

## AUGUST LEOPOLD CRELLE

Born in Eichwerder near Wriezen, Germany, **August Leopold Crelle** (March 11, 1780 – October 6, 1855) made no major original contributions to mathematics, but indirectly he is a mathematical star of the first magnitude. His father's modest income made it impossible to give Crelle a good education, but he learned enough on his own to become a civil engineer with the Prussian Ministry of the Interior. He was the architect and planner of the railway route from Berlin to Potsdam, the first in Prussia. Although his interest in



mathematics was considerably more than a hobby, Crelle was unable to study mathematics at a university because he had to earn a living. Nevertheless, he spent his leisure time studying mathematics on his own. Remarkably, at age 36 he submitted a thesis *De calculi variabilium in geometria et arte mechanica usu* to the University of Heidelberg and was awarded a doctorate. That same year in a little book *Über einiger Eigenschaften des ebenen geradlinigen Dreiecks* (On Some Properties of Plane Rectilinear Triangles), Crelle demonstrated how to determine a point in the interior of a triangle such that the lines joining this point to the vertices of the triangle and the sides of the triangle make equal angles.

Crelle's greatest contribution to mathematics was founding the *Journal für die reine und angewandte Mathematik* (Journal for Pure and Applied Mathematics) in 1826, which he edited until his death. Still in existence, the journal is now known informally as *Crelle's Journal*. It was not the first journal devoted exclusively to mathematics, that honor goes to the *Annales de Mathématiques Pures et Appliquées*, founded by Joseph-Diaz Gergonne in 1810, which lasted until 1831. However, Crelle's was the first periodical devoted exclusively to mathematical research. At the time there was a growing

division in mathematics between “pure” and “applied.” Crelle hoped to broaden the scope of mathematical interests, but his publication was soon packed with specialized mathematical articles. In *Mathematical Thought from Ancient to Modern Times*, Morris Kline reported that due to this it “often was referred to humorously as the *Journal für reine unangewandte Mathematik* (Journal Purely for Unappreciated Mathematics).

Crelle had a remarkable gift for recognizing real mathematical talent. His kindness to and nurturing of young mathematicians did more for the progress of mathematics at the time than did all of the mathematical academies put together. His journal introduced the work of many new young mathematicians and promoted mathematics instruction. Twenty-two of Norwegian Neil Abel’s memoirs appeared in the first three of its volumes, thus introducing Abel’s work to the continental mathematicians. When Abel arrived in Berlin in 1825 he serendipitously met Crelle. The two communicated with some difficulty in French. Crelle asked Abel what he had done in mathematics. Abel diplomatically mentioned that he had read Crelle’s recently published paper on “analytical faculties” (now called “factorials” in English) and then undiplomatically proceeded to tell Crelle what was wrong with his paper. Rather than take offense, as many others might have, Crelle pressed Abel for details. The pair had a long mathematical discussion, which caused Crelle to realize that Abel was a mathematical genius. Crelle did everything he could to gain recognition for Abel, but was unable to give him a long life.

Throughout the history of mathematics there are stories of young talent ignored and belittled by the established. This makes the role of individuals like August Crelle all the more important. Genius unrecognized may wither and never reach its potential. If it had not been for Crelle, the work of Abel, who died at 26, might not have become known. But Abel was only one of many young mathematicians who benefited from acquaintance with the mathematical enthusiast of limited ability. Crelle also

mentored the self-taught Swiss mathematical genius Jakob Steiner, often called “the greatest geometer since Apollonius.” Steiner used the Socratic Method, teaching geometry without using figures and when instructing doctoral candidates he darkened the room. He believed that students should see geometric ideas in their minds not on a blackboard. Crelle’s genius was in recognizing the importance of the research of mathematicians such as Dirichlet, Eisenstein, Grassmann, Hesse, Jacobi, Kummer, Lobachevsky, Plücker, and Weierstrass, all of whom earned fame when their early works appeared in *Crelle’s Journal*.

**Quotation of the Day:** “The real purpose of mathematics is to be the means to illuminate reason and to exercise spiritual forces.” – August Crelle