

An extensive report of the Sub-Commission has been published in *Monthly Notices RAS* 121, 123 to 173, 1960. It contains 5 sections. Section I refers to the history of the subject and summarizes the considerations which have led to the adoption of the new system (which is to be referred to as the 1958 Revision). This section also includes the complete version of the 1958 resolution and gives the exact figures of the positions of the pole and of longitude zero in the new system, and the approximate values of related useful quantities.

Sections II to V deal with the following investigations which provided basic information for the choice of the new system:

II. A 21-cm determination of the Principal Plane, by Gum, Kerr and Westerhout.

III. Radio data relevant to the choice of the system, by Gum and Pawsey.

IV. Optical determinations of the galactic pole, by Blaauw.

V. The position of the galactic centre, with special reference to the radio observations, by Oort and Rougoor.

A wide distribution of this report will be arranged.

With regard to the publication of the conversion tables mentioned under (e), the Sub-Commission has chosen to accept an offer from C. Schalén and Miss I. Torgard of the Lund Observatory, according to which Miss Torgard will supervise the computation of these tables, which then will be published in the *Annals of the Lund Observatory*. At the time of writing the computations have been practically finished and copy for offset printing is being prepared. Publication is expected well before the Berkeley meeting.

The tables will include the following:

- A. Tables for the conversion of equatorial to galactic co-ordinates for the equinox 1950, with intervals of 4^m in R.A. and 1° in declination; l and b will be given to $0^\circ.01$.
- B. Tables for the conversion of galactic to equatorial co-ordinates, also for the equinox 1950, for intervals of 1° in l and b ; α and δ to be given to $0^\circ.01$.
- C. Tables for the conversion of old galactic into new galactic co-ordinates. For each value of the old co-ordinates, the differences Δl and Δb between the new and the old co-ordinates are given in $0^\circ.01$.

Tables A and B will both be supplemented by two interpolation tables, one for detailed interpolation to full precision and one for rough interpolation.

A. BLAAUW

33c. SOUS-COMMISSION DES 'SELECTED AREAS'

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MEMBRES: Allen, F. Becker, Bok, Brouwer, A. N. Deutsch, Fehrenbach, Heard, Mme Kalandadze, Kharadze, Mlle Roman, Stoy.

INTRODUCTORY NOTE

With much regret we have all noted that Professor Pieter van Rhijn died on 9 May 1960. He was born in 1886, and from 1921 he was director of the Sterrenkundig Laboratorium Kapteyn in Groningen as immediate successor to J. C. Kapteyn. Professor van Rhijn was one of the

leading stellar statisticians, and his work has been of great importance for the development of our knowledge of the general structure of the Galaxy, the general luminosity function etc.

Reports on the progress of works within the regions proposed by Kapteyn in his famous Plan of Selected Areas were successively issued from Groningen by Kapteyn and van Rhijn (1). At the Cambridge meeting of the IAU in 1932 a special Commission, 32, on 'Selected Areas' was formed (2), and van Rhijn was elected President of the Commission. He remained in this capacity until the Moscow meeting in 1958 when this Commission was discontinued and incorporated in Commission 33 on Galactic Structure as a new Sub-Commission, 33c. The continued accounts on the Selected Area work van Rhijn gave in *Trans. IAU*, from the first report of the Commission to the Paris meeting in 1935 up to the sixth report of the Commission to the Moscow meeting in 1958 (3). Some words in memory of van Rhijn have been given in *Sky and Telescope* by B. J. Bok (31).

PROGRESS OF RESEARCH

A complete list of references to observational data on 'Selected Areas' up to 1954 is given in *Trans. IAU* 9, 469-472, 1957. References for the following period have been printed in *Trans. IAU* 10, 507, 1960. References for the years 1958-60, based on information from members of the Sub-Commission and others interested in the scheme of 'Selected Areas', are given on pages 397-98.

In the text below, the Selected Areas of Kapteyn's Systematic Plan are referred to, for short, as SA.

1. *Durchmusterung*

Two surveys are available, to which stars within the central regions of Kapteyn's Systematic Plan are often referred: Harvard *Durchmusterung* (32), and the Mount Wilson Catalogue (33). For wider areas, references are often given to the numbers of the stars of the Bergedorfer Spektral-Durchmusterung (34) and (for southern areas) the Potsdam Spektral-Durchmusterung (35).

