

First Wife's Role in Einstein's Work Debated

Researchers differ about the contribution Mileva Maric -Einstein made to major discoveries

By Simson L. Garfinkel
Staff writer of The Christian Science Monitor

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ALBERT EINSTEIN sometimes helped his first wife do the household chores: "He felt sorry that after her housework was done, she had to do his mathematical problems till way past midnight," says Senta Troemel-Ploetz, a linguist and historian.

But was Mileva Maric merely Einstein's housekeeper and algebraic assistant, or was she a physicist in her own right, who would have been recognized as a coauthor in her husband's work were it not for the pervasive sexual discrimination of the time?

Last week, a trio of researchers here presented papers, shouted their responses, and nearly came to blows arguing over Maric's role in the work of the young Einstein, during the annual meeting of the American Association for the Advancement of Science.

"Certain aspects of his life have been largely neglected by male biographers," said Dr. Troemel-Ploetz, who is working in the United States with a research grant from the West German government. For example, she says, in the 1979 biography, "Albert Einstein: The Human Side - New Glimpses From His Archives," "there is not a single letter written to either his first wife or his children, not even a single letter or text in which their names are mentioned."

Maric and Einstein met at the Swiss Federal Institute of Technology in 1896. They took almost the same courses, wrote their final theses in the same area, and took their final exams in the spring of 1900. Both received failing grades, but Einstein was allowed to graduate.

The two were frequently separated before their marriage three years later, as Einstein traveled. The second volume of the collection of his life works and letters was published this year; more than 30 volumes are expected.

In the 41 letters from Einstein to Maric that have been published, there are frequent references to "our research" and "our work." In one letter, Einstein wrote: "For the work on the Thomson effect I took refuge to still another method which has a certain similarity with yours . . . and which also presupposes your investigation. If only we could start tomorrow!"

Einstein eventually secured a job as an examiner in the Swiss Patent Office in 1902, and the couple married at the beginning of 1903. In 1905, while they were visiting Maric's father, she is reported to have told him "a short while ago we finished a very important work which will make my husband world-famous," said Troemel-Ploetz.

That year, Einstein published his papers on special relativity, Brownian motion (which led to the proof that matter is composed of molecules), and the photoelectric effect, for which he was

awarded the 1921 Nobel Prize. Einstein left Maric in 1914. She frequently had to take in boarders to buy food for herself and the couple's two children.

'How happy and proud I will be when the two of us together will have brought our work on the relative motion [the theory of relativity] to a victorious conclusion.'

- Letter from Einstein to Maric, March 1901

But he gave her the entire proceeds from the Nobel Prize, which she spent paying for the care of their psychotic son. She died in poverty. A book on her life, "In the Shadow of Albert Einstein: The Tragic Life of Mileva Einstein-Maric," originally written in Serbo-Croatian, is now in its fourth German printing.

Although Einstein's biographers have described Maric as an academically unexceptional "Serbian peasant girl," her parents would have had to have been wealthy to have paid for her study in Switzerland, said Troemel-Ploetz. "She couldn't have entered the physics class of an elite boys' school as the only girl with special permission if she had not been brilliant," she added.

Maric worked with physicist Paul Habicht to develop a machine for measuring small electric currents. "It took a long time, not only because she had so much to do, but also because of her thoroughness and perfectionism," reported Troemel-Ploetz, quoting Maric's biography. But when Einstein patented the device, her name was omitted and the patent was listed under the name "Einstein-Habicht."

"It was quite normal for men to appropriate women's work and take credit for it then," said Troemel-Ploetz.

An alternative explanation, she said, is that there was an agreement between the couple to keep the wife's contributions secret so that her husband would have a better chance of obtaining a university appointment. When Maric was asked why her name was not on the patent, she replied, "What for? We are both only one stone," said Troemel-Ploetz. (The name Einstein means "one stone.")

Finding out what role Maric played in the formulation of Einstein's most famous theories may be impossible, since only 10 of her

letters have survived. "Sources about women disappear," said Troemel-Ploetz. "It doesn't mean that they were intentionally destroyed: It is just negligence."

"True, only 10 of her letters to him are preserved, compared to 41 of his to her, but you could not pick 10 of his so devoid of discussions of physics," argued John Stachel, a professor at Boston University, who edited the first two volumes of Einstein's papers. "The fact remains that you can't get away from physics in his letters, while there is none in hers."

