

## Gauss: A Biographical Study, by W. K. Bühler

New York: Springer-Verlag, 1981. viii + 208 pp.,  
\$16.80.

Reviewed by Melvyn B. Nathanson

The history of mathematics is a difficult and dangerous subject. Few mathematicians know history, and few historians know mathematics. The literature is scanty. There are historical surveys by C. B. Boyer, F. Cajori, D. E. Smith, D. J. Struik, and others. There are beautiful works by T. L. Heath, O. Neugebauer, and B. L. van der Waerden on Egyptian, Babylonian, and Greek mathematics. There are studies of Newton, Leibnitz, and the development of calculus. For the history of the theory of numbers there are an encyclopedic three-volume treatise by L. E. Dickson and a long-awaited study by A. Weil. There is now even a journal, *Historia Mathematica*, founded by Kenneth O. May. Despite the labor of these and other specialists, however, the history of mathematics is still an endangered species of academic discipline.

Biographies of mathematicians are also rare. There are volumes on Abel, Courant, Fermat, Galois, Hilbert, Newton, and von Neumann, and recent autobiographies by Ulam, Wiener, and Dyson, though the latter curiously omits reference to his work in mathematics. And, of course, there is E. T. Bell's ubiquitous *Men of Mathematics*, a collection of short biographies of 34 great mathematicians from Zeno and Eudoxus to Poincaré and Cantor. Unfortunately, Bell is more poet than scholar, and though his style is beautiful, his history is unreliable.

The life of Carl Friedrich Gauss is a counterexample to the pattern of historical neglect. From 1863 to 1933 scholars toiled to produce the twelve volumes of Gauss's collected works. The archives of the Göttingen library contain Gauss's collected papers. A Gauss society publishes a journal *Mitteilungen der Gauss-Gesellschaft*. Gauss's correspondence and English translations of many of Gauss's major works, including *Disquisitiones Arithmeticae* and *General Investigations of Curved Surfaces*, have been published.

There are also several biographies of Gauss in English. In 1856, one year after the death of Gauss, his friend Baron Wolfgang Sartorius von Waltershausen, Professor of Geology at the University of Göttingen, published his reminiscences of Gauss in a short volume *Gauss zum Gedächtnis*. In 1966, Gauss's great-granddaughter Helen Worthington Gauss translated Sartorius into English, and published the translation, *Gauss: A Memorial*, in a mimeographed edition. Sartorius is the source of Gauss's most frequently quoted statement, "Mathematics is the Queen of sciences, and arithmetic the Queen of mathematics."

In E. T. Bell's 1937 book *Men of Mathematics*, Chapter 14, "The Prince of Mathematicians," is the life of Gauss.

In 1955, G. Waldo Dunnington published *Carl Friedrich Gauss: Titan of Science*, the most important and detailed biography of Gauss in English, but unfortunately out of print and difficult to find.

Tord Hall's Norwegian biography *Carl Friedrich Gauss* appeared in English translation in 1970. Hall clearly describes the mathematical and scientific work of Gauss, but only briefly discusses the life of the man.

Walter Kaufmann Bühler's recently published *Gauss: A Biographical Study* contains much information not available in other books on Gauss. Bühler tells the story of Gauss's education, his marriages, his children, and other aspects of his personal life, with many extracts from his letters to family and friends. Bühler discusses in detail Gauss's research both in mathematics and in astronomy, physics, and geodesy. Bühler's special contribution to the study of Gauss is his political and social history of Germany in the late eighteenth and early nineteenth centuries. Bühler examines Gauss not in isolation, but in the context of the Napoleonic wars and the other historical crises that afflicted the German states of Brunswick and Hanover and their citizens and rulers during Gauss's life.

It is worthwhile to compare Bühler's book with other works on Gauss. Other biographers have often simply repeated and enlarged anecdotes about Gauss that first appeared in Sartorius. Bühler is more careful and more austere.

