
Spatiality

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Mapping Forced Academic Migration

Abstract: In spring and early summer 1933, after the “Law for the Restoration of the Professional Civil Service” was passed on April 7, some 3.000 academics, the largest part of them Jewish, lost their positions in German universities and other research institutions. Despite the strict immigration laws, which were a result of World War I, over 50% of the dismissed academics (the numbers vary greatly among the different studies) left Germany and tried to continue or rebuild their academic careers in exile. The largest part migrated to the UK and the US, but also France, Sweden, Turkey, the British mandate of Palestine as well as Switzerland were target countries.

We are digitally mapping the geographical movement of academics triggered by mass expulsions from Germany, Austria, and other countries occupied by the Third Reich and shedding light on inner-institutional changes in respect to both academic staff and the academic standing of research institutions. In our contribution we shed light on the case of the mathematicians at Göttingen University in the early years of the “Third Reich” and the impact of National Socialist university politics on the field of mathematics. These are initial results of our larger study which help to identify patterns and ruptures of forced academic migration.

Keywords: forced academic migration, migration studies, exile, national socialism, World War II, university history

1 Introduction

The German philosopher Theodor W. Adorno (1903–1969), who, as a “non-Aryan”, was forced into exile by the National Socialists, wrote in his book *Minima Moralia*, “Every intellectual in emigration is, without exception, mutilated, and does well to acknowledge it to himself, if he wishes to avoid being cruelly apprised of it behind the tightly-closed doors of his self-esteem.”¹ He was speaking of his own

1 Theodor W. Adorno, *Minima Moralia: Reflections from Damaged Life* (London: Verso, 2005), 33.

Note: The authors’ names are listed in alphabetical order; all the authors contributed equally. The authors would like to thank Aleksandra Petrović and Sebastian Borkowski for their support with the database and data visualization.

biographical disruptions, the expropriation of language,² and political isolation and career breaks. But this experience was not his alone. Over 3,000 German academics, most of them Jewish either by self-identification or the racial laws of Nazi Germany, were dismissed from their positions, based on paragraph 3 of the Law for the Restoration of the Professional Civil Service. After April 7, 1933, Jews, other “non-Aryans”, and political opponents (under paragraph 4) could no longer serve as teachers, professors, and judges or in other governmental positions. Around 50% of dismissed scientists emigrated and tried to continue their careers abroad. This was likely the largest migration of academics in human history. The emigres faced, as we have seen with Adorno, alienation, racism, impediments, and often, psychological difficulties in exile, in both their private and their professional lives. However, precisely because emigration emerges from a crisis, it can bring about innovations and result in scientific and social achievements which, according to the historian Dan Diner, “would have hardly been expected under conditions of steadiness and continuity of life plans.”³

The biographical perspective of the impact of this forced migration during the 1930s and 1940s on individual careers is one of three main objectives of our research project titled “Science Transnational. Switzerland and the Academic Forced Migrants from 1933 to 1950.”⁴ We are equally interested in the way the transnational academic network and the academic landscape as such changed due to the expulsion of academics. Therefore, we are digitally mapping the geographical movement of academics triggered by mass expulsions from Germany, Austria, and other countries occupied by the Third Reich and shedding light on inner-institutional changes in respect to both academic staff and the academic standing of research institutions.⁵ Researchers agree that the mass expulsion of academics, some of them Nobel laureates, was an “intellectual decapitation of Germany”⁶

2 On this topic, also see: Stephan Braese, “Deutsche Sprache, jüdisches Exil – Optionen von ‘Identität’ nach 1933,” in *Exilerfahrung und Konstruktionen von Identität 1933 bis 1945*, ed. Hans O. Horch, Hanni Mittelman, and Karin Neuburger (Berlin: De Gruyter, 2013), 7–16.

3 Dan Diner, “Einleitung,” in *Tel Aviver Jahrbuch für deutsche Geschichte* 27 (1998), 3 (Translated from German by StM).

4 This project was funded by a five-year PRIMA-grant (No. 179819) from the Swiss National Science Foundation.

5 While we have included screenshots of the data-visualization throughout this article, on the project website, we have prepared corresponding scenarios for more explorative and dynamic data analyses, and the website data is updated daily.

