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Iryna Banakh

Pidstryhach Institute for Applied Problems of Mechanics and Mathematics of NAS of Ukraine, Lviv, Ukraine

Olena Hryniv

Ivan Franko National University of Lviv, Lviv, Ukraine

Hidden Names: Women in the Polish Mathematical Society in Lwów in the Interwar Period

Ukryte nazwiska: Kobiety w Polskim Towarzystwie Matematycznym we Lwowie w okresie międzywojennym

The Polish Mathematical Society in Lwów was founded in 1917 and operated until 1939. Among more than 60 members were such well-known mathematicians as Stefan Banach, Hugo Steinhaus, Stanisław Ulam, Stanisław Mazur, and others. We would like to reveal the names of the female members of the society. There were seven of them, namely: Zofia Napadiewicz, Waleria Sabatowska, Zofia Starosolska, Sala Weinlos, Maria Homme, Helena Plamitzer, and Ada Halpern. Their scientific activities and life paths will be discussed in our report.

Martina Bečvářová and Jindřich Bečvář

Prague (Czech Republic)

Birth of the First Modern Czech Mathematics Textbooks

Powstanie pierwszych nowoczesnych czeskich podręczników do matematyki

In the lecture, we will describe the complex effort of Czech teachers who, from the beginning of the 19th century, sought to teach mathematics in the Czech language in secondary schools, polytechnics, universities and theological seminars, and conduct mathematical research in their native language. We will analyze the creation, content and quality of the first modern Czech mathematics textbooks – *Počátkowé Arytmetyky* [Basic Arithmetics] (1806) and *Základowé Měřictwj, čili Geometrye* [Basics of Measurement or Geometry] (1822) within a broader historical, didactic, mathematical, political, social and cultural context.

We will outline the complicated lives of textbook authors − Stanislav Vydra (1741−1804), a member of Jesuit order, mathematician, teacher, writer, patriot and revivalist, and Josef Vojtěch Sedláček (1785−1836), a member of the canonical order of Premonstratensian monastery in Teplá, teacher, mathematician, writer, patriot and revivalist. We will explain their role in the development of the Czech national revival and their influence on the teaching of mathematics at the University in Prague and at the Lyceum in Pilsen.

We will mention their difficult journey and cooperation with their students, colleagues and other Czech patriots, their stuggles with the political authorities, cultural and church representations. We will also show the national and linguistic problems they faced because their efforts were not understood and accepted by the main representatives of the Czech nation and especialy of the Vienna goverment.

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Address

Professor RNDr. Martina Bečvářová, Ph.D., and

Associated Professor RNDr. Jindřich Bečvář, CSc.,

Department of Applied Mathematics

Faculty of Transportation Sciences

Czech Technical University in Prague

Na Florenci 25,

Prague 1, 110 00

Czech Republic

becvamar@fd.cvut.cz

becvajin@fd.cvut.cz

Danuta Ciesielska

L.&A. Birkenmajer Institute for the History of Science of the Polish Academy of Sciences, Warsaw (Poland), e-mail: smciesie@cyfronet.krakow.pl, ORCID: 0000-0002-3190-5617

About Poles who studied under David Hilbert. Introduction to the research

O Polakach, którzy studiowali pod kierunkiem Davida Hilberta. Wprowadzenie do badań

In the period 1885–1933 more than 100 young Poles studied mathematics, physics and astronomy in Göttingen, five of them obtained PhD in pure or applied mathematics – two supervised by Hilbert, four in physics, three in physical chemistry. More than 60 Poles studied with Klein, most of them in Göttingen, about 40 Poles studied with Hilbert and more than dozen with Schwarzschild. Under Hilbert studied, among others, Aleksander Axer (1880–1948), Tadeusz Banachiewicz (1882–1954), Leon Chwistek (1884–1944), Wacław Dziewulski (1882–1938), Antoni Hoborski (1870–1940), Roman Ingarden (1893–1970), Jakub Laub (1882–1962), Antoni Łomnicki (1881–1941), Stefan Mazurkiewicz (1888–1945), Antoni Przeborski (1871–1941), Alfred Rosenblatt (1880–1947), Wacław Sierpiński (1882–1969).

