

COPYRIGHT NOTICE:

Reinhard Siegmund-Schultze:

Mathematicians Fleeing from Nazi Germany

is published by Princeton University Press and copyrighted, © 2009, by Princeton University Press. All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher, except for reading and browsing via the World Wide Web. Users are not permitted to mount this file on any network servers.

Follow links Class Use and other Permissions. For more information, send email to: permissions@press.princeton.edu

The Terms “German-Speaking Mathematician,” “Forced,” and “Voluntary Emigration”

THIS CHAPTER tries to settle some fundamental concepts to be used in the book concerning the overall process of expulsion of scientists by the Nazi regime and which are not specific to “mathematics,” although the concrete examples are from that particular field. In addition, this chapter outlines the structure of argumentation and the mode of presentation used in the book.

The expulsion of many European mathematicians from their jobs and from their home countries between 1933 and the early 1940s forced upon them by Hitler’s regime is undoubtedly the central event of the social history of mathematics between the two world wars.

That momentous event has to be put, on the one hand, into a broader historical perspective and to be treated with some claim of historical completeness. On the other hand, however, the discussion has to be appropriately restricted to exemplary case studies that can be dealt with in a limited volume.

The restrictions concern basically an emphasis on the special process of “emigration” within the overall “expulsion,”¹ a focus on German-speaking émigrés,² and an appropriate delimitation of the notion of a “mathematician.”³ The demand for completeness and broader perspective implies a concern for as detailed data as possible with respect to the group of mathematicians in mind (as mainly reflected in the appendices). It also implies an embodiment of Nazi-enforced emigration into broader processes of cultural and scientific “emigration,” regarding both the change in historical conditions and the motives.

These restrictions enable a consistency of historical method, since the persons described were united by common traits of scientific education and socialization and by a common language, even if they in many cases

¹“Expulsion” and “persecution”—the latter notion including more than “emigration”—will be discussed for the example of mathematics in chapters 2, 4, and 5.

²This category is also the basis for a recent comprehensive German dictionary of emigrants (Krohn et al., eds. 1998).

³For the latter delimitation see the next chapter.

had their origins in peripheral countries⁴ and entered the German-Austrian⁵ system in order to undertake their university education or to work as mathematicians there. Thus “German-speaking” as used in this book means more than just fluency in the German language. It is related to the process of socialization of the respective mathematicians. Publications in German alone are definitely not the decisive criterion for calling a mathematician “German-speaking,” as German was still the leading language in mathematics at that time.⁶ There are borderline cases of mathematicians such as Zygmunt Wilhelm Birnbaum (1903–2000), whom I decided not to include, since Polish seems to have been the main language during his mathematical training although his written German was excellent.⁷

Even though similar conditions of training made for certain shared mathematical traditions among “German-speaking” emigrants, one has to account for differences as well, particularly between Germany and Austria.⁸

Although systematic historical investigations are still lacking, it seems indisputable to me that the political and philosophical environment in Vienna supported a specific kind of mathematical research already in the 1920s differing markedly from the dominating mathematical trends in the Weimar Republic. Here shall be mentioned but *two directions* in which such research, yet to be conducted, would have to proceed:

Firstly, there is no doubt that the systematic claim of Hilbert’s program of research in the foundations of mathematics, eventually refuted by Kurt Gödel’s first “incompleteness theorem” of 1931, can only be understood

⁴Typical examples are mathematicians such as John von Neumann and Gabor Szegő, who originally came from Hungary.

⁵Among the “German-speaking scientific centers” one has to name also the “Deutsche Universität” in Prague, which had been left largely intact as a German-speaking institution by the Czech Republic and fell under Nazi rule in 1939. The Swiss system (in particular the ETH Zurich), which with respect to the educational principles can be considered to belong to a more general “German” system, is less central here, because it was not under Nazi rule, although we include G. Pólya among the refugees. For Austria, in particular Vienna, the two-volume Einhorn dissertation (1985) is the most important biographical source. See also Pinl and Dick (1974/76).

