipzig 1916) and *Elementary Mathematics for Field Artillery* by Lester R. Ford (Louisville, KY, 1919; first circulating as lecture notes).

[8] Banach's mathematical career was spurred by his serendipitous meeting with Hugo Steinhaus in 1916 in Kraków (Domoradzki, Stawiska 2018 and the references therein).

The fighting continued until 1921 (the Peace of Riga with Soviet Russia and Soviet Ukraine as well as the Third Silesian Uprising against Germany). During the Polish-Soviet war of 1920–21 Stefan Mazurkiewicz, Wacław Sierpiński and Stanisław Leśniewski were engaged in cryptography work (Nowik 2010; McFarland, McFarland, Smith 2014). Breaking the Soviet ciphers and getting access to secret information through radio intelligence contributed to Polish victory in the battle of Warsaw and thwarting the Soviet offensive. While Mazurkiewicz, Sierpiński and Leśniewski returned to their research in topology, set theory and logic, respectively, a new generation of codebreaking mathematicians grew in the Second Republic of Poland. The work of Marian Rejewski, Jerzy Różycki and Henryk Zygalski, young adepts of a cryptography course at the newly created University of Poznań,[9] was instrumental in breaking the code of the German cipher machine Enigma (Rejewski 1980a; Rejewski 1980b/1982; Christensen 2007).

2. Polish mathematicians in the Russian Empire

2.1. Warsaw

At the beginning of the 20th century two academic-level schools existed in the Polish Kingdom where mathematics was taught:[10] the Imperial University in Warsaw and the Polytechnic Institute in Warsaw. The language of instruction was Russian.[11] A few future Polish mathematicians graduated from the University, e.g. Kazimierz Żorawski (in 1888) and Wacław Sierpiński (in 1903). In the later years some Poles boycotted

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[9] The university was established in 1919, under the name of Polish University in Poznań (Uniwersytet Polski w Poznaniu). Its roots go back to the Jesuit College confirmed in 1611 by the Polish king Sigismund III Vasa.

[10] There were 4 institutions of higher education in the Kingdom in 1914; see Bartnicka 2014.

[11] Mathematics in the Russian institutions in the Polish Kingdom represented quite a high level. The most prominent mathermaticians were Dmitri Dmitrievich Mordukhai-Boltovskoi (1876–1952), who worked at the Warsaw Polytechnic, and Georgy Feodosevich Voronoi (1868–1908), who worked at the University. Nikolai Yakovlevich Sonin (1849–1915) spent his entire career at the Imperial University, starting in 1871. Vsevolod Ivanovich Romanovskii (1879–1954), who worked in Warsaw in the years 1911–1915, followed as a professor to Rostov-on-Don, and in 1918 to Tashkent (Duda 2016; M. B. Nalbaldian, Yu. S. Nalbaldian 1995).

these institutions, but those who could not go to other provinces of the Empire or abroad still sought their education in the Kingdom. **Zygmunt Chwiałkowski (1884–1952)** graduated from the Imperial University in 1913 and stayed there to prepare for an academic career. He published a monograph on functional equations in Russian in 1914 (NN6 2014; M. B. Nalbaldian, Yu. S. Nalbaldian 1995).[12]

At the same time, the Society for Scientific Courses (Towarzystwo Kursów Naukowych) organized education in Polish at pre-academic and academic level in multiple disciplines, which was not officially recognized, just tolerated. The mathematician **Samuel Dickstein (1851––1939),** a graduate of the Imperial University (who started his studies when instead of the university there was the Main School), was an active promoter of Polish education and scientific organizations. He published at his own expense two mathematical journals, the first such ones in Polish: *Wiadomości Matematyczne* since 1897 and *Prace Matematyczno--Fizyczne* since 1888. He co-founded the Warsaw Scientific Society (Warszawskie Towarzystwo Naukowe) and donated a library of mathematical books to be used by the Mathematical Study within the Society. In the years 1906–1916 he was active in the Mathematical and Physical Circle, which brought together over 100 teachers from the Polish Kingdom.

The strife of Poles for restoration of Polish higher education in the Russian partition and liberalization of education in general[13] culminated in the massive school strike in the years 1905–1908. At that time the authorities made only small concessions, but the break of the war in 1914 brought a mitigation of the Russian policies towards the Polish society. As early as August 14, 1914, the Grand Duke Nikolai Nikolaevich issued an address in which he pledged unification of "self-governing" Poland under the rule of tsars.[14] With the hopes for freedom rekindled, the newly established Warsaw Civic Committee (Komitet Obywatelski Miasta Warszawy) set up a proposal of restoring the University of Warsaw,[15] which would continue the traditions of

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[12] In the independent Poland Chwiałkowski taught mathematics at high schools and co-wrote a geometry textbook in 1935 with Wacław Schayer (1905–1959) and Alfred Tarski (1901–1983) (A. McFarland, J. McFarland, Smith 1995).

[13] One of the postulates was admission of women to academic education.

[14] The address did not have tsar's authorization.

[15] Dickstein contributed to this plan.

the Royal University (1816–1831) and the Main School (1862–1869). Meanwhile, as the Central Powers advanced in the spring and summer of 1915, the Imperial University was evacuated. The files, libraries and equipment went first to Moscow, where they were followed by the personnel. Then the University moved to Rostov-on-Don, where it remained ever since.[16] The Polytechnic Institute was also evacuated, to Nizhny Novgorod.[17]

On August 5, 1915, the German army entered Warsaw. The Polish Kingdom was divided into two occupational zones, German and Austro-Hungarian. On September 4, the Germans created the Warsaw general governorate with General Hans von Beseler (1850–1921) as the Governor-General. An idea emerged of creating a Polish state as one of buffer states in *Mitteleurope* under political, economical and military control of Germany.[18] Efforts were made to Polonize the administration and court system. **Władysław (Ladislaus von) Bortkiewicz (1868–1931)**, a professor of statistics at the Friedrich-Wilhelm University in Berlin since 1901 (born in St. Petersburg to a Polish family and educated there), was a "scientific statistical support worker" for the Civil Administration of the General Governorship of Warsaw (Zivilverwaltung des Generalgouvernements Warschau) from November 1916 to February 1917 (Sheynin 2011).

Opening Polish institutions of higher education was important. Such institutions would prepare future specialists and administrators for the new state in a way that would suit the controlling powers and keep young people out of trouble. Moreover, their existence would improve the attitude of Poles towards the German Empire, so the Central Powers could mobilize Polish men and use resources from the occupied territories. In these favorable circumstances, the Civic Committee's project was revisited. The Section for Higher Education (Sekcja Szkół Wyższych) was created, divided into two commissions: the University Commission and the Polytechnic Commission. The mathematician **Stefan Mazurkiewicz (1888–1945)**, a native of Warsaw, who studied

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[16] Even though officially renamed in 1917, it used the name "Warsaw University" until 1924.

[17] It later gave rise to the Nizhny Novgorod State Technical University.

[18] The idea was officially announced in a joint declaration by the two respective Governors-General, von Beseler and Karl Kuk (1853–1935) on November 5, 1916.

in Kraków, Göttingen and Lwów, was a member of the subcommission for mathematics and natural sciences. In the fall of 1915 a Polish university and a Polish polytechnic school were established. Count Bogdan Hutten-Czapski (1851–1937), a Polish aristocrat in German state service, was named a curator, whose function was to act as an official contact between the General-Government and the administrative structures of the new schools. Józef Brudziński (1874–1917), a physician, became the rector of the University. The rector of the Polytechnic School was **Zygmunt Straszewicz (1860–1927)**,[19] a graduate in mechanical engineering of Eidgenössische Technische Hochschule in Zürich and a former student of mathematics at the Imperial University,[20] who until 1916 lectured on differential and integral calculus in the Technical Section of the Society for Scientific Courses and until 1919 taught mathematics and mechanics at the private Mechanical-Technical School of Hipolit Wawelberg (1843–1901) and Stanisław Rotwand (1893–1916) (Bartnicka 2015; Kauffman 2015; Garlicki 1982; Duda 2016; Kutrzeba 1988; Chwalba 2014).

According to Kauffman (2015), in the 1915–1916 academic year, the university's teaching staff included thirty-six lecturers ("wykładający"), the highest rank afforded to teaching staff at that time, twenty-three assistants (asystenci), and six foreign-language instructors (lektorzy). There were 1,039 students enrolled in 1915–1916. The polytechnic school comprised four departments, where 25 teaching staff instructed about 600 students. **Kazimierz Kuratowski (1896–1980)**, a Warsaw native who had to interrupt his engineering studies in Glasgow because of the war, was one of the first students at the University. The introductory courses in mathematics he took in 1915 were the following: projective geometry taught by **Stefan Kwietniewski (1874–1940)** (in Kuratowski's reminiscence, his lecture was very modern and thorough), analytic geometry by **Juliusz Rudnicki (1881–1948)**, and algebra by Samuel Dickstein. Along with Kuratowski, the freshman class included, among others, **Bronisław Knaster (1893–1980)**,[21] who studied medicine in Paris before the war, but in Warsaw switched his interest first to

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[19] Stefan Straszewicz's uncle.
[20] Expelled in 1883 in connection with so-called *apuchtinada*.
[21] In 1914 Knaster married Maria Morska (1895?–1945), later a renowned actress, a columnist, and a muse to the Skamander poetic group (Koper 2011).

logic (he translated Louis Couturat's *L'Algèbre de la logique* into Polish), then to matematics; as well as **Stanisław Saks (1897–1942)**, a graduate of the private gymnasium of Michał Kreczmar in Warsaw[22] (Kuratowski 1973; Duda 1987; Zygmund 1982). The lectures in mathematics at the Polytechnic also included some advanced contents. **Szolem Mandelbrojt (1899–1983)**, who started his studies there in 1917, recalled Rudnicki presenting Weierstrass's example of a continuous nowhere differentiable function. However, Mandelbrojt found mathematics at the University more attractive, appreciating both lectures and the possibility of private interaction with the faculty, in particular with Zygmunt Janiszewski. He spent two years as a student in Warsaw, published a paper on number theory in 1919, and continued his education in Kharkov, Berlin and Paris (Mandelbrojt 1985).