6 Helge Pross, “Die geistige Enthauptung Deutschlands. Verluste durch Emigration,” in *Nationalsozialismus und die deutsche Universität. Universitätstage 1966* (Berlin: De Gruyter, 1966), 143.

and a “dismantling of German science,”⁷ particularly the modern disciplines and sub-disciplines, such as economics, political science, sociology, atomic physics, and biochemistry. In these areas, the dismissal rate was up to 50% since the new research areas were represented to a higher degree by younger and often Jewish scholars.⁸ The universities “surrendered without a fight”⁹ to the drastic curtailment of their autonomy,¹⁰ and there was no public opposition to the forced dismissals from either colleagues or other universities. On the contrary, in April 1933, the boards of directors of German universities and, a little later, the universities expressed their approval of Adolf Hitler and the National Socialist state,¹¹ and at some universities, around 25% of all university teachers had joined the party by the summer of 1933.¹² At that time, among the party members, there were relatively few tenured professors, while the number of assistants, private lecturers, and associate professors was comparatively high. There were two reasons for this: first, the National Socialist university policy clearly represented the interests of a non-established younger generation against the tenured professors (*Lehrstühle*), and second, the mass dismissals improved the previously miserable career opportunities of young academics.¹³

While German research institutions suffered a (self-inflicted) loss of researchers, knowledge, and academic reputation, other countries had the rare opportunity to gain some of the best scientists worldwide. Our large-scale data collection will allow for a broad transnational evaluation of different states and universities with a special focus on the position of Swiss universities in the changing academic landscape. There has been a longstanding connection between German and Swiss universities with a strong intellectual as well as personal exchange. This, as well as a shared and a similar structural design of the university system, made Switzerland a likely emigration destination for many expelled scholars. Thus far, however, neither scholars of forced academic migration nor scholars of Swiss history have paid attention to emigree scholars in Switzerland or the dealing of Swiss universities with them. In this article as well as in our larger

7 Karl Dietrich Bracher, *Die deutsche Diktatur: Entstehung, Struktur, Folgen des Nationalsozialismus*, (Frankfurt am Main: Verlag Ullstein, 1980), 294.

8 Claus-Dieter Krohn et al., eds., *Handbuch der deutschsprachigen Emigration 1933–1945* (Darmstadt: WBG, 2008), 681–82.

9 Michael Grüttner, “Die deutschen Universitäten unter dem Hakenkreuz,” in *Zwischen Autonomie und Anpassung: Universitäten in den Diktaturen des 20. Jahrhunderts*, ed. John Conelly (Paderborn: Schöningh, 2003), 67.

10 Grüttner, “Die deutschen Universitäten unter dem Hakenkreuz,” 74.

11 Grüttner, “Die deutschen Universitäten unter dem Hakenkreuz,” 74–76.

12 Grüttner, “Die deutschen Universitäten unter dem Hakenkreuz,” 73.

13 Grüttner, “Die deutschen Universitäten unter dem Hakenkreuz,” 76.

project, we will be putting Swiss universities and exiled scientists in Switzerland on the map of forced academic migration.

We are working with *nodegoat*,¹⁴ a web-based research environment for the humanities, that allows for relational modes of data analysis with spatial and chronological forms of contextualization. Our research question-driven data model enables us to store all known personal and professional data of the dismissed scholars, including not only their career steps at academic institutions across the globe but also their publications, presentations, and research project collaborations, which allows us to illustrate transnational academic migration and shifts in global academic networks, shifting scientific centers, and the transfer of knowledge. This article contains links to interactive data visualizations; we recommend reading in conjunction with the online visualizations.¹⁵

In this article we will shed light on the case of the mathematicians at Göttingen University in the early years of the “Third Reich” and the impact of National Socialist university politics on the field of mathematics. These are initial results of our larger study which help to identify patterns and ruptures of forced academic migration. At a later stage, it will be part of a comparative study on forced academic migration in which we will be able to make comparisons between different academic fields, answer questions regarding the extent to which age and seniority had an influence on successfully continuing a career in exile, as well as shed light on the situation of female scientists after their expulsion from their positions.

In the first section, we will digitally trace in some detail the direct results of the declaration of the Law for the Restoration of the Professional Civil Service on the mathematicians at Göttingen University and focus on the changing academic reputation of the Göttingen Institute for Mathematics.¹⁶ In the second section, focusing on Switzerland and based on two examples, we explore the interdepend-

14 “nodegoat,” lab 1100, accessed February 9, 2021, <https://nodegoat.net>.

15 Accessed January 11, 2022, <https://forced-academic-migration.net/datapublications/datapublications.p/293.m/tag/Mathematics>.

16 The history of mathematics in Germany and in Göttingen has been studied extensively. See also: David E. Rowe, “Jewish Mathematics at Göttingen in the Era of Felix Klein,” *Isis* 77 (1986): 427–49; Arnold Dresden, “The Migration of Mathematicians,” *The American Mathematical Monthly* 49, no. 7 (1942): 415–29, accessed February 9, 2021, doi:10.2307/2303266; Colin R. Fletcher, “Refugee Mathematicians: A German Crisis and a British Response, 1933–1936,” *Historia Mathematica* 13 (1986): 13–17; Louise Grinstein and Paul J. Campbell, eds., *Women of Mathematics: A Biographical Sourcebook* (New York: Greenwood Press, 1987); Max Pinl and Lux Furtmüller, “Mathematicians under Hitler,” *The Leo Baeck Institute Yearbook* 18, no. 1 (1973): 129–82; David E. Rowe, “Klein, Hilbert and the Göttingen Mathematical Tradition,” *Osiris* 2nd ser., 5, no. 1 (1989): 186–213.

encies of Swiss universities and/or professors working at Swiss universities within the transnational network of science and show to what extent our digital approach also stimulates questions about Swiss appointment policy(s). Swiss universities had a long history of appointing German scientists as a means to strengthen their academic reputation and therefore the Swiss and German academia were closely interlinked. In the course of World War I however, Swiss immigration policies became more restrictive. The field of mathematics serves as an example to study the changing interlinking of Swiss universities in the transnational network of academia before and during the National Socialist period, this also helps us to understand, to what extent Swiss universities were able and willing to hire exiled mathematicians.

