30. COMMISSION DES VITESSES RADIALES STELLAIRES

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SUB-COMMISSION ON STANDARD VELOCITY STARS

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SUB-COMMISSION ON CO-OPERATION IN RADIAL VELOCITY OBSERVATIONS

CHAIRMAN: M. MOORE.

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SUB-COMMISSION ON WAVE-LENGTHS

CHAIRMAN: M. PETRIE.

MEMBERS: MM. Adams, Albitzky, Neubauer, Struve, R. E. Wilson.

Since the last meeting of the Union, this Commission has lost two valued members, Dr W. E. Harper and Dr J. S. Plaskett, a past-President of this Commission. Both Harper and Plaskett made extensive contributions in the field of stellar radial velocities.

The recent war seriously hindered research at all observatories, many of the institutions carrying on with reduced staffs and greatly diminished resources. The most serious blow to the work of this Commission was the destruction of the Pulkova and Simeis Observatories. The sympathy of the Commission is extended to our Russian colleagues for the loss of their splendid equipment and the destruction of their accumulated photographs. The hope is expressed that their important spectroscopic researches, so tragically interrupted, may soon be resumed.

SURVEY OF RADIAL VELOCITY WORK

During the past decade, radial velocity programmes have been energetically conducted and gratifying progress may be reported. The velocities of 3000 stars have been published and a considerable number of additional velocities await publication. This progress is due, in part, to several recent technical improvements; all large reflectors have been aluminized, and the optics of most spectrographs have been coated with non-reflecting fluoride films. Improved photographic emulsions have been further sensitized by baking or by mercury vapour sensitization. Fast Schmidt Camera spectrographs are in use at the Mount Wilson and McDonald Observatories permitting spectra of the 12th magnitude stars to be secured with reasonably short exposures. A substantial reduction in the labour of measuring spectrograms represents an important advance. Petrie, at Victoria, has introduced the projection comparator which reduces the time of measurement and reduction to one-half its former value, and at the Lick Observatory Johnson has constructed an experimental model of an automatic measuring machine.

Extensive programmes recently completed at Mount Wilson include:

(*a*) approximately 1000 F–M stars of 6th–9th visual magnitudes in Boss's *Preliminary General Catalogue*. The radial velocities of all stars with $\mu > 0''.1$ per annum have now been determined;

(*b*) the velocities of 400 M type giants by R. E. Wilson;

(*c*) the velocities of 180 dwarf stars with $\mu > 0''.35$ per annum by Joy, including stars of the lowest luminosity thus far observed for radial velocity;
(*d*) the velocities of over 280 R- and N-type stars by Sanford;
(*e*) the velocities of 204 stars in the region of the Taurus cluster by R. E. Wilson.

Among the current programmes at this Observatory may be mentioned:
(*a*) the observation of some 300 stars in the Kapteyn areas for which velocities have not been determined;
(*b*) a programme of the separate components of 200 visual binaries being observed by Joy and R. E. Wilson;
(*c*) the investigations of the O–B3 stars in 32 galactic open clusters by Sanford.

At the Lick Observatory, Moore and Paddock have completed their programme of 820 F–G-type stars of photographic magnitude 8·5–8·6, distributed fairly uniformly over the sky north of declination $-30°$. Neubauer has published the velocities of 433 O–B5 stars in the declination zone 0° to $-23°$; the great majority of the 3000 spectrograms were taken with a dispersion of 75 A./mm., although for some 80 stars fainter than magnitude 9·4, a dispersion of 150 A./mm. was employed. The current observations of some 200 faint O–B5 stars in the declination zone 0° to $+20°$ are well advanced. Trumpler's extensive investigation of some 670 stars in 80 open clusters, north of declination $-35°$, is now practically complete and his results are awaited with great interest.

At the David Dunlap Observatory, during the years 1935–42 the velocities of 874 stars brighter than photographic magnitude 7·59 in and near the Kapteyn areas in the northern hemisphere were determined. A second programme recently completed comprised 681 A–M-type stars brighter than magnitude 8·0, selected from Schlesinger's *Bright Star Catalogue*. Current programmes at this institution include:
(*a*) the observation of 1043 G–M-type stars brighter than magnitude 9·0, selected from the *Yale Zone Catalogue*;
(*b*) a programme of 105 stars brighter than magnitude 7·6 in the northern Kapteyn areas between RA 9^h and 18^h.

During the years 1938–41, two series of radial velocity observations were carried on at the Simeis Observatory by Shajn and Albitzky:
(*a*) a programme of 200 F5–K5-type stars between the magnitudes 6·5–7·5, for which a camera having a dispersion of 74 A./mm. at Hγ was employed;
(*b*) the observation of 100 bright A0–F2 stars whose spectra were photographed with a dispersion of 36 A./mm. at Hγ.

The results are in part being prepared for publication, but it will be some years before spectrographic work, interrupted by the war, is resumed.

At the McDonald and Yerkes Observatories, the 82-inch reflector and the 40-inch refractor have been used principally for spectrographic studies of spectrum and eclipsing variables, peculiar stars, and interesting binary systems. A number of important radial velocity contributions have been made: Seyfert and Popper determined the velocities of 268 faint class B stars, between photographic magnitudes 9·0–11·0. Two plates of each star were obtained with a II-prism spectrograph equipped with an $f/2$ Schmidt Camera of 180 mm. focal length, the resulting dispersion being 76 A./mm. at Hγ. The spectra were photographed on films, not generally preferred for radial velocity work. A systematic correction of $-2{\cdot}1 \pm 0{\cdot}8$ km./sec. to their velocities was deduced from 58 observations of 23 brighter B-type stars. The velocities of such faint and distant stars are very important for studies of galactic rotation and it is hoped that this programme will be continued.

The radial velocities of some 158 stars of large proper motion were determined by Popper, Munch and Luyten. Struve and Smith published the velocities of 71 stars of the Pleiades cluster, and 20 O- and B-type stars in and near the galactic cluster N.G.C. 6231 were observed by Struve.

The radial velocities of 708 10th magnitude K-type stars, contained in the McCormick Proper Motion Catalogues have been determined by Edmondson. The majority of the observations were made at the McDonald Observatory and the remainder at Mount Wilson. The linear dispersions of the spectrographs employed were 152 A./mm. and 120 A./mm.

at Hγ respectively. The preliminary analysis shows interesting results: a large and well-determined velocity dispersion was found, and 6% of the stars have peculiar motions exceeding 63 km./sec., all directed towards galactic longitudes between 120° and 0°. The observations of the 400 10th magnitude A-type stars are two-thirds complete. The dispersion used to photograph the spectra of these stars is 324 A./mm. at Hγ. The radial velocities of these faint stars of known proper motion will make important contributions to our knowledge of the motions of these stars.

