

24. COMMISSION DES PARALLAXES STELLAIRES
ET DES MOUVEMENTS PROPRES

PRÉSIDENT: M. J. JACKSON, *formerly H.M. Astronomer at the Cape.*

MEMBRES: M. Alden, Mme Burbidge, MM. Burns, Cecchini, A. N. Deutsch, Haas, Hertzprung, Hins†, C. Jackson, Mlle Jenkins, MM. Kohlschütter, Kuiper, Lavdovski, Lindblad, Luyten, E. G. Martin, Mitchell, Nechvile, Paloque, Parenago, Podobed, Schilt, Smart, Stearns, Strand, van de Kamp, van Rhijn, A. N. Vyssotsky, Wagman, R. E. Wilson.

NEW GENERAL CATALOGUE OF PARALLAXES

At the Zürich meeting it was reported by Prof. Brouwer that very few copies remained of the *Yale Second General Catalogue of Parallaxes* (1935) and, on account of the great number of new parallax determinations available, it was decided that a new general catalogue was most desirable. Prof. Brouwer reported also that Miss Jenkins, who had assisted Prof. Schlesinger with the earlier catalogue, had carried on the compilation of parallaxes as they were published and that she was willing to undertake the preparation of a new catalogue. The Union voted 1500 dollars toward the cost of publication. Since 1948 Miss Jenkins has been working on the catalogue. As a result of the discussions at Zürich it has been decided that the new catalogue will differ in several respects from the old one. It will contain only trigonometric determinations of parallax. An important feature of the old catalogue was that the individual parallaxes were made absolute, had systematic corrections applied and had the probable error adjusted before being entered. In the new catalogue the individual observed relative parallaxes will be given although the adopted mean absolute parallax will be given as in the earlier catalogue with corrections and adjustments applied. It will therefore be simple for anyone to examine anew the observational data for systematic errors.

With regard to the differences between the several series of observations, Miss Jenkins writes:

A least-squares solution of comparisons of each of the longer series of trigonometric determinations with every other has been made with approximately a 50% increase over 1935 in the number of stars common to any two observatories. In most cases the comparison for the 1935 catalogue was confirmed with only slight changes. The largest differences from the 1935 catalogue were such as to reduce to zero the negative corrections that were adopted in 1935. A similar comparison of the longer parallax series using the average differences without regard to sign was made for a redetermination of the probable errors of the various series, again very generally confirming the 1935 precepts.

Further investigations are being made to test whether the differences between parallax series arise from all the stars compared or only groups of them.

The proper motion of the stars will be taken from the *Albany General Catalogue* for all stars contained in that Catalogue. It is hoped that it will soon be possible to prepare the copy for the printing and that the new Catalogue will be distributed in 1951.

TRIGONOMETRIC PARALLAX DETERMINATIONS

The number of parallax determinations made since 1913 is approximately as follows:

Allegheny	1800	Mount Wilson	550
Bosscha	150	Sproul	400
Cape	1667	Stockholm	46
Dearborn	193	Uppsala	50
Greenwich	760	Van Vleck	229
Leander McCormick	1881	Yale (Johannesburg)	1728
London—Mill Hill	40	Yerkes	427
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This is an increase of 624 in three years as compared with 2900 in the previous thirteen years so that the annual rate has fallen off from 223 to 208. Of the new parallaxes nearly a quarter are from each of the three observatories Yale, Allegheny and the Cape and about half as many are from Leander McCormick. Mill Hill Observatory of the University of London is included for the first time.

The decrease in the number of new observations is less than might have been expected as it is known that a number of observatories are turning their attention to other fields of work with the feeling that the programmes they originally undertook are fairly worked out. Of the four observatories which have determined more than 1600 parallaxes, Allegheny is the only one which has not indicated that at least part of the time of the telescope will be devoted to other than parallax work. The other three observatories, Leander McCormick, Yale and the Cape, have large numbers of plates awaiting measurement. From these at least 500 additional parallaxes should be derived in the course of time although the rate of measurement of plates will be reduced. The number of stars under observation has dropped to about 220 at Yale and 50 at the Cape.

