BLANCH, Gertrude. February 2, 1897–January 1, 1996.
New York University (BS 1932), Cornell University (MS 1934, PhD 1935).

Gertrude Blanch was born Gittel Kaimowitz in Kolno, Poland, which was then under the control of Russia. She was the last of seven children of Dora (Blanc) and Wolfe Kaimowitz (also "Kamovitz" and "Kamowitz"). Her father had emigrated from Poland to the United States early in the century, and he was joined by his wife, Gittel, and another daughter in 1907. Gittel attended public elementary and secondary school in Brooklyn, New York, and graduated from the Eastern District High School at the beginning of 1914, the year her father died. By this time she had Americanized her first name to Gertrude. In order to support her mother she took a clerical job.

Gertrude Kaimowitz became a naturalized US citizen in 1921. After her mother died in 1927, she decided to resume her education, so she enrolled in the Washington Square College of New York University that year and began taking night courses. She also decided to leave her job working for a hat dealer in increasingly responsible positions. However, her employer, Jacob Marks, offered to pay her tuition if she would remain at the job; she accepted the offer and graduated summa cum laude with a major in mathematics and a minor in physics in 1932. Also in 1932, in February, she legally changed her name to Gertrude Blanch, an Americanization of her mother's name Blanc. Later in 1932 she used the name Gertrude K. Blanch.

When Blanch applied to graduate school at Cornell University, she used as one of her references Fay Farnum, who had earned her PhD in 1926 from Cornell as a student of Virgil Snyder and who had joined the faculty at New York University just before Blanch enrolled there. Blanch entered Cornell in September 1932 and received her master's degree in February 1934. She held a graduate scholarship her final year at Cornell and earned her PhD in 1935 after writing a dissertation in geometry and with minors algebra and analysis.

After receiving her PhD, Blanch returned to New York City and spent a year as a tutor at Hunter College replacing a faculty member on leave. She then took a job as a bookkeeper in Manhattan and, in order to remain mathematically active, took an evening course in relativity at Brooklyn College. The instructor of the course was Arnold N. Lowan. When Lowan learned that she had a doctorate in mathematics he invited her to join the WPA project that he had been asked to head. Although Blanch had no training in numerical analysis she had experience as an office manager and with office calculating machines. Thus, it was appropriate that she was hired to supervise the training of high school graduates to make sophisticated mathematical tables using only pencil and paper. At the beginning of 1938, Blanch became a mathematician for the Mathematical Tables Project in New York. In a 1973 interview her colleague Ida Rhodes described Blanch's method of writing detailed work sheets that could be followed one step at a time by people who had no mathematical training. She claimed that Blanch "did accomplish miracles. There is no doubt about that. It wasn't just the question of teaching those people, who never heard [that numbers have signs, how to compute.] That was an important thing, but not her most important [deed.] The [crowning accomplishment] was the raising of the morale of these people who had [felt] rejected by society and [thought] they were useless" (Tropp interview, 2, square brackets in the original).

Blanch worked for the project until 1942, spending the last two years as a tutor in the evening session of Brooklyn College. In 1942 she, along with many of the professional staff of the Mathematical Tables Project, became employees of the National Bureau of Standards (NBS) contracted to the Applied Mathematics Panel of the National Defense Research Committee. During this period Blanch applied for and was denied security clearance based mainly on the fact that her sister, in whose apartment she lived, was a member of the Communist Party. In 1946 Blanch was invited to join the staff at Los Alamos but was again denied a security clearance and remained with the Mathematical Tables Project. The group continued working in New York and was disbanded after the war. In 1948 Blanch went to California, still as an employee of NBS, as assistant director for computing at the Institute for Numerical Analysis (INA) located on the campus of UCLA. During the McCarthy era, she was again investigated, this time by a loyalty board of the Department of Commerce, which oversaw the NBS. David Alan Grier reports in his 2005 book that a May 1952 "hearing resolved the charges against Blanch and allowed her to return to her job" (308–09). With her loyalty no longer questioned, the following year she served as a US representative to a symposium on automated digital computing held at the British National Physics Laboratory.

Although Blanch was cleared of disloyalty, other employees of the INA remained under attack, and the Institute closed in June 1954. Blanch left at the end of 1953 and worked for the Electrodata Corporation, a section of the Consolidated Engineering Company in Pasadena, which was soon to be bought by the Burroughs Corporation. At the end of 1954 she became a senior mathematician at the Aerospace Research Laboratories at the Wright Air Development Center (later Division) of Wright-Patterson Air Force Base in Dayton, Ohio. At this time she was granted security clearance.

