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REVIEWS

Edited by CATHERINE GOLDSTEIN AND PAUL R. WOLFSON

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John von Neumann. By Norman Macrae. New York (Random House). 1992. 405 pp.

Reviewed by GARRETT BIRKHOFF

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Written by the retired principal editor of the London *Economist*, this biography contains a gold mine of information about von Neumann's family background. This is the main theme of its first three chapters. It also describes the related family backgrounds of his first wife, née Mariette Kovesi, and of his second wife, Klari Dan von Neumann, in fascinating and intimate detail. Based on interviews with many family members, the authenticity of these descriptions is indubitable.

Its spicy Chapter 5 also serves as a healthy antidote to the extreme leftist book *John von Neumann and Norbert Wiener*, by Steve Heims, which I reviewed in *Historia Mathematica* **10,** 243–248. Macrae's Chapter 5 contrasts the family backgrounds of Bertrand Russell and Wiener, quoting from a Russell letter to "a lady professor at Bryn Mawr" (presumably Charlotte Angas Scott (1858–1931)[1] that one of his pupils was

> an infant prodigy named Wiener, Ph.D. Harvard, aged 18. ... There is a perpetual contest between him and me as to who is to do the teaching.

[1] See [2, 3: 241–252]; also *Historia Mathematica* **9** (1982), 37–53. For Wiener, see [3] and [4].

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Macrae's Chapter 6, on von Neumann's work on the mathematical foundations of quantum mechanics during the years 1926–1931, although superficial, is sound. Its "attempted explanation of Hilbert space" (pp. 138–139) is perhaps the book's weakest point. Its more personal Chapter 7 is excellent. Regrettably, Macrae's Chapter 8 is seriously marred by its excessive reliance on Ed Regis's scandalous *Who Got Einstein's Office?* That book (copyrighted by Regis in 1987) holds up to shameless ridicule Princeton's Institute for Advanced Study, which has been since its founding one of our nation's most fruitful mathematical centers.[2]

Chapter 9 contains a valuable biographical account of von Neumann's personal life (including his remarriage and travels) during the years 1937–1943, but its title, "The Calculating Exploder, 1937–1943," is misleading. He was indeed making "shock waves" a central interest (another was operations research), as Macrae suggests, but his ideas about their numerical simulation did not take shape until 1944, with which the last three pages of Chapter 9 are in fact concerned.

Chapter 10, headed "Los Alamos to Trinity, 1943–1945," seems to me admirable. Its first 10 pages are devoted to a circumstantial description of famous scientists (especially Szilard, Fermi, and Oppenheimer) and to events preceding the establishment of the Los Alamos Laboratory. The good judgment of General Groves, who has sometimes been maligned, is brought out. Only treated too lightly is the fact that it cost two billion 1944 dollars and the dedicated efforts of a group of the world's leading scientists to achieve success.

Chapter 11, entitled "In the Domain of Economics," is of special interest as dealing with Norman Macrae's own field. Like the rest of the book, it makes lively and informative reading. However, scholarly readers will regret one omission: it does not mention Morgenstern's historical account of his role, published in the *Journal of Economic Literature*, XIV, pp. 805–816. Moreover, the "Miaw matrix" and the "Cuba matrix" given as examples do not really typify the essential ideas of the theory of games.

Chapter 12, on "The Computers at Philadelphia, 1944–1946," is full of stimulating hindsights concerning the ENIAC and other early electronic machines, against a background stretching from Babbage and Hollerith's punched card calculator to post-1970 MITI policies. Chapter 13 is a virtual continuation of Chapter 12, sketching the development of von Neumann's versatile electronic computer at the Institute for Advanced Study and its clones. Its focus on numerical weather forecasting seems very apt. The refusal of the Institute to provide space for the continuation of this activity [2, 3: 131] closes the chapter.

The last two chapters sketch von Neumann's role in the development of the first H-bomb, as mandated by President Truman, and von Neumann's role as AEC Commissioner under Lewis Strauss. There is a brief discussion of the development, after von Neumann's death, of the first intercontinental ballistic missile, under the

[2] For the most reliable account of the activities of the School of Mathematics of Princeton's Institute for Advanced Study (which included Einstein) during its pre-1965 years, see the article by Armand Borel in [2, 3: 119–147].

leadership of the Ramo–Wooldridge Corporation, as a response to Sputnik. It might have been nice to mention also the First Conference on the Peaceful Uses of Atomic Energy at Geneva, since this took place during von Neumann's term as AEC Commissioner.

REFERENCES

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2. Peter Duren, ed., *A Century of Mathematics in America*, 3 vols., New York: American Mathematical Society, 1988–1989.
3. Pesi Masani, *Norbert Wiener*, Basel/Boston: Birkhäuser, 1990.
4. A. H. Taub, ed., *John von Neumann*, *Collected Works*, 6 vols., Oxford/New York/London/Paris: Pergamon, 1961–1963.
5. S. M. Ulam, *Adventures of a Mathematician*, New York: Scribner's, 1976.

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Das Fotoalbum für Weierstraß. A Photo Album for Weierstrass. Edited by Reinhard Bölling. Braunschweig and Wiesbaden (Friedrich Vieweg & Sohn). 1994. 116 + xii pp. DM 98, $60.00, £46.00.

Reviewed by REINHARD SIEGMUND-SCHULTZE

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There is still in the literature a lack of reliable biographical sources, among them portraits, for the history of mathematics in the 19th century. So the principal merit of this German–English bilingual edition is to make available approximately 350 photographs of friends and students of the famous Berlin mathematician, Karl Weierstrass (1815–1897). The portraits were included in a photo album (actually in two volumes, due to the different sizes of the photos) which was presented to Weierstrass on his 70th birthday on October 31, 1885. The idea of the photo album originated with Carl Itzigsohn and the *Berliner Mathematischer Verein* rather late in the summer of 1885, when there was money left from a collection contributed to by German and foreign mathematicians. This collection had been organized for a bust of Weierstrass and a gold medal for his birthday, reproductions of which would have made nice additions to this fine volume. The edition reproduces both parts of the album, the first part in original arrangement, with seven portraits on average on each page. Lacunae are left where no portrait could be found when the editor discovered the album in two Berlin libraries in the 1980s. The album comprises photographs of some of the most famous foreign and German mathematicians of that period, among them Charles Hermite (who called Weierstrass "notre maître à tous"), Arthur Cayley, Pafnuti Chebyshev, Luigi Cremona, Felice Casorati, So-