Programmes have been gradually altered so that new parallaxes now refer in the main to faint stars rather than stars brighter than magnitude 5.5 which formed the bulk of the earliest programmes. The faint stars have generally been selected on account of large proper motion discovered photographically by Wolf, Ross, Luyten and others, but several observatories are now paying attention to dwarf M-type stars discovered spectroscopically by Vyssotsky. When sufficient material has been collected it will be interesting to compare the absolute magnitudes of these dwarf M-type stars, many of which have small or only moderate proper motions, with those of the first observed M-type dwarfs with very large proper motions. As an indication of the trend we give the observing programme for Yerkes Observatory: nine late type red dwarf stars with parallaxes of the order of $0''.2$, five white dwarfs, four sub-dwarfs, four high-velocity stars and about forty red dwarfs with expected parallaxes over $0''.1$. Most of these will be stars for which parallaxes have already been determined. From Allegheny Prof. Wagman writes: 'For a few stars that show evidence of unseen companions as many as thirty plates a year are being taken. The plates are measured as they are taken.'

With the completion of their original programmes several observatories have undertaken extensive series of observations of some of the nearest stars for the investigation of possible orbital motion and the determination of mass ratios in the case of binaries. Some additional results from such observations have been published. At Sproul Observatory van de Kamp has completed studies of Ross 614 and the 1.873 year orbit of Algol. Kuiper reports from Yerkes that such observations have been completed for Tau Cyg, 85 Pegs, 26 Draco, Zeta Herc (Hall, *A.J.* 54), 99 Herc (Strand and Duke, *A.J.* 54), 48 Cass (Kent, *A.J.* 56) and Procyon (Strand, *Ap. J.* 113).

With regard to programmes which should be undertaken Hertzprung writes:

1. The few wide double stars of large parallax—61 Cygni, Grb. 34, Σ 2398—will in due time (several hundred years) make a good determination of the mass ratio possible from meridian observations which should be made differentially. That means that comparison stars should be chosen in the region to which the double star is moving fast. The change in position will be of the order of a degree before one revolution is completed.

2. The search for faint companions to known parallax stars has so far had only a sporadic character. To avoid needless duplication it is recommended that every search made be reported in detail, even if the result has been negative. These details should contain the size of the field and the limiting magnitude—which ought to be the fainter the larger the parallax is.

3. A comparison of Luyten's survey of faint proper motion stars with the many faint and close double stars now known, may reveal a number of objects which promise rapid orbital motion.

Schilt writes:

I wish to stress the importance of doing as good a job on the so-called uninteresting stars of the standard programme as on the stars that have presumably large parallaxes. In the

systematic programme concerning the stars brighter than 5.5 magnitude, Schlesinger has I think unfortunately, given preference to stars that were expected to yield large parallaxes. As a consequence, the K giants have been neglected, and many of them are being measured now with probable errors of 0".010 or 0".011 instead of 0".006 to 0".008. This is a bad thing because not the least value of these parallaxes is to afford a basis for spectroscopic parallaxes. With the new spectroscopic criteria we will have excellent values for which the scale has to come from the trigonometric parallaxes. In some way a regression curve will be drawn through points representing spectroscopic values against trigonometric values, and if the accidental error is larger for the small parallaxes than for the larger ones, this fact will, in a disagreeable fashion, enter into the discussion of the reduction of the spectroscopic parallaxes to the scale of the trigonometric ones. A second instance, is the complete or almost complete lack of observations of bright B stars. I believe that observers engaged in the systematic plan of stars brighter than 5.5 magnitude should be encouraged to include at least a number of B stars.

I think most astronomers will agree with this. It will be possible when the new general catalogue is available to go into this in detail and arrange for the necessary observations to be made. At present several observatories are re-observing considerable numbers of stars especially those of large parallax and for which discordant results have been obtained in the past: these are very unlikely to be the stars to which Prof. Schilt refers.

Attention may again be drawn to the need to observe very faint stars of large proper motion. At present no reflecting telescope is being used for parallax work and only such a telescope can cope effectively with stars fainter than the 14th or 15th magnitude. Parallaxes of such stars are required for the extension of the luminosity curve to absolutely faint stars. To the observer such stars are the most promising for finding measurable parallaxes.

MAGNITUDES OF PARALLAX STARS

As there are many parallax stars for which no accurate magnitudes are available, it is important to determine their magnitudes. This is not fundamentally the work of the parallax observers and is probably not usually suited to the parallax telescopes; but at several observatories this work is being undertaken. Vyssotsky writes that at the Leander McCormick Observatory it is intended to determine the photovisual magnitudes of a number of faint parallax stars to ± 0.15 mag. Stearns writes that at Van Vleck Observatory, when time permits, it is planned to obtain photo-electrically the magnitudes and colours of the comparison stars. At the Cape a good deal of work has already been done to determine photographic and photo-visual magnitudes of stars down to magnitude 9.5 visual and 11.0 photographic by the Fabry method utilizing standards in the E regions at Dec. -45° . It has been found that many of the photographic magnitudes of bright southern stars given in the *Henry Draper Catalogue* are in error by more than half a magnitude.

