

## 24. COMMISSION DES PARALLAXES STELLAIRES ET DES MOUVEMENTS PROPRES

PRÉSIDENT: M. F. SCHLESINGER, *Director of the Yale University Observatory, New Haven, Conn., U.S.A.*

MEMBRES: MM. W. S. Adams, Alden, Bianchi, Cecchini, Finsen, Harper, Hertzprung, J. Jackson, Spencer Jones, Jordan, Lindblad, Luyten, J. A. Miller, Mitchell, Moffit, Nechvile, Russell, Shapley, Slocum, Smart, van Maanen, van Rhijn, Voûte.

ALLEGHENY OBSERVATORY, PITTSBURGH, PENNSYLVANIA, U.S.A. 30-inch Refractor.

Since the Paris meeting of the Union 3050 parallax plates have been secured and in the same interval 5604 plates have been measured and 182 parallaxes have been determined.

F. C. JORDAN

BRERA, MILAN, ITALY. 40-inch Reflector.

(1) The determination of the spectroscopic parallaxes of over 1200 stars of spectral types B, A and F has been delayed on account of the opportunity to base it upon accurate measurements of the intensity of the lines rather than upon simple estimates of the luminosity criteria. However, the work is well advanced at present. All the spectra (over 6000) have been registered by means of a thermopile microphotometer which has been constructed for that purpose in the Observatory shop. The criteria for an accurate spectral classification as well as for the luminosity determinations for each spectral class have been defined and fixed on the microphotometer tracings. Our work is thus not far from its conclusion; but on account of the large amount of work involved and of the Observatory staff being engaged in other investigations, we do not think that it will be finished by August 1938. (2) For the trigonometric determination of the parallaxes of some 60 stars of large proper motions and apparent magnitude around 8.5, some 1500 plates have been obtained. The particularly unfavourable state of the weather has greatly obstructed the observations.

E. BIANCHI

CAMBRIDGE, MASSACHUSETTS, U.S.A., HARVARD COLLEGE OBSERVATORY.

(1) Photographs for the determination of the parallaxes of a short selected list of faint stars of large proper motion are being made with the 60-inch reflector (Newtonian focus) of the Boyden Station of the Harvard Observatory by Dr Paraskevopoulos and his assistants. The list has been provided by Dr Luyten of the University of Minnesota, who will also undertake to measure and reduce the plates. The work has been in progress for about two years and preliminary results should be available within a year. (2) The co-operative survey of large proper motions of southern stars in which early and late photographs with the Harvard Bruce telescope at the Boyden Station are examined and measured by Dr Luyten and his colleagues at Minnesota is reported fully by Dr Luyten. The observational work is essentially complete, but in the course of a few years the repetition of Bruce plates of intermediate dates will be advisable and can probably be incorporated in the programme of the Station. Some satisfactory experiments have been made in the comparisons of old and new plates made with the Metcalf doublet

at Oak Ridge, scale:  $98'' \cdot 2 = 1 \text{ mm.}$ ; but the northern sky has been fairly well covered by Wolf, Ross and others, and we are at present planning no extensive programme on large proper motions with the Metcalf telescope. (3) Work on spectroscopic absolute magnitudes of southern stars has been resumed at the Harvard Observatory during the past two years. In *Harvard Annals*, **105**, Miss Hoffleit gives results for 370 bright southern stars of spectral classes A5 and later. A programme of spectrographic observations on fainter stars of the later spectral classes was inaugurated by the undersigned ten years ago, and Miss Hoffleit is now making a special study of the absolute magnitudes of several hundred fainter stars for which satisfactory material has thus been provided. The spectrograms are made with one  $15^\circ$  objective prism on the 13-inch Boyden telescope and the results obtained from this material appear to be closely comparable in accuracy with results obtained at Mount Wilson, Victoria, and elsewhere, with slit spectrographs. (4) Miss Hoffleit has made special studies of the sub-classification of stellar classes A5 and later, and has examined anew the various criteria for absolute magnitudes. Together with an assistant she is now making an investigation of 250 class M stars of both northern and southern hemispheres, with the object of finding more practical criteria for absolute luminosities. This work should be completed by the summer of 1938.

HARLOW SHAPLEY

CAPE OBSERVATORY. 24-inch Refractor.

