COMMISSION 8: POSITIONAL ASTRONOMY
(ASTRONOMIE DE POSITION)

Report of Meetings, 15, 21 and 22 August 1979

PRESIDENT: R. H. Tucker SECRETARIES: B. L. Klock, F. S. Gauss

Constitution of Commission

President: Høg. Vice-President: Tavastsherna.
Organizing Committee: Anguita, Billaud, Débarbat, Fricke, Hughes, Klock, Lopez, Nikoloff, Teleki, Tucker, Yasuda.
In order that the O.C. should adequately represent the great contribution of the U.S.S.R. to Positional Astronomy, the incoming President was asked to co-opt one or two new members to the O.C. after the G.A., under the terms of I.A.U. By-Law 21.
Deceased Members: Y. E. Gordon, A. K. Korol', H. U. Sandig, J. L. Schombert, L. S. T. Symms.
Retired: A. N. Adams, A. Bohrmann, W. Dieckvoss, B. Guinot, E. D. Hoffleit, S. Isobe, P. Rybka, R. H. Stoy, G. van Herk.
New Members: Bem, Benevides-Soares, Feissel, Hurukawa, Kovalevsky, Miyamoto, Polnitzky, Rusu, Sanchez, Yatskiv.
New I.A.U. Members: Backer, Carestia, Carrasco, Chamberlain, Chlietovsky, Corbin, Duma, Fedorova, Laclare, Loyola, Pham-Van, Pinigin, Poma, Russell, Sadzakov, Schwan, Sims, Smith.
Consultants: Blackwell, Branham, Fanselow, Helmer, Hemenway, Lindegren, Orelskaya, Pakvor, Zimmermann.
Numerical Strength (with previous values in brackets) 13 (13) Officers, 99 (84) Members, 9 (5) Consultants, Total 121 (102).

Working Groups and Study Groups (Chairman's name given first)

Refraction: G. Teleki; Altenhoff, Garfinkel, Hughes, Kolchinsky, Nefedeva, Ramsayer, Saastomoinen, Sugawa, Tengstrom, Yasuda.
Astrolabes: G. Billaud; Debarbat, Gliese, Gubanov, Noel.
Horizontal M.C.: E. Høg; Atkinson, Gietzen, Klock, Osorio, Pinigin, Timashkova, van Herk.
Co-ordination of Stellar Positional Work: (Jointly with Commission 24).
See report of Joint Meeting of 21 August for list of members.

Scientific Papers (15 August)

Débarbat presented papers by F. Chollet et al. (Astrolabe Observations of the Sun) and Requième (Photoelectric M.C., Bordeaux). A cooperative program for observing the Sun with Astrolabes, using a special filter, is being undertaken by Laclare (CERGA), Demarcq (Nice) and Chollet (Paris). The first experiments with the re-furbished M.C. at Bordeaux are expected in September, 1979. Limiting magnitude V = 12.5, expected error ±0".12 in each coordinate. Høg presented a report by himself and Høyer analysing 110,000 observations (Perth 70) and 60,000 by Nikoloff and his associates (Perth 75). Fricke remarked that this work is important for the FK4 Supp observations, rather than for proper motions. The desirability of publishing asymptotic errors was discussed. Smith gave a progress report on W_5 50, W_6 50, W_L 50, SRS, and the preliminary positions of the Sun, Moon and Planets for 1975-77 at U.S.N.O. He requested that SRS observers should send individual results. It is hoped that SRS will appear before the next General Assembly.

Teleki gave a report of the Study Group on Astronomical Refraction.

Yatskiv presented 6 papers by USSR authors. Tavastsherna has used classical and modified chain methods to reduce Melbourne R.A. observations between 1928 and 1941. Kurianova et al. report on the compilation of PFKSZ-2 from 42 catalogues reduced to the FK4 system. 22 catalogues were used for the proper motions. Duma et al. have determined corrections to FK4 equinox and equator from 18,471 planetary observations, between 1928 and 1971. Orelskaya used 10 minor planets observed from 1949 to 1968. Fricke commented on the difficulties of this type of work. Minor planets nos. 2 and 3 do not contribute at all to the equinox. The good results from 10 minor planets appeared to be fortuitous. The equinox is not easily determined from T.C. observations unless they are rigorously reduced to FK4, and this is difficult for planets. It is very hard to get anything out of Mercury and Venus. Yasuda's results from Mars agree with Duma's.

Afanasieva and Fomin used the RATA-600 radio telescope to measure astrometric positions of Mercury and Venus from their microwave radiation. The instrumental parameters are calibrated by simultaneous optical observations. The mean error quoted is $1\frac{1}{2}$ times that of the T.C. Observations are made only at elongation, and no correction for phase is made, as the illumination of the disc is not relevant to the thermal radiation. Finally, Zverev et al. proposed a new campaign of AGK3R and SRS observations, combining the lists into one as "IRS". A working group should be set up to study the problems.

