Sophie Germain Biography

Sophie Germain

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Biography

Sophie Germain was the daughter of a politically active merchant who became one of the directors of the Bank of France. He supported an extensive library out of which the young Sophie found ample material to nourish her keen intellect. She studied Latin, Greek and mathematics at home since a first-class public education was denied to women in general society. The great scientist of Greek antiquity, Archimedes, became Germain's hero and his experiences inspired her to strive for a career in mathematics against the will of her parents.

At the age of eighteen, Germain's intense interest in mathematics was further sharpened by studying the lecture notebooks of friends who were students at the Ecole Polytechnique, where she was not permitted to attend. Students at the Ecole Polytechnique were required to submit papers at the end of each term. Realizing the quality of her own work in mathematics, Germain submitted a report under a male pseudonym, "Le Blanc," to Joseph Louis Lagrange who was so impressed by the originality of the paper he sought out its author. He then discovered the true identity of Mr. Le Blanc and sponsored Germain's further development in the field of mathematics.

The primary means by which Germain acquired her higher education was in the form of correspondences with great scholars in literature, philosophy, biology and mathematics. One of her interests was in number theory, the subject of which figured prominently in lengthy correspondence with Carl Friedrich Gauss and Adrien-Marie Legendre. A result of her work in this area was a partial solution to Pierre de Fermat's "Last Theorem," in which Germain proved that for prime exponents less than 100, there were no solutions that were each relatively prime to the exponent. She also developed a theory using differential equations that mathematically modelled the phenomenon of standing waves produced on a vibrating plate, the so-called Chaldni figures.

Sophie Germain succeeded, where so many other women were stymied, in penetrating the barriers of an intensely unsupportive, male-dominated society. So impressed were her peers by her work that Carl Friedrich Gauss arranged to have her awarded an honorary doctorate from Gottingen. Unfortunately, Germain died before she could receive it.