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**INSTITUZIONI
ANALITICHE**

DELLA SOCIETÀ ITALIANA
DI D^{MA} MARIA GAETANA
AGNESI
MILANESE
Dell'Accademia dell'Eden a Bologna.
TOMO I.



IN MILANO, MDCCCLVDE
NELLA REGIA-BUCAL CORTE,
CON LICENZA DE' SUPERIORI.

An Achievement Worthy of Commemoration.

The Iowa State University Library's Two-Millionth Volume

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

ISTITUZIONI ANALITICHE LIBRO PRIMO



In October 1974, the Iowa State University Library celebrated a milestone in its history, the acquisition of its one-millionth volume. That volume, a first edition of Leonardo da Vinci's *Trattato della Pittura* (1651), was chosen because Leonardo's work symbolized the ties among science, the arts, and the humanities—ties essential to the mission of Iowa State University. Now, twenty years later, Iowa State University's Library celebrates another milestone in its history, one equally significant: the acquisition of its two-millionth volume. The two-volume set chosen for this honor is a first edition of Maria Gaetana Agnesi's *Istituzioni analitiche ad uso della gioventù italiana*—or *Analytical Institutions for the Use of the Youth of Italy*—published in Milan, Italy in 1748.

LIKE LEONARDO'S *TRATTATO DELLA PITTURA*, THE *Istituzioni analitiche* is an Italian scientific work, written by a scientific genius who was also a humanist. Maria Gaetana Agnesi (1718-1799) is generally regarded as the first woman mathematician in the modern Western world. But Agnesi was also a superb linguist who had strong interests in religious studies. Known by her contemporaries as a "walking Polyglot," Agnesi was called the "Seven-Tongued Orator" in her youth—a child-prodigy who was fluent in Italian, French, German, Spanish, Latin, Greek, and Hebrew.

It is especially significant that Maria Gaetana Agnesi was a woman. For her

time, just as is the case to a lesser degree today, to be a woman scientist or mathematician was atypical. According to the accepted wisdom of the eighteenth century, women and men had different temperaments. Women's scientific interests, if any were present, were often thwarted because they were considered unnatural. In Milan, however, where Agnesi grew up, a countervailing tradition existed in which women could attend universities, obtain doctorates, and teach. For the most part, women who sought higher education did so in the humanities or the arts, but there were a few scientists among them.

Even in such a society, Maria



MARIA GAETANA AGNESI



Agnesi was special. Born in 1718 as the first child of Pietro Agnesi and Anna Fortunato Brivio, she grew up in a wealthy and educated household. Agnesi's genius was recognized at an early age, and her father, a professor of mathematics, did everything he could to cultivate that genius. He brought tutors from all over Europe to teach her and established a scientific salon in his home to display her talents. By the age of nine she was a published author, first writing a lengthy speech on the necessity of higher education for women, then translating it herself into Latin for publication. The culmination of her education came in 1738, when at the age of 20 she defended 190 philosophical and scientific theses in a public display of intellectual prowess. Her *Propositiones philosophicae*, a compilation of the theses, was published the same year.

After 1738, Agnesi grew weary of her fame. She withdrew from society and devoted a quiet decade to an intensive study of higher mathematics, studying under Father Ramiro Rampinelli, a Benedictine mathematician. That study was the background of the publication of the *Istituzioni analitiche ad uso della gioventù italiana*, printed in two-volume quarto format in 1748.

Agnesi viewed her *Analytical Institutions* as a textbook of sorts, one that summarized and explained the new mathematical concepts in European scientific circles. The first volume of the two-volume work dealt with finite processes; the second volume treated the subject of infinitesimal analysis. Agnesi claimed there was little that was original in her work. Some of

her contemporaries, however, were less reserved in their description of the work, and its publication was met with acclaim among European scientists.

A committee of the French Academy of Sciences wrote of the work: "There is no other book, in any language, which would enable a reader to penetrate as deeply, or as rapidly, into the fundamental concepts of analysis. We consider this treatise the most complete and best written work of its kind." The Academy authorized a French translation of the second volume, which would appear in 1775. One of its scientists noted that the publication of the *Analytical Institutions* would have easily gained Agnesi membership in the Academy—had it admitted women as members.

In 1801 an English translation of both volumes appeared. Its translator, John Colson, was a Cambridge mathematician who had mastered Italian so that he could make Agnesi's work available in English.

Though Pope Benedict XIV appointed Agnesi to the chair of mathematics and natural philosophy at the University of Bologna in 1750, largely as a result of the reception of her *Analytical Institutions*, she considered the appointment an honorary one and never taught a class. Instead, she withdrew once again from social life, this time as well from mathematics, devoting her last forty years to religious studies and to helping the poor in Milan. In 1771 she became directress of a home for the indigent. Whether she formally became a nun is disputed, but she certainly lived like one, selling all her possessions for charitable purposes. Maria Agnesi died in Milan, where she had lived all her life, in 1799. It is hard to say what fame she may have

garnered had she not abruptly forsaken mathematical study, or what impact she might have had on a field in which she so clearly excelled. As it happened, her legacy may have been an indirect one. By her example, she helped convince learned Europeans that, to use an eighteenth-century phrase, a "Scientific Lady" was not a contradiction in terms. By doing so, she helped clear a path for her successors to follow.



It is most fitting that the acquisition of the Iowa State University's two-millionth volume has been made possible by a gift from one of those successors. Dr. Evelyn J. Weber, a biochemist and agronomist who earned her doctorate at Iowa State, donated the gift that has allowed the library both to purchase Agnesi's *Analytical Institutions* and to build a core collection of complementary books by and about women in science. Weber's B.S. degree from the University of Illinois was in chemistry, with minors in mathematics and German. She went on to get a Ph.D. from Iowa State in biochemistry in 1961, with minors in organic chemistry and animal physiology. She taught most of her career at the University of Illinois, in its Biochemistry and Agronomy Departments. Weber's research has included the areas of corn lipids and tocopherols in corn grain; she has over sixty publications to her credit. Since 1987 she has been Professor Emerita at the University of Illinois.

It is also appropriate that the acquisition of the library's two-millionth volume, the work

of a pioneer woman mathematician, takes place in conjunction with the inauguration of the Archives of Women in Science and Engineering in the library's Special Collections Department. From the need to document the history of women in science and engineering—their social history as well as the history of their scientific achievements—this new archive was born. Though women of the last two centuries who have chosen to pursue scientific or engineering careers have not faced the same level of isolation that Maria Agnesi experienced, many can still be considered pioneers. The Archives of Women in Science and Engineering collects the papers of women in these fields (with the exception of the health sciences) and the records of women's scientific and engineering organizations. It seeks not only the papers of the most notable women whose names are already in the history books, but also those of women who have labored in the background, sometimes with little or no recognition. They also have a place in history. As the only archive in the United States to target women in these areas, the Archives of Women in Science and Engineering hopes to play a part in preserving that history for future generations of researchers.

April 16, 1994



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