At the Dominion Astrophysical Observatory extensive radial velocity work is in progress. The most important of these is a programme of 800 stars of spectral types B 5 and earlier, north of declination +10° and between visual magnitudes 7·5 and 9·5, being observed by Pearce and Petrie. In addition to accurate radial velocities, it is important that these stars be classified as precisely as possible and that reliable luminosities be derived. For these reasons a dispersion of 51 A./mm. at Hγ is used and the spectra are made sufficiently wide (0·2 mm.) so that the photometry of important faint lines and the interstellar *K* line may be carried out. Relatively fine-grain emulsions are used. The exposures are necessarily long and progress consequently slow, but to date observing is about two-thirds completed. In the course of this programme a number of massive binary systems have been discovered and their orbits have been investigated. An auxiliary programme of 95 O to B 5 stars between visual magnitudes 5·5 and 7·5 has been completed. These stars have been observed in order to strengthen previous results. The plates have been measured and the results await publication.

Some 300 spectra of 70 members of the Pleiades cluster have been obtained by Pearce. He has determined radial velocities for the B-type members and will now measure the spectra of the A to G stars using the recently revised wave-length standards. The dispersion employed for the brighter members is 20 A./mm. and 30 A./mm. at Hγ and for the fainter stars it is 51 A./mm. The mean radial velocity from the fifteen brightest members is $+7{\cdot}8 \pm 0{\cdot}2$ km./sec.

The bright members of the Ursa Major Cluster have been observed with high dispersion (11 A./mm. at Hγ) by Petrie. The radial velocities of 19 stars have been determined and the results await publication.

The programme of stars near the galactic pole is mentioned elsewhere. Other studies include lists of selected visual binaries and some galactic clusters being observed by Petrie. In addition, a number of spectroscopic binaries are being followed for orbit determinations.

Galactic Pole Programmes

For the past three seasons, Petrie has been engaged upon a programme of 250 A–F 5-type stars, visual magnitudes between 6·5–9·5, in the region of the North Galactic pole. Three plates of each star are being secured with a dispersion of 51 A./mm., and the observations are 50% complete. A similar programme is being undertaken by Weaver at the Lick Observatory, who is observing 277 stars selected from Malmquist's list (*Lund Medd.* **4**, No. 37), brighter than photographic magnitude 12·1 and bluer than C.I. 0·45. He plans to obtain three to four plates of each star, and the linear dispersion of his spectrograph is 75 A./mm.

These programmes are undertaken to provide accurate data for the analysis of motions perpendicular to the galactic plane.

Objective Prism Radial Velocities

The comprehensive programme of determining the radial velocities of the 10th magnitude stars in selected fields along the entire Milky Way, attempted at Harvard (*H.A.* **101**), has unfortunately been abandoned. Bok reports that the results of their two-year research are affected by unexplained systematic errors. Pending the construction of specialized equipment suggested by Baker, this worth-while programme has been discontinued. At the Simeis Observatory Shajn and Albitzky, using a 120 mm. prismatic camera,

succeeded in obtaining satisfactory results for stars brighter than the 8th magnitude. By taking six plates per star and carefully correcting for field distortion, probable errors could be reduced to ± 8 km./sec.

The ingenious suggestion of Prof. R. W. Wood of securing objective prism spectra by means of a 'bi-prism grating' was tested out by MacRae and Bok (*Publ. A.A.S.* **10**, 60, 1940), who mounted a 6-inch 'bi-prism grating' over a 16-inch objective. The dispersion of the combination was 100 A./mm. at $H\gamma$, and exposures of 2 hours were necessary to obtain spectra of the 9th magnitude stars; the radial velocities had probable errors of ± 10 km./sec. The principal objection to this method is the great difficulty of constructing a first-order mosaic grating yielding spectra of excellent quality.

At the new Observatoire de Haute Provence, Fehrenbach has suggested the use of a new type of prism designed to reduce field corrections (*Annales d'Astroph.* **10**, 306, 1947). The results for the few stars obtained are very promising. The use of a Wernicke prism to eliminate distortion is proposed by Treanor (*The Observatory*, **68**, 94, 1948); he further suggests that an undispersed star image superimposed upon the spectrum would be a better calibration mark than the usual neodymium chloride line. Results obtained by these two new methods, tested on large-scale programmes of several hundred stars, are awaited with great interest.

The importance of expediting the radial velocities of the faint stars justifies the continuation of research to find a satisfactory objective-prism method of obtaining velocities with probable errors reduced to the limit set by statistical studies.

Spectroscopic Binaries

Spectroscopic binaries have been energetically observed at all observatories engaged in radial velocity work, but especially at the McDonald Observatory by Struve and his collaborators. It is not possible here fully to review the progress in this field, but mention should be made of Struve's researches on binaries accompanied by gaseous shells or streams, Hiltner's studies of Wolf-Rayet systems, and Petrie's extensive spectrophotometric determinations of light ratios. Many stars have been re-observed in order to study possible changes in their elements; observations of eclipsing variables as faint as the 9th magnitude have been undertaken at the Mount Wilson and McDonald Observatories, and at Victoria. As a general rule orbital elements are computed for all double-lined class B binaries discovered at the Lick and the Dominion Astrophysical Observatories.

The rapid accumulation of information on binary systems has made the publication of a new catalogue highly desirable. This has been undertaken by Moore and Neubauer, whose *Fifth Catalogue of Spectroscopic Binaries* containing the orbital elements of 475 systems published prior to January 1, 1947, is now in the press. The thanks of the Commission are here recorded and extended to these members for their work.

Catalogue of Radial Velocities

During the 16 years since the publication of the Lick General Catalogue, the number of radial velocities has increased from 6723 to approximately 12,000. With the completion of current programmes, within 3 years it is estimated that velocities will have been determined for at least 14,000 stars. The publication of a New General Catalogue so that these velocities may be available to students of stellar motions should not long be delayed. Discussions should be initiated at once, so that the best form of the catalogue may be agreed upon, and an editor selected to undertake this important task.

Radial Velocities of the Southern Stars

Unquestionably the most pressing need for additional radial velocities is in the southern hemisphere, where for one-quarter of the galaxy few observations exist for stars fainter than the 6th magnitude. The urgent need for these velocities has long been recognized and has been clearly manifested in all studies of stellar motions.