ERRORS OF OBSERVATION

One or two members of the commission have mentioned the importance of the optical adjustment of the objective and of the focus especially when the comparison stars are widely separated from the parallax stars.

At various times discussions have taken place as to the cause of systematic and accidental errors in the observations in order that, if possible, these errors might be avoided. There have been some outstanding cases in which different observatories have obtained results so different as not to be explicable in terms of the ordinary errors of observation. Prof. Schilt still suggests that such cases should be investigated to see if an explanation can be found in a different choice of reference stars, although this might involve re-measurement of plates with new reference stars. Others think that the influence of different sets of reference stars could be more easily assessed by spectroscopic or colour

observations of the stars. If the discordant results are obtained from series of observations at different epochs the explanation might well come from orbital motion of the parallax star with a period approximately equal to a year.

Amongst recent investigations into causes which influence the size of the probable error of a plate of unit weight we would draw attention to papers by Alden and Land in Parts II and III of the *Transactions of Yale Observatory*, Vol. 15. Land's discussion is based on 1323 parallaxes given in *Yale Transactions*, Vols. 8, 15. The dependence of the size of the probable error of a plate of unit weight is investigated with regard to distance of the comparison stars from the parallax star, diameters of images, sectors employed, exposure times, spectra, R.A., zenith distance and epoch. The most important factor in increasing the probable error is distance of the comparison stars from the parallax star, particularly in R.A. This confirms a result previously found by other investigators such as Schilt and Alden. It is attributed by Land to film shift and if so can be largely eliminated by reversing the plate between exposures at the telescope—a practice followed by some observers. It may, however, easily be an atmospheric effect produced before the star light reaches the telescope. In any case the configurations of the reference stars should be restricted in size as much as possible. A surprising result, previously found by Schilt, is that within the limits of actual observation difference in size of the stellar images is unimportant. This of course refers to the probable error of the parallax, not systematic error of the parallax. Most observers make the images of comparison stars and parallax stars as nearly equal as possible, and should continue to do so.

PROPER MOTIONS

The determination of proper motions concerns Commission 8 as regards the bright stars. The proper motions of all stars down to about magnitude 9 will result from the positions derived from photographs taken with wide-angle lenses in combination with early visual observations. As is well known most of the work for the northern sky has been completed but not published in Germany. Most of the work for zones $+30^\circ$ to -30° has been completed and published by Yale Observatory using plates taken at its southern station at Johannesburg. At the Cape, work for the zones -30° to -40° and -52° to -64° is practically complete and the plates for -64° to -80° have been taken (Zone -56° to -60° measured at Greenwich). For the zone -40° to -52° proper motions have been published, based on Cape Astrographic plates. It will be possible soon to improve many of the proper motions by plates taken at a third epoch. Yale Observatory already has plates for many zones north of Dec. $+30^\circ$ and south of Dec. -30° , and proposes to repeat many zones with a new 8-inch lens of 80-inch focus.

Many photographic proper motions have been determined from plates taken for the Astrographic Catalogue (Commission 23) in conjunction with recent photographs. At Toulouse proper motions have been published for the reference stars (four per square degree) for the first six hours of zones $+4^\circ$ to $+12^\circ$ utilizing meridian observations. For the same area proper motions for all the catalogue stars are expected to be determined by 1953 from plates with a 40-year interval. It is intended to extend this work to magnitude 14.0 utilizing the chart plates which show three exposures of each star at the corners of a small equilateral triangle. The new plates will have a single exposure of 30 minutes. Proper motion will be shown on superposition of the plates when the new image will not appear at the centre of the triangle formed by the old ones. Proper motions greater than $0''.2$ will be determined.

