The Repsold meridian circle at Lund Observatory was installed in August 1874 under the directorship of Axel Möller, who was Professor of Astronomy at Lund University from 1863 to 1895. The instrument was probably manufactured in 1873: that is the year engraved on the micrometer head. The original purpose of the instrument was to complement the observatory's main instrument, a visual refractor equipped with an eyepiece micrometer used to make differential measurements of comets and minor planets with respect to stars. The meridian circle was intended to determine the positions of the reference stars, so that the positions of the fainter objects could be expressed in a standard reference frame.

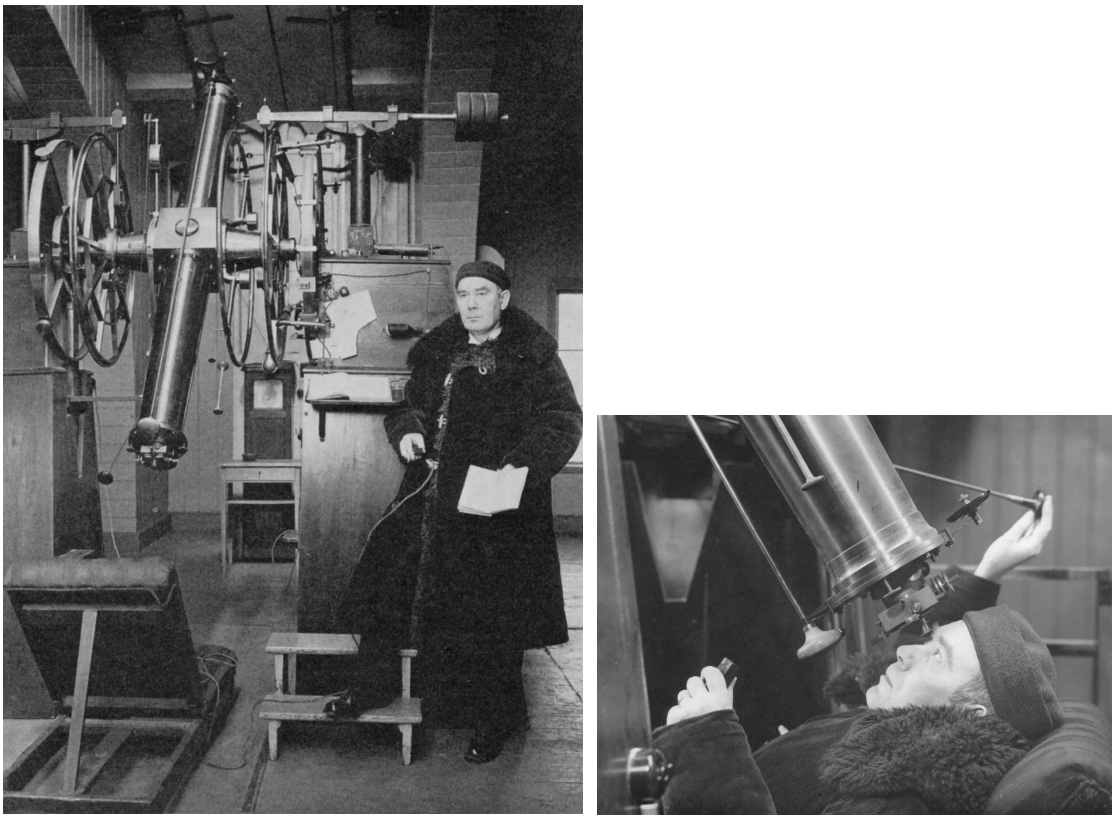

Figure 1. Observer Walter Gyllenberg at the meridian circle. Probably from around 1930–35.

However, during the meeting of the Astronomische Gesellschaft in Stockholm 1877, Möller agreed to take over the responsibility for observing AG zone +35° to +40°, left unfinished by the Dearborn Observatory in Chicago after the great fire there in 1871. The AG observations with the Repsold meridian circle became the most important observational programme at Lund Observatory from 1878 to 1893. The main observers were Anders Lindstedt, Nils Dunér and Folke Engström. The AG zone was re-observed 1920–26 under the leadership of Walter Gyllenberg (Fig. 1). Other major observational programmes using the meridian circle were undertaken by Frida Palmér 1928–36 (Fig. 2) and by Anders Reiz in 1943–45. It appears that no significant series of observations has been made with the instrument after 1945.

