

Refugee Mathematicians in the United States of America, 1933–1941: Reception and Reaction

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Summary

The coming of mathematicians to the United States fleeing the spread of Nazism presented a serious problem to the American mathematical community. The persistence of the Depression had endangered the promising growth of mathematics in the United States. Leading mathematicians were concerned about the career prospects of their students. They (and others) feared that placing large numbers of refugees would exacerbate already present nationalistic and anti-Semitic sentiments. The paper surveys a sequence of events in which the leading mathematicians reacted to the foreign-born and to the spread of Nazism, culminating in the decisions by the American Mathematical Society to found the journal *Mathematical reviews* and to form a War Preparedness Committee in September 1939. The most obvious consequence of the migration was an enlarged role for applied mathematics.

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1. Introduction

Immediately after the Nazis moved in April 1933 to expel non-Aryans and the politically tainted from German universities, concerned American institutions and individuals reacted by organizing efforts to aid these individuals. The Academic Assistance Council in Britain came into being earlier, influencing U.S. efforts; in relative terms, the United Kingdom ultimately absorbed more of these displaced scholars.¹

¹ For the British effort, see Walter Adams 'The refugee scholars of the 1930's' *The political quarterly*, 39 (1968), 7–14. Norman Bentwich, *The rescue and achievement of refugee scholars* (The Hague, 1954), and A. J. Sherman, *Island Refuge* (Berkeley, 1973). The best general study for the United States is Maurice R. Davie, *Refugees in America* (New York, 1947). Pertinent to this study is Donald Fleming and Bernard Bailyn (eds.), *The intellectual migration: Europe and America, 1930–1960* (Cambridge, Mass 1969).

American efforts were facilitated by the specific exemption of university teachers from immigration quotas in Section (4)d of the Immigration Act of 1924. The clause represented an unintended exception to the nativist, if not racist, character of that legislation. To take advantage of the exemption, a refugee needed the assurance of a post. The newly-formed Institute for Advanced Study at Princeton and a few universities directly hired refugee mathematicians; many others (as in other fields) came for temporary employment under the aegis of the Emergency Committee for Displaced German Scholars (later Displaced Foreign Scholars), often with the aid of the Rockefeller Foundation.² Although the number of mathematicians involved is not very large, the migration is significant both for its consequences and for what it discloses about historical processes of human and intellectual transfer. By the end of 1935, forty-four mathematicians were dismissed by the Nazis from their posts, to be joined by others subsequently.³ Through 1939 the number reaching America from the German language world reached fifty-one, plus others from elsewhere as Hitler's sway expanded. By the end of the war, the total migration was somewhere between 120 and 150. Many of these individuals remained permanently or for long periods in the United States, including a number we can characterize as being of, or near, world class in eminence. These numbers do not include younger mathematicians not yet in the professional community when forced to flee.⁴ What follows is an account of how the American mathematical community received and absorbed their overseas colleagues up to U.S. entrance into the war. That event materially changed the situation.

The actions of the American mathematicians is a story of the influence of the ideology of the universality of science; of the hazards of Depression conditions; of the reactions to the policies of Nazi Germany; of the influence of nationalistic and anti-Semitic feelings in the United States; and of the persistence of the image of the United States as a haven for the oppressed. It is a story of a real world far removed from the certainty and elegance of mathematics as a monument to human rationality.

² For the former, see Stephan Duggen and Betty Drury, *The rescue of science and learning . . .* (New York 1952) For the Foundation, see Thomas B. Appleget, 'The Foundation's experience with refugee scholars', March 5, 1946, in RG1/Series 200/Box 47/Folder 545a, RFA

This and many later footnotes cite manuscript sources. Here is the list of abbreviations used to indicate them

AMS Archives, American Mathematical Society, Lehigh University, Bethlehem, Pennsylvania
 BHA George David Birkhoff Papers, Harvard University Archives
 CIMS Archives, Courant Institute of Mathematical Sciences, New York University.
 GCE Griffith C. Evans Papers, Bancroft Library, University of California (Berkeley).
 NW Norbert Wiener Papers, Archives of the Massachusetts Institute of Technology.
 OV Oswald Veblen Papers, Manuscript Division, Library of Congress
 RBA R. G. D. Richardson Papers, Archives, Brown University, Providence, Rhode Island
 RFA Archives, Rockefeller Foundation, Rockefeller Archive Center, North Tarrytown, New York (cited above in this footnote).

³ Norman Bentwich, *The refugees from Germany, April 1933 to December 1935* (London, 1936), 174.

⁴ The 1939 count is from Arnold Dresden, 'The migration of mathematics', *American mathematical monthly*, 49 (1942), 415–429. The listing in Dresden is both incomplete chronologically and rather peculiar in some specifics. The range given here is an extrapolation. None of the sources really attempts to identify individuals who were not yet visible as members of a professional community at the time of migration, even though some entered into the field in the U.S.A. An interesting source is Max Pinl and Lux Furtmüller, 'Mathematicians under Hitler', Leo Baeck Institute, *Yearbook XVIII* (London, 1973), a revision of Pinl's series in *Jahresbericht der Deutschen Mathematiker-Vereinigung* under the title 'Kollegen in einer dunklen Zeit', 71 (1969), 167–228; 72 (1971), 165–189; 73 (1972), 153–208; and 75 (1974), 166–208

The programs of the Emergency Committee and the Rockefeller Foundation are important because they were designed as a mechanism leading to permanent posts. In the absence of a governmental position, these organizations formulated a *de facto* official policy. Mathematics loomed very large in both. Of the 277 individuals aided by the Committee, twenty-six were mathematicians, more than any other scientific field. Most were aided early in the period, before efforts switched to other disciplines. The Foundation supported twenty (some being aided by both).⁵ What is most striking is that mathematicians were singled out for rescue early for three reasons: (1) scientists and others recognised the intellectual importance of the field for modern culture, as evidenced by the composition of the newly-founded Institute for Advanced Study; (2) mathematicians were influential in both organizations—for example, the President of the Foundation, Max Mason, and the head of its natural science program, Warren Weaver, were mathematicians; and (3) leading U.S. mathematicians and their organizations became active participants in the reactions to Nazism.

Because the policies of the Committee and the Foundation reflected the difficulties in absorbing the displaced scholars and greatly influenced the rescue effort, I will first briefly sketch these policies in section 2. Then I will discuss pertinent aspects of the American mathematical community in sections 3 and 4 before giving a series of illustrative events from 1933 to 1939 in sections 5 and 6, concluding with an attempt to place these events in a larger framework in sections 7 and 8.

2. The Committee and The Foundation

In April 1933 officials in the Rockefeller Foundation became concerned over the fate of displaced German scholars. Many were known to them because of prior contacts and support, such as the mathematician Richard Courant (1888–1972) and his colleagues at Göttingen. The Rockefeller Foundation officials were appalled to see a great European nation rejecting the ideal of the universality of learning and lapsing into barbarism. They encouraged the formation of the Emergency Committee in May with funds from other private sources.⁶

Both groups were most conscious of the effects of the Depression. In October 1933, Edward R. Murrow, the second-in-command of the Committee, penned a memo on ‘Displaced American scholars’, noting that more than 2,000 persons had been dropped from the faculties of 240 institutions out of a total of 27,000 teachers.⁷ The two organizations decided that universities could not use their refugee funds to displace existing faculty; that they had to avoid a nationalistic reaction to the coming of foreigners; and that, at all costs, the program had to avoid the danger of arousing anti-Semitism.

Specifically, the two bodies decided that they would aid scholarship, not provide relief to suffering. The selection of individuals was based on merit as measured on a world-wide scale. That largely meant mature, or, at least, recognized scholars. Some younger mathematicians received fellowships from the Institute for Advanced Study. A later writer characterized the programs of the Committee and the

⁵ Based on Appleget (footnote 2) and on Duggan and Drury (footnote 2).

⁶ As evidenced by many documents in 2/717/91/725 and 726 RFA and elsewhere in the same collection

⁷ In 2/717/92/731. RFA

Foundation as dealing with the ‘few, often well-off and well connected’.⁸ In practice, the distinctions were sometimes overlooked even at the start. The Committee negotiated with individual universities requesting a particular scholar. Like the Rockefeller Foundation, the Committee wanted to place scholars in research settings but ones hopefully leading to permanent placement—a principal difference from the British program.⁹ Grants were often made for two-year periods, with local matching funds or a Rockefeller donation. The positions were not regular teaching posts but for research, perhaps involving an occasional graduate course. This was to reduce the perils of nationalism and anti-Semitism by avoiding regular posts and limiting calls on university funds.

The effect was often to the contrary. Some faculty members greatly resented giving special privileges to foreigners at a time when money was hard to get for research and when others were forced to carry heavy teaching loads. These Americans viewed the program as a way in which opportunities would be denied to young, promising native-born scholars because the top Europeans would be brought in under this program and then given a permanent place. It would cut off opportunities for young Americans ‘right at the top’, words uttered by more than one person. But others in the Foundation and the mathematical community had different perceptions.

3. The American mathematical community

The two principal agents of the mathematicians in aiding emigrés were Oswald Veblen (1880–1960) and R. G. D. Richardson (1878–1949).¹⁰ The former, a nephew of Thorstein Veblen, the great social theorist, was a distinguished topologist at the Institute for Advanced Study. For many years before, he had helped develop the mathematics department at Princeton, eventually attaining the Fine Professorship. Even before World War I, he had thoughts about expanding mathematical research in the United States. During the previous decade he had served a term as President of the American Mathematical Society (1923–1924), turning some of his ideas into reality. As Richardson admiringly wrote on several occasions, ‘He is our master strategist’. Veblen wrote about his efforts: ‘One of the greatest dangers... is the timid attitude which is taken by most of the scientific people who deal with these questions’.¹¹ Veblen was not timid.

A few more events in his life may give the flavor of the man. In 1943 he wrote to the Secretary of War, Henry L. Stimson, protesting against the form he had to fill out at Army Ordnance’s Aberdeen Proving Grounds. He had been a major in Ordnance in ballistics research in World War I, and was now a consultant: he protested against

⁸ In Sherman (footnote 1), 259

⁹ See Adams (footnote 1). For contemporary comments see R. A. Lambert to A. Gregg, May 20, 1933 (2/717/91/726); Lambert memo of 2 October 1933 (2/717/92/729), Lambert diary entry, 2 July, 1934 (2/717/109/840), all in RFA. In his reminiscences, the physicist Hans Bethe recalled the distinction between Britain and the U.S. ‘In America, people made me feel at once that I was going to be an American... Jeremy Bernstein ‘Master of the trade’, *The New Yorker* (3 December 1979), 100. Bethe noted about England ‘... it was clear there that I was a foreigner and would remain a foreigner’.