A resolution of this Commission, adopted by the General Assembly at the 1932 meeting, materially assisted in the establishing of the Radcliffe Observatory at Pretoria. One of the principal programmes planned with its 6-foot reflector was the determination of the radial velocities of the early-type stars, but unfortunately, for our work, that institution is still without spectrographic equipment. The present meeting would seem to be an appropriate time for this Commission to urge the International Astronomical Union to use every possible influence in expediting the delivery of spectrographic equipment to the Radcliffe Observatory, in order that spectrographic observations in the southern hemisphere, discontinued nearly two decades ago, may be resumed.

Reports of Sub-Committees

The following reports indicate that considerable progress has been made in these fields. The results accomplished are largely due to the personal efforts of the Chairmen of these sub-committees to whom the President desires to express the thanks of the Commission.

Agenda

The following subjects are proposed for the consideration of the Commission:

(*a*) discussion on and disposal of the reports of the three sub-committees;
(*b*) considerations of the format of a new General Catalogue of Stellar Radial Velocities;
(*c*) the desirability of publishing a sixth catalogue of spectroscopic binary stars;
(*d*) considerations of the best means of having spectrographic observations secured by observatories in the southern hemisphere;
(*e*) discussion of other subjects arising out of the Report;
(*f*) reorganization of the Commission.

J. A. Pearce
President of the Commission

REPORT OF SUB-COMMISSION ON STANDARD VELOCITY STARS

It seems best for ease of reference to republish the list of stars for standards of radial velocity which appeared in these *Transactions* (**3**, 171, 1928). In doing so the final values of the velocities as given in *Publ. of the Lick Observatory*, **18**, 1932, the co-ordinates for 1950, and the types as revised at Mount Wilson are given in Table I.

The other star list for standards of radial velocity, which was published in these *Transactions* (**5**, 191, 1935), was intended for use with low-dispersion instruments for which the stars in the first-mentioned list might be too bright. These velocities have been strengthened by numerous additional spectrograms obtained at the Mount Wilson Observatory either with a prismatic dispersion of 35 A./mm. at Hγ or of 10 A./mm. with the Coudé grating spectrograph at the 100-inch telescope. A study of all the velocities which have been obtained led to the rejection of eight stars which appear in the earlier list because of a suspicion of variability. It is recommended that the remainder (Table II) now be used instead of the list in **5**, 191, 1935.

Table I

Revision of Recommended Standard Velocity Stars
(*Trans. I.A.U.* **3**, 171, 1928)

HD	Name	Mag.	Type	α (1950) h. m.	δ (1950) ° ′	V (km./sec.)	No. obs.
3712...	α Cas	2·47	G7	0 37·7	+56 16	− 3·8±0·1	41
4128...	β Cet	2·24	G6	0 41·1	−18 16	+13·1±0·1	70
12929...	α Ari	2·23	K1	2 4·3	+23 14	−14·3±0·1	130
18884...	α Cet	2·82	M2	2 59·7	+ 3 54	−25·7±0·1	27

TABLE I (*continued*)

HD	Name	Mag.	Type	α (1950) h. m.	δ (1950) ° ′	V (km./sec.)	No. obs.
20902...	α Per	1·90	cF4	3 20·7	+49 41	− 2·4±0·1	245
29139...	α Tau	1·06	K5	4 33·0	+16 25	+54·1±0·0	168
36079...	β Lep	2·96	G1	5 26·1	−20 48	−13·5±0·1	42
36673...	α Lep	2·69	cF3	5 30·5	−17 51	+24·7±0·2	19
45348...	α Car	−0·86	cF0	6 22·8	−52 40	+20·5±0·0	114
62509...	β Gem	1·21	G8	7 42·3	+28 9	+ 3·3±0·0	171
81797...	α Hya	2·16	K5	9 25·1	− 8 26	− 4·4±0·0	68
84441...	ε Leo	3·12	cG3	9 43·0	+24 0	+ 5·1±0·1	50
87737...	η Leo	3·58	cA0p	10 4·6	+17 0	+ 2·2±0·2	22
102870...	β Vir	3·80	F8	11 48·1	+ 2 3	+ 5·0±0·1	22
108903...	γ Cru	1·61	M4	12 28·4	−56 50	+21·3±0·1	28
109379...	β Crv	2·84	G4	12 31·8	−23 7	− 7·7±0·1	50
124897...	α Boo	0·24	K0	14 13·4	+19 27	− 5·1±0·0	494
146051...	δ Oph	3·03	M0	16 11·7	− 3 34	−19·8±0·2	29
150798...	α Tri	1·88	K4	16 43·4	−68 56	− 3·7±0·1	27
156014*...	α^1 Her	3·48	M5	17 12·4	+14 27	−32·5±0·1	24
168454...	δ Sgr	2·84	K2	18 17·8	−29 51	−20·0±0·0	43
172167...	α Lyr	0·14	A1s	18 35·2	+38 44	−13·8±0·1	219
186791...	γ Aql	2·80	K4	19 43·9	+10 29	− 2·0±0·1	56
204867...	β Aqr	3·07	cG1	21 28·9	− 5 48	+ 6·7±0·1	44
206778...	ε Peg	2·54	cK0	21 41·7	+ 9 39	+ 5·2±0·3	74
222368*...	ι Psc	4·28	F5	23 37·4	+ 5 21	+ 5·2±0·2	17

* Suspected to have slightly variable velocity.

TABLE II

Revision of Recommended Standard Velocity Stars

(*Trans. I.A.U.* **5**, 191, 1935)

