THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

STANDING COMMITTEE ON OBSERVATIONAL ACTIVITIES

LUNAR SECTION — BULLETIN NO.5

Announcement

Upon the recent retirement of the Lunar Co-ordinator, Mr. R.R. Thompson, President of the Toronto Centre, the writer was asked by Mr. Vern Ramsay, as Chairman of the National Committee on Observational Activities, to assume this position.

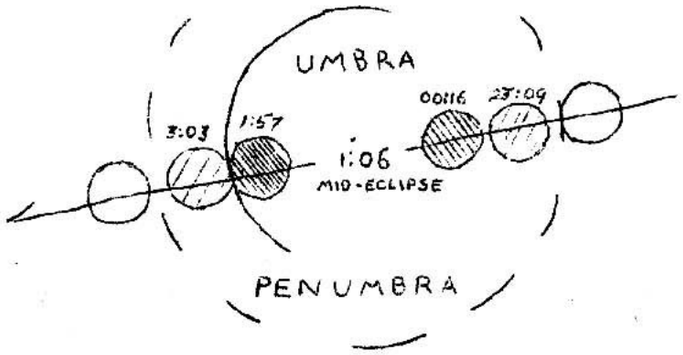
LUNAR ECLIPSE, JUNE 24th, 1964

The first lunar eclipse since the very dark eclipse of December 30th, 1963, has aroused considerable interest among lunar observers, particularly those wishing to compare these two eclipses with the two very dark total lunar eclipses of 1913.

Unfortunately for observers in Centres west of Windsor, Ontario, totality will be over when the moon has risen, a few minutes before sunset.

The following is a list of the nine Centres with contacts in each which are presently cooperating with the National Committee on Lunar Observing; moonrise and sunset times are provided in Universal Time (U.T.) for Wednesday, June 24th, 1964:

Centre	Contact	Moonrise h.	m.	Sunset h.	m.
Halifax	W. L. Orr	00	00	00	04
Quebec	Pierre Houde	00	38	00	44
Montreal	George Wedge	00	44	00	49
Ottawa	W. M. Cameron	00	49	00	53
Kingston	Raymond Burns	00	48	00	52
Niagara Falls	Frank Campbell	00	55	00	59
Toronto	Archie Ostrander	01	00	01	04
Hamilton	J. G. Craig	00	59	01	03
Edmonton	William Cable	04	06	04	10



	U.T. h.	m.
Moon enters penumbra	21	58
Moon enters umbra (1st con.)	23	09
Totality begins (2nd con.)	0	16
Middle of eclipse	1	06
Totality ends (3rd con.)	1	57
Moon leaves umbra (4th con.)	3	03
Moon leaves penumbra	4	14

While Halifax is the only Centre which can observe 2nd contact, valuable contributions can be made by other Centres should they wish to carry out one or more of the following programmes.

Crater Timing

One of the more important aspects of this event will be the timing of the passage of the moon through the earth's shadow. It is recommended that a small team (2 to 3 persons) be organized to time the immersion and emersion of specific craters into, and out of, the shadow as it crosses the face of the moon. Timing is best accomplished by radio time signals (CHU Ottawa, 3.330 K.C.). If these are simultaneously recorded on tape, along with the observer's verbal estimate, a very accurate time determination is provided, as well as a permanent record. As the official record of these events consists of the reports of those specifically responsible for timing, it is best to station them at considerable distance from the others participating. In deciphering a tape, much confusion can result when the record contains unwanted contributions from several people in addition to the comments of the appointed observers.

Fifteen craters recommended for this project are, from east to west - Grimaldi, Aristarchus, Kepler, Copernicus, Pytheas (bright), Timocharis, Tycho, Plato, Aristoteles, Eudoxus, Menelaus, Plinius, Taruntius, a bright ring and Proclus.

Colour and Intensity Observations

The colour of the eclipsed moon, and also the degree of darkness of the eclipse, vary from one eclipse to another and depend in part upon conditions in the earth's atmosphere where refraction of the light from the sun into the earth's shadow takes place.

Descriptions of the moon's colour vary with each observer, colour being subjective; therefore, observers are requested to use the terms in the accompanying Danjon Scale unless the colour as seen differs completely with the Scale. In this case, the observer should describe it in his own words.

It will be seen that the Danjon Scale is also applicable to the darkness of the eclipse and will be used in conjunction with Fisher's Scale, which measures only the degree of darkness. Observers are requested to familiarize themselves with each scale, and to use this terminology when reporting.

It is important that the time of the observation be recorded as well as information about any optical aid employed.

