MINOR CONTRIBUTIONS AND NOTES

THE THIRD CONFERENCE OF ASTRONOMERS AND ASTROPHYSICISTS.

At the Second Conference of Astronomers and Astrophysicists, held at the Harvard College Observatory in August 1898, a committee, consisting of Professors Newcomb, Comstock, Pickering, Morley, and Hale, was appointed to make arrangements for a third conference, and to draw up a constitution for a permanent organization. This committee was given power to add to its number, and accordingly Professors Boss, Michelson, Langley, and Ames were requested to serve with the members already appointed. A meeting of the committee was held in Washington in February 1899, and a constitution was drawn up. It was decided at that time to hold the next conference at the Yerkes Observatory. Details of the arrangements were left to Professor Comstock, secretary of the committee, and to the Director of the Yerkes Observatory.

The conference opened its session at the Yerkes Observatory on September 6, 1899, with Professor Harkness in the chair. The following papers were read:

A. S. Flint, The Repsold Transit Micrometer of the Washburn Observatory and Slat Screen Apparatus.


William Harkness, On the Semi-Diameters of the Sun and Moon.

F. R. Moulton, Problems in Modern Celestial Mechanics Treated by the Use of Power Series.

Ormond Stone, On the Motion of Hyperion.


Kurt Laves, Determination of the Principal Term of Nutation from Observations of Eros.


Asaph Hall, Jr., Aberration Constant from Meridian Zenith Distances of Polaris.

J. E. Keeler, The Ring Nebula in Lyra.

George E. Hale, Notes on Carbon in the Chromosphere, the Connection between Stellar Spectra of the Third and Fourth Types, and Some New Forms of Spectroheliographs.
E. B. Frost, Notes on the Reduction of Stellar Spectra, Titanium as a
Comparison Spectrum, and Corrections of Absolute Wave-Lengths
due to the Earth's Motion.

Frank Schlesinger, Suggestions for the Determination of Stellar Paral-
lax by Means of Photography.

S. I. Bailey, Note on the Relations between the Visual and Photo-
graphic Light Curves of Variable Stars of Short Period.


H. S. Davis, A Statement of the Progress of the New Reduction of
Piazzi's Meridian Circle Observations between 1792 and 1814.

W. W. Campbell, The Spectroscopic Binaries Capella and Polaris.

F. L. Chase, Refraction of Red Stars.

George C. Comstock, Some Researches in Stellar Color.


F. R. Moulton, Laplace's Ring Nebular Hypothesis.

G. W. Hough, On the Actinism or Photographic Power of the Moon
in a Total Eclipse.

M. B. Snyder, The Phonochronograph and its Advantages in certain
Astronomical Observations.

Abstracts of all these papers will be published in *Science*, and most
of the astrophysical papers will be published in full in this Journal.

Several committees appointed at the Harvard Conference presented
reports. The committee on a permanent society offered the following
constitution, which was adopted without material change:

**CONSTITUTION.**

**Article I. Name and Purpose.**

1. This association shall be called The Astronomical and Astrophysical
   Society of America.

2. The purpose of this society is the advancement of astronomy, astro
   physics, and related branches of physics.

**Article II. Membership.**

1. Those persons whose names were signed on or before September 15,
   1899, to the annexed statement of desire to form such an association shall
   constitute the charter members of this society. Other persons may be elected
to membership in the society by the council hereinafter provided.

2. The council shall prepare and publish, in the form of a by-law, uni-
form rules for the government of such elections.
Article III. Officers.

1. The officers of the society shall consist of a president, two vice presidents, a secretary, and a treasurer, who, in addition to the duties specifically assigned them by this constitution, shall discharge such other duties as are usually incident to their respective offices. These officers, together with four other members of the society, shall constitute a council, to which shall be entrusted the management of all affairs of the society not otherwise provided for. The president and secretary of the society shall serve respectively as chairman and secretary of the council, and every officer of the society shall be responsible to the council and shall administer his office in accordance with its instructions.

2. The council shall enact such by-laws as may be found needful and proper for administering the affairs of the society, and may, from time to time, modify or repeal such by-laws.

3. The president, the vice presidents, and the treasurer shall be elected annually, in a manner to be prescribed by the council, and shall serve until their successors are duly elected and qualified. Two members of the council shall be chosen at the first annual meeting of the society to serve for a period of one year, and two members shall be chosen annually to serve for a period of two years, or until their successors are duly elected and qualified. The term of office of the secretary shall be three years, or until his successor is duly elected and qualified.

Article IV. Meetings.

