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Section Officers. G E Patston recently expressed his wish to retire from the Secretaryship of the Section. His resignation was accepted by the Director and by Council with regret. Since 1965 Mr. Patston has supervised the checking of magnitude reductions, doing much of this work himself, and has prepared annual tabular summaries of the observations. After the resignation of the last Director, Mr. Patston took on himself for a while all the Section's correspondence. His work for the Section is far more than this, for he has served both as an observer and as cartographer since before the war. The value of his efforts will be felt for many years to come.

The Director is pleased to welcome D R B Saw, whom Council has appointed as Mr. Patston's successor. One of our leading observers of the past decade, Doug Saw is well fitted to discharge the duties of the Secretaryship. In future, all observations (except those made in connection with the Eclipsing Binary Project and international flare star patrols, which should be communicated to the Director), should be sent to the Secretary as soon as possible after the close of each calendar year.

Council has also appointed Steve Anderson as Assistant Director. In future all requests for charts and other publications, enquiries in connection with the distribution of these Circulars, and notification of changes of address, should be sent to him.

Future of the VSS. At the May meeting of the Association, the Director spoke on the future of the VSS. A report on the meeting appears in the current issue of the Journal, so the following remarks are merely in amplification of certain points.

1. The Programme. To make the work of the Section as effective as possible, and also to comply with the wishes of observers, the following decisions have been taken:

- (i) The programme should remain at about its present size.
- (ii) The programme should include some variable 'stars' of each of the types which can be effectively observed visually, including optically variable quasars and galaxies.
- (iii) There should not be a concentration on any one type. It would be advisable to drop the majority of the Mira stars included at present, but not to replace them with, say, dwarf novae alone.
- (iv) The wide range of instruments and observational experience which members possess must be catered for.
- (v) No more changes should be made than are strictly necessary, in view of the importance of continuity of observation.

At the Director's invitation, a committee, on which the Binocular Sky Society and Junior Astronomical Society Variable Star Section are represented, is now considering, among other matters, specifically which stars are to be dropped and which taken on by the VSS. So far, it has been agreed that:

- (i) the semiregular supergiants listed in VSSC 13 will be included;
- (ii) all known RV Tauri stars in the northern hemisphere brighter than visual magnitude 13 at minimum will be included from the beginning of 1974, for the duration of the international project described below, and some of these will be retained in the programme after the project has finished;
- (iii) among the Mira stars, R And, R Aql, V Cam, X Cam, S Cas, o Cet, S CrB, W CrB, R Cyg, S Cyg, χ Cyg, SS Her, R Hya, U Ori, R Ser, T UMa and others will be retained, since observations of these are important for one reason or another. The list of stars to be dropped will be published when it has been finalised. It is possible that some Mira stars of particular interest, not previously observed by the VSS, will be added to the working list.

2. Publications. The present series of analyses in the Journal will deal with observations up to the following years:

Semi-regular variables (SRb and SRc)	1969
U Gem stars (except SS Cyg)	1969
R CrB	1970
Novae and recurrent novae	1971
Z Cam stars (except TZ Per)	1972

RV Tau stars	1973
SS Cyg and TZ Per	1973
R CrB stars (except R CrB)	1974
Mira and SRa stars (Memoir?)	1974

Thereafter, a regular cycle of 5-yearly reports will keep the work up to date.

It has been decided that the series of annual duplicated Reports listing the original estimates will commence with 1973, rather than 1970 as provisionally suggested in VSSC 13. The reasons for this are that fragmentary observations of many stars for which inadequate sequences exist were made in 1970, and it would be a very time-consuming job to marshal these results into a form suitable for publication, whereas, now that a definite programme is published and adhered to by the majority of observers, the situation is much improved. Moreover, it seems unwise to start this work with a backlog. The series of backlog Reports now in preparation will therefore cover the years up to and including 1972.

3. International collaboration. European observers of variable stars are in an unfortunate position, in comparison with their American and Australasian colleagues, in that there are many small groups which, while doing admirable work in the stimulation of observers to greater efforts and the instruction of beginners, produce publications which to a considerable extent duplicate those of the other groups, and provide a confusing mass of material for the would-be user of the observations. The coordinators of other European groups, with whom the Director has been in correspondence, are agreed on the desirability of working towards the establishment of a federation of European variable star groups, in which the societies would retain their independent bulletins, but all observations would be pooled, and each group made responsible for the publication of all European observations of one or more classes of variable star. Copies of all these reports would of course be available to a member of any one of the groups.