⁶Typical for a “non-German-speaking” mathematician in this sense is the Polish logician Alfred Tarski, who was mainly educated in Warsaw in the Polish and Russian languages. Nevertheless he had a good command of German, and communicated freely in German with Kurt Gödel and other Austrian mathematicians. Tarski’s most important work on semantics and the notion of truth became visible internationally only after the German translation (1935) of the Polish original of 1933. Cf. Feferman and Feferman (2004).

⁷Birnbaum spent some time in Göttingen as assistant to Felix Bernstein. See Birnbaum (1982), Woyczynski (2001), and the Birnbaum Papers at the University of Washington in Seattle (USA), at http://www.lib.washington.edu/SpecialColl/findaids/docs/uarchives/UA19_14_5266BirnbaumZygmunt.xml.

⁸For the Austrian case and particularly emigration from Vienna see Sigmund (2001), the catalogue to an exhibition on the same topic in September 2001.

against a philosophical background much more neo-Kantian (retaining certain absolutes or a priori in its epistemology) than the philosophy of the Vienna Circle.⁹

Secondly, the deficiencies in Germany in several newer mathematical subdisciplines, such as topology, functional analysis, and some parts of mathematical logic, seem to have been conditioned by a certain self-sufficiency and by social hierarchies¹⁰ in Germany and, in particular, by a politically motivated sealing off from Polish mathematics, which was much less typical of mathematicians in Vienna (D).¹¹ The close contacts that Wilhelm Blaschke (who was in Hamburg and had come from Austrian Graz) and his geometric school kept with the topologists in Vienna could apparently not make up for the partial international isolation of mathematics in Germany. Also, the Austrian emigrant Olga Taussky-Todd (1988a) reports on partially differing German and Austrian traditions even in core subjects of research such as algebra. For the impact of emigration one has also to consider the longer-lasting contacts of the Austrian and Prague mathematicians with mathematicians abroad, contacts that were restricted for German mathematicians after 1933.¹² For this reason it is necessary to differentiate between the various streams of German-speaking emigration. The existence of differences between two geographically and linguistically close mathematical cultures such as the German and Austrian ones may also explain the differing in which the emigrants adjusted to the American mathematical culture. In this latter respect one could imagine a triangle of different German, Austrian, and American epistemic traditions or “working units of scientific knowledge production” as recently investigated for topological research in Austria and the United States in the 1920s.¹³

Although, as indicated above, the cognitive dissimilarities among the German-speaking regions were partly related to differing political conditions, there were also “political” experiences the German-speaking émigrés had in common, and their political socialization was undoubtedly at variance with that of mathematicians in other countries such as Poland and

⁹This difference is still valid, if one compares Reichenbach’s group in Berlin with the Vienna Circle. In Göttingen, the neo-Kantian L. Nelson was supported by Hilbert, who was opposed to most of the doctrines of the other schools of German idealistic philosophy. But Nelson’s Kantianism was—from the perspective of the Vienna Circle—still affected by metaphysical beliefs. See Peckhaus (1990). Incidentally, Gödel, with his Platonist views, was himself increasingly distant with the Vienna Circle.

¹⁰See the short remarks in 3.D.4.

¹¹See Menger (1994) and Szaniawski, ed. (1989).

¹²On the restriction of international contacts of German mathematicians after 1933 consult Behnke (1978) as an eyewitness report, and Siegmund-Schultze (2002).

¹³See Eppe (2004).

France. The latter fell under German rule between 1939 and 1940, and French mathematicians suffered various forms of expulsion. The chances of emigration¹⁴ worsened considerably at that time, mainly due to the current prevailing conditions of war. Although in Germany and Austria the expulsions had not been restricted to anti-Semitic purges either, in occupied countries such as Poland the Nazi policies of racial cleansing extended in many cases to whole social groups, in particular intellectuals. In fact, in occupied Poland the expulsions had the most deadly consequences for the victims.¹⁵ For reasons mentioned these mathematicians are not primary subjects of this book. The task of describing their fates will be left to their compatriots who are better qualified to study the purges in detail. One might say that the fates of these mathematicians were in total even more tragic than those of German-speaking refugees. They shall therefore always be kept in mind in the following discussion as a comparative example and a background for this investigation.