¹⁰ In his autobiography, *I am a mathematician*... (Cambridge, Mass., 1964), 175. Norbert Wiener names Veblen and John R. Kline. The latter shows up in sources known to me but not as significantly as Richardson. I have not located Kline’s papers which may say more on his role. Kline succeeded Richardson as Secretary of the American Mathematical Society in 1941.

¹¹ Veblen to Richardson, 6 May 1935, Old file AMS. These records consist of a New file (an attempt to reorganize which went only part way) and the Old file (largely an alphabetical correspondence file).

filling out a form that had an entry for race. Veblen said it was like the Nazis, and he did not want to do it. In 1946 at Aberdeen he refused to sign a form that waived the right to strike. He said he would not do it. A few years later, during the McCarthy period, there was an attempt to deny him his passport on the grounds that he was a Communist which, of course, he was not. He described himself then as an old-fashioned liberal.¹²

R. G. D. Richardson was chairman of the mathematics department at Brown University. Since 1926 he had been dean of its graduate school. He was also—most significant in this context—from 1921 to 1940 the Secretary of the American Mathematical Society (AMS). In other words, he ran the Society; he was the establishment. He was born in Nova Scotia and had come to Yale to get his Ph.D. Never to my knowledge did he publicly mention in this period that he was an immigrant himself. In 1908 to 1909 he was in Göttingen to study. (Veblen had not studied overseas: he was a graduate of Chicago.) During World War II Richardson launched a program that would eventually produce a notable applied mathematics institute at Brown. In contrast to the pure mathematician Veblen, Richardson advocated and promoted the application of mathematics.

During the 1920s the mathematical research community in the United States was a small but active and expanding body, in large measure because of Veblen's fund-raising. For one thing, he got mathematicians added to the National Research Council fellowship program, a very important move much appreciated by his colleagues. He also launched an endowment drive for the Society. The mathematicians up to that time had had very little success in fund-raising, and they were impressed by his skills in talking to foundations and the wealthy. He obtained money to subsidize the publications of the American Mathematical Society so that more research could be published in the United States.

By the time the Depression began in 1929, in the United States a mathematical community that had been expanding modestly from the start of the century was undergoing a great period of growth partly due to the infusion of money. Richardson, writing to the Rockefeller Foundation in 1929, ascribed all of this to the AMS: 'The atmosphere of scholarly devotion which has raised the sciences and arts of the European countries to a lofty plain is being cultivated by the SOCIETY'.¹³

After the Depression came, this promising expansion was imperiled. In 1932 Richardson estimated that, at a minimum, 200 of the members of the Society were out of work. The Society passed a resolution readmitting members who had had to drop out because of economic stringencies without asking them to pay a new initiation fee. Richardson and his colleagues were trying very hard to find ways to get these people back in the Society.¹⁴

Although Richardson and Veblen operated through the American Mathematical Society, it was not the entire formal institutional structure of mathematics in the United States. There was another group, the Mathematical Association of America (MAA). The MAA was quite different in character and purpose. It was founded in 1915 when the AMS had refused specifically to take on a concern for teaching at the

¹² Veblen to H. L. Stimson, 8 December 1943, to Col. Leslie Simon, 30 September 1946, to Simon, 5 February 1947 and item 11 in Box 21, Summary of Defense, all in OV

¹³ Richardson to Max Mason, 20 February 1929, 1 1/200/125/154, RFA. Veblen's papers contain charts, graphs and tables about the improvement in mathematics in this period

¹⁴ Richardson to G. D. Birkhoff, 25 February 1932, BHA; Richardson to O. D. Kellogg, 1 March 1932, RBA; minute of Board of Trustees, AMS, 2 January 1932, box 20, OV

undergraduate level and below, and was largely concerned with teaching. There was a great overlap in membership, and the two organizations quite frequently met together.¹⁵

The split was very important because most of the jobs that might be available for mathematicians were for teaching undergraduates, not for research and graduate education. Veblen, of course, decried the over-emphasis on teaching;¹⁶ to counter that, he strived to develop the research-oriented Institute for Advanced Study. Richardson, as an academic administrator, had a greater sympathy for the problem of undergraduate education. Academic administrators hesitated about hiring foreigners for undergraduate teaching. Even more than any language difficulties, many emigrés were startled and troubled by the different methods and attitudes in teaching in American colleges. Very few realized, as one emigré later wrote: 'It takes a long time for anyone not born or brought up in this country to realize... that... the primary aim of a college... is to educate members of a democratic society, that it includes among its functions the training of mind and character, of social attitude and political behavior'.¹⁷

A 1935 survey of the job market for mathematicians concluded that, given the normal demographic turnover, there were more potential teaching positions than the annual estimated production of Ph.Ds. This assumed only a slight relaxation of the economic conditions plus an upgrading of some posts not then occupied by holders of the doctorate.¹⁸ But as late as 1940, the job market had not appreciably improved in the opinion of many mathematicians. In a time of economic distress the always present conflict between teaching and research could and did become acute.

To cite one example, in 1934 the University of Michigan's College of Arts and Science had a greatly increased enrollment in mathematics. Significantly, the faculty member reporting the rise ascribed it to the perception of the importance of mathematics, 'both culturally and practically'. A lot more people were taking mathematics in 1934, at least in Ann Arbor. In the following year a young mathematician at Michigan wrote to Richardson that there had been an enormous struggle between the 'research' and 'non-research' groups over his tenure. He had won; he had a permanent job. He was not going to have to teach summer school any more in order to do his research and to earn a living; yet it was a real struggle, and it affected the kind of job opportunities for all mathematicians.¹⁹ The refugees, being marginal men because of Nazism, were particularly vulnerable in clashes between culture (that is, research) and practicality (that is, elementary teaching). As long as they were viewed as 'merely' researchers, not involved in the routine teaching, they

¹⁵ The specific spur to forming MAA was the AMS refusal to take over the *American mathematical monthly*. In 1938 R. C. Archibald of Brown, who favored a research emphasis, took issue with Richardson's *ex post facto* characterization of MAA as 'child of AMS', stressing the distinction. Richardson appealed to his contemporaries for reassurance on the closeness of the two. See Richardson to E. R. Hedrick and T. S. Fiske, 15 October 1938, and Hedrick's reply of 21 October 1938, in Old file, AMS.

¹⁶ See Veblen to J. W. Alexander 1 May 1923, OV.

¹⁷ Davie (footnote 1), 307. How this influenced social relations is shown by two anecdotes in S. M. Ulam, *Adventures of a mathematician* (New York, 1976), 90, 119.

¹⁸ E. J. Moulton, 'The unemployment situation for Ph.Ds in mathematics', *American mathematical monthly*, 42 (1935), 143-144. See also K. P. Williams and Elizabeth Rutherford, 'An analysis of undergraduate schools attended by mathematicians', *School and society*, 38 (1933), 513-516, and 'Report on the training and utilization of advanced students of mathematics', prepared for MAA, *American mathematical monthly*, 42 (1935), 263-277.

¹⁹ *American mathematical monthly*, 41 (1934), 612-613. R. L. Wilder to Richardson, 16 May, 1935. RBA.

were targets for those viewing research as a luxury expendable in a time of economic crisis.

In 1936 Richardson published a study of doctorate holders in America since 1862, whether foreign or native-born, and holders of domestic or overseas degrees. He identified 114 holders of foreign degrees (both native and foreign-born) compared to a total of 1286 degree holders from United States and Canadian universities.²⁰ The 34 from Göttingen far surpassed any other foreign source. To this indication of impact must be added individuals like Richardson who had gone to Göttingen but not to get a degree.

Richardson's analysis of the current situation disclosed 40 foreign-born Ph.D.s in the country as of 1930, and an estimated 20 new mathematicians arriving due to Nazi policies. He observed this actually represented a decrease in the percentage of mathematicians holding foreign Ph.D.s in the country because fewer Americans had gone overseas since 1913. Noting that foreign Ph.D. holders—native and immigrant—tended to be more prolific in research, Richardson feared inbreeding.²¹ The American increase in the award of the degree was more a matter of quantity than quality. What he did not say explicitly, but what emerges from his statistics, is the overwhelming preponderance of undergraduate teaching as a source of employment, not the conduct of research. Like the 1935 survey, Richardson predicted a shortage of mathematicians if only economics permitted hiring and up-grading. Until that occurred, even placing twenty or so leading mathematicians was a problem, considering the hazards of nationalistic and anti-Semitic reactions.

4. The perils of nationalism and anti-Semitism

There is no doubt of the existence of nationalistic and anti-Semitic sentiments. There is considerable difficulty in precisely estimating their consequences in many specific situations. A particular hazard is the need to separate the two kinds of sentiments. Hostile comments about foreigners may serve as code words to mask anti-Semitism. Evidence exists, however, of nationalistic feelings devoid, or largely so, of any hostility to Jews. Although U.S. history, to this very decade, is one in which immigration looms as a basic feature, newcomers have always attracted a measure of antipathy.

Such reactions existed among mathematicians before Hitler and continued after the start of the migration. In 1927, for example, Richardson wrote: 'With one foreigner Tamarkin in the department, we feel that it might be a considerable risk to take on another one such as Wilson. Englishmen do not adapt themselves very quickly to American ways, and generally they do not wish to do so'.²² But there were at least 39 others besides Tamarkin in the United States by 1930, if we can trust Richardson. Some must have been very self-conscious about their origins, judging by Tibor Rado's 1932 greeting to his colleagues 'as a representative of those born abroad who have adopted this as their country'.²³ From 1933 until 1940 Norbert Wiener kept on worrying about the need for assuaging nationalistic sentiments: 'Every

²⁰ R G D Richardson 'The Ph.D degree and mathematical research', *American mathematical monthly*, **43** (1936), 199–215

²¹ A similar conclusion was voiced by T. C Fry to Richardson, 12 July 1935, in Semicentennial Correspondence, AMS.

