

## ANNUAL REPORT OF THE UNION OBSERVATORY

1928

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*(Union Astronomer)*

**26½-inch Grubb Visual Refractor.**- The double-star survey of the Southern Hemisphere has been continued throughout the year. The year's work comprises;-

2678 measures of double stars (this includes the 9-inch measures),  
567 new pairs discovered.

In connection with the programme of the survey, Dr. van den Bos and Mr. Finsen visited the Lamont Hussey Observatory at Bloemfontein in September, and Messrs. Jessup and Donner of Bloemfontein spent a week at Johannesburg in October. As a result of these conferences the two observatories co-operate fully in double-star research to avoid duplication of work, and weekly reports of work done are exchanged.

Observations of the satellites Enceladus and Mimas of Saturn were continued for Professor Georg Struve of Neubabelsberg, but, owing to poor observing conditions, only 43 measures were obtained, as against 100 in 1927.

The year on the whole was characterised by a large number of clear nights, but by a very severe deficiency of nights of good definition.

**Franklin-Adams Star-Camera.** - During the year 876 plates were obtained with this instrument. The distribution of the plates was as follows: -

Minor planet regions and star maps	139 plates
Variable star regions	698 "
Comets	39 "

Many requests have been received from Europe for observation of minor planets, and an attempt is made, as far as possible, to obtain one or two observations of all planets out of reach of northern observatories. 258 accurately measured positions of minor planets have been forwarded to the Astronomisches Rechen-Institut, Berlin, for the year.

The instrument has been placed mainly at the disposal of Mr. H. van Gent of the Leiden Observatory for the photographic investigation of variable stars in the Southern Hemisphere. Mr. van Gent arrived at the Observatory on 1928 March 21.

**9-Inch Grubb Refractor.** - This telescope has been in use for observations of occultations of stars by the moon, eclipses of the satellites of Jupiter, and measures of the wider double stars. One night a week is set apart for visitors, the number recorded during the year being 1357.

**Occultation of Stars by the Moon.** - The programme of the last few years has been maintained. Predictions are made by a semi-graphical process for all stars for which accurate places are available, and disappearances are observed at the dark limb of the moon about the stage of first quarter. The observations are made with the 9-inch refractor, the Franklin-Adams Twin Telescope, and the 6-inch guider of the Franklin-Adams Star-Camera.

During the year 1928 the number of occultations observed was 171. The results of the year's observations are as follows:-

	s	"
1928.1	11.6	6.4
28.4	11.6	6.4
28.6	10.8	5.9
28.9	10.9	6.0

The second column indicates the time by which the Moon has arrived too early at any longitude, and the third column the distance the Moon is ahead of its tabular longitude..

Further observations of occultations have been made by Dr. J. Moir, Auckland Park, Johannesburg, and Mr. G.E. Ensor of Pretoria. These observations have been reduced here and the results forwarded to Professor E.W. Brown.

**Nova Pictoris.** - On March 23 Mr. Finsen, on examining Nova Pictoris with the 26½-inch refractor as the result of a request from Professor B.H. Dawson of La Plata that the diameter of the nova might be measured, found that the nova was a nebulous double star. His early observations are given in .MN.,88, 488 (1928 March). Later observations show that there are four components or nuclei in the image of the star, the brightest being in the centre, a somewhat fainter one following, a still fainter one south preceding, and a very faint, close one north, the existence of which is still considered doubtful. When the star came within reach of observation again in November no great change in its appearance was found.

The photographic image of Nova Pictoris, as obtained on plates taken with the Franklin-Adams Star-Camera, is extremely abnormal. The image is surrounded by a system of fairly sharp rings. Experiments with diaphragms over the lens indicated that

the rings might be optical effects due to the fact that the light of Nova Pictoris is mainly concentrated in a few lines of the spectrum.

**Comets.** - Comet 1927k (Skjellerup) was under observation from February 11 to April 28, Comet 1927 h (Encke) from March 20 to April 3, and Comet 1928 b (Forbes) from November 20 to December 24. All observations of comets are now made photographically with the Franklin-Adams Star-Camera. Although the scale of this instrument is small (180" = 1 mm.), yet by giving the shortest exposure necessary to obtain a measurable image and by using Schlesinger's method of dependences in the reduction of the plate measures, it is considered that the observations are far superior in accuracy to those obtained with the 9-inch refractor. also the period of observation is prolonged greatly by using the photographic method.

**Time-Service.** - Throughout the year, time has been taken from the Bordeaux rhythmic wireless time-signals at 8h U.T.

The signals sent out from Rugby, England, at 10h U.T. have also been received from their commencement. From 1929 January 1, the Rugby time-signals will be adopted as standards for the comparison of the Union Observatory clocks. An allowance of 0.027 seconds is made for the travel time of the signals.

**Union Observatory Circulars, Etc.** - During the year, Circulars Nos. 74, 75, 76, and 77 were issued, and the MS. of Circular No. 78 is in the hands of the Government printer.

Of the Southern Star Maps, 41 were issued with these Circulars, and the present state of this project is therefore:-

Maps already issued	319
Maps in the hands of Government printer	35
Maps still to be prepared	<u>202</u>
Total	556

The distribution of the **Loose-leaf Catalogue of Southern Double-Stars** was completed during the year.

**Personal.** - Dr. W.H. van den Bos was appointed Acting Chief Assistant as from 1928 January 1.