HD	Name		Mag.	Type	α (1950) h. m.	δ (1950) ° ′	V (km./sec.)	No. obs.
3765...	Lal.	1045	7·5	K5	0 38·1	+39 55	− 62·7±0·4	7
8779...	Boss	320	6·5	K0	1 23·9	− 0 39	− 5·9±0·7	6
9138...	μ Psc		5·1	K4	1 27·6	+ 5 53	+ 35·1±0·5	16
26162...	Boss	952	5·7	K1	4 6·2	+19 29	+ 23·8±0·6	18
29587...	Groom	864	7·3	G2	4 38·1	+42 2	+112·1±0·3	7
35410...	Boss	1300	5·2	K0	5 21·9	− 0 56	+ 20·6±0·4	12
44131...	Boss	1599	5·2	M1	6 17·5	− 2 55	+ 46·7±0·2	16
65583...	Lal.	15565	6·9	G7	7 57·4	+29 22	+ 13·0±0·4	7
66141...	Boss	2130	4·5	K3	7 59·7	+ 2 28	+ 70·7±0·3	14
89449...	Boss	2741	5·0	F5	10 17·0	+19 44	+ 5·9±0·4	10
92588...	Boss	2846	6·4	K1	10 38·9	− 1 29	+ 43·5±0·4	10
103095...	Boss	3112	6·5	G5	11 50·1	+38 5	− 98·8±0·4	15
107328...	Boss	3213	5·1	K1	12 17·8	+ 3 35	+ 35·5±0·1	11
114762...	Cin.	1695	7·7	F7	13 9·9	+17 47	+ 50·2±0·5	6
123782...	Boss	3631	5·4	M2	14 6·4	+49 42	− 13·0±0·4	16
144579...	Groom	2305	6·8	G8	16 3·2	+39 17	− 59·2±0·4	9
145001...	κ^1 Her		5·3	G4	16 5·8	+17 11	− 9·5±0·3	6
184467...	Groom	2875	6·7	K5	19 30·3	+58 29	+ 12·8±0·5	7
187691...	o Aql		5·2	F8	19 48·6	+10 17	− 0·4±0·5	13
212943...	Boss	5790	4·9	K0	22 25·3	+ 4 27	+ 53·9±0·3	13
213014...	Lal.	43876	7·5	G8	22 25·8	+17 0	− 39·7±0·6	8

R. F. SANFORD,
J. H. MOORE,
J. A. PEARCE.

REPORT OF SUB-COMMISSION ON CO-OPERATION IN RADIAL VELOCITY OBSERVATIONS

In order to prevent needless duplication of effort in the observation of the radial velocities of spectroscopic binaries, light variables, etc., where an extensive series of spectrograms of each object is required, your Sub-Committee prepared a list of such stars under observation on January 1, 1935, copies of which were distributed to the seven observatories interested in radial velocity work. A revision of this list containing 289 stars being observed at nine observatories was published in *Trans. I.A.U.* **6**, 259, 1938. Experience with this method of co-operation appears to justify its continuance and the Sub-Committee, therefore, has prepared a new list on the basis of data furnished by seven observatories now engaged in radial velocity determinations.

The accompanying table lists the spectroscopic binaries, light variables and other special stars under spectroscopic observation on January 1, 1948 at the six observatories indicated in column 6 by the following abbreviations:

D = David Dunlap	W = Mount Wilson
L = Lick	Y Md = Yerkes and McDonald
M = Michigan	V = Victoria

For the Yerkes and McDonald Observatories the observer who is studying the star is indicated in parentheses, by H = Hiltner, J = Jose, P = Popper and S = Struve; for the Lick by Hg = Herbig, Ne = Neubauer, Tr = Trumpler and We = Weaver; and at Victoria by McK = McKellar, Pt = Petrie and Wr = Wright. In the final column a brief notation is given of the purpose for which the star is being observed, O = orbital elements; O red = redetermination of orbital elements; sp var = spectral variation; sh per var = short period variation in velocity or spectrum or both; irreg vel var = irregular velocity variation; atm ecl effects = atmospheric eclipse effects in spectrum; etc. Additional data concerning the star or purpose for which observations are being obtained are given in the notes following the table and indicated by an asterisk (*).

The list contains the data for 252 stars of which only seven are under observation at more than one observatory. For 164, orbital elements are being determined, of which number, 63 are eclipsing variables. The other 88 stars, many of which are known intrinsic light variables, are being studied for spectral or velocity variations or both.

It is believed that the information contained in the final column increases considerably the value of such a list, not only to spectroscopists who may find it desirable to co-operate in the observation of certain stars, but also to photometric observers of eclipsing variables, when knowledge that a spectroscopic orbit will be available may influence their choice of object or prevent them from needlessly obtaining a series of radial velocity observations.

F. S. Hogg,
A. H. Joy,
D. B. McLaughlin,
J. A. Pearce,
G. A. Shajn,
O. Struve,
J. H. Moore, *Chairman*.

Variable Velocity Stars under Observation

Stars	α 1950 h. m.	δ ° ′	Mag.†	Sp	Observatory	Purpose
TW And	0 00·7	+32 34	Ecl	dF0+G0	Y Md (S, H)	O
225093	00·8	+72 53	7·5	A2	D	O
2019	22·0	+31 06	6·8	B9	D	O
TU Cas	23·6	+51 00	Var	F8v	W	vel curve
k Cass	30·1	+62 39	4·2	B0	D	sh per var?
3264	33·4	+48 17	7·4	B2	D	O

† Mag. Magnitudes are visual, except those printed in heavy type, which are photographic.

Variable Velocity Stars under Observation (*continued*)