²² Richardson to Birkhoff, 17 May 1927, RBA

²³ *American mathematical monthly* **39** (1932), 126

foreign scholar imported means an American out of a job . . . Any appointment for more than a year would cause a feeling of resentment that would wreck our hopes of doing anything whatsoever'.²⁴ Veblen voiced similar fears.²⁵ In Wiener's case it surely stemmed from concern about placing young American-Jewish mathematicians in a tight job market.

In 1934 A. B. Coble of the University of Illinois said, despite hostile questions from a state legislator, that he would hire a foreigner if better than any native prospect.²⁶ Wiener's reaction to such hostility was a 1934 proposal to raise new money to provide research posts not competitive with regular posts.²⁷ The Berkeley economist Carl Landauer disagreed with Wiener, asserting that university administrators were giving preference to Germans over Anglo-Saxons. Rather than concentrating the refugees in graduate courses, Landauer wanted them integrated into undergraduate teaching.²⁸

In the same year G. A. Bliss of the University of Chicago turned down a refugee: 'I must confess also that if we could secure a new man, I should want to try to get a strong American. It is pathetic to see the good young American men, who have received their Ph.D. degrees in recent years, so inadequately placed in many cases . . .'.²⁹ In 1941 a dean at Yale, writing about a mathematician, Einar Hille, said: 'No foreigner should be chairman of a department where undergraduate work is involved . . . One of the criticisms of these foreign importations is that they are not suited to undergraduate work or do not wish to do it. Hence they take the most desirable positions away from our American product . . .'.³⁰ Although educated at the University of Stockholm, Hille was born in the United States.

As to anti-Semitism, it was ubiquitous, in at least mild forms, in the genteel world of American academia before World War II.³¹ To cite a few examples, in 1931, the mathematician H. E. Slaught of the University of Chicago, writing about a mathematical astronomer said: 'He is one of the few men of Jewish decent [*sic*] who does not get on your nerves and really behaves like a gentile to a satisfactory degree'.³² In seeking to fill vacancies, administrators sometimes bluntly excluded Jews or asked, as in one case, for 'preferably a protestant'.³³ Coble stated that Illinois played it safe on appointments, 'a policy with which I am not wholly in agreement'. He explained that this arose because the graduate work was conducted by men paid through the administration of the undergraduate colleges, noting that 'leads to selections of a rather uniform type'.³⁴

But Illinois and a number of other departments already had Jewish members, typically one. This produced a problem for some when presented with the option of hiring a second. As a Dean at Kentucky wrote in 1935, 'You know that you have to

²⁴ Wiener to Otto Szasz, 13 August 1933, NW

²⁵ For example, Veblen to B. L. van der Waerden, 18 December 1933, OV

²⁶ Coble to Richardson, 30 June 1934, Old file, AMS

²⁷ See *Jewish Advocate* for 14 December 1934, 1, 4 ♣

²⁸ Landauer to Wiener, 7 January 1935, NW

²⁹ Bliss to Richardson, 10 April 1935, in Lewy file, RBA

³⁰ Charles H. Warren to Richardson, 28 November 1941, RBA

³¹ See, for example, the treatment of exclusionary practices in Marcia G. Synnott, *The half-opened door: discrimination and admissions at Harvard, Yale, and Princeton, 1900-1970* (Greenwood Press, Westport, Conn., 1978).

³² Slaught to Richardson, 23 January 1931, RBA

³³ D. Buchanan to Birkhoff, 18 August 1937, W. M. Smith to Birkhoff, 9 February 1937, BHA

³⁴ Coble to Richardson, 30 March 1935, Old file, AMS.

be careful about getting too many Jews together'.³⁵ Or, as the chairman at Indiana noted in 1938, 'But there is a question of two Jewish men in the same department, and a somewhat small one'.³⁶ Wiener encountered this problem with the possible placement of one of his students at M.I.T. In a conversation in 1935 Karl T. Compton noted the 'tactical danger of having too large a proportion of the mathematical staff from the Jewish race, emphasizing that this arises not from our own prejudice in the matter, but because of a recognized general situation which might react unfavorably against the staff and the Department unless properly handled'. After agreeing that no one should fail to receive fair consideration because of race, Compton continued: 'Other things being approximately equal, it is legitimate to consider the matter of race in case the appointment of an additional member of the Jewish race would increase the proportion of such men in the Department far beyond the proportion of population'.³⁷ By the standards of his day, Compton was an enlightened administrator, but he responded to and perhaps adapted to the conventions of his milieu.

Nor was anti-Semitism wholly absent from the inner workings of the American Mathematical Society. In 1934, the Society elected its first Jewish president, Solomon Lefschetz (1884–1972) of Princeton University, Veblen's successor to the Fine Professorship. That prospect apparently presented a problem earlier for one of the elder statesmen of the mathematical community, Professor G. D. Birkhoff of Harvard University (1884–1944), a close friend of Richardson. Birkhoff and Veblen were probably the two most eminent of the senior American mathematicians of that day. From 1935 to 1939, Birkhoff was Dean of the Faculty of Arts and Sciences at Harvard.

Lefschetz, a great topologist, was born in Russia and educated in France as an engineer. After coming to the United States in 1905, he lost both hands in an industrial accident. He then received a Ph.D. in mathematics from Clark University and taught at universities in the Midwest. In 1924 Veblen brought him to Princeton. Eventually, the two men would break.

Richardson foresaw troubles ahead, yet managed to survive the two years' incumbancy with little apparent damage. Birkhoff's opposition to the possibility had interesting overtones: 'I have a feeling that Lefschetz will be likely to be less pleasant even than he had been, in that from now on he will try to work strongly and positively for his own race. They are exceedingly confident of their own power and influence in the good old USA. The real hope in our mathematical situation is that we will be able to be fair to our own kind . . .'. And Birkhoff went on to say: 'He will get very cocky, very racial and use the *Annals* [*Annals of mathematics*] as a good deal of racial perquisite. The racial interests will get deeper as Einstein's and all of them do'.

In the same letter Birkhoff also expressed distress that the two-year presidency of the AMS, usually awarded on the basis of research eminence, would probably go to individuals (incidentally, all non-Jewish) all of whom, apparently, had different ideas from those he was espousing. He wondered how to arrange that the presidency be given for service to the society, rather than for eminence in research.³⁸ Despite Birkhoff's strong feelings and despite Richardson's apprehensions, when the proper

³⁵ Paul P. Boyd to Richardson, 18 March 1935, Lewy file: RBA. But the president of the university thought otherwise, expressing a desire for more men with European training.

³⁶ K. P. Williams to Veblen, 6 May 1938, OV. Also see S. A. Mitchell to Veblen, 14 December 1935, OV.

³⁷ K. T. Compton, Memorandum of a conversation with Norbert Wiener, 13 May 1935, NW. See Wiener's comments in *I am a mathematician* (footnote 10), 180, 211, relating to this incident.

³⁸ Birkhoff to Richardson, 18 May 1934, RBA.

moment came, it was Birkhoff who reported the nomination of Lefschetz for the presidency. To Marston Morse, writing to Veblen, the result was better than selecting a weaker man 'regardless of politics'.³⁹ Birkhoff's views were apparently fairly well known during his lifetime. In 1936 Norbert Wiener's student, the subject of the Compton memo, than at the Institute for Advanced Study, wrote his teacher a letter in which he closed: 'P.S. Einstein has been saying around here that Birkhoff is one of the world's greatest academic antisemites'.⁴⁰

5. Reactions to refugees and to Nazism

Even before Hitler came to power, there were signs of future American sentiments. In 1932 the *Bulletin of the American Mathematical Society* criticized the dismissal of the Italian mathematical physicist Vito Volterra for refusing to take the oath required by the fascist government as violating 'correct principles of academic tenure'.⁴¹ Perhaps that rather mild criticism influenced the early reaction to the Nazi program but, increasingly, many mathematicians foresaw deeper and more serious aspects of the occurrences in Germany. None, to my knowledge, perceived Hitler's Final Solution to the Jewish problem.

In May 1933 Veblen went to the Rockefeller Foundation about Nazi moves and became a member of the Emergency Committee on its founding. From then until the end of the war, he and his colleague Hermann Weyl ran an informal placement bureau for displaced mathematicians. In Veblen's papers in the Library of Congress are lists of names with headings such as scholarship, personality, adaptability and teaching ability. When information about a person was incomplete in the United States, Veblen wrote to European colleagues.

In April and May 1933 Richardson at Brown University saw an opportunity for America and for his university. In a memorandum of 23 May 1933 to the Brown University Graduate Council giving notes of a luncheon discussion of the German-Jewish situation, he wrote: 'In 1900 we were flocking to Germany but now more come here than go the other way'. Richardson agreed with the Foundation, Veblen and the Emergency Committee about the peril of bringing in a considerable number of mathematicians with so many young people unemployed—the 'danger of causing friction and even of fanning the flames of Anti-Semitism in this country'. To insure and control a proper distribution, perhaps one to three leading mathematicians in each participating university, the Society had to take a leading role. Provided funds were available, Brown could cooperate to the extent of taking two to four mathematicians.⁴² By early July the Council of the Society authorized its President, A. B. Coble of Illinois, to establish a committee of three to cooperate with the Emergency Committee. Naturally, Veblen was one of the three.⁴³ On 15 July 1933 Richardson could write the President of the American Jewish Congress that 'our organization views with dismay and almost incredulity the developments in Germany'.⁴⁴ There is no doubt of the genuineness of Richardson's personal aversion to the news coming out of the Third Reich.

³⁹ Morse to Veblen, 12 September 1934, OV.

⁴⁰ N. Levinson to Wiener, 1 October 1936, NW. For Wiener's view, see *I am a mathematician* (footnote 10), 27–28.

⁴¹ *AMS Bulletin*, (2) 38 (1932), 337.

⁴² In RBA. T. B. Appleget of the Rockefeller Foundation was a Brown graduate, and RFA has a number of relevant letters between him and Richardson in the spring and summer of 1933.

⁴³ Richardson to Veblen, 3 July 1933, OV. Richardson to committee, 25 July 1933, Old file, AMS.

⁴⁴ Richardson to B. S. Deutsch, 15 July 1933, RBA.

