Review of
In Service to Mathematics: The Life and Work of MINA REES
by Amy Shell-Gellasch
Reviewed by Linda Keen

This year is the centennial of the birth of Mina Rees and so it is fitting that the first full fledged biography appeared early this year. The biography begins with the following quote from Joachim Weyl in *Science*, 1970:[1]

> "Any respectable description of what Mina Rees has done, rather than an enumeration of the positions she has held, will inevitably read like a concise history of Americal mathematics during the last few decades."

Mina Rees was born in 1902 and grew up in New York City. She attended Hunter High School, a specialized high school for girls (now co-ed) where admission is based on scores on city-wide examinations. She did her undergraduate work at Hunter College, then a Women's college, and after graduation in 1923, summa cum laude, became an assistant teacher there. While teaching she studied mathematics at Columbia University. When she realized Columbia was not interested in having women as Ph.D. candidates, she switched to Teacher's College where she earned an MA degree. She then went on to pursue a Ph.D at Chicago, where she studied algebra with L.E. Dickson. As Saunders MacLane recalls,[2] few students at Chicago were expected to continue to do research. They were recommended for, and through the old-boys network, obtained post-doctoral research positions. Most, including all the women students, were expected to teach at the college level. Mina Rees received her degree in 1932 and went back to Hunter where she became an Assistant Professor, and in 1940, an Associate Professor.

In 1943, Mina Rees took a leave from Hunter and joined the war effort working with the Applied Mathematics Panel (AMP) coordinating and supporting scientific research in Washington. This panel identified the mathematical aspects of work carried out by the military. At the end of the war, based on the huge success of the AMP, Congress and the post-war military establishment realized the importance of continued support of research in the sciences. Mina Rees became the first head of the Office of Naval Research. Her broad knowledge of mathematics and mathematicians led her to promote policies for government support of the full range of mathematical research and not just "applied" problems. Her work there and later, her role on the advisory panel of NSF, set the stage for the huge development of both mathematics and computer science in the second half of the twentieth century. Her role in assuring continued support for "pure" mathematics was recognized by a resolution of council the American Mathematical Society in 1953. It states in part,

> "Needless to say, as the purest of all sciences, mathematical research might well have lagged behind in such an undertaking. That nothing of the sort happened is beyond any doubt traceable to one

[1] F.J. Weyl, "Mina Rees, President-Elect 1970,", *Science*, Vol. 167, n0. 3921, pp. 1149-1151, 1970

[2] J. Green, J. LaDuke, U. Merzbach, "Mina Spiegel Rees, (1902-1997)," *Notices, AMS*, 1998, vol. 45, no. 7, pp. 866-873

> person — Mina Rees. Under her guidance, basic research in general, and especially in mathematics, received the most intelligent and wholehearted support."

In 1953, Rees returned to Hunter College and in 1961 played a central role in the development of graduate education at the City University of New York. Until the Rockefeller administration in New York in 1961, New York State had no public universities that offered doctoral degrees. In the wake of the Sputnik launch, the administration indicated its support of graduate public education and both the City University of New York (CUNY) and the State University of New York (SUNY) were born. CUNY was the umbrella structure for the existing New York City supported colleges, City College, Hunter College, Brooklyn College and Queens College, and several community colleges. During the '60's these campuses grew, several split — the "downtown campus" of City College became Baruch College and the "Bronx campus" of Hunter College became Lehman College. None of these campuses offered doctoral degrees. A new campus, the Graduate School, later the Graduate School and University Center, was established. Its role was to offer doctoral degrees. Mina Rees was in charge of developing doctoral programs for this new campus. Faculty for this campus were hired, but in addition, faculty from the existing colleges were invited to participate in the new programs. This "consortial setup" built on the strengths of the campuses and strong leadership in a central place to provide top quality graduate education in New York City. Mina became Provost and then President of the Graduate Center until her retirement in 1972. Mathematics was among the first programs at the Graduate Center, offering its first courses in 1963 and its first Ph.D in mathematics was awarded in 1966.

Mina had very strong ideas about higher education and wrote many articles about it. She was aware that the role of women and minorities in society was changing and graduate education needed to accommodate these changes. CUNY had a day care center for students and faculty as early as the late 1960's. She was a strong role model for women and for me, in particular. In 1966, I became a member of the doctoral faculty in mathematics at CUNY and met Mina. I was the only woman on the mathematics faculty for a number of years. Mina was not only welcoming, but was very supportive in an environment that was not uniformly so. This support was important to me through my early years as a single mother in establishing myself as a mathematician.

After her retirement, Mina continued to serve the community in various ways and pursued some of her other more personal interests. Aware of the importance of her work in Washington, Mina wrote a number of articles about it. These appeared in periodicals as diverse as the AWM Newsletter, 1979, SIAM News, 1978 and the Annals of the History of Computing, 1985, among others. She died in 1997. The library at CUNY is named for her and her estate endowed a chair in mathematics. In 2002, Viktor Kolyvagin was appointed as Mina Rees Professor of mathematics.

The book under review gives a much fuller picture of this extraordinary woman than these few paragraphs could possibly do. It is divided into three basic parts: The early years and a discussion of Mina's studies and her thesis; the middle years in Washington during the war and at the ONR; the later years and graduate education. The most interesting, I found, were the chapters on the middle years. Much of this is based on Mina's own writings and an interview with Uta Merzbach in 1969. Given the current atmosphere in which government support of education and science is

under attack, it is important to understand the role that government played in the the second half of the last century — and Mina Rees' role in that development.

The book started out as the author's thesis for her Doctor of Arts in mathematics at the University of Illinois at Chicago in 1998. The book seems very close to the original thesis and includes many copies of pictures and documents relating to Mina's life. It also has an extensive bibliography, including all of Mina's writings. Its main drawback is that it lacks a certain immediacy because the author never met Mina and the book contains little of a personal nature. Mina managed to be extremely effective in a time when women were not accepted as equals either in academe or high levels of government. She was well aware of this and was an important role model for those of us in the next generations. This aspect of Mina is barely touched on. Information on this was available in 1998 and the book would be stronger had it been included.