

*The transit instrument and the geographical latitude*

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The coordinates of Christiania became part of a wider exercise of nation building in 1814 when professor of applied mathematics Christopher Hansteen stated that their precision should compare with those of the cultural nations of Europe. He began observations with modest equipment at temporary locations, but eventually succeeded in establishing the reference meridian for Norway at the University Observatory. The latitude was determined with the meridian circle and officially published in 1849. An alternative method by Gauss (1824), using a transit instrument set up perpendicular to the meridian, was not employed in Norway until astronomy professor Carl Fearnley introduced it during the European Geodetic Arc Measurements, an international project 1862-1895. Assistant astronomer Hans Geelmuyden used a transit instrument in 1887-1888 to derive a time series of latitude determinations in a cooperative observing program involving Norway, Sweden, and Russia. Improved analysis techniques, involving clever approaches to establish the proper motions of stars in the sky, were required to significantly reduce the errors of the final results. They superseded the previous latitude result with the meridian circle. The results were accurate enough to detect that the latitude was not constant, but varied systematically with time. This geophysical phenomenon is still a research topic in the geosciences with several processes contributing to the observed behavior of planet Earth.

Key words: astronomy – geodesy – latitude – transit instrument

The presentation involves Power Point illustrations.