Letters

Seeing Mercury: I

From Mr J. C.Vetterlein

My first recorded observation of the planet Mercury was in the early 1950s when I was still at school. I note from my diary dated 1952, 22 March: 'At 19h 00m observed Mercury with 60×50 refractor (altazimuth). The crescent phase was readily seen despite the planet being at an altitude of only 8.5 degrees.'

Naked eye observations of Mercury necessarily have to take place around maximum elongations when the planet is at relatively low altitudes in twilight. This is not a good time to be observing the planet telescopically. Even in large telescopes, with Mercury high in the sky during daylight, little can be seen beyond vague smudges. (At 50% phase Mercury has an apparent diameter of around 7 arcseconds.)

The problem of finding Mercury in the day sky is frequently exaggerated. Ian Ridpath in *Norton's 2000.0* states, quite correctly, that observing Mercury in daylight presents some difficulties as well as dangers owing to its proximity to the Sun. However he overstates the difficulties in locating the planet. Having stated that a well adjusted equatorial with setting circles is essential, he continues: 'Even then success is not guaranteed, chiefly because of the ever present glare of the Sun and the bad seeing in daylight hours.' True the seeing in daylight is frequently poor but this too is overstated in my experience. None of this should be surprising since, as most solar observers will recognise, there are times of remarkably good seeing enabling fine images of spots and other features to be recorded.

As recently as 2003 we have the authors of *Exploring Mercury – The Iron Planet* (Strom & Sprague) on page 5: '...Mercury is often difficult to find. This was especially true in the past before telescopes benefited from computerised finding and tracking systems.' This is nonsense, of course. Equatorial telescopes equipped with circles and drives have been around for over 200 years. It is no more difficult to locate Mercury in a clear, daylight sky with a good equatorial refractor of around 100mm aperture than it is to find faint double stars at night.

In sharp contrast we have from Young's excellent *Textbook of Astronomy* (1889): 'For the most part Mercury can be observed only by daylight; but when proper precautions are taken to screen the object-glass of the telescope from direct sunlight, the observation is not difficult.' Indeed it is not. Close to superior conjunction I have observed Mercury to within 1.9° of the Sun's limb using an 85mm equatorial refractor.

It is not generally appreciated just how bright Mercury appears when close to superior conjunction. It is interesting to compare the two events this year when Mercury and Venus both reach superior conjunction. On 2006 May 18, Mercury was at magnitude –2.3. When compared to the data for Venus at superior conjunction on October 27, we find that the surface brightness per unit area will be almost identical for both planets. Put another way, Mercury would be at magnitude –3.7 if it had the same apparent diameter as Venus. (Venus on October 27 will be at magnitude –3.9.) There are times in fact when the surface brightness per unit area for Mercury outdoes Venus herself. Naturally, when Mercury is close to inferior conjunction it is both faint and too close to the Sun to even attempt an observation.

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Seeing Mercury: II

From Mr Nicholas Kollerstrom

In times gone by, Mercury was quite a headache for astronomers. 'This star tormented me' Copernicus observed, 'with its many twistings and toilings, in trying to explore its motions;'[1] to which Kepler added: 'Certainly this is the one planet which most of all disgraces the reputation of the astrologers, and confounds the whole theory of things on high.'[2] The diagrams help us to appreciate what was so perplexing: astronomers could only see the outer tips of these images, from which they had to reconstruct the planet's orbit.

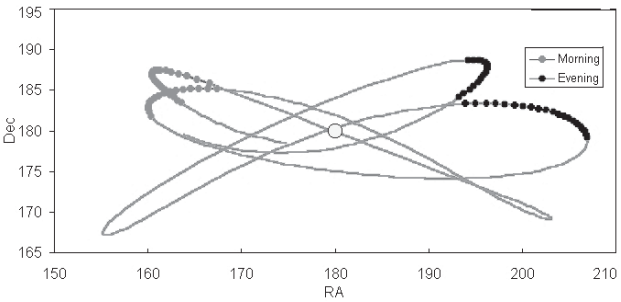

Figure 2. Mercury's motion in 2006, with the Sun at the centre, from Stuttgart Planetarium figures.

