a single observation provides accurate adjustment of the plate-holder, in both right ascension and declination.

To make the position-angle adjustment of the plate-holder slide, insert a clear glass plate or film with a dark E and W line finely drawn upon it. By watching 10 or 15 minutes earlier, twist the slide till the star trails along this line or exactly parallel to it. Then collimate (1) the center of the objective on the center of the plate-holder, and (2) the center of the plate-holder on the center of the objective. Lastly, verify the focal plane.

CAMP BARTA, CASCO, MAINE, MAY 17, 1932.

Syracuse Meeting of Section D (Astronomy)
A. A. A. S. 21 June 1932

By PHILIP FOX, Secretary

The pre-occupation of astronomers with preparations for observation of the eclipse of August 31 and for the meeting of the International Astronomical Union which follows immediately thereafter made the attendance at Syracuse small but still at each of the two sessions there was an attendance of about thirty. There were sixteen titles on the program, distributed with rather unusual balance, with ten on problems of the solar system, two instrumental, and only four on stellar problems. As no representative of the Mount Wilson Observatory was in attendance, the papers from that institution were distributed among eastern astronomers for presentation. In the absence of the Vice-President, Professors S. L. Boothroyd and W. S. Eichelberger presided.

The first paper on instruments was a description of The New Ballbearing Support System for the 100-inch Mirror by F. G. Pease. The distortion of the mirror from friction on the supporting disks has been overcome by ball-thrust bearings placed between the disks actually in contact with the mirror and the supporting plates. The system has been in use for a year. The star images have been round except during times of rapid temperature changes.

R. C. Williams in his paper on Deposition of Chromium on Glass for Reflectors, described a method wherein a tungsten wire heavily electroplated with chromium is used as a hot filament in a vacuum. The chromium evaporates off and forms a hard opaque deposit on the reflector which is enclosed in the vacuum chamber. The chromium surface reflects 60% at λ 4250, 70% at λ 3400, and 60% at λ 2900. The process and the product may be of great value to astronomy.

There were six papers dealing directly with the Sun. S. B. Nicholson made a study of Sun-spots and the Weather. He finds no definite correlation between the number of sun-spots and seasonal rainfalls of Sacramento and San Francisco. The mean annual temperatures of six

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tropical stations were compared with the sun-spot curve. The correlation coefficient is \(-0.37\), which, though low, is probably real. (Investigators in this field must eventually realize that no results of value can be expected until the scope of investigation of terrestrial response is world-wide. Nothing can be expected from consideration of data from a few stations.) Nicholson and Miss Elizabeth E. Sternberg in The Present Phase of the Solar Cycle estimate that the sun-spot minimum will occur between 1933.6 and 1934.8, probability favoring the earlier date. The date of minimum is important in view of the approaching eclipse and the coronal form to be expected. Frederick Slocum in his address on Solar Coronal Problems discussed coronal form, structure, and motion. He pointed out that the spottedness of the Sun on the eclipse day and more especially near the limb was of more significance in determination of form than the mere stage in the solar cycle. Ross Gunn discussed the forces and motions imposed on the ions of the Sun’s atmosphere by magnetic and electric fields and their influence in solar phenomena. His calculations indicate that the magnetic and electric forces far exceed those of gravity and radiation pressure and that these forces should determine the stability and provide the mechanism for the support of the corona. He suggests that the Sun’s atmosphere rotates more rapidly than the Sun proper and urges that observations of the rotation of the upper chromosphere and corona be included in eclipse programs.

Investigations of band spectra are becoming increasingly valuable agents for interpretation of solar and stellar surface conditions. The strongest bands of the hydrocarbon molecule are at \(\lambda 4300\), \(\lambda 3900\), \(\lambda 3143\). The first is found conspicuously in the Sun and the stars of class G0 and later. While the other bands have not been observed in stellar spectra, R. S. Richardson finds evidence of them in the solar spectrum. Moreover, from the study of the distribution of intensity in the P branch of the \(\lambda 4300\) band, he determines the temperature gradient in the reversing layer. The determination is based on the fact that if the temperature of an emitting gas layer is not homogeneous the intensities of the band lines show for the higher rotational energy levels a higher temperature than for the lower ones. Therefore if the depth is known the difference between the temperature for the higher and lower rotational quantum numbers should give the temperature gradient in the gas layer. A temperature of \(4410^\circ \pm 249^\circ\text{ K}\) was found for the lower quantum numbers and \(6020^\circ \pm 432^\circ\text{ K}\) for the higher. Assuming a depth of 125 km the temperature gradient is about \(13^\circ\text{ per km}\). Also he found the relative pressure in sun-spots and reversing layer, using a formula based upon the theory of band line intensities and the equation of dissociation equilibrium for molecules, to be 0.48.

R. W. Shaw identifies members of the OH bands at \(\lambda 3064\) and \(\lambda 3428\) in the solar spectrum in large numbers, with close correspondence in relative intensities to those of the laboratory. For the band
λ 3428 the identification rests entirely on the members of the R branch, every member of which is identified. A study of the intensities of the lines in this band gives the solar temperature at 5100° C.

W. S. Adams and Theodore Dunham contributed a very interesting paper on Absorption Bands in the Infra-red Spectrum of Venus. In the region λ 7400 to λ 8900 occur the telluric bands due to oxygen (the Λ band) and water vapor (region λ 8200). Though the scale was large, 5.6 A.U. per mm, and the planetary radial velocity adequate to separate the corresponding lines in the atmosphere of Venus if present, no such lines were detected. However, three bands not present in the solar spectrum, with heads at λ 7820.2, λ 7882.9, and λ 8688.7 and all degraded toward the red, were detected. Measurements of the separations and considerations of moment of inertia indicate that the bands may be due to carbon dioxide.


C. C. Wylie estimates that about 17 meteorites strike in the United States per year, that about 1/30 of these fall in villages and cities. While the urban population is denser and chance of observation therefore greater, the city noises and illumination are offsetting factors which balance the count in city and country.

S. L. Boothroyd in a paper on the important work of the Arizona Meteor Expedition reported that over 10,000 meteors had been observed with naked eye through reticles. Twenty-nine hours of telescopic observing yielded 396 meteors, of which 2/3 were seen in six hours on a mountain station, elevation 10,300 feet. The greater transparency of the higher altitude yields a large increase. This has been amply borne out by later observations. Velocities of 200 to 300 km/sec for the telescopic meteors seem to be the rule rather than the exception.

R. E. Wilson contributed a paper on the Taurus cluster increasing the membership of 136 by adding 221 and expanding the spread of it from diameter 18 to 250 parsecs. He calls the additional stars "group stars." He finds that the distributions of spectra in the cluster and group stars are similar.

In a paper on Elimination of Coma Effect from Observed Stellar Wave-lengths, Sebastian Albrecht dealt with one of the causes of troublesome spurious displacements of lines of the spectrum which arise within the optical system of the spectrograph and presented tables for corrections.

Two papers on stellar spectroscopy closed the program. R. F. Sanford presented accumulated evidence for the presence of the carbon isotope C13 in stars of classes R and N. Heads of the primary bands and the related secondary bands of C13 C12 were measured at λ 4737.02 and λ 4715.52, of C15 C13 at λ 4744.66 and λ 4722.90, of C14 C13 at λ 4752.27 and λ 4730.23. The growth of the bands was shown in a sequence of three class R and four class N stars.