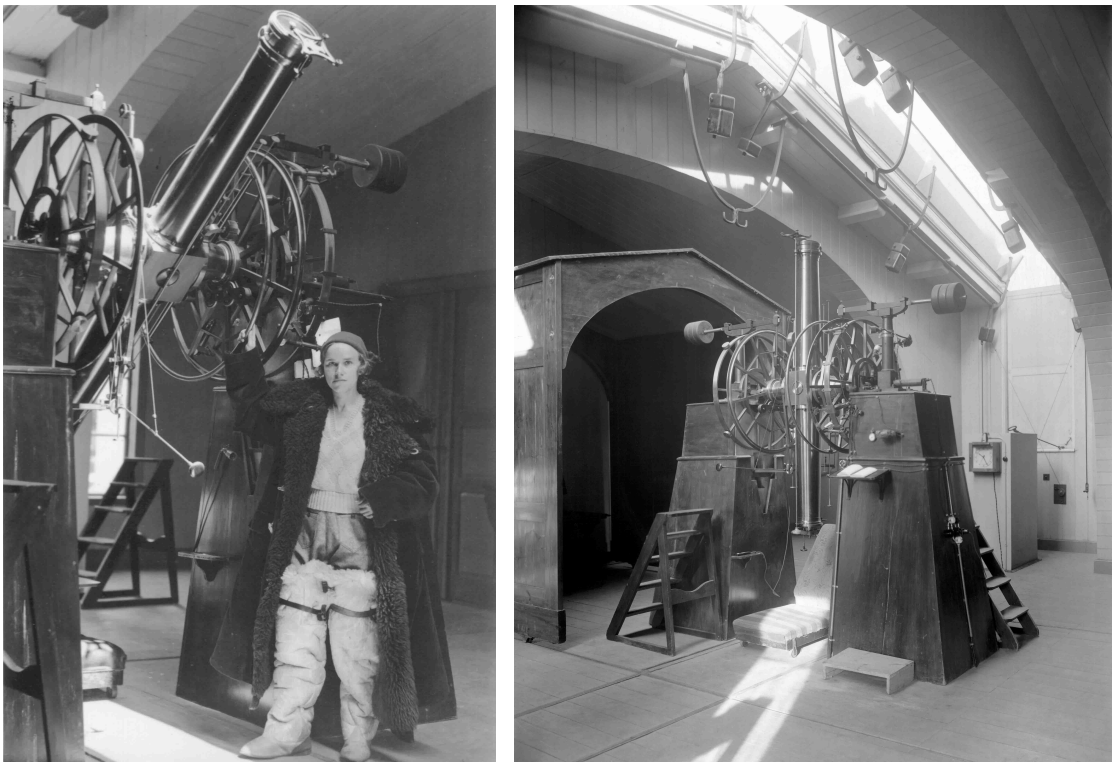

Figure 2. Left: Observer Frida Palmér at the meridian circle. Probably from around 1930–35. Right: Overview of the Lund meridian circle. Probably from around 1950–55. The dent in the tube can be seen some 4 dm below the declination axis.

When the meridian circle was not used, it was protected by a wooden hut that could be moved in the East-West direction along iron rails set in the floor (Fig. 2, right). This hut was probably put in place after a serious accident occurring shortly after the instrument had been installed. Craftsmen working on the roof hatches had used some bricks to secure the tarred roofing felt when leaving for the day. The observers were unaware of this, and when the hatches were opened in the evening, several bricks fell down in the meridian room. One of them hit the instrument's brass tube, creating a dent a few cm wide and a some mm deep. Apparently, the accident did not harm the quality of the observations, and no attempt was made to remove the dent. It is still there, and can be seen in a more recent picture (Fig. 2, right) about a third of the distance from the horizontal axis towards the micrometer end of the tube.

