Koenigs, Gabriel | Encyclopedia.com

(*b*. Toulouse, France, 17 January 1858; *d*. Paris, France, 29 October 1931)

differential geometry, kinematics, applied mechanics.

After achieving a brilliant scholarly record, first at Toulouse and then in Paris at the École Normale Supérieure, which he entered in 1879, Koenigs passed the examination for the *agrégation* in 1882 and in the same year defended his doctoral thesis, "Les propriétés infinitésmales de I'espace réglé." After a year as *agrégé répétiteur* at the École Normale he was appointed a deputy lecturer in mechanics at the Faculty of Sciences of Besançon (1883-1885) and then of mathematical analysis at the University of Toulouse. In 1886 he was named lecturer in mathematics at the École Normale and deputy lecturer at the Sorbonne, which post he held until 1895. In addition he taught analytical mechanics on a substitute basis at the Collége de France.

Appointed assistant professor (1895) and professor (1897) of physical and experimental mechanics at the Sorbonne, Koenigs henceforth devoted himself to the elaboration of a method of teaching mechanics based on integrating theoretical physical and experimental research with industrial applications. He created a laboratory of theoretical physics and experimental mechanics designed especially for the experimental study of various types of heat engines and for perfecting different testing procedures. This laboratory, which began operations in new quarters in 1914, played a very important role during World War I. Koenigs won several prizes from the Académie des Sciences and was elected to that organization, in the mechanics section, on 18 March 1918.

A disciple of Darboux, koenigs directed his first investigations toward questions in infinitesimal geometry, especially, following plücker and F. Klein, toward the study of the different configurations formed by straight lines: rules surfaces and straightline congruences and complexes. In analysis he was one of the first to take an interest in iteration theory, conceived locally; and in analytic mechanics he applied Poincare's theory of integral invariants to various problems and advanced the study of tautochrones.

His *Lecons de cinématique* (1895-1897) enjoyed considerable success. They were characterized by numerous original features, including a definite effort to apply recent progress in various branches of geometry to kinematics. This work also contains a thorough investigation of articulated systems, an area in which Koenigs made several distinctive contributions. He demonstrated, in particular, that every algebraic surface can be described by an articulated system, and he produced various devices for use in investigating gyrations. His interest in the study of mechanisms is also reflected in his important memoir on certain types of associated curves, called conjugates.

Starting about 1910, however, Koenigs, working in his laboratory of physical and experimental physics, increasingly concentrated on research in applied thermodynamics and on the development of more precise test methods. Despite his successes in these areas it is perhaps regrettable that this disciple of Darboux thus abandoned his initial approach, the originality of which appeared potentially more fruitful.

BIBLIOGRAPHY

I. Original Works. Koenigs' books are *Sur les propriétés infunitésimales de I'espace réglé* (Paris, 1882), his dissertation; *Leçons de I'agrégation classique de mathénatiques* (Paris, 1892); *La géométrie réglée et ses applications. Coordonées, systémes linéaires, propriétés infinitésimales du premier ordre* (Paris, 1895); *Leçons de cinématique...* (Paris, 1895); *Leçons de cinématique... Cinématique théorique* (Paris, 1897); with notes by G. Darboux and E. Cosserat; *Introduction á une théorie nouvelle des mécanismes* (Paris, 1905); and *mémoire sur les coubes conjuguées dans le mouvement relatif le plus général de deux corps solides* (Paris, 1910).

Koenigs published some 60 papers, most of which are listed in poggendorff, IV, 778-779; V, 652-653; and VI, 1354; and in the Royal Society *Catalogue of Scientific Papers*, X, 429; and XVI, 376-377.

Koenigs analyzed the main points of his work in his *Notice sur les travaux scientifiques de Gabriel Koenigs* (Tours, 1897; new ed., Paris, 1910).

II. Secondary Literture. Besides the bibliographies and his *Notice* (See above), Koenigs' life and work have been treated in only a few brief articles:A. Buhl, in Enseignement mathematique, **30** (1931), 286-287;L. de Lauany, in *Comptes rendus hebdomadaires des séance de I'Academie des sciences,***193** (1931), 755-756; M.d'Ocagne, in *Histoire abrégée des scinces mathématiques* (Paris, 1955), pp. 338-339; and P. Sergescu, in *Tableau du XXXe siécle* (1900-1933), II, *Les science* (Paris, 1933), pp. 6-68, 98, 117, 177.

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