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### **Thomas Clausen (1801-1885) - a Danish astronomer in Estonia**

#### **Abstract**

Thomas Clausen was an astronomer of the 19th century who lived and worked in the Baltic Sea region, apart from his years in Munich. He spent the first part of his life in Denmark and Germany and the second part in Dorpat (Tartu) in Estonia in the Russian Empire.

“Plovdrengen, der blev astronom”, the plough boy who became an astronomer: Thomas Clausen advanced from a poor farmer's son to an imperial Russian astronomer at one of the most important observatories in this empire. He gave lectures on astronomy without having studied at a university. A Dane who mastered the German language perfectly, who had to live amongst the scholars who mainly belonged to the German Baltic nobility.

Thomas Clausen was unusual; an astronomer trained in optics and mechanics, who published a lot in astronomy. His research areas include star occultations, the observation of comets and the computation of their orbits. However, he was more important as a mathematician. The DMF, the Dansk Matematisk Forening, chose as its logo Clausen's crescent moons, a commemoration of his paper on the quadrature of the moon of Hippocrates. This proves his reputation as one of the most important Danish mathematicians.

However, Clausen is not mentioned in a 3-volume book on astronomy in Denmark, neither as an astronomer in (Danish) Altona, nor as a Danish amateur astronomer, or as a Danish astronomer abroad.

Further mathematical research topics of Clausen are the computation of 250 digits of  $\pi$  and the factorization of big numbers into primes. He obtained a prize of the Royal Danish Society and became a member of the Göttingen Academy of Sciences and a honorary member of the University in Saint-Petersburg.

In 1856 Clausen obtained the Gauss Medal which reminds us of his research in the area of combinatorics investigating combinatorial problems in the tradition of Euler and in indirect cooperation with Gauss via Schumacher, his astronomical teacher in Altona. This opened further research which later led to applications in e.g. agriculture, the so-called Knut Vik designs. Knut Vik worked in an agricultural high school in the north of Norway.

Thomas Clausen belonged to the Danish, to the German and to the Estonian - Russian cultural area, but he is not much known in these countries today; he is at most partially remembered. Considering the above remarks he should be better known.

In relation to mathematics education he is one of the very few successful scholars who never studied mathematics and astronomy, though as an astronomy observer in Tartu he had to give lectures in astronomy when he became a professor. Who influenced Clausen? Firstly, and maybe most importantly, the local priest, who taught him mathematics and even Latin when he was a young boy. Moreover, he learnt from his work in the observatory in Altona and in the Fraunhofer workshop in Munich. However, he mainly “learnt by doing”, accompanied by an enormous interest in mathematics, astronomy and related sciences.

Further details can be obtained from the following references.

#### **References**

K.-R. Biermann (1964). Thomas Clausen, Mathematiker und Astronom, *J. reine angew. Math.* **216**, 159-198.

- K.-R. Biermann (1970). Thomas Clausen als Astronom, *Janus* **57**, 299-305.
- H. Gropp (1995). : "Gaussche Quadrate" or Knut Vik designs, the history of a combinatorial structure. In: M. Behara et al. (ed.), *Symposia Gaussiana*, pp.121-134.
- H. Gropp (2001). "Vielleicht für menschliche Kräfte unausführbar." A mathematical proof of a Danish astronomer? In: E. Fuchs (ed.), *Mathematics throughout the ages*, 196-201.
- H. Gropp (2004). Thomas Clausen, a Danish astronomer and mathematician. In: L.D.Andersen, O. Geil (eds.), *Proc. of the 8th Nordic Combinatorial Conference Aalborg*, pp.71-81.
- C. Lathro & L. Stemkoski (2007). Parallels in the work of Leonhard Euler and Thomas Clausen. In: *Euler at 300*, pp. 217-225.
- J. Schonbeck (2004). Thomas Clausen und die quadrierbaren Kreisbogenzweiecke, *Centaurus* **46**, 208-229.
- T. Viik (2004). Thomas Clausen – from shepherd boy to professor.
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