Further restrictions and focus of this investigation have to be mentioned: Since the United States became the final host country for more than half of the mathematician-emigrants—which was a natural consequence of the course of the war but had additional historical reasons—this book will be focusing on immigration to the United States.¹⁶

Some authors distinguish between “emigration” and “exile.” Historical research on “exile” concerns refugees “who went into exile in order to work politically, culturally or scientifically for a democratic future of

¹⁴Well-known mathematicians from the non-German area who survived and were able to emigrate are André Weil (France), Alfred Tarski (Poland), and Guido Fubini (Italy), Fubini a victim of the Fascist regime in his country after the introduction of the racist law of 1938.

¹⁵In a letter to the French Académie des Sciences on September 27, 1945, the Polish mathematician W. Sierpinski names the following thirteen Polish mathematicians murdered by the Nazis: H. Auerbach, C. Bartel, A. Hoborski, J. [or M.] Jacob, A. Lindenbaum, A. Łomnicki, S. Kempisti, A. Rajchman, S. Ruziewicz, S. Saks, J. P. Schauder, W. Stozek, and A. Wilk [Archives AS, Dossier Sierpinski]. As victims of the war, Sierpinski mentioned in addition S. Dickstein, A. Kozniowski, S. Kwietniewski, A. Przeborski, and W. Wilkosz. The list of victims published in *Fundamenta Mathematicae* 33 (1945): p. v., also names, the following four murdered: S. Kaczmarz, A. Koźniowski, J. Pepis, and J. Zalcwasser. According to later investigations one has to add J. Marcinkiewicz, S. Lubelski (*Acta Arithmetica* 4 [1958]: 1–2), and M. Presburger (Zygmund [1991]). Feferman and Feferman (2005), p. 129, remind of the fate of the female logician J. Hosiasson-Lindenbaum (1899–1942), wife of A. Lindenbaum. In 2003 R. Wójcicki also mentions logicians J. Salamucha and M. Wajsberg as murdered by the Nazis. See <http://www.ifspan.waw.pl/StudiaLogica/PL.Logic.html>. According to Kuratowski (1973), pp. 80–90, the following Polish mathematicians have to be added as well: Miss S. Braun, M. Eidelheit, S. Kołodziejczyk, J. Schreier, L. Sternbach, and M. Wojdysławski.

¹⁶But there will be side views on emigration to other countries as well, particularly in chapters 2 and 5. When there is no danger of misunderstanding, the United States will occasionally be called “America.”

Germany.”¹⁷ Unlike many artists, the great majority of German academics forced to flee after 1933 did *not* belong to the *exile* in this sense but rather to the more general *emigration*, which is also attested by the fact that only a few of them returned to Europe after the war.

Furthermore, a distinction has to be made between *forced emigration* and *voluntary emigration*, depending on whether the lure of the host country or the pressure from the home country (“pull” or “push”) were predominant. Both in pre-1933 emigration and in the employing of German and other European specialists in the United States and the Soviet Union after World War II, *voluntary* emigration was certainly dominant, although political pressures and economic hardships influenced the decisions as well. This kind of academic migration¹⁸ or *brain drain*, has continued until today, with a peak in the 1960s.

Research on “academic emigration” includes the movement of persons and ideas and is not at all restricted to the investigation of individual biographies of academics. It has developed in Germany since the second part of the 1980s and has been particularly supported by a program of selected measures issued by the Deutsche Forschungsgemeinschaft (DFG).¹⁹ Stimuli for that program not only came from research on the history of science during the “Third Reich,” it was also stimulated by more general, partly epistemologically inspired, investigations into the acculturation of scientific styles, into the *gains* (for the host countries) and *losses* (for the countries of origin) due to academic emigration. This discussion developed in a context of controversial debates on the cultural and political consequences of emigration. Papcke (1988) referred to political tendencies in the United States that stressed the ambivalence of the impact of immigration and the possible loss of “original” American values.²⁰ Yet in Europe then and today one finds the articulation of a certain resentment against an exaggerated *Americanization* of the various national European cultures. Although Papcke does not share either kind of resentment (which in his opinion expresses either isolationist or nationalist thinking), he also stresses that “culture cannot be internationalized in a simple way” (p. 24 [T]). This

¹⁷Papcke (1988), p. 18. A similar distinction is also done in Pross (1955), p. 18.

