Tomáš W. Pavlíček
[Institute of History, Polish Academy of Sciences]
https://orcid.org/0000-0003-0671-4226

"The gentlemen did not like each other." Experiencing relationships in the mathematical community that are not disclosed in textbooks

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Abstract
Although the history of Polish mathematics has been documented, even the best synthesis of the history of universities cannot reflect the relationships between professors. This article presents the contribution of the oral history method to the analysis of scientific cooperation among mathematicians from the Polish People's Republic and Czechoslovakia, focusing on new ways of circulating knowledge at the time of the Cold War. The image of the professorship in the Polish People's Republic and their influence on students within the transfer of knowledge is discussed.

Keywords
history of science, circulation of knowledge, entanglements, oral history, Polish mathematics

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Introduction[1]

The title of the article refers to an interview in which the interviewee recalls the tension that arose between his former mathematics professors in Poznań. One might search in vain for such information in books and documents on the history of mathematics or the university, which further indicates the value of oral histories for research across various fields in the history of science. This kind of tension did not enclose only personal relations or gossip but it was mentioned by the interviewee in terms of diminution of circulation of knowledge and possibility of free choice of research by doctoral students. I chose to conduct interviews with scientists, particularly mathematicians, for three main reasons: 1) to study the collective memory of scholars and their practices in student supervision, 2) to popularize their life-time experiences and achievements, and[2] 3) to analyze the multidirectional transfer of knowledge and scientific cooperation during the Cold War.[3] However, the actors of this research are defined more by the nature of their scientific activity than by their particular academic positions. For the aims of the project, I trace Czechoslovak–Polish ties among researchers in the natural and social sciences, examining the settings in which the relationship emerged and stabilized after the Second World War. I am equally interested in the extent to which contacts enabled the transfer of knowledge, as well as their impact.[4]

1 The article was written as an output of the research project "Czechoslovak–Polish Scholarly Entanglements in the Cold War between High Politics and Individual Strategies," funded by the National Science Centre, Poland, OPUS 2020/39/I/HS3/03589.

2 The anthropological approach is introduced by W. Burszta, A. Jawor, M. Pęczak, M. Rauszer, P. Zańko, *Etnografia pamięci PRL-u. Kultura codzienności Polski powojennej 1956–1989*, Warszawa 2021. On the other hand, in syntheses of the history of mathematics, it happens that the author lists only deceased mathematicians, assuming that readers will rely on their own knowledge of the field to identify which living mathematicians were once students of whom. Cf. R. Duda, *Historia matematyki w Polsce na tle dziejów nauki i kultury*, Warszawa 2019, p. 333.

3 Most studies of the Cold War tend to focus on diplomatic relations and the participation of scientists in expert roles, which may be useful in the perspective of epistemic communities; see M. Machoň, *Bureaucratic and Market Sources of Epistemic Authority*, "Teorie vědy / Theory of Science", vol. 44 (2022), no. 2, pp. 127–167. However, there is also a broad perspective of Cold War internationalism; see Ł. Stanek, *Architecture in Global Socialism: Eastern Europe, West Africa, and the Middle East in the Cold War*, Princeton University Press, 2020.

4 Most of the interviews are conducted by the author and in cooperation with his colleague Barbora Kulawiaková, a student of Polish and Czech philology, who works in cognitive linguistics and prepares transcripts of oral history records. For further details on the project's objectives, see T.W. Pavlíček, *Czechosłowacko-polskie sieci akademickie podczas zimnej wojny między wielką polityką i strategiami indywidualnymi – prezentacja projektu badawczego. Analiza wyników czechosłowacko-polskich transferów w naukach ścisłych na podstawie materiałów archiwalnych i oral history*, "Wrocławski Rocznik Historii Mówionej", vol. 12 (2022), pp. 350–354.

I will discuss not only the bilateral exchanges but also the overarching structure of the academic community in the Eastern Bloc, including the relative isolation of certain areas and the USSR's impact on them.

Oral history of knowledge and science

I assume that both archival data and interviews can be used to analyze scholarly networks. While archival research is a fundamental component of historiography, it frequently highlights institutional collaboration and interactions between academies or institutes. This was similarly the case with the first general overview of Polish mathematics in the 20th century written by Kazimierz Kuratowski, the first director of the Institute of Mathematics of the Polish Academy of Sciences (Instytut Matematyczny Polskiej Akademii Nauk, hereinafter IM PAN). Kuratowski chose not to apply historical methods but rather summarized research, education, and official international collaboration. Although the book is an apologia for the director and is referenced by many historians as a 'source', it is "flawed."[5]

Research into the history of a particular scientific discipline and biographical studies of eminent scientists have traditionally received a significant amount of attention but are "flawed" for at least one reason – the increasing lack of personal correspondence in the archival collections of postwar scientists (partly due to the shift from individual communication to formal correspondence, partially as a result of the shift to e-mail, telephone communication, etc.).[6]

The study of biographies, laudations for beloved mentors, and obituaries is traditionally the primary source of information in the history of science. It is important to note that the authors of these texts are often the successful and popular students of the scientists in question, while the others are relegated to a less prominent role. There are advantages and disadvantages to the omission of contacts or people who were farther removed from the laboratory, institute, and scientific team. Such individuals are frequently overlooked, as the scientific establishments were typically responsible for organizing honoring ceremonies, publishing works and memoirs, pertaining to their distinguished mentors.[7] The second drawback of

5 K. Kuratowski, *Pół wieku matematyki polskiej*, Warszawa 1973. There are also specific distinctions in the English edition of the book as to how IM PAN should be presented abroad. The contribution of mathematics to the socialist idea was diminished in the English version. Cf. K. Kuratowski, *A Half Century of Polish Mathematics. Remembrances and Reflections*, Oxford–New York–Toronto–Sydney–Paris–Frankfurt 1980.

6 See T.W. Pavlíček, *Memento obětí totalitních režimů jako motor kariéry, nebo závazek kontinuity vědecké práce*, "Kultúrne dejiny", vol. 13 (Supplementum 2022), pp. 128–152.

7 The inventor of flexible contact lenses, Czech scientist Otto Wichterle, and the anniversaries celebrated by the Czechoslovak Academy of Sciences, of which he served as president, may serve as an example. During the jubilees, and even in his own memoirs, the author omitted the merits of his friend Drahoslav Lím for the invention. Cf. O. Wichterle, *Recollections*, Praha 1994.

these texts is the lack of information relating to failed research, mistakes, scientific dead ends and complicated relationships. As Sven Dupré and Geert Somsen argue, the history of knowledge is not a mere expansion of the history of science, but can "ask new questions about the boundaries, hierarchies, and mutual constitution of different types of knowledge as well as the role and assessment of failure and ignorance in making knowledge."[8]

Thus, the methodology of oral history demonstrates advantages in several aspects; however, it is clear that there is no one method that can be used for all historical research.[9] Although historians of science rarely apply the oral history method (and then with some distrust), there was one significant achievement in the elite history of quantum physics at the beginning of the 1960s. Thomas Kuhn, John Heilborn, Paul Forman, and finally their secretary Lini Allen led the project "Sources for the History of Quantum Physics" (1961–1964) and interviewed many physicists who participated in the Manhattan Project, especially Niels Bohr.[10] They did not work as oral historian researchers, but their questions concerned the processes of knowledge, development of quantum physics, construction of atom models, and cooperation during research.[11]

Without doubt, there is a temporal as well as scholarly requirement to document and analyze particular disciplines and scientific communities, in our case mathematicians. Among Polish mathematicians, there have only been a few previous interviews with scholars conducted by mathematicians,[12] but without the ambition of an anthropological way of questioning. Some scholars have published their interviews with scientists, but there has been a limit to the selection of prominent members of the Polish Academy of Arts and Sciences in Kraków.[13]

8 S. Dupré, G. Somsen, *The History of Knowledge and the Future of Knowledge Societies*, "Berichte zur Wissenschaftsgeschichte", vol. 42 (2019), no. 2–3, p. 187.