The number of students at the University was rising through years, reaching about 4,500 in 1918. **Antoni Zygmund (1900–1992)**, who as a gymnasium student in 1914 was evacuated with his family to Poltava, returned to independent Poland in 1918, completed his education in Kazimierz Kulwieć's Gymnasium[23] and entered University of Warsaw in 1919. Zygmund became a student of **Aleksander Rajchman (1890–1940)**, a graduate of Sorbonne, who before the war was giving private lessons (to Szolem Mandelbrojt, among others), spent the year 1914/15 in Vienna on a scholarship from Władysław Kretkowski's[24] fund (Ciesielska 2016; Maligranda, Piotrowski 2017), and then worked at the University of Warsaw since 1919, starting at the rank of a junior assistant (Domoradzki, Pawlikowska-Brożek, Węglowska 2003).[25] Finally, women gained full access to higher education.

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[22] The Russians allowed private Polish schools, but their number was limited and they were subject to frequent inspections. After the school strike the situation eased. Kreczmar's school was known for its patriotic atmosphere.

[23] Kazimierz Kulwieć (1871–1943), a naturalist and explorer, organized a Polish gymnasium in Moscow in 1915, which he directed for 3 years. After returning to Warsaw he established a school for re-immigrants from Russia.

[24] Władysław Kretkowski (1840–1910), a mathematician and a benefactor of science, graduated from Sorbonne, got a PhD from Jagiellonian University and taught as a lecturer (*docent prywatny*) at Lwów Polytechnic and Lwów University.

[25] Since 1926 Rajchman was a *docent* at the University and an associate professor (*profesor nadzwyczajny*) at the Free Polish University (Wolna Wszechnica Polska). He worked on functions of a real variable and probability.

Stanisława Nikodym (née Liliental, 1897–1988)[26] enrolled at the University in 1916, but took a break in the year 1918–1919 to teach mathematics to army recruits. She returned to her studies and went on to receive her PhD in mathematics in 1925 as the first woman in Poland, to work as an assistant at the Warsaw Polytechnic and to publish several research papers in mathematics (Ciesielska 2017a; Ciesielska 2017b; NN4 1983).

Many of the faculty had previous connection to the Society for Scientific Courses. Kwietniewski, who got his PhD at the University of Zürich in 1902, concentrated his activities on popularizing mathematics, especially geometry, as well as translating and editing foreign textbooks and monographs. In the years 1907–1909 he taught at the Society for Scientific Courses and later contributed to the "Guide for the self-study". In the independent Poland he continued his university lectures in geometry on a basis of annual contracts. Rudnicki, a graduate of Sorbonne and later a PhD recipient from Jagiellonian University, taught in private Warsaw schools for men and women since 1912. At the same time he conducted lectures in mathematics at the Society for Scientific Courses (TKN) and at advanced pedagogical courses for women. After the Russians' retreat from Warsaw he was a member of the Polytechnic Commission of the TKN (the electrotechnical--mechanical sub-commission). After creation of the Warsaw Polytechnic he taught mathematics and (briefly) physics there. He was also active in the Society for Aid to the Victims of War (Towarzystwo Pomocy Ofiarom Wojny). Later he became a professor in Vilnius University (Królikowski 1989).

Among the faculty of the University there also were Stefan Mazurkiewicz and **Zygmunt Janiszewski (1888–1920)** (later the recipients of the first two chairs in mathematics). This was remarkable on two accounts. First, both of them were rather young; second, both were previously connected to Lwów (Janiszewski taught there as a senior lecturer (*docent*[27]) and Mazurkiewicz got his doctorate under Sierpiński in 1913) and Beseler (contrary to the wishes and efforts of the Civic Committee)

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[26] Otto Nikodym's wife.

[27] In Janiszewski's folder there is also a nomination for the position of an assistant for the period 1917–1919. He had a license to lecture; lectures were planned.

did not want too many professors from Austrian universities coming to Warsaw.[28] However, they had significant mathematical achievements and scholarly output: Mazurkiewicz published 16 papers and Janiszewski 20 papers before 1916. Janiszewski was available only part-time, as he was still serving in the military. Since 1916 Janiszewski and Mazurkiewicz conducted a seminar in topology at the university, possibly the first one in the world in this new discipline. Kuratowski, Knaster and Saks participated as students (Kuratowski 1979).

Student organizations played a major role in the academic life. For example, the analysis of Stanisław Zaremba's *Theoretical Arithmetic* by **Jan Łukasiewicz (1878–1956)**[29] in his course on methodology of deductive sciences prompted a discussion involving professors and students. The discussion of related issues continued in the meetings of Mathematical and Physical Circle of the Warsaw University, with Kuratowski giving a two-part talk on December 6 and 13, 1917, "On the definition of a quantity", which soon became his first scholarly publication (see Kuratowski 1979). On a larger scale, events related to Polish history and Polish national heroes were commemorated. However, the arrest of two students after celebrating the anniversary of the 3rd of May Constitution, led to the students' strike in 1917 and temporary closing of the schools. The occupational authorities transferred the control of the schools to the Temporary Council of State, the first government of the Kingdom of Poland. Józef Piłsudski, who held the authority over the military matters, resigned from the Council, which led to the so-called Oath Crisis. The Council was ultimately disbanded in August 1917. In the fall of 1918 Polish army started to organize itself and students were joining in great numbers. The Academic Legion (Legia Akademicka) – a unit comprised entirely of students – was formed.

The creation of Polish academic institutions did not eliminate the need for the Society for Scientific Courses. There still were many people

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[28] According to Kuratowski (1979), Mazurkiewicz supported the candidacy of the Polonized archduke Karol Stefan Habsburg-Lotaryński (1860–1933) for the throne of the Polish Kingdom under the auspices of Austro-Hungary and Germany.

[29] Łukasiewicz was a philosopher and a logician whose work was taking more and more mathematical character. He was a pioneer of multi-valued logic and an inventor of the Polish notation.

aspiring to higher education with insufficient credentials for admission, so the Society continued its activity during the war. The Department of Mathematics and Physics separated from the Department of Mathematics and Natural Sciences in 1915. In 1915/16 it run the following compulsory courses: descriptive and projective geometry, taught by **Wacław Gniazdowski (1864–1938)**;[30] analytic geometry, taught in the fall by **Romuald Witwiński (1890–1937)**[31] and in the spring by **Tadeusz Gutkowski (1881–1962)**;[32] introduction to analysis by **Władysław Wójtowicz (1874–1942)**.[33] The optional courses in the first semester were differential and integral calculus, taught by Juliusz Rudnicki, and vector calculus, by **Wacław Werner (1879–1948)**.[34] Lectures by Stanisław Leśniewski and Stefan Mazurkiewicz were also planned, but did not run. In the first and second semester there were respectively 27 and 19 students. In 1916/17, **Franciszek Włodarski (1889–1944)**,

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[30] Gniazdowski, a textile engineer, taught mathematics and technological subjects at the Technical School of the Warsaw-Vienna Railway (Szkoła Techniczna Drogi Żelaznej Warszawsko-Wiedeńskiej). After the school's evacuation he founded his own private 7-grade school of technology and transportation (Majewski 2007). He also taught mathematics at the Real 7-Grade School directed by Witold Wróblewski (1839–1927) with instruction in Polish in the years 1915–1918. Later he was a senior lecturer (*docent*) at the Warsaw Polytechnic, teaching principles of perspective at the Department of Architecture (NN1 1938).

[31] Witwiński authored several papers and problem books in geometry and at least 2 papers in number theory. Dates of birth and death after (Schinzel 1993).

[32] Tadeusz Gutkowski, an optical engineer, graduate of Institut d'Optique in Paris, taught mathematics in Warsaw high schools, and later worked in the optical industry (Gutkowski 2012).

[33] Władysław Wójtowicz – a teacher of mathematics, textbook author and translator of mathematical works. An editor of the journal *Wektor* for teachers, editor of a series published by the Mianowski Fund, author of high school geometry textbooks and logarithmic tables for the school use, later director of the Methodical Center for Mathematics (Piotrowski 2003).

[34] Wacław Werner studied electrotechnology in Darmstadt, mathematics and physics in Kraków, Göttingen and Fribourg. He received a doctorate from the Faculty of Mathematics and Natural Sciences in Fribourg. In 1909–1939 he taught physics in high school in Warsaw. In 1916/17 he was the dean of the Department of Mathematics and Physics in the Society for Scientific Courses. During that time he co-managed family-owned metal works. Since 1915 he worked at Warsaw Polytechnic, lecturing and conducting experiments; given the title of professor in 1948 (Werner 1998).

a geometer with doctorate from the University of Fribourg, started to lecture (Maligranda 2017; Błędowski *et al.* 1917–1919).

Mathematical subjects were also taught at the Department of Technology, among them trigonometry by **Tomasz Świętochowski**,[35] algebra with geometry by **Bruno Winawer (1883–1944)**[36] and analytic geometry by **Lucjan Zarzecki (1873–1925)**.[37] The recitation classes were taught by **F. Łazarski**[38] (differential and integral calculus), R. Świętochowski[39] (descriptive geometry), A. Winawer[40] (high school mathematics), W. Wójtowicz (higher mathematics as well as analytic geometry, together with the lecture). Later the Society also gave rise to the Free Polish University (Wolna Wszechnica Polska), a fully accredited private university operating in the years 1918–1952 in Warsaw and Łódź (Błędowski *et al.* 1919).

The publication of the series "Guide for the self-study" (Poradnik dla samouków)[41] continued during the war. A volume on mathematics, starting the second series, was published in 1915. It contained chapters written by Jan Łukasiewicz (On Science), Zygmunt Janiszewski (General Introduction; Introduction to Level III; Ordinary Differential Equations; Functional, Difference and Integral Equations; Series Expansions; Topology; Foundations of Geometry; Logistics; Philosophical Issues of Mathematics; Conclusion; Informational Section), Stefan Kwietniewski (Level I; Level II; Methodology of Teaching; Analytic

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[35] Świętochowski taught mathematics at the Real 7-Grade School directed by Witold Wróblewski with instruction in Polish in the years 1915–1919 (NN3 1977). We were not able to find the dates of birth and death for him (see the footnote below about R. Świętochowski).

