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Gauss, a biographical study, by W. K. Bühler, Springer-Verlag, Berlin, Heidelberg, New York, 1981, viii + 208 pp., $19.80. ISBN 0-387-10662-6

Most contemporary mathematicians would demur if asked to name the greatest mathematician of the last fifty years. However, if the period were lengthened to a hundred years, most mathematicians would become less reticent and many would mention the name of Hilbert. If the period were lengthened to two hundred years, reticence would largely disappear and almost all mathematicians would immediately give the name of Carl Friedrich Gauss (1777–1855). In addition to his top ranking in mathematics, Gauss also ranks very high in such other scientific fields as astronomy, computing science, geodesy, physics, and statistics.

In a very real sense Gauss marks the beginning of the present epoch in mathematics. Gauss was the first person to give a proof of the Fundamental Theorem of Algebra which present-day mathematicians would find acceptable and the first person to write down the unique factorization theorem for ordinary integers in the form which we use today. Gauss aimed for a standard of mathematical precision comparable to that generally accepted today, in contrast to the occasional sleight-of-hand practiced by many of his predecessors. But, aside from this modern-seeming insistence on perfection of form, his writings have an almost contemporary flavor simply because his work has had a tremendous influence in shaping the subsequent trends of mathematical research. A symposium on the Mathematical Heritage of Carl Friedrich Gauss would be an impossibility, since it would have to cover a large part of present-day mathematics, including such widely separated fields as number theory, field theory and polynomials, linear algebra, functions of a complex variable, potential theory, special functions, calculus of variations, foundations of geometry, differential geometry, probability theory, numerical analysis, and dynamical systems.

In addition to the extraordinary level of his basic mathematical talent, several other ingredients went into the making of Gauss's outstanding mathematical career. First, he received solid financial support for his study and