It is clear that in those days Poles were trying to become a part of international society of scientists. *Nachlassverzeichnisse*. The result of my research is not impressive in numbers but is in my opinion interesting and presents new information. I will sketch the list of Hilbert lectures in Göttingen. I will verify information about Poles who studied with Hilbert. That is no easy work as in Hilbert *Nachlass* there is no *Dozent manuel* left. Fortunately, many certificates and some reports of Poles who studied in Göttingen I collected from the archives. It helps to verify some false belief about Hilbert's students and present some absolutely new information. These result will be presented during the talk.

After very careful studies on archival records, the problem of the exact number of Poles who obtained or failed to obtain doctorate under Hilbert is still open. There were at least two Poles with PhD under Hilbert. Michał Feldblum (1875–1925) from Warsaw was the first one. In 1899 he presented dissertation *Über elementar-geometrische Konstruktionen* (Warschau 1899). The next year he was promoted in Göttingen. The second one was Hugo Steinhaus (1887–1972) from Jasło, who in 1911 presented dissertation *Neue Anwendungen des Dirichlet'schen Prinzip* and the same year he was promoted by Albert Peters *cumma sum laude.* In 1914 Jacob Grommer (1879–1933) from Brest-Litovsk obtained PhD for the dissertation *Ganze transzendente Funktionen mit lauter reelen Nullstellen,* under Klein and finaly Hilbert. The problem is: was he Pole? He was born under Russian law. In 1920s he was using Polish passport but in 1930s he moved from Berlin to Belorussian SSR, not to Poland. At least one Pole failed his attempt to the degree. It was Włodzimierz Stożek (1883–1941). Probably the same happened to Zygmunt Janiszewski (1880–1920). These five stories I will presented in details during my talk.

I will also present some documents: letters and certificates. There was a very limited group of Poles who sent any letter to Hilbert. In the period 1900–1920 there were 12 Polish correspondents who

sent 23 letters on the number theory, differential equations or abstract functions but mostly on academic life, organization and congresses. The correspondents sent one or two letters. Leon Lichtenstein (1878–1933), Grommer and Vlodymir Levic'kij (1872–1956) sent them from Berlin. It was Marian Smoluchowski who was a real Hilbert's coresspondent. Extracts from some letters will be presented.

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Stanisław Domoradzki

Inter-Class Commissions for the Commission on the History of Science of the Polish Academy of Arts and Sciences (Kraków, Poland)

Institute of History University of Rzeszów (Poland)

Mykhaylo Zarichnyi

Institute of Mathematics, University of Rzeszów (Poland)

Ivan Franko National University of Lviv, (Ukraine)

Topology in the Lwów School of Mathematics of Stefan Banach

Matematyka stosowana w Lwowskiej Szkole Matematycznej Stefana Banacha

Despite the Lwów School of Mathematics created and led by Stefan Banach and Hugo D. Steinhaus it mostly know by its contribution to functional analysis, the topological results obtained by members of the School are also significant and had essential influence on the development of topology and related topics. In the talk, we will present a survey of topological results obtained in the Lwów School of Mathematics between the two world wars and discuss some of their applications.

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Olena Hryniv, **Iryna Mahdych**

Ivan Franko National University of Lviv, Lviv, Ukraine

Wawrzyniec Żmurko and his geometrical approach to teaching mathematics

Wawrzyniec Żmurko i jego geometryczne podejście do nauczania matematyki

Wawrzyniec Żmurko (1824 –1889) was a Polish mathematician. He studied at the Vienna University and Polytechnic School. In 1849, Żmurko published «Beitrag zum Integralcalcul», and was habilitated as an associate professor of higher mathematics at Vienna Polytechnic. In 1851 he moved to Lwów, where he was appointed a professorship in Mathematics at the Polytechnical School, and later, he became a professor at Lwów University.

