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(*b*. Snogback, Denmark, 16 January 1801; *d*. Dorpat, Estonia [now Tartu, Estonian S. S. R.] 23 May 1885),

mathematics, *astronomy*.

Thomas Clausen was the eldest of the eight children of Claus Clausen and Cecilia Rasmussen Clausen. The elder Clausen was a poor peasant farmer in northern Schleswig. A local pastor, who was interested in the natural sciences and for whom young Clausen herded cattle, became interested in the young man and instructed him in Latin, Greek, mathematics, astronomy, and natural science over a seven-year period. On his own, Clausen studied French, English and Italian. Upon the pastor's recommendation, H. C. Schumacher made Clausen, a very individualistic man, had a falling out with his superior; and at the end of 1828 he moved to Munich as the appointed successor to Fraunhofer at the Joseph von Utzschneider Optical Institute. He held this position in name only, however; Utzschneider allowed Clausen to devote himself completely to his mathematical and astronomical calculations and publications, which soon gained him the attention and recognition of such authorities as Olbers, Gauss, Bessel, Steinheil, Hansen, Crelle, A. von Humboldt, Arago, and W. Struve.

In the middle of 1840, after a severe bout with mental illness, Clausen returned to Altona, where he spent two years in seclusion and reached the zenith of his scientific creativity. He also engaged in a mathematical argument with C. G. J. Jacobi. In 1842 he was appointed observer at the Dorpat observatory, and in 1844 he took his doctorate *honoris causa* under Bessel. On 1 January 1866 he was made director of the Dorpat observatory and professor of astronomy at Dorpat University. He went into retirement at the end of 1872. Clausen never married. In 1854 he received through Gauss a corresponding membership in the Göttingen Academy. In 1856 he received the same class of membership from the St. Petersburg Academy.

Like many astronomers of the first half of the nineteenth century, Clausen was a self-made man. He differed from most of his professional colleagues in that he was in a position to make a major contribution to those mathematical problems with which the leading intellectuals of his time were preoccupied. He possessed an enormous facility for calculation, a critical eye, and perseverance and inventiveness in his methodology. As a theoretician he was less inclined toward astronomy. Gauss soon recognized the "out standing talents" of Clausen. The Copenhagen Academy awarded him a prize for his work "Destermination of the Path of the 1770 Comet.[1]" Bessel commented: "What a magnificent, or rather, masterful work! It is an achievement of our time which our descendants will not fail to credit him with.[2]" Clausen's approximately 150 published works are devoted to a multitude of subjects, from pure and applied mathematics to astronomy, physics, and geophysics. He repeatadly solved problems that were posed to him publicly by other mathematicians or proved theories that had been published without proof, as was the custom at that time, and corrected mistakes and errors in others. Special mention should be made in this connection of the calculation of fourteen paths of comets, as well as of the theorem, named for Staudt and Clausen, dealing with Bernoullian numbers.[3] Fermat had hypothesized that all numbers of the form $F(n) = 2^{2^n} + 1$ were prime numbers. Euler disproved this hypothesis in 1732 by factoring Fermat's $F(5) = 2^{25} + 1$. In 1854 Clausen factored $F(6) = 2^{26} + 1$ and thus proved that this number also is not a prime number. Clausen used as a basis his own new method-still unpublished-of factoring numbers into their prime factors.[4] There is substantial reason for believing that Clausen gained a deeper insight into the field of number theory than the material published by him would indicate.

NOTES

1. *Astronomische Nachrichten*, **19** (1842), 121–168.

2. *Ibid*., pp. 335–336.

3. *Ibid*., **17** (1840)351–352

4. *Journal für die reine and angewandte Mathematik*, **216** (1964), 185.

BIBLIOGRAPHY

I. Original Works. In addition to the works cited in the text, see *Astronomische Nachrichten, Journal für die reine and angewandte Mathematik, Archiv der Mathematik and Physik, and Publications de l'Acdémie impériale des sciences de St. Pétersbourg*, in which almost all of Clausen's works appeared. See also the bibliographical aids in the Biermann work cited below.

II. Secondary Literature. For a study of Clausen, see Kurt-R. Biermann's "Thomas Clausen, Mathematiker and Astronom," in *Journal für die reine and angewandte Mathematik*, **216** (1964), 159–198. This biography contains a virtually complete list (pp. 193–195) of the literature dealing with Clausen and a list of his MSS and unedited letters (pp. 191–193). Moreover, reference should be made to J. Gaiduk, "Thomas Clausen ja tema matemaatika-alane looming," in *Matemaatika ja kaasaeg*, **12** (1967), 116–122; and U. Lumiste, "Täiendusi Th. Clauseni biograafiale," *ibid*., pp. 123–124.

Kurt-R. Biermann