

ANNUAL REPORT OF THE UNION OBSERVATORY

1927

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During the year, joint colloquia of the staffs of the Yale Southern Station and the Union Observatory were held on twenty-five occasions (eighteen at the Union Observatory and seven at the Yale Telescope, the latter with Dr. Alden in the chair). Amongst the visitors to these were Dr. Rossiter from Bloemfontein, Dr. Spencer Jones from Cape Town, Mr. Ensor from Pretoria, and Dr. Moir.

26½-Inch Grubb Visual Refractor. - This instrument has been in continual use throughout the year. In November it was found that the rails on which the dome rotates had in part perished, and for four weeks the dome could not be moved; it was, however, left with the opening on the south meridian, so that the double star surveys were hardly affected. Observations of the satellites Enceladus and Mimas of Saturn were made for Professor Georg Struve by Dr. van den Bos and Mr. Finsen. One hundred measures have been obtained. The double-star programme was relentlessly pursued. The work may be summarised as follows;-

2361 measures of double-stars,
503 new pairs discovered.

Estimates were only made on a few occasions when the driving clock failed; the clock is so placed that even simple repairs have to be made in the daylight. It is much better to have the driving clock exposed on the floor or thereabouts. The separating power of the telescope continues to give complete satisfaction, but it is not often that definition is perfect compared with the experience with the 9-inch. Every increase in aperture renders a telescope more susceptible to bad seeing.

On a few nights sweeps over the region of the Large Magellanic Cloud were made. The results have appeared in Circular No.73.

Occlusions of Stars. - The programme of the last few years has been maintained. In addition, amateurs are assisting. A number of observations by Dr. Moir, Auckland Park, Johannesburg, have been worked up here, and the results forwarded to Professor E.W. Brown; they agree well with those obtained here. It is hoped that by next year results from other amateurs will be received. The occultation results since the introduction of Brown's Tables, roughly grouped, give the following results, the first

value giving the time the moon arrives too early at any longitude, the second the distance the moon is ahead of its predicted position:-

	s	"
1927.1	12.9	7.1
27.3	13.1	7.2
27.6	12.6	6.9
27.8	11.8	6.5

Throughout the year, time has been taken from the Bordeaux signals at 8h G.M.T., corrected according to the provisional correction telegraphed the following day. The African Broadcasting Company broadcast the Union Observatory time automatically from Johannesburg on weekdays at 13h, 17h, and 20h S.A. Standard Time. The company at first had some difficulty with the apparatus, but for some time past the accuracy of the signals has been satisfactory. Allowing that the accuracy of these results is limited by the necessarily weak star-places used, it is still apparent that the maximum time-error of the Moon in longitude was reached in 1924, and that it is now decreasing. The conclusions from the recent Transit of Mercury also indicate that the time-error is decreasing. Unfortunately the morning of November 10 was cloudy, and Mercury was seen only a few moments before egress, so that no observations were obtained. Some results kindly communicated, and others published in the journals, have been worked up and will appear in Circular No.75. The diminution from 1924 May to 1927 November is 4.3 secs., the occultations give 4.5 secs.

9-Inch Grubb Refractor. - This telescope has been in constant use for occultations, eclipses of Jupiter's satellites, comets, and measures of the wider double-stars, and on one night a week for visitors.

Franklin-Adams Star-Camera. - During the year 306 plates were obtained with this instrument. The distribution of the plates was as follows: -

Minor planets and star maps	83 plates
Variable star regions	69 "
Comets	146 "
Miscellaneous	8 "

The comet plates include a long series of short-exposure photographs on Pons-Winnecke's Comet at the time of its near approach. With the 6-inch guiding telescope attached to the star-camera, the following visual observations were made:

49 occultations of stars by the Moon
20 eclipses of Jupiter's satellites to 1927 December 28 inclusive.

Comet Pons-Winnecke. - A series of observations of this comet was made here from June 24 to December 12, and an intensive campaign was carried out over the time of nearest approach to the Earth. These observations, both photographic and visual, are

now being reduced. It is worth while remarking that upon the night of nearest approach the definition was very fine, and in the 26½-inch the nucleus was absolutely stellar and not in any way different in aspect from those of the numerous stars it quickly moved past. As an elongation of 0".15 would have been seen, it may be said its diameter did not surpass that figure, which means that the larger limit for the diameter was about 2¾ miles, whilst the real diameter might be very much smaller.

Skjellerup's Bright Comet. - The news of this discovery reached here on December 6, but clouds prevented observation of it until December 8. The comet was very badly placed for good work, but from the communicated positions of the comet and two obtained here, a rough orbit was computed and cabled to Copenhagen.

Union Observatory Circulars. - During the year, Circular Nos. 71 to 75 were issued, and the MSS. of Circulars Nos. 74, 75, and 76 are in the hands of the Government printer. These contain, in addition to the results of the routine work on comets, minor planets, occultations, Jupiter's satellites, etc., in No. 73 a further list of proper motions of stars on the Melbourne plates of the Large Cloud and partial descriptions of the clusters in it; in No. 74, a 6-hour empirical ephemeris of Comet Pons-Winnecke over the period of its close approach to the Earth, and a discussion of the observations of the Transit of Mercury on November 10.

Southern Star Maps. - During the year, 27 of these maps were issued. The present state of this project is therefore:-

Maps already issued	266
Maps in Government printer's hands	28
Maps still to be prepared	<u>262</u>
Total	556

Loose-leaf Catalogue of Southern Double-Stars. - The issue of this work was completed in 1927 December, and hardly calls for additional comment. It is to be regretted that only about one-half of the region covered by this catalogue has been surveyed with the 26½-inch refractor, but the end is in sight.

The issue of this report coincides with the retirement of the present Union Astronomer. He is succeeded as from January 1 by Mr H.E. Wood, M.Sc., F.R.A.S., who for many years has been his enthusiastic coworker - to him and the other members of the Staff, the writer puts on record his grateful thanks.