BAA/ALPO TRANSIENT LUNAR PHENOMENA NEWSLETTER May 2004

By David Darling

I am writing this month's report as Tony Cook is busy sorting out his student exams and marking. For March observations received were from Clive Brook (Plymouth, UK), Marie Cook (Mundesley, UK), Robin Gray (Winnemucca, NV, USA), Martin Mobberley (UK), Gerald North (UK), and Brendan Shaw (UK). Observations received for March are on the web site: http://www.cs.nott.ac.uk/~acc/Lunar/2004mar.htm

I recall when I first read the report by Walter Haas that took place on 2 Sep 2003, describing the pink border to the ray of the crater Proclus, how rare this sort of report is. I then remembered a report from 10 years earlier of a similar observation by Kermit Rhea of Paragould, Arkansas: "I have not pursued TLP on a regular basis; however my observation of the Moon on 01:30-01:45 UTC, 27 February 1993 was an astonishing revelation for me. This concerns the crater Proclus and surrounding area or region. The views on the evening mentioned above so impressed me that I decided to make a report on my sightings. The seeing and transparency on this particular night was above average. Seeing was about 6-8 *(US system)*; transparency was about 5 *(US system)*. Proclus appeared bright. Actually the rays as portrayed in the sketch included herein did not appear to be connected to the crater - stopping before actually touching the crater itself. The brightness of the rays appeared to change the colouring of the region involving Palus Somini, which contrasted significantly with other regions of the Moon. The rays, one of predominantly integrated light and the other of predominantly a red hue were arranged as to remind one of the rays of the rainbow or the light effect from a prism. On 28 February 1993 UTC, about the same time, or perhaps a few minutes later, I looked at Proclus and surrounding under poor skies with interspersed clouds, using my 6 inch reflector at 166X. The rays with the predominant red hues appeared to be absent. The contrast of the grey colouring of Palus Somini; was not forthcoming as on the previous evening, when I observed the region using my 6 inch reflector at 54X. The experience was amazing to me!"

I had sent a letter to Mr. Rhea and ask the standard questions, such as did you check the other features on the Moon for similar phenomena? He said that he did and nothing else was showing the color effect. When asked if the eyepiece was replaced with another, it was not. But he did say that he used this particular eyepiece to view Venus and have never suffered any colour effects before, or since. I asked if he had scanned the sky for high flying cirrus clouds, and he said that he did that and could see nothing. The weather forecast for that night was supported by a clipping from a local paper that predicted "fair, cold tonight with low temperature in lower 20Fs, with a wind out of the northeast 5 to 10 mph.". When I examined both observations and compare data I found that there are some close similarities. Mr. Haas's observation was on 2 Sep 2003, 02:20-02:36 UTC. The duration of the event was 16 minutes long. When you look at Mr. Rhea's 1993 observation, the duration was 15 minutes long. The age of the Moon for Mr. Haas's observation was 5.3 days and for Mr. Rhea's 5.5 days. It's at this point that the similarity ends. The Moon's altitude above the horizon for Mr. Haas observation was 25 deg and for Mr. Rhea observation 49 deg. Looking at the data displayed below shows that there were not any matches between the Selenographic Latitude and Longitude. I ran Lunar Observers Tool Kit by Harry Jamieson, to see if I could get a match on similar lighting conditions. The closest match was ~8 hours before Mr. Haas's observation. Another aspect of the observation that was different was Mr. Haas reported that he observed the following day and could still detect a tinge of pink on the southwest edge of the ray. The table below shows the ephemeris for the two observed events, when comparing the numbers I found no close match with any of the selected fields. So what ever was the cause of this phenomena it appears not to be lunar libration.

UT Date & Time	Earth Selene Lon.	Earth Selene Lat.	Sun Col.	Sun Selene Lat.	Fraction Illuminated	Phase Angle	Moon Age	Anomalistic Phase
2 Sep 2003, 2:20 UT	1.06	-0.34	340.26	1.46	0.340	108.7	5.370	0.048
27 Feb 1993, 1:30 UT	-5.98	-4.13	336.43	1.52	0.253	119.6	5.517	0.614

When looking at the initial data I had first come to the conclusion that what the observer had witnessed was local atmospheric phenomena. But after discovering that another observer witnessed a

similar phenomena , I am reconsidering the local atmospheric dispersion theory. I wonder if, in fact, some other factor is coming into play here such as some glass material imbedded into the ray material. In the forty years that I been observing the Moon I have never seen any chromatic effects on any lunar rays. The only feature that would come close to that color effect was on the Sinus Iridum. I must conclude by saying that for this researcher this case is far from closed, and will need continued investigation. Who knows, maybe in another ten years, another observer will submit a report about the rainbow ray of Proclus.