¹⁸While *emigration* is reserved for movements between different countries, the more general notion, *migration*, is also being used for academic mobility within the same country. See Hoch (1987).

¹⁹See results in Strauss, Fischer, Hoffmann, and Söllner (1991), and a parallel program by the Volkswagen Stiftung, which led, e.g., to Kröner (1989). The DFG program continued an earlier one that went by the name of “Exilforschung.” See Briegel and Frühwald, eds. (1988).

²⁰A. Bloom, *The Closing of the American Mind* (New York: Simon and Schuster 1987). Papcke (1988), p. 22, mentions exaggerated self-criticism, relativity of values, and lack of orientations as those alleged consequences of immigration.

statement may sound irrelevant to mathematics at first sight. The investigation will, however, show that, even in mathematics, traditional judgments on success or failure of academic emigration have to be carefully evaluated, and the broader cultural and political context has to be considered.

As to academic emigration in the sciences, Papcke finds the following distinction: “Everywhere in the sciences there was a considerable transfer of knowledge. But a noticeable cultural impact can only be found in the USA” (p. 19 [T]). Coser, in the introduction to his book dealing with the impact and the experiences of émigrés in the United States, emphasizes that the transfer of knowledge requires direct and personal contacts: “The experience of being taught by a great scientist or a great humanist scholar cannot be duplicated by even the most diligent perusal of published works or by listening to even a major paper at an occasional international meeting.”²¹ In fact, the importance of this “oral communication” in the sciences was already apparent in the 1920s, and foremost U.S.-American foundations took account of that by granting stipends on an international basis. The foundation policies of the 1920s had a strong pro-American bias. However, the foundations also tried to promote American science indirectly, not just by supporting immigration but also through the support of European science on its home ground. This attracted American students in large numbers.²² Contemporary witnesses before and after 1933, in particular some representatives of the Rockefeller Foundation, saw the drawbacks—due to emigration—of a loss of cultural diversity in world science, something that hitherto had stimulated science at large.²³ This policy, of course, had to be changed after Hitler came to power, but slowly, as argued by some concerned politicians and scientists. Some of them insisted that the United States should only temporarily host European scholars who later on intended reviving science in their countries of origin. The Rockefeller Foundation, for example, supported for a long time the sojourn of European mathematicians in their first host countries,²⁴ before global political developments made this less and less possible.

Evaluating *gains* and *losses* during emigration one has to be careful not to fall into the *post hoc, ergo propter hoc* trap, that is, to claim that developments in the host countries (the gain) would not have taken place without immigration.²⁵ The opposite assumption—that these de-

²¹Coser (1984), p. xi.

²²See for details Siegmund-Schultze (2001) and the discussion in chapter 3.

²³In retrospect, American mathematician Garrett Birkhoff saw the dangers of an “overkill” of mathematics due to emigration. See below.

²⁴Gumbel at Lyon, Neugebauer at Copenhagen, Feller at Stockholm, etc.

²⁵Particularly Fischer (1991), pp. 35–36, warns against making that mistake in historical methodology.

velopments would have taken place in the country of origin as well (the loss)—is equally illegitimate. This also shows that research on emigration cannot evade the dilemmas of “counterfactual” historical claims,²⁶ which can only be handled with extreme care in a historical investigation.