Stars	α 1950 h. m.	δ ° ′	Mag.	Sp	Observatory	Purpose
δ And	36·6	+30 35	3·5	K4	L	O
3881	39·1	+59 39	7·4	A6	D	O
64 Psc	46·3	+16 40	5·2	F6	L	O
BM Cas	51·7	+63 48	Ecl	cA5	Y Md (P)	O
γ Cas	53·7	+60 28	Var	B0nne	M	sp var
σ Psc	1 00·1	+31 32	5·5	B9	L (e)	*
o Psc	11·0	+24 19	4·6	G7	L	O
*+57° 252	16·5	+58 00	9·7	B2	L (Tr)	O
47 And	20·8	+37 28	5·5	A3	Y Md (J)	O
8634	22·8	+23 15	6·1	F5	V (Wr)	O
8862	25·2	+43 47	6·6	B9	D	O
XX Cas	26·2	+60 42	Ecl	B4n+B6	Y Md (H)	O
9021	27·5	+70 00	6·0	F5	V (Wr)	O
AX Per	33·2	+54 00	Var	M+pec	D	sp var
10588	41·0	+31 58	6·4	G5	D	O
α UMi	48·6	+89 02	Var	cF7	L	long per O
ζ Cet	49·0	−10 35	3·9	K0	L	O
ξ Psc	51·0	+ 2 56	4·8	G7	L	O
β Ari	51·9	+20 34	2·7	A3	L (We)	O red*
XZ And	53·8	+41 52	Ecl	A0	Y Md (H)	O
60 And	2 10·1	+44 00	5·1	K5	L	O
65 Cet	10·3	+ 8 37	4·5	G4	L	O
*+56° 587	18·7	+56 54	9·6	B2	L (Tr)	O dbl ls
14688	19·8	+16 39	6·8	A1s	D	O
15138	24·5	+50 20	6·3	F2	D	O
*+60° 497	28·2	+61 23	9·0	O8	L (Tr)	O
*+60° 501	28·8	+61 15	9·8	O9	L (Tr)	O
*+60° 502	28·9	+61 14	7·8	O7	L (Tr)	irreg vel var
*+59° 552	47·2	+60 13	7·1	O8	L (Tr)	O (triple)
SU Cas	47·5	+68 41	Var	F2–F9	D	sp var
γ Per	3 01·1	+53 19	3·1	G0+A2	M	O
β Per	04·9	+40 46	Ecl	B8	M	O (triple)
RS Ari	11·5	+27 40	Ecl	F9+G5	Y Md (H)	O
ζ Eri	13·4	− 9 00	4·9	A3	L	O
20336	15·5	+65 28	4·8	B3ek	M	sp var
o Tau	22·1	+ 8 51	3·8	K1	L	O
23626	44·6	+32 03	6·2	F6	D	O
23862	46·2	+24 00	5·2	var pec	M	sp var
X Per	52·2	+30 54	Var	B0nne	M	sp var
RW Tau	4 00·8	+28 00	Ecl	B9 (K0e)	WY Md (H) V (Pt)	O
*+50° 940	11·2	+51 07	8·9	cB9	L (Tr)	O
52 Per	11·5	+40 22	4·9	cG3	L	O
27483	18·0	+13 45	6·1	F4	D, V (Wr)	O
29104	32·7	+19 47	6·6	F8	D	O
B 1074	33·2	+41 10	4·5	K0+A3	M, W	O
R Lep	67·3	−14 53	Var	N6o	W	vel curve
ε Aur	58·4	+43 44	Ecl	F5p	M	O
ζ Aur	59·0	+41 00	Ecl	K5+B1	M	atm ecl effects
BF Aur	5 01·5	+41 13	Ecl	A0	D	O
η Aur	03·0	+41 10	3·3	B3	D	sh per var?
RW Aur	04·6	+30 20	Var	G0	W	vel curve
ρ Ori	10·7	+ 2 48	4·6	K3	L	O
UV Aur	18·5	+32 28	Var	Nep	W	vel curve
35189	20·8	+16 39	6·1	A1s	D	O
35439	22·1	+ 1 48	4·7	B3ne	M	sp var
114 Tau	24·6	+21 54	4·8	B3	D	sh per var?

Stars	α 1950 h. m.	δ ° ′	Mag.	Sp	Observatory	Purpose
FO Ori	5 25·5	+ 3 34	Ecl	—	Y Md (S)	O
δ Ori	29·5	− 0 20	Ecl	B1nk	Y Md (S)	O
36484	30·2	+32 46	6·5	A2	D	O
VV Ori	31·0	− 1 11	Ecl	B2	Y Md (S)	O
ι Ori	33·0	− 5 56	2·9	O8sk	L (We)	O red*
*+34° 1103	33·0	+34 07	8·5	B2	L (Tr)	O
*+34° 1107	33·1	+34 06	9·2	B2	L (Tr)	O
T Ori	33·3	− 5 30	Var	A3e	L (Hg)	vel curve
ζ Tau	34·7	+21 07	3·0	B3e	M	O sp var
σ Ori	36·2	− 2 38	3·8	B0	D	sh per var?
37366	36·2	+30 52	7·5	B3	D	O
B 1399	38·3	− 1 09	5·0	B3	L (We)	O red*
40372	55·8	+ 1 50	6·1	A5	D	O
60 Ori	56·2	+ 0 33	5·2	A0	L	O
AZ Aur	57·7	+39 39	Var	Ne	W	vel curve
μ Ori	59·6	+ 9 39	4·2	A2	Y Md (P)	var vel sys
CQ Aqr	6 00·6	+31 19	Ecl	—	D	O
41335	01·8	− 6 42	5·1	B2e	M	sp var
*+24° 1123	06·0	+24 22	7·8	B4	L (Tr)	var vel doubtful
WY Gem	08·9	+23 14	Var	M3ep	D	sp var
η Gem	12·2	+22 32	Var	M3	M	O
SV Mon	18·8	+ 6 30	Var	F8–K5	D	sp var
44458	19·1	−11 45	5·5	B2ne	M	sp var
BN Mon	19·3	+ 7 22	Var	N	W	vel curve
T Mon	22·5	+ 7 07	Var	cG4v	W	vel curve
45194	23·8	+13 08	6·6	F8	D	O
10 Mon	25·5	− 4 44	5·0	B3	D	sh per var?
β′ Mon	26·4	− 7 00	4·7	B3ne	M	sp and vel var
*+4° 1299	29·4	+ 4 55	8·5	B1	L (Tr)	O dbl ls
RW Mon	32·0	+ 8 52	Ecl	A0	D	O
SV Cam	35·1	+82 19	Ecl	dG3+dG5	Y Md (H)	O
47415	36·5	+24 39	6·5	F8	D	O
*+9° 1332	37·8	+ 9 51	7·8	B5	L (Tr)	O dbl ls
42 Cam	45·7	+67 38	5·0	B3	D	sh per var?
RX Gem	46·9	+33 18	Ecl	A2	V (Pt)	O red
SS Cam	7 10·3	+73 25	Ecl	gG1+dF5	Y Md (H)	O
*−10° 1933	12·1	−10 14	6·0	O9	L (Tr)	long per vel var
27 CMa	12·2	−26 16	4·7	B5	Y Md (S)	vel curve
*τ CMa	16·6	−24 52	4·4	O9	L (Tr)	O red
RY Gem	24·6	+15 45	Ecl	A2+K	V (McK)	O red
65 Gem	26·7	+28 01	5·1	K1	L	O
U Mon	28·4	− 9 40	Var	G5–K2	D	sp var
B 1985	31·5	−14 24	5·1	K5, B	M	long per vel var?
13 Pup	41·8	−28 50	4·1	cA2ep	L (Ne)	vel curve
63630	48·4	+46 05	6·5	A5	D	O
63887	51·8	+71 50	7·5	A0	D	O
XY Pup	8 07·2	−11 50	Ecl	A3	Y Md (H)	O
TW Cnc	26·9	+12 37	Ecl	G5	Y Md (P)	O
RZ Cnc	36·0	+31 58	Ecl	K0+K4	Y Md (H)	O
TX Cnc	37·2	+19 11	Ecl	—	Y Md (S, P)	O
S Cnc	41·0	+19 13	Ecl	A0 (G5)*	W	O
12 Hya	44·0	−13 22	4·4	G4	L	O
T Cnc	53·8	+20 22	Var	N3	W	vel curve
ξ Cnc	9 06·5	+22 15	5·2	G9	L	O
τ UMa	06·8	+63 43	4·7	cF6	L	O
RS Cnc	07·6	+31 10	Var	M6	W	vel curve
81995	27·4	+44 59	7·1	A5	D	O
82191	28·4	+27 37	6·6	A0	D	O
82780	32·2	+40 11	6·6	F2	D	O

