

Laurent, Matthieu Paul Hermann | Encyclopedia.com

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(*b.* Echternach, Luxembourg, 2 September 1841; *d.* Paris, France, 19 February 1908),

mathematics, higher education.

Laurent's father, Auguste, was a noted chemist. After his father's death in 1853, Laurent was sent to the École Polytechnique in Paris and the École d'Application at Metz. He rose to the rank of officer but resigned in 1865 and took his *docteur-ès-sciences* at the University of Nancy with a thesis on the continuity of functions of a complex variable. In 1866 he became *répétiteur* at the École Polytechnique but returned to active military service during the [Franco-Prussian War](#). He resigned to resume the post of *répétiteur* at the École Polytechnique, and in 1871 he was appointed actuary for the Compagnie d'Assurance de l'Union. In 1874 he married Berthe Moutard; in 1883 he became an *examinateur* at the École Polytechnique, and in 1889 he was appointed professor at the École Agronomique in Paris. In 1905 he was made an officer of the Legion of Honor.

Although Laurent's output comprised about thirty books and several dozen papers, his importance lies mainly in the teaching rather than in the development of mathematics. His papers dealt primarily with problems in analysis (especially relating to infinite series, elliptic functions, and Legendre polynomials), the theory of equations, differential equations and their solution, [analytic geometry](#) and the theory of curves, and the theory of substitutions and elimination. In the latter field he made one of his most useful contributions by extending some of the known techniques of eliminating variables to find the solutions to equations. Laurent was also noteworthy in developing statistical and interpolation formulas for the calculation of actuarial tables, annuities, and insurance rates; and he gave the name "chremastatistics" to subjects such as insurance and economics. He was a founding member of the Société des Actuaires Français and from 1903 was responsible for the mathematical section of the *Grande encyclopédie*, to which he contributed over 130 articles. He was a member of the editorial boards of the *Journal des mathématiques pures et appliquées* and of the *Nouvelles Annales des mathématiques*, contributing articles especially to the latter.

Laurent's first textbook was the short *Traité des séries* (1862), one of the first works devoted entirely to the convergence as well as the summation of series; it was followed by *Traité des résidus* (1865). (It was Pierre Alphonse Laurent who was responsible, in 1843, for the Laurent series.) Of Laurent's later works, the comprehensive seven-volume *Traité d'analyse* (1885-1831) is notable. It is divided into two parts, of two and five volumes respectively, on the differential and [integral calculus](#), and includes not only the standard treatments of the derivative and the integral and their applications to geometry but also substantial sections on the theory of functions, determinants, and elliptic functions. The last three volumes are devoted entirely to the solution and application of ordinary and partial differential equations. Laurent's other books deal with probability, arithmetic and algebra, rational mechanics, and statistics and its applications in economics. In 1895 he published *Traité d'arithmétique* under the names of his friends C. A. Laisant and Émile Lemoine, since arithmetic was part of the curriculum of the École Polytechnique, and he was not allowed as an examiner to publish the work under his own name.

BIBLIOGRAPHY

I. Original Works. In addition to works mentioned in the text, the following are worthy of note: *Traité du calcul des probabilités* (Paris, 1873); *Théorie élémentaire des fonctions elliptiques* (Paris, 1882); *Traité d'algèbre* (Paris, 1867; 5th ed., 1894); *Traité de mécanique rationnelle*, 2 vols. (Paris, 1889); *Théorie des jeux de hasard* (Paris, 1893); *Théorie des assurances sur la vie* (Paris, 1895); *Opérations financières* (Paris, 1898); *L'élimination* (Paris, 1902); *Traité de perspective* [intended for artists and draftsmen] (Paris, 1902); *Appendice sur les résidus ...* (Paris, 1904); *Théorie des nombres ordinaires et algébriques* (Paris, 1904); *La géométrie analytique* (Paris, 1906); and *Statistique mathématique* (Paris, 1908), his last book. A substantial number of his papers on statistical and related matters were published in *Bulletin trimestriel de l'Institut des actuaires français*.

II. SECONDARY LITERATURE. The most comprehensive source of bibliographical and biographical information is a 63-page pamphlet published in 1909 under the title *Hermann Laurent 1841-1908. Biographie-bibliographie*. This work is, however, extremely rare; and a fairly substantial amount of information may be gleaned from Poggendorff, IV, 844; V, 713. A notice on Laurent appeared in the *Grande encyclopédie*, XXI,1038.

I. Grattan-Guinness