In this investigation I will mostly discuss *forced* emigration after 1933, when the great majority of mathematicians emigrated for strictly political reasons,²⁷ due to either racist policies (the dominating reason) or political dissent with the resulting pressure on them. However, in many cases the dividing lines between forced and voluntary emigration are blurred, and for historical reasons emigration has to be put into a broader perspective.²⁸ It is necessary to include some mathematicians who had emigrated before 1933 but who could also be considered forced emigrants, as they continued work in and for German mathematics after emigration, which was finally interrupted by the Nazi seizure of power.

A clear differentiation between forced and voluntary emigration is for instance not possible for Theodor von Kármán (1881–1963) and John von Neumann. The important *International Biographical Dictionary of Central European Émigrés, 1933–1945* (henceforth *IBD*), edited by W. Röder and H. A. Strauss in 1983, does not mention von Neumann and von Kármán. The latter had gone to the California Institute of Technology in Pasadena by 1929, mainly because he felt that anti-Semitism was impeding his career in Germany. Both men maintained contact with Germany until it was broken off in 1933; the much younger von Neumann, who at the time had a partial appointment in Princeton, even canceled his preannounced lectures in Berlin. In the case of von Kármán there is the additional problem of whether he can be justifiably included among “mathematicians” (see chapter 2). It appears to me, therefore, that for a sensible definition of the (forced) “emigrant” to be used in this book, the dividing line should be drawn exactly between von Neumann and von Kármán, including the former and excluding the latter from the focus of the discussion.²⁹ There is, however, agreement between the *IBD* and the present book in treating the statistician and pacifist Emil Julius Gumbel as a (forced) emigrant, since he was a German-speaking mathematician who

²⁶Thiel (1984), p. 228. “Counterfactual” is meant to signify the hypothesis that history could have developed otherwise, “contrary to the facts” that really occurred.

²⁷Economic reasons, which in a certain sense are certainly also political, were becoming less an issue with the partial recovery of the economy in Nazi Germany in the late 1930s, when the chances for mathematicians, who were “Aryan” by Nazi standard, gradually improved.

²⁸See particularly chapter 3 on early emigration.

²⁹But von Kármán’s relations with emigrants as documented in his rich archives at the California Institute of Technology are a crucial source also for the present book.

emigrated from Nazi-occupied territory (or Nazi-threatened in the case of southern France where Gumbel was in 1940).³⁰

There is no way of considering refugees such as Richard von Mises as “voluntary” emigrants, even if, to the outsider, they were the ones who abandoned their appointments in 1933 or later. They were clearly under threat; they left in awareness of the impending developments and would have been dismissed later on anyway. As in the case of von Mises, they often had to leave their work and projects in shambles and unfinished.

There were, though, early emigrants in mathematics such as Theodor Estermann (1902–1991), Hans Freudenthal (1905–1990), Eberhard Hopf (1902–1983), Heinz Hopf (1894–1971), Chaim (Hermann) Müntz (1884–1956), Wilhelm Maier (1896–1990), and Abraham Plessner (1900–1961), who left for predominantly economic reasons and out of concern for their scientific careers. Some of them are—partly without their approval—treated as refugees from the Nazi regime in other historical accounts. This happened, for instance, with Estermann, Freudenthal, and Müntz (Pinl/Furtmüller 1973), although Estermann had left for London in 1926, Müntz for Leningrad in 1929, and Freudenthal for Amsterdam in 1930. Of course arguments pointing to academic anti-Semitism in pre-1933 Germany, which without any doubt hampered the careers of Müntz and Plessner,³¹ and diminished their chances of return after 1933, could also be cited. The argument to count early Jewish emigrants as refugees from the Nazis is supported by the fact that non-Jewish early emigrants, such as Eberhard Hopf and Wilhelm Maier, returned to Hitler’s Germany after 1933 and profited partly from the dismissals of their Jewish colleagues. Nevertheless, in accordance with this book’s main restriction and for reasons of historical systematics, Estermann, Freudenthal, and Müntz do not appear in the list of emigrants (Appendix 1 [1.1]).³² The Nazi seizure of power did not deprive them of an existing, immediate chance of returning to Germany or of a very important professional position, as it did for von Neumann. Freudenthal, who supported many a refugee from Germany before 1940,³³ shared the fate of other non-German emigrants in

³⁰In a broader sense Gumbel could already have been included as a forced emigrant without that fact of renewed expulsion, because he was dismissed from the University of Heidelberg before 1933 for exactly the same political (Gumbel’s antimilitarism) and racist “reasons,” which after 1933 were used as a pretext by the Nazi regime.