Variable Velocity Stars under Observation (*continued*)

Stars	α 1950 h. m.	δ ° ′	Mag.	Sp	Observatory	Purpose
10 Leo	9 34·6	+ 7 04	5·1	G9	L	O
RT Leo	42·6	+20 09	Ecl	—	Y Md (H)	O
4 Sex	47·9	+ 4 35	6·2	F5	Y Md (P)	O
η Leo	10 04·6	+17 00	3·6	A0p	D	sp var
88815	13·8	+73 19	6·5	F0	V (Wr)	O
μ UMa	19·4	+41 45	3·2	K5	L	O
V Hya	49·2	−21 00	Var	N6	W	vel curve
α UMa	11 00·6	+62 01	2·0	G7	L	vis bin, sh per var
97334	09·8	+36 05	6·9	G0	D	sp var
100018	28·1	+41 34	7·0	F2	V (Pt)	O
105702	12 07·5	+ 6 05	6·0	F0	D	sp var
110533	38·4	+83 55	7·2	F7	V (McK)	O
110628	40·8	+26 24	7·0	F0	D	sp var
ξ^2 UMa	13 23·2	+55 15	4·0	A5n	D	sh per var?
W Vir	23·5	− 3 06	Var	cG0p	W	vel curve
BF Vir	45·3	− 0 21	Ecl	A0	D	O
BH Vir	55·9	− 1 26	Ecl	G0	Y Md (H)	O
UW Boo	14 19·2	+47 19	Ecl	F	D	O
131511	51·1	+19 21	6·0	K0	V (Wr)	O
β CrB	15 25·8	+29 17	3·7	A7s	L (Ne)	sh per var?
TW Dra	33·1	+64 01	Ecl	A6+K2	Y Md (S)	O
B 4008	43·5	− 1 39	5·4	B8	L (We)	O red*
V CrB	47·8	+39 44	Var	N3e	W	vel curve
T CrB	57·4	+26 04	Var	—	W	vel curve
RR Her	16 02·8	+50 38	Var	Nep	W	vel curve
SW Oph	13·8	− 6 51	Ecl	A0	Y Md (H)	O
V Oph	23·9	−12 19	Var	N3e	W	vel curve
*−41° 11037	50·7	−41 46	8·5	O9	L (Tr)	O
*−41° 11042	50·8	−41 46	8·5	O9	L (Tr)	O dbl ls
TT Her	52·2	+16 55	Ecl	A5	Y Md (S)	O
154528	58·3	+77 44	6·7	A0	D	O
WZ Oph	17 04·2	+ 7 50	Ecl	G0+G0	Y Md (H)	O
μ^1 and μ^2 Dra	04·3	+54 32	5·1	F6	L	sh per var?
158013	22·5	+57 02	6·6	A2	D	O
157978–9	23·9	+ 7 38	6·0	G0+A0	M	O (triple)
*−32° 12935	31·4	−32 33	5·7	O7	L (Tr)	O red dbl ls
Y Oph	50·0	− 6 08	Var	F8–G7	D	sp var
Z Her	55·8	+55 01	Ecl	F2+F2	Y Md (H)	O
164898	59·7	+45 21	7·4	A0	D	O
*−24° 13831	18 01·5	−24 22	8·3	B0	L (Tr)	O dbl ls
ζ Sct	20·9	− 8 58	4·8	K0	L	O
AW Her	23·4	+18 16	Ecl	K2+G4	Y Md (H)	O
B 4667	24·7	+ 0 10	5·3	G0+A2	M	O (triple)
V 451 Oph	26·8	+10 51	Ecl	A0	D	O
AC Her	28·2	+21 50	Var	G6ev	W	vel curve
170829	28·6	+20 48	6·6	G8	D	O
172187	35·2	+43 10	6·3	A5	D	O
B 356 Sgr	44·9	−20 20	Ecl	A0	Y Md (P)	O
DI Her	51·4	+24 13	Ecl	B5	V (McK)	O
δ′ Lyrae	52·0	+36 54	5·5	B3	V (McK)	O red
B 4797	52·6	+22 34	4·6	G0+A3	M	O
FF Aql	56·0	+17 18	Var	F5	W, D	vel curve, sp var
V 337 Aql	19 01·5	− 2 08	Ecl	B3n	D	O
TT Aql	05·7	+ 1 13	Var	G5–K0	D	sp var
η Lyr	12·1	+39 04	4·5	B3	D	sh per var?
180316	13·0	−27 51	6·7	B5	D	O
RS Vul	15·5	+22 21	Ecl	B8+B9	Y Md (H)	O