2 A Period of Transition? The Göttingen Institute for Mathematics in the 1930s

The Institute for Mathematics at the Georg-August-Universität Göttingen has a long history of excellence, reaching back to the 18th century. Along with Berlin, Göttingen was one of Germany's, and one could argue the world's, main centers for mathematical research. Despite prejudice against Jews before Hitler's rise to power, the University of Göttingen hired several Jewish mathematicians, some of whom were full professors. In April 1933, when Law for the Restoration of the Professional Civil Service was passed, their positions were in jeopardy. So, in 1934, a mere year after the mass-dismissal, David Hilbert (1862–1943), the former head of the Göttingen Institute and the “grand old man of German mathematics” was asked by Bernhard Rust (1883–1945), the German minister of education, how mathematics at Göttingen was, now that it was free from Jewish influence. Hilbert allegedly replied: “There is no mathematics in Göttingen anymore.”¹⁷

In this first section, we explore the question of whether and how this much-quoted statement by Hilbert can be verified based on our relational database, which not only includes the personal data of academics and their career steps linked to institutions but also information on the reasons for their changing positions. The question of the Göttingen Institute's global standing after 1933 thematically overarches this analysis.

¹⁷ Constance Reid, *Hilbert: With an appreciation of Hilbert's Mathematical Work by Hermann Weyl*, 4th ed. (New York: Springer, 1970), 205.

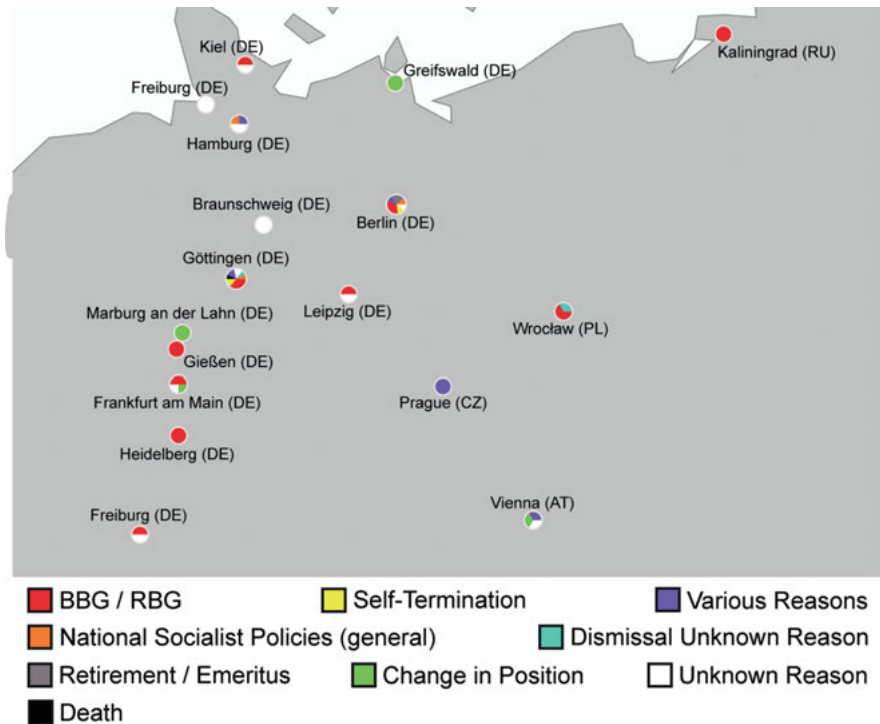


Figure 1: Reasons for termination at German universities, 1933–1939.

Figure 1 shows the various reasons for changes in professional positions at German universities between 1933 and the invasion of Poland in 1939.¹⁸ Using pie charts in these figures allows an immediate assessment of not only the different reasons for quitting a position during this period but also of the differences between universities. For increased clarity, the various reasons for change have been grouped thematically as colored pie slices.

