

“A New Era in the Development of Our Science”: The American Mathematical Research Community, 1920-1950

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Happy Birthday, Joe!

It was the end of August 1950 and some 2,300 mathematicians had gathered from all over the world in Cambridge, Massachusetts for the eleventh International Congress of Mathematicians (ICM). An ICM had never before been held in the United States, and the American mathematical research community had a point to make. Princeton's Oswald Veblen, President of the ICM and one of its principal organizers, put it this way: “If this Congress could have been held, as originally planned in 1940, it would have marked in rather a definite sense the coming of age of mathematics in the United States.”¹ By 1950, however, the mathematical landscape had changed even more dramatically. North America had absorbed some of Europe's best mathematical minds as political refugees had sought new homes on the other side of the Atlantic. That brain-drain had been a blow for mathematical Europe but a boon for the United States. In Veblen's view, in 1950, it was more than “possible to hope that ...the American gains will be permanent.”

Veblen was speaking for the entire American mathematical research community from that podium in Cambridge. He and his colleagues sensed that a definite shift had occurred over the course of the three decades from 1920 to 1950. As one mathematician expressed it, the interwar years marked “a new era in the development of our science.”² What had changed in the mathematical landscape to give them this sense?

Building the Financial Infrastructure for Mathematical Research: 1920–1929

World War I had served as a kind of wake-up call for America's scientists, who had realized that their technical expertise could and should play a key role in the defense of the nation if only it could be effectively mobilized. In 1916, the National Research Council (NRC) had been founded under the aegis of the National Academy of Sciences (NAS) to coordinate the nation's non-governmental scientific and technical resources with those of the military. Two years later, U. S. President Woodrow Wilson issued an Executive Order that charged the NAS to make the NRC a permanent organization. After a year of planning, the new NRC was launched in 1919 “to promote research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineering, agricul-

¹[Veblen 1952], p. 124. The quotation that follows in this paragraph may also be found here.

²Roland Richardson to Oswald Veblen, 19 December, 1923, Box 10, Folder: “Richardson, R. G. D. 1923” in [Veblen].

ture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare" ([Anonymous 1919], p. 458 and [Barrows 1933], p. 7). Funded initially through the income from an endowment of \$5,000,000 provided by the Carnegie Corporation of New York,³ the NRC also received significant support from the Rockefeller Foundation for a post-doctoral fellowship program that aimed at providing "the more able young scientists with opportunities to acquire 'momentum' in their research, before settling down to permanent positions" ([Richtmyer 1919], p. 15). The close of World War I thus marked at least the symbolic beginning of what would increasingly become the symbiotic relationship between private and governmental funding sources, American science, and American institutions of higher education.⁴

Although mathematics had been included among the sciences that the NRC would ostensibly support, the post-doctoral fellowship program was initially open only to candidates in physics and chemistry with the stated purpose of "promoting fundamental research" in those fields "primarily in the educational institutions of the United States" ([Anonymous 1919], p. 462). In 1919, those were the two sciences widely deemed to have been the most relevant to the war effort, but they were also the two sciences believed by influential forces within the Rockefeller philanthropic organization to hold the greatest promise for further advances in the medical sciences, a key interest of the Rockefeller Institute of Medical Research ([Kohler 1991], p. 138 and [Siegmond-Schultze 2001], p. 28). What kind of brave new world was evolving for American science? Who knew? One in which patrons would significantly affect the direction of scientific research? And/or one in which negotiation and persuasive skills would be as important to scientific production as talent in basic scientific research? And/or ...?

In 1919, these questions—much less their answers—were only dimly perceived, at least by the mathematicians. They had largely not been part of the belated U. S. scientific mobilization for World War I, and, when they had participated, it had been to use their most basic skills in the service of ballistics.⁵ World War I had been the chemists' and—to a lesser extent—the physicists' war, with the development especially of chemical weapons. The chemist Arthur Noyes of MIT, the physicist Robert Millikan of the University of Chicago, the Caltech astrophysi-

³See [Barrows 1933], p. 9 and [Siegmond-Schultze 2001], p. 29. In 2013 U. S. dollars, this was equivalent in "economic status" (considering the money as income or wealth) or in "income value" (considering the money as a commodity) to an endowment of some \$353,000,000 based on the nominal gross domestic product per capita. All currency conversions to follow will use this measure. For more, see www.measuringworth.com.

⁴The Carnegie Institution of Washington ostensibly included mathematics among the subjects it supported from its founding in 1902, but, effectively, its support of the field was spotty at best and came primarily in the form of underwriting specific publications. See [Fenster 2003]. The John Simon Guggenheim Foundation, founded in 1925, also provided funds for the support of individual researchers in all academic fields—mathematics among them—beginning in the 1926–1927 academic year. See [Anonymous 1925], p. 471.

⁵On the involvement of American mathematicians in World War I, see [Archibald et al., to appear].