Despite early successes and the strong backing of men like Veblen and Richardson, the placement program had a built-in peril. It assumed the universities (or most of them) would absorb the first wave of refugee mathematicians into their regular staffs at the expiration of the two-year grants from the Emergency Committee and the Rockefeller Foundation, roughly in 1935.⁴⁵ That depended, in large measure, upon improvements in the economic climate. In turn, such improvements could provide a degree of security against the perceived dangers of nationalism and anti-Semitism. As 1935 approached and the unemployment of mathematicians continued, pessimism developed. Writing to the Danish mathematician Harald Bohr on 5 April 1935, Richardson gloomily predicted that half of those presently supported (in all fields) were absorbable by the universities. Most of the rest had possibilities for temporary placement pending later absorption. Beyond that—and this presumably meant others in Europe hoping to come over—Richardson, with a few exceptions, could only see the possibility of providing unemployment relief, not aiding scholarship. With seventy-five American mathematical Ph.D.s out of work, even the small number taken on by the Committee or employed directly approached an upper limit.⁴⁶

But before going on to discuss the unfolding reactions of the American mathematicians to the Nazis and their victims, let us consider three instances of successful placement by 1935. The fate of the Göttingen group became an immediate concern to the Rockefeller Foundation and individuals like Veblen. Bryn Mawr College provided a post for Emmy Noether (1882–1935). For all his ambitious plans, Richardson had to content himself with the youngest man in the group, Hans Lewy (1904–). Despite sour comments from at least one outside observer,⁴⁷ Richardson was very pleased with his new colleague.

Richard Courant presented a more difficult problem. For one thing, Richardson had clashed with him in Göttingen before the first World War. Although hostile to Courant's coming, Richardson pledged not to interfere with efforts to place Courant. As late as 1936, Richardson was grumbling about Courant;⁴⁸ the two men would clash at the start of World War II when each had ambitions to launch an applied mathematics program. Courant also had a reputation as a promoter which both helped and hindered his placement.

Veblen first thought of the mathematics department in Berkeley, then undergoing a reorganization. Before Hitler's ascension, he had recommended American mathematicians; by May he was pushing Courant and other displaced Germans.⁴⁹ California had selected Griffith C. Evans of Rice Institute as the new departmental chairman. Evans strongly opposed Courant, asserting:

To say that there are too many foreigners in American universities is not chauvinism, but merely, that the careers of promising students in America are being cut off at the top. I do not see how this can be anything but an

⁴⁵J. R. Kline to Veblen, 23 November 1933, OV

⁴⁶Richardson to Bohr, 5 April 1935, RBA

⁴⁷In his diary entry for 24 June 1934, Warren Weaver reported the critical comments of the physicist F. K. Richtmyer of Cornell, then head of the Division of Physical Sciences of the National Research Council. Richtmyer objected to Lewy's favored treatment while so many were unemployed. 2/717/109/839, RFA

⁴⁸Constance Reid, *Courant in Göttingen and New York* . . . (New York, 1976), 227. Richardson to H. Bohr, 26 December 1933, OV. Richardson to Birkhoff, 21 July 1936, BHA

⁴⁹Veblen to J. H. Hildebrand, 23 January and 9 May 1933, OV

unfavorable situation in which to develop intellectual life. A generation ago we were in need of direct stimulation and there was plenty of room; now we could well interchange.⁵⁰

To this Veblen replied with a succinct statement of his position:

I think I would differ from you only in attaching a little more weight to the importance of placing a few first-class foreigners in positions where they will stimulate our activity. I am inclined to think that doing so will in fact increase the number of positions that are available to the better grade of American Ph.D.s, even though it may decrease the total number of positions . . . almost any method of strengthening the local scientific group will make it easier to place our scientifically strong products . . .⁵¹

In a later letter to Richardson, Evans elaborated his position:

It seems to me that at the present time our own young men should be the first consideration, given the fact that Europe would not reciprocate in appointing Americans in their universities. Of course, they would say 'But look at the difference!' I doubt if there is much, myself, allowing for the difference in teaching programs . . .⁵²

Even before the exchange with Evans, Veblen had moved to place Courant in New York University, arguing that it presented an opportunity for Courant's entrepreneurial skills. By 1936 Veblen was pointedly noting Courant's good works in a region 'unnecessarily arid', including providing openings for American mathematicians.⁵³ Even before World War II, Evans and Courant were on cordial terms; after the war Berkeley made an unsuccessful attempt to move Courant's entire group to its campus.⁵⁴

To return to Hans Lewy, he was one of the victims of the 1935 financial situation; Brown could not keep him. Richardson wrote across the country to many departments on his behalf, the previously given references to Coble, Bliss and Kentucky being examples of some responses. But Evans hired him for Berkeley on a regular appointment without benefit of subsidy from the Emergency Committee or the Rockefeller Foundation.⁵⁵ Evans's nationalistic sentiments were not necessarily anti-Semitic. While at Rice, for example, he wrote in 1932 about a young Jewish mathematician: 'But emphatically, there should not be a prejudice against him, discounting ability on the ground that he is a Jew'.⁵⁶

These actions involving Lewy and Courant occurred while the mathematicians displayed an increasing sensitivity to the implications of Nazism both at home and abroad. At the time of the Veblen-Evans exchange, for example, John R. Kline, the chairman of the mathematics department at Pennsylvania, wrote Richardson about the planned Gibbs Lecture Einstein would give in December 1934 at the meeting of the American Association for the Advancement Science in Pittsburgh. He advised

⁵⁰ Evans to Veblen, 16 January 1934. OV As part of the upgrading, two American mathematicians were dismissed and four others placed on notice. Perhaps this influenced Evans. C A Noble to Evans, 23 October 1933. Carton I, GCE

⁵¹ Veblen to Evans, 23 January 1934, OV

⁵² Evans to Richardson, 18 April 1934. Displaced German Scholars file, RBA.

⁵³ Veblen to Chancellor Chase, 13 November 1933; to E. B. Wilson, 13 April 1936. OV

⁵⁴ G. C. Evans to Courant, 11 April 1939. Master Index File, Courant to G. C. Evans, 8 December 1949. General File, both in CIMS.

⁵⁵ Evans to Richardson, 1 May 1935, Lewy file, RBA.

⁵⁶ Evans to Birkhoff, 13 April 1932. BHA.

against publicity which ‘might involve Einstein in some unpleasantness should the Nazi sympathizers in Pittsburgh attempt to pack the meeting’.⁵⁷ In fact, no incident occurred.

In the spring of 1934 American and British mathematicians were incensed by Ludwig Bieberbach’s article ascribing different forms of mathematics to racial characteristics. G. H. Hardy wrote a scornful response in *Nature*; Oswald Veblen sent off a deftly scathing letter to Bieberbach.⁵⁸ In the 1934 summer joint meeting of the Society and the Association at Williams College, Arnold Dresden of Swarthmore, as President of the latter (himself an immigrant from the Netherlands) declared ‘the conviction has been growing recently that no country is safe from the distress that has fallen upon Germany the past year’. He and E. R. Hedrick, of UCLA, a former president representing AMS, called in defense for renewed adherence to the intellectual standards of mathematics.⁵⁹

In 1937, the Society had an opportunity to face up to what was happening in Nazi Germany. An invitation came to attend the bicentennial of the founding of Göttingen University. Like other Americans, the previous year’s celebration at Heidelberg had offended Richardson. Writing to Birkhoff, he declared himself against ‘science as a national tool rather than as an end to itself’.⁶⁰ Richardson decided that so important a matter had to be laid before all of the present and past officers and members of the Council, almost 90. He sent out the invitation accompanied by a memorandum written by his colleague, Raymond Clare Archibald, declaring that the invitation was not from the Göttingen known to all from the old days. The university now was a different body and, like the 1936 celebration at Heidelberg, its bicentennial would provide an opportunity for Nazi propaganda in violation of the universality of science. Archibald suggested simply sending a letter complimenting Göttingen on its past and hoping that the future would be similar.

The returns were overwhelmingly against participation. Simply say no, wrote Eric Temple Bell of the California Institute of Technology. Professor C. A. Noble at Berkeley remembered his happiness at Göttingen (1893–96, 1900–01), his indebtedness to his professors ‘and to Germany of those days’. Nevertheless, he concurred with Archibald, as did 54 others. Only ten recommended participation for reasons such as maintaining solidarity with colleagues. One of the ten, W. A. Wilson of Yale, thought the Jews ‘are largely responsible for their troubles’.⁶¹

Another occasion implicitly to face the consequences of Nazism occurred in the 1938 celebration of the Society’s semi-centennial. Its planners foresaw a festive occasion for a small strong, tightly-knit group. Archibald, who was also an historian of mathematics, would write a history of the Society, and a dozen or so papers would survey the development of fields of mathematics in the United States. Archibald thought the American emphasis could ‘open [us] to charges of provincialism’. Veblen wanted to avoid an historical review of mathematical subjects, suggesting simply a

⁵⁷ Extract of John R. Kline to Richardson, 18 January 1934, in Richardson folder, OV

⁵⁸ G. H. Hardy, ‘The J-type and the S-type among mathematicians’, *Nature*, **134** (1934) 250, also in Hardy’s *Works* vol 7 (1979) 610–611. Veblen to Bieberbach, 19 May 1934, RBA. Ludwig Bieberbach ‘Personlichkeitsstruktur und mathematisches Schaffen’, *Forschungen und Fortschritte*, **10** (1934), 235–237

⁵⁹ *American Mathematical Monthly*, **41** (1934), 433

⁶⁰ 21 July 1936 BHA.