18 Based on our classifications in nodegoat, the reasons for termination were grouped thematically. This is a brief explanation of the Figure 1 and 2 legends. BBG/RBG: Dismissals on the basis of the Law on the Restoration of Professional Civil Service of April 7, 1933 and the Reich Citizenship Law of September 15, 1935. National Socialist Policies (General): Cases attributable to National Socialist policies in general. Self-Termination: All persons who resigned from their positions. Dismissal Unknown Reason: Reason for dismissal could not yet be determined. Retirement/Emeritus: retired or emeritus. Change in Position: This category includes terminations due to a change of academic position; for example, if one had completed a qualification (PhD, habilitation, etc.). Various Reasons: Individual cases that do not belong to any of the above-mentioned categories (health reasons, outbreak of war, etc.). Reason Unknown: Cause of termination is unknown.

Particularly noticeable are the white areas, which indicate cases where the causes are still unknown, and the red slices, which stand for dismissals due to the Law for the Restoration of the Professional Civil Service (BBG) in 1933 and the Reich Citizenship Law (RBG) enacted in 1935. To increase the readability and enable us to classify and compare Göttingen to other German universities, the following map (Figure 2)¹⁹ only focuses on reasons related to the National Socialists' seizure of power.²⁰ From the simplified visualization of the data in Figure 2, we can conclude that whereas a considerable number of universities, such as Frankfurt am Main or Heidelberg, lost their mathematicians due to the new legislation (i.e., the BBG and the RBG), in Göttingen the reasons were more varied.²¹

From Figure 2, we can indeed confirm the hypothesis that many mathematicians left Göttingen due to National Socialist policies in general, but not all of them left with manifest reference to the BBG or RBG.

Given its reputation, we have to assume that the departures of most of the faculty members and senior researchers at the Göttingen Institute of Mathematics had an impact on the academic standing of mathematics at the University of Göttingen. One way to trace this potential shift in the significance of the Göttingen Institute is to display the researchers' career steps before and after 1933. For this purpose, the career paths of the mathematicians were traced on a world map and presented in chronological sequence (Figures 3–5). The colored dots indicate career positions, meaning places of graduation or scientific appointments. Their size corresponds to the frequency of career positions at this location – the larger the dot, the more mathematicians' career steps are located at this institution. The lines connect the temporal and geographic dimensions, creating an interactive

19 Interactive version of this figure is the same as Figure 1. By clicking on the different “reasons” in the legend it is possible to show or hide them: <https://forced-academic-migration.net/datapublications/datapublications.p/293.m/17/mathematicians-reason-for-termination>.

20 Lemerrier and Zalc emphasize the importance of simplifying visualizations as much as possible to facilitate their readability, which is true for the maps in this article. Claire Lemerrier and Claire Zalc, *Quantitative Methods in the Humanities: An Introduction* (Charlottesville: University of Virginia Press, 2019), 127–28. However, simplifications also carry the risk of misinterpretation or overestimation of the factors presented. It is therefore extremely important to draw the reader's attention to the way in which the presentation has been simplified and what it does or does not show. For example, Figure 2 focuses only on certain reasons, and it should not be forgotten which other reasons for dismissal also occurred but are not essential for the current research interest.

21 State of work in progress as of January 2021: the focus lies on Göttingen mathematicians. The online version of the visualization is continuously evolving.

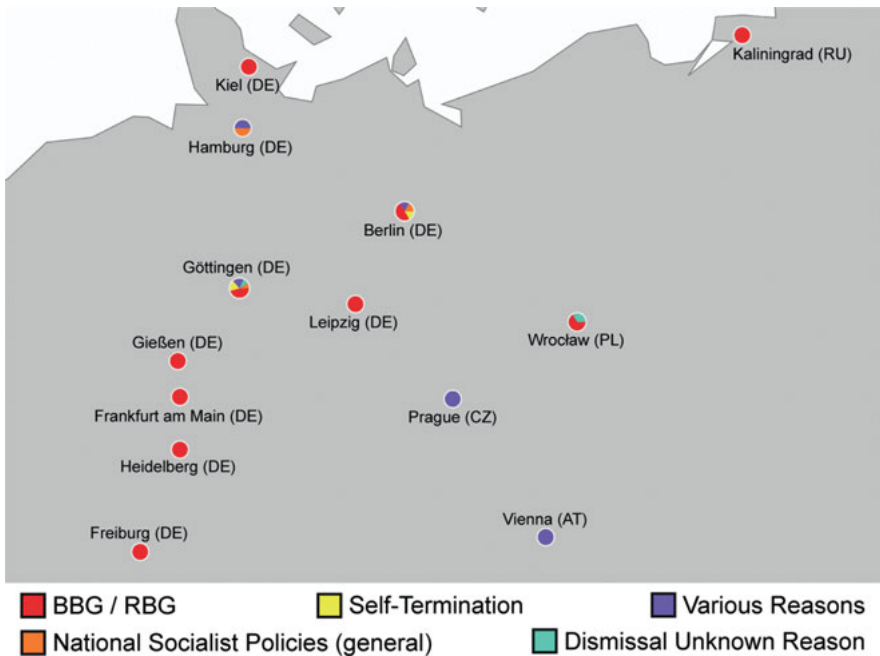


Figure 2: Selected reasons for termination at German universities, 1933–1939.