The obstacles to such a federation, in the lack of standardisation of charts, comparison star magnitudes, observing techniques and reporting methods, are considerable. We are therefore indebted to Prof. Plant, Kapteyn Laboratory, for suggesting that, in order to encounter and resolve these problems on a smaller scale, the groups collaborate in a project on all RV Tauri stars in the northern hemisphere brighter than visual magnitude 13. The BAA VSS has the responsibility for drawing up the charts and sequences to be used in the project. The Director, with much valuable assistance from Messrs. I D Howarth and A L Smith, is currently working on this. Observations will commence on 1974 Jan 1 and continue for at least 18 months. They will be collected by the coordinators of the individual groups, and forwarded to the Dutch group, who will be responsible for their publication.

The participants will be the Belgian, Dutch, French, German, Scandinavian and Swiss groups, and in this country, the Binocular Sky Society and the BAA VSS. As well as providing a valuable experiment in collaboration, the project should shed new light on these RV Tauri stars, few of which have been extensively observed visually, and it is hoped that all VSS members will give their full support. An announcement will be published when the charts required are available.

Members List. In view of Council's decision not to publish full member lists in future, a list of members of the VSS with the addresses and home telephone numbers where known, is enclosed with this Circular. Members will thus be enabled to contact others in their neighbourhoods. Any corrections to the list should be notified to the Assistant Director.

1972 Observations. A total of 11,336 observations by 63 members had been received for last year by 1973 June. The Director apologises for the fact that some late observations are not included in the following statistics, but believes that the general picture is accurate.

The observers were as follows:

	Obsns.	Principal Instrument
O J Knox	1883	32 cm Spec.
D R B Saw	1347	35 cm Spec.
P.A. Moore	1043	32 cm Spec.
C.R. Munford	679	22 cm Spec.
R.J. Livesey	485	15 cm Spec.
P.J. Young	469	31 cm OG
M J Gainsford	439	21 cm Spec.
I D Howarth	344	31 cm Spec.
A M Savill	331	10 cm Spec.
G P Hawkins	315	25 cm Spec.
S F Burch	295	15 cm Spec.

K M Sturdy	267	15 cm Spec.
R A H Paterson	261	32 cm Spec.
I Miller	253	30 cm Spec.
D Pye	228	30 cm Spec.
W E Pennell	226	26 cm Spec.
P W Hornby	214	22 cm Spec.
M D Taylor	206	8 cm OG
D Vest-Askew	199	22 cm Spec.
R D Pickard	193	22 cm Spec.
G Broadbent	117	8 cm OG
B Jobson	111	8 cm OG
41 Others	1431	various
TOTAL	11336	

The results are distributed among the programme stars as indicated below. The stars marked with an asterisk are particularly commended to observers' attention. The group of six stars at the end were taken on during the course of the year, and it was not to be expected that they would be well observed in 1972.

Star	Obsns.	Obsrs.	Star	Obsns.	Obsrs.
R And	137	8	R Aur	67	2
RX And	277	12	X Aur	54	5
R Aql	70	5	SS Aur	415	20
* UU Aql	111	10	R Boo	132	7
R Ari	136	7	S Boo	100	4
* U Boo	9	3	R Leo	219	15
* V Boo	24	1	* X Leo	71	8
* V Cam	55	2	R Lyn	41	2
X Cam	108	4	W Lyr	123	6
Z Cam	450	11	* AY Lyr	182	7
AF Cam	79	4	* U Mon	43	9
R Cas	74	4	* RS Oph	63	6
S Cas	140	7	U Ori	160	12
T Cas	217	9	* CN Ori	70	8
W Cas	180	7	* CZ Ori	84	8
HT Cas	34	2	R Peg	83	10
γ Cas	255	15	RU Peg	275	17
ρ Cas	603	24	R Per.	54	2
S Cep	33	1	S Per	62	5
T Cep	175	10	TZ Per	300	12
o Cet	71	10	UV Per	217	8
R CrB	775	22	R Sct	190	12
* S CrB	34	6	* R Ser	23	4
T CrB.	250	10	T Tau	195	6
* W CrB	26	3	* RV Tau	46	3
R Cyg	154	8	SU Tau	220	11
S Cyg	77	8	R Tri	53	3
U Cyg	147	5	R UMa	127	4
W Cyg	332	16	S UMa	163	5
SS Cyg	620	18	T UMa	133	5
χ Cyg	171	8	SU UMa	239	11
S Del	90	5	* SW UMa	80	8
HR Del	237	12	S UMi	116	7
R Dra	120	4	S Vir	17	1
* AB Dra	126	6			
R Gem	55	4	* UW Aql	8	1
* U Gem	192	13	* BC Cyg	12	1
T Her	146	9	* BI Cyg	12	1
U Her	31	4	* RS Per	7	1
* SS Her	31	5	* BU Per	7	1
* R Hya	11	3	* - UMa	10	2