The number of parallaxes sent to the Royal Astronomical Society is now 836 and an additional 14 have since been determined. Volume XIV, Part III of the *Cape Annals* giving details of the plates for stars in our third and fourth lists has been passed for press. The catalogue of the proper motions of 20,000 stars of magnitudes 9.1 to 9.5 in the C.P.D. between declinations  $-40^\circ$  and  $-52^\circ$  has been completed. With the aid of a grant of £80 made by the Royal Astronomical Society from the Spencer Bequest and with the co-operation of Harvard Observatory the spectra of about 18,000 of these stars have been classified by Miss Cannon. The introduction is now being written and the copy should be sent to the printers early in 1938.

J. JACKSON

GLASGOW, SCOTLAND, UNIVERSITY OBSERVATORY.

Determination of the mean parallaxes of the BD stars of the Cambridge proper motion fields by a new method based on the Two-Stream constants. The paper is *M.N.* **96**, 131, 1935. The formulae used in the paper are from "Some theorems in the Statistical Treatment of stellar motions", *M.N.* **95**, 115, 1934. Both papers by myself.

W. M. SMART

GREENWICH, ENGLAND. 26-inch Refractor.

(1) During the summer of 1935, the 26-inch refractor was reconstructed in order to add a sliding dew-cap. To permit this, a 2-foot section of the tube was removed from below the objective, and another 2 feet added above the breech end. The tube can now be ventilated before each duty, a fan having been installed in the side of the tube above the breech to provide a forced draught down the tube from eight 2-inch holes bored just below the objective. Loss of exposure time owing to dewing has been almost eliminated by these means, changes of focus during the night have been considerably reduced and the quality of the images has been improved.

Opportunity was taken during the reconstruction to substitute for the gravity clock drive a synchronous motor, which behaves satisfactorily. At the beginning of 1937 the short-screw micrometer was adapted to the projection method of measurement suggested by Dr Schlesinger. This method reduces the strain on the observer by making possible the use of both eyes. Measurements made subsequent to the change suggest that the probable errors of measurement have not been increased, but sufficient material is not yet available to decide whether the accuracy has actually improved. Trigonometrical parallaxes have been determined for 94 stars since the 1935 meeting, making a total of 677 since the programme was started in 1913. The results are published annually in the November issue of the *Monthly Notices of the R.A.S.* (2) Since 1935, 125 plates have been taken through the glass on 71 stars, for comparison with earlier parallax plates. Plates made of plate glass are employed for this work. In addition to the parallax comparison stars originally used, a few additional stars have been measured. The time interval is never less than 10 years, the probable error of a determination being  $0''.002$ . Proper motions in both co-ordinates have been completed for 23 stars.

H. SPENCER JONES

GRONINGEN, HOLLAND, KAPTEYN LABORATORY.

We have not determined any parallaxes since the Paris meeting. A student of this University, B. Hiemstra, has determined the proper motions of the stars in the areas 2, 5, 9 and 24 of Kapteyn's Special Plan of Selected Areas. The plates have been taken at the Radcliffe Observatory with the 60-cm. photographic refractor (focal length, 690 cm.); the interval is 15 years. The proper motions will be published in the near future. The areas show a black opening surrounded by rich parts of the Milky Way. The determination of the distance and absorption of the intervening clouds is well under way.

P. J. VAN RHIJN

MIDDLETOWN, CONNECTICUT, U.S.A., VAN VLECK OBSERVATORY. 20-inch Refractor.

Since the Paris meeting in 1935 the parallax programme has been continued as in the past, except that in January 1936 we changed from Wratten and Wainwright Panchromatic plates to Eastman Kodak I-G special green sensitive plates. This reduced the exposure times by 50 per cent. We are concentrating chiefly on faint stars, down to the 13th photographic magnitude, with proper motions of  $0''.5$  or greater. About 600 plates per annum are being secured. A list of thirty parallaxes was published by Mr Stearns in *Astronomical Journal*, No. 1071. A volume giving the details of the reduction of 130 stars is ready for the printer and will probably be distributed before the 1938 meeting. We have made no special study of proper motions, either of the parallax stars or of the comparison stars, but in the future we plan to give more attention to the proper motions of the faint parallax stars. In a few cases where the plates have been extended over more than the usual number of epochs, the residuals appear to show a periodicity, and in these cases the observations are being continued to see if this can be verified. It might be well to suggest to other parallax observers that they be on the lookout for similar cases. If these should prove to be real, they might explain some of the discrepancies in the parallaxes obtained by different observers.

FREDERICK SLOCUM

MINNEAPOLIS, MINNESOTA, U.S.A., UNIVERSITY OBSERVATORY.