map of mathematicians' movements. In the online version of the map the movements are changing over time and the directions are visible too.²²

Until the end of 1932 (Figure 3), many mathematicians' careers passed through Göttingen, represented on the one hand by the relatively large dot at the University of Göttingen and on the other hand by the many lines leading to and from Göttingen. In 1933, however, the picture changed abruptly (see Figure 4). Although Göttingen is still mapped, its position becomes marginal. The lines now tend to move away from Göttingen toward Switzerland, the United Kingdom, and, especially, the USA. It is worth noting that after 1933, many mathematicians, as shown in Figure 4, immigrated directly to the USA. Figure 5 confirms this trend also for the years 1935–1945, albeit with slight geographical shifts. Rather than leading from Germany directly to other states, first and foremost to the USA, the lines also connect dots in Switzerland and Great Britain with the USA.

²² The interactive versions of Figures 3–5, accessed January 11, 2022: <https://forced-academic-migration.net/datapublications/datapublications.p/293.m/16/geographic-movement-of-gottingen-mathematics>.

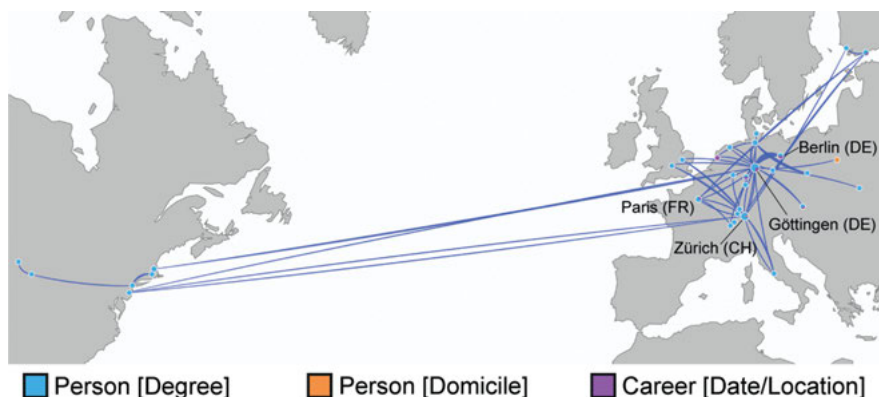


Figure 3: Movements of Göttingen mathematicians, 1925–1932.

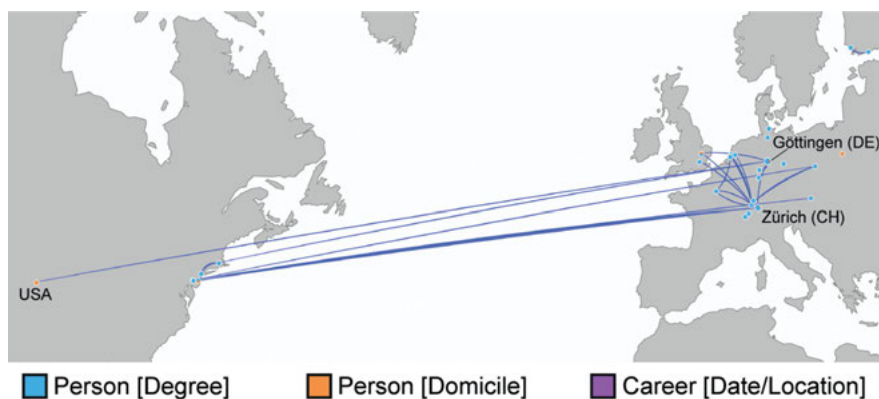


Figure 4: Movements of Göttingen mathematicians, 1933–1934.

Thus, Figure 4 suggests that the mathematicians' career paths often did not end at their first station of exile. Often, the academics had to move several times before settling down definitively, which follows from the shown movements in Figures 3–5. The questions of how many mathematicians managed to proceed directly to the USA and why this was the case remain to be answered in future research. However, connections between Göttingen and research institutions in the USA before 1933, as shown in Figure 3, can provide first insights: personal networks played a significant role in the process of (forced) academic

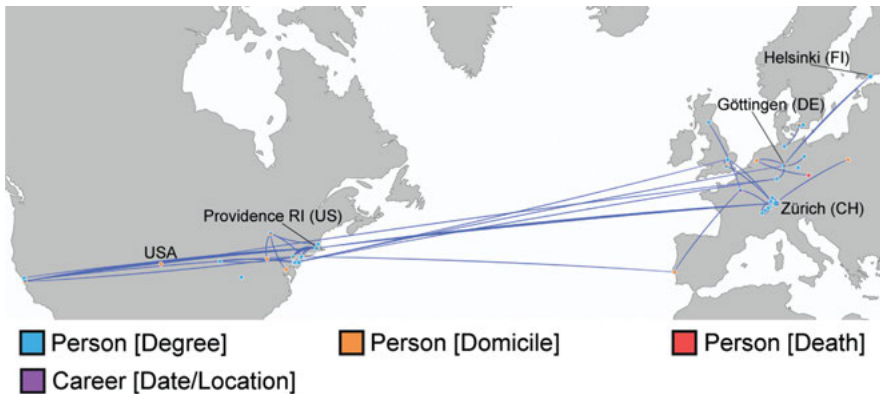


Figure 5: Movements of Göttingen mathematicians, 1935–1945.