Here is an example. In 1791, at the age of fourteen, Gauss was introduced to Duke Carl Wilhelm Ferdinand, the ruler of the German state of Brunswick. The Duke granted Gauss an annual stipend that enabled him to study, first in the Collegium Carolinum in Brunswick and then in the University of Göttingen in the state of Hanover. Duke Ferdinand was the leader of the Prussian army in the war against Napoleon in 1806, but in his first battle against the French the Duke was seriously wounded and carried back through Brunswick on the way to Altona, near Hamburg.

Sartorius described the following incident: "On a morning late in the fall Gauss, then living on the Steinweg, saw a big ambulance drawn by a pair of horses pass out the gate of the Castle garden and move toward Brunswick's Wenden Gate. In the ambulance lay the sorely wounded Duke on his flight to Altona. Gauss watched with deep emotion the departure of this friend who had done for him what a father might well have done. He said little but was deeply moved."

In *Men of Mathematics*, Bell repeated and embellished Sartorius's account: "Gauss at the time was living in Brunswick. His house was on the main highway. One morning in late autumn he saw a hospital wagon hastening by. In it lay the dying Duke on his flight to Altona. With an emotion too deep for words Gauss saw the man who had been more than his own father to him hurried away to die in hiding like a hounded criminal. He said nothing then and but little

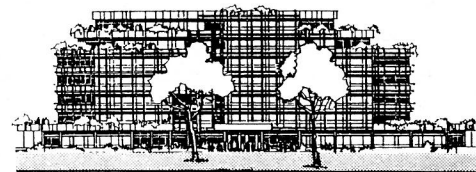
afterwards, but his friends noticed that his reserve deepened and his always serious nature became more serious."

C. Waldo Dunnington elaborated with even more grandiloquence than Bell: "Living at the time at Steinweg 22, just opposite the castle gate, Gauss looked out his window on the morning of October 25 and saw a long carriage drawn by two horses leaving the castle yard. The gate opened and it moved on out and toward the Wendenthor, so slowly and gloomily that several thought it contained a corpse. The wounded and dying Duke was within, on his flight to Altona, so that he might at least die in freedom. With stricken heart and in grieving silence Gauss saw the departure of his patron and friend. He was as though annihilated. A serious expression came over his face. He was quiet and speechless and bore this great sorrow without words and sounds of complaint. This same seriousness and quietude was prevalent among all the people. Although Gauss said very little, his thoughts and emotions were the more aroused by this fact. Poignant grief gained control of him, accompanied by rancor against the invaders of Germany, in whom he also hated the enemy of his beloved prince."

Walter Kaufmann Bühler does not embellish or imagine, but describes the incident simply. "[The Duke's] party, taking refuge from Napoleon, went through Brunswick, and we know that Gauss, early one morning, was stirred from his sleep by the melancholic rattle of the coaches which left the city through the Hamburg gate." This is all that Bühler writes, and all that is required.

George Sarton, the great historian of science, wanted to explain why the history of mathematics has been almost ignored. In his book *The Study of the History of Mathematics*, he wrote, "The history of mathematics is essentially different from the history of other sciences ... The reason for this is obvious: mathematics being far more esoteric than the other sciences, its history can only be told to a select group of initiates." We mathematicians are the initiates, and we must be grateful to Walter Kaufmann Bühler for a serious and original contribution to the history of our subject and of one of its masters.

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## The Making of Statisticians

Editor: J. Gani

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This lively, non-technical volume is a collection of sixteen new autobiographical sketches by eminent statisticians and probabilists from widely differing background and fields of interest. As modern statistics is still a relatively young science, the editor was able to invite many of the pioneers in this field to tell their own stories, preserving the chance to find insight into the origins of many an important statistical development. The contributors outline their lives, explain how they became interested in probability and statistics, give an account of their major contributions, and hazard some predictions regarding the future of the subject. Their essays are supplemented by photographs and third-person introductions. The historically minded statistician will be fascinated by the wealth of experience, the vitality, the independence of thought and the humanity which emerge from these invaluable self-portraits.

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