

8. COMMISSION DE L'ASTRONOMIE DE POSITION

Report of Meetings

PRESIDENT: F. P. Scott

SECRETARIES: R. d'E. Atkinson and P. Sémirot

First meeting, 16 August 1961

The Commission met at 11^h 00^m under the chairmanship of the President Mr F. P. Scott.

The *Draft Report* was adopted as originally printed, with the addition of I. A. Dyukov, 25 June 1961, to the names of deceased members, and with a few minor amendments.

Dr M. P. de Barros reported on the Mirror Transit Circle built under his direction at Oporto. The instrument is substantially complete, but its performance has not been rigorously tested, and owing to shortage of staff no clear prospect is seen either of doing this or of putting it into effective use if the tests proved satisfactory. The Commission adopted Resolution 1 given below unanimously.

Professor W. Fricke reported on the completion of the fundamental catalogue FK 4, giving the numbers of new catalogues incorporated since the FK 3, both for individual star-corrections and for systematic ones, and outlining the differences from FK 3; these are much smaller, and smoother, than the FK 3–NFK ones, but the southern stars are still inadequately observed. A full account will appear in the Publications of the Astronomisches Rechen-Institut.

Dr W. Gliese tabulated the mean errors of the FK 4, as obtained from discordances between individual fundamental catalogues. The errors vary with declination, but not with right ascension. South of -25° they increase, and beyond -70° they become very considerable, owing to the discordance between the Cape and Cordoba systems. The differences were also obtained between the individual catalogues of one instrument and the mean of all work with that instrument only. The resulting graphs ($\Delta\alpha \cos \delta$, at different epochs, as a function of δ) give a clear picture of the stability of each instrument. The Washington 6-inch is conspicuously more stable (though not necessarily more free from permanent systematic error) than the other three instruments studied in this way. A full report will appear in the Publications of the Astronomisches Rechen-Institut.

Second meeting, 17 August 1961

It was announced that the President of the Commission, for the ensuing 3-year term, would be Mr F. P. Scott, with Dr R. H. Stoy as Vice-President, and that the Organizing Committee would consist of Dr R. d'E. Atkinson, Dr J. R. Lévy, Professor S. Slaučitajs, Dr G. van Herk and Professor M. S. Zverev.

It was announced that Dr G. Fayet had completed a Catalogue of 969 Intermediary Stars between $+5^\circ$ and $+15^\circ$ of declination, based on observations with the Brünner meridian circle at Nice, between 1912 and 1914.

Dr B. Guinot presented an analysis of 60 000 Paris astrolabe observations of 360 stars in FK 3 and 211 in FK 3 Supp. The mean observational error in α is $\leq \pm 0^s.005$ for 80% of

the stars, and in δ it is $\leq \pm 0''.07$ for 75%. The mean values of the differences (Astrolabe – FK 3), for intervals of 2^h in α and 10° in δ were shown as a surface, and were also shown as graphs both for FK 3 and for FK 4. The differences, corrected for the above astrolabe scatter, would imply mean errors of $0^s.025$ and $0''.16$ in the FK 3 and of $0^s.014$ and $0''.09$ in the FK 4. The largest features in the FK 3 differences are much reduced in the FK 4, but most of those that still remain are also found at Neuchâtel and Pulkovo (photo-electric). He urged other observatories having astrolabe observations to analyse them also in this way, or else to forward them to Paris for the purpose. The importance of the star-places so obtained was stressed by various members, both present and absent, and the Commission decided to prepare suitable resolutions on the subject (see below).

Dr J. R. Lévy discussed methods of reduction in "differential" programmes. The results may depend on the size of the region used for comparison in each case, and the fundamental stars actually observed in each region. He suggested that the resulting ambiguity would be avoided if very few fundamental stars were employed, preferably distributed in a very regular pattern. These stars would thus form a first-order network to which other fundamental stars would be referred.

A report was presented from Dr K. N. Tavastsherna on the Pulkovo reduction of 2500 Backlund-Hough stars observed at Melbourne between 1928 and 1941 and only partially reduced there. The observations, consisting of about 30 000 in α and 20 000 in δ , together with those for the instrumental constants, have all been sent to Pulkovo. So far, only the declinations have been worked on; the reductions from apparent to mean place and the evaluation of the instrumental constants are complete and punched on cards, and a trial reduction of 30 stars led to a mean error for one observation of about $\pm 0''.50$. It is hoped to complete the work in 5 years, and that fundamental places will result which will be of value for proper-motion discussions.