Professor Żmurko was renowned for the originality of his courses and lectures. He operated on the principle that mathematics is intrinsically linked to space and that algebraic rules can be derived from spatial concepts. He designed his mathematics course to blur the line between algebra and geometry, even attempting to construct an analog of complex numbers in space.

Another area of Żmurko's scientific and technical research was the construction of mathematical examples for curve drawings. At an industrial exhibition in Paris in 1878, he demonstrated an integrator – a device for the graphical solving of integral calculus problems.

Izabela Jóźwik

Politechnika Łódzka, Łódź (Poland)

e-mail: izabela.jozwik@p.lodz.pl

Małgorzata Terepeta

Politechnika Łódzka, Łódź (Poland)

e-mail: malgorzata.terepeta@p.lodz.pl

100th anniversary of Banach-Tarski Paradox

100. rocznica Paradoksu Banacha-Tarskiego

One of the most paradoxical consequences of the axiom of choice is the paradoxical distribution of the sphere. Two eminent Polish mathematicians, Stefan Banach and Alfred Tarski, published it, hence the name Banach-Tarski paradox. 100 years ago, in 1924, the article [1] was published in Fundamenta Mathematicae and it was their only joint work. They presented a theorem which can be formulated as follows: The three-dimensional sphere K can be ”cut” into a finite number of parts from which, using only translations and rotations, two spheres congruent to the sphere K can be assembled (equivalent to the sphere K by finite (decomposition).

The theorem is completely contrary to our intuition because, on the one hand, the volume of the sphere is doubled as a result of cutting, moving, rotating and folding and, on the other hand, the translation and rotation operations used are isometric, i.e. they preserve the volume of the solid.

The essence of the problem is that the parts into which the sphere is divided are not Lebesgue measurable, i.e. they have no volume. Hence the additivity of measure, according to which the sum of the measures of disjoint measurable sets is the measure of the sum set of these sets, cannot be applied to them. In our talk we will present the history and some consequences of the Banach-Tarski paradox.

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Stanislawa Kanas

Institute of Mathematics University of Rzeszów (Poland)

Polskie Towarzystwo Kobiet w Matematyce

e-mail: skanas@ur.edu.pl

The visibility of women in science

An explicit goal of the equal opportunities work at PTKM is to increase the visibility of women in science. Promoting women therefore means, on the one hand, searching for role models to emulate, and on the other hand, the implementation of equal opportunities that are hampered by learned prejudices, gender stereotypes and role clichés. These unconscious biases affect the way we think, speak and act and they are reproduced in our everyday scientific lives as well.

It is documented that talking about great personalities in science in a as geniuses or brilliant encourages a belief alludes to the fact that they were born with certain predetermined traits of character or intelligence. Women have been found to be especially under-represented in fields where innate talent is led to be believed as a primary requirement for success, especially if they are stereotyped as not possessing it.

Jan Koroński

Cracow University of Technology, Department of Applied Mathematics Faculty of Computer Science and Telecommunications, ul. Warszawska 24, 31-155 Cracow, Poland E-mail:
jan.koronski@pk.edu.pl jan.koronski@gmail.com https://orcid.org/0000-0001-6440-6526

Around the Books of Protocols of the Mathematical and Physics Society of Students of the Jan Kazimierz University in Lvov

Wokół ksiąg protokołów Koła Matematyczno-Fizycznego Studentów Uniwersytetu Jana Kazimierza we Lwowie

The subject of the study is the analysis of two books of protocols from the years 1899-1906 and 1911-1923 of the Mathematical and Physical Students' Society of the Jan Kazimierz University in Lvov from the perspective of time. In particular, we will show the further fate and scientific significance of the members of this Society. Moreover, we will indicate the participation of outstanding representatives of the Lvov School of Mathematics in the activities and their influence on the members of this Society.

