BOOK REVIEWS

Historic Disparities

Women Scientists in America. Before Affirmative Action, 1940–1972. MARGARET W. ROSSITER. Johns Hopkins University Press, Baltimore, 1995. xx, 584 pp., illus. $35.95.

The Second World War, the Korean War, and the Cold War were accompanied in the United States by national concern with "manpower" and technological advance. One result of this concern was heavy investment in science infrastructure and research, "a golden age for science" as Margaret Rossiter notes, in terms of achievements as well as available resources for education and research. In this period of growth, however, women scientists were thoroughly marginalized, and the expansion and upgrading of science and technology in universities in fact undermined the few niches that they had established for themselves in academia. Those individual women or groups who sought to point out the problem or complain were silenced, sometimes rather brutally. It was only in the late 1960s and early '70s that the concerns expressed in critical popular studies of the position of women in American society like Betty Friedan's *The Feminine Mystique* (1963) and women social scientists' powerful analyses of the disadvantaged position of women in academia were manifested in the agendas of new pressure groups like the National Organization for Women (NOW), campaigns within disciplinary organizations, the reactivation of academic pressure groups like the American Association of University Women (AAUW), and the birth of new ones at the national and institutional level.

In this long-awaited sequel to her 1984 study of American women scientists before 1940, Rossiter demonstrates empirically the extent of the marginalization of women that occurred in the period before affirmative action. Adopting a broad definition of science, Rossiter considers the situation of women not only in the natural science fields but also in the social and behavioral sciences (as defined by the National Science Foundation) and (for some periods) applied fields like engineering and nutrition. She also uses a flexible definition of "scientist," which in some of her discussion encompasses all those with some postsecondary education in a scientific field regardless of actual occupation or institutional setting. The reasons for these definitional decisions are simple: data on American women scientists in a period in which few were in highly visible or well-documented positions are scattered and incomplete. What we have here is a remarkable example of historian as detective, piecing together information from statistical reports, autobiographies, professional directories and biographical dictionaries, college and university catalogs, records of professional associations, newspaper and journal articles, and obituaries.

WORLD RENOWNED—Dr. Maria Goeppert Mayer, 57, holds the slide rule she uses in the study of nuclear physics that won her a Nobel Prize today. She is a University of California professor here.

S.D. Mother Wins Nobel Physics Prize

Dr. Mayer 1st Woman in U.S., 2nd in History So Honored

By FRANK HOGAN

Dr. Maria Goeppert Mayer, 57, a research physicist

"When Maria Goeppert Mayer, on the faculty of the University of California at San Diego, won the Nobel Prize for Physics in 1963, the headline in the local newspaper emphasized her maternal rather than her professional status." [From *Women Scientists in America*; reprinted from the *San Diego Evening Tribune*]

The book is organized topically and chronologically. In the first three chapters, Rossiter examines the manpower question in the Second World War and after, including the post-Sputnik "ambivalent encouragement" of women's scientific education.

During the Second World War, despite a shortfall of trained scientists (the wartime manpower reports exclude social scientists but include engineers), and despite some more visible women in responsible posts, the vast majority of women scientists were channeled into jobs as research assistants, librarians, or technical aides both in government projects and in industry. Although the number of women scientists identified in the National Roster of Scientific Personnel more than doubled from 1941 to 1945, the change largely reflects differences in data collection or definition; in any case, the proportion female in the roster increased negligibly. Some women leaders objected and fought for more, but most women accepted their situation, perhaps, Rossiter speculates, because they shared prevailing attitudes about women's role, or were reluctant about "rocking the boat" in a time of national emergency.

Next, Rossiter looks at changes in postwar academia. The late '40s saw women scientists demoted or replaced by returning veterans, and younger women's access to higher education was limited by the flood of veterans taking advantage of the G.I. Bill. Although the number of women receiving science doctorates rose, that of men rose even faster. Universities eliminated or downgraded administrative positions like dean of women (which had sometimes been havens for scholars who were not welcome in academic science departments); older women who were already established faculty were ignored, isolated, or not promoted; and department chairs openly expressed skepticism or outright opposition to hiring new women. College and university nepotism rules hardened, barring employment of both members of a couple within the same department or sometimes institution.

The Korean War brought new manpower concerns but little change in opportunity as contradictory trends (encouraging young women to become scientists and discrimination in graduate support and hiring at all levels in industry as well as academia) intersected. Nevertheless, women persisted in seeking graduate scientific training.

Women were part of the great postwar expansion of scientific personnel (here again the source is government registers, now including behavioral and social science, but excluding engineering), but—not surprisingly—their participation was distributed unevenly across fields. A large majority of all the women scientists registered in 1954–55 were in chemistry, biological sciences, and psychology, but they were less likely than men to hold Ph.D.'s. By 1970, the proportion female had doubled, but again changing definitions preclude any firm conclusions. (In addition, neither the wartime National Roster nor the post-war National Register was a systematic sample.) Nevertheless, women scientists' annual earnings (1970) were on average 76.3% of men's (higher than the overall ratio for women in the labor force).

Rossiter turns next to the microlevel changes within universities and colleges, including the consequences of antinepotism rules in major universities and marginalization of women scientists (especially married ones) in non–tenure-track positions as visitors, research associates, or even "volun-

teer professors." One of the critical consequences of the irregular positions to which women scientists were confined was that institutions denied them the right to apply for research funds in their own names. Earlier opportunities in home economics departments and women's colleges disappeared as male presidents and deans sought to add prestige to their faculties by raising the male ratio. (Here small Catholic colleges and their enterprising sister presidents resisted the trend, as the "Sister Formation Movement" of the 1960s paid off with better credentialed female faculty.)

