4. *H. Zirin.* The spectrum of the flare of 1960 November 14.

5. *M. C. Ballario.* On the classification of solar flares. (Presented by *G. Righini*).

6. *S. Lukyanov, A. B. Severny, A. Babin, G. Sidorov, N. Steshenko* and *V. Sinitzin.* The comparison of line profiles in flares and in laboratory pinch. (Presented by *A. B. Severny*).

7. *M. R. Kundu.* Correspondence between X-ray emission producing SIDs and 2800 Mc/s bursts.

8. *J. C. Noyes.* The characteristics of solar active regions associated with flares producing low-energy solar protons.

10*a*. SOUS-COMMISSION DE CINEMATOGRAPHIE DES PHENOMENES SOLAIRES

Report of Meeting, 17 August 1961

PRESIDENT: W. O. Roberts.

SECRETARY: M. N. Gnevyshev.

The meeting was opened by the President, who called attention to the fact that this was the last meeting, *per se*, of the Sub-Commission for Cinematography of Solar Phenomena, presided over for so many years by Dr Lyot. He pointed out that the work of the Sub-Commission, under the IAU reorganization, will be carried on by a Working Committee, or otherwise as the parent Commission 10 may decide. The President also paid tribute to Dr McMath for his pioneering work in solar cinematography.

CONTINUOUS MOTION PICTURE OF DISK ACTIVITY

The President recalled the long-standing goal of the Sub-Commission, to assist the preparation of a continuous, unbroken film of solar disk Hα activity on a 24-hour per day basis for an extended period. He then called on Dr H. Smith to report on work of the Special Working Committee entrusted with this task. Dr Smith reported on work subsequent to the formal report previously submitted. The Working Committee had elected the period 6–20 July 1959 for a trial movie, as one of the great periods of activity in Solar Cycle 19. Twelve observatories in eight countries have contributed films to the combined effort. There are numerous small-time gaps, usually of the order of one hour, but coverage is approximately 90% complete. Final editing is in progress at Sacramento Peak Observatory. Numerous disparities of image size, orientation, density and contrast must yet be removed, and a uniformly advancing clock must be superimposed on the images. These difficulties are, however, being surmounted, and approximately 20 000 individually adjusted frames of film are being completed. The final prints are expected to be ready to distribute in mid-1962. The master negative will be stored in the IGY Data Center A, and duplicate copies will be available there. The quality of the final prints will not equal the original films, of course, because of the need for multiple copying and for other photographic manipulations.

Dr Smith emphasized the degree to which future efforts of this sort would be enhanced by uniform standards of size, orientation, registration, density and contrast. Dr Michard also appealed for establishment of uniform standards for these characteristics. The President expressed thanks to the Working Committee for its excellent progress. The report of Dr Smith was accepted by the meeting.

CORONAL INTENSITY STANDARDIZATION

The President then opened discussion of the matter of coronal intensity standardization, the subject of the Working Committee headed by Dr Rösch. Dr Trellis reported for Dr Rösch the work of the Committee.

The Working Committee studied the relation of coronal intensity scales of all active coronal observatories. The work revealed that there appear to be substantial changes, on occasion, of coronal intensities in periods as short as a few hours. However, the large dispersion of coronal observations of the same coronal intensities is still evident. Dr Trellis emphasized the need, suggested by this work, for photo-electric photometry for such observations, which would presumably be more nearly free from accidental errors. An instrument for this purpose has been constructed at Paris Observatory, and will be used in the period immediately ahead.

The report of Dr Rösch's Working Committee can be obtained from the President or directly from Dr Rösch. The President thanked Dr Trellis for the report.

Mr Hansen reported that calibrating filters have been made available from the World Data Center at Boulder, Colorado, for coronal standardization by photographic methods.

The President then invited Dr Bell to describe briefly her analysis of the latitude of coronal peak intensities for the period of observation of Climax and Sacramento Peak Observatories. Her data show that the maxima of coronal activity progress from higher latitude to lower, in unbroken sequence, from approximately four years before the minimum of solar activity. This result confirms the earlier results of Dr Trellis.

CENTRALIZATION OF DATA AND FILMS

The President then introduced the subject of centralization and exchange of data and films of Hα and other disk solar activity. He pointed out that the IGY organizational schemes had been highly effective. The experience suggests a continuing need for data to uniform standards, rapidly centralized. Particularly is this so with the increased use of artificial satellites for geophysical research, and with world-wide interest in manned satellites.

Dr Michard then summarized his studies of the completeness of solar flare patrol operations in recent years. He suggested that critical time zones for further coverage are in summer at $01^h\,30^m$ to $06^h\,00^m$ U.T., in winter also at $12^h\,00^m$ to $16^h\,00^m$ U.T. He urged improved coverage in India, China and by earlier observations, if possible, at U.S.S.R. stations such as Ussuriysk, Tashkent and Alma Ata. He also spoke with hope of possible further coverage in Eastern North America, in the Canary Islands, and at Huancayo, Peru.

Extended discussion confirmed the needs for further patrol work in the years ahead, and particularly during the IQSY period (1964–65). The discussions led to unanimous adoption of the following resolution:

> "The Sub-Committee notes with satisfaction the effectiveness of the co-operative solar flare patrols of the IGY and the IGC-1959, and the continued co-operation of many observing stations in voluntary cinematographic flare coverage and data centralization; the Sub-Commission also notes the increasing demand for accurate solar flare data and for patrol of other abrupt solar Hα phenomena during the IQSY period, and through the solar activity minimum; the Sub-Commission therefore commends continued efforts towards complete flare and disk coverage on a co-operative international basis; the Sub-Commission notes in particular the importance of filling the major time gaps by further patrol coverage from China, the U.S.S.R., India, Latin America and Eastern North America; it further urges preparation by the World Data Centers of a full catalog of films available at co-operating stations."

SPECIFIC RECOMMENDATIONS

The Sub-Commission then turned its attention to several specific recommendations. In addition to the recommendations mentioned in the Sub-Commission report, the members adopted, by unanimous vote, the following resolution:

"The Sub-Commission recommends the preparation by the World Data Centers of a co-operative catalog of records of swept-frequency solar radio noise telescopes, covering all longitudes, and emphasizes the great importance to solar physics, space physics, and solar-terrestrial research of the widest possible international co-operation to assure full observational coverage."

The final meeting of the Sub-Commission concluded with enthusiastic endorsement of a resolution by Dr Dodson-Prince to send, on this occasion, telegrams of greeting and appreciation to Dr L. d'Azambuja, Dr R. McMath, Dr G. Abetti and Madame Lyot for their devoted support of the historic goals of the Sub-Commission. The President agreed to send such messages immediately upon the close of the session.