An attempt has been made to determine the parallaxes of two stars of very large proper motion, and while the resulting values are affected by large uncertainties they indicate that both stars are among our very nearest neighbours in space and are probably closer than 4 parsecs. The proper motion survey of the southern hemisphere carried out by the undersigned in co-operation with the Harvard Observatory, and on plates taken with the 24-inch Bruce refractor, has been finished. Altogether slightly more than 100,000 stars with appreciable proper motion were found, mostly brighter than the 16th photographic magnitude. Among these are some 900 stars with motions in excess of  $0''.5$  annually, about 530 of which were not known before. In addition more than 1000 pairs of stars with common motion were found. The motions of all stars south of declination  $-55^\circ$ , about 24,000 in number, have been measured and reduced, and it is hoped that those between  $-55^\circ$  and  $-50^\circ$  (another 8000) may be completed by June 1938. Statistical discussions of these various sets of data are in progress. It is unfortunate that no material is available in the northern hemisphere which can compare in either homogeneity or completeness with that in the south. The blink surveys in the north, chiefly those of Wolf and Ross are still far from complete. It is hoped to extend these with the northern Bruce plates at Harvard but even so, large gaps will remain. From the southern survey it can be stated with some confidence that for the available plates, covering 94 per cent. of the southern hemisphere, the material is complete for large proper motions down to photographic magnitude 14.5. It will be many decades before a similar conclusion can be reached for the north. The principal recommendation the undersigned would like to make is that in the near future parallax observations be directed even more than in the past to those stars likely to be within, say, 10 parsecs. I believe that in this way we could, in a few years, nearly double the number of stars now known within this restricted limit and thus obtain more knowledge concerning the properties of the average population of space. As a corollary I would like to suggest that Commission 24 make the proper representations to the commissions on magnitudes, spectra, and radial velocities for the purpose of having the above-mentioned stars observed as completely as possible. In view of this I might also suggest the preparation of catalogues of stars nearer than, say, 5 or 10 parsecs. The Commission might suggest that the Union undertake periodic publication of such lists.

W. J. LUYTEN

MOUNT WILSON OBSERVATORY, CALIFORNIA, U.S.A. 100-inch Reflector.

Since the publication of the long list of spectroscopic parallaxes, we have collected spectra of 1000 to 1200 new stars. These include some stars from the *Preliminary General Catalogue* of Boss, a number of sixth magnitude stars from the *Draper Catalogue* not found in Boss, stars of the Selected Areas, numerous faint stars in the Hyades, and a good many stars of large proper motion selected from various sources. The whole group probably has a larger proportion of dwarf stars in it than did our long Catalogue. We have not completed the reductions of absolute magnitude and parallax for these stars, since we have been awaiting the conclusion of the discussions by Russell and Stromberg of the comparison of spectroscopic and trigonometric values. Russell has finished his paper and Stromberg is well advanced on his discussion of the K and G stars. Both Russell and Stromberg find that the dispersion in absolute magnitude is somewhat too small for the spectroscopic

results. On the other hand their actual values differ rather considerably, and their probable errors even more so. After their investigations have been finished we can perhaps form a better idea of the corrections which it is necessary to apply to our present system. I believe that we shall have the absolute magnitudes and parallaxes for our new stars completed during the summer or autumn of 1938.

WALTER S. ADAMS

MOUNT WILSON OBSERVATORY, CALIFORNIA, U.S.A. 100-inch and 60-inch Reflectors.

*Trigonometric Parallaxes.* The total number of parallaxes measured is now 444. Besides some stars of special interest on account of their spectral type, the programme is now made up mostly of faint stars of large proper motion. Over a hundred new stars measured for parallax have absolute photographic magnitudes fainter than +10, while for 14 the absolute magnitude is even below +15.