⁶¹ Taken from the Göttingen Celebration file in AMS. Noble’s letter is dated 10 April 1937. E. T. Bell’s 9 April, and W. A. Wilson’s 8 April

survey of current knowledge. Others, like Lefschetz, objected to having ‘ancients’ speak, simply wanting the best in each speciality. The compromise, suggested by Kline, called for contributions from outstanding mathematicians who were to be free to give or not give historical contributions, not even necessarily concerned with U.S. contributions. He also suggested excluding recent arrivals in the country as authors, even if they were the best persons for a topic. By 1937 Hedrick noted the apparent exclusion of the foreign-born and those trained abroad. (Although one speaker, E. T. Bell, was born overseas, all were products of U.S. universities.) That did not arouse controversy. Kline’s other suggestion did; he wanted Birkhoff to have a prominent place in the program.⁶²

Birkhoff presented a historical survey of mathematics in the United States during the past 50 years, giving praise and criticism. He then brought up the question of the foreign-born mathematicians. He felt they had an advantage. In getting research positions, they did less teaching than the native-born; they lessened the number of positions for American mathematicians who were ‘forced to become hewers of wood and drawers of water. I believe we have reached the point of saturation. We must definitely avoid the danger’. Starting out with praise, Birkhoff then listed all of the people who had come in the last 20 years. Included in the list were such colleagues of his as Alfred North Whitehead and others who were neither German nor Jewish. Despite the nature of Birkhoff’s list, many ascribed his views to anti-Semitism.⁶³

The speech and its printed version elicited strong responses. Abraham Flexner of the Institute for Advanced Study eloquently argued against the presumed bad effects.⁶⁴ Lefschetz, who was listed, complained that he had been in America for 33 years; all of his mathematical work had occurred in the United States. Writing to his old friend, Richardson reported that people, ‘not all Jews’, looking at the semi-centennial volumes expressed marked disapproval of the sentiments. Perhaps reflecting feelings about his own immigrant origins, Richardson gave two omitted names, one a Briton whose residence in the United States was nearly as long as his own.⁶⁵

If Birkhoff’s public pronouncement offended many,⁶⁶ other private incidents in the life of the Society just before and after 1938 evinced sensitivity to the presence of the foreign-born. In all probability anti-Semitism was absent, or nearly so, in these

⁶² Based on the Semicentennial celebration folder in AMS, which is largely from 1935. See also E. R. Hedrick to L. P. Eisenhart, 30 January 1937, AMS.

⁶³ In volume two of AMS, *Semicentennial publications* (New York, 1938), 276–277. Reid (footnote 48), 211–213.

⁶⁴ 30 September 1938, BHA.

⁶⁵ 20 September 1938, BHA.

⁶⁶ There are later echoes of this incident in the literature. It was referred to indirectly in Marston Morse’s obituary. ‘Birkhoff was at the same time internationally minded and pro-American’. Being detached from the world, his social and political views gave rise to misunderstandings (see Birkhoff, *Collected works*, vol. 1 (1950), xxiv). Veblen’s necrology of his deceased colleague specifically discussed the address ‘It may be added that a sort of religious devotion to American mathematics as a “cause” was characteristic of a good many of his predecessors and contemporaries. It undoubtedly helped the growth of the science during this period. By now mathematics is perhaps strong enough to be less nationalistic. The American mathematical community has at least been healthy enough to absorb a pretty substantial number of European mathematicians without serious complaint’ (*ibid.*, xxvff.).

Garrett Birkhoff recalled the incident when he discussed the problem from the standpoint of a young American mathematician (see J. D. Tarwater, J. T. White and J. D. Miller (eds.), *Men and institutions in American mathematics* (Lubbock, 1976), 66). For a recent comment by an immigrant, see Ulam (footnote 17), 101.

cases. For example, in 1936 Veblen proposed opening the Society's series of *Colloquium publications* to non-U.S. mathematicians. Whatever Veblen intended, the proposal was taken to refer especially to those now resident in the United States. The varied responses inclined to go along. A. B. Coble approved for those who 'have identified themselves for a long period with our American program'. Kline would publish high calibre work, rejecting any provincial or narrow attitude.⁶⁷ As usual, Evans had one of the more interesting replies: 'so long as the authors are expected to be permanently or semi-permanently a part of this American scene, even if the best work under conditions that are denied to the rest, and do not seem at present to be contributing to the solution of problems confronting American universities and American mathematicians'.⁶⁸ Evans was mistaken in at least two instances. Lewy, right after arriving at Berkeley, wrote Richardson expressing concern about high school training in America.⁶⁹ In Courant's earliest efforts to form a center at New York University, he proposed including efforts on improving high school instruction.⁷⁰ Both men were obviously in the tradition of Felix Klein.

Concern over the foreign-born reappeared again in 1939 during the deliberations for the award of the Cole Prize for algebra. Evans, now president of the Society, wrote to Richardson, reporting that the chairman of the prize committee, Eric Temple Bell, was unhappy with the presence in his group of a recent arrival, Emil Artin. Bell strongly believed Artin would not support an American, contrary to the intentions of the donors, but 'will vote prize to some strange bird of passage'. Richardson's response pointed out that the Society's policy had explicitly moved away from limiting prizes to the American-born. In fact, that policy originated in 1921 when Richardson amended the terms of the Bôcher prize specifically to include any 'resident of the United States and Canada' without regard to citizenship. The crisis on the prize committee vanished when its members, with no apparent acrimony, agreed on the merits of the work of a Jewish American-born mathematician, A. Adrian Albert.⁷¹

6. The founding of *Mathematical reviews*

Of all the reactions to Nazism of the American mathematicians, by far the most significant was the decision in 1939 to found *Mathematical reviews*. Into the decision entered explicit judgments about events overseas, about choices of intellectual and national ideologies, and about relationships with refugees in the United States and colleagues overseas. Reviewing and abstracting media have played roles in the life of science since their appearance in the seventeenth century. Beyond the obvious roles in dissemination and validation of new knowledge, such publications often reflect predominance or even hegemony of national research or linguistic communities. By World War I the Germans had developed an extensive network of reviewing and

⁶⁷ In Richardson file, February 1936, OV

⁶⁸ Evans to Richardson, 30 March 1936, New File, AMS.

⁶⁹ 6 January 1936, RBA.

⁷⁰ Courant to Weaver, 6 December 1936, in Master Index File, CIMS. Both Courant and Lewy were indicating an interest in the non-research tasks Evans and others feared were neglected by research-oriented refugees.

⁷¹ Evans folder, New file, AMS, especially Evans to Richardson, 13 April 1939, and Richardson's reply of 1 May. In the Special Funds folder, Old file, AMS is E. B. Van Vleck to Richardson, 18 November 1921. Richardson is clearly looking out for Canadians, although his letter of 1 May 1939 indicates some discomfort on how the policy developed.

abstracting media clearly reflecting their extensive research activities, as well as a penchant for organization and thoroughness. Some scientists in the Allied powers reacted by moving to form alternate sources of scientific information.

Among American mathematicians the desire for a critical abstracting journal was part of the general drive to develop a well-rounded mathematical community not in a state of colonial-like dependence on Europe. In 1922 H. E. Slaughter included it in his proposal for increasing funding and activities of mathematics.⁷² Oswald Veblen also tried for an abstracting journal during his presidency of the Society. The Depression halted efforts in this direction. Influencing Veblen was dissatisfaction with both the German *Jahrbuch über die Fortschritte der Mathematik* and the Dutch *Revue semestrielle des publications mathématiques*, particularly concerning the time lag in publishing the abstract.

The situation changed materially in 1931 when the Berlin firm of Springer launched the *Zentralblatt für Mathematik und ihre Grenzgebiete*. It was satisfyingly prompt, critical and complete in coverage. Its editor, Otto Neugebauer, a member of Courant's group at Göttingen, was not Jewish but was politically suspect to the Nazis. Neugebauer fled to Denmark in 1934. Reputedly, he later said of his exile: 'I did not have the honor of having a Jewish grandmother'. As early as August 1933 Veblen proposed bringing Neugebauer to America to continue the *Zentralblatt*. Richardson disagreed because of financial conditions.⁷³

Some mathematicians, perhaps Veblen, perceived a European neglect of, and indifference to, American contributions, particularly among the Germans. It was, one suspects, especially galling in view of the recent strenuous efforts to expand such contributions. Writing to Veblen in 1935 about comments in the *Zentralblatt*, T. Y. Thomas, then at Princeton University, referred to 'the usual European attitude towards American work which was exhibited in a very tactless manner'.⁷⁴ A mathematician at Wisconsin, Rudolph E. Langer, in 1936 commented to Birkhoff: 'When Europeans give their recognition to an American, there can be no doubt that it is deserved'.⁷⁵ As late as 1942, I have encountered a reference to a hypothetical 'European Citation Verein'.⁷⁶

A deterring effect was simple doubt of the intellectual capacity of the American mathematical community for this task. In a different context Evans wrote in 1936 about helping the *Zentralblatt* and the *Fortschritte*: 'Or it may be desirable to have an American agency take over the entire task. I doubt however if there are a sufficient number of Americans of the required scholarship to perform the task. It must be remembered that while on the Continent there is a considerable amount of ambitious scholarship even in the secondary instruction, there is in this country, due to our methods of selecting teachers, a dearth of it both in secondary schools and in colleges'.⁷⁷

Perhaps more important than doubts like Evans's was Richardson's growing conviction of the strength of mathematics in the United States. A few months after Evans wrote, Richardson with obvious relish quoted G. H. Hardy's words to the

⁷² H. E. Slaughter, 'Subsidy funds for mathematical projects', *Science*, n.s. 55 (1922), 1-3

⁷³ Veblen to Richardson, 4 August 1933; Richardson to Veblen, 9 August 1933. Veblen to Richardson, 12 August 1933. Displaced Scholars file, RBA.

⁷⁴ T. Y. Thomas to Veblen, 13 July 1935, OV.

⁷⁵ Rudolph E. Langer to Birkhoff, 22 October 1936. BHA

⁷⁶ J. D. Tamarkin to C. N. Moore, 17 August 1942. RBA.

⁷⁷ Evans to Richardson, 1 July 1936. Evans correspondence, New file AMS.