All observations described above were carried out with the original micrometer using fixed wires. The instants when the star was occulted by the wires were recorded, originally by the "eye and ear" method, but from 1879 by means of a chronograph. The instrument was never equipped with an impersonal visual micrometer. In 1956, an attempt to modernise the instrument was initiated by Anders Reiz and Nils Hansson. The intention was to use the instrument for the observation of reference stars for the AGK3 catalogue. The original (silver coated, and partially damaged) declination scale was replaced by a gold scale divided at the U.S. Naval observatory. A photographic micrometer was designed and installed (a turning glass plate was used

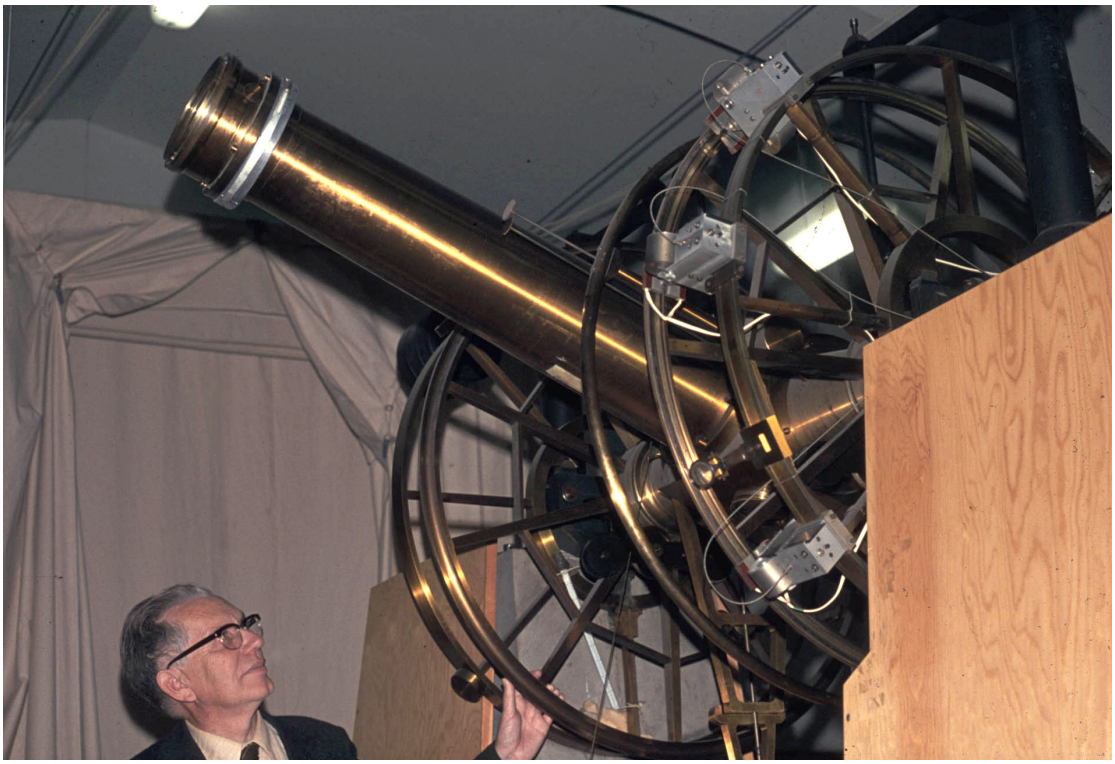

Figure 3. Technical manager Nils Hansson at the meridian circle. This picture was taken (around 1970–75) after the modernisation begun in 1956: the reading microscopes are photographic, and the counterweight near the objective shows that the heavier photographic micrometer was mounted on the tube, although not visible in the picture.