*Proper Motions.* (1) The work of finding faint stars of large proper motions in the 139 Selected Areas of  $-15^\circ$  and farther north, which was begun by van Maanen and Willis, was finished by Oosterhoff; of the 165,000 stars examined 773 were found to have an annual motion exceeding  $0''.05$ , but only 5 exceeding  $0''.5$  and none exceeding  $1''$ . The plates used here were taken at the primary focus of the 60-inch reflector with an exposure of one hour and show stars to about magnitude 19 photographic. (2) Four fields taken at the same focus with two pairs of exposures, each of 15 minutes, have been measured for proper motion. On these plates practically all the stars measured by Seares for magnitude could be measured for proper motion. The probable error of a final  $\mu_\alpha$  or  $\mu_\delta$  is  $0''.0024$ . On these plates an attempt was made to measure some of the faint nebulae. Only 13 of these, however, could be measured and their probable error is double that for the stars. The work is being continued, although the results may not warrant the measurement of all the 139 fields. (3) On 222 fields taken at the 80-foot focus of the 60-inch reflector, 92 stars, brighter than 16th photographic magnitude, were found with proper motions exceeding  $0''.05$ . Moreover 17 companions were found of the central stars, which are all stars of motions exceeding  $0''.5$  annually. In all these 17 cases the parallaxes of the central stars were known. The apparent photographic magnitudes of the 17 companions range from 11.5 to 15.8, the absolute magnitudes from +10.2 to +14.7.

A. VAN MAANEN

PRAGUE, CZECHOSLOVAKIA. 24-inch Reflector.

No new proper motions or parallaxes were determined. In connection with previous researches some plates were secured, the regions of which contain new stars with large proper motion or double stars with interesting proper or orbital motion. The work is pursued at the Prague National Observatory and Observatory of Astrophysics at Stará Ďala, where a new Zeiss reflecting telescope (60 cm. in diameter and 3 and 10 m. focal length) will be used.

C. NECHVÍLE

PRINCETON OBSERVATORY, PRINCETON, NEW JERSEY, U.S.A.

(1) A list of dynamical parallaxes of 108 stars was prepared and published by R. G. Aitken and C. E. Moore (*Lick Bulletin*, No. 485). These have been determined on the same system as those in the earlier Princeton list (*Astronomical Journal*,



No. 930) and Finsen's list. (2) The memoir upon the masses of the stars, which is now under preparation and is to appear as one of the University of Chicago Monographs, is planned to incorporate a general catalogue of dynamical parallaxes including over 2000 stars with all results on a uniform system, and revised when necessary to take account of recent observations. (3) The writer is just sending for publication, as a Mount Wilson Contribution, "A comparison of trigonometric and spectroscopic parallaxes". The results indicate that the systems of the Yale Catalogue of trigonometric parallaxes and the Mount Wilson Catalogue of spectroscopic parallaxes are in the mean in excellent accordance, and confirm the reliability of both types of determination. The necessity of calibration by means taken for stars showing similar spectral criteria (which is equivalent to the use of a regression curve in the correlation diagram connecting spectroscopic and trigonometric parallaxes) results inevitably in the under-estimate of the differences of individual spectroscopic parallaxes from the mean values for stars of the same spectral subclass, and methods of correction for this, when necessary, have been developed.

HENRY NORRIS RUSSELL

STOCKHOLM OBSERVATORY, SWEDEN. 24-inch Refractor.

The determination of trigonometric parallax and proper motions with the 24-inch photographic refractor is in charge of Dr S. Asklöf. The parallax programme contains (a) all available stars of proper motions exceeding  $0''.75$  for which no, or only one, previous determination exists; (b) stars for which spectra have been investigated at the Stockholm Observatory; (c) a list prepared by van Maanen containing stars of large proper motions for which no, or only one, determination exists. The programme contains at present 95 stars, all of which have been observed to some extent; 27 stars are completely observed with 20 to 30 plates in each case. For 20 stars the measurements have been completed and the parallaxes will be ready for publication in the near future. For future determinations of proper motions 356 plates (III since the Paris meeting) have been taken in the central region of the Milky Way, at the galactic pole, for stellar clusters, and in fields containing small nebulae as points of reference. The spectrophotometric methods of determining absolute magnitudes have been applied to a great number of faint stars (limiting magnitude about 13.5). The work started here by E. Stenquist on the stars in the Cambridge regions for which proper motions have been determined by W. M. Smart has been completed by him at the Upsala Observatory. G. Malmquist has investigated 2800 stars in the region of the Pleiades, and J. Ramberg the stars in the region of the Hyades and Praesepe.

BERTIL LINDBLAD

SWARTHMORE, PENNSYLVANIA, U.S.A., SPROUL OBSERVATORY. 24-inch Refractor.