³¹Gaier (1992). In Plessner’s case as in others, like S. Bochner, the anti-Semitic prejudice was mixed with and partly hidden by concern for their lack of a German citizenship.

³²Müntz was included in that list in the German edition of this book in 1998 due to erroneous information from Pinl and Furtmüller (1973), which has meanwhile been corrected by Ortiz and Pinkus (2005) and by recent findings in the Oswald Veblen Papers and the Bodleian Library (SPSL).

³³Among them were Blumenthal and Rosenthal, and also Pinl, who was persecuted in Prague.

other occupied countries. After the German occupation of the Netherlands in 1940 he had to go into hiding. Müntz, however, was expelled without the right to a pension from his professorship in Leningrad in 1937 (a professorship once occupied by P. L. Chebyshev), because he had retained his German citizenship and because tension between Nazi Germany and the Soviet Union was growing.³⁴ As both Freudenthal and Müntz were German-speaking³⁵ and because Müntz was potentially threatened in Sweden and therefore tried to get to the United States, both of them are included as borderline cases in the list of persecuted German-speaking mathematicians (Appendix 1 [1.3]). Other borderline cases are Robert Frucht and Karl Menger. Frucht left Berlin in 1930 for economic reasons and became an actuary in Italian Trieste. He can be considered an “early emigrant,” but also a part of the forced German-speaking emigration after 1933, since he had to leave Italy in 1938 when the racial laws were passed. Also Menger can be categorized both as an early and a forced emigrant, as the discussion in chapter 3 will show. I decided, however, not to include Henri A. Jordan (1902–?) among the forced emigrants, because he went from Germany to Italy in 1930, where he was dismissed in Rome for reasons of restriction of staff at the International Institute for Educational Cinematography (League of Nations) in December 1933.³⁶

A very interesting and important borderline case between early and forced emigration is the well-known set theorist Adolf Fraenkel, who immigrated to Jerusalem twice (in 1929 and 1933) and who later in Palestine called himself Abraham A. Fraenkel.³⁷

A further historical problem lies in how far Switzerland and, in particular, the Eidgenössische Technische Hochschule (ETH) in Zurich, traditionally with strong ties to German mathematics,³⁸ can be regarded as a host to refugees or—in contrast—as origin for forced German-speaking emigration during the Nazi years. On the one hand, Switzerland offered refuge to early emigrants such as topologist Heinz Hopf, and to forced

³⁴Müntz to H. Weyl, Stockholm, August 8, 1938, OVP, cont. 32, f. Muentz, Hermann 1938–41. According to the same letter, Müntz fled through Estonia (Tallin), where he was guest-professor for one term (but had to leave because he taught in German), to Sweden, where he arrived in February 1938.

³⁵The first-mentioned mathematician was later fluent in Dutch, even as a novelist; Müntz probably acquired the Russian language during his eight years in the country.

³⁶Jordan was born in Brussels, had acquired German nationality, and went to school and studied at Frankfurt in the 1920s. He took his doctoral degree on Bessel Functions there in 1930. After 1933 he went through the United Kingdom to the United States in 1936. See his file in SPSL, box 281, f. 1, Tobies (2006), p. 173, and a short note in OVP, cont. 31.

³⁷See Fraenkel (1967) and in chapters 3 and 8.

³⁸This connection, which goes back to the nineteenth century, is exemplified by the work of Hermann Weyl at the ETH in the 1920s. See chapter 3.