1. The council shall determine the time and place of each meeting of the society, and shall provide for an annual meeting, at which officers shall be elected.

2. The council shall have charge of the program for each meeting.

3. At meetings of the society, regularly called, twenty members shall constitute a quorum.

Article V. Finance.

1. The council shall levy an annual assessment upon the members of the society sufficient to provide the funds required by the society for the ensuing year; provided that this assessment shall not exceed the sum of five dollars per member in any year.

2. If at any time there shall be required, for the purpose of the society, a larger sum than can be obtained in accordance with section 1 of this article, the council shall present at an annual meeting of the society a statement of such need, and of the circumstances attending it, and the society shall thereupon determine by ballot a policy to be adopted in the matter.

3. No officer of the society shall receive any compensation for services rendered to it, but the council may by resolution direct the treasurer to
reimburse to any officer expenses necessarily incurred by him in the dis-charge of his official duty.

Article VI. Amendments.

1. This constitution may be amended by the affirmative votes of three fourths of the members present at any annual meeting of the society, but no amendment shall be voted upon unless a notice setting forth the nature of such proposed amendment shall have been forwarded to the several members of the society at least one month before the meeting at which it is proposed to be voted upon.

2. It shall be the duty of the secretary to forward such notices of a proposed amendment to this constitution when so requested in writing by ten members of the society.

A by-law subsequently adopted by the council provides that

Any person deemed capable of preparing an acceptable paper on some subject of astronomy, astrophysics or related branch of physics may be elected by the council to membership in the society upon nomination by two or more members of the society. At least once in each year the council shall consider all such nominations and may request the opinion of persons not members of the council with reference to the qualifications of the nominees. Blanks for such nominations to membership shall be furnished by the secretary.

It was decided that officers of the new society should be elected on the last day of the session, and the committee on organization was instructed to take nominating ballots on the afternoon of the previous day. The results were announced at the final session on Friday morning, when officers of the Astronomical and Astrophysical Society of America were elected as follows:

<table>
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<th>OFFICERS.</th>
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<tr>
<td>President</td>
<td>Simon Newcomb.</td>
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<tr>
<td>Vice Presidents</td>
<td>C. A. Young,</td>
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<td></td>
<td>George E. Hale.</td>
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<td>Secretary</td>
<td>George C. Comstock.</td>
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<td>Treasurer</td>
<td>C. L. Doolittle.</td>
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<td>Councilors, for two years</td>
<td>E. C. Pickering,</td>
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<td>J. E. Keeler.</td>
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<td>Councilors, for one year</td>
<td>E. W. Morley,</td>
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<td></td>
<td>Ormond Stone.</td>
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On account of the poor health of Professor Comstock, Professor E. B. Frost, of the Yerkes Observatory, has consented to serve as acting
secretary for the present. The list of the charter members of the new society includes one hundred and fourteen names.

At a meeting of the council held on September 8, it was decided that the next meeting of the society should be held in June 1900, at New York, in conjunction with the meeting of the American Association for the Advancement of Science.

The committee on the total solar eclipse of May 28, 1900, consisting of Professor Newcomb, chairman, Professor Hale, secretary, Professor Barnard and Professor Campbell, presented the following preliminary report:

THE TOTAL SOLAR ECLIPSE OF MAY 28, 1900.

The committee on the total solar eclipse of May 28, 1900, appointed at the Second Conference of Astronomers and Astrophysicists, presents herewith a preliminary report.

The aim of the committee has been:
1. To ascertain the opinions of astronomers regarding the best means of securing coöperation, the most important classes of observations and the best means of making them, and the plans of the various eclipse parties.
2. To collect other information likely to be useful to persons planning to observe the eclipse.

For the purpose of securing information on the various points referred to in paragraph (1) a circular letter was addressed to American astronomers. From an examination of these replies it appears:
1. That there is a general willingness to coöperate with the committee in securing thorough observations of the eclipse phenomena and effective distribution of stations along the line of totality.
2. That, in the opinion of those from whom replies were received, the most important observations include studies of the minute structure of the corona, both visually and by means of large scale photographs; photography of the flash spectrum and determination of the wave-length of the green coronal line; measurement of the heat radiation of the corona; photographic search for an intra-mercurial planet.
3. That several institutions, including the Princeton, Lick, Naval, Goodsell, Chabot, Flower and Yerkes Observatories, will probably be represented by well-equipped parties; while a considerable number of astronomers with good instrumental equipment will take part as individuals.
4. That no general appeal to the public for funds is required, as each institution will endeavor to secure the amount necessary for its work.
5. That the work already planned includes observations of contacts, photography of the corona with large and small cameras; visual and photographic observations of the spectrum of the Sun's limb and of the corona;
visual examination of the details of the coronal structure; measurement of the brightness of the sky at different distances from the Sun; search for an intra-mercurial planet; observations of the shadow bands.