[36] Bruno Winawer – a physicist, writer and popularizer of science, a graduate of University of Heidelberg.

[37] Lucjan Zarzecki – a mathematician and educator, a graduate of St. Petersburg University in 1897.

[38] We were not able to find the full first name and the dates of birth and death for him.

[39] Born 1882 (Kiepurska 1981); probably a misprint of the initial.

[40] Probably a misprint of the initial.

[41] The series appeared in several cycles in the years 1898–1932, financed by the Mianowski Fund. It was meant as an educational aid at an academic level. Each volume presented the development and the state-of-the-art of a given scientific topic, along with exhaustive bibliography. The editors were Aleksander Heflich (1866–1936) and Stanisław Michalski (1865–1949).

Geometry; Synthetic and Descriptive Geometry; Differential Geometry; History of Mathematics: History of Mathematics in General; History of Mathematics in Poland), Wacław Sierpiński (Arithmetics; Number Theory; Higher Algebra; Set Theory; Theory of Functions of a Real Variable; Differential and Integral Calculus; Differential Calculus and Summation), Stanisław Zaremba (Theory of Analytic Functions; Differential Equations with Partial Derivatives; Theory of Groups of Transformations; Calculus of Variations) and Stefan Mazurkiewicz (Theory of Probability) (Pawlikowska-Brożek 1992b). Marian Smoluchowski contributed a chapter on physics to the 1917 volume.

2.2. St. Petersburg (1914–1924 Petrograd; 1924–1991 Leningrad)

Polish presence was very strong in the Russian capital. In 1910 the number of Poles living there reached its historical maximum of about 65,000 (3.4% of the total population of the city). Polish nationals could be found among officers, civil servants, artists and scholars (Garczyk 2016).

Julian Karol Sochocki (Yulian Vasilievich Sokhotsky, 1842–1927), born in Warsaw, was educated at the University of Saint Petersburg and was a professor of mathematics there. His results in the field of one complex variable (Sochocki-Casorati-Weierstrass theorem, Sochocki-Plemelj formula) became classic. **Jan Ptaszycki (1844–1912)** was a professor of mathematics at the University of Saint Petersburg and at the Mikhailovskaya Military Artillery Academy. His work dealt with elliptic functions and algebraic differentials. **Wiktor Emeryk Jan Staniewicz (1866–1932)**, born in Samara, educated in St. Petersburg, held the chair of mathematics at St. Petersburg Polytechnic Institute since 1902. He worked in number theory and mathematical analysis. In 1909 his state service was suspended for three years, because illegal political activities were discovered to go on in dormitories that he supervised. In that period he lectured as a contract professor. In the years 1915–1917 he was the dean of the Faculty of Civil Engineering, in 1917–1918 a vice-rector. Polish mathematicians in St. Petersburg did not form a separate learned society, but were active in the Polish Union of Physicians and Naturalists (Związek Polski Lekarzy i Przyrodników). Sochocki also presided over St. Petersburg Mathematical Society in the years 1884–1927 (Domoradzki, Pawlikowska-Brożek 1999).

The year 1917 brought dramatic political and social changes to the Russian Empire. The (changing) authorities were trying to win the

support of Poles. In December 1916 Tsar Nicholas II as the commander in chief issued an order number 870 to land and maritime armed forces, which among the goals of further campaign mentioned the "creation of free Poland". In March 1917 the Provisional Government stated that it counted on forming a "free military union" with Poland in the future, while the Petrograd Soviet of Workers' and Soldiers' Deputies (later taken over by the Bolsheviks) announced Poland's right to complete political independence, and the general right of nations to "self-determination" (Zasorin 2017). In the circumstances favorable to the Polish cause, in July 1917 Staniewicz became a president of the Polish Radical-Democratic Union in Lithuania and Belarus (Polski Związek Radykalno-Demokratyczny na Litwie i Białorusi) and took part in the attempts to form the Polish National Executive Commission (Polska Narodowa Komisja Wykonawcza) in Russia. In October 1919 he moved to independent Poland and became a professor of mathematics at Stefan Batory University in Wilno (Vilnius), serving as its rector in the years 1921–1922. He was the first president of the Polish Mathematical Society (actually, the Society first elected Kazimierz Żorawski, who was absent from the meeting and could not take office [Jackiewicz 2002; Iwiński 1975]).

2.3. Moscow

According to the census from 1897, there were 9236 Poles living in Moscow, 0.89% of its population. The massive evacuations from the Polish Kingdom at the beginning of war raised this number.

Bolesław Młodziejowski (Boleslav Kornel'jevich Mlodzeevskii, 1858–1923) was born in Moscow in a physician's family.[42] He graduated from Moscow University in 1880 and became a professor of mathematics there in 1892. His research interest was in geometry. In 1902 he served as an opponent in the doctoral defense of Antoni Przeborski.[43] In 1911 he resigned from his position in protest against decisions of

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[42] Młodziejowski's maternal grandfather was a Czech musician Vincenz (Vikientii) Lemoch (1792–1862?), a brother of Wojciech Ignacy Lemoch (1802–1875), who was a professor of geometry and a rector of the Lwów University (NN2 1970; Pawlikowska-Brożek 1972).

[43] Other faculty refused, citing anti-Polish regulations from 1864 (Odinets 2014).

the enlightment minister Lev Aristidovich Kasso (1865–1914).[44] He continued his teaching activities at the Higher Courses for Women as well as at Moscow City People's University.[45] At the latter, he conducted lectures in differential geometry and introduced modern-style seminars. In January 1914, he chaired the organizing committee of the Second All-Russian congress of lecturers in mathematics, in which 20 speakers from Polish territories took part. After the February revolution in 1917 Młodziejowski returned to the university. In 1921 he became the first director of the newly created Research Institute of Mathematics and Mechanics at the Moscow University (Zverkina, Pugina 2009; Odinets 2014).

Stanisław Leśniewski (1886–1939), born in Serpukhov in the Moscow governorate and brought up in Irkutsk, studied philosophy and mathematics in Germany, Switzerland and Russia. He completed his doctorate in philosophy in 1912 at the Lwów University under the direction of Kazimierz Twardowski. Afterwards he taught at a school in Warsaw. When the war broke out, he went to Moscow.[46] He taught matematics at a Polish gymnasium and at the Real School of the Polish Committee of Aid to the War Victims (Szkoła Realna Polskiego Komitetu Pomocy Ofiarom Wojny), founded for boys from families that were evacuated from the Polish Kingdom.[47] Leśniewski was also active in the Polish Scientific Circle (Polskie Koło Naukowe). Through the Circle, he published his book *Foundations of General Set Theory, Part I* in 1916. The second part was planned for 1917, but never came out.

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[44] Kasso proposed new ways of staffing vacant chairs at Russian academic institutions, which met with disagreement of the professors.

[45] The People's University was also referred to as Shanyavskii's University, after its founder Alfons Lvovich Shanyavskii (Alfons Fortunat Szaniawski; 1837–1905), a general of Polish origin in the Imperial army. It was a research-oriented university, open to anyone regardless of their origin, education, gender, age, nationality, or religious beliefs. It operated in the years 1908–1918 (Ragulsky 2011).

[46] It is not clear why Leśniewski went there. It could be as a result of an evacuation or in connection with his political activities as a member of Social Democracy of the Kingdom of Poland and Lithuania (Socjaldemokracja Królestwa Polskiego i Litwy).

[47] The school was directed by the distinguished educator Władysław Giżycki (1875–1947). Among the students there was the future poet Konstanty Ildefons Gałczyński (1905–1953) (Gałczyńska 2003).

Despite the title, the book treated Leśniewski's own theory of parts, wholes and concrete collections, which was later developed into his system of Mereology. In 1918 he returned to Warsaw and on December 14 he submitted his habilitation dissertation in logic and philosophy of mathematics to be evaluated by Wacław Sierpiński.[48] In 1919 Leśniewski became a professor of philosophy of mathematics at the University of Warsaw. In 1920, along with Stefan Mazurkiewicz and Wacław Sierpiński, he contributed to breaking Soviet codes in the Polish-Soviet war (Betti 2009; A. McFarland, J. McFarland, Smith 2014; Simons 2015).

Wacław Sierpiński (1882–1969) – a native of Warsaw, a graduate of the Imperial University (under the direction of Georgy Voronoi) and a PhD recipient from the Jagiellonian University, was an associate professor (*profesor nadzwyczajny*) of mathematics and the interim leader of the Chair at the Lwów University since 1910. The outbreak of the war found him in Poznajów near Witebsk (Belarus), in the estate of his parents-in-law. As an Austro-Hungarian citizen, and hence an enemy alien, he was interned in the city of Vyatka (nowadays Kirov). Thanks to the efforts of Moscow mathematicians (mainly Dmitri Fyodorovich Egorov, 1869–1931) he was allowed to relocate to Moscow in 1915. The Rectorate of the Lwów University was notified of Sierpiński's internment in Moscow through the American consulate[49] in Vienna in February 1916. The university administration made efforts to transfer to Sierpiński his overdue (since 1914) salary using the same diplomatic channels, but they were unsuccessful.

The Moscow period was very fruitful for Sierpiński. It marked a beginning of his deep studies of the axiom of choice and its role in mathematics. He gave a talk on the subject at the meeting of the Moscow Mathematical Society on February 21, 1917.[50] He also started

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[48] The dissertation consisted of the works "Problems of the General Theory of Sets, I" and "A Criticism of the Logical Principle of the Excluded Middle".

[49] The United States of America remained neutral in the war until April 6, 1917.

[50] It was preceded by a note in *Comptes Rendus* of the French Academy in 1916. The expanded version of the talk was later published in French as "L'axiome de M. Zermelo et son rôle dans la théorie des ensembles et l'analyse" in *Bulletin International de l'Académie des Sciences de Cracovie. Classe des Sciences Mathématiques et Naturelles, Série A* 1918, pp. 97–152 and in Russian as "Aksioma Zermelo i eio rol' v teorii mnozhestv i analize" in *Matematicheskii Sbornik* 1922, vol. 31(1), pp. 94–128. See also Lewandowska 2013.
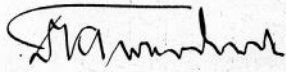
Science in Poland

S tudia
H istoriae
S cientiarum

965 ex 1916/17.

