

## ANNUAL REPORT OF THE UNION OBSERVATORY

1913

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*(Union Astronomer)*

***Instrumental Equipment.*** - This has been increased by the arrival of a twin 6-inch and 7-inch refracting telescope carrying a transferable camera-end and a 6-inch object-glass prism, the whole equipment having been presented to the Observatory by the late Mr. J. Franklin-Adams. A building for the use of this instrument is now in the course of erection. The disks for the 26-inch refractor have not yet been delivered to Sir Howard Grubb, but Messrs. Chance Bros. hope to have them ready immediately, so that there is some prospect that the telescope may be in commission in 1914.

***9-inch Refractor.*** - Measurements of double stars have been continued and completed. Measurements of upwards of 540 pairs (at least two nights' observations on opposite sides of the meridian) were secured; of these 118 are under 1" in distance; incidentally 13 new pairs were recorded. Several interesting cases of binary motion have been noted, and others have been confirmed: thus  $\beta$ 738,  $\alpha$ Fornacis, I 390 are at present single; Brisbane 3574 turns out to be a binary of unusual character; I 83 shows an increase of  $39^{\circ}.5$  in angle in 16 years; I 221 a decrease of  $28^{\circ}$  in the same period; Sellors 19 an increase of  $32^{\circ}$  in 18 years;  $\lambda$  238 of  $31^{\circ}$  in 16 years; and Russell 321 a decrease of  $26^{\circ}$  or more in 33 years; besides these there are several pairs showing large changes, but with which a 9-inch telescope is not powerful enough to deal with certainty. Measures of nearly every southern pair in motion have been secured.

The Phenomena of Jupiter's Galilean satellites have been observed on the same lines as before.

Comets 1913 e (Zinner) and 1913 f (Delavan) were followed as long as possible.

***2.5/8-inch Talcott Telescope.*** - Latitude and time observations have been maintained, but latitude observations are now limited to three nights a week, so that the winter series (cloudless nights) will not greatly out-number the summer series (frequent cloudy nights).

***Franklin-Adams Star-Camera.*** - The exposures made covered 99 hours, and were almost entirely limited to plates for minor planets and comets. The plates of 118 minor planets were sent to Dr. Cohn at the Recheninstitut, Berlin. With the 6-inch guiding telescopes many duplicate observations of the phenomena of Jupiter's satellites have been made.

**Observatory Circulars.** - Nos. 2 to 9 were actually distributed during the year, and Nos. 10 to 12 are in the Government printer's hands. In circulars Nos. 2 and 5 the adoption of a permanent system of reference (called the Galactic System) for the stars and planetary orbits is urged, and in those circulars and Nos. 5, 6, 8, and 9, numerous examples of the simplifications which would result and tables of reduction for 1913 and 1914 are given, whilst in circular No. 10 (1913 November 22) a table for the rapid conversion of right ascension and declination into Galactic coordinates is given. The other chief contents of the circulars are:- No.3, results of the observations of Jupiter's satellites in 1912, and a photograph of the Nkandhla nickel-iron meteorite which was seen to fall; No.4, measures of double stars in 1912; Nos. 6 and 7, occultations of two stars by Jupiter; No.8, the proper motion of  $\alpha$  Centauri =  $0''.83$  towards  $l63^{\circ}7'$ , and on measurements of star photographs by means of projection and simple apparatus; No. 9, a plate showing the variable star 1855,  $19^{\text{h}} 42^{\text{m}}.2$   $-16^{\circ} 21'$  at two phases. The remaining circulars now in the press will contain: No.11, observations of Zinner's comet 1913e; No. 12, observations of Jupiter's satellites 1913.

**Time-Service, Meteorological and Seismological Observations.** - These have been continued unchanged. A second mean-time clock, Riefler 286, has been installed.

**Staff.** - Mr. Innes and Mr. van der Spuy measured double stars with the 9-inch telescope; and Mr. Innes with the 9-inch, and Mr. and Mrs. Wood with the 6-inch guiding telescopes, observed the phenomena of Jupiter's satellites. Mr. Wood was in charge of the Franklin-Adams star-camera, and Mr. Worsell in charge of the latitude and time observations, many of which were made by Mr. Simpkins. Mr. Wood was on vacation leave until 1913 March 3, and visited several European Observatories; he contributed a paper on South African earthquakes to the American Seismological Society (*Bulletin*, Vol.iii, No.3).

Mr. Innes read a paper on "Cosmogonic Hypotheses" before the South African Association for the Advancement of Science at Lourenco Marques, but it has not yet appeared officially: the main argument is that heavy atomic elements cannot be built up by the gravitational condensation of the light atomic elements which exist in nebulae, and that the chief source of energy in the cosmos is more probably due to the ultimate atomic disintegration under enormous pressure of the heavier elements which are present in meteorites or planetesimals.