The parallax programme has been continued as in previous years. Twenty-five additional parallaxes have been completed and 10 others await measurement. In 1934 Pitman selected 300 stars from Aitken's *Double Star Catalogue* as being the most promising for investigation of masses and mass-ratio. He submitted the list to Dr Aitken, who rejected a small number, advising that we await later measures. Interesting binaries discovered by Kuiper were added to the list. The accuracy of the determination of mass-ratios for close pairs depends upon our knowledge of the proper motion, parallax, orbital motion and the difference in magnitude of the

components. It is important that the series extend over the critical part of the orbit so that the proper motion and orbital motion can be completely separated; that the magnitudes should be photographic for photographic lenses and visual for visual lenses; and that the equations should be solved simultaneously for all variables. Since 1934 the mass-ratios of four stars have been determined:  $\delta$  Pegasi,  $\beta$  101,  $\epsilon$  Hydrae,  $\delta$  Equulei. The parallax programme at Sproul is being continued, as part of a comprehensive photographic astrometric programme. In the latter a number of stars of appreciable parallax are being photographed at regular intervals. This has given and will give mass-ratio material for other stars, whose duplicity may become known later, and it may reveal such duplicity through variable proper motion. A number of stars are being kept under observation for secular acceleration.

JOHN A. MILLER

UPSALA OBSERVATORY, SWEDEN. 15-inch Refractor.

Twenty-nine parallaxes have been published to the end of 1935 (*Upsala Medd.* No. 63). The programme of observations now includes about 50 stars, most of which are bright F-type stars, north of declination  $+30^\circ$  and between R.A.  $0^h$  and  $12^h$ .

ÖSTEN BERGSTRAND

VICTORIA, BRITISH COLUMBIA, DOMINION ASTROPHYSICAL OBSERVATORY. 72-inch Reflector.

(1) With a number of other things on the go, we have done practically no spectroscopic parallax work since the last meeting of the International Astronomical Union. It is true I used the registering microphotometer shortly after it was completed to determine the intensities of the lines used in absolute magnitude work in class F stars. From a number of the stars used as standards in this class, it was found that the empirical curves relating line-intensity with absolute magnitude could be determined with less spread for the individual stars. As a result it was felt that higher precision could be arrived at without an undue increase of labour, but other matters have caused further work along this line to be postponed. (2) The use of the interstellar lines, particularly Ca II 3933, as a criterion of distance requires caution. It was used here for O and B stars and empirical curves correlating intensity with distance were established. Intensity measures of greater precision have naturally resulted from the use of the registering microphotometer and at the same time more accurate parallaxes of the stars used as standards have become available so that the resulting empirical relationship should be more precisely defined. Such a curve is given in Volume VI, No. 20 of our *Publications*. Nevertheless, it has been established that in addition to the general interstellar absorption of ionized calcium, there is also absorption due to irregular masses of such material. As a consequence, individual parallaxes may be considerably in error, although statistically the results are very acceptable. (3) Radial velocity observers should always calibrate their plates so that later they can be used for line-intensity studies.

W. E. HARPER

VIRGINIA, U.S.A., LEANDER McCORMICK OBSERVATORY. 26-inch Refractor.

(1) Parallax work has been continued without substantial changes, but on account of concentration of efforts on the proper motion work the measurements have lagged behind observations. As the parallaxes of the brighter stars on the

original working programme have been completed, attention is now concentrated on fainter stars with known proper motions. A third parallax volume containing the details of 600 stars is being prepared for the printer. (2) Volume VII of our *Publications* has recently been distributed. The proper motions of 18,000 faint stars give values for galactic rotation and luni-solar precession in excellent agreement with other determinations. The motions reduced to the system of the Boss *General Catalogue* by means of 574 Boss stars give the position of the Solar Apex at R.A.  $285^\circ$  and Decl.  $+36^\circ$ , a substantially different position from that derived from bright stars. Moreover, it was found from the discussion that the secular parallaxes were larger in the northern galactic hemisphere than in the southern and also that the minimum value of secular parallax was not found at the galactic equator but  $20^\circ$  north and south. (3) With the help of tables recently published by Jenkins, it has been possible to reduce our proper motions to the FK3 system. The surprising fact brought out was that the Solar Apex from the faint McCormick stars is in considerably closer agreement with the position found from bright stars than was found with the Boss system. On the FK3 system the secular parallaxes in northern galactic latitudes are again greater than those in southern zones. The minimum in the values of the secular parallaxes continues to be at galactic latitude  $\pm 20^\circ$  and not at the galactic equator, but the minimum is less pronounced on the FK3 system than on the Boss system. The differences between  $0^\circ$  and  $20^\circ$  are approximately of the same sizes as the probable errors. (4) On account of their small size, the proper motions of faint stars are particularly sensitive to any small systematic errors in the adopted fundamental system. The high accuracy of the proper motions of faint stars determined by photography by refractors of great focal length and with a time interval of a dozen years or more will give observations of great value for the determination of the systematic errors of fundamental proper motion catalogues. A number of years ago measures of McCormick photographs gave the values of the systematic error in declination in the *Preliminary General Catalogue*. In order therefore to give further information on systematic errors of catalogues and also to check the greater secular parallaxes in the northern galactic latitudes, we have started the taking and measurement of another 350 regions in the sky. As this series is being photographed with a grating, the limiting magnitudes will not be as faint as in the former work. Some 10,000 proper motions will be added to those from the earlier 18,000 stars. (5) As the radial velocities of about 125 Cepheids have been published from Mount Wilson, it will now be possible for van Maanen at Mount Wilson and the McCormick Observatory to derive the proper motions and parallaxes of the Cepheids for which the first series of plates were taken by both Observatories a decade ago. (6) The first series of photographs, two plates each with two images, have been secured for the determination of the proper motions of 438 long period variables.