Figure 3 *Hans Freudenthal (1905–1990). The noted topologist was an early emigrant from Berlin (1930); he helped émigrés to the Netherlands after 1933 and survived the Nazi occupation in hiding.*

emigrants such as logician Paul Bernays. Thus Switzerland, which—unlike Austria and Prague—never fell under Nazi rule, can primarily be considered a (rather exceptional and marginal) host country. Then, on the other hand, borderline cases such as that of Georg(e) Pólya (1887–1985), who emigrated from Zurich to the United States in 1940 because he saw the possible occupation of Switzerland as a real danger, point, once again, to the difficult problem of the definition of “forced emigration.”³⁹

³⁹I nevertheless include Pólya among the German-speaking refugees from Hitler’s domain because I do not consider it my business to decide in hindsight how strongly he felt threatened and whether there was maybe less danger for him than for Müntz in Sweden.

Another matter, quite apart from my decision to “classify” emigrants for reasons of historical systematics, is whether emigrants—either early ones such as Estermann,⁴⁰ or the ones who “asked for dismissal” after 1933 like von Mises and Hermann Weyl—would have liked to be represented as “refugees” or “emigrants,” names that for some bore the stigma of the unsuccessful. Hermann Weyl, for one, occasionally described himself as a “voluntary emigrant,” although the threats against his Jewish wife and children in Germany really left him with no choice.⁴¹

Even among the “forced emigrants” one has to differentiate in the historical investigation between the concrete “reasons” for their dismissal.⁴² These “reasons,” arbitrarily presented by the Nazis as relevant for academic careers, were important for the concrete fates and the self-image of the emigrants. They influenced their chances for acculturation in the host countries⁴³ and even had ramifications for post–World War II compensation claims.

In spite of the problems of definition just discussed, the present book will attempt to separate *early emigration* (chapter 3) from *forced emigration*, the latter being the main focus of the book. Chapter 2 will analyze how the extent of forced emigration within mathematics can be quantitatively measured. For this purpose the entire population (as far as known from the sources up to this moment) of mathematicians dismissed after 1933 is compared to the (large) subset of emigrants. The Appendix 1 (1.1) listing the emigrants contains only “successful” emigrants who made it to a host country outside the Nazi domain of power before 1945. Temporary refugees to Holland (Blumenthal, Remak, etc.), Belgium (Grelling), and Prague (Pinl), later caught by the Nazi Reich, appear as victims rather than as emigrants (appendices 1.2. and 1.3). Among the forced emigrants a further distinction will be made between those finally ending up in the United States and the (rather few) ending up in other countries. Special quantitative methods,

⁴⁰“Professor Estermann died in December 1991 and he always made it very clear to people that he was never a refugee of any description and in fact would become very upset if anyone assumed he was. He apparently arrived in Britain firstly in 1926 and then settled here permanently from 1929” (R. Whiting to R. Siegmund-Schultze, July 6, 1993).

⁴¹See Weyl’s letter of resignation written to the Nazi Prussian Ministry of Culture October 9, 1933, printed in Schappacher (1993), pp. 81–83, where Weyl describes these threats, not without reflecting sentimentally on his ties to Germany. For more on Weyl’s self-image as “voluntary emigrant,” see below in chapter 7.

⁴²See also below chapter 11, where objections by emigrants against Pinl’s meritorious report (Pinl 1969–72) are documented, criticizing that Pinl thought it advisable not to mention those reasons he found were no real “reasons” at all.

⁴³On this see for instance the example of the differential geometer and son of an industrialist, Herbert Busemann, in chapters 5 and 7.

such as “co-citation analyses” of publications,⁴⁴ will not be used because of the relatively small size of the investigated population of mathematicians and because of the priority of presenting the unpublished material first. Further discussion in the second chapter will show that principal problems of historical methodology allowing certain types of emigration to fall into oblivion add to rather circumstantial problems of historical sources, something that will, hopefully, be partially repaired by the present publication. Both reasons, however, continue to make a complete representation of the German-speaking emigration in mathematics impossible.

⁴⁴This has been partly used in Fischer (1991). This paper points to a possible extension of the present investigation, although the author Fischer acknowledges (pp. 52f.) that co-citation analyses are controversial as to their historical expressiveness.