Lwów, 13.grudnia,1916.

Do
    Dziekanatu Wydziału
        f i l o z o f i c z n e g o.

Otrzymawszy w lutym 1916 za pośrednictwem amerykań-
skiego Konsulatu generalnego we Wiedniu wiadomość, że
prof.Sierpiński przebywa w Moskwie i pozbawiony jest swej
pensyi od października 1914, rozpoczął podpisany Rektorat
bezzwłocznie kroki, by zaległe pobory zostały prof.Sier-
pińskiemu do Moskwy w drodze dyplomatycznej przekazane.
Ciągnące się od tego czasu zabiegi dały jednak wynik ujem-
ny, jak tego dowodzi załączony w odpisie reskrypt Mini-
sterstwa wyznań i oświaty.

    Z Rektoratu c.k. Uniwersytetu lwowskiego.

                                    t.cz.Rektor.

1 załącznik.

Fig. 1. An official note about a failed attempt of the Lwów University to pay Sier-
piński his overdue salary through diplomatic channels (Lviv District Archive, per-
sonal file 26.5.1723; copy made for the first named author for non-commercial use)

a collaboration and friendship with Nikolai Nikolaevich Lusin (1883––1950).[51] In the years 1915–1918 he published 41 papers, 4 of them jointly with Lusin and 3 on problems related to Lusin's research (Sierpiński 1974). While interned, Sierpiński was active in the Polish Scientific Circle (Polskie Koło Naukowe) established in November 1915 in Moscow. Through the Circle he published the first volume of *Mathematical Analysis*, which he dedicated to the Polish University

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[51] The scientific relations later also extended to Lusin's students, who visited Poland and published in Polish journals.

in Warsaw.[52] He also gave talks in the Moscow Mathematical Society. In February 1918 he returned to Poland through Finland and Sweden. He resumed his lectures in Lwów in the summer semester 1918, but in the fall he moved to Warsaw. He was nominated for a full professor (*profesor zwyczajny*) of mathematics at the philosophical faculty of the Warsaw University by the decree of the Chief of State from March 28, 1919.[53] He announced his resignation from the chair in Lwów in a letter dated May 19, 1919, thanking his colleagues for the kindness they offered him during his stay in Lwów (Mioduszewski 1998; Sinkiewicz 1995; LDA-Sierpiński).

Kazimierz Jantzen (1885–1940) got a doctorate in astronomy in Munich in 1912. In the years 1912–1914 he was at the astronomical observatory in Potsdam. The outbreak of the war found him in Warsaw. As a German citizen, he was interned by the Russian authorities in Vyatka, and then transferred to Moscow. He taught in Polish high schools and was active in the Polish Scientific Circle. He published a book *On the influence of the spectral type of stars on determining the apex of the Sun (O wpływie typu widmowego gwiazd na wyznaczanie apeksu słońca)*. He returned to Poland in 1918, worked at the astronomical observatory in Warsaw, Warsaw Polytechnic (lecturing on advanced surveying and the error theory) and the Military Geographical Institute. Then he took a chair of astronomy at the University of Wilno (Vilnius), where he also lectured on analytic geometry, statistics and mathematics for naturalists (Domoradzki 2017; Rybka 1964). In 1932 he published a paper on a problem in number theory (Schinzel 1993).

2.4. Kharkov

The University of Kharkov was established in 1805 by a Polish aristocrat, Seweryn Potocki (1762–1829). In 1897 there were 3969 Poles living in Kharkov, 2.28% of its population. The distance from the front lines of the World War I allowed for the university activities to go on as usual, at least at the beginning of the war. **Jerzy (Yuri Cheslavovich)**

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[52] Like in the case of Leśniewski, the second volume was planned, but never appeared.

[53] The ordinary chair of mathematics was offered to Sierpiński by the Ministry of Religious Denominations and Public Education on February 27, 1919.

Neyman (1894–1981), born in Bendery, in the Bessarabia governorate, entered his second year of studies at the University of Kharkov in 1914/15. Rejected in the draft because of poor eyesight, he was preparing a paper on Lebesgue integral to enter a university-wide competition at the encouragement of his professor **Cezary (Cezar Karlovich) Russjan (1867–1934)**.[54] His 580-page work won and he received a monetary equivalent of the gold medal (the actual medal could not be awarded because of wartime restrictions on metals). In 1917 Neyman finished his course of studies and, on Russjan's recommendation, was granted a government stipend to prepare himself for an academic career. At the same time he started working in the Kharkov Institute of Technology as an assistant to **Antoni Bonifacy Przeborski (A. P. Psheborskii, 1871–1941)**,[55] in analytic geometry and introduction to analysis, and as a lecturer in elementary mathematics.

The wartime situation in the Russian empire was complicated by the outbreak of 2 revolutions: in February and October 1917, and by the Ukrainian-Soviet war. Ukrainian People's Republic of Soviets formed in 1917 in Kharkov fought Ukrainian People's (or National) Republic proclaimed in January 1918 and based in Kiev, which was aided by the Germans after the Brest-Litovsk peace treaty between Germany and Russia was signed on February 9, 1918. The fightings continued after the Germans withdrew. The University and Polytechnic Institute in Kharkov continued to operate under the Bolshevik rule (with some interruptions), opening their doors to many more people from underprivileged background. Neyman was assigned a task of teaching remedial classes in mathematics to these new students. In addition, he taught mathematics and physics in a newly opened Polish high school in Kharkov. He also spent a brief time in prison, arrested for bartering

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[54] Russjan got his doctorate in Odessa in 1900. For some time he held lectures at the Lwów Polytechnic and the Jagiellonian University. In 1907 he took the chair of mathematical analysis at the University of Kharkov. His main interests were differential equations and probability.

[55] Przeborski got his doctorate in 1902 at Moscow University. In 1908 he became an ordinary professor at the University of Kharkov. He also taught at Kharkov Polytechnic Institute, Women's Higher Courses and the Workers' University. His main interests were analytic functions, dfferential equations and variational calculus. In the independent Poland he was a professor of universities in Warsaw and Vilnius; he also taught mathematics and mechanics at the Warsaw Polytechnic.

matches for food in the black market. It was during the wartime that Neyman got interested in statistics (which later became the field of his highest achievements), through discussions he had with Sergei Natanovich Bernstein (1880–1968), newly promoted to professorship at the University of Kharkov.

In the years 1919–1920 Przeborski was the rector of the university, reorganized into the Academy of Theoretical Sciences. Neyman recalled that in the time of severe deprivations Przeborski arranged for the professors to obtain permission to chop trees in the nearby park for fuel. Due to a misunderstanding about legitimacy of the permission several professors were arrested, including Przeborski himself. He was released, later made the dean, and then the rector again. Eventually, Neyman and Przeborski left for Poland after the Polish-Soviet war (in 1921 and 1922, respectively). Russjan remained in Kharkov until his death in 1934[56] (Reid 1998; Kijas 2011).

2.5. Kiev

The Imperial St. Vladimir Kiev University, established in 1843, could be viewed as contination of the Krzemieniec Lyceum, since it started with the Lyceum's assets and its Polish faculty. It was a popular destination for Polish students; the poets Bolesław Leśmian (1877–1937) and Jarosław Iwaszkiewicz (1894–1980) studied there. Overall, there were 16,579 Poles in Kiev in 1897, 6.69% of its population. In 1919 the number went up to 36,800, or 6.77%. **Eustachy Żyliński (1889–1954)**, born to a Polish family in the Podolia district, graduated from the St. Vladimir University as a student of Dmitrii Alexandrovich Grave (1863–1939). He passed his exams for master's degree in 1914 in Kiev after taking a study trip to Göttingen, Cambridge and Marburg, then completing his exams and presenting a thesis "On the field of p-adic numbers". From 1912 to 1915 he worked at the St. Vladimir University. On April 16, 1916 he was drafted into the Russian army as a *Praporshchik* (ensign). As part of his officer's training, he completed several courses in engineering subjects and in radiotelegraphy in Kiev and Petersburg.

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[56] Some publications give his year of death as 1935. According to Savchuk and Kushlakova (2008) Russjan worked at the University of Kharkov until 1934 and remained a member of the Kharkov Mathematical Society until 1935.

On February 7, 1917, he was nominated to the rank of *Podporuchik* (Second Lieutenant). He became the Head of Radiotelegraphy of the South-Western Front, then he commanded an officers' class. He did not engage in combat; his main task was to teach electrotechnical subjects to the Staff of 103rd Front in Kamenets-Podolskii (Kamieniec Podolski; Kamianets-Podilskiy) and Berdichev.

On July 24, 1917, Polish I Corps was formed in Belarus from Polish soldiers serving on Northern and Western Fronts, under the command of General Józef Dowbór-Muśnicki (1867–1937). Żyliński reported to the commander of the Corps in November 1917. In the period from December 1917 to February 1919 he worked in the Polish University College, Ukrainian State University and Higher Private Polytechnic Institute in Kiev. He taught classes in analytic geometry, set theory, higher algebra and introduction to analysis. He got his habilitation at the Polish University College. He published one paper, "O zasadach logiki i matematyki" ("On the principles of logic and mathematics") in the *Reports of Polish Scientific Society in Kiev (Sprawozdania Polskiego Towarzystwa Naukowego w Kijowie)* in 1918. He also wrote 2 extensive works in the fields of algebra and logic during the period of war (both probably remained unpublished). On February 19, 1919, Żyliński went to Warsaw as an officer in the Polish army. He taught in the Officers' School of Communication. He remained in the military service until September 1919, still as a second lieutenant (*podporucznik*) in a radio-telegraph battalion. He was released to become an associate professor (*profesor nadzwyczajny*) of mathematics at Jan Kazimierz University in Lwów.[57] Earlier, he rejected an offer to take a chair of mathematics at the Kamianets-Podilsky State Ukrainian University (formed in 1918 under a law signed by Pavlo Skoropadskyi (1873–1945), Hetman of Ukraine). In Lwów he soon became the head of the Chair A. He initiated a revival of algebra in Lwów (Maligranda 2009; Domoradzki, Stawiska, Zarichnyi 2016).