migration.²³ The visualization emphasizes that as well as research institutions in the USA, universities in Switzerland seemed to be, at least temporarily, a center of attraction for mathematicians. This raises questions about the determining pull factors for the mathematicians' immigration decisions, such as immigration policies, aid organizations, personal and professional networks, and university policies. The relevance of these factors, particularly that of university policies in the emigration process of dismissed scientists, in this case, mathematicians, will be discussed in the following section based on the example of Switzerland.

3 Transnational Linkages and Local Idiosyncrasies: Mathematics Professors at Swiss Universities

In geographical, linguistic, and cultural terms, Switzerland was an obvious and important emigration destination for German-speaking academics. After April 7, 1933, Swiss university members received numerous personal visits and letters from German scholars (and from Swiss professors employed in Germany), who had been dismissed for racial and/or political reasons, hoping to take up teaching and research activities in Switzerland. How Swiss universities dealt

²³ The contact existing between Göttingen and the USA, visualized by gray lines between the University of Göttingen and various places in the USA, originates from Roland Richardson, who was a postdoctoral student with David Hilbert in Göttingen (nodegoat database).

with these forced academic migrants is the subject of this section, again focusing on the field of mathematics. In the following, we will focus on two examples: first, the interconnections of Swiss universities and professors working at Swiss universities within the transnational network of academia and, second, the development of Swiss appointment policy(s) in regard to exiled scholars. As in the first section, our analysis is built upon a nodegoat database, in this case with information about academics in Switzerland.

Figure 6 is a geographical visualization of the career paths of all mathematicians who held a full professorship at a Swiss university between 1900 and 1950.²⁴ Consequently, this map visualizes the (inter)national mobility of this group of mathematicians in the first half of the 20th century. The green dots symbolize the university cities, and the larger the dot, the more career path moves mathematicians made through the university. The sequences of the moves are indicated by the blue arrows.²⁵

Due to the focus on Switzerland, the Swiss university cities are recognizable as the largest dots, particularly Zurich, since it is home not only to a university but also to the Swiss Federal Institute of Technology (ETH). This visualization illustrates the close ties between German and Swiss universities over the entire period. Particularly



Figure 6: Career paths of full professors in mathematics at Swiss universities, 1900–1950.

²⁴ All academic positions (and, if known, the place of study) of professors at the universities of Basel, Bern, Fribourg, Geneva, Lausanne, Neuchâtel, Zurich, and the Swiss Federal Institute of Technology in Zurich are included; however, the data are not yet complete.

²⁵ Link to interactive visualization: Mathematics (full professors) at Swiss Universities: <https://forced-academic-migration.net/datapublications/datapublications.p/293.m/18/mathematics-full-professors-at-swiss-universities>.

striking is the exchange with the important Göttingen Institute of Mathematics. A large number of mathematicians who were full professors at a Swiss university had completed part of their studies in Göttingen or held a faculty position there. Among them was the German mathematician Hermann Weyl (1885–1955). From 1913, he was a full professor at the ETH. He then returned to Göttingen in 1930 upon receiving a call from his former alma mater. Due to the increasing threat of National Socialism, Hermann Weyl, his wife Helene Weyl-Joseph (1893–1948), a Jewish writer and translator, and their children migrated to the USA. Through mediation, by Albert Einstein among others, he managed to obtain a position at Princeton University.²⁶

The visualization also makes it apparent that there was not only movement to the USA, but also back to Europe. One reason for this is temporary research stays, such as the one of George Pólya (1887–1985), a mathematician whose parents converted from Judaism to Catholicism before his birth. A full professor of mathematics at the ETH, he went to Princeton University as a Rockefeller Fellow in 1933 and then returned to his position in Switzerland the same year. Like other scholars working in Switzerland, George Pólya used the connections established during his time abroad to finally emigrate to the USA in 1940 in response to the political situation in Europe and the widespread fear amongst people of Jewish descent in Switzerland that Nazi Germany might invade the country. There, he taught and researched at Stanford University until 1953.²⁷

In addition to studying these transnational networks by means of geographical visualizations, developments in the appointment policy(s) of Swiss universities can also be made accessible through chronological visualizations, as Figure 7 illustrates. It depicts the total number of full professors in mathematics in Switzerland (vertical blue lines) and their distribution among various universities (horizontal colored lines/dots) between 1914 and 1950. Personnel changes in the mathematical institutes – appointments as well as departures – can be quickly

26 Hermann Weyl studied mathematics in Munich and Göttingen. There he also received his doctorate and habilitation. From 1913 to 1930 he was a full professor at the ETH, and from 1930 to 1933 at the University of Göttingen. Preempting his dismissal, Weyl submitted his application for discharge in October 1933. He then worked at the Institute for Advanced Study in Princeton until 1951. Reinhard Siegmund-Schultze, *Mathematicians Fleeing from Nazi Germany: Individual Fates and Global Impact* (Princeton, NJ: Princeton University Press, 2009), 56.