Archival sources:

[1] Book of protocols of the Mathematical and Physical Society of Students of Jan Kazimierz University in Lvov from the years 1899-1906.

[2] Book of protocols of the Mathematical and Physical Society of Students of Jan Kazimierz University in Lvov from the years 1911-1923.

Przedmiotem opracowania jest analiza dwóch ksiąg protokołów z lat 1899-1906 i 1911-1923 Koła Matematyczno-Fizycznego Studentów Uniwersytetu Jana Kazimierza we Lwowie z perspektywy czasu. W szczególności pokażemy dalsze losy i znaczenie naukowe członków tego Koła. Ponadto wskażemy na udział wybitnych przedstawicieli Lwowskiej Szkoły Matematycznej w działalności i ich wpływ na członków tego Koła.

Źródła archiwalne:

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Christine Phili

National Technical university of Athens (Greece)

Caratheodory's memorandum in order to reorganize the university of Athens in 1930

Memorandum Caratheodory'ego w sprawie reorganizacji uniwersytetu w Atenach w 1930 r.

In May 1928 the great Greek statesman El. Venizelos (1864-1936) returned on the political stage and in August 1928 he won the elections by an overwhelming majority(225 deputies over 250). As one of his main task was the reform of the higher education for the third time he invited Caratheodory from Munich to present his proposals in order to reorganize the University of Athens , established by King Otto (1815-1867) in 1837.

The great mathematician of Diaspora being aware of the unstable political situation in Greece didn't resign from his post in Munich university and could obtain a leave of absence staying in Athens during the spring semester. In order to realize his new task he was appointed by a decree of 3 October 1931 as Governmental Commissioner ,having the task to control the implementation of law, to participate without vote in all committees and to supervise the academic authorities, a post which resounded the first article of Metternich's Carlsbad decrees in 1819, regarding the special representative.

Caratheodory's memorandum which was edited in 1930 contains 357 articles which could modernize the status of the Athenian university, without copying the western institutions .His memorandum had as principal task to regulate the financial questions, to construct new buildings for the medical school, to reduce the number of students(from 6400 to 2850), to increase the fees, to establish an editorial house, to increase the number of seminars and to reduce the ex cathedra teaching. Moreover he demanded the reduction of the number of full professors, the increase of he number of privat dozent, and to reward , doubling their salaries, the academics who will opt to devoted themselves entirely to their functions (teaching and research).

It might be stressed that his reform was proclaimed undesirable by the students, as the *numerus clausus* and the increase of the fees affected their majority. On the other hand his colleagues were also against this new reform

Important manifestations paralyzed the city of Athens but finally his memorandum was agreed by the parliament on the 23 of March 1932.

However in April 1932 Caratheodory, once more was obliged to leave his homeland, as the resonances of the Great Depression of 1929, led the prime minister to proclaim a temporary external debt. As his government was weakened, in 21 of May 1932 Venizelos gave his resignation. The professor of the medical School professor N. Alevizatos (1876-1945) became the new Governmental Commissioner until 1933 when this post was abolished.

However Caratheodory's memorandum with few additions became the basis for the university law 5343 of 23 March 1932, and lasted for 50 years. It was substituted in 1982 by the new law 1268 of A. Papandreou socialist government.

Paweł Perekietka

e-mail: pawel.perekietka@gmail.com

Editor Project Museum of Mathematics Zakłady Kórnickie Foundation, Kórnik (Poland)

The Stodółkiewicz Arithmoscope
A Teaching Aid for Narrative Teaching of Arithmetic

Arytmoskop Stodółkiewicza
Pomoc dydaktyczna do poglądowego nauczania arytmetyki

In the early 1900s, Leon Stodółkiewicz (1845–1913), who had spent many years teaching at elementary schools in the Kielce Governorate (in Kielce and Warsaw), proposed an arithmetic board based on his idea, as a teaching aid for narrative teaching of arithmetic.