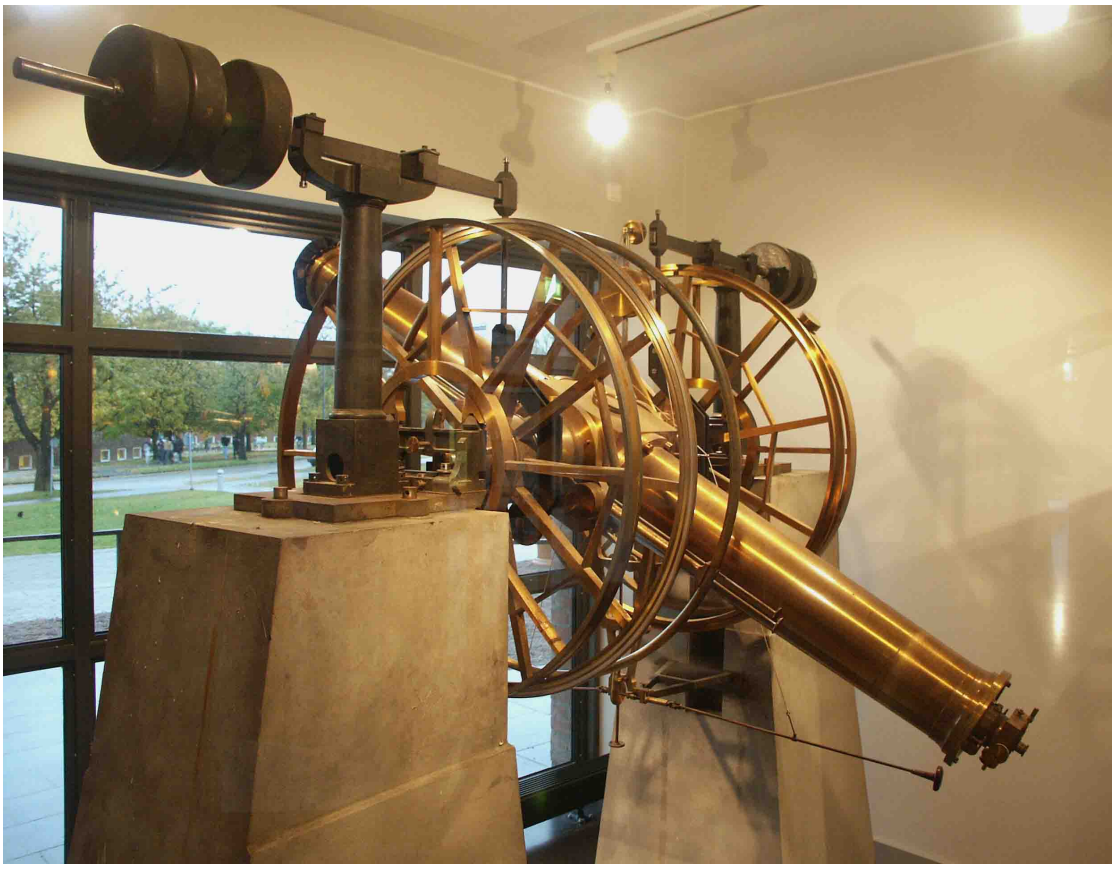

Figure 4. The meridian circle at display in the entrance hall of the new astronomy building (October 2002).

to “stop” the star image on the photographic plate during exposure), and photographic reading of the declination circle was also introduced, using 35 mm film. However, only a small number of test observations were made in this new configuration. In the 1980’s the original visual micrometer and reading microscopes were re-installed and the instrument was subsequently only used for demonstration purposes. In 2001 it was moved to the new institute building, where it is now on display in the main entrance hall (Fig. 4). Most of the original instrument has been preserved, except for one pair of reading microscopes and the complicated illumination system. Of the original equipment we also still have the reclining observing chair and the swivel mechanism for reversing the instrument.

Main technical data

The following technical data are taken from Möller’s description (1875). The focal length is 7 ft (231 cm) and aperture 6 in (16 cm). The circle, with a diameter of 3 ft (99 cm) has two scales: one with a division of 10 arcmin used for setting the instrument, the other with a 2 arcmin division for reading the declination. Four reading microscopes are used, set at 90° angle to each other. Two more microscopes were available for the determination of division errors. The micrometer has 23 vertical and 2 horizontal fixed wires, plus 3 vertical and 3 horizontal wires connected to micrometer screws.

Slightly different dimensions are given in a description from 1966: focal length 228 cm, aperture 15.7 cm, circle diameter 100 cm. Possibly these numbers are based on measurements rather than a specification. As mentioned earlier, the original silver scale with 2 arcmin division was replaced (in 1956) by a gold scale with 3 arcmin division.

Written by L. Lindegren, Lund Observatory, 20 March 2006
(figures added March 2023).