Florian Cajori

Swiss-born American mathematical historian **Florian Cajori** (February 28, 1859 – August 14, 1930) was born at Saint Aignan near Thusis in Graubünden, Switzerland, the son of a leading civil engineer. At the age of 16, he moved to the United States. He attended the State Normal School in Whitewater, Wisconsin and taught in country schools before enrolling in the University of Wisconsin, from which he received his B.S. degree in 1883. He next studied at The Johns Hopkins University before returning to the University of Wisconsin, which awarded him his Master's degree in 1886. He became professor of applied mathematics at Tulane University in 1887, and was the recipient of the first doctorate in mathematics from that university in 1894.

Due to health problems Cajori was forced to leave Tulane and was appointed professor of physics at Colorado College in 1889. Nine years later he became professor of mathematics at the College, and five years later was appointed the founding Dean of the School of Engineering. In 1918, Cajori was appointed to a chair specially created for him in the history of mathematics at the University of California at Berkeley. This resulted in an editorial in the Colorado College student newspaper, *The Tiger*, on May 14, 1918, bemoaning the loss to the students and the college of "Caj", as he was affectionately known. The unsigned editorial in the student paper concluded with the following sentiment:

> "We are proud of all the achievements of our "Caj", of course, but we are especially proud of what he has done for us here, and it is for this reason that we shall always hold him in our memory. As a friend and an instructor he has been more to us than we can ever measure, and we shall always look back upon the days when we had 'Caj.'"

That his students revered him is evident from the recorded memories of students up to fifty years later. As Cajori approached the age of seventy his health began to fail. He underwent major surgery in February 1930, from which he never

fully recovered. He died at his home in Berkeley six months later. On the centenary of Cajori's birth, Colorado College sponsored a public lecture in his honor and memory. Norwegian mathematician and mathematical historian Øystein Ore gave the address, but made no mention of Cajori. The next year Harold Davis of Northwestern University, a former student of Cajori, gave another Cajori lecture, sprinkled throughout with reminiscences of Cajori.

Cajori's specialty was the history of mathematics and his international reputation rests on the research and the books he wrote in this area. His highly successful *A History of Mathematics* (1894) was the first attempt to present the subject in a popular, readable fashion. At the time, Cajori made the claim: "No subject loses more than mathematics by any attempt to dissociate it from its history." Cajori's influence on the modern perception of the development of mathematics was enormous and lasting. Altogether Cajori wrote twelve books on the history of mathematics including *A History of Elementary Mathematics with Hints of Methods of Teaching* (1896) followed by *A History of Physics in its Elementary Branches: Including the Evolution of Physical Laboratories* (1899) and *History of the Logarithmic Slide Rule and Allied Instruments* (1909).

His greatest work, which is still often consulted in the mathematical world, is *A History of Mathematical Notations*, two volumes, 1928-29. The first volume was limited to the history of mathematical symbols found in elementary mathematics, and the second volume was dedicated to notations found mainly in higher mathematics. The principal intent of the books was to provide an interesting array of historical facts and perspectives on how the successes and failures of past mathematical symbols related to notational problems of modern mathematics. In addition Cajori wrote several school textbooks in arithmetic and algebra, and 111 research papers, mostly in the history of mathematics.

It is impossible to measure the extent to which improvement in symbols and notations to represent mathematical ideas has contributed not only to the development of the subject but also to extend the numbers of those who can use and understand the mathematics thus symbolized. The use of symbols and other notations to simplify mathematics has evolved over the millennia. With each improvement in the symbolic language of mathematics, mathematical tasks and procedures have been simplified to such a point that non-mathematicians can employ them productively. One need only consider what a vast improvement the Hindu-Arabic number system was over those that preceded it, such as the Greek use of letters of their alphabet to represent numbers or the Roman numerals, which although suggestive were no easy things to manipulate. The

advantage of symbols over words in mathematics is that words can be interpreted in too many ways; whereas symbols mean only what is agreed that they are to mean.

Quotation of the Day: “If a lunatic scribbles a jumble of mathematical symbols it does not follow that the writing means anything merely because to the inexpert eye it is indistinguishable from higher mathematics.” – Florian Cajori