

# Tilly, Joseph–Marie De | Encyclopedia.com

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(*b* Ypres, Belgium, 16 August 1837; *d.* Schaerbeek, Belgium, 4 August 1906)

*geometry.*

Tilly, one of the most profound Belgian mathematicians, attained the rank of lieutenant general by the time of his retirement. As a second lieutenant in the artillery, he was assigned in 1858 to teach a course in mathematics at the regimental school; and it was there that he studied the principles of geometry. In 1860, in *Recherches sur les éléments de géométrie*, Tilly used Anatole Lamarle's methods to criticize Euclid's fifth postulate and achieved results that Lobachevsky had published but of which he was unaware until about 1866. In *Études de mécanique abstraite* (1870), based on the negation of Euclid's postulate, Tilly worked with a Lobachevskian space. He was the first to study non-Euclidean mechanics, a subject he virtually created. His research brought him into contact with Jules Houël, the only French mathematician then interested in the new geometries. Although they never met, their correspondence (1870–1885) was a valuable stimulus to Tilly, who had been working for nine years without guidance.

In *Essai sur les principes fondamentaux de la géométrie et de la mécanique* (1878), Tilly established the Riemannian, Lobachevskian, and Euclidean geometries on the concept of the distance between two points. In his formulation these geometries were based, respectively, on one, two, and three necessary and sufficient, irreducible axioms.

Tilly also wrote on military science and on the history of mathematics in Belgium, including the centenary report on the mathematical activities of the Belgian Royal Academy from 1772 to 1872. These studies were undertaken in the midst of Tilly's demanding professional duties as director of the arsenal at Antwerp and as commandant and director of studies at the École Militaire for ten years. In *Essai de géométrie analytique générale* (1892), the synthesis and crowning achievement of his work, Tilly stressed the fundamental relationship among the ten distances between any two of a group of five points. In brief, he established that geometry is the mathematical physics of distances.

Tilly's last years were marred by his unjust dismissal as commandant of the École Militaire in December 1899 and his forced early retirement in August 1900. The actions of the minister of war were motivated by complaints that Tilly had unduly emphasized the scientific education of future officers. The inspector of studies at the École Militaire, Gérard-Mathieu Leman (later a general), had forbidden Tilly to use the notions of the infinitely small and of the differential.

In 1870 Tilly was elected corresponding member and, in 1878, full member of the science section of the Belgian Royal Academy, of which he was president in 1887.

## BIBLIOGRAPHY

See two articles by P. Mansion, in *Annuaire de l'Académie royale de Belgique*, **80** (1914), 203–285, with portrait and bibliography; and in *Biographie nationale*. . .XXV (Brussels, 1930–1932), 264–269.

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