

Director:- G.W.Amery

Assistant Director:- P.W.Foley

From the Director. I am typing this after having returned from the Section meeting at Bristol which was most enjoyable, with some very interesting papers on both theoretical and practical aspects of lunar work. Once again Bristol Astronomical Society made us very welcome and our sincere thanks are due to them. A full report of this meeting will appear in the January Circular.

This is the last Circular you will receive in 1970 and I would like to take the opportunity to thank everyone for their support during the year and to wish you all a very Happy Christmas and New Year. Without wishing to be accused of putting in a 'commercial', I would like to endorse Miss Botley's comments on the 1970 'Yearbook' (see 'Letters to the Editor'). It is certainly of special interest to Lunar Section members this year, not only because of the excellent article on transients, but Miss Botley herself, and other Section members, Miss Couper and Dr Maddison, have also contributed fine articles; and of course it is edited by Patrick Moore. It will make an excellent Christmas present!

It is pleasing to report that the BAA Council have offered us financial support to publish a new edition of the Section Handbook 'Guide for Observers of the Moon'. This excellent booklet was first published in 1972 with a second edition in 1974. It is now out of print although the demand remains. We are grateful to Council for this help, and the Committee will meet very soon so that we can discuss the new format. If anyone has any definite ideas about the new Handbook please let me know as soon as possible so that I can put them before the Committee.

Our membership continues to increase steadily. This month we extend a welcome to the following new members:-

- Mr S. Armstrong, 18 Woodside Close Loudwater, High Wycombe Bucks
(150mm refl/60mm). O.G. Occultations)
- Mr M. Herbert 'Red Eaves' 59 Spring Hill, Worle, Weston-super-Mare.
(10x50 binocs - Occultations)
- Mr M. Peel, 17, Manor Close Hoghton Preston Lancs.
(297mm refl./binocs, - Occultations)
- Mr M. Price 15, The Fairway Camberley Surrey
(152mm refl. 10x50 binocs - Features, Occultations)
- Mr M. Ratcliffe, 19, Middle Close, Newbury Berks.
(100mm O.G. 220mm refl. - Occultations, photography.)
- Mr P. Rudge, 55 Church Road, Braunston Daventry Northants.
(225mm refl. 152mm refl- TLP Occns.)
- Mr R.C. Sargeant, Fazantenkamp 79, 3607 CD Maarssen Nederland;.
(150mm refl. Occultations.

Mr Price has already submitted some excellent drawings.

The TLP Section

I have received the following letter from Patrick:-

"It is with great regret that I give up my position as TLP Coordinator.

I hope you will realize that this is due purely to personal circumstances which are completely beyond my control.

I have been honoured to serve under the present Director who has revitalized the Section and is doing a grand job. At least I can continue as an observer, so that I will not be losing touch. Thank you all for your help and support over the years - during my regimes as Director, Secretary Editor and Coordinator. And my best wishes to the Section and everyone in it".

I have written to Patrick, expressing the Sections thanks for the work he has done for us, and accepting his resignation on a temporary basis, so that when circumstances improve, he can resume as Coordinator if he so wishes. In the meantime, Mr P.W. Foley, our Assistant Director and a very active TLP observer has kindly agreed to take over as Acting Coordinator.

He will handle the routine work, accept Network Alert calls, and prepare reports for the Circular, until the situation is clarified.

So please note. the telephone number for Alerts is now 0622 812740.
Failing this, I can be reached on the number given in the BAA Journal.

News and Views Firstly I must apologise for an error concerning the Aldebaran graze report in the November Circular. In my haste to submit my report I forgot to include half of it! It is therefore reproduced in full this month.

I would like to remind you that MSF receivers cannot receive signals if you are in a valley as the ground wave is unable to follow it down the contours in some cases. This should only prove to be a problem in certain areas but it is worthwhile, when doing graze site observations to check reception on low sites before the event.

Observers News Mr Taylor (Wakefield) has sent in two immersions timed in August and September. He also asks for information on the MSF receivers and I will be announcing shortly that I will have some built ready for use.

Mr Herbert (Weston-super-Mare) has asked for details of the occultation programme, which have been sent to him.