Outside of academe, nonprofits were a relatively bright spot, but women were even rarer as a proportion of those in industrial science and technology positions than in educational institutions. By the late 1950s, the Women's Bureau (another female niche) had been cut back, and there was relatively little growth in the number of women scientists in the federal government. The Civil Service Commission was slow to change its ways, even after initial reforms recommended by John F. Kennedy's Commission on the Status of Women. More action came under Lyndon Johnson, and the high-ranking women he appointed, such as Mary Bunting, herself a biologist and long a promoter of women's scientific education, first at Douglass College, then at Radcliffe. Rossiter nevertheless concludes that overall in the 1960s, "little changed for women scientists in the federal government"; they made up only 4.3% of federal scientific and engineering personnel (quote on p. 297; table 13.4, p. 298). Chapters on women in scientific associations and as winners of scientific prizes, including those offered by women's clubs and sororities, conclude her analysis of those dismal decades.

The "path to liberation" was blazed primarily by women social scientists, as Rossiter demonstrates in a concluding chapter. She contrasts two articles published in 1960: one, by the physicist Dorothy Weeks, presented discouraging, outdated data, but tried at the same time to see improvement and encourage women to enter science. The other, by sociologist Sylvia Fleis Fava, presented and fully analyzed current data on women in her field, documenting the declining proportion of women at each level within the university, from undergraduate to faculty, and in the profession as participants at annual meetings.

In the period after 1966, the number of women scientists employed in educational institutions increased rapidly, especially in sociology and the biological sciences, but also in chemistry, mathematics, and psychology, possibly producing a "critical mass" phenomenon. The civil rights, anti-war, and student movements were mature and active; although Rossiter does not make this argument, the claim-making of other groups provided both example and opportunity for women, in the academy and without. Sociologist Alice Rossi was well primed to seize the moment, given her own experience as a Columbia Ph.D. in sociology with a fine research and publication record, married to a prominent sociologist, but with no regular position of her own. She followed up publication of her "Equality between the sexes: an immodest proposal" (*Daedalus* **93**, 615 [1964]) with a paper at a Massachusetts Institute of Technology conference about young women and scientific careers (an abbreviated version entitled "Women in science: Why so few?" was published in *Science* **148**, 1196 [1965]). Rossi was a founding member of NOW in 1966; that organization made the elimination of job discrimination an important objective in a campaign to extend current executive orders concerning racial discrimination to sex as well. In 1969, women sociologists implemented a plan to get the same issues on the agenda of the American Sociological Association, and women in other professional societies followed suit. Women's caucuses were founded, and a spate of "status of women" reports in the disciplines followed. In the same period federal legislation was passed and executive orders amended to cover sexual as well as racial discrimination and civil rights.

"Microbiologist and college president Mary Bunting, shown being sworn in as a member of the Atomic Energy Commission, was one of several women 'doers' whom President Lyndon Johnson appointed to high positions in 1964." [From *Women Scientists in America*; Radcliffe College Archives]

Although her analytic chronology clearly documents the dilemmas of women scientists and the discriminatory practices of the period, Rossiter gives inadequate attention to the importance of social, demographic, or psychological explanations for the marginalization of women in science. She only hints at the social psychology of either the discriminators or those discriminated against and offers little analysis of the range of social mechanisms that turned attitudes into exclusion.

The attention Rossiter gives to identifying individuals and the details she provides about marriage, barriers (especially to regular academic employment), underrecognition, disappointments, and—yes—real accomplishments and rewards breathe life into her frequently poignant account. The abundance of names (there are thousands in the index) is sometimes overwhelming, however, and one disappointing consequence of both the breadth of inclusion and the scattered documentation (and the energy and time that were devoted to finding it) is that Rossiter provides no overall collective biography of the population of women scientists in these years (or even of a better documented set of them). She is thus unable to explore questions about possible cohort differences in access to education, the kinds of institutions that were most likely to produce scientists, the proportion married, and variations in "careers" or life histories.

She also does not systematically follow up her own provocative suggestions that the careers of foreign-born and -trained women scientists were distinctive and that "protégée chains" in women's colleges and the field of home economics functioned in the early period to place several "generations" of women scientists but disappeared with the death or retirement of the "old girls" by the 1960s. A collective biography would also have provided the essential data for tracing networks across time and space.

Rossiter concludes by reporting some striking achievements of women scientists in the 1960s and '70s—years of legislative gain—but also brings up an issue that has not gone away: the "Ph.D. glut" and the radical reduction of new positions in many academic fields that began to occur in the early 1970s. Women scientists are still underrepresented in many academic fields (note, for example, that the NSF sponsored yet another conference on "Women and Science: Celebrating Achievements, Charting Challenges" in December 1995); the fact that in the last 20 years talented women have found satisfying work in scientific fields to a historically unprecedented extent must be credited to the contemporary women's movement (in academia and in society at large), the men and women in the courts, legislatures, and government administration, and the women scientists who worked to include sexual discrimination in equal employment opportunity legislation and changed their institutions and professional associations from within.

Louise A. Tilly
Committee on Historical Studies,
Center for Studies of Social Change,
New School for Social Research,
New York, NY 10010–8002, USA