It was designed to replace the Schoty, the Russian abacus used in schools, which Stodołkiewicz felt was better suited to accountants, but not children.

In my report, I'll present some parts of a demonstration lesson described in the Warsaw daily newspaper 'Gazeta Powszechna' in December 1905.

Andrew Schumann

University of Information Technology and Management in Rzeszow, (Poland)
e-mail: andrew.schumann@gmail.com

Univalent Foundations of Mathematics in the History of Ancient Logic

Uniwalentne podstawy matematyki w historii logiki starożytnej

Discipline: logic

Abstract: It is worth noting that from the point of view of pure mathematics, all these logics: Stoic, Epicurean, Hellenistic, Indian, Buddhist, etc. are not logical theories in the narrow sense (Schumann 2024). They are not axiomatized, do not have algebraic structures and therefore cannot be represented in the form of mathematical logic. But at the same time they contain the doctrine of drawing conclusions based on a certain set of inference rules. Let us try to evaluate this science from the point of view of pure mathematics. Let us take the logical theory T as understood in mathematical logic. Now we can take a fragment F from T. If this fragment can form reasoning, it is called a logeme. Therefore, assume that the set of formulas F' will be consistent and assume that at least one inference rule can be applied in F', then F is a logeme. We say that the logeme F has meaning if and only if its Lindenbaum-Tarski algebra is poset. Homotopy types allow us to identify different logemes. Let F and F be two logemes. They are considered identical if and only if their poses are of the same homotopy type (Univalent Foundations Project 2013). This approach can be helpful in studying ancient logics based on their posets.

Keywords: Poset, univalent foundation, homotopy type, Stoic logic, Buddhist logic

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Antonín Slavík

Charles University, Prague, (Czech Republic)

Mathematicians in the spa of Karlovy Vary

Matematycy w kurorcie Karlowe Wary

The talk will focus on the visits of famous mathematicians (G. W. Leibniz, B. Riemann, G. Mittag-Leffler, V. Volterra, G. B. Guccia, F. Severi, C. Carathéodory, R. Courant, K. O. Friedrichs) in the Czech spa of Karlovy Vary (also known under its German name of Karlsbad). We rely on the data from the preserved lists of spa guests (the so-called Kurliste), and on the correspondence and biographies of various mathematicians, which often contain interesting details about the visits.

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Rafał Zaczkowski

Muzeum im. Przypkowskich, Jędrzejów (Poland)

Gnomonics in Poland from the 18th century to the end of the 20th century

Gnomonika na ziemiach polskich od XVIII wieku do końca XX wieku

The aim of the paper is to present the didactics of gnomonics in Poland, the creators and so-called "silent craftsmen" of sundials operating in Poland – from the eighteenth century to the latest times. While the topic of sundials itself has been the subject of many extensive studies, the issue of didactics of gnomonics in Poland, i.e. the non-trivial art of designing sundials, or, as it used to be said, "drawing compasses", has not been addressed in the literature so far. And yet it used to be a very respectable field, the importance of which has faded over time, but the role it played for centuries cannot be overestimated.

In the 18th century gnomonics was in the curricula of selected: Polish Jesuit schools, the Cracow Academy, departmental and sub-faculty schools during the KEN reforms, Toruń Gymnasium and Collegium Nobilium. Admittedly, the fact that it was thought, predominantly a result of the teachers` individual decisions. A hundred years later it became a compulsory topic discussed during classes in mathematics, astronomy and descriptive geometry in Polish secular schools.

At the end of the 17th century and the end of the first halt of the 18th century, the first workshops producing sundials and scientific instruments in Poland were established in Malbork and Warsaw. The last king of Poland also interested in sundials, many of them were made of Carrara marble on his request and to this day they decorate the Łazienki Palace and surrounding garden. In the 19th century they were produced in factories in Cracow and Warsaw. The designers of the "compasses" cooperated with talented craftsmen and university mechanics who made sundials and in their workshops. These were often real masterpieces signed with the emblems of their creators, decorated with original poetic maxims.