Society at the Harvard Tercentenary: 'now America could produce three mathematicians of rank to every one that could be produced by any other country'. He added: 'With the influx of distressed German scholars and others, mathematics has probably forged ahead relatively more than other sciences in the last dozen years'.⁷⁸

In late 1938 the *Zentralblatt* removed the Italian mathematician Levi-Civita from its board for racial reasons, presumably under pressure from the regime. Neugebauer resigned, as did many foreigners on the advisory board such as G. H. Hardy, Oswald Veblen and Harald Bohr. On 27 November 1938, Richardson reported the resignations to Evans, as president-elect of the Society, adding news of the barring of Russians as collaborators and as referees. Not surprisingly, refugee mathematicians were also excluded from the review process.⁷⁹

An indication of the reaction to the new policy of the *Zentralblatt* is in the correspondence of J. L. Synge, then at the University of Toronto. On 9 December 1938 he wrote Richardson: 'I do not believe in a policy of appeasement. I regard the directors of the *Zentralblatt* as having betrayed a confidence placed in them . . . Of course, if there is in the Society any considerable number of members who approve Nazi policy, the situation is more delicate'. On 19 January 1939 Synge wrote Ferdinand Springer severing his connections with the *Zentralblatt*. He protested the removal of Levi-Civita. The bar against emigré reviewers of German papers was an uncalled for violation of scientific internationalism: 'the prohibition introduced by the publishers of the *Zentralblatt* appears to me insulting to a body of mathematicians for whose academic eminence and personal integrity I have a high regard'.⁸⁰

Having long prepared for this moment, Veblen drafted a statement urging the founding of an American journal. In it he wrote, after referring to his efforts fifteen years previously, that the United States was then 'not yet strong enough to carry the load without much of a strain on its creative elements. Since then the number of productive mathematicians in our country has increased much more rapidly than anticipated and has also been supplemented by an influx of scholars who found it difficult or impossible to continue their work in Europe. As a result the mathematical center of gravity of the world is definitely in America'. Veblen called for a new journal passing judgment on new theories, one 'based on the traditional decencies of scientific and human intercourse'.⁸¹

Although outwardly neutral, Richardson's position was now favorable to the proposal. He moved to get Neugebauer a place on the Brown faculty so that the journal would function in Providence. Richardson's actions caused tensions with Veblen, eventually leading to a clash after the periodical was founded.⁸² Early in December 1938, Richardson organized a committee of the Society to consider what should be done and also prepared for what he knew should be a spirited discussion at

⁷⁸ Richardson to James McKean Cattell, 5 October 1936, New file, AMS

⁷⁹ H. Bohr to Veblen, 11 March 1938, Veblen to J. H. C. Whitehead, 22 November 1938. OV Richardson to Evans, 27 November 1939, Mathematical Reviews file, New file, AMS

⁸⁰ See his pencilled draft of 'The abstract journal problem: historical background', box 17, OV

⁸¹ Synge to Richardson, 9 December 1938, and Synge to Ferdinand Springer, 19 January 1939, both in Box 17, OV

⁸² Richardson to Birkhoff, 18 January 1939, BHA, which also discloses opposition to Neugebauer's coming in Richardson's department. The later clash brought out explicitly the differences between the research-oriented Veblen and the Society-oriented Richardson: 'Veblen is not interested in helping build up the Society. He thinks it is being run by a group of mediocrities and has even suggested that there be a new organization of a limited number of people who are actually doing high grade research. . . [and is a] bit contemptuous of the ordinary way of looking at things' (Richardson to Mark Ingraham, 24 January 1940, RBA)

the Christmas meeting in Williamsburg, Virginia. Writing on the question to his opposite number in the MAA, W. D. Cairns, Richardson penned a paragraph whose meaning was instantly clear to the Society's insiders who were sent copies: 'We must avoid any reference to political, religious, or racial questions. We must under no circumstance put ourselves in a position of appearing to kill the *Zentralblatt*. We must study the question objectively and make up our minds as to what is best to be done for mathematics'. What Richardson meant in his letter was that the question of Nazi racial policies should not figure explicitly in the committee's composition or its stated conclusions.⁸³

E. R. Hedrick, newly installed as Chancellor of the University of California at Los Angeles, responded to the letter to Cairns: 'I believe that the time has passed when we need to consider the tender feelings of people in Germany connected with the *Zentralblatt* and I doubt whether we need worry about the matters mentioned in the last paragraph of your letter. . . . I would not wish to say anything political in criticism of the actions taken by the Germans, simply because I do not see that it would do any good, but I do not believe we ought to hesitate about any action we [care] to take on evening accounts'. President Evans, who could not come to Williamsburg, telegraphed Richardson to have one 'Hebrew' on the committee, suggesting Lefschetz instead of Marston Morse.⁸⁴

There were lively sessions at Williamsburg. In addition to the abstracting journal issue, a largely unsuccessful move was afoot to democratize the management of the Society. Because nearly three hundred members had petitioned the Society to launch an abstracting journal, the matter was discussed in a lively unusual open council meeting attended by more than one hundred people. Richardson wrote to Veblen about this session: 'The political, religious, and racial questions which were involved were bound to come to the surface, although people were requested to keep the discussion on a purely objective basis'. To Evans, a few days later, Richardson defended the exclusion of Lefschetz: 'We don't want to make it appear that this is in any way a Jewish protest. (You can understand that there were a great many cross currents with regard to this and other questions at the meeting.)'.⁸⁵ But Richardson made sure that the committee was headed by C. R. Adams, a member of his department at Brown.

The Council directed the committee to consider three necessary conditions for the launching of an abstracting journal: (1) financial assurance for the first five years of publication; (2) international cooperation; and (3) confirmation that the *Zentralblatt* was not likely 'to make its reviews unimpeachable'. The first condition reflected considerable hesitation, if not anxiety, about an undertaking large enough to imperil the solvency of the Society. Veblen handled that problem by getting a \$65,000 grant from the Carnegie Corporation. The second condition generated a spate of letters to organizations and individuals in many nations asking for cooperation and pledging adherence to scientific internationalism.

The existing *Zentralblatt*, warmly regarded by many American mathematicians, provided the thorniest problem for the committee. Richardson observed: 'I cannot

⁸³ 4 December 1938. OV Evans to Richardson, telegraph, n d. [December 1938?], in *Mathematical reviews* file. New file. AMS Evans did tell Richardson to go ahead if the Lefschetz suggestion was not acceptable

⁸⁴ Hedrick to Richardson, 9 December 1938, *Mathematical reviews* file, New file, AMS

⁸⁵ Richardson to Veblen, 31 December 1938, box 17, OV Richardson to Evans, 4 January 1939. Evans file. New file AMS. See also Richardson to Committee, 9 January 1939, box 17. OV

now see what assurances they [Springer] could give that would be satisfactory to me He had recently read in *Science* that German medical abstracting journals now omitted reviews of articles by Jews. As he wrote to Hardy before the matter was decided, Richardson wanted an international journal ‘independent of the whims of a dictatorship’.⁸⁶ The Society even considered the possibility of purchasing the *Zentralblatt* from Springer. To the American criticism Ferdinand Springer replied: ‘I am determined to continue the *Zentralblatt* at the prevailing level as a non-party international abstract journal—at the moment I see this is not possible, my interest in the enterprise ceases’. To the purchase offer, Springer later asserted he did not regard the journal as a commercial venture. More importantly, he offered to dispatch an emissary to America, F. K. Schmidt of Jena.⁸⁷ The Society deferred decision until Schmidt met with the committee.

Not only did considerations of equity require the delay; within the Society sentiment existed against the proposed journal because of a desire to aid Springer and German mathematical colleagues, as well as a reluctance to take any action splitting the international mathematical community. The department at Wisconsin, for example, went on record along these lines. One can doubt the depth of such sentiments. Mark Ingraham of Wisconsin, an officer of the Society, tepidly agreed with his colleagues but added a postscript to a letter: ‘Since writing this I have had a wave of indignation against the Nazis and feel more inclined to go ahead . . .’.⁸⁸

Still another argument, derived from the fear of splitting the international community, called for a single abstract journal rather than two or more. That struck a responsive chord, perhaps in resonance with fiscal anxieties. Eventually, that point simply faded away. By May, Lefschetz could write that physics flourished with two parallel abstract journals (*Physics abstracts* and *Physikalische Berichte*). He added that the printing and editorial jobs should go to Americans as ‘our learned world is supported by American funds’.⁸⁹

In March and April an unexpected event further tipped the balance of opinion. Marshall Stone, then at Harvard, received a letter from Helmut Hasse of Göttingen. Hasse justified the splitting of the refugees from other possible referees. ‘Looking at the situation from a practical point of view, one must admit that there is a state of war between the Germans and the Jews He failed to understand why the Americans withdrew their collaboration with the *Zentralblatt* and referred to ‘Neugebauer’s pro-Jewish policy’. C. R. Adams circulated the Hasse letter to his committee in preparation for the coming meeting at Durham, North Carolina, noting: ‘Mr. Veblen insists that there is a war by the Germans against *civilization*’.⁹⁰ The letter made a strongly unfavorable impression on the members of the committee and the Society’s council.⁹¹ In his 2 May reply to Hasse, Stone said the decision on

⁸⁶ Richardson to Veblen 11 January 1939, box 17, OV. Richardson to Hardy, 8 April 1939, in Richardson file, OV, which also contains other comments about these events.

⁸⁷ The quotation is from Springer to Veblen, 12 January 1939, which was in response to Veblen’s letter of 5 December 1938, box 17, OV. The refusal to sell is in Springer to C. R. Adams, 24 April 1939, filed under F. K. Schmidt in OV.

⁸⁸ Rudolph E. Langer to C. R. Adams, 21 February 1939, and Mark Ingraham to Adams, 21 February 1939, in box 17, OV.

⁸⁹ Lefschetz to Richardson, 18 May 1939, OV.

⁹⁰ C. R. Adams to Committee, 11 April 1939, enclosing translated extract of Hasse to Stone of 15 March 1939, which Stone received on 29 March, in box 17, OV. See S. L. Segal, ‘Helmut Hasse in 1934’, *Historia mathematica*, 7 (1980), 46–56.