Stars	α 1950 h. m.	δ ° ′	Mag.	Sp	Observatory	Purpose
26 Aql	19 17·9	− 5 31	5·1	K0	L	O
υ Sgr	18·8	−16 04	4·6	B8p	M	sp var
RR Lyr	23·7	+42 42	Var	A5v	Y Md (S), W	var vel curve
TT Lyr	25·9	+41 36	Ecl	A	D	O
183794	28·7	− 2 13	6·7	B8	D	O
β^1 Cyg	28·7	+27 52	3·2	K0+A0	M	slow vel var
U Vul	34·4	+20 13	Var	cG4v	W	vel curve
φ Cyg	37·4	+30 02	4·8	K0	L	O
BR Cyg	39·4	+46 40	Ecl	—	D	O
SVS 873 Cyg	40·3	+31 11	Ecl	B8	L (Hg)	O
SU Cyg	42·8	+29 09	Var	F2p	D	sp var
δ Sge	45·2	+18 24	3·8	Ma+A0	M	O sp var?
CI Cyg	48·4	+35 33	Var	Ocp	D	sp var
SV Vul	49·5	+27 19	Var	K1v	W	vel curve
V 505 Sgr	50·3	−14 44	Ecl	A2	Y Md (P)	O
S Sge	53·7	+16 30	Var	cG3v	L	vel curve, long per O
120073	20 00·6	+ 5 36	7·9	A0p	D	sp var
KR Cyg	07·0	+30 24	Ecl	—	Y Md (H)	O
191610	07·6	+36 42	4·8	B3nne	M	sp var
KU Cyg	11·1	+47 15	Ecl	cF2	Y Md (P)	O
31 Cyg	12·1	+46 35	4·0	K0+B8	M	O
32 Cyg	14·0	+47 34	4·2	K0+A3	M, V (W)	O red
*+37° 3860	14·7	+37 28	8·2	B0	L (Tr)	2 per var ampl
*+37° 3862	14·7	+37 28	9·2	B1	L (Tr)	O (triple)
RW Cap	15·1	−17 50	Ecl	A3+A4	Y Md (H)	O
35 Cyg	16·7	+34 50	5·2	cF5	L	O
MY Cyg	18·1	+33 46	Ecl	A	D	O
U Cyg	18·1	+47 44	Var	Nep	W	vel curve
*+38° 4063	22·0	+38 21	9·0	F5	L (Tr)	O
Bε Vul	23·7	+27 12	Ecl	—	D	O
195987	31·1	+41 43	7·0	G5	V (Wr)	O
196133	32·0	+45 00	6·6	A2	D	O
GO Cyg	35·4	+35 16	Ecl	B9n+A0	Y Md (H)	O
AE Aqr	37·6	− 1 03	Var	G8e	W	vel curve
X Cyg	41·4	+35 24	Var	F8–K0	D	sp var
E Cyg	44·2	+33 47	2·6	K0	L	O
VW Cep	45·5	+75 24	Ecl	G5	Y Md (P)	O
198287–8	46·1	+39 06	7·0	cA7se	W	vel curve
199140	52·2	+28 20	Var	B1	V (Pt)	sh per var
RR Vul	52·6	+27 44	Ecl	A	Y Md (H)	O
S Equ	54·7	+ 4 53	Ecl	B9	V (Pt)	O
CG Cyg	56·2	+34 58	Ecl	F2	D	O
200120	58·1	+47 20	4·9	B3ne	M	sp var
ξ Cyg	21 03·1	+43 44	3·9	cK5	L	O
201032	03·2	+63 11	7·3	A5	D	O
DT Cyg	04·4	+30 59	Var	F5	W	vel curve
203338–9	17·9	+58 24	5·6	M1+B(e)	M	sh per vel var?
203467	18·3	+64 40	5·2	B3nek	M	sp var
205114–5	29·8	+52 24	6·2	K0+A3	M	vel var?
EE Peg	37·6	+ 8 57	Ecl	A0	D	O
AI Cep	44·7	+56 42	Ecl	—	D	O
*+61° 2213	52·0	+62 21	9·1	B3	L (Tr)	O dbl ls
*+61° 2217	52·5	+62 21	7·1	B2	L (Tr)	O
VV Cep	55·3	+63 23	Ecl	M2ep+B	M	O sp var
208835	55·9	+46 37	7·4	B8	D	O
UZ Cyg	57·2	+44 07	Ecl	A3+K1	Y Md (S)	O
RT Lac	59·5	+43 39	Ecl	G9+K1	Y Md (H)	O
AR Lac	22 06·6	+45 30	Ecl	K0+G5	D, W, Y Md (H)	O
212076	19·1	+11 57	4·9	B3e	M	sp var

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VARIABLE VELOCITY STARS UNDER OBSERVATION (*continued*)

Stars	α 1950 h. m.	δ ° ′	Mag.	Sp	Observatory	Purpose
π Aqr	22 22·8	+ 1 07	4·6	B1wnek	M	sp var
XZ Cep	30·9	+66 54	Ecl	B5	V (Pt)	O
214168	33·7	+39 22	5·8	B3nek	M	sp var
W Cep	34·5	+58 09	Var	Mp	D	sp var
214946	38·9	+44 45	7·1	A2	D	O
WY Cep	44·7	+67 28	Ecl	A7	D	O
*+57° 2607	44·9	+57 49	8·9	O9	L (Tr)	O dbl ls
217050	54·8	+48 25	5·2	B3nek	M	sp var
β Psc	23 01·4	+ 3 33	4·6	B5e	M	sp var
SZ Psc	10·8	+ 2 24	Ecl	G5	D	O
94 Aqr	16·5	−13 44	5·3	G4	L	O
AR Cas	27·7	+58 16	Ecl	B3	V (Pt)	O red
Z And	31·3	+48 32	Var	Oop	D	sp var
R Aqr	41·2	−15 34	Var	M+Be	D	sp var
ρ Cas	51·9	+57 14	Var	Var	M	sp and vel var

* NOTES

σ Psc	Test for variation in line intensity with position in orbit.
+57° 252	In cluster NGC 457.
β Ari	Test for variation in line intensity with position in orbit.
+56° 587	In cluster χ Per.
+60° 497	In cluster IC 1805.
+60° 501	In cluster IC 1805.
+60° 502	In cluster IC 1805 ADS 1920.
+59° 552	In cluster IC 1805 IC 1848 ADS 2161.
RW Tau	Spectrum K0e at minimum.
+50° 940	In cluster NGC 1528.
ι Ori	Test for variation in line intensity with position in orbit.
+34° 1103	In cluster M 36.
+34° 1107	In cluster M 36 ADS 4194 A.
B 1399	Test for variation in line intensity with position in orbit.
+24° 1123	In cluster M 35.
+ 4° 1299	In cluster NGC 2244.
−10° 1933	In cluster NGC 2353.
+ 9° 1332	In cluster NGC 2264 ADS 5316.
τ CMa	In cluster NGC 2362 ADS 5977.
S Cnc	Spectrum G5 at minimum.
B 4008	Test for variation in line intensity with position in orbit.
−41° 11037	In cluster NGC 6231.
−41° 11042	In cluster NGC 6231.
−32° 12935	In cluster NGC 6383.
−24° 13831	In cluster NGC 6530.
+37° 3860	In cluster IC 4996 ADS 13626 B.
+37° 3862	In cluster IC 4996 ADS 13626 C.
+38° 4063	In cluster NGC 6913.
+61° 2213	In cluster NGC 7160 ADS 18420 A.
+61° 2217	In cluster NGC 7160 ADS 15434 B.
+57° 2607	In cluster NGC 7380.