Professor S. Slaucitajs reported that the Lick meridian circle originally taken to La Leona has been moved to La Plata for re-lapping of the pivots and other reconditioning. Meanwhile the La Plata instrument will be sent to La Leona. This will delay all La Plata programmes by some months.

Mr A. N. Adams reported on the method of recording R.A. and Dec. micrometers now being adopted on the Washington 6-inch and 7-inch instruments. The micrometer screw carries a selsyn designed to be good to $1/1000$ rev.; this controls a coded disk read by brush-contacts on command from the clock (or from the observer, for Dec. and for instrumental constants). The reading goes to a transistorized memory, from which the values can be punched. So far, the planned accuracy has not quite been attained, but nearly so, and improvements are in hand. The variable-speed R.A. drive is a precision ball-and-disk integrator.

Mr F. P. Scott spoke on the four additional star-lists (*a*) Bright Stars, (*b*) Double Stars, (*c*) Latitude Stars, and (*d*) PZT Stars. He announced that the commitments as printed must be revised: the observatories of San Fernando, Nicolaiev, and Bucharest will withdraw, in order to work on the Southern Reference Stars programme (SRS). The question of a central collection and analysis of the observations of these lists was discussed, but no final decision was reached.

Dr E. P. Fedorov presented some remarks from Professor M. S. Zverev, and supported them himself as President of Commission 19, on the need for more extensive meridian circle work on the latitude and PZT stars, especially from the point of view of studying non-polar variations. The Sternberg Institute has prepared lists of 2 000 and 1 000 stars respectively, in these categories, and these are being re-observed, but the number of participants is in-

sufficient. He requested support from the Commission and also proposed a small working group to study the accuracy requirements. (See below).

Dr R. d'E. Atkinson reported that outline proposals for the design of a Mirror Transit Circle at Herstmonceux, together with photographs of the mirror and axis already completed and tested, were on view in the Exhibition Room. At the request of the Ottawa astronomers, an informal discussion was arranged on such instruments in general, with special reference to the Ottawa one, and it was found necessary to hold a second meeting also.

Third meeting, 22 August 1961

The Chairman announced that the former Sub-Commission 8*a* had now been re-constituted as a Working Group, with Professor D. Brouwer as Chairman and with membership as before.

Dr B. Guinot announced that the seismological observatory at Wellington had decided to resume astrolabe observations as from April 1962 and that the observatory at São Paulo had decided to install an astrolabe. The Commission welcomed these announcements very cordially. The Commission then adopted Resolutions 2 (chain of astrolabes) and 3 (astrolabe results) unanimously. (See below).

The Chairman appointed a Working Group consisting of Dr E. P. Fedorov (Chairman), Dr R. d'E. Atkinson, and Dr P. Melchior, to study the accuracy-requirements for meridian-circle observations of the declinations of latitude-stars. Resolution 4 was then adopted. (See below).

The Chairman reported on the present state of the AGK 3*R* programme. All observatories are very far on in their observing programmes, the overall total being now about 95% complete; a very large fraction of the reductions is also expected to be complete by 1963.5. The final reduction procedure will, however, probably differ somewhat from that originally envisaged, in view of the fact that the FK 4 is now definitely available. Two proposals have emerged from correspondence:

(1) That all individual observations of fundamental stars and of reference stars be centrally collected (at Washington) and used first to make minor further improvements in FK 4; the reference-star observations would then be adjusted, night by night, to this rectified fundamental system.

(2) Professor P. Lacroute had proposed that reference stars and fundamental stars should all be used to revise the instrumental constants of each night, by comparison of each star's preliminary place for that night with its preliminary places for all other nights. Speaking on this proposal he said that trial runs at Strasbourg had shown that the weights of the instrumental corrections were increased by about 20 to 30%, and he claimed that some systematic night-errors were eliminated. The final result would not be exactly on the FK 4 system, but could be rigorously compared with it.