Mr Peel (Preston) sent his report on the August Aldebaran event which has now been sent to HMNAO.

Mr Mellor (Sheffield) has found that recording time signals at 4.8cm per sec. seemed to give the greatest accuracy (± 2 sec/15min). He has also enquired about USNO predictions.

Project Fade Mr Easto (Reigate) produced a graph of the 'fade' of Aldebaran which he observed during the graze which he saw in Scotland. This report is very interesting and will be sent to Dr Dunham.

Mr Haymes (Maidenhead) has sent a report of a 'fade' of SAO 164461 on 1978 October 11. The fade exceeded a period of 2/5sec. and was very noticeable. If anyone else observed this event please send me a report of what you saw.

"Not exceeding"

Report of the Grazing Occultation Of Aldebaran, 1978 August 26 A.E.Wells

This event would seem to be one of the best recorded in recent times and I regret that I was unable to join those who were fortunate enough to see it. Below are items by several observers who undertook the mission.

The track was from Ardnamurchan to Nairn and the event coincided with the only clear night for several weeks, although there was slight haze in the Moray Firth. Two observing teams were organized:- Mr J. Righton and Sandra King (Croydon) 254mm refl., Norman Fisher (Croydon, 152mm refl) Chris Clayton (Bath) and Richard Phillips (Bath, 120mm Celestron) Brian and Jean Mills (Croydon 152mm refl), Ray Easto (Croydon 152mm refl.) were at intervals along a minor road south of Inverness, perpendicular to the track, while on the lonely Inverness to Kyle of Lochalsh road, 64km to the south west were Donald and Pat Ferguson (Reading, 112mm refl) Martin Fodor (Dundee and St Andrews, 79mm O.G.) Dave Taylor (Dundee 112mm refl) Robert McNaught (Dundee 10x30 binocs) Dave Gavine (Fort Augustus 79mm O.G.) and Tim Haymes (Maidenhead, 152mm refl. and cine camera).

The latter four observers set up across the top of the 650m long dam of Loch Cluanie power station at a height of 210m O.D. (Unbelievably the reservoir was nearly empty; NW Scotland has suffered from lack of rain). Conditions at Cluanie were perfect; a warm night and a glorious sky with several meteors and deep sky objects to divert attention during the interval while waiting for the graze. All groups observed several immersion-emersion events and Dave saw eight; and could be heard reeling them off onto his tape, while only 100m away the star was occulted for Tim, and Dave Gavine, although they saw a 1st mag. fade lasting about 2sec!

The graze was a valuable exercise in the organisation of a group activity. For weeks beforehand preliminary predictions were studied and plotted people on the spot examined possible sites taking into consideration the low altitude of the Moon. Over the preceding two days Dave Gavine's house at Fort Augustus became a centre of operations as equipment was tested and weather reports came in. Much was learned for future expeditions. For instance, it was discovered that the Great Glen, hemmed in by hills, rendered MSF Rugby signals very weak and troubled by interference, requiring some hours of critical tuning. Poor telephone communications and the distance between call boxes on site caused some difficulties for those using TIM and we could do with a few digital watches. Thanks to the experience of Tim Haymes and Dave Taylor there were no disasters and it was an occasion to celebrate.

Tim Haymes has sent me preliminary graze results and a profile which HMNAO have produced, but this does not include R. McNaught and M. Fodor. (I am looking into this as I passed them on. A.E.Wells). The tape recording method in last month's issue works well and six events were timed at Salford in March 1977 giving good results. It is hoped to show the cine film soon. (This was shown at Bristol. Ed.) I thank all the above observers for this most interesting report. A.E.Wells.

Some Recent Observations

D.Jewitt

Some of my recent lunar observations may be of interest to members as they illustrate several points regarding 'blue-haze' reports which have appeared in past Circulars. The observations concerned were made this summer with the 10inch guiderscope to the Dome - D astrograph at Herstmonceux. This telescope is a refractor.

