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ABSTRACTS *

Barney, Ida. Recent progress at the Yale Observatory on the photographic zone catalogues in northern declinations.

Since 1933, six volumes of the *Yale Observatory Transactions* have been published containing zone catalogues from $+20^\circ$ to $+30^\circ$ and from -10° to -30° . These catalogues give the positions for 69,135 stars and the proper motions for all of these stars except those which had been observed only once in the Astronomische Gesellschaft catalogues. The final positions for the two zones from -2° to -10° have been derived except for some 3000 faint stars without spectra. The publication of the catalogues will have to wait for the determination of the spectra of these faint stars, since it has been found that on the Yale plates a star's color affects its photographic position slightly. The probable error of a catalogue position is $\pm 0''.14$ in the northern and $\pm 0''.11$ in the southern zones already published.

The Royal Observatory at Greenwich has observed stars from 0° to $+20^\circ$ which are now being used as comparison stars to reduce the Yale plates from $+9^\circ$ to $+20^\circ$. At present Greenwich positions from 0^h to 16^h in right ascension have been received. Plate constants have been determined for half of the 72 zone plates which are 40 minutes wide in right ascension, and overlap so each star appears on two plates. The application of the plate constants to the measures of all the 21,000 zone stars has been well started.

Proper motions will be derived for all stars observed more than once in the Astronomische Gesellschaft catalogues. The time interval between the Astronomische Gesellschaft observations and the Yale plates is about seventy years, so that in general the proper motions will have probable errors ranging from $\pm 0''.005$ to $\pm 0''.008$.

Two determinations of the probable error of a final catalogue position are possible at present. One is obtained by comparing the two positions

for each star on overlapping plates. The other comes directly from the least-squares solutions for the plate constants. From the data now available the two methods agree that in the zones from $+9^\circ$ to $+20^\circ$ the probable error of a Yale catalogue position depending on the mean of two plates is $\pm 0''.115$ in either right ascension or declination.

With these Greenwich positions and the Cape positions from -2° to 0° , it will also be possible to reduce the plates from -2° to $+9^\circ$, which were taken in Johannesburg in 1937 and measured in 1938-39. When positions and proper motions are derived from the measures on these plates all the zone catalogues from $+30^\circ$ to -30° will be finished. The catalogues to be published will fill six more volumes of the *Yale Observatory Transactions* and include approximately 58,000 stars.

Yale University Observatory,
New Haven, Conn.

Cuffey, James. NGC 6939.

NGC 6939, near Cygnus, was investigated for red color indices ($\lambda\lambda 4300-6300$). The color-magnitude relation shows a giant branch extending from $m_r = 13.5$, $C_r = 1.0$, to $m_r = 11.7$, $C_r = 2.0$, and a well defined main sequence extending from $m_r = 14.0$, $C_r = 1.0$, to $m_r = 16.0$, $C_r = 1.8$. In addition, there are two early-type stars of low color index ($+0.4$), which appear to be quite independent of the cluster's main sequence. Their apparent magnitudes indicate that they are either cluster stars or, at least, at nearly the same distance as the cluster. They indicate a color excess of 0.5 magnitude, and an absorption $A_{pg} = 1.5$ mag. The cluster's distance, estimated from its main sequence, is 1300 parsecs.

* Of papers presented at the Seventy-second Meeting of the American Astronomical Society, Philadelphia, Pa., June 28, 29, 1944.