

**ANNUAL REPORT OF THE UNION OBSERVATORY
JOHANNESBURG**

1953

(Director, Dr. W.H. van den Bos, Union Astronomer)

1. *Astronomical Observations and Research.*

The 26½-inch refractor has been used on 209 nights with the interferometer by Dr. Finsen for the measurement of known double stars and a search for new pairs. He has discovered the duplicity of the star Epsilon Ceti, which proves to have a period of 2.6 years, with one exception the shortest so far known for a visual double star.

The telescope has also been used on 60 nights with the micrometer by Dr. van den Bos and Mr. Churms for the measurement of known double stars.

The card catalogue of double stars south of -19° declination has been kept up-to-date and information has been supplied to other astronomers on request. The first half of the manuscript of a General Catalogue, mentioned in the previous report, has been written.

With the Franklin-Adams telescope the following plates were obtained by Messrs. Johnson, Bruwer and Churms:

Minor Planets	353 plates
Comets	68 "
Variable Stars	51 "
Miscellaneous	1 "
Total	<hr/> 473 "

In addition, 116 plates for minor planets and 2 plates for comets were obtained with the Rockefeller telescope of the Leiden Southern Station by kind permission of the Leiden Observer.

The resulting positions of minor planets and comets have been regularly communicated to the respective Central Bureaus of the International Astronomical Union at Cincinnati and Copenhagen.

With the 9-inch and 6-inch refractors, occultations of stars by the Moon have been observed by Messrs. Bruwer and Churms on 34 nights. The results have been communicated to H.M. Nautical Almanac Office. These telescopes have also been used by amateur astronomers who are members of the Astronomical Society of South Africa for observations of planets and variable stars.

The occultation of Antares and its companion on March 7 was successfully recorded photoelectrically by a team of observers using the Leiden telescope. The transit of Mercury on November 14 was observed with three telescopes by Messrs. Finsen, Bruwer, Seligmann and Churms.

With a 3-inch refractor counts of sunspots were obtained on 288 days, the other days of the year being overcast or unsuitable for reliable counts. The results are communicated daily to the Telecommunications Research Laboratory of the South African Council for Scientific and Industrial Research, and monthly to the Magnetic Observatory at Hermanus and the Receiving Station of the South African Broadcasting Corporation at Panorama.

2. *Publications*

Circular No.113 and the Annual Report for 1951 have been printed and distributed.

The following papers by members of the staff were published in other journals:

W.H. van den Bos,	Orbits of 7 double stars	<i>MNASSA</i> , 12, 19
	Orbits of 6 double stars	<i>MNASSA</i> . 12, 57
	The Astronomer's Tools	<i>Iscor News</i> , April 1953.
P.C. Seligmann,	Time.	<i>MNASSA</i> ,12, 24

3. *Public Services.*

The Time Service is under the general supervision of Dr. Finsen, with Mr. Hers in charge, assisted by Mr. Seligmann and, when necessary, by Messrs. Bruwer and Churms.

Efforts were mainly directed towards increasing the reliability of the quartz crystal clock installation by improvement of the crystal temperature control units, the emergency battery power supply and the frequency divider units. A second Muirhead Phonic Notor Timing Device was put into operation. As a result of these steps, oscillator Q2 was unaffected by power failures (which totalled 12 hours) throughout the year and it was found desirable to stop most of the pendulum clocks and rely on the quartz clocks only. The ageing rate of Q2 was 3.0 parts in 10^8 per month at the end of the year.

Numerous interruptions in the power supply to oscillator Q2 made its frequency rather erratic.

The six quartz crystal oscillators and associated dividers and beat counters, manufactured for the Observatory by the British Post Office, were delivered in October. They were immediately installed in the old clock room and after two months their performance already compares favourably with that of the two original oscillators. Their presence has made possible a much more accurate determination of time signal corrections. However, the shortage of accommodation is now acute and there is no room left for emergency high tension batteries for the new clocks.

New equipment constructed during the year includes a test set which checks stop watches with millisecond accuracy. An alarm unit in the main building gives audible and visible warning of a number of possible faults which may occur in the clock equipment at the top of the hill.

New apparatus received during the year includes a Mercer Survey Chronometer and two universal test meters.

179 Certificates for stopwatches were issued during the year.

The Wiechert horizontal seismograph was in operation throughout the year. The following local earth tremors were recorded:

Light	5446
Medium	702
Strong	208
Very strong	108
Very very strong	40
Total	<u>4504</u>

Monthly returns have been sent to the Inspector of Mines and the Bernard Price Institute of Geophysics.

In addition to these local tremors, a number of distant earthquakes were recorded by the instrument. These records are forwarded to the Bernard Price Institute for inclusion in its monthly Seismological Bulletin. Several have been lent, on request, to overseas geophysical institutes.

Records of rainfall have been sent monthly to the Weather Bureau, Pretoria.

Certificates for legal purposes have been issued and numerous requests for information have been answered. A monthly bulletin giving the astronomical phenomena for the coming month has been sent to the Editor, South African Journal of Science, and to the South African Press Association for distribution to the Press.

There were 42 visiting nights during the year and the total number of visitors received was 1286. When weather permitted, celestial objects were shown with the telescopes. In addition, a display of astronomical exhibits was arranged in the library. Valuable assistance in entertaining the visitors and preparing additional exhibits was rendered by members of the Transvaal branch of the Astronomical Society of South Africa.

4. *General.*

On the 1st April the Observatory celebrated its Golden Jubilee by holding an Open Day; about 4000 visitors were conducted over the Observatory between 10 a.m. and 10 p.m. Congratulatory telegrams were received from Her Majesty's Astronomer and the Staff of the Royal Observatory and from the President of the Astronomical Society of South Africa. The Film Department, the Weather Bureau, the Leiden Observer, the Astronomical Society, the Public Works Department, the Police, the Traffic Department and St. John's Ambulance rendered valuable assistance in the arrangements, reception and entertainment of the visitors. The South African Broadcasting Corporation, with the assistance of the Staffs of the Royal and Union Observatories, gave a national programme of historical astronomical character and on the Union Observatory's fifty years.

The Union Astronomer paid official visits to the Harvard Southern Station at Mazelspoort and the Royal Observatory at the Cape in February. The Leiden Observer Dr. Walraven returned to Leiden in October and was succeeded by Dr. Muller, who arrived in August.

The building to house the Franklin-Adams telescope at the Observatory's Annexe at Hartbeespoort was completed and it is planned to transfer the instrument as soon as a supply of electric power and water has become available.

Astronomers Code, Cousins, Evans, Hirst, Hoffmeister and Mrs. Hoffmeister Houck, Morrisby, Russo, Smith and Mrs. Smith, Stoy, Thackeray, Voûte and Wanick visited the Observatory.