9 A. Thomson, *Four Paradigm Transformations in Oral History*, "The Oral History Review", vol. 34 (2006), pp. 49–70.

10 A. te Heesen, *Revolutionäre im Interview. Thomas Kuhn, Quantenphysik und Oral History*, Berlin 2022, pp. 14–17.

11 The aim was also to document the scientific work and copy private correspondence and pictures. Although Kuhn had no idea about the oral history method in the 1960s, he created a form of research interview, with a strong authentic accent. He advocated on behalf of the interviewee and, at least, facilitated opportunities for narrative exposition. Sometimes it was a conversation in which the interviewer's questions yielded solutions or clarifications from the interviewee, which could be criticized from the perspective of oral history methodology. *Ibidem*, p. 174.

12 K. Ciesielski, Z. Pogoda, *Conversation with Andrzej Turowicz*, "Mathematical Intelligence", vol. 10 (1988), no. 4, pp. 13–20, or research by Zofia Pawlikowska-Brożek in 1970s and 1980s, see Z. Pawlikowska-Brożek, *Stefan Banach w świetle wspomnień*, in S. Fudali (ed.), *Matematyka przełomu XIX i XX wieku. Materiały IV Ogólnopolskiej Szkoły Historii Matematyki*, Szczecin 1990, pp. 101–112.

13 A.M. Kobos, *Po drogach uczonych. Z członkami Polskiej Akademii Umiejętności rozmawia Andrzej M. Kobos*, vol. 1–6, Kraków 2007–2017. For mathematicians, the 2nd volume is important.

According to the oral history method, I focus on both successful and "unsuccessful," or better "minor," scholars. Finally, such interviews should be repeated in the following decades in order to describe changes in the collective memory of the community.[14]

During the interview, the interviewees decide for themselves which of their accomplishments they consider a contribution to science. They are able to combine their biography and research directions, explain any details and the complexity of their discipline, and translate scientific knowledge to a non-expert.

The conversation provides a foundation for evaluating how the history of science views the circulation of knowledge during the Cold War, or how the interviewee experienced the effects of geopolitical reorganization in their everyday life.[15] At that time (the period from 1945 to 1989), the world was not only divided, but contacts between the various Eastern Bloc communities were also restricted and limited, resulting in the creation of an internal border.[16] In my oral history research, I look for narrators on the basis of research into topics in archives and on the recommendations of previous interviewees. The snowball effect should not eliminate anyone, enabling us to reach out to scientists who were (or are again), for various reasons, constrained, marginalized, or excluded.[17] The aim of the project is not to focus on obtaining a statistically representative number of respondents. All of the above contributes to the presentation of a more subtle and diversified model of scientific contacts than the one traditionally based solely on official records, on the history of the most fascinating and successful scientific achievements, and on jubilee anniversaries. Finally, when the interviewees discuss their experiences from their youth and studies, private and professional lives, and activities in the scientific community, I also notice differences in their narratives.

Distinctions in the Perspective of Postwar Science

My objective is to critically examine the traditional perspective of "captive universities" and "chained academies" in central eastern Europe after 1945.[18] In particular, institutions themselves bound their employees limiting their international

14 Cf. A. Lochmatow, *Public Knowledge in Cold War Poland. Scholarly Battles and the Clash of Virtues, 1945–1956*, London–New York 2023.

15 For more information about the sense of historical events during the interview, see A. Portelli, *What Makes Oral History Different?*, in R. Perks, A. Thomson (eds.), *The Oral History Reader*, New York–London 2003, pp. 68–69.

16 D. Vargha, *Polio Across the Iron Curtain: Hungary's Cold War with an Epidemic*, Cambridge 2020.

17 Indeed, I have had experiences where some researchers have been either marginalized or even forgotten in some sense of the word after their retirement. The perspective of those marginalized as one of the important starting points of the oral history method has been noted by both P. Thompson and A. Portelli.

18 J. Connelly, *Captive University. The Sovietization of East German, Czech, and Polish Higher Education, 1945–1956*, Chapel Hill–London 2000; R. Herczyński, *Spętana nauka: opozycja intelektualna w Polsce 1945–1970*, Warszawa 2008.

contacts. The scientific research programs were governed by the state. Every stay abroad had to be approved by the academic leadership and political institution and at the beginning of the new academy of sciences in the 1950s there were quotas governing how many scholars could travel abroad per year.[19] It is important to note after the Second World War, there was a popular belief that science defines the modern world, as well as peace (e.g. James B. Conant).[20] Scientific observation served as the driving force for the transformation of postwar economics. The central narrative called for scientific planning and research oriented toward the practical needs of the economy.[21] The question remains: how did this influence the decision to study mathematics?

Poland and Czechoslovakia welcomed a broad transformation and democratization of their higher education systems as well as the reform of the academic fields (1952 – foundation of the Polish Academy of Sciences, hereinafter PAN; 1953 – foundation of the Czechoslovak Academy of Sciences, hereinafter CAS).[22] Although the Stalinist period was overcome with acceptance, Polish scientists were led to believe they were involved in a broader process of social transformation and technological revolution.[23] The vision of dynamic modernity was argued from a Communist perspective but also included capitalist elements for the advancement of the contemporary society.[24] Considering the broader education of people, even the Stalinist concepts turned to the rich historical tradition of the Enlightenment. Even the socialist or Bolshevik revolutionaries from 1917 considered themselves children of the Enlightenment who had finally succeeded in liberating science from religion.[25] Therefore, the discursive expectations of the scientific community toward the collective mission of civilization could be observed in the recollection of scholars from Polish Enlightenment.[26] Famous names such as Hugo Kołłątaj, Marcin Poczobutt, or Jan Śniadecki were newly connected with the didactics of mathematics, educational shift, and the fight against illiteracy in postwar Poland.

Resuming our interviews, it is obvious that our interviewees take a negative view of the construction of socialism under the communist system, because of both

19 A. Míšková, *Vytváření mezinárodní vědecké spolupráce ČSAV v letech 1952–1961*, "Práce z dějin Československé akademie věd", vol. 1 (1986), p. 234. See also P. Hübner, *Siła przeciw rozumowi... Losy Polskiej Akademii Umiejętności w latach 1939–1989*, Kraków 1994, p. 343.