DANJON SCALE:

(0) Very dark eclipse, moon almost invisible, especially mid-eclipse;
(1) Dark eclipse, gray or brownish colouration, detail very vague;
(2) Deep red or rust colour, very dark central area, outer edge relatively bright;
(3) Brick red eclipse, usually with a bright or yellow shadow rim;
(4) Very bright copper red or orange eclipse with bluish, bright shadow edge.

FISHER'S SCALE:

(0) 6" telescope or larger needed to see "seas" and principal craters.
(1) 2" or 3" aperture required for major detail.
(2) Naked eye only needed to see principal details.

The appearance of the shadow edge may not correspond with the general eclipse colour as outlined in the Danjon Scale. A notation should be made if this occurs and any unusual shape exhibited by the shadow edge should be noted.

Soon after totality begins, intensity observations should be made and at 10-minute intervals thereafter until third contact. This should be the responsibility of those assigned to this observation (assuming a group is organized).

The enclosed form for recording such data, in addition to the outlined discs which are to be used to indicate colour boundaries, may be obtained from the writer.

Special Area Observation

During a total lunar eclipse, the moon's surface is subject to rapid changes in temperature. These rapid changes may trigger observable effects in certain areas which have, on occasion, exhibited transitory changes in appearance which so far are not explained. Many such areas have been reported but it is not possible to devote the necessary study to all of these; hence three easily found craters which are suitable for most eclipse conditions have been selected.

The first is the very bright crater Aristarchus and adjacent area. Late in 1963, astronomers at Lowell Observatory reported a redness surrounding this crater which seemed to change shape from minute to minute. This report was confirmed by a group of amateurs in Japan which observed a similar phenomenon on December 28th, 1963. This will be of prime interest in the forthcoming eclipse and should be observed with the largest aperture available at a magnification not less than 200 times. Close attention should also be paid to the adjoining crater Herodotus and cleft, all located on the north-east quadrant of the moon.

The crater Pluto, a dark grey, level floored crater, located on the northern edge of Mare Imbrium, has had several spots and white streaks reported on its floor. The spots, in some cases, represent craterlets and the streaks, notably two forming a wedge on the south-west corner, have an obscure origin.

These spots and streaks are unaccountably invisible at times when the surrounding landscape is plainly visible. It has been speculated that "mists" or evolution of gases may cause this phenomenon. Perhaps a rapid temperature change will induce this effect and it may be detected with the aid of a telescope.

Another lunar crater of much historical interest is Linne, a small object on the floor of Mare Serenitatis, lying just west of the opening into Mare Imbrium. This diffuse white spot has been reported to change in size during eclipse and a search should be made for this effect.

Each area should be studied before, during and after the eclipse in order to see if any change has taken place. It is recommended that observing the moon on the evening before the eclipse will provide the necessary familiarization.

Seeing conditions may render invisible the fine detail in Plato and Linne. All reports of observation of these objects should include the rated seeing conditions, type, size and power of optical equipment and, if possible, drawings or sketches of the area.

LUNAR-METEOR WATCH

A lunar eclipse affords the best opportunity of observing a meteorite impact on the moon. If such an impact is observed, it is essential that the exact location, direction, time and appearance of the flare be noted. Should the observation be duplicated at another site, it can be determined whether the flare is truly a lunar phenomenon or whether it is of terrestrial origin, seen against the lunar background.

The observer should: (1) be able to judge the location of principal lunar features so as to be able to plot a flare or trail on an available map; (2) in the event of a flare, call out "FLARE" so that the time can be recorded automatically; (3) immediately plot the location on the map, noting direction and length, if moving; (4) note particularly if it is stationary; (5) estimate duration of flash; (6) note colour and estimate brightness.

Theoretical Appearance:

A lunar flash may appear as a faint, slowly moving point of light, ending in a burst, lasting 2 or 3 seconds. Estimated length of trail - 75 miles or 1/30 of the moon's diameter. Previous reported sightings (unconfirmed) have been described as: "small bright flash, lasting 3 seconds, changing from blue-white to greyish yellow" and "bright speck, lasting one second and leaving a glow for perhaps two seconds or more".

Recommended Equipment:

Two 6" telescopes of sufficient power to cover the required field, lunar map, light source, and proximity to time and tape recorder station. Two observers should search at any one time, for not longer than 15 minutes per watch, then alternating with another team of two, to maintain a high level of efficiency.

LUNAR ECLIPSE PHOTOGRAPHY: Enclosed with this bulletin is a special supplement consisting of two parts as produced by the Kodak Co. numbered C-20 and M-18, to provide helpful guidance.

Reports from Centres participating in one or more of the above programmes should be mailed to the writer at the address given below. All results will then be collated and a report on the lunar eclipse observations issued to all Centres.

Archie L. Ostrander,
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12 June, 1964.