Sadzakov presented a paper on Recent Observations with the Belgrade Meridian Circle, and Teleki reviewed refraction investigations between 1976 and 1978. No new studies have been made of temperature effects inside the telescope tube. Hughes reported new investigations of humidity effects at USNO. The Pulkovo Tables humidity correction works well at standard pressure, but there is considerable error at low pressure, and some attention should be given to this. Yasuda gave a progress report on the NPZT observing program. Billaud presented a report of the Working Group on Astrolabes, and Høg reported the work of the Study Group on Horizontal Meridian Circles. Teleki presented a report by Nefedeva on the new Pulkovo Refraction Tables. The functional relationships used are described in the publication. The water vapour correction methods are practically the same as those of the Fourth Edition. For zenith distances less than 70° there are no practical differences between the tables.

Hemenway reviewed the Implications of Space Astrometry on Ground Based Work. Discussion afterwards concentrated on the Space Telescope, which had a focal length of 60 m, an astrometric precision of 0".002, and an unknown accuracy. No facility for comparison of widely separated fields was in prospect.

Tucker gave a report of IAU Colloquium No. 48 (Vienna) of which the Proceedings had been published already. Teleki reported on the Nomenclature meeting held the previous day at Montreal. Débarbat presented a Bibliography of Astrolabe Literature prepared by A. Stoyko.

Joint Meeting, Commissions 8 and 24 (21 August). Chairman: C.A. Murray

After some opening remarks by Eichhorn, Høg surveyed the prospects of Astrometry in the Eighties. Strand questioned the value of 1 micron for emulsion stability, estimating the true value to be about 0.4 micron. Murray suggested that the limiting instability was the atmosphere, but Strand said this would not be true for short-focus telescopes. Smith presented some suggestions for improvement of AGK3R and SRS. Fricke remarked that greater care must be taken in future when setting up a list. The dominance of K stars in the present lists resulted from a compromise to satisfy various groups of astronomers. Corbin reported the current state of AGK3R and SRS proper motions. In reply to Murray, he remarked that color was

obviously considered more than observational history. The distribution in the weaker zones would not be improved by adding more stars. Fricke recommended that the list should not be changed. If necessary, a proper motion should be based on only 2 catalogs to avoid discarding the star.

Eichhorn presented De Vegt's paper on a proposed Fourfold Plate-Overlap Coverage of the Sky. Nicholson reported on the progress in measuring Cape Photographic Plates at Herstmonceux, and Routly on the Zodiacal Catalog Program at USNO. Corbin remarked that both the De Vegt and Routly projects deserved support. Two catalogs are better than one, as in the Yale zone $+20^{\circ}$ to $+30^{\circ}$ where the Yale and AGK2 results were combined. The two catalogs could also provide checks for each other at the fainter magnitudes. Robertson reported on the work done with the Sydney astrograph, and remarked that he would appreciate offers to measure 1000 plates.

Stock gave a paper on Magnitude and Color Errors in Refractors, which Murray remarked should be considered by the new Joint Working Group. Yatskiv reported a proposed Photographic Survey by 10 double astrographs in USSR to observe about 400,000 stars.

A Joint Working Group for coordination of work on the Stellar Reference Frame had been set up by Commissions 8 and 24, with the following composition:
H. K. Eichhorn (Chairman); Høg, Hughes, Lederle, Murray, Nikoloff, Requième, Tavastsherna, De Vegt, Fresnaux, Gavrilov, Jones (B.), Potter, Robertson, Stock.

Murray raised the question of the aims of the Joint Working Group. It was agreed that these should be

(1) To consider the needs of Stellar Reference Frames for the next 20 years
(2) To formulate and implement plans for meeting these needs.

Study Group on Horizontal Meridian Circles (22 August)

Osorio reported on the status of the Oporto HMC.

Høg presented a paper on the Brorfelde design study for a horizontal instrument, formerly known as the GMC. The following points emerged during discussion:

The single taper roller bearing acted as a pivot.
The main tube will probably have additional counterweighting.
There are two auto-collimating systems.
The tilt of the main mirror will be measured with each observation.
The micrometer rotates with the main mirror.
The total weight of the moving components is 200 kg.
The mirror is small enough to have insignificant deformation imposed by the mounting springs.
The wear on the roller bearing will be negligible.
The timetable for construction has not yet been fixed.
The use of an evacuated tube would be attractive, but would raise a whole series of new problems.

Scientific Papers, Commission 8 (22 August).

Tucker formally proposed a resolution adopted at the Uppsala Symposium, calling for a special Joint Commission of IAU and IAG in the field of Refraction. This was carried by 12 votes to nil. Hughes gave a report on the status of the USNO Transit Circles, including an experimental micrometer using an image dissector, now under bench test. No details had been published as the design was still being developed. Yasuda described the projected Automatic Photoelectric MC being constructed for Tokyo Observatory. Pakvor reported on the observation of bright polar stars with

the Large Transit Instrument at Belgrade. Corbin reviewed problems arising from double stars in FK4. Débarbat reported recent observations of Beta Persei, and requested information on radio source stars bright enough to be observed with an astrolabe. Tucker reported on the Anglo-Danish collaborative project for Meridian Astronomy on La Palma. It is hoped that 1377 FK4 stars will be observable, and the total number of observations in two years will be over 200,000.

In discussion, it was stated that the instrument will require two observers, working three or four days on, followed by four or three days off, for three weeks at a time. Requième (Bordeaux) has expressed interest in joining the collaboration. Stars can be observed to about 5th magnitude by day. The building is planned to permit observations down to $4\frac{1}{2}$ degrees altitude. The Spanish astronomers hope soon to take an active part in the project with the Danish and British teams.

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