20 D. Olšáková, *Pugwash in Eastern Europe. The Limits of International Cooperation under Soviet Control in the 1950s and 1960s*, "Journal of Cold War Studies", vol. 20 (2018), no. 1, pp. 210–240.

21 See W. Nowacki, *Notatki autobiograficzne*, Warszawa 1985.

22 Cf. discussion about new university between Tadeusz Kotarbiński and Józef Chałasiński: P. Hübner, *op. cit.*

23 Compare the argumentation by A. Zysiak, *Punkty za pochodzenie. Powojenna modernizacja i uniwersytet w robotniczym mieście*, Kraków 2016, pp. 29, 42.

24 J.P. Arnason, *Communism and Modernity*, "Deadalus", vol. 129 (2000), p. 71.

25 S. Kotkin, *Magnetic Mountain: Stalinism as a Civilization*, Berkeley 1997.

26 A. Zysiak, *op. cit.*, pp. 28–31.

their personal experience and the fact that it was often only after 1989 that they were able to obtain professorships and experienced changes favoring the internationalization of the scientific work. On the other hand, I wonder how they understand and positively appreciate their youth experiences in the scientific community, which occurred during the reconstruction of the state economy and the modernization of higher education. This kind of tension in narration will be discussed with regard to mathematicians. I assume it will be important to talk with our narrators again and observe the possibility of a critical distance to transformation in the 1990s, which was not mentioned when we talked about their youth, studies, and the beginning of careers in the communist period. But today, 35 years after the revolution, there is an opportunity to examine the 1990s correctly and critically.

Finally, I presume that, on the basis of the interviews, it is feasible to reconstruct the scientific networks from a rhetorical perspective as well. If one were to quantitatively elaborate on all the relationships and mentions made during the interview by the interviewee alone, one would get not a statistical, but a frequency model of contacts, how important any particular person was, or what emotions and relationships are recalled by memory (the interviewee's professional and academic relations or social ones, I would also note the interviewee's description of other people's relationships – relational).[27]

Let this view of scientific elites be offered to those historians of the People's Republic of Poland or to historians of science, who approach oral history with distrust and skepticism.[28] The case of mathematics was chosen as an area of exact sciences (with no ideological connection to Marxism[29]) and because of the usefulness of differential and other equations and operations for the state economy and construction industry. It proposed career prospects for a new generation of experts. Finally, the Polish School of Mathematics had been famous abroad and had unfortunately been a casualty of the war, decimated by the conflict.[30] One of its leading figures

27 "Relations […] should be evaluated by deciding whether they are supported by personal memory traces. The chance that the material in the story represents actual occurrences (whether the memories are accurate or not) is determined by the historian's assessment given during analysis, i.e., after the interview;" M. Kurkowska-Budzan, M. Stasiak, E. Soroko, *Wywiad ustrukturyzowany w badaniach historycznych. Propozycja procedury badawczej*, " Wrocławski Rocznik Historii Mówionej", vol. 10 (2020), p. 11.

28 See E. Hobsbawm, *On History*, London 1997, pp. 272–273.

29 This does not mean mathematics was the only pure non-ideological discipline, but there was little effort at the implementation of Marxism into the subject of research. There were also Communist Party members among the mathematicians, but as mentioned in the interviews, it happened that such a large and central IM PAN did not have its own Party branch at the institute, and Party members had to go to Party meetings at another PAN institute (cf. Interview with Wiesław Żelazko conducted by T.W. Pavlíček, 27.06.2022; similar in Prague). Sometimes, it was useful to hire one Party member to help with official matters (cf. The interview with Zofia Adamowicz conducted by T.W. Pavlíček, 14.07.2022, authors private archive).

30 R. Duda, *Pearls from a Lost City*, Providence 2014.

was Professor Hugo Steinhaus, who moved to Wrocław after the war and who emphasized the application of mathematics to the economy, industry, and computing machines as well as calling for greater support for mathematics education.[31]

Oral history of Czech and Polish mathematicians

The set-up for our research into Czechoslovak–Polish interconnectedness among mathematicians after 1945 was not conducted via a questionnaire with statistical relevance, but instead by questions involving the training of students by professors and the shared experiences of a generation of students.[32] The central position of the two academic Mathematical Institutes (PAN and CAS) in Warsaw and Prague resulted in the transfer of an important part of the training of most doctoral students from universities to academic institutes, although the new model of doctoral studies could also be implemented at universities. I therefore believe the research of international visits and cooperation should start within the Academy of Sciences. The guest lecture of a mathematician during his stay at university was organized through the Academy of Sciences because most traditional scientific societies had been affiliated with the academy since 1952.

The initial point of my research was an interview with Czech mathematician Jaroslav Kurzweil (1926–2022). He was the most prominent Czech mathematician in the field of ordinary differential equations and defined the Henstock–Kurzweil integral. In his biography, a reported internship in 1953 in Poznań presented no specific explanation, although, in the mathematical community in Prague, there was mention of relationship with Professor Władysław Orlicz (1903–1990).[33] In the interview, Kurzweil explained this relationship and additionally named additional significant Polish figures, especially Orlicz's students Andrzej Alexiewicz, Stanisław Szufla, and Julian Musielak.[34] The archival research confirmed his collaboration with the Poznań mathematical community.[35] Kurzweil was also the first foreign student of Władysław Orlicz and one of the first Czechoslovak doctoral students in Poland under the system of aspirantship (*aspirantura*). Under

31 Cf. H. Steinhaus, *Matematyka wczoraj i dziś*, "Zeszyty Naukowe Uniwersytetu Wrocławskiego im. B. Bieruta", (1959), no. 2, pp. 5–19; compare with Steinhaus's memories which are important because of how he criticized the academic policy in Poland; H. Steinhaus, *Wspomnienia i zapiski*, Wrocław 2002, p. 559.

32 Soviet "aspirantura" with the titles Doctor or "candidatus scientarium" CSC. in the Soviet Union, Czechoslovakia and some other countries.

33 Cf. J. Jarník, Š. Schwabik, M. Tvrdý, I. Vrkoč, *Eighty years of Jaroslav Kurzweil*, "Mathematica Bohemica", vol. 131 (2006), p. 115.

34 The interview with Jaroslav Kurzweil conducted by T.W. Pavlíček , 07.02.2017. See the transcript: T.W. Pavlíček, *Rozhovor s prof. Jaroslavem Kurzweilem*, "Pokroky matematiky, fyziky a astronomie", vol. 65 (2020), no. 2, pp. 90–117.

35 PAN Archive in Warsaw, Poznań branch, personal collection of W. Orlicz, correspondence, letters by J. Kurzweil from 1953–1990. Unfortunately, the personal archive collection of J. Kurzweil is held by his family, and therefore not available.