27 George Pólya was born in Budapest, Hungary, in 1887. He studied and received his doctorate in Budapest. From 1914, Pólya was a private lecturer at the ETH in Zurich and a full professor from 1928. He then emigrated to the USA, where he first worked at Brown University and then Stanford University, including previous research stays in Vienna, Paris, Cambridge, and Princeton. David Gugerli, Patrick Kupper, and Daniel Speich, *Die Zukunftsmaschine: Konjunkturen der ETH Zürich 1855–2005* (Zurich: Chronos-Verlag, 2005), 242; Gerald L. Alexanderson, *The Random Walks of George Pólya* (Washington, DC: Mathematical Association of America, 2000).

grasped through the visual representation. After a steady increase in the number of full professors in mathematics until 1933, years of stagnation and decline followed. From 1944 onwards, a renewed increase can be observed: vacant positions were filled and additional positions were created. This breakdown by university also allows the disciplinary focus of the universities to be filtered and compared. In addition, it is possible to make a subdivision according to gender to show the changing positions of women within the professoriate.²⁸

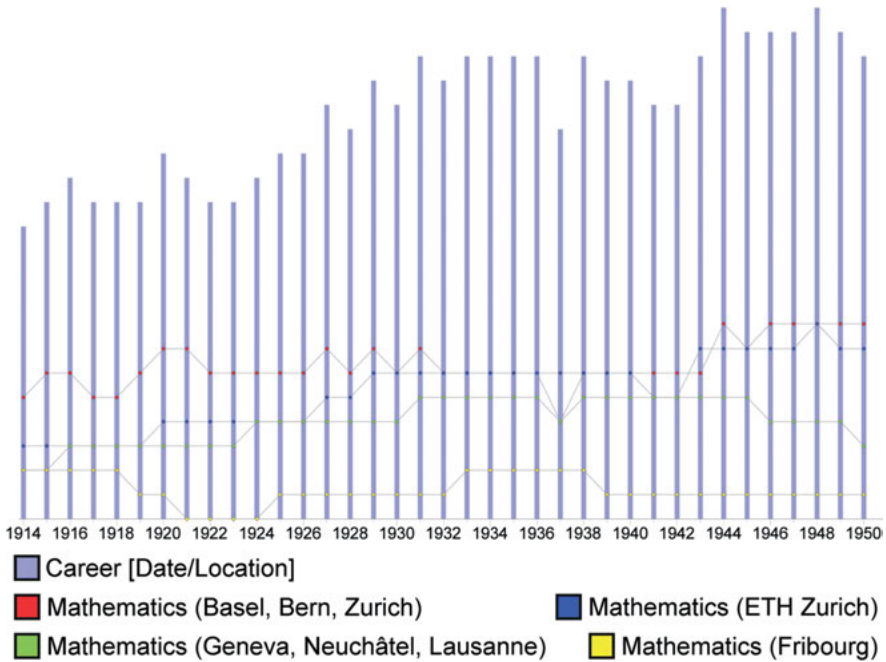


Figure 7: Total number of full professors in mathematics and their distribution amongst Swiss universities, 1914–1950.

Regarding the question of what appointment policy(s) the Swiss universities pursued from 1933 to 1945 and what positions were taken toward academic

²⁸ Sophie Piccard became the first female full professor in mathematics at a Swiss university in 1943. Christine Riedtmann, “Wege von Frauen: Mathematikerinnen in der Schweiz,” in *Math. ch/100: Schweizerische Mathematische Gesellschaft 1910–2010*, ed. Bruno Colbois, Christine Riedtmann and Viktor Schroeder (Zurich: European Mathematical Society Publishing House, 2010), 403–21.

migrants, the visualization in Figure 7²⁹ indicates that there was only one appointment of a full professor in the field of mathematics in 1933, that of the Austrian mathematician named Anton Huber (1897–1975), who was not an academic migrant. Huber had been an associate professor at the University of Freiburg in Switzerland since 1928. In 1935, he joined the *Nationalsozialistische Deutsche Arbeiterpartei (NSDAP)*-Switzerland,³⁰ and in 1938, after the *Anschluss* of Austria, he accepted a position at the University of Vienna.³¹ Huber’s appointment as a full professor was the last of a foreign mathematician until after the end of the war, which indicates that none of the mathematicians dismissed in Germany since 1933 could continue their scientific activities in Switzerland – at least not in the position of full professor. Support was provided, for example, in the form of temporary teaching assignments. Such was given to the Jewish-Swiss mathematician Paul Bernays by the ETH, upon being dismissed from his position at the University of Göttingen in 1933. Despite interventions by Weyl on Bernays behalf, the ETH did not promote Bernays until after the end of the war. Bernays received tenure in 1945 when he was appointed to associate professor. His academic positions, however, did not correspond to his scientific importance.³²

