

several trials made with 60-inch plates from which he found that a large number of nebulae were required on each plate in order to obtain accurate results.

The question of establishing a few additional Selected Areas was discussed and a motion by Adams to have the President appoint a sub-commission to deal with this matter was adopted.

COMMISSION 33 (STELLAR STATISTICS)

PRESIDENT: Prof. BERTIL LINDBLAD.

SECRETARIES: Prof. H. L. VANDERLINDEN and Dr C. SCHALÉN.

The Commission met on August 4, at 9.30.

The report prepared by the President of the Commission was adopted. A few important and interesting points were further discussed.

(1) Mr Bok gave an outline of a general programme of determining radial velocities by means of objective-prism spectra. Measurable spectra can be obtained for stars as faint as 10^{m-2} using one comparison line; the probable error is of the order of ± 20 km. per sec. A greater precision should be obtained if more comparison stars were available.

(2) Mr Shapley made the following proposal concerning the appointment of a sub-commission for establishing co-operation on the construction of magnitude sequences.

"The Commission on Stellar Statistics endorses the proposal that the Commission on Stellar Photometry (25) consider the appointment of a sub-commission on magnitude sequences, noting that for work on stellar distribution, variable stars, external galaxies, faint asteroids and faint proper-motion stars the need of more precise photographic and visual magnitudes is very great."

The motion was adopted by the Commission.

(3) Mr Vyssotsky made a few remarks concerning extensive plans for classifying stellar spectra.

(4) Mr Andersen summarized a paper by himself bearing on the general theoretical basis of probability in statistics.

(5) Mr Mineur called attention to the importance of securing radial velocities of galactic clusters, as they should allow a good determination of the distance of the galactic centre. Radial velocities of a greater number of globular clusters are also extremely desirable.

COMMISSION 35 (CONSTITUTION OF THE STARS)

PRESIDENT: Sir ARTHUR EDDINGTON.

SECRETARY: Prof. B. STRÖMGREN.

The Commission first discussed the problem of the density distribution in the interior of the stars. The President summarized the arguments leading to stellar models characterized by a polytropic index of $1\frac{1}{2}$ at the centre which increases outwards to a value between 3 and $3\frac{1}{2}$ near the outside. The President then commented

on the problem stated in the Draft Report, namely, to what extent are the properties of a star with polytropic index increasing outwards from n_1 to n_2 intermediate between those of the two polytropes with constant indices n_1 and n_2 respectively? It can be shown, comparatively easily, that the properties are intermediate at least up to the "envelope point" on the outer polytrope, defined by the family of solutions of the corresponding Emden equation.

The President mentioned the alternative methods of studying the density distribution in the case of eclipsing binaries and cepheids, and invited discussion on the subject.

Prof. Russell, Dr Kopal, Prof. Hagihara and Dr M. Schwarzschild took part in the following discussion, which dealt with theoretical and observational questions of the problem of determining information about the density distribution in the interior of eclipsing binaries, from observations of the motion of the line of apsides, and from observed ellipticities.

The Commission then discussed the subject of nuclear processes in the interior of the stars. The discussion was opened by Prof. B. Strömgren and Dr Atkinson. A summary was given of recent investigations by von Weizsäcker, Bethe, Gamow and others, with special regard to the question of possible neutron sources in the stellar interiors. In the discussion the President commented on the problem of the helium content of the stars. Prof. Russell discussed the questions of the empirical mass-luminosity law and the foundation of the method of spectroscopic parallaxes, and their connection with the problems of the hydrogen and helium content of the stars. Prof. Lemaître commented on the question of the most luminous supergiants and the time-scale.

The Draft Report as printed was unanimously adopted.

COMMISSION 36 (SPECTROPHOTOMETRY)

ACTING PRESIDENT: Dr M. MINNAERT.

SECRETARY: Dr D. CHALONGE.

(a) DISCUSSION OF THE DRAFT REPORT

The acting Chairman brought over to the Commission the best compliments from Dr Pannekoek, who had been elected as President in 1935, and expressed regret at his absence, especially because the discussion which would be carried on is so intimately connected with his work. In the name of the whole Commission the Chairman thanked very much Dr Pannekoek for his fine Draft Report, which gives a very clear view on the present state of astrophysical spectrophotometry.

The Draft Report then came into discussion.

I. *Calibration and standardization.* Dr Minnaert said that, according to the proposal made at the Paris Meeting, Pt filters and Pt step-reducers were made on quartz and calibrated at the Utrecht Heliophysical Institute. Their transmissions will be measured also in the following institutions: National Physical Laboratory, Massachusetts Institute of Technology, Bureau of Standards, Physikalisch-Technische Reichsanstalt, Optical Institute Leningrad. An intercomparison of the results will be made at Utrecht. Though this work is not achieved, some reducers with preliminary calibrations were lent to Dr Allen and Dr Beals.