Orlicz's supervision, Kurzweil focused on analytical operations in Banach spaces. After returning to Prague, he transferred this knowledge from Poland and inspired his colleagues in this subdiscipline. Following the award of his CSc., Kurzweil turned his attention to another discipline and became the leader of the Department of Differential Equations in the Institute of Mathematics CAS and opened broad cooperation with Polish mathematicians not only in the field of differential equations.[36]

Otherwise, the period with Orlicz was an initiation for him, and therefore I will try to study his influence on younger Polish and Czech scholars. It is clear how the history of the Orlicz school of functional analysis was presented in textbooks. Orlicz had studied in Lwów in the class of Stefan Banach and Hugo Steinhaus, who introduced him to the world-famous Scottish Café. He gained doctorate in 1926 and habilitation in 1934. In what follows, I will recall the importance of the Lwów School of Mathematics for Orlicz's method of education. Although he was appointed an associate professor at Poznań University in 1937, he remained in Lwów during the war and from 1941 was "employed" as a louse feeder at the Institute for Typhus and Virus Research. In March 1945, Orlicz and his two students, mentioned below, had to relocate from Lwów to Poznań, where he became a professor in 1948 at the Adam Mickiewicz University (hereafter AMU). Orlicz's wife Zofia was a physicist, and first moved to Kraków out of fear of persecution by the Communist government; she was later arrested in 1948.[37]

Both at university and in the local branch of PAN, Professor Orlicz even worked with mathematicians in disciplines that were far from functional analysis,[38] as stated by the textbooks (without addressing his mentorship style). His regular Wednesday seminars from half past twelve to two o'clock were very motivating and may well have influenced Kurzweil.[39]

The experience of his internship in Poznań was also formative for Kurzweil's colleague Vlastimil Pták (1925–1999) who came to Orlicz a year later. I mention

36 This discipline is not the topic of this article, but Kurzweil cooperated especially with Tadeusz Ważewski and his students in Kraków. Kurzweil also cooperated with the famous mathematician Otakar Borůvka from Brno who helped with the teaching and training of doctors in Slovakia. Every four years, Kurzweil organized prominent conferences on differential equations – EQUADIFF – alternately in Prague, Brno, Bratislava, where many Polish and other foreign mathematicians were also welcomed.

37 During the war, Zofia Orliczowa (1898–1999) was an active member of the Polish resistance movement (the Home Army). After her release from communist prison in 1953, she moved to Poznań. Cf. T. Schramm, *Uniwersytet Poznański w latach 1945–1956*, in P. Hauser, T. Jasiński, J. Topolski (eds.), *Alma Mater Posnaniensis. W 80. rocznicę utworzenia Uniwersytetu w Poznaniu*, Poznań 1999, pp. 209–225.

38 One of Orlicz's students, who continued his work; L. Maligranda, *Władysław Orlicz (1903–1990) – jego życie i wkład do matematyki*, in L. Maligranda, W. Wnuk (eds.), *Władysław Orlicz (1903–1990)*, "Roczniki Polskiego Towarzystwa Matematycznego", vol. 36 (2000), pp. 33–80.

39 B. Kulawiaková, T.W. Pavlíček, *The Training of the Czech Mathematician Jaroslav Kurzweil with Władysław Orlicz in Poland*, "Antiquitates Mathematicae", vol. 15 (2021), no. 2, pp. 181–206.

this because it had a decisive impact on the creation of a network of contacts which Pták would use in the future when organizing his annual Spring Schools of Functional Analysis (hereinafter conferences).[40]

When I was thinking about the proposal for this project during the summer of 2020, I attempted to get in touch with Orlicz's senior students through the AMU Museum, but I was unable to do so. Unfortunately, Professor Stanisław Szufla had passed away on 14 July 2020; meanwhile, Prof. Julian Musielak was in a very poor condition (he passed away on 11 October 2020). Thus, the meeting with the three mathematicians from the second generation of students, which took place at the end of September 2020, introduced many individual Czech–Polish contacts, which remain forgotten.[41]

I will begin by introducing our first interview with Professor Andrzej Sołtysiak, which opened the reconstruction of Czechoslovak–Polish entanglements and also explained relationships between the professorship and students. This significant interview enabled the extension of our oral history research and helped to elucidate the relationships between professors and to expand our research to other mathematical disciplines (but here I remain in the field of functional analysis).

Andrzej Sołtysiak was born on 1 December 1950 in Giżycko. He graduated with a degree in mathematics in 1973 from the AMU in Poznań. In 1974, he began his PhD studies under the supervision of Professor Alexiewicz. It was his decision to commute regularly to Warsaw to the IM PAN to attend seminars by Professor Wiesław Żelazko, who later became his scientific supervisor.

As I said, during the recording in Poznań, we conducted a total of three interviews with mathematicians who evaluated their university environment from their undergraduate years to the beginning of their academic careers. Most of the respondents answered the questions we had sent.[42] The first part dealt with personal information and information about the course of study, as well as professor evaluations from the Poznań community. The next questions focused on the interviewee's professional background, international connections, and how much Polish–Czech cooperation had affected both their career and their supervisor.

40 Later, the name of the conference was changed to Function Spaces and Applications.

41 Together with Barbora Kulawiaková, I conducted interviews with: Prof. Andrzej Soltysiak (29.09.2020), Prof. Lech Maligranda (30.09.2020), and Prof. UAM dr hab. Magdalena Jaroszewska (01.10.2020). The recording was performed at the AMU Museum with the technical assistance of Mgr Anna Wojtera and organizational support of Prof. Andrzej Gulczyński. L. Maligranda proposed an in-depth consultation of the history of mathematical knowledge in the field or school led by Orlicz. M. Jaroszewska gave a lecture about the history of mathematics at the University of Poznań from the very beginning.

42 However, in this case, A. Sołtysiak was invited by M. Jaroszewska but did not receive our list of questions from her; see also M. Kurkowska-Budzan, E. Soroko, M. Stasiak, *Structured Interview in Historical Research: A Description of Research Procedures*, "Historyka", vol. 51 (2021), pp. 299–323.

Our oral history questionnaire was not exactly set in stone, but it helped us to ask similar questions and compare some statements even across generations. It should be noted that mathematicians often ask for a list of topics in order to precisely prepare facts before the interview. Although the methodology of oral history draws attention to the pitfalls of interviewing members of the academic elite,[43] in the case of scientists I encounter an awareness of the importance of data collection for historical research. Of course, even here it must be remembered that the interviewee chooses different strategies for their narration. However, mathematicians try to adhere to the topic matter-of-factly and rationally. They do not feel the need to explain the wider historical and philosophical context, as my experience from interviews with historians has shown.

Recalling the atmosphere at Orlicz's seminars, Sołtysiak explained to us how the interwar generation of Professor Orlicz[44] differed from that of his students Alexiewicz and Musielak who moved from Lwów to Poznań. Alexiewicz received his PhD with Orlicz in Lwów in 1944; after his habilitation in 1948 in Poznań, he started to lead his own seminar group. Musielak was younger and obtained his PhD in 1958. Both of them were experts in function spaces and functional analysis.

Historians of mathematics have praised members of the Lwów School of Mathematics,[45] but their influence on the young generation of postwar students is not very clear. Of course, it is well known who tutored which PhD candidates,[46] but what is not known is how students or their topics were allocated to and by professors. Some published interviews with mathematicians refer to the personality of the infamous Professor Orlicz and other members of the Lwów School of Mathematics[47] but did not explain how the supervision looked, or which practices were usual in his seminar group.