New Report Forms. A revised form has been prepared, for use by all three variable star groups in Britain. The principal changes, as compared with the forms currently in use in the VSS, are:

- (1) The introduction of a column for the Julian Date and Decimal. It is necessary to convert the calendar dates and times in hours and minutes before observations are analysed or published, and, in order that the publication of analyses and reports can go ahead quickly as possible, it is necessary to ask observers to carry out his conversion before submitting their results. It is the Director's opinion that British observers have had the smooth end of the stick for too long, since all overseas groups require their members to do this conversion! However, there are two slight savings:
- (2) The omission of the 'Sky' column. Observers should take account of the sky conditions when completing the 'Class' column. Unfortunately, they do not always do so, but the omission of the 'Sky' column should encourage conformity. If haze or cloud is present, this should of course be noted under 'Remarks', so the 'Sky' column is really redundant.
- (3) In future, magnitude reductions are required to the nearest tenth only, not to the nearest hundredth. The VSS practice of recording to the nearest hundredth, in opposition to the rest of the world, has given rise from time to time to a heretical belief on the part of British observers in the superior accuracy of their work.

It is no secret that the VSS has always rounded observations to the nearest tenth before analysing or publishing them, so it will save everyone trouble, and cause no loss of accuracy, if deduced magnitudes are rounded to the nearest tenth when entered on the forms.

The pages of the 'Methods Pamphlet' which have had to be revised are enclosed with this Circular. Members are asked to keep these instructions to help them complete the new forms, which will be issued as soon as existing stocks are exhausted.

LPV Predictions. It should be noted that the predictions for R Aql and R Hya given in VSSC 14 are in error by a few months. These stars are notorious for the changes in their periods, which render the prediction of their future maxima and minima a hazardous procedure.

It was originally intended to publish in this Circular, more detailed predictions to the end of 1974 for all Mira stars on the programme, at the earnest request of several observers. However, since it is possible that some Mira stars will be dropped from the programme at the end of 1973, the predictions have been held over to the next Circular.

New and Revised Charts. The attention of observers of AB Dra and CN Ori is directed to the revisions indicated below.

AB Dra: Final charts for this star are available from Steve Anderson. The preliminary 9^o chart is to be replaced by a 3^o chart which will permit the field to be found more easily, using Kappa Cep as a guide star. Stars F, H and M are dropped from the sequence, but the magnitudes of the remaining comparison stars are unchanged.

AH Her: Preliminary charts for this Z Cam star are available from Steve Anderson.

CN Ori: Star E is incorrectly identified on the 20' chart. The correct identification is the star about 1' south and slightly following the marked position, i.e. 45 mm from the left-hand and 24 mm from the top frame lines. (The error has been corrected in some recently issued copies.) The Director would welcome comments on the comparison star sequence for this object.

WZ Sge: Preliminary charts for this recurrent nova (7.0 - 15.5 pg, outbursts in 1913 and 1946) are now available from Steve Anderson. It is believed that the adopted sequence, which collates information from several sources, is the first to be published covering the variable's entire range. Because of its relative faintness at maximum, and the brevity of its outbursts, it is probable that past maxima of this nova have been missed, and they may occur more frequently than indicated by the dates of the two observed outbursts. Since a maximum may occur at any time, the star is commended to the attention of observers.

R Trianguli. The last Circular included a request for observations of this star covering the 1973 Feb maximum to be communicated to the Director, following a report from A L Smith that the maximum was an unusually bright one. The only helpful response came from M J Gainsford, who did not see the star brighter than 5.5, whereas the extreme maximum is 5.4 according to the 1971 GCVS Supplement.

Eruptive Object in UMa (see VSSC 14 and 15). J E Bortle reports that the spelling 'Tanskij', given as the discoverer of this object in IAUC 2408, was an error for 'Goranskij'; and I D Howarth reports that the object has now been designated SVS 1851, which should, as he remarks, obviate future spelling difficulties.

IAU Flare Star Patrols. Members are reminded of the international patrol on the flare star UV Ceti. This star was not observed well enough last year for a report to be published, the only reported results being negative estimates. (The minimum visual magnitude is 12.9, according to the GCVS). The limits of this year's patrol are Sep 20 and Oct 4. Requests for charts should be sent to Steve Anderson.

Observations of EV Lac secured during the Aug 22 - Sep 4 patrol must be in the Director's hands by Sep 30 to be included in the report to be published in the IAU Information Bulletins.