2. *Photometry*

Apparent photographic magnitudes are available in the surveys mentioned in Section 1. Many other publications giving photometric data for more restricted numbers of areas have also been enumerated in the lists, referred to above, in *Trans. IAU* 9 and 10. Useful photometric data are also contained in some of the papers there mentioned in the Sections on Proper Motions, Absolute Magnitudes, and Spectral Classification. Concerning the progress of some important photo-electric programmes initiated before 1958, it has unfortunately not been possible to obtain information. The following summary has been condensed from the reports received.

Basel. W. Becker is planning three-colour photometry in the *RGU* system down to about magnitude 19 with the 48-inch Mount Palomar Schmidt to be made in SA 51, 54, 57, 71, 82, 94, 107, 133, 141 and 158.

Cape. R. H. Stoy reports that positions, magnitudes, blue-yellow colours, and proper motions are being determined automatically for many southern SA stars in the course of the work for the Cape Photographic Catalogue for 1950.0 (36). Comparisons between the Cape magnitudes and those published by C. J. Kooreman and P. Th. Oosterhoff (37) show good consistency between the two kinds of magnitudes (23, 24).

Photo-electric three-colour magnitudes are determined for some SA stars included in a

rather wider programme, Fundamental Data for Southern Stars, for which some results have been published (38); later papers will appear in *Royal Observatory Bulletins*. Also for the B stars in SA 172, 193, and 194, studied for radial velocities at the Radcliffe Observatory, the Cape observers have used three-colour photo-electric photometry.

Engelhardt (Kazan). *UBV* photometry is planned for the spectrophotometric investigation reported below in section 6.

Groningen. J. Borgman reports on a programme which he is undertaking in co-operation with H. L. Johnson. The aim is to determine *UV* excesses for F and G stars in SA 3, 4, and 5, for which T. Elvius has given photometric and spectrophotometric data (39). So far about 200 stars, mostly in SA 4 and 5, have been measured in the *UBV* system. The correlation between *UV* excesses and tangential velocities derived from proper motions has been studied, but the preliminary results are not encouraging. There are, however, indications that very large tangential velocities are accompanied by large *UV* excesses.

Haute Provence (Saint Michel). R. Bouigue has determined photo-electric magnitudes and colours in some galactic fields, among them SA 19 (4). J.-H. Bigay has made photo-electric measurements in the *UBV* system for B stars in SA 49 (5).

Leiden. P. Th. Oosterhoff reports on the work on photographic magnitudes for the southern SA. A catalogue giving data for the stars brighter than about $10^{m.5}$ was mentioned in the previous report (37). C. J. Kooreman now extends this work to include stars down to about $13^{m.5}$ in the following areas: SA 118, 121, 124, 127, 130, 133, 136, 139, 142, 145, 148, 151, 154, 157, 158, 160, 163, 164, 167, 170, 172, 173, 176, 178, 182, 185, 186, 189, 190, 192, 193, 195, 198, and 203. The reduction of the measurements is practically completed, but it will take some time before the work is ready for publication.

Lick (Mount Hamilton). G. Kron has published infra-red photo-electric magnitudes for a sequence in SA 68 (6).

Mount Stromlo (Canberra). B. J. Bok reports concerning the work previously mentioned in the reports for SA 141, 158, and 193. Together with Mrs. P. Bok he now has in press photo-electric standard magnitudes and colours for sequences in these areas (7). SA 141 (near the south galactic pole) and its surroundings have been made the subject of an extensive photographic colour-magnitude survey by Mrs. J. Basinsky and B. J. Bok. The results of this survey will be discussed in conjunction with a spectral survey performed by the Uppsala Observatory. For SA 158 (a relatively unobscured low-latitude area in a direction not far from the galactic centre) a similar investigation of photographically determined magnitudes and colours is under way, with the work extended to include the field selected for variable stars studies by L. Plaut, cf. (40). For SA 193 (which may represent the least obscured direction in which to view to great distances along the 'Carina Arm' (41)). B. J. and P. Bok have photo-electric colours and magnitudes for all O and B stars in the region. Mrs Basinsky has extended this survey photographically to include all A stars.

Stockholm (Saltsjöbaden). T. Elvius and Mrs K. Lodén have published a third SA catalogue, giving photometric (pg- and pv-magnitudes, colour indices) and spectral data for 759 stars brighter than $m_{pg} 14.0$ in SA 11-14 (8). The size of the regions is $1^{\circ}.5 \times 1^{\circ}.5$. This catalogue also gives maps. See also sections 6 and 8.