Kazimierz Abramowicz (1888–1936), born in the Polish Kingdom, finished his course of studies in mathematics at St. Vladimir's University

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[57] Żyliński's candidacy was supported by a mathematical committee, consisting of an astronomer Marcin Ernst (1869–1930), a physical chemist Roman Negrusz (1874–1926), a philosopher Kazimierz Twardowski (1866–1938) and a physicist Ignacy Zakrzewski (1860–1932).

in Kiev in 1911, receiving a gold medal for his work "On hypergeometric functions with one removable singular point". He worked under direction of Boris Yakovlevich Bukreev (1859–1962). In 1914 he passed his master's degree exams and went to Berlin and Göttingen for further studies. Because of the outbreak of the war, he returned to Kiev. In the academic years 1914/15 and 1915/16 he lectured at the Kiev Polytechnic Institute. He was delegated as a senior lecturer (*docent*) to the Perm branch of the Petrograd University for the year 1916/17.[58] As the branch became an independent university in 1917, Abramowicz was nominated a full professor (*profesor nadzwyczajny*) in the chair of mathematics. Because of the war operations he could not return to Perm in the fall of 1918, so he taught recitation classes in mathematics at the Polytechnic Institute in Kiev. He returned to Poland in June 1920 and started working at the newly established University of Poznań in 1921. His research concerned mainly automorphic functions (Maligranda 2016, Schinzel 1993).

Izabela Abramowicz (1889–1973)[59] was the first woman to receive the 1st degree diploma at the Faculty of Mathematics and Physics of the St. Vladimir University in Kiev and a gold medal for the thesis "On double integrals on algebraic surfaces", in 1911. Like her brother, she worked under direction of Boris Bukreev. She stayed at the university, by permission of the education minister, but without a stipend, to prepare herself for exams towards her master's degree. She also taught at three gymnasia in Kiev. In the years 1917–1920 she lectured on introduction to mathematics (as a senior lecturer [*docent*]) at the Polish University College in Kiev.[60] She joined the College when it expanded its course offer

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[58] The branch was established in 1916 as a result of evacuation of the Petrograd University deep into the territory of the Empire, to safeguard people and to alleviate provisional shortages. Mathematicians Yakov Davidovich Tamarkin (1888–1945), Alexander Alexandrovich Friedmann (1888–1925), Abram Samoilovich Besicovitch (1891–1970), Nikolai Maximovich Gjunter (1871–1941), Rodion Osievich Kuzmin (1891–1949) and Ivan Matveevich Vinogradov (1891–1983) taught there in the early years (Demidov 2015).

[59] Kazimierz Abramowicz's sister.

[60] The College was established at the initiative of Wacława Peretiatkowiczowa (1855–1939), a headmistress of two women gymnasia in Kiev. It started in 1916 as Higher Polish Learning Courses, initially allowed to offer only a program in humanities. It continued in 1917–1919 as the Polish University College. The faculty was recruited

to mathematics and sciences. She was one of two women among the faculty members; the other one was Antonina Dylewska (1883–1951), a mineralogist. In addition to her teaching activities, Abramowicz was also a member of the short-lived Polish Scientific Society in Kiev. The College faculty and students started to leave as the fightings continued. Even after the Great War had ended, Kiev changed hands, passing from Germans to Ukrainians to Bolsheviks to White Russians to Ukrainians and Poles to Bolsheviks again. Abramowicz was supposed to leave Kiev in 1920 with the retreating Polish army (her name was on the list of those approved for departure). Only in August 1923 did she arrive in Poznań; no record is known of her whereabouts and activities in 1920–1923. During the Second Republic and after World War II she taught mathematics in high schools in Poznań (Maligranda 2016).

2.6. Yuryev (Dorpat; Tartu)

The University of Dorpat continued the traditions of a Jesuit college established by the Polish king Stefan Batory in 1583 and attracted many Polish students.[61] Among distinguished graduates there were Tytus Chałubiński (1820–1889), a physician and promoter of tourism in Tatra mountains, and Wincenty Lutosławski (1863–1954), a philosopher. Jan Niecisław Ignacy Baudouin de Courtenay (1845–1929), a renowned linguist, was a professor there in the years 1883–1893. **Tadeusz Banachiewicz (1882–1954)**, a native of Warsaw,[62] took a position of

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from Poles teaching at Russian institutions of higher education as well as academics from the Polish Kingdom and Galicia who for various reasons found themselves in the Russian Empire. About 40 people overall taught there. Some of them, including Eustachy Żyliński, obtained their habilitation at the College. The students – mainly Polish nationals from the Kiev Governorate, along with some incomers from the Polish Kingdom or Galicia – were interested in getting higher education and preparing themselves for professional specialization or teaching in Polish schools in the Western Ukrainian territories. The majority of them – 572 out of 718 in the first semester – were women. The College's activities were financed mainly by the Society for Supporting Polish Culture and Learning in Ruthenia (Towarzystwo Popierania Polskiej Kultury i Nauki na Rusi) (Róziewicz, Zasztowt 1991).

[61] Until 1893 the language of instruction was German. Then the university was fully Russified. The city itself was renamed Yuryev.

[62] Banachiewicz studied at Warsaw, Kazan, Moscow and Göttingen. He was involved in the activities of the Society for Scientific Courses. He was primarily an

a junior assistant in September 1915 at the Astronomical Observatory there, moving from the University of Kazan. He also submitted his thesis "Three essays on refraction theory", for which he got habilitation and became a lecturer (private *docent*) at the Yuryev University. It was difficult for him to carry out his observations as planned, because some instruments were evacuated to places further inside the Russian Empire. However, his theoretical work (on orbit determination, involving high-precision solutions to Gauss' equation) was going well and brought him the master's degree in 1917, which in turn led to nomination for a senior lecturer (*docent*), winning the competition for a professor position in 1918 and the appointment as the director of the observatory. The university was being transferred to Voronezh and Banachiewicz got a nomination for a professor's position there, which he did not accept. He was allowed by the German occupying authorities[63] to go to Warsaw in September 1918. The end of war and proclamation of independent Poland found him there. From October 1918 to March 1919 he was a deputy professor of geodesy at the Warsaw Polytechnic. In 1919 he took a chair of astronomy at the Jagiellonian University, which he was offered in May 1918 (Flin, Panko [2011]; Bujakiewicz-Korońska, Koroński [2016]).

3. Poles in other countries

Leon Lichtenstein (1878–1933) held PhD degrees in engineering and mathematics (from Technische Hochschule Berlin-Charlottenburg and Friedrich-Wilhelm University, respectively) and was active both as a mathematician and an engineer in Berlin. From 1910 (*veniam legendi*) to 1919 he taught at the Technische Hochschule Berlin-Charlottenburg, lecturing on synthetic and descriptive geometry, graphic static, vector calculus, trigonometric series, integral equations, potential theory and other subjects. At the same time (from 1902 to 1920) he worked for Siemens & Halske (later renamed Siemens-Schuckert Werke), becoming

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astronomer, but made a lasting contribution to mathematics by inventing the (non--associative) algebra of Cracovians. He is also credited with a proof of Schur's determinant formula.

[63] The independent Republic of Estonia was declared on February 24, 1918. The Germans withdrew from the territory and handed over control to the Estonian Provisional Government in November 1918.

a head of the electric laboratory in the factory of electric cables in 1906 and a mathematical expert in 1918.[64] The electrical industry was important for German economic growth.[65] The Siemens company was also active in the arms industry[66] and contributed to the war effort of the German Empire (it developed, among other things, a type of a rotary aircraft engine). The usefulness of his work was probably the reason why Lichtenstein, who was born in Warsaw and completed one-year "voluntary" service in the Russian army (in 1897), was able to obtain German citizenship in the first days of the war (Przeworska-Rolewicz 2005).

Chaim (Herman) Müntz (1884–1956), born in Łódź, obtained his doctorate in mathematics at the Friedrich-Wilhelm University in Berlin in 1910. He was unsuccessful in getting habilitation and academic position in Germany, so after a period of supporting himself with private lessons he became a teacher of mathematics in a boarding school called the Odenwaldschule near Heppenheim in southern Hessen.[67] He was given ample time to work on his mathematical research. In 1915 he left and took a position at another boarding school, also in Hessen (having only Hessian residency but no German citizenship he could not move freely), from which he was dismissed in 1917 as a "little Polish Jew". Müntz was able to write and publish 5 mathematical research papers while teaching. Also in 1915, he met and befriended the philosopher Martin Buber (1878–1965). He contributed (under the pseudonym of Herman Glenn) to a journal *Der Jude*, founded and co-edited by Buber (Ortiz, Pinkus 2005).

Mieczysław Biernacki (1891–1959): In the years 1909–1911 he studied chemistry at the Jagiellonian University. He was expelled for taking part in students' protests. Then he continued his studies at Sorbonne,

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[64] Some of Lichtenstein's engineering papers are mentioned here: High tension cable manufacture, present state and future. *London Electrician*, June 2, 1911; Testing high-tension cables. *Elek. Zeit.*, October 8, 1914.

[65] According to Eksteins (1989), by 1913 the value of German electrical production was twice that of Britain and almost ten times that of France, while Germany's exports in this area were the largest in the world, almost three times those of the United States.

[66] This activity resulted in January 1914 in the so-called Siemens Scandal involving bribes for supplying the Japanese navy.

[67] It was a renowned modern co-educational school, founded and run by the innovative educator Paul Geheeb (1870–1961).

switching to mathematics. When the war broke out, he voluntarily enlisted in the French army. He fought at the Western front, suffering gas poisoning and a severe wound. For his service he received the distinction of the Officer's Cross of the Legion of Honour. On June 4, 1917, the president of France issued a decree about forming an independent Polish army in France. Biernacki transferred to the Polish units. He returned to Poland with the Polish army under the command of General Józef Haller (1873–1960), also known as the "Blue Army". In 1928 Biernacki obtained a doctorate in Paris under the direction of Paul Montel (Montel 1962; Radziwiłłowicz 1997; Domoradzki 2013).

