Throughout this book there is discussion of a great variety of mathematical topics, many of which I had forgotten or about which I had little prior knowledge (class field theory, dimension theory, Noetherian modules and ascending/descending chain conditions, etc). There are many extracts from letters between mathematicians on such matters, and much concentration is needed to maintain a grip on the narrative. But David Rowe is to be congratulated on the production of this fine book. He provides a vivid presentation of Emmy Noether as a warmly magnanimous person and gives an exact account of her achievements in the context of early twentieth century mathematics.

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The new era in American mathematics: 1920-1950 by Karen Hunger Parshall, pp. 640, £40 (paper), ISBN 978-0-69123-524-0, Princeton University Press (2022)

In the history of mathematics, a few decades can make a huge difference. Research mathematics came fairly late to the United States, and it was not until the end of the nineteenth century that the United States began really to develop a research agenda. At the beginning of the twentieth century, the US was hardly a mathematical superpower. But by 1945, things had improved to the point where John Kline, who at the time was Secretary of the American Mathematical Society, could write that the US "has assumed world leadership in mathematics".

This book, by historian and mathematician Karen Hunger Parshall (co-author, with David Rowe, of *The Emergence of the American Mathematical Research Community, 1876-1900,* reviewed in the March 2000 issue of this journal), tells the story of how the United States got to that position. It is an interesting and important book, meticulously researched and engagingly written, and will no doubt become the definitive account of this chapter in mathematical history.

Prior to looking at this book, I had not given a great deal of thought to the question of how mathematics in the United States developed. I suppose I just assumed that its growth was the result of the influx, starting in the late 1930s, of European mathematicians fleeing from a continent that was about to be ravaged by war. Certainly this was a factor, but Parshall compellingly argues that there were significant additional considerations.

The book is divided into three multi-chapter parts, each part corresponding (to within a year or two) to one of the decades from 1920 to 1950. In the first part (1920–1929), Parshall begins by surveying the initial state of American research, discussing not only the mathematicians involved but where they were located. She also discusses important developments that allowed for future mathematical research, such as Veblen's successful efforts in persuading the Rockefeller Foundation to extend their research grants to cover mathematics as well as physics and chemistry.

The stock market crash of late 1929 ushered in the Great Depression of the 1930s, a decade that was also characterised by several waves of mathematicians emigrating from Europe to the United States. These events are chronicled in Part II of the book, covering the time period 1929–1941. This period saw the development of several mathematical institutions, including the Institute for Advanced Study. Parshall discusses the development of these programs, and surveys the research landscape in such areas as algebra and topology.

The 1940s were, of course, dominated by World War II. In Part III of the book (1941–1950) Parshall looks at the effect of the war and its aftermath on the development of American mathematics. Unlike the situation in World War I, mathematicians were not caught off-guard by its successor. In the years between the two wars, people had begun to realise that mathematical research could have significant relevance to wartime needs, and as a result, even before the US officially entered the war, mathematicians had formed a War Preparedness Committee, which Parshall discusses at some length. Post-war events in the development of mathematics in the US included a 1946 conference in Princeton on mathematical problems (emulating the famous Hilbert speech at the turn of the century) and Congressional action which ultimately resulted in the creation of the National Science Foundation (which recognised mathematics from the outset). And then, in 1950, the International Congress of Mathematicians was held, for the first time, in the United States (at Harvard). An American ICM had been scheduled for 1940, but had to be cancelled because of the War. These events are also discussed in the book.

This is not a book that will be used much for casual reading, or even as a classroom text. It is dense with details and footnotes, and seems primarily intended as a scholarly reference. The bibliography alone is fifty pages of small type. But as a reference it is outstanding. It certainly belongs in any university library, and on the shelves of any mathematician with an interest in the history of the subject.

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All the mathematics you missed (but needed to know for graduate school) (second edition) by Thomas A. Garrity, pp. 388, £22.99 (paper), ISBN 978-1-00900-919-5, Cambridge University Press (2021)

This book is aimed as a reasonably niche audience, but I think it merits a wider appeal. It is written for those attending graduate school in the US, which for us in the UK translates to those studying beyond their first degree. There are many higher degrees needing a level of mathematics perhaps beyond that which the student studied in their undergraduate course, or students starting a higher degree after some time has passed since their first degree so that some or much of what was learned has become rather hazy.

Garrity takes the reader through twenty key mathematical areas, ranging from linear algebra, Euclidean geometry, Stokes's theorems and probability theory to more specialised topics such as the Zariski topology of commutative rings.

The introduction deals with some hard truths for the reader—some encouragements that maths is exciting but coupled with the warning that it is hard and needs hard work and self-discipline. This reinforces the challenges that all of us face from time to time at all levels but it should serve as a warning and a comfort to those wishing to study at the highest of levels.

Garrity spells out definitions fully and explains examples clearly for each topic. He emphasises that this is not a rigorous exposition; rather, he aims to be intentionally non-rigorous, to be deliberately loose in style, to present the material in a more conversational than academic style.

I remember finding Fourier series rather a challenge during my degree, so I turned to that chapter to see what I can remember. The initial definitions and discussion are very clear and give a good overall explanation. I am clearer in a couple of pages as to the big picture—the *why* of Fourier series—and indeed far clearer after a few minutes reading than I remember feeling during my degree. There are clear definitions and examples to explain inner products, induced norms, Lebesgue integrable functions and so on.