

Women in the Sciences

Bridgette Polite

The role women played in society dramatically changed with the entrance of the United States into World War I. Women were forced out of the home and into the workforce while so many men were fighting in Europe. After World War I, the period during the 1920s also led to more freedoms for women, especially through the women's suffrage movement. Despite the trend towards equal treatment of women over the past sixty years, women have continued to face obstacles in their work that men have not experienced. In the biological sciences in particular, it is obvious that successful women have not been properly recognized for their work.

One clear example of conflict between the sexes within the scientific community occurred in the 1950's with Rosalind Franklin, James Watson, and Francis Crick. The race for the structure of DNA was on, and Watson and Crick were serious about their work. Their blatant ridicule of Pauling's model in their first publication in *Nature* shows their competitive attitude towards their research (Watson and Crick). However, Watson and Crick may never have found the double helix structure without the help of Rosalind Franklin. At the time, Franklin was working with x-ray diffraction in an attempt to determine the structure of DNA. Franklin was successful in her work, but unfortunately, Franklin died in 1958, only four years after Watson and Crick's publication. Rosalind Franklin was not a gregarious woman; she kept to herself, and had few acquaintances. James Watson commented on Franklin:

Constantly exposing your ideas to informed criticism is very important, and I would venture to say that one reason both of our chief competitors failed to reach the Double Helix before us was that each was effectively very isolated. Rosalind Franklin found small talk awkward and until it was too late did not realize how much good advice Francis would willingly have given her. Had she started to talk to him, Francis would have led her to use her facts to find the base pairs. (qtd. in *Linus Pauling*)

Rosalind Franklin certainly did not get on well with James Watson; his personality and possibly sexist attitudes clashed with Franklin's personal views on several occasions. Watson did comment on Franklin's intelligence and work ethic regarding the DNA project:

Rosalind Franklin was a very intelligent woman, but she really had no particular reason for believing that DNA was particularly important. She was trained in physical chemistry. I don't think she'd ever spend any length of time with people who thought DNA was important. And she certainly didn't talk to Maurice [Wilkins] or to John Randall, then the professor at Kings. (qtd. in *Linus Pauling*)

Franklin struggled through many sexist obstacles at King's College during her time there, and as Watson mentioned, she was not open with either Maurice Wilkins or John Randall, her supervisors at King's College (United States). If Rosalind Franklin had not died so soon after the DNA structure was announced by Watson and Crick, she may have received some recognition for her vital work on the project. However, it is not likely that Franklin would have received a Nobel Prize, as Maurice Wilkins (her supervisor) did in 1962 (*Nobelprize.org*).

A second clear example of discrimination against a woman scientist also occurred during the 1950s, when Alfred Hershey and Martha Chase were working on their well known "blender experiment," which concluded that DNA was the hereditary material in viruses. Martha Chase was a lab technician under Hershey at the Carnegie Institute of Washington. The two worked together and co-authored their publication, "Independent Functions of Viral Protein and Nucleic Acid in Growth of Bacteriophage" in 1952. Alfred Hershey was awarded the Nobel Prize in Medicine in

1962 for his work in "discoveries concerning the replication mechanism and the genetic structure of viruses" (*Nobelprize.org*). However, Chase was not recognized as she was working in a lab assistant's role at the time. Although her name will always be carried on in the "Hershey-Chase Experiment," she received no formal recognition for her work. Alfred Hershey did not mention Chase or her work in his Nobel Lecture, "Idiosyncrasies of DNA Structure," in 1969 (*Nobelprize.org*). After she finished working with Hershey, Chase moved on to the University of Southern California and received her PhD in 1964. Then after personal and professional setbacks, including a divorce and the loss of her job in the 1960s, Chase ended her scientific career. In later years, Chase suffered from severe dementia and short-term memory loss. However, she is still remembered by friends as "a remarkable but tragic person"; Martha Chase recently died in August, 2003, at the age of seventy-five (Dawson).

The situation of these two women in the field of biology, whose significant work has been overlooked, remains a common trend in the scientific fields. While 770 Nobel Prizes have been awarded in Physics, Chemistry, Medicine, Literature, Economics, and Peace since 1901, only eighteen Nobel Prizes have been awarded to women, all of them after 1960 (*Nobelprize.org*). These statistics provide clear evidence that recognition has not been received where it is due. We can only hope that we are at the beginning of an evolutionary process in our culture so that some day women scientists may be able overcome these obstacles to their professional career development.

Works Cited

- Dawson, Milly. "Martha Chase Dies." *The Scientist* 4.1 (2003): 20030820-03. 17 Apr. 2005
<<http://www.the-scientist.com/news/20030820/03>>
- Hershey, A. D. and M. Chase. "Independent Functions of Viral Protein and Nucleic Acid in Growth of Bacteriophage." *Journal of General Physics*. 36.1 (1952): 39-56.
- Linus Pauling and the Race for DNA*. Special Collections, Oregon State University Valley Library. 2005. 14 Apr. 2005.
<<http://osulibrary.orst.edu/specialcollections/coll/pauling/dna/index.html>>.
- Nobelprize.org*. "List of All Laureates." The Nobel Foundation. 2005. 13 Apr. 2005
<<http://nobelprize.org/index.html>>
- United States. National Institutes of Health. "The Francis Crick Papers." *Profiles in Science*. U.S. National Library of Medicine. 2005. 14 Apr. 2005 <http://profiles.nlm.nih.gov/SC>
- Watson, James D. and Francis H. C. Crick. "Molecular Structure of Nucleic Acids." *Nature*. 171.4356 (1953): 737-738.