Nova Patrol. (Carmine Borzelli writes:) The AAVSO has had a Nova Search Program for many years. Last October, I was, appointed Nova Search Chairman of the AAVSO, having been a member of that organisation since 1965. In November of last year, I met Variable Star Section Director John Isles in London. He told me that some members had expressed an interest in such a programme for the BAA.

I looked into the possibility of the BAA conducting a joint programme with the AAVSO. I received approval from AAVSO Director Margaret Mayall, with the understanding that the same reports be published in the AAVSO and BAA Journals, with a cross reference in each publication. In April this year I became a member of the BAA and, shortly thereafter, an Assistant Director of the VSS, to put these plans into effect.

I have received enquiries into the programme from several BAA members, and I thank them, for their interest. The programme consists of 175 search areas in and about the plane of the Milky Way system. Having been assigned an area, one merely needs a pair of 7x 50 binoculars and a copy of the Field Edition of the Skalnate Pleso Atlas Coeli. Reports are made monthly and results are published annually. In addition to the search for novae, we are currently starting a Supernova Search in external galaxies, building on the work of and co-operating with the Webb Society, to whom I am deeply grateful for their assistance and guidance. The minimum equipment here will be an 8in. telescope and good skies. We will have galaxy charts available shortly.

If you are interested in either programme or both, please write to me:

Carmine V Borzelli Jnr.
12 Corbin Ave,
Jersey City, N.J. 07306
U. S. A.

(Atlas Coeli, as well as Atlas Borealis and Atlas Eclipticalis, may be purchased through the Junior Astronomical Society's book scheme; write to Guy Fennimore, 42 Dunster Road, West Bridgford, Nottingham NG2 6JE).

Photoelectric Photometry. (E G Moore writes:) If anyone is looking for any solid state replacements for the photomultiplier field, extensive investigations that I was engaged on elsewhere show that, in spite of some preliminary data produced by the manufacturers, nothing yet exists. There are 'Darlington-pair', (high-gain to the un-initiated) phototransistors that look OK in theory but in practice are so voltage, temperature and everything else dependant as to be useless. Spectral response is not just indeterminate, it is unknown. I have also tried cadmium sulphide cells, (the professional ones, manufactured to a standard as high as any photomultiplier tube): they work well on very bright stars, if you want to measure the infra-red! Unfortunately, temperature control is vital, to better than 0.1° C!

Betelgeuse came out about half a magnitude brighter than Rigel earlier this year. As an experiment, I turned off the temperature control. Betelgeuse started 'brightening' at about a magnitude a minute. I have therefore rejected these also. This information may well save someone time and temper investigating these fields. There is nothing to replace the photomultiplier yet.

On the subject of the safety considerations in the use of electrical equipment attached to telescopes, the following are the points that matter.

1. The entire telescope assembly must be solidly bonded in good electrical connection. Care must be especially taken if, for instance, part of an eyepiece mount is of insulating material and then any part of any electrics at any voltage in excess of about 12, (and only if battery supplied even then), can get to any instrument mounted in an eyepiece. In these cases the electrical apparatus should include a permanent earth-wire back to the main telescope body.
2. Having completed '1.' the assembly should be solidly earthed by an earth COMPLETELY SEPARATE FROM THE MAINS EARTH. This should consist of a copper rod or tube driven several feet into the ground. It should not be located within the confines of the building (assuming that an observatory building exists) as the soil can dry out there. It should be located as closely as possible outside. Make sure that the cable is well protected and cannot be severed by gardening tools. In very dry weather use a bucket of water to keep the vicinity of the earth-rod moist. DO NOT EARTH TO A GAS OR WATER PIPE NOR TO THE EARTH PROVIDED BY THE POST OFFICE FOR TELEPHONE PURPOSES.
3. If the apparatus is mains driven, it should be supplied via a 1:1 isolating transformer with a screen. The connection to the mains should be via a permanent fitting, such as a spur connector and properly fused. The screen of the transformer should be to the mains earth via the permanent facility provided in the spur connector, or similar device. DO NOT FEED VIA A PLUG AND SOCKET. DO NOT EARTH EITHER SIDE OF THE SECONDARY OUTPUT.
4. Power from a 12 V battery is much safer. Nevertheless charging arrangements must be provided. Arrange a changeover relay so that when on charge the battery is completely disconnected from the telescope and all of its equipment. This can easily be arranged to operate automatically when the battery goes on charge. Make

sure all 12 V circuits are properly fused and that a main fuse is fitted as close to the battery as possible. 12 volts is not lethal but heavy currents can cause fires under fault conditions.

