Letters

An observation of 'mock moons'

From Mr Lee Macdonald

Howard Miles' letter in the 2006 December *Journal*[1] reminded me of an observation of 'mock moons' that I made way back in 1990. On August 10 of that year, between 22:50 and 23:15 UT, I saw two mock moons as well as the 22° halo. The Moon was some four days past full that night. As in Mr Miles' observation, one mock moon was much brighter than the other, although in my case the one to the north of the real Moon was the brightest. Again as in Mr Miles' observation, the phenomenon was transitory. My observing notebook from the time does not record any colour, but some colour is visible in the original of the accompanying picture, because the long exposure has captured more light than the eye is ever able to.

Mock moons are formally known as 'parselenae' or 'paraselenae' (singular 'parselena' or 'paraselena') and, like their daytime equivalent parhelia ('mock suns', singular 'parhelion'), they are formed due to refraction by hexagonal ice crystals in cirrus or cirrostratus clouds. Large quantities of such clouds are commonly seen ahead of an advancing warm front – hardly an uncommon occurrence in the UK. In theory, parselenae should be no rarer than parhelia, and John Naylor has suggested that 'hardly a week goes by without, at the very least, a halo or parhelion being visible for an hour or more'.[2] But for parselenae to be bright enough to be visible, I would say that the Moon has to be at least half illuminated – in other words, its phase must be somewhere between First Quarter and Last Quarter. Thus parselenae, even in theory, are only half as likely to be seen as parhelia. Even so, although fairly unusual, they are not, in principle, a very rare phenomenon. I feel that the main reason why so few of them are reported by astronomers is that they tend to occur when the Moon is more than half full and on nights when the sky contains a lot of cirrus cloud – conditions when few astronomers are out observing. It might therefore be more accurate to describe parselenae not as rare events but as little-observed events.

A parselena or 'mock moon', photographed by Lee Macdonald on 1990 August 10 at 22:55 UT, using a 50mm lens at f/2 and a 10-second exposure on Kodak Ektachrome 200 film. The tree in the foreground is lit up by a nearby streetlight. Image contrast was moderately enhanced after scanning.

Interestingly, I also observed and photographed a parhelion earlier that day, at 18:25 UT – a reminder that large amounts of cirrus can persist for many hours.

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1 Miles H., 'A sighting of 'mock moons', *J. Brit. Astron. Assoc.*, **116**(6), 2006 December
2 Naylor J., *Out of the Blue*, (Cambridge, 2002), p. 138

Asteroid data in the BAA *Handbook*

From Mr Bob Dryden

I have just opened my 2007 BAA *Handbook* to find out where any of the brighter binocular asteroids might be in January. I was disappointed to find the positional information I wanted is not there. Instead, I am requested to visit a website.

Surely, the *Handbook* is superfluous if all it is going to say is visit the Web? All information printed in the *Handbook* is available on the Internet. So the question to ask is: 'what is the purpose of the *Handbook*?'

Personally, I use it when I am away from a computer, when I just need to check something out in the field (often literally), or to find an answer to a question at a Society meeting.

The casual asteroid observer just needs the RA and Dec. of the bright objects to check where they are on the star atlas while outside with binoculars. Serious asteroid observers will already have plotted the objects they want to look at before they go anywhere near a telescope. They will not be using the *Handbook* as they visit the appropriate websites frequently.

Why the positional information has been omitted this time I don't know. It cannot be lack of space as there are three blank pages at the back of the *Handbook*. So, please could we have the basic, simple asteroid information back for future issues?

Bob Dryden

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From the Director of the Asteroids and Remote Planets Section

I did attempt to cover most aspects of asteroid observing and imaging in the 2007 *Handbook* by including information on visual observing, digital SLR imaging, astrometry, occultations, photometry, shape modelling and NEO close approaches.

Being a CCD imager myself it is quite possible that I did not pay as much attention as I should have to the needs of visual observers, for which I apologise. That being the case I will certainly include these data in future editions of the *Handbook*.

As this is a longer term solution, in the New Year I will send Bob and anyone else who may request it that information for the brighter asteroids, and publish it on the ARPS website for all to see.

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M.V. Lomonosov and the aurora borealis

From the former Director of the Aurora Section

I read with interest Mr Williamson's letter in the December *Journal* relating to Mikhail Vasilevich Lomonosov and the aurora. Lomonosov (1711–1765) was Russia's first great scientist and astronomer, and rose from being a fisherman's son. He helped to found Moscow State University which opened on 1755 April 27.

M. V. Lomonosov. *(Moscow State University)*

While browsing through a secondhand bookshop in North Berwick, I came across a hardbacked folio containing 11 folded pages comprising 43 undated drawings of the aurora borealis. All forms from quiet arcs to coronal structures would be familiar to our present observers. Translating from the Russian the folio was entitled *'Drawings of the northern lights executed by M. V. Lomonosov. Appendix to third volume of an earlier treatise'*.

There is no information as to the location of the observations or the publisher. Perhaps someone knows of Lomonosov's publications to which the Appendix refers.

Mr Williamson is correct in thinking that the aurora was once attributed to sunlight being reflected from ice crystals in the atmosphere. Sund Arnelius (1681–1740) described and illustrated this hypothesis at Uppsala University in a publication dated 1708 entitled *'Exercitium philosophicum de chasmatibus'*. Sunlight tangential to the Earth's orb was thought to be reflected from the crystals to be seen by observers within Earth's shadow.