⁹¹ For example, see the letter to Hardy cited in footnote 86.

the journal was 'not likely to be taken for the purpose of passing judgment on the past history of the Zentralblatt... [but] primarily on the desire to assume for the future of mathematical abstracting a responsibility commensurate with America's great and growing mathematical importance... As for the Americans who withdrew, I feel that they merely acted with true loyalty to their own national traditions and ideals...'.⁹²

Nor did Schmidt's presentation in May convince many American mathematicians. Springer offered a compromise arrangement with two separate editorial boards: one for the United States, Britain and its commonwealth, and the Soviet Union; the other for Germany and nearby countries. To avoid any imputation of racial motivations, Springer now asked that papers by German authors not be reviewed by German emigrants, whether Jew or Gentile. Writing to A. B. Coble about the meeting, C. R. Adams said that Schmidt 'states that the German idea is that mathematics, like everything else, exists in a real world in which political considerations play a part; and that, like everything else, mathematics must expect to be affected in some measure by political considerations'.⁹³ Springer's proposal was perceived as a gross affront to the ideal of scientific internationalism. One mathematician, T. C. Fry of Bell Telephone Laboratories, commented that Springer gave no assurance against a future ban against refereeing of Aryans' papers by non-Aryans who were not German refugees.⁹⁴

Unexpectedly, Schmidt found allies among some members of the Harvard mathematics department. Fearing a German boycott of the planned 1940 international congress in Cambridge, Massachusetts, William C. Graustein argued against the proposed journal: 'We would, I feel, be denying a principle for which we have long fought—that of the emancipation of science from international politics'.⁹⁵ It was an ironic obverse of Schmidt's position. Although Graustein sat in on the committee's last session and addressed an open letter to it and to Council members, the effect was minimal. Richardson regarded Graustein's letter as playing into the hands of the Germans, who were acting on Harvard advice.⁹⁶ Adams told the committee on 17 May that Springer's moves were simply designed to confuse issues.⁹⁷

Not everyone in Harvard (let alone MIT) agreed with Graustein and Birkhoff. Marshall Stone, as a member of the AMS Council, convened a meeting of Cambridge, Massachusetts, mathematicians on 18 May, 1939, presided over by Saunders MacLane. The meeting unanimously repudiated Graustein's letter and supported the proposed journal with only one abstention.⁹⁸ Norbert Wiener, hard at work in arranging part of the 1940 Congress, drafted a letter to Graustein on 19 May threatening to resign with a public denunciation if Graustein persisted in his efforts.⁹⁹ Richardson, who had taken control of the process from his ill colleague,

⁹² Copy in box 17 OV.

⁹³ See Adams to Coble, 3 and 8 May 1939, also Schmidt to Richardson, 15 May 1939, all in box 17, OV.

⁹⁴ T. C. Fry to Adams, 19 May 1939, BHA.

An oral tradition exists of anti-Semitism in the *Fortschritte*. Whether true or not, it did not figure specifically in the events in the United States.

⁹⁵ Graustein to Adams, 11 May 1939, box 17, OV.

⁹⁶ Richardson to Veblen, 13 May 1939, box 17, OV. Richardson to Evans, 28 June 1939, Evans file, New file, AMS.

⁹⁷ Adams to Committee, 17 May 1939, box 17, OV.

⁹⁸ Stone to AMS Committee, 24 May 1939, enclosing minutes of meeting, Carton XIV, GCE.

⁹⁹ Draft, Wiener to Graustein, 19 May 1939, NW. It is uncertain whether the letter was sent

C. R. Adams, determined to push the decision through.¹⁰⁰ On 22 May Birkhoff proposed a compromise, a publication of bibliographic entries without any analysis.¹⁰¹ On 25 May Richardson wrote his old friend that the Council of the Society had voted 22 for the new journal, 5 against, and 4 uncertain.¹⁰² Oswald Veblen was named chairman of the committee to launch and to supervise the newest publication of the Society.¹⁰³

7. The coming of war and the elevation of applied mathematics

While the leadership of the Society, the disciplinary establishment, grappled with the impact of the foreign-born already in their ranks, others continued to come across the ocean in the closing years of the 1930s. As Hitler's pressures expanded, still more became potential migrants. The unemployment situation remained discouraging. Richardson thought America had done all it could to absorb refugees. Approvingly, in 1938 he cited to W. D. Cairns the policy of the Emergency Committee (and the Rockefeller Foundation): 'I think the principle laid down there [that is, in the Committee], namely that humanitarian considerations must be laid aside, should be followed and what can be done should be for those of high scientific merit. We want to save the scholar for the sake of scholarship'.¹⁰⁴ After his retirement from the Secretaryship, Richardson explained in 1941: 'I have been compelled to consider these cases of appointments from the scientific and monetary point of view. If I should think of the humanitarian aspects I would get bogged down very quickly'.¹⁰⁵

Not everyone adopted that stance. In the 1938 letter to Cairns quoted above, on a 'hopless case', Richardson also wrote: 'You might write to Veblen. That would seem the only possibility'. Like his colleague Hermann Weyl, who ran a German Mathematicians' Relief Fund during the period, Veblen no longer restricted his efforts to the eminent. Nor were they alone. John R. Kline wrote to Courant in 1938 about an Austrian who 'is not an outstanding mathematician and it may be difficult to do anything for him but still the need is extremely desperate and human feeling makes us wish to do anything that is at all possible'.¹⁰⁶

Veblen's actions rested on more than humanitarian considerations. Almost at the very time Richardson saw a saturated job market, Veblen asserted to Karl Menger 'our power of assimilation in this country is not yet exhausted . . .'.¹⁰⁷ Certainly, the university authorities did not agree with Veblen. Under the leadership of President Conant of Harvard, many joined in a drive to raise an endowment for aiding refugees

¹⁰⁰ Richardson to Evans, 25 May 1939, enclosing his letter of 24 May to AMS Committee, Carton XIV, GCE

¹⁰¹ Birkhoff to Committee, 22 May 1939 box 17, OV

¹⁰² 25 May 1939, in *Mathematical reviews* file, New file, AMS In his obituary of Birkhoff, Veblen noted he loyally worked for the new publication 'after main issues decided against his judgment' (see Birkhoff's *Collected papers*, vol. I (1950) xxi).

¹⁰³ In 1947–1948, when F. K. Schmidt and others decided to revive a German abstracting journal for mathematics, both Veblen and Courant were bothered by what Courant described as the 'aggressive German nationalistic attitude' (Schmidt to Courant, 1 December 1947, Courant to Schmidt, 14 January 1948, Courant to Veblen, 3 February 1948, all in Master Index File, CIMS Veblen to F. K. Schmidt, 25 February 1948, OV) In 1938–1939, Courant stayed out of the discussions because of his relations with the Springer firm

¹⁰⁴ 23 May 1938: in Cairns file, New file, AMS

¹⁰⁵ Richardson to Weyl, 25 June 1941, RBA

¹⁰⁶ 12 December 1938, General File, CIMS

¹⁰⁷ 22 July 1938, OV

as the existing funds were so limited. Many university authorities were anxious to shoulder the Emergency Committee aside in order to reaffirm control over faculty selections. Without new funds, Conant and his allies saw little hope for other refugees.¹⁰⁸

What Veblen had in mind becomes clear from the refugee files that he and Weyl maintained. Not only were they aiding the non-eminent, but also the two men had long stopped limiting placements to institutions with research capabilities. Veblen was now placing refugees in any willing four-year college or even in junior colleges. In these moves Weyl and Veblen had the cooperation of Harlow Shapley, head of the Harvard College Observatory. The matter was sensitive; it was, after all, the upgrading called for in the 1935 article on the job market and in Richardson's 1936 piece.

If teaching posts at these lesser institutions were conspicuously filled by refugees, then the existence of a substantial number of unemployed native-born mathematicians might lead to the feared nationalistic and anti-Semitic backlash. To avoid a clash, Veblen needed the agreement of Birkhoff whose influence stemmed both from intellectual prominence and the role of Harvard as the leading undergraduate source of American mathematicians. On 24 May, 1939, Shapley wrote Weyl: 'When Veblen and Birkhoff were in my office the other day, it was agreed that the distribution of these first-rate and second-rate men among smaller American institutions would in the long run be very advantageous, providing at the same time we defended not too feebly the inherent rights of our own graduate students'.¹⁰⁹

The meeting occurred just as the Society decided to found an abstracting journal. The Society made another decision in September 1939. It formed a War Preparedness Committee, chaired by Veblen's colleague, Marston Morse. Evans and Richardson at first wanted to bar participation of individuals with German names. Morse smoothly avoided that position by insisting: 'it is important that such German names as we have represent the best possible choices'.¹¹⁰ The Society now moved, modestly but unequivocally, towards the time in World War II when mathematicians were in short supply and refugee skills could help to free the Old World from the Nazi blight.

Nazi policies contributed to an upgrading of the status of applied mathematics in the United States. To men like E. B. Wilson, a friend of Richardson from his student days at Yale, pure mathematicians had blocked applied mathematics by the control of the department at Harvard and of the section in the National Academy of Sciences.¹¹¹ To Courant in 1927, advising the Rockefeller Foundation, U.S. mathematicians were too abstract, specifically pointing to the work in topology. In 1941 he ascribed this tendency as a reaction against superficial utilitarianism.¹¹²

¹⁰⁸ See Duggan and Drury (footnote 2), 96–101, and the comments in David C. Thomson, 'The United States and the academic exiles', *Queens quarterly* (Summer 1939), 212–225. This proposal continued the theme of protecting young American scholars while clearly reflecting an impatience with a process in which a non-academic body exerted pressure

¹⁰⁹ In box 29, OV.

¹¹⁰ Morse to Evans, Carton XIV, GCE

¹¹¹ See E. B. Wilson to H. Shapley, 5 November 1925 and 21 March 1928, Shapley Papers, Harvard Archives. I am indebted to Karl Hufbauer for these references. For Wilson's views on applied mathematics, see his letter to Richardson, 11 June 1941, in RBA

¹¹² See A. Trowbridge to W. Rose, 27 May 1927, in International Education Board, 1/1/110, RFA, and related documents in same location. Also, 'the little black book' with its ratings of mathematicians in 1/10/142. Courant's 1941 comment is in his draft memorandum on 'A National Institute for Advanced Instruction in basic and applied science', p. 2, copy in Richardson Papers, RBA.

Other mathematicians were rather proud of the emphasis. In his contribution on algebra to the semicentennial, Eric Temple Bell wrote:

It may be said at once that American algebra, contrary to what some social theorists might anticipate, has not been distinctly different from algebra anywhere else during the fifty-year period. According to a popular theory. American algebraists should have shown a preference for the immediately practical, say refinements in the numerical solution of equations occurring in engineering, or perfections of vector analysis useful in physics. But they did not. The same topics . . . were fashionable here when they were elsewhere, and no algebraist seems to have been greatly distressed because he could see no application of his work to science and engineering. If anything, algebra in America showed a tendency to abstractness earlier than elsewhere.¹¹³

Veblen made a related point earlier, in 1929, in opposing a proposal for AMS to found a journal of applied mathematics: ‘the second reason [after financial problems] is that I do not believe that there is, properly speaking, such a thing as applied mathematics. There is a British illusion to that effect. But there is such a thing as physics in which mathematics is freely used as a tool. There is also engineering, chemistry, economics, etc., in which mathematics play a similar role, but the interest of all these sciences are distinct from each other and from mathematics. . . .’¹¹⁴ From this position, Veblen’s priority for pure research over both teaching and applications arose naturally. He assumed that good teaching and effective applications flowed best from abstract theory.