Blanch remained at Wright-Patterson until her retirement in 1967. She later said, "I was never as happy in any other place as I was at Wright Field. I had complete freedom to do exactly what I wanted the way I wanted to do it and, I think, my best work was done there" (Tropp interview 1973). The Air Force recognized her accomplishments by awarding Blanch a Special Service Certificate in 1963 and a Senior Citizen Award the following year. Also during this period she continued her work on Mathieu functions and published extensively in this area, including the contribution on the subject to the 1964 NBS-sponsored *Handbook of Mathematical Functions*. At the base she taught mathematics to officers needing training in aerodynamics. She was active in the Dayton branch of the AAUW and was higher education chairman in at least 1963.

Starting in the 1940s, Blanch made significant contributions to many volumes of tables that do not bear her name as an author but were brought out by the WPA Mathematical Tables Project and later by the National Bureau of Standards computation laboratory. While she was at INA and Wright AFB Blanch supervised the computations for many projects that resulted in publications or technical reports in which her assistance was acknowledged. In addition, she contributed to research in other ways by reviewing and assisting editors. Soon after the National Research Council journal *Mathematical Tables and Other Aids to Computation* was begun in 1946, Blanch began contributing reviews to the section RMT (Recent Mathematical Tables). In 1955 the section became known as "Reviews and Descriptions of Tables and Books," and Blanch continued to contribute reviews, as she did when

the journal changed its name to *Mathematics of Computation* in 1960. In the 1960s she started contributing to the *Mathematical Reviews*; her forty-second and last review appeared in 1987. In addition to refereeing for various journals, Blanch also served as organizational representative from Wright Air Development Center to the *SIAM Review* during its first five years, 1959–63.

On March 3, 1964, Blanch received the Federal Woman's Award. The following year, when the women's movement of the 1960s was just beginning, she noted in an article for the student journal of the NCTM that "frequently letters come to my desk asking whether there is a place in mathematics for women," while others ask if they can "hope to attain recognition, eventually" (**1965**, 1). She answered by sketching the careers of Sonya Kovalevsky and Emmy Noether and ended her article:

> Acceptance of minority groups—women or other groupings—comes when there is need for the service this group can render. The following excerpt from Sonya Kovalevsky . . . is worth quoting: "I received . . . an article by Strindberg, in which he proves, as decidedly as two and two make four, what a monstrosity is a woman who is professor of mathematics, and how unnecessary, injurious, and out of place she is. I think he is right *au fond;* only I wish he would prove clearly that there were plenty of mathematicians in Sweden better than I am and that it was only *galanterie* which made them select me!"
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> Even today, the man would probably be preferred by most employers over an equally competent woman. However, the prospects ahead are for many more positions than there are applicants to fill them. In such a climate, there can be no effectual discrimination. There is no essential handicap to a career by a women; we look forward to a crop of women scientists, to perhaps disprove Strindberg's judgment of them. (**1965**, 4)

At her retirement in 1967 the Aerospace Research Laboratories published the *Blanch Anniversary Volume: A Series of Papers Presented on the Occasion of her Retirement by the Friends of Gertrude Blanch.* One of her closest colleagues, Ida Rhodes, commenting on Blanch's receiving the Federal Woman's Award, said that "if I had anything to do with awarding medals, I would have given her [one] made all of diamonds for the early work that she did, in welding a malnourished, dispirited crew of people, coming from [the] Welfare Rolls, [into] a group that Leslie J. Comrie said was the 'mightiest computing team the world had ever seen' " (Tropp interview with Ida Rhodes 1973, 2, square brackets in the original).

Even in retirement Blanch continued her involvement with mathematics beyond writing reviews. Until 1970 she was an Air Force consultant through a contract with Ohio State University. She then returned to California where, in 1973, she was writing a book on numerical analysis for people who had computational experience but did not understand the numerical processes involved. At that time she expected it to take her five years to finish it. The unpublished manuscript is in her papers at the Charles Babbage Institute.

Gertrude Blanch died in San Diego on New Year's Day 1996, a month before her ninety-ninth birthday.

Organizational affiliations: AMS, MAA, SIAM, AAAS (fellow), Phi Beta Kappa, AAUW.

Thesis and dissertation:

1934 Number of representations by certain positive ternary quadratic forms. MS thesis, Cornell University. Typescript.

1935 Properties of the Veneroni transformation in S_4. PhD dissertation, Cornell University, directed by Virgil Snyder. Typescript. Printed abstract, 1935, reprinted from *Amer. J. Math.* 58:639–45.

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Gertrude Blanch. Interview by Henry Thacher, 17 Mar 1989, San Diego, CA. Audiotape donated to author by AWM; also listed in Gertrude Blanch Papers.

Other sources: Master's thesis vita 1934; PhD dissertation vita 1935; Owens questionnaire 1940; Division of Rare and Manuscript Collections, Cornell University Library; Former Members of the Department files, Cornell University Department of Mathematics; Ida Rhodes (1900–1986), interview by Henry Tropp, 21 Mar 1973 (transcript); SSDI.

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