In contrast, an interview with an expert (here A. Sołtysiak), based on the oral history method can bring new explanations and also better present mathematical knowledge to amateur readers and explain distinctions in this case between Orlicz and both younger professors.

43 Cf. P. Thompson, J. Bornat, *Głos przeszłości: Wprowadzenie do historii mówionej*, Warszawa 2021, pp. 545–547.

44 L. Maligranda, W. Wnuk, *Władysław Orlicz (1903–1990)*, "Wiadomości Matematyczne", vol. 36 (2000), pp. 85–147.

45 R. Duda, *Pearls...*

46 The Department of Mathematics at North Dakota State University publishes data about supervisors on the website Mathematics Genealogy Project and cite 40 students (Doctors) of W. Orlicz: https://www.mathgenealogy.org/id.php?id=51907 [accessed: 31.03.2023].

47 A.M. Kobos, *op. cit*, vol. 6, pp. 155–169, Interview with Zbigniew Ciesielski conducted by A.M. Kobos, 27.09.2013, (PhD in 1960 under Orlicz), here p. 169: "When it came to my consciousness who was picking on me – all those great mathematicians of ours, you know..."

There are certain character variations, but our interlocutor noted the authoritarian leadership style of the scholars of the interwar period. The choice of subjects was less restricted at seminars with Professor Alexiewicz. Both departments were directed differently: Orlicz's larger Department of Mathematics I included functional analysis, function theory, and analytic number theory, while Alexiewicz's smaller Department of Mathematics II included functional analysis on two-normed spaces, and approximation theory.[48]

In every interview, it is necessary to distinguish between subjective memories and listened narratives (fabulation). This interview is of great value, considering the interviewee deliberately avoids discussing the period prior to Sołtysiak's arrival at the university. In 1968, during his student years, he witnessed the reorganization of academic departments and positions, which resulted in Professor Orlicz's retirement from his position (although he continued his scientific work by conducting seminars at the Poznań branch of IM PAN). At that time, the two departments were merged into the Institute of Mathematics. After Alexiewicz was appointed as its director, the relationship between them grew tense. "The gentlemen did not like each other," said our interviewee from his own experience.[49] Thanks to oral history, we can explore relationships in the mathematical community that are not disclosed in textbooks.

However, the interviewee stressed that animosities between the professors did not affect the students (or at least he used to be resistant). The significance of the interview also stems from its potential to uncover new insights about the long-standing interaction between the professors, with the interviewee discussing this openly and respectfully. In contrast to another interview on group of mathematicians in Poznań, the atmosphere seemed patronizing, although it was described by the interviewer in a highly laudatory manner.[50] But atmosphere, humorous anecdotes, and gossip are not the basis of doctoral work. Roman Duda remembers how his tutor insisted on the topic of his thesis and did not make the method clear.[51] Duda talked about professor Bronisław Knaster (1893–1980), another member of the Lwów School of Mathematics, whose expectations of general topology remained unconfirmed.

48 Cf. Z. Grot (ed.), *50 Lat Uniwersytetu Im. Adama Mickiewicza: 1919–1969*, Poznań 1969, pp. 235–236. The text completely omits the name of Alexiewicz and other members of Department II.

49 Cf. the edited interview with A. Sołtysiak: B. Kulawiaková, T. W. Pavlíček, *Andrzej Sołtysiak: The Best Way for You Is to Study Math, You Just Put Some Chalk in Your Pocket, Go to the Classroom and Don't Care." Choosing the Field of Studies – the Entangled Cooperation between Polish and Czech Mathematicians*, "Wrocławski Rocznik Historii Mówionej", vol. 13 (2023), pp. 198–222.

50 Interview with Magdalena Jaroszewska.

51 Interview with Roman Duda conducted by T.W. Pavlíček, 9.05.2023. He received his PhD in 1961 in general topology.

Entanglements

Lastly, the interview with Professor Sołtysiak illustrates the unproductive rigidity of official contacts and the extent of the state's control over international contacts, in terms of both facilitation and restriction. Furthermore, it reveals the possibility of establishing spaces of freedom, both outside official channels and frequently within them. Annual conferences organized by the Czech mathematician Pták in various places, often in the Czechoslovakian mountains, in 1970–1992 created new bilateral contacts. Sołtysiak took part, invited by his new mentor Professor Żelazko, and was later invited to an internship in Prague at IM CAS by Vladimír Müller, with whom he had a number of publications on the basis of their shared interest in Banach algebra.[52] Around the same time, the Spring Schools of Functional Analysis enabled the transfer of knowledge. Functional analysis at the international level has been addressed by the specialized journal "Studia Mathematica" from Poland since 1929. The journal's editorial board included Professor Żelazko, who was joined by Czech mathematician Jaroslav Zemánek (1946–2017). Zemánek's relationship with his previous supervisor in Prague, Pták, was fraught with difficulty, but thanks to his participation in the conferences, he was able to travel to Warsaw and work under Żelazko's mentoring.[53] Finally, Zemánek moved to Warsaw and worked at IM PAN.

In the field of functional analysis, the Lwów School of Mathematics had an impressive international reputation. However, after the Second World War academia underwent huge changes. Lwów was no longer the centre of knowledge. Professors transferred to different institutes in Poland.[54] Both the organization of academia and the educational system were changed. The interwar professors with an authoritative way of directing people did not align with the new system of education.[55] Contrary to Alexiewicz's seminar, there was a stronger sense of freedom in

52 The first of three coauthored articles was published in a leading journal for mathematical analysis: V. Müller, A. Sołtysiak, *Spectrum of generators of a noncommutative Banach algebra*, "Studia Mathematica", vol. 93 (1989), pp. 87–95.

53 Similar, if not more important, were the conferences in the fields of geology and speleology; cf. Interview with Zbigniew J. Wójcik conducted by T.W. Pavlíček, 27.02.2023, and Interview with Pavel Bosák conducted by T.W. Pavlíček, 12.03.2020); see K. Kaucká, T.W. Pavlíček, *Szkoła speleologiczna: "Později na Školy začali zvát špičkový vědce ze Západu." Československo-polské vědecké kontakty po roce 1968 (materiálová studie a rozhovor s geologem prof. Pavlem Bosákem)*, "Slovanský přehled", vol. 108 (2022), no. 2, pp. 359–380.

54 Compare this with Thomas Kuhn's oral history research project, quantum physics in the 1920s and 1930s settled at different places in Germany, Denmark, and Switzerland, students travelled to particular universities to attend lectures by famous physicists. During and after the Second World War, the core of the community settled at the University of California. Without this oral history research, the history of the project Manhattan could not be documented; see A. te Heesen, *op. cit.*, pp. 15–17.