Finally, Tony Cook reports some news from the Lunar and Planetary Science Conference that he attended in Houston, Mar 15-19, 2004: 1) There was an excellent poster by Chuck Wood explaining the virtues of high resolution lunar imagery now been taken by amateur astronomers, and it's potential use to planetary geologists. 2) Paul Lucey in his talk on "Global Images of Mg-Number derived from Clementine data" reported a high Magnesium anomaly at Tycho. 3) B. Ray Hawke in his talk on "The Origin of Lunar Crater Rays" stated that lunar rays were bright because of compositional contrast with their surroundings. There were also some (a minority) of dark rays on the Moon e.g. Dionysius. (4) Concerning impact flashes, Sugita et al state that impact flash intensity is proportional to the velocity to the power of a value of between 4 and 8. Using a hypervelocity gun they found that little emission occurs at velocities below 2 km/sec. But above this CaO molecular and Na Atomic lines begin to appear. At higher velocities (they could only go upto 5.5km/s) Ca atomic emission took over. However they were using Calcium Carbonate as a target, so it was not surprising they had Ca emission lines. Schultz et al displayed emission spectra from hypervelocity impact experiments – these showed a gradual increase towards near IR and some specific emission lines e.g. Na. Blewett and Hawke had a poster on a colour ratio analysis of the area around the proposed crater for Stewart flash. They conclude that the one proposed in Icarus, although a fresh crater, is simply not young enough. Matsuhita from Japan had a poster about a spectrometer they had built for the Moon. Resolution was 9km and 10nm in visible, and 20km and 20nm in the near IR. Finally, Becker et al had a poster describing how the United States Geological Survey is producing ultra-hi resolution scans of old Lunar Orbiter images, removing the stripes and map projecting these to create a digital lunar mosaic.

The following repeat illumination and libration events occur for April, please observe if you can:

Event: Herodotus (Wilkins, 1950 Mar 30) can be seen on/from (UTC): 2004 May 01 Germany, Italy (19:00-22:38); Ukraine (18:43-22:38); UK (20:00-22:38) *[can you see a pseudo central peak?]*

Event: Gassendi (Moseley, 1967 Mar 22) can be seen on/from (UTC): 2004 May 01 New Zealand (07:29-08:05) *[look for red colour between central peaks and ESE wall]*

Event: Aristarchus (Bartlett, 1955 Nov 27) can be seen on/from (UTC): 2004 May 02 New Zealand (06:00-06:07) *[can you detect any blue glare at inner base of W. wall, and how well visible is the central peak?]*

Event: Marius (Bolton, 1901 Oct 25) can be seen on/from (UTC): 2004 May 02/03 Puerto Rico (23:00-00:48); Houston (01:00-01:24); Orlando (01:00-01:01) *[are there any light streaks of light on the floor?]*

Event: Proclus (Bartlett, 1971 Sep 04) can be seen on/from (UTC): 2004 May 03 Germany, Italy (19:00-20:50); Ukraine (18:10-20:50); UK (20:00-20:50); *[how visible/bright is the central spot?]*

Event: Agrippa (Bartlett, 1966 Nov 26) can be seen on/from (UTC): 2004 May 03 Germany, Italy, Ukraine, UK (19:12-22:49) *[sketch/image dark patches on SW floor]*

Event: Aristarchus (Kozyrev, 1969 Apr 01) can be seen on/from (UTC): 2004 May 03/04 Germany, Italy (22:48-02:37); Ukraine (22:48-01:35); UK (23:39-02:37) *[check for a tiny red spot on W. slope]*

Event: Near Thaetetus (Cherboneaux, 1902 Oct 16) can be seen on/from (UTC): 2004 May 04 New Zealand (10:08-12:59); Atlanta, Madison, Orlando, Pittsburgh (09:07-09:59); Houston (09:07-10:58); LA, Phoenix, Winnemucca (09:07-11:59); Las Cruces (09:07-11:54) *[original observation with 33" Meudon refractor – look for a white cloud effect]*

Event: Aristarchus, Byrgiuss, Kepler, Manilius, Proclus, Tycho (Argentiere, 1956 Nov 18) can be seen on/from (UTC): 2004 May 04 New Zealand (14:22-18:49) *[do you regard these craters as extra-ordinarily bright?]*

