portant and more valuable than any other programme I can think of. I am a little perturbed, however, by the somewhat large number of faint stars contained in the AG reference-star list. There has been a strong tendency in recent years to restrict meridian observations to stars not fainter than magnitude 8.5, or even 8.0, and to leave the positions of fainter stars to be determined by photographic methods. The travelling wire micrometer is not well adapted to the observation of faint stars; if the star is lost behind the wire, accuracy of observation must be lost. Professor Heckmann recommends the use of two parallel wires, with a separation of, say, 8". We have had no experience with this method of observation at Greenwich. I should have expected it to be liable to larger accidental errors of observation and also to larger personal errors. If it were not for the many faint stars in the AG list I should be prepared here and now to state that the Greenwich Observatory will share in the observations.

The conventional transit circle is by no means an ideal instrument for the accurate observation

of the positions of stars. At Greenwich we have thought about alternative designs of instrument, which would be free from many of the disadvantages of the transit circle. Some years ago a horizontal transit instrument was designed for the observation of transits only: a certain amount of experimental work on the design was carried out, but this work is at present in abeyance because of pressure of other work. A mirror transit instrument was also designed, in which the mirror is the only movable part. A small model of the design was made. In planning the meridian groups of instruments at Herstmonceux space has been earmarked for a mirror transit circle. But it will not be possible to proceed with the construction until the completion of the removal of all equipment from Greenwich, because of the heavy demands on workshop time which the removal entails.

Royal Greenwich Observatory,
Herstmonceux Castle,
Sussex, England,
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POSITION ASTRONOMY AT DOMINION OBSERVATORY, OTTAWA, CANADA

By W. S. McCLENAHAN

Abstract. The results of meridian circle observations 1911–1923 and 1923–1935 were published in recent years; those for 1935–1950 are now ready to be printed. The current observing list for the meridian circle consists of PZT stars for Richmond, Florida, and for Ottawa and a proposed list for Herstmonceux. Commencing 1954 it is proposed to observe the stars in FK3 and the FK3 supplemental list north of $-27^{\circ}5'$, a total of 3000 stars. A photographic zenith tube has been in operation for nearly two years. Development of a mirror meridian circle is being considered. The time service is being maintained; crystal clocks have replaced the Shortt free pendulum as the master clock.

During the last ten years the Position Astronomy Division of the Dominion Observatory, Ottawa, Canada, has completed most of the computations of the observations dating back to the start of meridian circle work in 1911. Observations taken during the years 1911 to 1923 appear in the *Publications of the Dominion Observatory* 15, No. 1.

Primarily the program was undertaken to improve star positions needed in carrying out field observations for latitude and longitude in Canada. Right ascensions are determined differentially with a selected list of stars from Boss P.G.C. used as the fundamental catalogue. Declinations were computed from nadir readings with $45^{\circ} 23' 39''.0$ used as a provisional latitude

of the meridian circle. No correction for flexure was applied and Pulkovo refraction tables were used. Corrections for variation of latitude were taken from values given by the International Latitude stations. Tables of pivot errors, circle division errors, etc., are given. Clamp errors were investigated and a solution from pole stars at upper and lower culmination gave the corrected latitude $45^{\circ} 23' 38''.67$. A reversing prism was used with the eyepiece throughout the work. Tables give comparisons of the Ottawa values with those of Boss P.G.C., Eichelberger's positions for 1925 and the *First Greenwich Catalogue for 1925.0*.

Volume 15, No. 2, contains results of observations in the years 1923 to 1935. The program