55 S. Majewski, *Reformy szkolnictwa w Polsce od XVIII do XX wieku i ich wpływ na kształt współczesnego systemu szkolnego*, "Studia Pedagogiczne. Problemy Społeczne, Edukacyjne i Artystyczne", vol. 14 (2003), pp. 97–118.

the choice of topics, said Sołtysiak. Only oral history research can explain how contacts among professors were entangled, how mentorship for young PhD students looked, and where and by whom the seminars and conferences were organized. While certain facts can be found in archives or the literature, the image of the mentor and their school as presented in an interview differs. The cases of Sołtysiak and Zemánek serve as examples of the geographical, social, and knowledge entanglements of mathematics, as they both attended local conferences organized by Pták and highly valued Żelazko's seminars in Warsaw.[56]

I use the term entanglements to refer to the experiences of mobility and interconnectedness of knowledge, which is not one-directional.[57] Through our project, we aim to contribute to a more accurate picture of transnational Czechoslovak–Polish contacts and provide insights that may improve the functionality of international scientific networks. The use of this approach, in conjunction with oral history, reinforces the argument that studying international contacts from the Cold War period "from below"[58] is a more effective method than starting from imposed political norms.[59] Since the 1970s, the younger generation has been compelled to organize their own regional conferences; yet, some of these events have rapidly gained prominent status in Europe. Young scholars who began their academic careers in the 1970s pioneered novel methods of establishing new connections, frequently unrecorded in academic publications and official documents. They were occasionally held in English, and in the early 1990s underwent a transition that caused them to be forgotten.[60]

In my research, I try to describe the course of Polish–Czech–Slovak connections and determine if they were asynchronous. This includes the matter of the availability of professional literature in the Eastern Bloc. Specifically, during the

56 J. Surman, T.W. Pavlíček, *The Formal and the Informal in the History of Socialist Scholarly Interconnectedness in East Central Europe*, "NTM Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin", May 13, 2024, https://doi.org/10.1007/s00048-024-00387-0 [accessed: 31.08.2024].

57 See also the critique of historiography that focuses only on the transfer from the center to the colonies; K. Raj, *Beyond Postcolonialism… and Postpositivism: Circulation and the Global History of Science*, „ISIS", vol. 104 (2013), no. 2, pp. 337–347.

58 "From Below" became Paul Thompson's starting point; see also study of astronomers from below T.W. Pavlíček, M. Šolc, P. Hyklová. *Astronomers behind the Iron Curtain: The First Postwar Generation in Czechoslovakia*, Praha 2024.

59 Additionally, it should be noted that the topics of academic obstruction for political reasons were not cited at all during the interview. In her article, Anna Siekierska explains how it was forbidden for a maths instructor at an elementary school, technical school, or agricultural school to discuss social topics with the students; see A. Siekierska, *Krzysztof Koszlaga: „Miałem zakaz prowadzenia rozmów z uczniami." Nauczyciel w przestrzeni zawodowej, społecznej i politycznej Polskiej Rzeczypospolitej Ludowej*, „Wrocławski Rocznik Historii Mówionej", vol. 11 (2021), pp. 182–205; cf. S. Wykusz, *Nauczyciele wobec stanu wojennego*, „Zeszyty Naukowe. Ostrołęckie Towarzystwo Naukowe", vol. 28 (2014), pp. 340–351.

60 On the need for collaboration between memory studies and oral history, see P. Hamilton, L. Shoeps, *Building partnerships between oral history and memory studies*, in P. Hamilton, L. Shoeps (eds.), *Oral History and Public Memories*, Philadelphia 2008, pp. vii–xvii.

1950s and 1960s, many aspiring humanists and natural scientists faced difficulties in obtaining the original literature required for their research. As a result, they relied heavily on Russian translations, which were frequently of poor quality, as recalled by Professor Żelazko and his wife. According to Sołtysiak, students after 1968 did not experience this issue. However, the interviewee attests to the value of IM PAN's professional library. His own extensive record of written textbooks testifies to the demand for books at that time.

Minor-scholar practices

The research on academic interconnectedness "from below" also enabled identification of data on minor scholars, who are usually marginalized by academia and the institutional history of science because of their age, gender, position, and political and social circumstances. Therefore, it should be mentioned that, from the perspective of the marginalized history of science, I am not seeking disregarded scholars, but rather studying scientific practices, which are based on observations. This shift towards emphasizing practices and context appeared in the history of science in the 1980s and 1990s, but David Bloor argued that this approach has not engender trust in science.[61] "From below," I tried to contact other scientists. Thanks to Professor Sołtysiak's recommendation, it was possible to record an interview with Mrs Hanna Stande-Żelazko and her husband, Professor Wiesław Żelazko – an internationally known mathematician who works on functional analysis and topological algebra.[62] Professor Żelazko supervised the doctoral studies of Czech mathematician Jaroslav Zemánek in 1977 at IM PAN in Warsaw. In the interview, Wiesław Żelazko and his wife Hanna Stande-Żelazko confirmed the value of the Vlastimil Pták conference and expressed their appreciation for Sołtysiak. The student from Poznań prepared his doctoral thesis under the supervision of Wiesław Żelazko, commuting to Warsaw location regularly at his own expense. Mrs. Stande-Żelazko recalls: "Sołtysiak once said: For me, there is only one mathematics professor – my husband. Yes, Sołtysiak is very nice, very humble."[63] Professor Sołtysiak himself explained how influential the mentorship of Żelazko was and the quality of his seminar.

It is important to mention that the glorification of Sołtysiak appeared not at the beginning of the interview or due to him being mentioned, but as the result

61 D. Bloor, *Knowledge and Social Imagery*, 2nd ed., Chicago–London 1991.

62 Interview Wiesław Żelazko and Interview with Hanna Stande-Żelazko conducted by T.W. Pavlíček, 27.06.2022. See also https://entanglements.ihpan.edu.pl/interview/prof-wieslaw-zelazko-i-dr-hanna-stande-zelazko-wywiad-1/ [accessed: 30.06.2024]. Often Polish mathematicians during the interviews began to explain the historical tradition and contributions of the Lwów School of Mathematics, without particular relevance to the topic. Based on the example of W. Żelazko, it is characteristic how he praised the personal relations with members of the Lwów School of Mathematics.

63 See Interview with Wiesław Żelazko; Interview with Hanna Stande-Żelazko.

of many stories about relationships among Polish mathematicians. In particular, other PhD students of Wiesław Żelazko were recalled as people who were more or less "socially awkward." In contrast, the couple praised others – Hannas Stande-Żelazko's five students in secondary school later obtained titles of university professors of mathematics – and recommended initially contacting the Warsaw professor of mathematical logic Zofia Adamowicz.[64] Three individuals played a prominent role in her decision to pursue mathematics – her teacher, her grandfather Stanisław Straszewicz (founder of the Polish Mathematical Olympiad), and her PhD professor Andrzej Mostowski.

In this interview, it became clear the kind of pressure she experienced through her PhD studies from some male colleagues. Even during a peer review process, she was subjected to gender pressure (reviewing journal article was not anonymous at the time). Adamowicz mentioned how gratifying it was for her when a mathematician from Czechoslovakia praised her paper at a bilateral conference. It was possible to recall this memory and contact the mathematician in question. Thanks to this, an interview with Pavel Pudlák, currently a professor of mathematical logic, could subsequently be recorded.[65]

Professor Pudlák spoke very modestly about the excellent results of his research in logic and theoretical computer science. He pointed out how his supervisor Petr Hájek was strongly influenced during his internship in Warsaw in 1973 with Andrzej Mostowski. Thanks to this, Hájek and Pudlák subsequently opened up a new area of research in first-order arithmetic.[66] As a result of Hájek's experience from Warsaw, he and other Czech logicians started to attend Polish winter conferences on logic in Karpacz and also organized similar Czechoslovak–Polish meetings on the other side of Karkonosze in Alšovice.