A similar investigation is under way for SA 8-10. The magnitudes from photographic plates (pg and pv) will here be based on photo-electric scales, whereas in the previous three catalogues (8, 39), the magnitudes rely on photographic comparisons.

A programme for southern SA is also in progress at the observatory, based on material

obtained at the Boyden Observatory, mainly by Mrs Lodén. The investigation deals with stars down to m_{pg} 14.0 in SA 91, 103, 115, 116, 126, 150, 166, 190, 192, and 193, for which photometric and spectral plates have been secured. For each area a sequence of about 20 stars has been photo-electrically determined in the *UBV* system by the Boyden observers. A connection with standard stars in the E-regions is also secured (42).

Uppsala. Magnitudes and colours are automatically determined for stars brighter than about m_{pg} 10.0 in some SA in connection with the extensive spectrophotometric survey of stars along the Milky Way. SA 40 is covered by (43), where K. G. Malmquist, B. Ljunggren and T. Oja present results for (old) galactic longitudes 40° – 60° . SA 8 and 19 are included in the zone 80° – 100° , just investigated by Oja. SA 67 and 87 fall within Ljunggren's planned zone between 10° and 40° (old) galactic longitude.

In co-operation with others working at the observatory, T. Elvius has initiated a programme for the determination of photo-electric magnitudes and colours for stars in northern SA. The aim is to observe relatively bright stars in some SA in the $+75^\circ$ and $+60^\circ$ declination zones. Determination of pg, pv, pr, and possibly also *UV* magnitudes by photographic means, is planned for some areas.

Elvius has, with the Uppsala 50/65 cm Schmidt telescope at Mount Stromlo, started a programme for a photometric and spectrophotometric investigation in SA 68, 92, 138, 164, 165, 188, 200, 201, 204, 205, and 206. Pg and pv plates have been taken. Photo-electric measurements for the establishment of photometric scales have been started in these areas. So far he has only been able to secure, with the 65 cm telescope at Stromlo's Bingar station, *UBV* magnitudes for a couple of brighter stars in each area, suitable for photometric zero-points. Here may also be mentioned SA 141, which is situated within the region around the south galactic pole where integral magnitudes are determined by P. I. Eriksson from plates taken with the Uppsala Schmidt telescope at Mount Stromlo.

3. Variable stars

Engelhardt (Kazan). L. Urasin reports that 170 plates have been taken in the SA with a 38/51 cm Schmidt telescope. Seven pairs of plates have been blinked. About 100 stars were found suspected of variability.

Sternberg (Moscow). N. E. Kurochkin has investigated 9 variable stars in the region of SA 110. The field is $10^\circ \times 10^\circ$ and the limiting magnitude is 17 (9). Later he studied 23 more variables in the same region (10). Five of these latter variables were discovered by him. Kurochkin has further discovered 10 new variables in the region of SA 57 (11).

D. Ya. Martynov has investigated 8 variable stars in the region of SA 40 (12). N. B. Perova found 5 variables in the region of SA 57 (13). L. P. Metik has discovered a few variable stars in the region of SA 87.

4. Proper motions and positions

Catalogues giving proper motions in the SA have been enumerated in the reference list of the report in *Trans. IAU* 9. Concerning work going on, or planned, the summaries in *Trans. IAU* 9 and 10, should be consulted. The following additional information has been received for the period 1958–60.

Bonn. J. Meurers reports that in 18 SA between -10° and $+10^\circ$ galactic latitude, 5000 proper motions have been derived with a mean error of $\pm 0''.20$ in 100 years for a single determination. The limiting magnitude is between 13.5 and 14.0. The catalogue to be published will give proper motions, photographic magnitudes and spectral types (according to the Bergdorf determinations (34)) together with accurate positions.

Cape. R. H. Stoy reports that the work on measuring proper motions, from repeated Carte du Ciel plates for stars in SA 164–187, continues with special attention to SA 172, 173, 179, and 180. Also, in the course of the work with the Cape Photographic Catalogue for 1950·0 (cf. Section 2 above), proper motions and positions are automatically determined for many stars in the southern SA.