Shouting his words, Dr. Stachel stated there is "not a shred of evidence known to me indicating that Maric worked on [special relativity]. I cannot assert categorically that she did not; I merely ask that we weigh the probabilities in the light of all the available evidence."

But an analysis of Einstein's letters by Evan Harris Walker, a physicist and cancer researcher in Maryland, shows that Einstein often acknowledged points of physics and theory that Maric had raised in letters that are now lost. Dr. Walker also presented evidence at the symposium that a Russian physicist named Abraham F. Joffe had seen the original manuscripts - now lost - of Einstein's 1905 papers while Dr. Joffe had been a graduate student.

One of the authors on the papers was "Einstein-Marity," the Hungarianized spelling of Maric's name. Abraham Pais, a physicist at Rockefeller University in New York who has written a major biography of Einstein, said in a telephone interview, "I have heard such stories before. From all my readings and my detailed studies and knowledge, I believe that Mileva was a great help to Einstein in [only] a technical sense."

"You know, they were fellow students. She tried to pass the exam, and failed both times," said Dr. Pais, who knew Einstein but never spoke with him regarding his first wife.

Maric's failing grade means nothing, argued Troemel-Ploetz, who said that it wasn't until 1982 that the Swiss federal court ruled that universities could not have different academic standards for men and women.

Troemel-Ploetz knows of these practices first hand, she said, because she was once a professor in Switzerland. "I often saw women who were better than men get poorer grades," she said. "I could not defend them to my colleagues because I was only one voice."

Japan: A Friend in Space

NEW reports made much of Japan's growing potential to compete with the United States and other space-faring powers when the Japanese lunar mission orbited Jan. 24. It's worth taking a second look at that mission from the perspective of cooperation.

The Muses-A satellite pair, now getting into position for their lunar rendezvous March 18, are testing navigational techniques to be used on a joint mission with the US in 1992. Other joint missions are planned to follow it. Japan is preparing to become a major space power in the next millennium - only a decade away. But right now, and in terms of space science, it anticipates a decade of cooperative ventures.

The Muses-A mission is testing "gravity assist" navigation, using the moon that the United States successfully employed to send the International Cometary Explorer probe to rendezvous with Comet Giacobini-Zinner in September 1985. Repeated lunar flybys give a spacecraft new energy and can drastically change its orbit.

When the Japanese satellite swings by the moon at a minimum distance of about 18,000 kilometers (11,185 miles), it will release a basketball size minisatellite that will go into lunar orbit and radio back engineering data for a month. Meanwhile, the main satellite will return to orbit Earth 3 1/2 more times. Then it will swing back by the moon, coming within 35,000 kilometers (21,749 miles).

All this maneuvering and vehicle testing will help Japan prepare for eventual scientific missions to the moon and to other planets. But the first objective is the 1992 GEOTAIL mission with

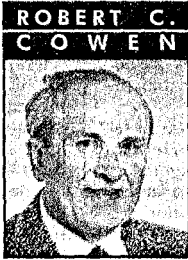
the United States. The US National Aeronautics and Space Administration will use a Delta II rocket to launch a Japanese satellite to study our planet's magnetic field where it is drawn out into a long tail on Earth's nightside. Two lunar swingbys will allow the satellite to probe a region out to 220 times Earth's radius.

In mid-decade, the two partners will switch roles. Japan plans to launch an America satellite to monitor tropical rainfall. Meanwhile, next year, Japan is to launch the Solar-A sun-watching satellite. It will carry both Japanese and American X-ray telescopes to track solar flares.

Japan's small space science agency, the Institute of Space and Astronautical Science, is running the joint programs. The National Space Development Agency (NASDA) runs the bulk of Japan's government-backed space effort. This group has its eyes on manned spaceflight and commercial applications. It's developing Japan's competitive muscle, yet also plans cooperative projects.

Besides its commitment to supply a \$2 billion laboratory module for the US space station, NASDA is working with NASA and the European Space Agency on the Advanced Earth Observation Satellite. Japan plans to launch the satellite in 1995 carrying instruments from all three partners to monitor climate and the ozone layer.

If these programs come off as planned, they will generate much useful space science. Americans are understandably edgy about Japan moving into the space business. Yet when they look over their shoulders to see if this potential competitor is gaining on them, they may find, instead, that they have a helpful friend.



ROBERT C. COWEN