A common feature of scientists' memoirs are stories of new achievements, methods, and directions of research, which reflects how Shmuel Noah Eisenstadt interpreted modernity as the continual establishment and change of many models of modernity.[67] The reconstruction of the academic network shows how significantly and bilaterally mathematical environments were entangled through the circulation of knowledge. Traditional models of professorial seminars and formal congresses were transformed into working research teams that began to network internationally on the basis of methods rather than institutional hierarchies.

64 Interview with Zofia Adamowicz.

65 Interview with Pavel Pudlák conducted by T.W. Pavlíček, 3.04.2023.

66 Z. Haniková, *Petr Hájek: A Scientific Biography*, in F. Montagna (ed.), *Petr Hájek on Mathematical Fuzzy Logic, Outstanding Contributions to Logic 6*, Cham 2015, pp. 21–38.

67 S.N. Eisenstadt, *Modernity in Socio-Historical Perspective*, in E.B. Rafael, Y. Sternberg, S.N. Eisenstadt (eds.), *Comparing modernities: pluralism versus homogenity*, Leiden 2005, pp. 31–56.

In an effort to obtain a representative sample, I approached other male and female teachers of mathematical analysis.[68]

When addressing the issue of gender, I also pay attention to the aspect of postwar academic networks: what reinforced male dominance in the newly constituted fields?[69] To what extent did women's work and delegations to international scientific congresses represent their officially declared equality? Were Polish female scientists in a more favourable position than their Czech counterparts in this regard?[70] I am certain that a separate oral herstory project is required to capture the perspectives of women in science.[71] When we first asked a question about gender-related statistical differences among students of mathematics in Sołtysiak's generation, we were not understood. First and foremost, the narrator misunderstood the question because both interviewers were wearing masks due to the pandemic. Then, he confirmed what was known from the literature, that the representation of male and female students in the field of mathematics was comparable. However, in a further statement defending their supervisor, claiming that "women were not harassed or mistreated," the interviewee acknowledged the existence of prejudice against women from other professors. At this point, it is worth noting how carefully the interviewee tried to find the right term for how to phrase the sentence.

Another distinguishing feature is the interviewee's honesty and modesty. Sołtysiak speaks fondly of IM PAN (including his PhD supervisor, Professor Żelazko, deputy director of IM PAN): "outstanding library; people always very active; a lot of foreign visitors, whereas there were relatively few visitors in Prague and with the trips were much worse than those from Poland." In fact, he compared the situation in Poznań and Prague with that in Warsaw.

68 Cf. P. Thompson, J. Bornat, *op. cit.*, pp. 378–384. In the interview with Dina Štěrbová's assistant in Olomouc, it turned out that she had met Professor Żelazko personally and had even taught set theory according to Polish textbooks. She is an example of when the academic environment isolates former workers and forgets about them; Interview with Dina Štěrbová conducted by T.W. Pavlíček, 10.03.2023.

69 Traditionally, since the 19th century, women had been employed in mathematical institutes or astronomical observatories in "calculator" (*rachmistrz* in Polish, *počtářka* in Czech) positions with the stereotypical belief that calculations are done more precisely, and with the assumption that such work can be lower paid, almost as little as women who washed chemical glass apparatus in "dishwasher" positions in laboratories. Men were not hired for such work, although it is necessary to remember there were "masculine" positions like handling telescopes, operating generators, engines, etc.

70 Questions about the co-educational context provided after the Second World War concern the encouragement of girls to become more competitive; see K. Stańczak-Wiślicz, *"...być dziewczyną." Wychowanie, dorastanie i edukacja dziewcząt*, in K. Stańczak-Wiślicz, P. Perkowski, M. Fidelis, B. Klich-Kluczewska (eds.), *Kobiety w Polsce 1945–1989*, Kraków 2020, pp. 217–289. Here, the Polish–Czechoslovak comparison can show new asymmetries.

71 Why women should be listened to was explained by Lynn Bloom (1977); see D. Kałwa, *Herstoria mówiona w Polsce. Kilka uwag o feministycznych projektach oral history*, "Wrocławski Rocznik Historii Mówionej", vol. 11 (2021), p. 9.

The interviewee draws a comparison between different academic contexts, on both a global and local scale, as he speculates elsewhere that the ways in which the well-known Professor Orlicz managed mathematicians in Poznań were rather authoritarian in manner. This information, along with the title "The gentlemen did not like each other," is given off the record, but with authorization. Similarly, professor of logic Roman Murawski explains why he decided to pursue his PhD in Warsaw and not in Poznań.[72] The interviewee's intention is not to criticize their own academic environment; rather, he seeks to elucidate the distinctions between individual personalities and approaches within the field. Therefore, based on the interview, it is easy to understand why Andrzej Sołtysiak felt motivated to come to Warsaw for his PhD seminars in this particular circumstance.

The entire interview follows the format of a dialogue, with some information appearing between the lines. This ties to question: can we trust oral history sources? As stated by Alessandro Portelli, the recollection is influenced by present events. It is noteworthy that during the interview on Polish–Czechoslovak relations, the interviewee endeavoured to elaborate and respond to our subsequent inquiries regarding the working methods of mathematicians, the nature of their studies, and the interpersonal dynamics among professors. And of course, he recalled episodic memories, which are a natural element of autobiographical memory, have a narrative structure that can be analyzed for verification.[73]

Generational experiences

The interviews confirm the significance of generational consciousness and shared experiences from the periods of adolescence and university studies.[74] Professor Żelazko and his wife remember the implementation of co-education in Poland, but both of them still attended traditional single-sex secondary schools in Warsaw. The first contact with the opposite sex was in the first year of university studies in Warsaw in 1951. Furthermore, they both met in the same class. Their story does not illustrate the same level of competition as mentioned in the literature.[75] However, Adamowicz experienced unpleasant rivalry as a PhD student in the 1970s.

What can be concluded from the statements of scientists about their generational experiences? It seems useful to compare positive memories from their youth with difficulties in scientific work during their careers. Firstly, such a distinction seems natural from the point of view of memory. Memories of school and childhood are colourful, positive, sometimes even full of sentiment. Conflicts occurring at the end of studies, during the aspirantship, through the control of scientific workers

72 Interview with Roman Murawski conducted by T.W. Pavlíček, 10.05.2023.
73 T. Maruszewski, *Pamięć autobiograficzna*, Gdańsk 2005, pp. 24–25.
74 For the methodology of using the category of generation in biographical research, see M. Corsten, *Time of Generations*, "Time & Society", vol. 8 (1999), pp. 249–272.
75 K. Stańczak-Wiślicz, *op. cit.*, p. 218.

(ideological clearances) or difficulties in obtaining a passport for congress trips show the ambivalent relationship of the scientific community with the authorities, both academic and state (or Communist Party).