5. Whatever the source of power, make sure that there is a switch that can immediately isolate the telescope and associated equipment from the source under fault conditions.
6. In photo-electric equipment, very high voltages are used in the vicinity of the eyepiece. The voltage across a photo-multiplier tube may exceed 1000 volts and whilst the source feeding such devices is usually such that only a small, probably non-lethal, current can be drawn, a slight shock when one is on observing steps can cause a fall. This applies equally whether the original source of the supply at the high voltage is mains or battery.
7. Never take risks in experimental set-ups. Remember that the conditions of moisture and dew obtaining in an observatory may be very different from those of the test-bench in the workshop. Under moist conditions and with leather shoes on a damp concrete floor, a condition often obtaining around the amateur telescope, the electrical resistance of the human body can fall to ten percent or less of its normal value. This means that a shock from a source of only 25 volts can be as severe as a shock from the mains under indoor conditions. If in doubt, play safe, and if you do not know, ask someone who does.

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(We hope to publish a regular Photoelectric Photometry Supplement to future Circulars, in which members can exchange information on equipment and techniques. Contributions will be welcomed. Would anyone be interested in editing it? - J E I)

Nomogram for Reducing Fractional Estimates. Members who regularly use the fractional method frequently complain at the laboriousness of the reduction of their light estimates to magnitudes; and the problem is even greater for those who undertake checking of observations for the Section. Among the solutions which have been attempted are the compilation of reduction tables for the most commonly used intervals in each sequence, and the calculating machine described by Shepherd in the Journal, 72 (5) 224, 1962. The construction of this machine can, in fact, be simplified to the drawing of a few lines on a sheet of paper.

Take a sheet of lined A4 paper, and mark ten points along the bottom edge at intervals of 2 cm, starting from the left corner. Rule straight lines joining each point to the top left-hand corner. (It is a good idea to rule alternate lines heavily, and to use a different colour for the fifth line). Label the lines 1, 2 ... 9, 10 at the foot, from left to right. In the estimate $A(a)V(b)B$, let the magnitudes of A, B be x, y respectively. Place a mm rule (it may be helpful if this is transparent) parallel to the horizontal lines of the paper, with the reading at the left hand edge in cm and mm equal to the tenths and hundredths of x . Select the diagonal line $(a + b)$, and slide the rule vertically (keeping it accurately horizontal) until this line cuts the scale at a reading in cm and mm equal to the tenths and hundredths of y (+10 cm if the integer part of y is one greater than that of x). The magnitude of V is the reading at the point where, diagonal line a cuts the rule (cm and mm corresponding to tenths and hundredths), plus the integer part of x . Where the diagonal lines at the base are not sufficiently widely separated, multiply a and b by 2 or 3.

Example: $A(2)V(3)B$, $A = 11.^m46$, $B = 12.^m63$. $y - x$ is too large to reduce the estimate as it stands, so convert to $A(4)V(6)B$. Set 4.6 cm on the left-hand edge and slide the rule vertically until diagonal 10 cuts it at 16.3 cm. Diagonal 4 cuts the scale at 9.3cm. V is therefore $11.^m93$. (Accurate calculation yields the result $11.^m928$).

Visual Spectroscopy. R J Livesey writes that he has been observing stellar spectra visually using a 12,500 line/inch diffraction grating held in a Barlow lens carrier which slips conveniently over the eyepiece. This method presents the advantage that spectra are quickly located on either side of the image of the star itself. On Mar 31 and Apr 1 T Cep appeared to have a bright emission in the green, with darker zones in the green and blue, and the red did not seem conspicuous. More recently T Cas was compared with its comparison star 5 by aligning the grating lines with the line joining them so that equal wavelengths of the two parallel spectra were adjacent. The fluted spectrum of T Cas, with light and dark patches, showed clearly in contrast to the more uniform line of star 5. The red and blue components of Beta Cyg also showed a fine contrast. An 8½ in. reflector was used for all observations.

Naked-eye Acuity. G P Hawkins writes: "Has any kind of survey been done to find out whether the naked-eye visual acuity of Section members differs in any way from other Sections, or indeed from the general public? I was quite surprised to find some weeks ago that I can see star 1 ($6.^m69$) in the R Lyn sequence with the naked eye. It seems to me that VSS members might do better than, for example, planetary or lunar observers, but I could be wrong." It might be difficult to arrange a meaningful experiment in which planetary or lunar observers without variable star experience are participants, but members' suggestions are invited.

Next Circular. It is planned to issue a further Circular before the end of the year. Any material for inclusion should be sent to the Director.