How these examples can be located within the appointment policy(s) of Swiss universities or to what extent they indicate a discipline- or university-specific appointment practice can only be answered once all the necessary data have been recorded. What is already apparent, however, is that the use of digital methods not only generates new research questions but also promotes stimulating and constructive exchanges between different research projects.

29 To obtain a clearer visualization, the universities were divided into groups: 1. German-speaking universities (Basel, Bern, and Zurich); 2. French-speaking universities (Geneva, Lausanne, and Neuchâtel); 3. the only Catholic and German–French speaking university, Fribourg; and 4. the Federal Institute of Technology in Zurich. The University of St. Gallen, which did not receive the right to award doctorates until 1939, was not (yet) involved in these investigations. Link to interactive visualization: Distribution of mathematics (full professors) at Swiss universities: <https://forced-academic-migration.net/datapublications/datapublications.p/293.m/20/distribution-of-mathematics-op-at-swiss-universities>.

30 In 1932, the Swiss National Group of the NSDAP was formed and subordinated into the NSDAP Foreign Department in Germany. Its purpose was to integrate Germans living abroad into the National Socialist system, but it also served intelligence purposes. The NSDAP was only banned in Switzerland shortly before the end of the war. Catherine Arber, “Frontismus und Nationalsozialismus in der Stadt Bern: Viel Lärm, aber wenig Erfolg,” *Berner Zeitschrift für Geschichte und Heimatkunde* 65, no. 1 (2003): 7–8.

31 Roman Pfefferle, *Glimpflich entnazifiziert: Die Professorenschaft der Universität Wien von 1944 in den Nachkriegsjahren* (Göttingen: V&R Unipress, 2014), 291.

32 Future research will show if and how academic migrants gained access to other academic positions. Gugerli, Kupper, and Speich, *Die Zukunftsmaschine*, 240f.

4 Conclusion

Data visualizations, as shown in this article, are invaluable in answering “traditional” research questions about the consequences of Nazi politics for German academia with respect to emigration, routes of migration, changing reputations of research institutions, networks, and transfer of knowledge; they bring together all the different aspects of academic forced migration into a larger picture, as the example of mathematicians has shown. The forced dismissal of the scientists had tremendous impact on German institutions, as the Göttingen Institute of Mathematics lost its academic standing in the world, on individual academic biographies, and on institutions outside Germany. Personal and institutionalized networks play a key role in the process of academic migration as well as in exile. Yet, data visualization also enables us to detect unexpected events and patterns and thus generate new questions in the field of *Exilforschung*, such as differences between academic disciplines, the extent of multiple migrations, or the relevance of personal vis-à-vis institutional networks.

Moreover, digital tools such as nodegoat allow us to study the macro-level of academic forced migration as well as its micro-historical aspects, as our data model allows us to zoom in on the career paths and personal networks of individual scholars. We have employed a research-question driven digital approach, which exemplifies Miriam Rürup’s plea, in the concluding roundtable of the January 2021 #DHJewish conference, to bring an “analogue perspective” to the digital. However, there are limitations to the digital approach. If we want to address more biographical issues, such as the experiences of individual exiled scholars or personal contingency management strategies, as raised by Adorno, we need to also integrate more traditional historical methods and the kind of qualitative approach that a human close reading of primary sources offers.

Migration is a core element of Jewish existence, from ancient history to modern days, and is thus a central research interest of academic Jewish Studies. Migration is being studied in the context of religious, literary, and cultural studies because the individual and collective experiences of migration of the Jewish people have found expression in religious and profane texts, in art, and in memoirs. Historical research into the topic covers a broad field of questions including political, social, and cultural changes as well as questions about gender and age, to mention just a few.

We understand our project on forced academic migration to be part of the field of *Exilforschung*. *Exilforschung* primarily deals with single and collective biographies of German-speaking émigrés, with their personal and professional experience in exile as well as their contribution to the cultural, industrial, and academic sphere. A tremendous amount of research has been conducted in this

field thus far and has helped us to understand the complexities and ambiguities of exilic existence. Our data-driven projects add to the field by making interconnected comparisons possible. So far, the history of exiled scientists is divided in studies on aid organizations or selected disciplines, there is research on questions like gender, publications on universities, academic associations, and there are books dealing with the consequences the expulsion had on German academia. Through a digital approach it is now possible to integrate these aspects in a more comprehensive picture, and thereby greatly enhance our understanding of the phenomenon of *Exil*.

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