From July 12 to 22 the Moon was observed with the 10inch guider and a magnification of about x120. On each night, high contrast regions of the Moon were observed to be coloured more or less strongly with blue. In the early phases several such regions were located near the terminator, adjacent to black-shadowed areas. At around Full Moon, the dominant colour centre was located on Aristarchus, with less obvious coloration around Proclus and other high contrast objects. Tycho was not affected.

Interesting time-variations in the visibility of the Aristarchus blue-haze were recorded on July 19, when the rising Moon was observed in a darkening twilight sky. Initially no blue coloration was visible, but as time passed, an intense blue haze developed. Later still, one or two other features developed similar, though less intense coloration.

The above effects were instantly recognised as being due to chromatic aberration in the objective. By refocussing the eyepiece a fraction of a millimetre, it was possible to enhance or suppress the blue-haze effect, although only at the expense of producing slight red effects. (These colour observations were repeated with the 13inch astrograph itself, using an eyepiece slung in a modified plate-holder). It should be noted that the above mentioned blue haze was quite distinct from the atmospheric coloration also present. The latter appeared only in narrow zones above and below high contrast objects whereas the former was apparent as a wide 'fuzzy' zone, roughly concentric with and larger than the crater (in the case of Aristarchus).

I have on occasions made similar observations with my own telescopes, (all reflectors), and once with the 10inch refractor at Orwell Park Observatory, Ipswich. Whilst the observations are neither revolutionary nor difficult to explain, I think that they prompt a number of points which should be remembered whenever blue haze reports are considered:-

1. A given observer using a refractor may or may not detect blue haze around an object depending on
 - a/. the contrast of the object over its immediate surroundings.
 - b/. the darkness of the sky.
 - c/. the focus position of the eyepiece.
2. Two observers using the same telescope need not both detect such blue colorations, since in general, the observers will require slightly different eyepiece-focus positions and so effect 1c/. is applicable.
3. Refractor chromatic aberration may not manifest itself in the classical multicolored form! It is entirely possible for 'blue-hazes' to be produced with no sign of other spectrum colours. (On refocussing, however, other colours become visible of course).
4. All blue-haze observations, when made with refracting telescopes, should be regarded with extreme suspicion. Unless firm contrary evidence is available, such observations should be rejected as of spurious origin.

Some of these points are applicable to blue haze observations made with reflectors. In this case chromatic effects may result from the eyepiece. Alternatively, Rayleigh scattering from dusty telescope mirrors may produce blue haloes around high contrast objects.

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Evolution of the Earth - Moon System.

C.M.Botley.

Nature and the New Scientist for October 19 both contain accounts of the investigations carried out on growth rings of the chambered Nautilus of the South-west Pacific, which has survived unaltered for half a million years. Researchers Kahn and Pompea conclude that the number of days per lunar month has increased dramatically during the last 420 million years, showing that the Moon has receded much more rapidly, and was much closer to the Earth, than indicated by short term observations and theory.

This supports evidence from fossil corals. From laser measurements the present rate of recession is 4cm. per annum.

Reference. Nature. 275 (5681) 606. (1973).

Some Notes on Spurious Colour*

W.W.Mellor

I wish to suggest that the commonest spurious colour effects on the Moon show a characteristic and normal pattern, namely:

1. At a boundary between light and dark areas, reddish fringing tends to be visible when the dark area is to the S. and the bright to the N.
2. At a boundary between light and dark areas, blue-violet fringing tends to be visible when the bright area is to the S. and the dark to the N.

This pattern was described, and a theoretical explanation of it given, by Mr Fitton¹ in 1975; but he appears to regard it as the result of exceptional meteorological conditions, and comments "Many weather systems produce temperature and density 'layering' in which the orientation of the observed colours would be inverted". On purely observational grounds, I would like to suggest that the pattern described is normal, and in no way exceptional. If inversion from meteorological causes ever occurs, I have neither observed it myself, nor read of others doing so.