Juliusz Paweł Schauder (1899–1943): He graduated from Gymnasium VIII in Lwów in 1917, was drafted into the army and sent to the Italian front.[68] He was taken prisoner. While in the camp, he learned about a Polish army being formed in France under the command of Gen. Haller. On January 24, 1919, he reported to the local recruitment office and was enlisted into a company of ensigns in the rank of corporal. He returned to Poland with Haller's army and wore his blue uniform long after being discharged, because of material hardship (Derkowska 1990).

Stefan Straszewicz (1889–1983): He taught at the Society for Scientific Courses (fundamental notions of set theory, among other things). In summer 1913 he went to Zürich, thanks to the scholarship from the Mianowski Fund.[69] He got his PhD at the University of Zürich in 1914 under the direction of Ernst Zermelo (1871–1953) on the basis of the thesis "Beiträge zur Theorie der konvexen Punktmengen" (Research on the theory of convex sets). He continued his research in geometry and topology and translated into Polish the book *Stetigkeit und irrationale Zahlen* (Continuity and the irrational numbers) by Richard Dedekind (1831–1916). He belonged to the Union of Societies of Polish Youth for Independence (Unia Stowarzyszeń Polskiej Młodzieży Niepodległościowej), commonly called Filarecja. He returned to Poland in 1919. He fought in the Polish-Soviet war, then taught in Warsaw, first at the University and then at the Polytechnic (Piłatowicz 2006–2007).

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[68] The most important operations on the Italian front took place in the Isonzo valley. Ultimately the Italians prevailed and the armistice with Austro-Hungary was signed on November 3, 1918.

[69] According to Piłatowicz (2006–2007), Stefan Straszewicz's studies were financed by Zygmunt Straszewicz, his uncle.

Henryk Gustaw Lauer (1890–1937): Born in Warsaw, he took part in the school strike in 1905. In the years 1908–1910 he studied mathematics at the Polytechnic (ETH) in Zürich, in 1910–1912 at the Sorbonne in Paris. In 1914 he returned to Zürich, where in 1918 he obtained a doctorate in mathematics at ETH under the direction of Adolf Hurwitz and Herman Weyl on the basis of the thesis "Sur la réduction des formes positives d'Hermite". He authored a few papers in mathematics. He was active in the Socialist Union of Student Youth and in the Social Democratic Party of Switzerland. In 1919 he returned to Poland, joined the Communist Workers Party of Poland (Komunistyczna Partia Robotnicza Polski) and devoted himself entirely to the party activity.

4. Conclusion

Few individual losses, students developing interests in mathematics as well as the arrival of a few promising or already established mathematicians (Kazimierz Abramowicz, Jerzy Neyman, Antoni Przeborski, Wiktor Staniewicz, Eustachy Żyliński) after the fall of the Tsarist Russia and the Bolshevik upheaval meant that Poland did not experience a generational gap in mathematics, unlike France. The so-called Bourbaki thesis (see Aubin, Goldstein 2014) claims that the occurrence of such a gap hindered modern development of mathematics. Another statement discussed in (Aubin, Goldstein 2014), Forman's thesis, claims that the war caused a collapse of traditional ways of thinking and hence accelerated progress in physics and mathematics, especially in Germany. We have not argued here whether or how either of these theses could be applied to Polish mathematics and mathematicians. But we should point out an audacious proposal made during the war, which was crucial for the direction that Polish mathematics took afterwards. We mean here the publication of the article "On needs of Polish mathematics" ("O potrzebach matematyki polskiej") by Zygmunt Janiszewski in 1917, answering an appeal of a new journal *Polish Science. Its Needs, Organization and Development* (*Nauka Polska. Jej Potrzeby, Organizacja i Rozwój*), published by Mianowski Fund. In that article Janiszewski announced his famous program of advancing Polish mathematics and it was rather radical of him to propose that it should be done by concentrating research on one discipline, possibly in one academic center, and establishing a specialized scientific journal devoted to this discipline. Yet to a large extent

the program was carried out by the Polish School of Mathematics, continuing years after Janiszewski's premature death. Moreover, Janiszewski already practiced his program when the Polish university opened in Warsaw in place of the Russian one. In conducting lectures and seminars and developing research he was aided by like-minded colleagues such as Stefan Mazurkiewicz and Wacław Sierpiński. Topics in which he was interested managed to attract attention of several younger mathematicians. Janiszewski understood the importance not only of individual ideas, but also of research collaboration and institutional support. It took many intellectual and organizational efforts of Polish mathematicians before the Polish School of Mathematics emerged. The end of the Great War brought in the independent Polish state, in which the School thrived.

5. Acknowledgments

Bibliography

ARCHIVAL SOURCES

Lviv District Archive (LDA). W. Sierpiński, personal file, 26.5.1723.

STUDIES

Aubin, David; Goldstein, Catherine 2014: Placing World War I in the history of mathematics. [In:] *The War of Guns and Mathematics. Mathematical Practices and Communities in France and Its Western Allies around World War I.* Edited by David Aubin and Catherine Goldstein. Providence RI: American Mathematical Society. ISBN: 978-1-4704-1469-6, pp. 1–55 ("History of Mathematics", 42).

Bartnicka, Kalina 2014: Access to higher education and study for Poles in the second half of the 19th century. *Technical Transactions* 1-NP (7), pp. 13–35.

Bartnicka, Kalina 2015: How to study mathematics – the manual for Warsaw University 1st year students in the interwar period. *Technical Transactions* 2-NP (20), pp. 13–33.

Beckett, Ian F. W. 2001/2009: *The Great War 1914–1918*. Harlow: Pearson Education Limited. ISBN 978-0582322486 ("Modern Wars in Perspective"). Polish translation by Rafał Dymek 2009: *Pierwsza wojna światowa 1914–1918*. Warszawa: Książka i Wiedza.

Betti, Arianna 2009: Stanisław Leśniewski. *Polish Philosophy Page*, ed. by F. Coniglione. Available online (24.01.2018): http://segr-did2.fmag.unict.it/~polphil/polphil/lesnie/lesnie.html.

Błędowski, Ryszard *et al.* 1917–1919: *Dziesięciolecie Wolnej Wszechnicy Polskiej TKN: Sprawozdanie z działalności Towarzystwa Kursów Naukowych 1906–1916*, opracował Ryszard Błędowski [*et al.*]; redagował Stanisław Orłowski. Warszawa: nakładem Zarządu TKN: skład gł. w Księgarniach Gebethnera i Wolffa (Druk. K. Kowalewskiego).

Bujakiewicz-Korońska, Renata; Koroński, Jan 2016: The life of Tadeusz Banachiewicz and his scientific activity. *Studia Historiae Scientiarum* 15, pp. 275–300. Available online: http://pau.krakow.pl/SHS/shs-15-2016-11.pdf.

Christensen, Chris 2007: Polish mathematicians finding patterns in Enigma messages. *Mathematics Magazine* 80 (4), pp. 247–273.

Chwalba, Andrzej 2014: *Samobójstwo Europy. Wielka Wojna 1914–1918*. Kraków: Wydawnictwo Literackie. 978-83-08-05303-4.

Ciesielska, Danuta 2016: Rola Funduszu im. dra W. Kretkowskiego w kształtowaniu krakowskiego ośrodka matematycznego. *Studia Historiae Scientiarum* 15, pp. 157–192. Available online: http://pau.krakow.pl/SHS/shs-15-2016-7.pdf.

Ciesielska, Danuta 2017a: Stanisława i Otton Marcin Nikodymowie w Polsce i Stanach Zjednoczonych. [In:] M. Kordas, K. Kucharski, I. Stefaniak (eds.), *Polacy w Ameryce: Materiały z polsko-amerykańskiej konferencji naukowej z okazji 50-lecia Muzeum im. Kazimierza Pułaskiego w Warce, 27–28 czerwca 2017, t. 1*. ISBN 978-83-61790-56-3, pp. 143–156; tłumaczenie: *eadem*, Stanisława and Otto Nikodym in Poland and United States of America – Childhood and school years. [In:] *ibidem*, pp. 396–410.

Ciesielska, Danuta 2017b: A mathematician and a painter Stanisława Nikodym and her husband Otton Nikodym. *Mathematisches Forschungsinstitut Oberwolfach Report* 2, pp. 115–118. DOI: 10.4171/OWR/2017/2. "Mini-Workshop: Women in Mathematics: Historical and Modern Perspectives".

Demidov, Sergei S. 2015: World War I and mathematics in "the Russian world". *Technical Transactions* 2-NP (20), pp. 77–92.

Derkowska, Alicja 1990: Juliusz Paweł Schauder (1899–1943). [In:] *Matematyka przełomu XIX i XX wieku. Materiały z IV Ogólnopolskiej Szkoły Historii Matematyki*, red. S. Fudali, Szczecin, pp. 39–43.

Domoradzki, Stanisław 2013: Cztery doktoraty z matematyki uzyskane przez Polaków we Francji przed 1939 r. [In:] J. Bečvář, M. Bečvářovà (eds.), *34. mezinárodni konference Historie Matematiky*. Praha: Matfyzpress, Univerzita Karlova, pp. 93–100.

Domoradzki, Stanisław 2017: Wileńskie środowisko matematyczne w czasach młodości profesora Krzyżańskiego. [In:] Jan Koroński (ed.), *Wybrane zagadnienia dla równań różniczkowych*. Kraków. "Monografie Politechnika Krakowska". Series "Nauki Podstawowe Matematyka", pp. 57–66.

Domoradzki, Stanisław; Pawlikowska-Brożek, Zofia 1999: *Matematyka polska w okresie rozbiorów i dwudziestolecia międzywojennego*. Sprawozdanie z realizacji grantu KBN, kierownik S. Domoradzki, projekt realizowany w WSP w Rzeszowie w latach 1996–1999 (unpublished).