Celem wystąpienia jest przedstawienie dydaktyki gnomoniki w Polskich szkołach, twórców i „cichych rzemieślników" działających na ziemiach polskich – od wieku XVIII do czasów najnowszych. O ile sam temat zegarów słonecznych doczekał się wielu obszernych opracowań, to kwestia dydaktyki gnomoniki na ziemiach polskich, czyli nietrywialnej sztuki projektowania zegarów słonecznych lub, jak niegdyś mówiono – „kreślenia kompasów" nie był dotąd w literaturze podejmowany. A przecież była to dawniej bardzo szacowna dziedzina której znaczenie z czasem wprawdzie zanikło, niemniej rola, jaką przez wieki odgrywała jest nie do przecenienia.

W XVIII wieku gnomonika była w programach nauczania w wybranych polskich szkołach: jezuickich, Akademii Krakowskiej, wydziałowych i podwydziałowych w okresie reform Komisji Edukacji Narodowej, Gimnazjum Toruńskiego i Collegium Nobilium. Wprawdzie o tym, że ona była wykładana, w głównej mierze wynikało z indywidualnej decyzji nauczycieli. Sto lat później stała się ona obowiązkowym zagadnieniem omawianym podczas zajęć z matematyki, astronomii i geometrii wykreślnej w Polskich świeckich szkołach.

Pod koniec XVII wieku do końca pierwszej połowy XVIII wieku w Malborku i w Warszawie powstały pierwsze warsztaty na ziemiach polskich, w których wytwarzano zegary słoneczne i przyrządy naukowe. Zegary słoneczne pozostawały też w kręgu zainteresowań ostatniego króla Polski Stanisława Augusta Poniatowskiego, na którego zlecenie były wykonywane z marmuru karraryjskiego i do dnia dzisiejszego ozdabiają Pałac Łazienkowski i otaczający go ogród. W XIX wieku były one produkowane w zakładach w Krakowie i w Warszawie. Projektanci „kompasów" współpracowali ze zdolnymi rzemieślnikami i też uniwersyteckimi mechanikami, którzy w swych warsztatach wytwarzali zegary słoneczne. Były to często prawdziwe arcydzieła sygnowane emblematami swych twórców, zdobione oryginalnymi poetyckimi sentencjami.

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Joanna Zwierzyńska

University of Silesia in Katowice (Poland)

There and Back Again. About two female Felix Klein undergraduate students

Tam i z powrotem. O dwóch studentkach Felixa Klein

In 1895, two women who had come from St. Petersburg gave talks at Felix Klein's famous seminar at the University of Göttingen. How far – not only in the geographical sense – did they have to travel? How wide-ranging were their prospects after their stay in Göttingen?

The second half of the 19th century was a pivot period for women's higher education. They were still not formally admitted to universities, but institutions aimed exclusively at them gradually emerged, making higher education possible. The largest and best-known such institution in the Russian Empire was the Bestuzhev Courses - a four-year course founded in 1878 in St. Petersburg that enabled women deprived of access to universities to obtain higher education.

We will focus on the fate of two female graduates of the Bestuzhev Courses: Helena Bortkiewicz (Helene von Bortkewitsch) and Aleksandra Stebnicka (von Stebnitzky), of Polish origin and noble birth. Both came to Göttingen attracted by the opportunity to study under Felix Klein's tutelage. Because of their gender, they were not allowed to enter the matriculation book, but they were able to attend lectures and seminars of professors who gave their consent. Both not only participated in Klein's courses but also presented papers in his seminar.

We will present brief biographies of the two women mentioned above. We will discuss their stay in Göttingen, their previous history, and later fates. In particular, we will present selected excerpts from their presentations at Klein's seminar.