The proper motions of 3188 stars in five Special Kapteyn Areas have been determined by A. N. Deutsch and V. V. Lavdovsky from astrographic plates with an interval of about twenty-five years (*Poulkovo Bull.* 17, 6, 58). Other proper motions of stars in the Kapteyn Selected Areas (Commission 32) are being measured by Prof. van Rhijn at Groningen. For the equatorial areas recent plates taken with the Astrographic Telescope at Algiers will be measured against the original Carte du Ciel plates. An area $3\frac{1}{2}^\circ \times 3\frac{1}{2}^\circ$ round each centre will be measured for the stars in the *Bergedorf Spectral Durchmusterung*,

Vol. 5, to be published in 1952. The proper motions of stars as faint as magnitude 16 in all the southern Kapteyn Areas will be determined from plates taken with the Yale-Columbia refractor at Johannesburg in 1927–28 in combination with plates to be taken in the near future.

Besides the above work on proper motions which may be considered as coming under the auspices of Commissions 8, 23 or 32 proper motions are being determined with the parallax telescopes, generally in connection with parallax work. Many of the telescopes are being used to determine more accurate proper motions in R.A. and Dec. than can be derived from the parallax plates which cover an interval of only two or three years. At Johannesburg the intention has been to re-observe the parallax stars at intervals of seven and fourteen years after the completion of the parallax observations and it is expected that most of the observational work on the stars of the main programme will be completed in four or five years. At the Leander McCormick Observatory the measurement of the plates for long period variables is going forward—the interval between epochs being more than twenty years. The homogeneity of the data should provide excellent secular parallaxes and peculiar motions for these stars. Vyssotsky continues to determine the proper motions of dwarf M stars as they are discovered, generally by the comparison of Astrographic positions with those on new plates. At Yerkes about 90% of the first-epoch plates have been secured for all stars known to have a proper motion in excess of $0''.3$, brighter than the 14th magnitude and north of Dec. $+20^\circ$ for which more accurate results are desirable. Second-epoch plates will start in 1952. An attempt is being made to determine the proper motions of μ Geminorum stars brighter than the 13th magnitude at maximum. At Stockholm Observatory second-epoch plates are being taken after a 15-year interval for proper motions of stars in open clusters. For stars in five regions in Lacerta, Auriga—Taurus, Cygnus, at the north galactic pole and near the Andromeda Nebula most of the first-epoch plates have been taken with exposures varying from a few seconds to thirty minutes and with an objective grating with a 2.9 mag. interval. Prof. Nechvíle reports that in collaboration with Prof. Bosler he has determined proper motions in a 4-degree area around the Ring Nebula of Lyra and found exactly 100 stars down to magnitude 14 with a proper motion exceeding $0''.02$. He has also found three new stars of large proper motion suitable for parallax observations.

Prof. Luyten reports on the progress in the work on proper motions at the University of Minnesota as follows:

1. In the general survey of proper motions in the Southern Hemisphere made on plates lent us by the Harvard Observatory, motions for more than 82,000 stars have now been measured and reduced, leaving only 18,000 for future measurement. Thus, there seems to be every likelihood that by 1954 the entire programme will have been completed. Owing to duplication and overlapping of plates the 82,000 motions measured refer to only about 63,000 different stars; of these 28,535 have been published in mimeographed form; another 14,000 are ready for publication, and the last 17,500 are now being prepared for publication.

2. Through the co-operation of the Harvard Observatory and the American Academy of Arts and Sciences a further colour survey has been made for the entire area south of declination -45° , with the object of determining approximate colours for the 37,000 stars contained in this region. These plates are being examined; among the 7500 stars for which the examination has been completed thirteen new white dwarfs and some 2500 intermediates have been found. More accurate colours are being determined for these stars through the co-operation of the Cordoba Observatory.

3. A catalogue giving more detailed data for all stars with motions over $0''.2$ annually is likewise being prepared. It is hoped that approximate colours for these stars north of -45° can be determined through the co-operation of the Steward Observatory in Tucson; this work has been progressing slowly during the past seven years.

4. The Blink survey for large proper motions in the Northern Hemisphere on plates again furnished by the Harvard Observatory is also progressing, but only very slowly since priority has been given to all previously listed programmes.

5. Finally, proper motions have been determined for all blue stars found by Zwicky and Humason, again on plates furnished by the Harvard Observatory and the Mount Wilson Observatory.