REPORT OF SUB-COMMISSION ON WAVE-LENGTHS

1. The determination of satisfactory wave-lengths for radial-velocity determinations remains, and will remain for some time, one of the important concerns of the Commission. Discussions in previous reports have made it clear that it is unwise to suggest the general adoption, at different observatories, of a set of effective wave-lengths. For spectral types

later than A0 nearly all the principal features used in general radial-velocity work are blends of two or more lines and the effective wave-length of the blend depends upon the purity and dispersion employed. Recent studies at Victoria on spectral types from A0 to K8 have confirmed this conclusion reached by other investigators. It may be possible to recommend standards for general adoption for the less complex O and B spectra, although even here several of the important features are blends and it is not certain that satisfactory values can be suggested for all dispersions without further study and comparison. The question is now under investigation and it should be possible to make more definite statements in the near future.

2. In view of the above it is suggested, therefore, that attention be centred upon the means used to determine effective wave-lengths. Methods employed should ensure that the radial velocities for all spectral types, and determined with any given spectrograph, shall refer to a common zero point which is based upon independent dynamical results. To this end the following procedure is proposed:

(*a*) For solar-type stars, defined for this purpose to embrace the range F5 to K8, the adopted wave-lengths shall reproduce the velocities of members of the solar system as computed from their orbital elements, and shall also reproduce the adopted radial velocities of the brighter Standard Velocity Stars observed with high dispersion.

(*b*) For other spectral types (O, B, A0–F2, M) the adopted wave-lengths shall reproduce the radial velocities computed from the space motion of moving clusters. Preference is to be given to the clusters for which a reliable space motion can be calculated from proper motions and trigonometrical parallaxes. For others the adopted cluster motion is to be based upon radial-velocity determinations of solar-type members using wave-lengths found as in (*a*), above.

(*c*) In addition to the clusters certain visual binaries may serve as control objects. Those selected are to have one component a solar-type star and the velocity is to be determined from it using wave-lengths verified as in (*a*) above. In selecting binaries wide pairs are to be preferred so that the relative radial velocities of the components may be ignored. Every precaution is to be taken to make sure that the pair constitute a physical system.

It is not recommended that wave-lengths be adjusted arbitrarily to force *exact* agreement with the standards used as control velocities. To do so would incorporate into the wave-lengths instrumental errors and those due to measurement. There is also the danger that such a procedure may mask real velocity differences between members of clusters and other interesting effects such as the gravitational shift. An alternative, and more fundamental, method is to employ the standard velocities as checks and controls upon the adopted effective wave-lengths (*J. Roy. Ast. Soc. Can.* **40**, 325, 1946). These wave-lengths are to be predicted from studies of high-dispersion stellar and laboratory spectra, bearing in mind the degree of blending introduced by the particular spectrograph being used.

3. In order to implement the above proposals the Sub-Committee notes the need for work as follows:

(*a*) Radial velocities should be determined and adopted for suitable control objects to be used as standards for spectra other than solar-type. The Ursa Major,* Taurus, Pleiades, and Coma clusters may be regarded as reasonably well known, but clusters containing O and B stars should be studied to determine reliable values for adopted cluster motions. Suitable visual binaries should also be proposed.

(*b*) Detailed studies are required for a number of representative stellar spectra using the highest possible dispersion. All lines should be listed, and accurate wave-lengths and careful intensity estimates should be provided. It appears that relative intensities on a visual scale are sufficient. The Revised Rowland Table and the recent valuable Coudé studies from the Mount Wilson and McDonald Observatories

* Some of the stars of this cluster exhibit radial-velocity residuals not yet fully explained.

are essential to an understanding of the blended features which must be used in general radial-velocity work with relatively low dispersion. The need for such information is felt most keenly for stars of types A0 and earlier.

(c) Studies of the mechanism of blending should be encouraged as discussed in the previous Report. The purely instrumental effects should be distinguished from physical causes. In solar-type spectra the blended wave-length may be found by weighting the separate components roughly according to their Rowland Intensities. The subject is more obscure for the early-type stars where the influences of rotational broadening and Stark effect complicate the problem. Attention may be drawn specifically to the helium triplets λλ4026, 4471 in the B stars, and the blends of hydrogen and ionized helium at λλ4101, 4340 in the O stars, since these lines generally have high weight in radial-velocity determinations.

4. It is highly desirable that published lists of radial velocities be accompanied by a tabulation of the wave-lengths used or that the system be described in sufficient detail. Dr Adams reports that for spectral types between A5 and M he employs the solar wave-lengths of the Revised Rowland Table for measures of Coudé spectra.

At Victoria the entire wave-length system has been studied anew and revised values have been adopted for spectral types from A0 to K8 inclusive, while the O and B spectra are now under investigation. The revised wave-lengths will be published in full, the following having appeared:

(i) F4 to K8—High Dispersion. *J. Roy. Ast. Soc. Can.* **40**, 325, 1946.
(ii) F4 to K8—Moderate Dispersion. Ibid. **40**, 325, 1946.
(iii) A0 to F2—High Dispersion. Ibid. **41**, 311, 1947.

W. S. Adams, O. Struve,
V. Albitzky, R. E. Wilson,
F. J. Neubauer, R. M. Petrie.

Report of meetings

President: Dr J. A. Pearce.

Secretary: Dr R. E. Wilson.

Two meetings of the Commission were held, Dr J. A. Pearce presiding, and Dr Ralph E. Wilson acting as secretary. The Draft Report (received too late for publication) was adopted with some minor amendments.

A fifth Catalogue of the orbital elements of 475 spectroscopic binary systems deduced prior to January 1, 1947 has been compiled by Moore and Neubauer and is now in the press. The thanks of the Commission were extended to the authors for their work.

The need for a New General Catalogue of Stellar Radial Velocities is generally recognized. Since the publication of the Lick Observatory Catalogue of 1932, the number of stellar radial velocities has increased from 6700 to 12,000, and it is estimated that approximately 14,000 radial velocities will have been determined by 1950. The Commission is pleased to announce that Dr Ralph E. Wilson has consented to edit a New General Catalogue of Stellar Radial Velocities, to contain all velocities determined before January 1, 1950. This Catalogue will be published by the Mount Wilson Observatory.

The Commission again emphasizes the urgent need for spectrographic observations in the Southern Hemisphere, where for one-third of the Galaxy no radial velocities have been determined for stars fainter than the 6th magnitude. The asymmetrical distribution of velocities militates against advancement in many fields, and this deplorable condition will be further accentuated unless spectrographic observations are immediately resumed and energetically carried out in the Southern Hemisphere. The Commission hopes that the Radcliffe Observatory will undertake this important work at the earliest possible date, and appeals to the President to exert every possible influence of the International Astronomical Union in expediting the construction of a spectrograph for the Radcliffe Observatory.