Extracts from the letters of various astronomers are appended to this report.

A preliminary report on the weather conditions along the line of totality has been prepared by the Weather Bureau, at the request of the committee (p. 221). From this it appears that interior stations are probably to be preferred to those on the seacoast, in spite of the shorter duration of the total phase. The full report of the Weather Bureau, which will soon be published, will contain much valuable matter, including maps of the eclipse track, showing location of towns and railways; information regarding hotel accommodations, desirable sites; etc.

It is understood that the Naval Observatory will issue instructions to observers, and that a map of the eclipse track will be published by the Nautical Almanac Office. The Treasury Department has made arrangements by which the instruments of foreign parties will be admitted free of duty.

The committee, if authorized by the conference to continue its work, will be glad to receive and publish further information from eclipse parties regarding their plan of observations and location of stations.

In response to the circular letter referred to above the committee has received the following statements regarding the classes of observations which are considered most important.

Ordinary photographs of the corona with cameras of different kinds; photographs with the apparatus designed by Mr. Burckhalter. (I am convinced from an examination of the photographs secured by this method in India, that such photographs show the forms of the coronal streamers far more satisfactorily than a comparison of ordinary photographs taken with different exposures.) Photographs for determining the exact wave-length of the "coronal line." It appears that this line has been erroneously identified with a line in the solar spectrum. Possibly, photographs for showing the displacement of this line on opposite side of the Sun, like those made by Deslandres, though very effective apparatus will be required for this purpose. Photographs of the spectrum of the "reversing layer." In my opinion the best form of instrument for this purpose is an object-glass spectroscope, arranged as follows: the refracting edge of the prism is placed parallel to the disappearing limb of the Sun. At the focus is a fixed slit, placed radial or lengthwise of the spectrum, and the photographic plate below it is moved slowly at right angles to the slit, securing a continuous record of the spectrum. The same observations are repeated at the end of totality. The details of the apparatus require, of course, careful consideration.

James E. Keeler.
I think a photographic search for an intramerician planet, and a study of the brightness of various portions of the sky by means of photography, such as I made in Grenada in 1886 (H. C. O. Annals, 18) would be of value. I do not think that mere pictures of the corona, unless upon a large scale with good definition, will have anything more than a personal interest. . . .

I shall make a study of the brightness of the sky as above described. I should like to make a search for an intramerician planet. I have already completed a series of photographic observations which show that during an eclipse it is possible to photograph stars as faint as the seventh magnitude. We are at the present time reasonably sure from visual observations that no such planet brighter than the 3.0 or 3.5 magnitude exists, but have no evidence with regard to smaller bodies. My observations show that a body of the size of an average asteroid, say, 20 miles in diameter, located within 15 million miles of the Sun, would certainly show upon my plates. The nearer to the Sun it lies the more conspicuous it would become.

W. H. Pickering.

In thinking about what the observatories having small incomes might do in connection with the total eclipse of the Sun of May 28, 1900, it has occurred to me that it might be useful to take photographs during totality at various points along the path of the shadow in America and also in Spain, and from these possibly obtain definite evidence of change in the corona during the interval. Careful orientation would be necessary. To obtain a zero of position angle a réseau or a single line on the plate might be used (possibly a vertical line) and the crescent Sun photographed just before and after totality. A combination of three photographs taken at any given place with the same instrument, one before, one during, and one after totality, ought to fix the position angle of any given coronal ray pretty accurately.

Ormond Stone.

(a) Little has been learned of the details of structure in the corona. A closer examination of special portions under good telescopic power is suggested in addition to photographs. (b) Corresponding observations made by observers in this country and in Portugal and Spain can be arranged to advantage in this eclipse on any agreed-upon subject. (c) A cloudy weather program, made up, e. g., of meteorological notes, degree of darkness, change of color, change in light by jumps instead of gradually, it is well to arrange for, in case the sky is cloudy.

Winslow Upton.