Prof. A. N. Deutsch writes as follows regarding work in the U.S.S.R.:

(a) As part of a large co-operative work of U.S.S.R. observatories connected with the catalogue of 'Faint stars', selected areas of the sky with extra-galactic nebulae were photographed according to a list by P. G. Kulikovskiy and G. N. Neuymin, supplemented by A. N. Deutsch. The suitability of the nebulae for exact measurement was estimated and suitable centres of the areas were chosen. Studies were made in Pulkovo and Tashkent with normal astrographs ($f=3.4$ m.) and in Moscow with an astrograph of $f=6.4$ m. About 800 plates with nebulae have been obtained since 1939, war-years excluded. Over 300 of these plates have been obtained in the past three years (1948–50). Experiments on the photography of extra-galactic nebulae with an astrograph of $f=5.5$ m. were begun in 1950 at the Kiev Observatory of the Acad. Sci. U.S.S.R.

A preliminary list of 302 nebulae with estimates of their suitability has been published in catalogue form. It contains a supplement of seventy-three long-period cepheids (a photographic copy was published in 1950 by the Sternberg Institute). A list, with estimates and a short description, of the nebulae observed at the Tashkent Observatory in 1939–41 has been published (*Tashkent Publ. ser. 2, Vol. 1, 1950*).

(b) Proper motions of 1446 stars to the 15th magnitude in relation to thirteen extra-galactic nebulae have been determined from plates obtained at Pulkovo with a normal astrograph and partly at Tashkent, with a difference in epochs of about forty years. The nebulae are located in four areas of the sky with centres in NGC 5194 (M51), NGC 224 (M31), NGC 5457 and NGC 3031. The absolute motions of the stars in relation to the nebulae were compared with their absolute motions in relation to the stars of Boss's catalogue. A short summary of the work was published by N. V. Fatchikhin in *C.R. Acad. Sci. U.R.S.S. Vol. 21, no. 2, 1950*. A full account will appear in a Pulkovo *Bulletin*.

(c) Proper motions of 376 stars in the region of the Kapteyn vertex ($\alpha=6^h$ and $\delta=+22^\circ$) of star streams were determined and investigated from plates obtained at Pulkovo with the normal astrograph, with a difference in epochs of approximately forty years. The mean parallaxes of these stars up to $14^m.5$ have been calculated and the right ascension of the solar apex was found to be 286° (A. N. Deutsch and V. V. Lavdovskiy, *Pulkovo Bull. No. 138, 1947*).

(d) Proper motions of eight globular clusters have been determined and investigated from plates obtained at Pulkovo with a normal astrograph—difference in epochs about forty years. Probable error of the proper motion of the globular clusters was estimated at $\pm 0''.001$ for the cluster as a whole (N. V. Gamaley, *Pulkovo Bull. No. 114, 1948*).

(e) Proper motions of 3188 stars in five Kapteyn areas, Nos. 9, 12, 17, 24, 25, containing dark nebulae, have been determined from plates obtained with the Pulkovo normal astrograph with a difference in epochs of about twenty-five years (A. N. Deutsch and V. V. Lavdovskiy, *Pulkovo Bull. No. 141, 1948*; see Report for Commission No. 32). A. N. Deutsch derived the absorption in dark nebulae for these areas from an analysis of the proper motions of stars (*Pulkovo Bull. No. 141, 1948*; Report for Commission No. 32).

(f) P. P. Parenago and N. M. Artyukhina determined the proper motions of 1565 stars to 16^m in an area of 9 sq. degrees in the Orion nebula, from plates obtained with the astrographs of Moscow, Tashkent and Pulkovo Observatories.

(g) M. I. Uranova deduced proper motions of ninety stars and verified the proper motions of 200 stars for P. P. Parenago's investigation of stellar velocities in space (*A.J. U.S.S.R. 27, no. 3, 1950*).

(h) V. V. Lavdovskiy of the Pulkovo observatory has begun to photograph second epochs of open star clusters with a normal astrograph with a difference in epochs of about fifty years. He expects to obtain proper motions of fifteen open clusters and to deduce the internal motions of stars for some of them. Proper motions were determined from five pairs of plates, each containing, on the average, about 1000 stars.

(i) B. A. Savitsky of the Tashkent Observatory has completed an article 'On the proper motions of the galactic cluster NGC 6705 (M11) and the stars of the surrounding area'

(j) P. P. Parenago of the Sternberg Institute continues the compilation of a general catalogue of stellar parallaxes. Up to the present time, the catalogue contains all the available determinations of parallaxes—trigonometric, spectral, dynamic and orbital—for 21,000 stars.