Domoradzki, Stanisław; Pawlikowska-Brożek, Zofia; Węglowska, Danuta 2003: *Słownik biograficzny matematyków polskich*. PWSZ Tarnobrzeg.

Domoradzki, Stanisław; Stawiska, Małgorzata 2018: Polish mathematics and Polish mathematicians during World War I. Part I: Galicia (Austro-Hungarian Empire). *Studia Historiae Scientiarum* 17, pp. 23–49. Available online: http://pau.krakow.pl/SHS/shs-17-2018-3.pdf.

Domoradzki, Stanisław; Stawiska, Małgorzata; Zarichnyi, Michael 2016: On algebra in Lwów in the years 1870–1939. [In:] *XIII Österreichisches Symposion zur Geschichte der Mathematik*, Herausgeber: Dr. Christa Binder, Tagung 1 bis 7 Mai (2016), Miesenbach (Niederösterreich): Österreichische Gesellschaft für Wissenschaftsgeschichte, pp. 86–95.

Duda, Roman 1987: Life and work of Bronisław Knaster (1893–1980). *Colloquium Mathematicum* 51, pp. 85–102.

Duda, Roman 2012: *Matematycy XIX i XX wieku związani z Polską*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego. ISBN: 978-83-229-3316-9.

Duda, Roman 2016: Matematyka. [In:] Andrzej Kajetan Wróblewski (red.), *Nauki przyrodnicze i ścisłe na Uniwersytecie Warszawskim*. Warszawa: Wydawnictwa Uniwersytetu Warszawskiego ("Monumenta Universitatis Varsoviensis 1816–2016"), pp. 671–749. Available online (24.01.2018): http://www.wuw.pl/data/include/cms/monumenta-ebook/pdf/Nauki-scisle-i-przyrodnicze-na-Uniwersytecie-Warszawskim.pdf.

Eksteins, Modris 1989: *Rites of Spring. The Great War and the Birth of Modern Age.* Boston – New York: A Mariner/Peter Davison Book, Houghton Mifflin Company. ISBN: 978-03-9593-758-7. Polish translation by Krystyna Rabińska: 2014 *Święto wiosny. Wielka wojna i narodziny nowego wieku.* Warszawa: Państwowy Instytut Wydawniczy, ISBN: 978-83-7785-294-1.

Flin, Piotr; Panko, Elena 2011: Tadeusz Banachiewicz in Tartu (1915 to 1918). *Baltic Astronomy* 20, pp. 305–308. Available online: http://esoads.eso.org/abs/2011BaltA..20..305F.

Gałczyńska, Kira 2003: *Zielony Konstanty czyli opowieść o życiu i poezji Konstantego Ildefonsa Gałczyńskiego.* Warszawa: Książka i Wiedza, wydanie drugie. ISBN: 978-8305131384.

Garczyk, Bartłomiej 2016: Polacy w Petersburgu od XVIII do początku XXI wieku. Historia, liczebność, struktura społeczna. [In:] Dariusz Konstantynow (red.), *Petersburg i Polska. Zbiór esejów.* Kraków: Międzynarodowe Centrum Kultury, pp. 5–32. Available online (24.01.2018): http://www.polskipetersburg.pl/zbior-esejow.

Garlicki, Andrzej 1982: Lata 1915–1920. [In:] Andrzej Garlicki (ed.), *Dzieje Uniwersytetu Warszawskiego 1915–1945.* PWN: Warszawa ("Polska XIX i XX Wieku"). ISBN: 8301028637.

Gutkowski, Witold 2012: *Życie w ciekawych czasach.* IPPT PAN Publications Collection. Available online (25.01.2018): http://www.ippt.pan.pl/Repository/zycie_%20w_ciekawych_czasach_15_10_2012.pdf.

Iwiński, Tadeusz 1975: *Ponad pół wieku działalności matematyków polskich. Zarys historii Polskiego Towarzystwa Matematycznego 1919–1973.* Warszawa: Państwowe Wydawnictwo Naukowe.

Jackiewicz, Mieczysław 2002: Wiktor Emeryk Jan Staniewicz. *Internetowy Polski Słownik Biograficzny.* Available online (26.01.2018): http://www.ipsb.nina.gov.pl/a/biografia/wiktor-emeryk-jan-staniewicz.

Janiszewski, Zygmunt 1917/1963: O potrzebach matematyki w Polsce. *Nauka Polska, Jej Potrzeby, Organizacja i Rozwój.* Warszawa 1917; reprint *Wiadomości Matematyczne* 7, pp. 146–155.

Kauffman, Jesse 2015: *Elusive Alliance: The German Occupation of Poland in World War I.* Cambridge, Massachusetts: Harvard University Press, ISBN: 978-06-7428-601-6.

Kiepurska, Halina 1981: Wykładowcy TKN (1906–1915). [In:] Ryszarda Czepulis-Rastenis (ed.), *Inteligencja polska pod zaborami. Studia.* Instytut Historii, Polska Akademia Nauk. Warszawa: PWN, pp. 261–309.

Kijas, Artur 2011: Polscy profesorowie na Uniwersytecie Charkowskim do 1917 roku. *Wrocławskie Studia Wschodnie* 15, pp. 47–64.

Knaster, Bronisław 1960: Zygmunt Janiszewski (w 40-lecie śmierci). *Wiadomości Matematyczne* IV, pp. 1–9.

Koper, Sławomir 2011: *Wpływowe kobiety Drugiej Rzeczypospolitej*. Warszawa: Bellona, ISBN: 978-83-11-12145-4.

Królikowski, Lech 1989: Juliusz Rudnicki (1881–1948). [In:] Sylwetki profesorów Politechniki Warszawskiej. *Pracownia Historyczna BGPW* 66, wyk. ZGPW z. 723/89 n. 100, 1989. Available online (25.01.2018): http://bcpw.bg.pw.edu.pl/dlibra/doccontent?id=877&dirids=1.

Kuratowski, Casimir 1947: Stefan Mazurkiewicz et son oeuvre scientifique. *Fundamenta Mathematicae* 34, pp. 316–331.

Kuratowski, Kazimierz 1972: Wacław Sierpiński 1882–1969. *Acta Aritmetica* 21, pp. 1–5 (1 plate, errata insert).

Kuratowski, Kazimierz 1973/1980: *Pół wieku matematyki polskiej 1920–1970. Wspomnienia i refleksje*. Warszawa: Wiedza Powszechna. English translation by Andrzej Kirkor: *A Half Century of Polish Mathematics. Remembrances and Reflections*. With a preface by S. Ulam. Elmsford, N.Y.: Pergamon Press, Inc.; Warsaw: PWN– Polish Scientific Publishers, 1980 ("International Series in Pure and Applied Mathematics" 108), viii+200 pp. ISBN: 0-08-023046-6.

Kuratowski, Kazimierz 1979: Zapiski do Autobiografii. Część pierwsza. Narodziny polskiej szkoły matematycznej. *Kwartalnik Historii Nauki i Techniki* 24(2), pp. 243–289.

Kuratowski, Kazimierz 1981: *Notatki do autobiografii*. Przedmowa: Ryszard Engelking. Warszawa: Spółdzielnia Wydawnicza Czytelnik.

Kutrzeba, Stanisław 1988: *Polska odrodzona 1914–1939* (przejrzał, uzupełnił i do druku przygotował Stanisław Grodziski). Wydanie pierwsze (piąte), Kraków: Społeczny Instytut Wydawniczy Znak. ISBN: 83-7006-092-7.

Lewandowska, Katarzyna 2013: Aksjomat wyboru w pracach Wacława Sierpińskiego. *Zagadnienia Filozoficzne w Nauce* LII, pp. 9–33.

Majewski, Jerzy S. 2007: Chmielna 88 – historia szkoły kolejowej. *Gazeta Wyborcza*, Warszawa 23 sierpnia 2007. Available online (25.01.2018): http://warszawa.wyborcza.pl/warszawa/1,97596,4428335.html.

Maligranda, Lech 2009: Eustachy Żyliński (1889–1954). *Antiquitates Mathematicae* 3, pp. 171–211.

Maligranda, Lech 2016: Kazimierz Abramowicz (1888–1936). *Wiadomości Matematyczne* 52/2, pp. 251–288.

Maligranda, Lech 2017: Franciszek Włodarski (1889–1944). *Antiquitates Mathematicae* 11, pp. 3–35.

Maligranda, Lech; Piotrowski, Walerian 2017: Aleksander Rajchman (1890–1940). *Wiadomości Matematyczne* 53/1, pp. 43–82.

Mandelbrojt, Szolem 1985: Souvenirs à bâtons rompus de Szolem Mandelbrojt. *Cahiers du séminaire d'histoire des mathématiques* 6. Edited by René Taton and Pierre Dugac. Institute Henri Poincaré, Paris, pp. 1–46.

Marczewski, Edward 1972: O pracach Wacława Sierpińskiego. Główne wątki prac mnogościowych. Wspomnienia i refleksje. *Wiadomości Matematyczne* 14, pp. 65–72.

McFarland, Andrew; McFarland, Joanna; Smith, James (eds.) 2014: *Alfred Tarski: Early Work in Poland – Geometry and Teaching*. With a bibliographic supplement. Foreword by Ivor Grattan-Guinness. New York: Birkhäuser/Springer. ISBN: 978-1-4939-1473-9; 978-1-4939-1474-6.

Mioduszewski, Jerzy 1998: Okres moskiewski Wacława Sierpińskiego. *Uniwersytet Szczeciński, Materiały z XI Ogólnopolskiej Szkoły Historii Matematyki, Materiały Konferencje* 30, Szczecin, pp. 67–72.

Montel, Paul 1962: Souvenir de Mieczysław Biernacki. *Colloquium Mathematicum* IX/2, pp. 362–363.

[NN1] 1938: Śp. Wacław Gniazdowski. *Głos Szkoły Zawodowej. Organ Stowarzyszenia Nauczycieli Szkół Zawodowych* (Warszawa) X/7–8, p. 2.