The Chairman considered that this method would be longer, and raised the question whether the completion of the AGK 3 programme should wait for this, and also whether it should wait for all KSZ observations. Professor Lacroute stated that his analysis could not start until receipt of the last set of observations made at all declinations. The Chairman considered that electronic computers made it reasonable to contemplate using both methods independently, and the comparison should be valuable. He proposed Resolution 5, which was carried. (See below).

He then reported on the proposed Southern Reference Star programme (SRS). The list of commitments given in the Draft Report could now be extended as follows:

Observatory	Range
Bergedorf southern	0° to -90° (possibly)
Bordeaux	0° to -20°
Bucharest	0° to -10°
Nicolaiev	0° to -20°
San Fernando	0° to -30°
Tokyo	-15° to -30°
Abbadia (Hendaye)	

Professor M. S. Zverev and Dr A. A. Nemiro requested (by letter) that all southern observations be sent to Pulkovo and the results published in U.S.S.R. They also considered that FK 4 is not adequate for southern stars, and that new fundamental observations and a complete discussion are required. The Chairman felt that northern observatories making southern observations would complete their task well before a fundamental discussion would be possible, and he would propose to treat these like the AGK 3R programme, and as soon as possible. After discussion, Resolution 6 was adopted. (See below). It was stated that Pulkovo proposed to photograph the whole southern sky with a Maksutov camera of two metres focal length, having a field $4\frac{1}{2}$ degrees square. The following were appointed as an Expediting Committee for the entire S.R.S. programme: Mr F. P. Scott (Chairman), Professor D. Brouwer, Dr P. Sémirot, Dr R. H. Stoy, Dr J. E. B. von der Heide, Professor M. S. Zverev; with Professor W. Fricke as consultant.

It was announced that Pulkovo had prepared a "Bright Star List" in two parts, north and south of -30° respectively. It consists principally of FK 3, FK 3 Supp., and Backlund-Hough stars. There appeared to be some risk that the latter might be neglected, but it was considered important to keep them up. Resolution 7 was discussed and carried. (See below).

RESOLUTIONS ADOPTED BY THE COMMISSION

1. Commission 8 has noted with great interest the virtual completion, since the last General Assembly, of the "Mirror Transit Circle" at the University of Oporto. This pioneering project has been carried through with great courage and perseverance, and the Commission expresses the most earnest hope that means may be found to subject the instrument to the necessary tests and to bring it into appropriate operation at a very early date.

2. Commission 8 notes with regret that although astrolabe observations are of recognized value for improving fundamental catalogues, particularly in the southern hemisphere, no practical effect has been given to the resolutions in favour of establishing a chain of astrolabes, which were adopted at the tenth General Assembly in Moscow and at the second Astrometric Conference in Cincinnati. The Commission repeats this recommendation once again.

3. In view of the fact that many astrolabe observations have not yet been discussed for the purpose of improving star-places, Commission 8 urges the authors in question either to undertake this analysis or to notify the Paris Observatory that they do not propose to do so; in the latter case the Commission understands that the Paris Observatory will itself undertake the work.

4. Commission 8 recommends that on the basis of the findings of the Working Group appointed to consider meridian observations of latitude stars, a sufficient number of observatories having meridian circles be urged to make the necessary number of observations.

5. Commission 8 recommends that: (a) the individual observations of the AGK 3R stars, and of the fundamental stars used in their reduction, be made available to the U.S. Naval Observatory, for the formation of a reference-star catalogue rigorously related to the system of

the FK 4; (b) the individual observations thus collected at the U.S. Naval Observatory be made available by it to the Strasbourg and Pulkovo Observatories.

6. For the purpose of forming catalogues of the Southern Reference Stars, Commission 8 recommends: (a) that the individual observations of Reference Stars and Fundamental Stars in the zone 0° to -30° be made available to the U.S. Naval Observatory and that those in the zone -30° to -90° be made available to the Pulkovo Observatory; (b) that the U.S. Naval Observatory and the Pulkovo Observatory exchange as many of these observations as may be requested by either, to meet the requirements of their catalogues and to obtain a good connection with the AGK 3R catalogue.

7. Commission 8 recommends that the "Bright Star List", 0° to -90° , be observed during the Southern Reference Star programme.