Groningen. L. Plaut reports, concerning the work performed at the Kapteyn Laboratorium, that the relative proper motions previously published (44) derived from Algiers—Carte du Ciel plates have now been reduced to absolute proper motions in the FK 3 system (14). With reference to the determination of proper motions in SA of the -15° declination zone mentioned in the preceding report, he reports that, at the Yale-Columbia Southern Station at Mount Stromlo, the four missing plates have been taken and sent to Groningen, where they will be measured in due course.

Helsinki. G. Järnefelt reports on the determination of proper motions of stars in the photographic zone of the observatory, and that proper motions for a few variables (in SA 21, 40, and 41) have been published (45).

London (Mill Hill). C. W. Allen reports that a repetition of proper-motion plates taken with the Radcliffe refractor (46) has been initiated. Since April 1957 two or more proper-motion plates have been secured in each of SA 3, 4, 5, and 20, and one plate in each of SA 10, 15, 21, 23, and 31. Two plates have been measured for each of SA 3 and 5, and one for each of SA 4 and 23.

Pulkovo. A. N. Deutsch has prepared a catalogue of double and multiple stars with common proper motions in 115 areas. He has detected 288 double and multiple systems (15).

5. Radial velocities

Cape. R. H. Stoy mentions that the work on fundamental data on southern stars (see section 2) also embraces radial velocities for some SA stars.

David Dunlap (Richmond Hill, Toronto). J. F. Heard reports (concerning the work referred to in the previous report) that further measurements of radial velocities have been added in the interest of achieving greater accuracy. The results of the survey have therefore still not been published, but a tabulation of velocities now regarded as satisfactory can be had from the observatory. The stars involved are those without previously reported radial velocities as follows: 95 stars of spectral class A 0 and later between m_{pg} 7·5 and 8·0 in $6^\circ \times 6^\circ$ regions centred on the SA from $+15^\circ$ northward and between 0^h and 6^h ; 104 stars of spectral class A 0 and later, brighter than m_{pg} 7·6 in $8^\circ \times 8^\circ$ regions centred on SA from $+15^\circ$ northward between 9^h and 18^h . Among these stars about 15 have been established as having variable velocities.

Concerning the work on fundamental stars (which was briefly mentioned in the previous report) Heard now gives the following information. Observations and measurements are well advanced on a programme for the determination of radial velocities of 55 stars included in C. H. Hins' catalogue (47). The actual stars are in SA 13–15, 29–35, and 53–60 (north galactic polar cap). They are brighter than m_{pg} 10·1, and they have not been observed for radial velocities previously.

Goethe Link (Bloomington, Indiana). F. K. Edmondson mentions, concerning his previously reported programme on 11th magnitude A and K stars in SA of the -45° declination zone, that the observations made at the McDonald Observatory have now been finished. The K stars have all been measured, and the A stars are now being measured.

Haute Provence (Saint Michel) and Marseilles. Ch. Fehrenbach reports on the great programme for measurement of radial velocities and determination of spectral types from spectro-

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grams taken with specially designed objective-prisms. Two prisms have been used, one with limiting magnitude 9.5 or 10.0, and a larger one which permits observations of radial velocities of stars down to about magnitude 12. The actual state of the research is as follows:

- (a) Results have been published for SA 19 (16), SA 24, and 55 (17).
- (b) Measurements are ready, but not yet published, for SA 8, 56, 67, 74, and 87.
- (c) Measurements are close to accomplishment for SA 9, 40, 41, and 58.
- (d) A good number of plates have been taken, but measurements have only just begun, for SA 25, 43, 46, 49, 52, 57, 64, 68, 69, 80, 81, 98, and 110.
- (e) For SA 19, plates taken with the larger prism have also been measured. This area is the subject of a special investigation by Mme M. Duflot (18).

It is hoped that the installation of a large objective-prism at an observation station in South Africa will also yield material of radial velocities for southern SA.

Radcliffe (Pretoria). The spectral work reported in section 6, for SA 172, 193, and 194, also includes determination of radial velocities.

6. Spectral and luminosity classification; absolute magnitude

Abastumani (Mount Kanobili). B. A. Bartaya has published a catalogue of absolute spectral magnitudes for 766 B and A stars brighter than magnitude 9 in 44 areas situated along the galactic belt ($-30^\circ < b < +30^\circ$) (19).

N. B. Kalandadze has published a catalogue of absolute magnitudes for 425 stars of spectral types G and K, brighter than magnitude 9 in 26 areas (20).