The extent and intensity of spurious effects does, of course, vary both with the Moon's altitude, and with meteorological conditions. Tentatively I would suggest that haze with steady seeing tends to inhibit false colour, while the bright but unsteady image associated with showery weather tends to encourage it. On two occasions in 1978 (May 22 and June 18) I observed spectacular displays of false colour all over the Moon. Plato, Grimaldi, and Sinus Iridum showed the characteristic red fringing along their north boundaries; Aristarchus, Proclus, Censorinus and Dionysius were especially noted as showing blue-violet to the north and red to the south. Blue-violet fringing was discernable along the S. wall of Plato. On many other occasions, red fringing at the N. margins of Plato and Grimaldi, blue-violet at the N. margin of Aristarchus, and a weaker red at its S. margin have been observed; so frequently, in fact, that I have come to regard these effects as the rule rather than the exception.

As noted by Mr Fitton³, similar effects are often observable at the lunar limb; the E. and W. limbs showing no colour, the N. limb showing blue and the S. limb showing red. While the inherently high contrast at the margins of Plato, Aristarchus and Grimaldi is obviously relevant to the frequency with which they display colour effects, contrast may not be the only factor involved. On September 17 I examined the dark-floored Billy. Little effect could be seen in Billy itself, but a strong red fringe was observed along the N. edge of the dark triangular area between Billy and Zupus, although this is much less dark than Billy. Possibly this is because this boundary, unlike the N. margin of Billy, is (very roughly) straight, and lies east and west⁴.

Obviously, the optical system of the telescope, particularly the eyepiece, plays a part in producing these effects. Sometimes, but by no means always, it is possible to modify or even invert the colour-orientation by bringing the boundary under observation to the edge of the field of view; this is particularly liable to happen with a wide-angle Erfle eyepiece. On the other hand, I have never found that a change of eyepiece modified the effects observed near the centre of the field. It is, however, relevant to note that all my observations were made with a 200mm. Maksatov f/13.5, and it may be that the corrector plate has some effect. It would be interesting to know how far observers using refractors would agree with my findings.

Finally, a note about Aristarchus. In spite of the frequency of spurious blue at the N. margin of this formation, I hesitate to suggest that the celebrated 'blueness of Aristarchus' is wholly due to this cause. On certain occasions, with selenographic colongitude around 60° , I have observed a blue-grey tinge confined to the crater floor, which seemed to me unlike the type of spurious effect described above. But I am uncertain about this, and prefer to keep an open mind about it.

I am grateful to Dr. Patrick Moore for helpful and encouraging comments on my observations.

References.

1. Fitton L.E., J. Brit. Astr. Ass. 85 (6) (1975 October), pp. 519 - 527.
2. *ibid.*, p.525
3. *ibid.*, p.524
4. *ibid.*, p.521

Letters to the Editor

Dear Sir,

I am in full agreement with Bill Peters in his suggestion to resurrect the old system of crater allocation for members of the TLP Network. I always felt much happier when starting an evenings session knowing my special areas. These were allocated to me by Patrick Moore in October 1973 and are: Aristarchus, Grimaldi, Riccioli, Alphonsus, Gassendi, Stofler - Maurolycus, M. Crisium, Proclus, Atlas - Hercules, Thales, Lichtenberg, Ros, Ross D and Petavius. I got to know these areas very well. Good viewing to all members!

Yours sincerely,
B. Woodward.

Dear Sir,

The 'Yearbook of Astronomy 1979' is, as usual, packed with interesting information; indeed, the articles seem to be of unusually high quality. Of particular interest to Section members is the account of lunar transients by Michael Bode of Keele. The only point to be mentioned is that (p.159) he does not suggest a connection between the lack of observations about 1800-1820 with the very low minimum of solar activity at that time.

Yours sincerely,
C.M. Botley.

Dear Sir,

Just a casual thought. You might run a small light-relief section in the Circular devoted to the queer questions that observers have been asked by non-astronomers. My own two favourites are:

1. "Have you discovered any new constellations?"
2. (After explaining how formations near the terminator appear in relief because of the Sun's low angle). "And is that our Sun?"

I am, of course, always being asked if I have discovered any new comets or stars, and my negative replies are usually taken to show that I'm not a real enthusiast. No doubt about the kind of astronomy that gets the publicity!

Yours sincerely,
W.W. Mellor.