Prof. A. N. Deutsch also sends the following recommendations:

Selected areas of the sky with extra-galactic nebulae for the determination of the absolute proper motions of stars are provided with observations in the Northern Hemisphere; whereas observations in selected areas of south declinations are totally unprovided for. In order to secure observations of the extra-galactic nebulae in selected areas for the sky of both hemispheres it is necessary to carry out photographic observations at Observatories located in southern geographical latitudes.

In order to connect extra-galactic nebulae and the stars of the catalogue by means of a small-field astrograph, of the order of four sq. degrees, or less, a number of stars should be added to the catalogue, especially in regions with extra-galactic nebulae.

It is highly desirable to determine for the selected areas (the number of which for the whole sky is 250–300) the photographic stellar magnitudes of a certain number of stars. These values might serve as standards for the determination of stellar magnitudes of all the other stars the proper motions of which have to be established. It is also highly desirable to have spectral characteristics of these stars, or at least their colour indices.

Attention may be drawn to the following publications:

W. J. Luyten and P. D. Jose: Colour indices of 139 single stars of large proper motion and the components of 214 wide double stars with common proper motion, *Ap. J.* **107**, 269.

A. H. Joy and S. A. Mitchell: The spectral types and radial velocities of 90 McCormick parallax stars mostly late-type dwarfs of mag. 9–11, *Ap. J.* **108**, 234.

W. J. Luyten: Charts to identify 96 white dwarfs, together with magnitudes and colour indices, *Ap. J.* **109**, 528.

W. J. Luyten: New star of large proper motion, *Ap. J.* **109**, 532.

O. J. Eggen: Photo-electric Studies IV Colour-Luminosity Array for stars in the region of the Sun (containing the magnitudes and colours of 78 stars within 14 parsecs of the Sun), *Ap. J.* **112**, 141.

The reports received show that the observatories which originally undertook parallax work are still undertaking many investigations connected with parallax and the nearer stars. When the new general catalogue of parallaxes is available it may be useful to set up a small sub-committee to list the stars which require parallax observations most urgently and to indicate what additional observations are required to supplement our knowledge of the nearer stars.

J. JACKSON
President of the Commission

RAPPORT SUPPLÉMENTAIRE

Early in 1952 Prof. A. N. Deutsch reported in connection with (a), p. 352, that work on the classification of nebulae for astronomic purposes had been completed for 460 plates. A catalogue, ready for printing, gives a description and the positions of about a thousand extragalactic nebulae in 200 areas north of declination 25°. Many of the plates which have two exposures of 65 minutes each can be used as first-epoch plates in determining proper motions.

Report of meeting

PRESIDENT: Dr J. JACKSON.

SECRETARY: Prof. H. L. ALDEN.

The President called attention to the developments since the preparation of the Draft Report. He referred particularly to the publication of the *Parallax Catalogue* by the Yale University Observatory and emphasized its importance. He proposed a vote of thanks by the Commission to Miss Jenkins for her part in the preparation of that volume. Dr Weaver stated that the *Catalogue* is available on punched cards and proves very useful in that form.

A communication from Prof. Hertzsprung again urged the measurement of the relative position of wide doubles observed for parallax. Attention was directed to the need for an accurate parallax of ξ Bootis in order to derive the total mass of the system. The star χ Draconis was cited as a binary with a large spectroscopic orbit and a parallax of sufficient size to warrant investigation of the astrometric orbit. Alden reported that an extensive study of this orbit at the Leander McCormick Observatory would be published in the near future.

Prof. Oort requested parallax observation of the star CD $-29^{\circ} 2277$, whose space velocity may exceed the velocity of escape from the Galaxy and thus prove to be an inter-galactic object. Dr Weaver stressed the need for more accurate parallaxes of stars of unusual absolute magnitude or spectra. Dr Jackson suggested that the President of the Commission might serve as a clearing-house for requests for parallax observations of special objects.

Dr Kulikovsky presented a paper prepared by Prof. Parenago which recommended for consideration:

1. Additional observations of stars for which previous parallax determinations are discordant.
2. Need for more parallaxes of bright stars in the southern sky, for a number of which there is only a single determination or none at all.
3. The importance of including in fundamental meridian circle programmes certain stars of magnitude 7 or 8 which have been neglected in recent years. The cepheid variable Z Scuti was cited as an example as no meridian observations of this star during the present century are available.

In view of the interest of several other Commissions in the proper motions of faint stars, it was felt that the discussion of proper motions in general could be more profitably deferred to the joint sessions which have been arranged.