Cape. In the course of the above mentioned programme on fundamental data for southern stars (section 2), spectral types in the MK system are also determined.

Engelhardt (Kazan). L. Urasin mentions that the observatory has, in co-operation with the Department of Astronomy at the Kazan University, started spectrophotometric work according to the 'Swedish system of classification'. The areas to be investigated are SA 25, 26, 27, 28, 30, and 31, which are in the direction of the anti-centre, distributed from the plane of the Galaxy towards its northern pole.

Haute Provence (Saint Michel) and Marseilles. The programme mentioned in section 5 also includes classification in Morgan's spectral system.

Mount Stromlo (Canberra). B. J. Bok reports that W. Buscombe and Miss Morris are performing MK classification for SA stars. In the southern galactic polar cap, which includes SA 141, they are investigating the B and A stars brighter than magnitude 8. In the galactic area SA 193 they are classifying the B stars of the magnitude interval 9-11.

Radcliffe (Pretoria). A. D. Thackeray reports that work is continuing for spectral classification of early B stars in SA 172, 193, and 194 in the MK system from slit spectra (86 Å/mm) for all stars classified in the Potsdam Spektral-Durchmusterung (35) as B 2 and earlier. The results will be published together with similar observations of other moderately-faint southern B stars. Photo-electric observations of the same stars have been made by the Cape observers, as reported in section 2. Distance moduli have been calculated for adequately observed stars.

Stockholm (Saltsjöbaden). The third Stockholm Selected Area Catalogue by T. Elvius and Mrs K. Lodén (8), also reported in section 2, gives spectral types, spectrophotometric equivalents and absolute magnitudes for stars brighter than $m_{pg} 13.5$ in SA 11-14. Corresponding determinations are just being performed for SA 8-10. SA 91 ($\delta = +15^\circ$) is also being investigated, as it can be observed both from the Stockholm and Uppsala Observatories and from the Boyden and Mount Stromlo Observatories, thereby giving means for inter-calibration of the spectrophotometric results based on different instruments.

For SA 91, 103, 115, 116, 126, 150, 166, 190, 192, and 193, also mentioned in section 2, spectral plates have been secured with the 80/90 cm Baker-Schmidt telescope of Boyden Observatory, and spectrophotometric measurements have been initiated for determination of spectral types and absolute magnitudes.

Uppsala. In the course of the spectrophotometric survey of stars along the Milky Way, some SA are also included, as mentioned above in section 2 (SA 8, 19, 40, 67, and 87). In addition to this scheme, plates will be taken with the various objective-prisms of the observatory for a study of the brighter stars in others of the northern SA. Here it may also be mentioned that K. G. Malmquist's catalogue (48) for the north galactic polar cap, with spectrophotometric data analysed in Uppsala from Stockholm astrographic spectrograms, partly overlaps the Bergedorf region of SA 56 ($\delta = +30^\circ$).

T. Elvius, as mentioned in section 2, has started a spectral survey of southern SA, using the Uppsala Schmidt telescope at Mount Stromlo. The areas for which he has up to now secured plates (SA 68, 92, 138, 164, 165, 188, 200, 201, 204, 205, and 206) mean an extension of the zone for which plates have been taken at the Boyden Observatory (see Stockholm programme, above).

For B. J. and P. Bok's standard magnitude sequence in SA 141 (7), B. Ljunggren and T. Oja (21) have published spectral types from plates taken with the Uppsala Schmidt at Mount Stromlo, in connection with G. Malmquist's and P. I. Eriksson's investigation of the southern galactic polar cap.

7. Polarization

Stockholm (Saltsjöbaden). L. O. Lodén reports on his programme of polarimetric observations in some SA, for which spectrophotometric investigations have been made, or are in progress, at the observatory (8, 39). Generally his observations are made by a photo-electric device. The practical limit seems to be about $m_{pg} 12$, but under ideal circumstances stars down to $13^{m.5}$ can be measured.

Lodén's polarization measurements have been completed for SA 2, 3, 7, 11, 17, 18, 19, 40, 42, 192, and 193 (the last two areas have been observed at the Boyden Observatory, and are included in the above-mentioned Stockholm programme for southern SA). Measurements are in progress for SA 20 and 41, and planned for SA 8 and 9. The analysis of the degree and orientation of polarization in dependence of colour excess and distance modulus is under way. A preliminary note concerning the interstellar polarization in SA 192 has been published (22).