On a Possible Lunar Atmosphere

In its early history the Moon almost certainly had a primitive atmosphere, probably composed essentially of hydrogen, methane and ammonia. We know that this atmosphere was gradually lost because of the Moon's low escape velocity, but just what period of time was required for this is still uncertain. In a paper published in the June issue of Nature (Vol. 273, 5663, 497) Yu. B. Chernak tackles the problem by considering the effect a lunar atmosphere would have on the impact velocities of micrometeoroids and their ability to produce craters in lunar rocks and glassy spherules.

The effect of an atmosphere on incident meteoroids depends on their mass and Chernak concludes that no particles between 10^{-7} and 10^{-4} grams hit the lunar surface at cosmic velocities for about 10^3 yr. Since it is unlikely that the mass distribution of the cosmic dust cloud has changed significantly in the past 10^3 yr. the deficiency is probably caused by atmospheric retardation.

Thus, by Chernak's hypothesis the Moon had an atmosphere sometime in the past 10^3 yr. with a total mass some 5×10^7 that of the present lunar atmosphere. - (Ed.)

Notice to Occultation Observers

Geoff Amery

I have received notice from Hans Bode in Hancver, that the minor planet Amphitrite (11m.3) will probably occult the star SAO 146788 (9m.0), on 1978 December 6 at approximately 22h 24m UT for observers in the U.K.

SAO 146788 lies in Pisces (approx. RA 23h 33m. Dec. 0° 0) and will be fairly low in the west-southwest at this time. I will be pleased to send a finder chart to any member who is interested in this event; please send a s.a.e. to me at the address below. Since this is not a lunar event I cannot justify space in the Circular to publish the chart, but experienced occultation observers may like to attempt this observation. If the occultation does occur it will result in a temporary dimming of the star, the duration of which should be accurately timed. Observations, with station coordinates, should be sent to Mr Wells for forwarding to HMNAO.

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Physical Data for Lunation 692 (Reproduced with permission from data supplied by the Science Research Council).

1978	Age d.	Fr. Ill	PABL	Rises	Sets	Notes
Nov. 30	29.2	0.00	146.0	07.21	15.57	New Moon 08h 19m.
Dec. 1	0.7	0.01	246.1	08.30	16.47	
2	1.7	0.04	257.4	09.31	17.50	Perigee 16h.
3	2.7	0.10	256.8	10.24	19.05	
4	3.7	0.18	254.2	11.07	20.28	
5	4.7	0.28	251.4	11.43	21.53	
6	5.7	0.39	249.0	12.15	23.17	
7	6.7	0.50	247.4	12.42	First Quarter 00h 34m.
8	7.7	0.61	246.5	13.09	00.40	
9	8.7	0.71	246.3	13.35	02.01	
10	9.7	0.80	246.6	14.02	03.21	
11	10.7	0.88	247.2	14.31	04.38	
12	11.7	0.94	247.3	15.04	05.52	
13	12.7	0.98	244.5	15.41	07.01	
14	13.7	1.00	224.3	16.24	08.04	Full Moon 12h 31m.
15	14.7	1.00	131.7	17.12	08.57	
16	15.7	0.98	109.8	18.05	09.41	
17	16.7	0.94	107.3	19.02	10.16	
18	17.7	0.89	108.0	20.02	10.44	Apogee 16h.
19	18.7	0.83	109.6	21.03	11.07	
20	19.7	0.75	111.2	22.06	11.26	
21	20.7	0.66	112.4	23.09	11.43	Saturn 3 ^o NoM 11h.
22	21.7	0.57	113.2	11.59	Last Quarter 17h 41m.
23	22.7	0.47	113.4	00.15	12.15	
24	23.7	0.38	113.1	01.22	12.32	
25	24.7	0.28	112.1	02.31	12.52	
26	25.7	0.19	110.6	03.42	13.16	Uranus 4 ^o SoM 10h.
27	26.7	0.11	108.9	04.55	13.48	
28	27.7	0.05	108.3	06.06	14.31	Mercury 3 ^o SoM 06h.
29	28.7	0.01	115.2	07.13	15.27	New Moon 19h 36m

Maximum Librations Long. Dec. 10 5.7^oW Lat. Dec. 1 6.5^oS.
 Dec. 25 7.5^oE Dec. 14 6.5^oN.

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