S. A. MITCHELL

YALE OBSERVATORY, NEW HAVEN AND JOHANNESBURG. 26-inch Refractor.

(1) The chief programme for parallax determination at Johannesburg is nearing completion. This includes all stars brighter than 5.5 in the *Henry Draper Catalogue* south of  $+10^\circ$  declination, with the exception of stars of class B. We have now determined the parallaxes of 1380 stars and the plates have been completely secured for about 200 others. In those parts of the sky where this programme is nearing completion, fainter stars of large proper motion are being added. (2) Since the Paris meeting the Gesellschaft Zones between  $-10^\circ$  and  $-20^\circ$  have been



measured and reduced and are nearly ready for publication. In this zone the proper motions of 20,000 stars have been derived with a probable error of about  $0''.01$ . The positions and proper motions of any of these stars will be communicated on request to astronomers who may have need of them. Plates have been completely measured and have been partly reduced for the zones between  $-20^\circ$  and  $-30^\circ$ , and at this date (March 1938) the zones between  $-2^\circ$  and  $-10^\circ$  are a little more than half measured. (3) The work on proper motions in the Selected Areas as described in previous reports has been continued. This is done in such a way as to yield absolute proper motions based on the Boss System.

FRANK SCHLESINGER  
H. L. ALDEN

#### YERKES OBSERVATORY AND McDONALD OBSERVATORY.

(1) For some years past it has been growing more difficult for the parallax observers to maintain a programme as productive as in the early years of this work, in spite of recent improvements in technique. This arises from the fact that as time goes on a general parallax programme must go to increasingly fainter stars, with longer exposure time and correspondingly fewer plates per night. It was decided to reduce the time to the minimum needed for the completion of series of plates at present almost finished, and to reorganize the programme later with consideration of the statistical problems in which the members of our staff are particularly interested. This reorganization will take some time, and will go into effect after the 82-inch Texas reflector has partly unburdened the 40-inch. (2) Mr Ross secured new plates with the 10-inch Bruce telescope to duplicate fields taken by Barnard in 1915 and 1920. This will complete many of the vacancies in Mr Ross's survey of proper motions made in 1924 to 1929. He expects later to duplicate the fields secured by him and Dr Zug in the Kapteyn areas during the interval of 1927 to 1929. This will practically complete the proper-motion survey of the northern sky. Mr Ebbighausen started, under Dr Kuiper's supervision, the determination of accurate proper-motions in galactic clusters, by means of plates first taken by Schlesinger and others, and now repeated by Mr Ebbighausen.

OTTO STRUVE

It appears from the above reports that the character of trigonometric determinations of parallaxes is undergoing a change. Programmes were set on foot some years ago at several observatories for the determination of distances of bright stars. These programmes are now nearing completion at these observatories and whatever additions are being made to the observing programmes refer for the most part to faint stars of large proper motion recently revealed by the researches of Wolf and Ross in the northern hemisphere and of Luyten and others in the southern. It is obviously the opinion of many members of the Commission that this change is the one that best serves the requirements of astronomy at the present time.

It is probable from the above reports that the point of view with regard to proper motions of faint stars is also changing. The tendency seems to be more and more to determine the absolute motions of faint stars than relative motions. Much work on absolute motions is in progress on the duplication of the Gesellschaft Zones, or their equivalent, from pole to pole, by the Gesellschaft itself and at Yale and Cape Observatories.

FRANK SCHLESINGER  
*President of the Commission*