[NN2] 1970: Vincenz Lemoch. *Österreichisches Biographisches Lexikon und biographische Dokumentation, 1815–1950* 5 (Lfg. 22, 1970), p. 125, Verlag der Österreichischen Akademie der Wissenschaften, ISBN: 978-3-7001-3213-4. Available online (26.01.2018): http://www.biographien.ac.at/oebl/oebl_L/Lemoch_Vincenz_1792_.xml.

[NN3] 1977: Nauczycielstwo 1876–1976. Na podstawie monografii Szkoły autorstwa Bolesława Dunikowskiego "Szkoła imienia Tadeusza Czackiego w Warszawie 1876–1976", Warszawa 1977. Available online (26.01.2018): https://www.czacki.edu.pl/static/uploads/2017/10/Nauczyciele-Czackiego-1876-2016.pdf.

[NN4] 1983: Bibliography of the papers of Stanisława Nikodymowa. *Wiadomości Matematyczne* 25/1, pp. 87–88.

[NN5] 1992: Antoni Szczepan Zygmund: December 26, 1900 – May 30, 1992. *Studia Mathematica* 103/2, pp. 119–121.

[NN6] 2014: Warszawska baza nekrologów. Available online (26.01.2018): http://www.nekrologi-baza.pl/zlista/54.

Nalbaldian, M. B.; Nalbaldian, Yu. S. 1995: *Iz istorii Obshchestva Estestvoispytatelei pri Varshavskom (Donskom, Severo-Kavkazskom) Universitete*, dopolnitel'nyi material k lekcionnomu kursu "Istoria matematiki", Rostov-na-Donu: Rostovskii Gosudarstvennyi Universitet (inprint).

Nowik, Grzegorz 2010: *Zanim złamano „Enigmę" rozszyfrowano Rewolucję. Polski radionywiad podczas wojny z bolszewicką Rosją 1918–1920*. Warszawa: Wydawnictwo Rytm. ISBN 978-83-7399-425-6.

Odinets, Vladimir P. 2014: *Predtechi i pervye tvortsy pol'skoĭ matematicheskoĭ shkoly (1860––1922)*. Syktyvkar: Komi Gosudarstvennyĭ Pedagogicheskiĭ Institut (inprint), 60 pp. ISBN: 978-5-87661-250-2.

Ortiz, Eduardo L.; Pinkus, Allan 2005: Herman Müntz: a mathematician's odyssey. *Mathematical Intelligencer* 27/1, pp. 22–31.

Pawlikowska-Brożek Zofia, 1972: Ignacy Wojciech Lemoch. *Internetowy Polski Słownik Biograficzny*. Available online (26.01.2018): http://www.ipsb.nina.gov.pl/a/biografia/ignacy-wojciech-lemoch.

Pawlikowska-Brożek, Zofia 1982: Wykaz profesorów i docentów matematyki pracujących w polskich uczelniach w latach 1919–1939. *Wiadomości Matematyczne* XXIV, pp. 219–223.

Pawlikowska-Brożek, Zofia 1992a: Zygmunt Janiszewski – organizer of science and author of the idea of the Polish mathematical school. [In:] *Mathematics at the Turn of the Twentieth Century (Jaworze, 1988)*, Katowice: Uniwersytet Śląski, pp. 45–52 ("Prace Naukowe Uniwersytetu Śląskiego", Katowice, 1253).

Pawlikowska-Brożek, Zofia 1992b: "Poradnik dla samouków". Periodyczne wydawnictwo miarą rozwoju potrzeb intelektualnych społeczeństwa. [In:] J. Mioduszewski (red.), *Matematyka przełomu XIX i XX wieku. Nurt mnogościowy*. Katowice: Uniwersytet Śląski, pp. 53–60.

Piłatowicz, Józef 2006–2007: Stefan Straszewicz. *Polski Słownik Biograficzny* XLIV. *Internetowy Słownik Biograficzny*. Available online (25.01.2018): http://www.ipsb.nina.gov.pl/a/biografia/stefan-straszewicz.

Piotrowski, Walerian 1987: Aleksander Axer (1880–1948) i Henryk Lauer (1890––1939). *Wiadomości Matematyczne* 27/2, pp. 232–234.

Piotrowski, Walerian 2003: Wojtowicz (Wójtowicz) Władysław Baltazar (1874–1942). [In:] Domoradzki, Stanisław; Pawlikowska-Brożek, Zofia; Węglowska, Danuta 2003: *Słownik biograficzny matematyków polskich*. PWSZ Tarnobrzeg.

Piotrowski, Walerian 2014: Jeszcze w sprawie biografii Ottona i Stanisławy Nikodymów. *Wiadomości Matematyczne* 50/1, pp. 69–74.

Przeworska-Rolewicz, Danuta 2005: Leon Lichtenstein (1878–1933). On 125th anniversary of his birthday and 70th anniversary of his death. [In:] *European Mathematics in the Last Centuries*, pp. 99–122. Wrocław: Univ. Wrocław.

Radziwiłłowicz, Dariusz 1997: *Błękitna Armia. W 80 rocznicę utworzenia*. Warszawa: Ministerstwo Obrony Narodowej, Departament Społeczno-Wychowawczy

Ragulsky, Valerii V. 2011: About people with the same life attitude: 100th anniversary of Lebedev's lecture on the pressure of light. *Physics-Uspekhi (Advances in Physical Sciences)* 54/3, pp. 293–304.

Reid, Constance 1998: *Neyman.* New York: Springer-Verlag. ISBN: 978-0387907475.

Rejewski, Marian 1980a: An application of the theory of permutations in breaking the Enigma cipher. *Zastosowania Matematyki* 16, no. 4, pp. 543–559.

Rejewski, Marian 1980b: Jak matematycy polscy rozszyfrowali Enigmę. *Roczniki Polskiego Towarzystwa Matematycznego, Seria II, Wiadomości Matematyczne* XXIII, no. 1, pp. 1–28. English translation in: Rejewski, Marian 1982: Mathematical solution of the Enigma cipher. Translated from the Polish by Christopher Kasparek. *Cryptologia* 6(1), pp. 1–18.

Róziewicz, Jerzy; Zasztowt, Leszek 1991: Polskie Kolegium Uniwersyteckie w Kijowie (1917–1919). *Rozprawy z dziejów oświaty* 34, pp. 93–123.

Rybka, Eugeniusz 1964: Jantzen Kazimierz. *Polski Słownik Biograficzny* X, pp. 580––581.

Savchuk, Varfolomij S., Kushlakova, Nadiya M. 2008: Ucheni pols'koho pokhodzhennia v Kharkivs'komu Matematychnomu Tovarystvi, Istorychnyj Arkhiv. *Naukovi Studii* 2, pp. 152–159, http://istarhiv.chdu.edu.ua/article/view/67822/63084.

Schinzel, Andrzej 1993: Historia teorii liczb w Polsce w latach 1851–1950. *Wiadomości Matematyczne* XXX, pp. 19–50.

Sheynin, Oscar 2011: Władysław von Bortkiewicz: biografia naukowa. *Antiquitates Mathematicae* 5, pp. 249–266.

Sierpiński, Wacław 1974: *Oeuvres Choisies. Tome I: Bibliographie, Theorie des Nombres et Analyse Mathematique.* Warszawa: PWN (Hardcover).

Simons, Peter 2015: Stanisław Leśniewski. *Stanford Encyclopedia of Philosophy.* Available online (26.01.2018): https://plato.stanford.edu/entries/lesniewski/.

Sinkiewicz, Galina I. 1995: On the collaboration of Waclaw Sierpinski and Nikolai Luzin (Polish). Translated from the Russian by Stefan Zamecki. *Kwartalnik Historii Nauki i Techniki* 40/1, pp. 41–58. Available online: http://bazhum.muzhp.pl/media//files/Kwartalnik_Historii_Nauki_i_Techniki/Kwartalnik_Historii_Nauki_i_Techniki-r1995-t40-n1/Kwartalnik_Historii_Nauki_i_Techniki-r1995-t40-n1-s41-58/Kwartalnik_Historii_Nauki_i_Techniki-r1995-t40-n1-s41-58.pdf.

Tatarkiewicz, Krzysztof 1995: Materiały do historii mechaniki w Polsce. Warszawa (unpublished).

Tatarkiewicz, Krzysztof 1998: Co to są matematycy polskiego pochodzenia na obczyźnie? *Uniwersytet Szczeciński. Materiały Konferencje* 30, pp. 281–283.

Werner, Stanisław 1998: Profesor Wacław Werner (1879–1948). *Analecta* 7/1(13), pp. 183–215.

Woleński, Jan 1995: Mathematical logic in Poland 1900–1939: people, circles, institutions, ideas. *Modern Logic* 5/4, pp. 363–405.

Yekelchyk, Serhy 2007: *Ukraine: Birth of a Modern Nation.* Oxford: Oxford University Press. ISBN: 978-019530546-3.

Zasorin, Siergiej 2017: Luty 1917 r. w Rosji i dążenie Polski do niepodległości. *Sputnik Polska*, 10.02.2017. Available online (25.01.2018): https://web.archive.org/web/20170210080721/https://pl.sputniknews.com/swiat/201702104801929-Sputniknews-Rosja-1917-Polska-niepodleglosc/.

Zhang, Fuzhen (ed.) 2005: *The Schur Complement and Its Applications.* New York: Springer-Verlag, xvi+295 pp. ISBN: 0-387-24271-6 ("Numerical Methods and Algorithms" 4).

Zverkina, G. A.; Pugina, L. B. 2009: B. K. Mlodzeevskii – vydayushchiisya deyatel' vysshego matematicheskogo obrazovaniya. *Istoriya matematiki i matematicheskogo obrazovaniya. Trudy VII Mezhdunarodnykh Kolmogorovskikh Chtenii.* Yaroslavl: Izdatelstvo YaPGU, pp. 406–413.

Zygmund, Antoni 1982/1987: Stanisław Saks (1897–1942). *Wiadomości Matematyczne* 24/2, pp. 145–156. An abbreviated English translation in: A. Zygmund 1987: Stanisław Saks, 1897–1942. *Mathematical Intelligencer* 9/1, pp. 36–41 (translated from the Polish by Christopher Atkin).