It is proposed to measure the rate at which the radiating power of the solar atmosphere diminishes with the altitude above the photosphere, and to obtain a rough quantitative comparison with photospheric radiation. The apparatus required is as follows: (1) a large siderostat with a good driving-
clock, and freely moving attachments permitting rapid but fairly accurate adjustment. The plane silvered mirror should be about a foot and a half in diameter. (2) A concave silvered mirror, about one foot in aperture and 30 to 40 feet in focal length, mounted on a tripod with adjusting screws. (3) A linear bolometer (exposed part of strip about 5 mm long by \( \frac{1}{4} \) mm wide) in a cylindrical water jacket, the strip being viewed from behind by an eyepiece. The entire bolometer case must be capable of being moved radially in the solar image by a recording, slow-motion screw, the strip being set tangent to the limbs of the Sun and Moon at the point of internal contact by revolution of the case in its holder. The holder preferably slides on a vertical bar with massive tripod base, and adjustments resembling those of a cathetometer. (4) A delicate galvanometer, nearly dead-beat, with time of half-swing three to five seconds, and a wide-range shunt operated by the reader. The shunt may be a resistance box, with coils from \( \frac{1}{1000} \) to 1000 ohms, the resistance of the galvanometer being about 10 ohms. (5) A bolometer battery suited to the rest of the apparatus.

The reflection from the concave mirror need not return on the path from the siderostat, but may fall upon the bolometer placed in a shelter on one side, where also the galvanometer and battery are situated. The concave mirror and siderostat may have separate shelters.

The screens for exposing may be permanently withdrawn during totality, but the galvanometer's zero-reading must be approximately constant.

Final adjustments, with instruments almost entirely screened, must be made on the vanishing crescent a few minutes before totality.

One observer must be detailed to keep the siderostat accurately pointed to the Sun, not, as is commonly done, by the use of a finder attached to some part of the siderostat-movement, and sharing its lost motion, but by means of a telescope with adjustable cross-wires, receiving a portion of the beam from the mirror. A micrometer-reader at the bolometer, recording silently both the setting and the time, a galvanometer-reader, who also manipulates the shunt and calls the galvanometer deflections aloud, an observer at the eyepiece who exposes by withdrawing the screens in the path from the siderostat to the concave mirror, setting the bolometer thread in the coronal image, and calling out "read," a timekeeper and a recorder who has the faculty of doing several things at once, and who records galvanometer readings and times, with any remarks by the observer at the eyepiece, will be needed. The observer at the eyepiece controls the others by his movements, and must give directions and warnings.

Since we cannot tell beforehand what deflections to expect, there must be the ability to alter the sensitiveness of the galvanometer rapidly. Suppose that the first deflection, immediately after totality is announced, is 25 div. (the shunt being 1 ohm). The shunt resistance is at once increased until
a deflection of (let us say) 250 div. is obtained for tangency, or in the brightest part of the corona. The micrometer-reader notes the micrometer setting for the position of tangency at that instant. The bolometer is then moved radially outward by steps, the galvanometer-reader calling successively (e.g., 200, 150, 100, 50, or whatever the readings may be) and the micrometer-reader noting the corresponding positions. Our reading must be made on the Moon during totality to determine atmospheric radiation.

If there is still time, shift 180° (most rapidly effected by the assistant at the siderostat) and repeat the measurements on the opposite side of the Sun, securing, if possible, tangential readings just before emergence.

Final measurements on the photosphere may be made conveniently by following the edge of the Moon, noting times. A variety of stops should be provided for the concave mirror, to be used in addition to the shunt in securing manageable deflections during this stage. I do not allude to the precautions required in bolometric measurement, as this would require a small treatise.

Since there is no present prospect of my securing such an outfit, I can only add that I should be very glad to undertake the work, if opportunity offers.

FRANK W. VENY.

As to the observations to be considered most important, I rather naturally think of spectroscopic, especially in the lower portion of the spectrum, which thus far has been only very imperfectly reached by photography. The questions as to changes in the “flash-spectrum” from second to second, and, in view of Mr. Lockyer’s recent paper in Nature, and Mr. Campbell’s observations of the eclipse of 1898, the verification or otherwise of their result for the wave-length of the coronal line. Photographic and visual observations should be combined, and both “analyzing” and “integrating” spectroscopes. I leave to others problems relating to photometry and polarization.

C. A. YOUNG.

By vote of the conference the committee was continued. Intending observers of the eclipse are requested to communicate with the committee regarding their plans of work.

The committee on the United States Naval Observatory, appointed at the Harvard Conference, reported that the opinions of astronomers regarding the organization of the Naval Observatory had been obtained and communicated to the Secretary of the Navy. In harmony with the suggestion of the committee, the Secretary of the Navy, with the advice and approval of the Superintendent of the Observatory, has appointed a Board of Visitors to visit, examine and report upon the United States