Norbert Wiener, Richard Courant and R. G. D. Richardson probably agreed with Veblen’s position except for one crucial point. Wiener once referred to the importance ‘of a physical attitude’.¹¹⁵ Courant came from a tradition which assumed that the other sciences presented raw data for the labors of mathematicians, as in his work on Plateau’s problem. One suspects that Veblen and others preferred to see mathematics simply as abstract games with symbols with considerations of reality and utility totally absent.

Richardson saw an opportunity to aid industry and engineering in the coming of the exiles. In 1941 he launched a summer school at Brown which later developed into an institute of applied mechanics. Richardson described the United States as the world leader in pure mathematics and high in a few ‘applied’ fields like statistics and mathematical physics. He proposed to correct the lag in applied mechanics, particularly fluid dynamics and elasticity. The faculty at Brown in this area was overwhelmingly composed of German refugees.¹¹⁶

At the same time Richard Courant tried to launch a more ambitious institute for basic and applied sciences at New York University. Richardson’s move killed Courant’s 1941 initiative. According to Courant’s biographer, Richardson was motivated, in part, by his antipathy to the foreigner Courant.¹¹⁷ Resiliently, Courant obtained war contracts and later launched what is now the Courant Institute of the Mathematical Sciences, a name reflecting a viewpoint congenial to

¹¹³ AMS, *Semicentennial publications* (footnote 63), vol. 2, 1

¹¹⁴ Veblen to Richardson, 5 April 1929, in the R. L. Moore 1931–1935 folder, Old file, AMS.

¹¹⁵ Wiener, *I am a mathematician*. (footnote 10), 34.

¹¹⁶ For Richardson’s views, see Richardson to Birkhoff, 10 April 1937 Birkhoff Papers, BHA; Richardson to Courant, 18 March 1941, with enclosed proposal, Master Index File, CIMS.

¹¹⁷ Reid (footnote 48), 228f, Courant to T. Saville, 19 March 1941, in Richardson folder, Master Index File, CIMS

the founder's Göttingen roots and thus different from Veblen's position. The existence of a strong pre-war belief in pure mathematics helps explain why World War II led not only to an efflorescence of applied mathematics but also to a great growth of abstract research.¹¹⁸

8. Conclusion

Even before the United States joined the conflict, writings appeared appraising the meaning of the transfer of cultural skills across the ocean. To the chemist C. A. Browne in *Science*, it was a rerun of history, recalling the Göttingen seven and the Forty-Eighters: 'That Germany should now repeat on a vastly greater scale the tyrannical follies of a century ago seems too incredible for belief'. Making no mention of anti-Semitism, he noted how well earlier German migrants had assimilated, enriching the country.¹¹⁹ Like Browne, other writers stressed both Nazi folly and American precedent. In 1942 Arnold Dresden of Swarthmore gave a listing of refugee mathematicians, opening and closing with an account of Joseph Priestley's 1794 arrival and welcome by the American Philosophical Society. The recent migrants became another example of America's traditional role as a haven for the oppressed of Europe.¹²⁰ And in 1943, replying to a letter from Weyl about a German refugee mathematician in Chile, Griffith C. Evans expressed interest, noting: 'Certainly at Berkeley we are proud of Lewy, Tarski, Wolf and Neyman'.¹²¹ It was quite a contrast to his 1934 exchange with Veblen.

The growth of the American mathematical community clearly helped absorb the individuals in the migration. At the same time, this growth, coinciding with the Depression, created a problem for the refugees. Insecurity about economic conditions reinforced insecurity about status in the world community of mathematicians. Despite these persisting feelings, the statistics disclose a different situation. In the decade of the twenties, American universities granted a total of 351 doctorates in mathematics. The number rose to 780 in the following decade. Some universities had spectacular expansions in the same period. Princeton went from 14 to 40 in doctorates granted; MIT from 5 to 32; Michigan from 11 to 59; and Wisconsin from 8 to 32.¹²² Although published figures on mathematics alone do not exist, the total number of teachers in higher education in the period 1930–1940 rose approximately 77%.¹²³ The job market problem was largely one of accommodating the increase in home-grown Ph.D.s. Despite Depression conditions, somehow many mathematicians, including refugees, did get posts, if not always matching aspirations. As in the case of physics in the United States, the Depression period was one of growth for mathematics in terms of both quality and quantity.¹²⁴

¹¹⁸ For some indications of the development of applied mathematics in the U.S.A. in World War II, see the recollections of M. Rees in 'The mathematical sciences and World War II', *American mathematical monthly*, 87 (1980), 607–621

¹¹⁹ C. A. Browne, 'The role of refugees in the history of American science', *Science*, n.s. 91 (1940), 203–208.

¹²⁰ Arnold Dresden (footnote 4).

¹²¹ Feb. 11, 1943, in Frucht file, box 30, OV. The addition of a Czech and two Polish mathematicians indicates the widening effect of Nazism.

¹²² Lindsay Harmon and Herbert Soldz, *Doctorate production in United States universities*. (Washington, 1963), from tables in Appendix 1.

¹²³ U.S. Bureau of the Census, *Historical statistics of the United States* (Washington, 1957), 210

¹²⁴ Spencer R. Weart, 'The physics business in America, 1919–1940: a statistical reconnaissance', in N. Reingold (ed.), *The sciences in the American context: new perspectives* (Washington, 1979), 295–358.

At the same time American mathematicians and physicists in 1933–34 were noticeably sensitive about the perils of nationalism and anti-Semitism. Afterwards, in his defense against charges of Communism, Veblen described his efforts to place refugees as seriously encountering 'the opposition of American anti-Semites'.¹²⁵ Both perils existed, and the latter certainly affected young Americans born into the wrong faith entering learned professions in the inter-war years. In retrospect, the fears expressed in 1933 and 1934 were overstated. Recent historical studies have pointed to the New Deal as the period in which the concept of a pluralistic society took root and even as a source for much of the post-World War II expansion of civil rights.¹²⁶ Foreign observers in the early thirties reacted differently from most of the Americans. From a comparative prospect, they noted the absence of the virulent, pathological nationalism and anti-Semitism of many European countries.¹²⁷ Certainly, the American university with all its peculiarities appears innocently idyllic in contrast to the German university at the end of the Weimar era. The Nazi era had the ironic effect of ending this idyll by disclosing the dangers of anti-Semitism.

Like all significant historical events, the reception of the emigré mathematicians was filled with ambiguities and contradictions reflecting the complexity of the situation. Like Richardson, many Americans were influenced both by altruism and cool calculations of national and institutional advantage. It is always gratifying to do well while doing good. Precisely disentangling the two motives is impossible. Veblen clearly convinced himself that his course favored both the refugees and the future of mathematics in the United States. Others were not so certain.

Judgments of motives are hazardous. Birkhoff does nominate Lefschetz and aids individual refugees despite his stated position. Evans refuses Courant in 'strong nationalistic terms and then hires Lewy. Evans and Richardson stood up for internationalism, as they saw it, in the founding of *Mathematical reviews* but later wanted to bar the War Preparedness Committee not only to refugees but also to Americans of German ancestry. Instead of implacable historical forces or clear-cut social processes, the sources disclose troubled, inconsistent humans struggling to do right, however defined, in the face of opposing or indifferent trends. The mathematicians were just like everyone else in this respect.

Time and place clearly mattered—what Schmidt meant by mathematicians being unable to escape from the realities of the world. By the 1930s the American mathematical community had a leadership firmly committed to the primacy of pure mathematics and a general membership earning their livelihood by teaching elementary branches of the subject to non-mathematicians. Since applied mathematics, as we know it today, existed on a most modest scale, undergraduate teaching was seen as the utilitarian function justifying support of pure mathematics. Veblen and others in the inter-war years attempted to broaden the utilitarian grounds for support with limited success. Birkhoff's concern for sharing the teaching load was far more typical than Veblen's absolute priority for research. Independent of any prejudices, the structural features of higher education and of the mathematical

¹²⁵ Duggan and Drury (footnote 2), 68, Veblen's Summary of Defense, item 11, Box 21, OV.

¹²⁶ See, for example, the recent article by Richard Weiss, 'Ethnicity and reform: minorities and the ambience of the depression years', *Journal of American history*, 66 (1979), 566–585

¹²⁷ In RFA, 2/717/92/730, is a note of a conversation of 6 November 1933 between A. V. Hill and R. A. Lambert of the Foundation on this point. See Lambert's earlier statement of 2 October 1933 in 2/717/92/729.

community might have frustrated the successful reception of the refugees. Even in 1939 Veblen needed Birkhoff's cooperation.

Outcomes did not flow simply from true or supposed realities of the world. Schmidt's position implied a social determinism beyond human interference. At every point alternatives existed, many quite reasonable by the standards of the day. What actually happened was partly a triumph of two ideals deliberately or tacitly accepted by the leaders of the mathematical community.

One ideal was nationalistic. Despite the immigration quotas and the economic crisis, there were Americans in the 1930s who wanted to believe in the reality of the traditional view of the United States as a refuge from tyranny. From the deliberations in the Rockefeller Foundation to Dresden's article of 1942, there was a desire to live up to that ideal.

Whatever its relation to a complex and obscure reality, the ideal of the universality of science clearly appealed to the hearts and minds of the mathematicians. The commitment to pure research in the most abstract of all fields undoubtedly reinforced the will to believe in this ideal.

Faced with Nazism abroad and its victims in the United States, the leaders of the mathematical community persisted in voting, in effect, for a world in which these two ideals were to prevail. The decision to establish the War Preparedness Committee in September 1939 was the culmination of a process of politicization. As pure mathematicians and as U.S. citizens, the leading mathematicians genuinely believed in disciplinary avoidance of both domestic and foreign politics. As far as surviving sources permit judgment, they were largely of moderate or even conservative political leanings. Leftist views were very scarce. As an activist, Oswald Veblen (the self-described old-fashioned liberal) was atypical. Like his more famous uncle, a hint of prairie populism clung to the man.

As events occurred in Europe and as the small number of refugee mathematicians settled into U.S. posts, the community of mathematicians progressively lost its belief in political neutrality and, more and more, assumed an explicitly hostile stance to Nazi Germany. Increasingly, that country was seen as a menace both to national ideals and to the ideals of science.

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