Event: Proclus (Green, 1938 Nov 08) can be seen on/from (UTC): 2004 May 05 Germany (02:54-02:57); New Zealand (18:56-18:59) *[look diffuse white patches on floor]*

Event: Aristarchus (Bartlett, 1959 Mar 25) can be seen on/from (UTC): 2004 May 05 Germany (02:08-02:21); New Zealand (06:00-08:45); Atlanta, Phoenix (04:17-08:18); Houston, Orlando, Puerto Rico (04:17-08:45); LA (04:17-08:09); Las Cruces (04:18-08:34) *[look for colour and obscuration, especially on E side]*

Event: East of Picard (Noble, 1878 Mar 10) can be seen on/from (UTC): 2004 May 25/26 Italy (22:10-22:59); Atlanta, DC, New York, Orlando, Pittsburgh (01:00-02:03); Houston, Madison (02:00-02:03); Puerto Rico (23:09-02:03) *[look for a badly defined white patch]*

Event: Eudoxus (Trouvelot, 1877 Feb 20) can be seen on/from (UTC): 2004 May 26/27 Germany (23:34-23:57); Italy (23:34-23:50); UK (23:34-00:58); Atlanta, DC, New York, Orlando, Pittsburgh (01:00-02:05); Houston, Madison (02:00-02:05); Puerto Rico (23:34-02:05) *[look for a fine luminous line of light E-W across crater]*

Event: Alphonsus (Wise, 1967 Apr 17) can be seen on/from (UTC): 2004 May 27 New Zealand (08:37-10:48) *[dark patches prominent and suspected red patch]*

Event: Plato (Wise, 1967 Apr 17) can be seen on/from (UTC): 2004 May 27 New Zealand (08:37-09:33) *[can you detect a red patch?]*

Event: Alphonsus (Wise, 1968 Apr 06) can be seen on/from (UTC): 2004 May 27 Puerto Rico (23:00-00:02) *[is there a glow on the W(?) wall?]*

Event: Plato (Wise, 1968 Apr 06) can be seen on/from (UTC): 2004 May 27 Puerto Rico (23:00-00:02) *[do you think that the dark patches on the floor are prominent?]*

Event: Straight Wall (Wise, 1968 Apr 06) can be seen on/from (UTC): 2004 May 27/28 Puerto Rico (23:00-00:02) *[is there a shadow from the N. End of the Straight Wall going towards Birt?]*

Event: Tycho (Barker, 1931 Mar 27) can be seen on/from (UTC): 2004 May 27/28 Puerto Rico (23:11-00:15) *[how visible is the central peak and could it be described as a "curuious gray"?]*

Event: Proclus (Farrant, 1967 Apr 18) can be seen on/from (UTC): 2004 May 28 New Zealand (06:00-06:45) *[would you say that this crater appears dark and the rim subdued?]*

Event: Messier & A (Kelsey, 1968 May 07) can be seen on/from (UTC): 2004 May 28 Germany (20:00-22:27); Italy (19:00-22:27); Ukraine (18:00-22:27); UK (21:00-22:27) *[check for colour enhancement in ray-tail halo (N. Ray) over time]*

Event: Messier (Jean, 1968 May 07) can be seen on/from (UTC): 2004 May 28 Ukraine (18:00-22:27) *[original observation: "Long white streak E.(ast.) of Messier (A?, if A could be rays)?"]*

Event: Pitatus (Jean, 1968 May 07) can be seen on/from (UTC): 2004 May 28 Ukraine (18:00-22:27) *[original observation stated: "Dark shadow, horizontal-shaped at Pi" - do you see anything like this?]*

Event: Thaetetus (Jean, 1968 May 07) can be seen on/from (UTC): 2004 May 28 Ukraine (18:00-22:27) *[are there 3 dark points in the area of this crater]*

Further predictions, including the more numerous illumination only events can be found on the following web site: http://www.lpl.arizona.edu/~rhill/alpo/lunarstuff/ltp.html. For members who do not have access to the internet, please drop me a line and I will post predictions to you. If you would like to join the TLP telephone alert team, please let me know your phone No. and how late you wish to be contacted. If in the unlikely event you see a TLP, please call on Tony Cook's cell phone: +44 (0)798 505 5681 and he will alert other observers. Note when telephoning from outside the UK you must not use the (0). When phoning from within the UK please do not use the +44!

David Darling, 416 Wilson Street, Sun Prairie, Wisconsin, 53590-2114. UNITED STATES OF AMERICA. Email: DOD121252@AOL.COM