8. Investigations based on the material of Selected Areas

The photographic magnitudes of the -60° declination zone of Selected Areas have been investigated by Miss E. A. Ralston and R. H. Stoy (23). They compare the Leiden magnitudes by Kooreman and Oosterhoff (37) with those of the Cape Photographic Catalogue for 1950.0 (36). A corresponding comparison has been made for the -45° zone by W. Dunkhase (27) who has investigated the relations between the Leiden magnitudes and those given for nine E-regions of the -45° zone in *Cape Mimeogram* no. 6 (42). The results of these two studies are very satisfactory, and give, as Stoy states in his report, every reason to have confidence in the average quality and consistency of both series of magnitudes.

A. N. Deutsch and B. N. Chudovicheva (25) have made a comparison of proper motions of stars in the areas 9 and 24 of Kapteyn's Special Plan from measurements at Pulkovo and Groningen. A catalogue of proper motions and magnitudes of 1028 stars is given. A method is proposed for the determination, from proper motions, of the absorption of light by dark nebulae. The method has been applied to the areas in question.

P. J. van Rhijn has studied the velocity distribution of the stars as a function of the distance from the galactic plane (26). He used the proper-motion catalogues for Selected Areas (44, 46, 49) and the two Cape catalogues by H. Spencer Jones and J. Jackson (50). The dispersion of the linear motions in the three axes of the velocity ellipsoid were determined, and it appeared that the dispersions increase with increasing values of the distance from the galactic plane. The explanation that this may be due to admixture of RR Lyrae stars, sub-dwarfs, white dwarfs or Humason-Zwicky stars with the normal A stars, is rejected by van Rhijn, and he supposes that there may be two Gaussian waves with different dispersions, but leaves the question open concerning possible spectral differences between the two groups of stars.

Mrs Lodén has made a preliminary study of tangential velocities by combining the Radcliffe and Pulkovo proper motions (46, 49) with data concerning distance moduli and colour excesses according to the Stockholm SA investigations (8, 39).

The question of the intrinsic colours to be used for the Stockholm spectral types in studies of interstellar absorption, has been the subject of a series of analyses by T. Elvius and colleagues. A preliminary study for the F stars was made by Elvius (27). In the discussion of the material of the third Stockholm SA Catalogue, Elvius and Mrs Lodén have treated the question again (8). A comprehensive study has been made by Elvius and Y. Ekedahl (28), who used the material of colour indices in the eight Stockholm areas where all the photometry had been made at the Stockholm observatory. J. M. Ramberg's Lacerta investigation (51) was also included. By restricting the investigation to stars that are obviously unaffected by interstellar reddening, the authors have been able to study the relations between the intrinsic colours and the various spectral equivalents used for the determination of spectral classes and absolute luminosities. In this connection it may also be mentioned that the interesting blue sub-dwarf in SA 4, which has been investigated by T. Elvius and U. Sinnerstad (29) and discussed by D. Chalonge (52), is the subject of further studies at the Uppsala Observatory.

L. Perek reports on a search for faint blue stars on the paper prints of the *Palomar Sky Atlas*. SA 15, 16, 18, and 61 have been investigated by him and O. Rousová (30). They find that faint blue stars go down to the limit of the Palomar survey. The absolute magnitudes of the stars must be fainter than +3 or +4, if the stars are within the galactic system. Their mean apparent magnitude increases with increasing galactic latitude. No attempt has been made to determine the number of white dwarfs among the faint blue stars.

DESIDERATA FOR FUTURE WORK

In his last two Selected Area reports, van Rhijn has given his views as to where it is especially desirable that efforts are made to improve and extend the Selected Area work (53). Some of van Rhijn's suggestions have initiated new work which after some time will give important results. Still more work is needed and reference is once more made to the above-mentioned desiderata. The following items are especially recommended again:

- (a) Determination of photo-electric sequences for all areas for checking of older scales and for erection of new scales, preferably in the *UBV* system. Publication of already existing preliminary data would be of great help.
- (b) Photo-electric spectrophotometry and photo-electric colour determinations, and also of kinds other than *UBV* are desirable in some areas for more stars than the sequence stars.
- (c) Extension of the resumed proper-motion programme to more areas.
- (d) Publication of identification charts.

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