There is an interesting present-day phenomenon whereby light emitted from refineries and gas flares on platforms is reflected from water crystals in the upper atmosphere. This forms a false red aurora-like apparition called a 'Tygom', a name derived from the Danish gas platforms of Tyra and Gom from where the first instances of such an event were identified. A false aurora was once noted by Howard Miles from Cornwall, which was created by the Milford Haven flare stacks below his northern horizon.

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More on seeing Mercury

From Mr John C. Vetterlein

Chris Hooker is to be congratulated on his images of Mercury (*J. Brit. Astron. Assoc.,* **116**(6), p 340). I have seen little more 'detail' visually with refractors of up to three times the aperture used by Chris. I would be interested to know the altitude of the planet at the time of these observations.

Mention is made of transient good seeing conditions in daylight. I refer to my letter in the previous edition of the *Journal* (Seeing Mercury: I, p 271), and would point out once again that seeing can often be of excellent quality during daytime.

Chris goes into some detail for locating Mercury with a GOTO system. Some of the difficulties in finding objects in daylight may be overcome by replicating the positioning on a hard surface of a properly polar aligned mounting. Even so one is still dependent to a certain extent upon the use of bright stars for the final adjustments in the case of many GOTO systems.

Unfortunately few mountings these days are provided with adequate setting circles. Using the crude circles on the Meade series of cradle mounts one can estimate declination to around 30', and a slightly better accuracy is possible on the hour circle. (Note: the vernier simulation is just that and is not functional.) This has enabled me to locate Mercury without too much difficulty in a 7-inch Maksutov with the planet at magnitude 1.3 or brighter in good daylight skies.

It is hard to better a good German equatorial properly set up and equipped with reliable setting circles. My Wray 85mm refractor is fitted to such a mounting. The brass circles are a mere 5 inches (dec.) and 4 inches (RA) diameter yet read, via verniers, to 3' and 10" (adjustable hour circle) respectively. Using this device, together with an accurate sidereal timepiece, I can guarantee to have any object close to the centre of the field of view in half the time it takes with a GOTO.

John C. Vetterlein

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The role of the visual observer

From Mr Tony Markham

The reference to 'quality vs quantity' in my letter in the October *Journal* was in no way meant to imply that I believe that visual observing should be considered inferior.

An example of what I was referring to can be seen in observations of semi-regular variable stars. Occasionally, a lightcurve based on CCD observations by a single observer will be published which will clearly show a periodicity. Visual lightcurves covering the same dates usually appear less impressive as they generally contain more scatter. However, the regular observation of semi-regular variables does not seem to be a fashionable use of CCD technology. Thus if it wasn't for the sheer quantity of regular observations made by visual observers, the BAA VSS records of these variables would be very sparse indeed. We certainly don't want to discourage these visual observers.

Fortunately, most BAA observing Sections are good at supporting all types of observer and we see a good variety of observing methods represented in the *Journal*.

My comment about the need to cater for observers who are 'happy to observe for pleasure...' was certainly not meant to be negative. It is unfortunate that in the UK we sometimes get too obsessed with the scientific aspect and, as a result, people can feel that they have to 'defend' their observations by explaining how they are useful scientifically. Amateur astronomy is a hobby and we need to remember to 'enjoy' observing.

Personally I observe variable stars to see them vary in brightness – if my observations are of scientific value then that is an added bonus.

Tony Markham

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The star of Bethlehem

From Mr Rod Jenkins

My paper 'The Star of Bethlehem and the comet of AD66' was published in the 2004 December BAA *Journal*. In 2005 December I presented my ideas to the BAA at their Christmas meeting and a summary by Dominic Ford appears in the 2006 December issue. There are however a few additional points that I would like to emphasise.

When reviewing the extensive literature on the Star of Bethlehem I never cease to be surprised at how easily some astrono-

mers, once they start delving into the subject, are apparently seduced by the attractions of astrology. The result is that they end up supporting a case based on astrological signs even though they would almost certainly normally reject the prognostications of astrologers and the principle that heavenly signs could have any such validity. An example is the triple conjunction of 7 BC. This popular theory is based purely on the perceived astrological significance of this astronomical event.

Another popular theory is the appearance of a *hui-sing* in 5 BC. This was described as a comet but could possibly have been a nova. Though this was the most notable astronomical event during the period of interest it can be discounted as it would not have triggered the Magi, as there are approximately three naked eye novae/supernovae every 100 years, and very importantly during its period of visibility it never rose heliacally, as when it was first seen it rose more than 4.5 hrs before dawn.

It is a historical fact that in A.D.66:

A deputation of Magi did come from the east to bring gifts and pay homage and they did return home by another route;

A bright comet with an impressive tail appeared over Jerusalem.

These Magi were on a journey to visit Nero, then the most powerful man on earth. The comet was Comet Halley.

My theory is based on the author of Matthew's gospel using these two well known significant events to get his points across. At a stroke by saying that Magi had also visited Jesus he was elevating him to at least the level of Nero, himself recognised as a god. In addition the appearance of a star strengthened the claim that Jesus was someone special, as the beliefs of the time were that stars heralded the births of important people. By using events that people could relate to, and making the story compatible with the peoples' beliefs he made the whole story all that more believable – a brilliant piece of spin.

This simple solution to the mystery does not leave any untidy ends; for example:

– It explains why the story only appeared in Matthew;
– It explains why the Magi were never heard of again;
– It requires no Magi-triggering event;
– It is compatible with the historical record;
– It is not dependent on any belief in astrology;
– It is not dependent on any act of faith.

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