Taurinus, Franz Adolph | Encyclopedia.com

(*b*. Bad König, Odenwald, Germany, 15 November 1794; *d*. Cologne, Germany, 13 February 1874)

mathematics.

In F. Engel and P. Stäckel's *Die Theorie der Parallellinien von Euklid bis Gauss* two writings of Taurinus are mentioned as contributions to the subject. Since their book is a collection of documents in the prehistory of non-Euclidean geometry, they reproduce the most important passages of the original works, including extracts from those of Taurinus, which in 1895 were available in only a few copies.

According to the information given by Engel and Stäckel, Taurinus was the son of a court official of the counts of Erbach-Schöneberg; his mother was the former Luise Juliane Schweikart. He studied law at Heidelberg, Giessen, and Göttingen, and from 1822 lived in Cologne as a man of independent means; he thus had the leisure to pursue various scientific interests.

Taurinus presented the results of his mathematical investigations in *Die Theorie der Parallellinien* (1825) and *Geometriae prima elementa* (1826). He received the stimulus for these studies from his uncle F. K. Schweikart (1780–1857), who from 1820 was professor of law at the University of Köonigsberg, and with whom he corresponded concerning his work. Taurinus also communicated several of his results and demonstrations to Gauss, whose replies are printed in Gauss's *Werke* (VII, 186).

According to Engel and Stäckel, Taurinus' investigations on the theory of parallel lines sought to demonstrate that the sole admissible geometry is Euclidean. As the basis for his argumentation Taurinus used the axiom of the straight line, which postulates that through two points there could be exactly one straight line. In this regard, however, he had no choice but to accept the "internal consistency" of the "third system of geometry," in which the sum of the angles of a triangle amounts to less than two right angles.

His remarks in *Geometriae prima elementa* show that by 1826 Taurinus had clearly recognized the lack of contradiction of this "third system," "logarithmic-spherical geometry," as he called it; had even developed the suitable trigonometry; and had successfully applied trigonometry to a series of elementary problems.

Taurinus' works on the problem of parallel lines, like those of his uncle, Schweikart, represent a middle stage in the historical development of this problem between the efforts of Saccheri and Lambert, on the one hand, and those of Gauss, Lobachevsky, and Bolyai, on the other. Although he sought to preserve the hegemony of Euclidean geometry by reference to the infinite number of non-Euclidean geometries; nonetheless, through an idea that was very close to Lambert's, he moved on to non-Euclidean trigonometry as it was later developed by Bolyai and Lobachevsky.

Moreover, Taurinus presented the idea that elliptical geometry can be "realized" on the sphere. This concept was first taken up again by Bernhard Riemann.

BIBLIOGRAPHY

Taurinus' major works are *Die Theorie der Parallellinien* (Cologne, 1825) and *Geometriae prima elementa* (Cologne, 1826).

F. Engel and P. Stäckel, *Die Theorie der Parallellinien von Euklid bis Gauss* (Leipzig, 1895), contains selections from Taurinus' works.

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