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(b. Győr, Hungary, 16 December 1849; d. Budapest, Hungary, 8 April 1914)

mathematics.

Koenig studied at Vinea and Geidelberg, where he earned his Ph.D. in 1870. He qualified as a lecturer at Budapest in 1872 and became a full professor only two years later at the city's technical university. He remained in Hungary; and during his last years he was involved, as a senior civil servant in the Ministry of Education, with the improvement of training in mathematics and physics. He was also a secretary of the Royal Hungarian Academy of Sciences in Budapest.

Koenig's two years at Heidelberg (1868-1870) were of decisive importance for his scientific development. Helmholtz was still active there, and under his influence Koenig began working on the theory of the electrical stimulation of the nerves. But the mathematician Leo Königsberger, who was very well known at that time, soon persuaded Koenig to devote himself to mathematics; Koenig therefore wrote his dissertation on the theory of elliptic functions.

In Hungary, Koenig progressed very rapidly in his academic career. He was also productive in various fields of mathematics, chiefly analysis and algebra. Some of his works appeared simultaneously in German and Hungarian; others published only in Hungarian were naturally less influential. Among Koenig's writings is the prize essay for the Royal Hungarian Academy of Sciences, which was published in German in *Mathematische Annalen* under the title "Theorie der partiellen Differentialgleichungen Ordnung mit 2. unabhängigen Veränderlichen." In it Koenig specified when the integration of a second-order differential equation can be reduced to the integration of a system of total differential equations, for which there already existed the integration method devised by Jacobi and Clebsch.

Koenig's most important work is the voluminous *Einleitung in die allgemeine Theorie der algebraischen Grössen*, published in German and Hungarian in 1903. This book draws heavily on a fundamental study by Kronecker, *Grundzüge einer arithmetischen Theorie der algebraischen Grössen* (1892), although Koenig had had very little personal contact with Kronecker. In his work Kronecker had set forth the principles of the part of algebra later called the theory of polynomial ideals. Koenig developed Kronecker's results and presented many of his own results concerning discriminants of forms, elimination theory, and Diophantine problems. He also employed Kronecker's notation and added some of his own terms, but these did not gain general acceptance. The theory of polynomial ideals later proved to be a highly important topic in modern algebra and [algebraic geometry](#). To be sure, many of Kronecker's and Koenig's contributions were simplified by later writers, notably Hilbert, Lasker, Macaulay, E. Noether, B. L. van der Waerden and Gröbner; and their terminology was modified extensively. Hence, despite its great value, Koenig's book is now of only historical importance.

In the last eight years of his life Koenig took great interest in Cantor's set theory and the discussion that it provoked concerning the foundations of mathematics. The result of his investigations was the posthumous *Neue Grundlagen der Logik, Arithmetik und Mengenlehre* (1914) published by his son Dénes. The title originally planned was *Synthetische Logik*; and in it Koenig intended to reduce mathematics to a solidly established logic, hoping in this way to avoid the many difficulties generated by the antinomies of set theory. Dénes Koenig (b. 1884) also has become known in the literature of mathematics through his *Theorie der endlichen und unendlichen Graphen* (Leipzig, 1936).

BIBLIOGRAPHY

Koenig's writings include *Zur Theorie der Modulargleichungen der elliptischen Funktionen* (Heidelberg, 1870); "Theorie der partiellen Differentialgleichungen 2. Ordnung mit 2 unabhängigen Veränderlichen," in *Mathematische Annalen*, **24** (1883), 465-536; *Einleitung in die allgemeine Theorie der algebraischen Grössen* (Leipzig, 1903); and *Neue Grundlagen der Logik, Arithmetik und Mengenlehre* (Leipzig, 1914), with a portrait of Koenig.

Werner Burau