Secondly, it seems more important to compare positive and negative experiences in the context of the discussion in historiography about the evaluation of the People's Republic of Poland in the times of postwar modernization. The traditional approach associated with the totalitarian paradigm shows the political impediments that affected both institutes and scientists, only that the historical picture created is convex (accent of delay, accent of USSR imposition, accent, how much all Eastern Europe was suffering).[76]

From positive memories, one can gather that there was gratitude for the postwar educational system, especially from the definition of new areas of research. In contrast, there is a widely known story about the Lwów School of Mathematics, which acted as the leading voice in its field after the war, but also confronted new areas of knowledge (e.g. discrete mathematics and theory of informatics). Could the apodictic and authoritative style of mentorship be a reason for the younger generation pursuing their own method of mathematical research?

When it comes to our interviewees, I pay attention to their individual life experiences, taking them very seriously and respectfully (sometimes, it really was life under two totalitarian regimes). However, one can observe how the interviewee when talking about scientific policy tries to present evidence of the missing freedom and democracy.[77]

A separate approach in historiography viewing socialism as postwar modernization makes it possible to explain both the longer process of communism and the modernization leap. Agata Zysiak recalled the real expectation of socialism as an alternative to capitalism and the actors' motivations to be useful in the transformation of the state and implementation of necessary social reforms.[78] I believe that the positive assessment of co-educational schools, new fields of studies, and the introduction of the Mathematical Olympiad in Poland (1949 saw the first nationwide olympiad) confirm the thesis of postwar modernization in Eastern Europe. In particular, the reform of the educational system in Poland and Czechoslovakia was earlier and more dynamic than in some Western countries.[79]

76 E.g. K. Bałżewska, *Przestrzenie totalitarnego zniewolenia. Doświadczenie wojny i okupacji w twórczości Józefa Mackiewicza*, Warszawa 2020.

77 R. Klementowski, S. Ligarski (eds.), *Budujemy socjalizm. Materiały pokonferencyjne*, Wrocław 2010.

78 A. Zysiak, *op. cit.*

79 Another comparison would be with the Soviet Union, where the postwar generation was under greater pressure from previous reforms; see J. Fürst, *Stalin's Last Generation. Soviet Post-War Youth and the Emergence of Mature Socialism*, Oxford 2010.

Conclusion

When comparing various interpretation schemes in interviews with mathematicians, it can be seen that it is difficult to accommodate two different narratives in one person's memory. Based on ten conducted interviews, I would like to propose a different perspective.[80] Although some scientists try to justify their critical attitude to the communist times, and I appreciate and respect this, it does not bother me if they do not give an overly critical assessment of the scientific community and its entire transformation after 1989. They also do not mention the shift of many intellectuals to the left after the Second World War (which does not mean they do not remember).

It is more important what circumstances and in what order they remember the period of their studies and youth, in particular to which mentors they refer. In this context, the quoted statements testifying difficulties and conflicts sound interesting. Based on this, one can conclude how great the difficulties were and when the announced socialism was no longer seen as positive, but rather unscrupulously used individually by others, often by peers or co-workers. The interviews show that sometimes the most difficult relationships were experienced in the environment itself, in the individual behaviour of those who selfishly used the system and what socialism had to offer.

It is not the interviewer's goal to direct the interviewee to such a precise evaluation of concepts, relationships, and contacts. However, the oral history method contributes multiple observations to the history of science: small-scale, individual, but important changes that happened even in one environment, in one institute (e.g. Orlicz's Department of Mathematics I). The power system allowed conflict and exploitation to persist for years without consequences. This fact highlights the importance of observing actors through the perspective of minor scholars. If their initial efforts to bring about a change had been successful, the saturated actors would probably have had little reason to complain about the complex power system.

Relations between professors observed by the generation of students are also important because of the limits of the announced democratization of the profession of university teacher in Poland. It can be seen that the changes related to the socialist modernization project took place somewhat later, rather in the generation educated in the 1970s. The mathematical environment itself remained rooted in a certain reproduction of the interwar tradition, although in practice it was not as liberal as it is usually presented.[81] The habits of individual professors resisted the new changes.[82] However, the biographies of our interviewees

80 For alternative potential of oral history, cf. A. Portelli, *op. cit.*, pp. 68–69.

81 A. Zysiak *op. cit.*, p. 17.

82 T. Gecko, T.W. *Pavlíček, Kariérní postup vědce. Vztah učitele se žákem a vytváření vědeckých škol*, in M. Franc (ed.), *Habitus českých vědců 1918–1968. Příklad dvou generací*, Praha 2021, pp. 63–118.

illustrate that some people of the first and second postwar generations came from working-class families (W. Żelazko, R. Duda, P. Pudlák, R. Murawski). The image of a generation "seduced" by the system cannot be generally applied to them, as was shown by Palska or Świda-Ziemba.[83]

I conclude that aspects of everyday work and gender relations can reveal the key to deciphering the entire scientific community and, for example, explain such things as why some Czech scientists after 1968 decided to return to the country from a stay abroad, although they later testified about the difficulties. Furthermore, this research process can show why some Czech scientists, within their institutions, expressed reluctance to continue formal cooperation with the Polish Academy of Sciences (as a protest against August 1968), but they still took part in small conferences. For this reason, comparing interviews from two Eastern European countries bear further fruit as it avoids the adoption of unified memories.

I argue that the history of science should be placed in a broader context – as a reaction to changing societal circumstances and environments.[84] If the Cold War modernism contributed to a period of inactivity in the making of knowledge – "knowledge inactivity" on the official or institutional level of academies of sciences, I would argue that the creation of personal entanglements was able to cross borders (not only regional and national, but also borders between disciplines), and the new conferences contributed to "knowledge activity."

83 As shown by H. Palska, *Nowa inteligencja w Polsce Ludowej: świat przedstawień i elementy rzeczywistości*, Warszawa 1994; H. Świda-Ziemba, *Młodzież PRL: portrety pokoleń w kontekście historii*, Kraków 2010.

84 S. Dupré, G. Somsen, *The History of Knowledge*..., p. 188.

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Summary
Although the history of Polish mathematics has been documented, even the best synthesis of the history of universities is not able to reflect the relationships between professors. This article presents the contribution of the oral history method to the discussion of the interpretation of postwar education – which traditionally fluctuates between the image of a totalitarian state and the approach of education reforms and socialist transformation – and offers a contribution to the analysis of scientific cooperation among mathematicians after the Second World War.

The interview with the Polish mathematician Andrzej Sołtysiak is of great importance because it shows how students reflected on the hidden tension between professors at the university in Poznań and how crucial the relationship with his mentor, Professor Wiesław Żelazko in Warsaw, was for him as a PhD student. Thanks to his recommendation, interviews with other mathematicians were conducted in both countries: Poland and Czechia.

The author focuses on the experience of the bilateral Czechoslovak–Polish conferences in mathematical analysis, which enabled new ways of circulating knowledge at the time of the Cold War. He discusses the image of the relationship between mentors and students described in textbooks and shows the importance of interconnectivity, individual contacts, and their manifestation in individual memory.