Figure 1 plots the differences between Mercury and the Sun in RA and declination, whereby the Sun rests immobile at the centre.[3] The intervals given by the US Nautical Almanac Office for Mercury's visibility in 2006 are shown on the diagram, contrasting its morning appearances on the left, with evening appearances on the right. Thus, as an evening star they give Feb 8–March 8, May 26–July 11, and Sept 12–Nov 3. These intervals seem rather generous.[4]

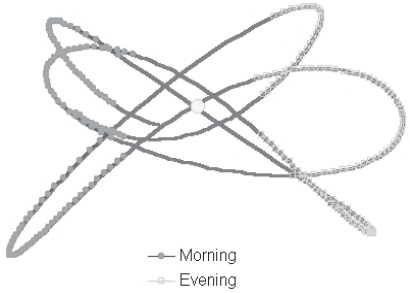

Figure 1. Mercury's motion in 2006, with the Sun at the centre, from US Nautical Almanac figures.

In the next figure, more experiential viewing times for Mercury have been plotted, as given in a German calendar. For 2006 this gives Mercury's visibility in the northern hemisphere as:

Evenings: Feb 15–Mar 2, May 31–June 20;
Mornings: Aug 5–Aug 20, Nov 17–Dec 10.[5]

In the northern hemisphere one never gets to see Mercury below the level of the Sun in this diagram. The figure shows Mercury's path crossing in front of and behind the Sun, one of these being the Mercury transit of 2006 November 8. It may be of interest to get some British data, on the timespans over which town or country dwellers can see Mercury.

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1 Copernicus N., *De revolutionibus*, Book V, Ch. 30
2 Kepler J., *The New Astronomy,* trans. Donahue, 1992, Ch XIX p.191
3 Joachim Schultz's 1963 Rhythmen der Sterne first did these Mercury diagrams.
4 *Astronomical Phenomena for the year 2006*, NAO, Washington 2003, p.7.
5 Keller H.–U., *Kosmos Himmelsjahr 2006*, Stuttgart Planetarium, 2005

Letters

'Where have all the observers gone?'

From Mr Tony Markham

The letters from Lorna McCalman and Martin Mobberley in the August *Journal* illustrate a major decision that the BAA Observing Sections have to face. Should their efforts be primarily directed towards quality (using the latest technology to produce observations that will be admired by professional astronomers) or towards quantity (encouraging as many BAA members as possible to go out and observe)?

It will always be the case that only a small number of observers will have the time and money to exploit the latest technology and/or be driven by the aim to produce scientifically useful observations. Their enthusiasm makes it inevitable they will be well represented amongst Section officers and *Journal* contributors. We need to remember however that the vast majority of current and potential new observers are still happy to observe for pleasure, and/or are not looking to go beyond visual observing using binoculars or small telescopes. Any impression that the BAA no longer caters for this latter group needs to be avoided.

We also need to be wary of undermining campaigns against light pollution by giving excessive prominence to the results that can only be achieved using the latest technology. Although a small number of observers exploit technology which allows them to image objects much fainter than they could have done 30 years ago, it is essential that the message we get across is that most current and potential new observers are being badly affected by light pollution.

Tony Markham

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From Mr J. N. Brown

I hesitate to interfere in the difference of opinion on recording visual observations, especially since Mr Mobberley is at the top of the tree as a 'webcam' observer and Mr Heath as a 'pen and pencil' man. (My own skills in comparison, although I am experienced, would be like comparing a Sunday league clogger with Wayne Rooney.)

However, as a run of the mill telescopic observer, I consider that to record on paper what one sees at the eyepiece requires greater concentration and enables one to see more than relying on a camera. Most of the great observers agreed pretty well when drawing planets or lunar features. Indeed I remember observing with the late W. E. Fox and being astonished at what he could see and record.

The case of Percival Lowell and his team of experienced observers, using an excellent telescope in a first class location, is an odd one, possibly unique in the annals of astronomy. Their mistaken 'canals' should not however be used to invalidate centuries of skilled 'pencil and paper' observations.

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From Mr Alan W. Heath

Martin Mobberley's letter in the August *Journal* [**116**(4), 207 (2006)] in defence of Webcam technology is testimony to an imager who takes the care to produce images which show accurately what is seen visually. Visual and CCD should complement each other, which is my point exactly.

I have had many letters supporting the value of visual work, including one from Walter Haas of the Association of Lunar and Planetary Observers, who asks of CCD images handed around at astronomical societies, 'Where is the science?'. Observing a planet visually with a telescope allows the aesthetic appreciation of a real object rather than recording it by proxy as with an electronic image. Let us not forget the value of visual observations of meteors and variable stars. One need not have an array of equipment to obtain both pleasure and scientific results.

I wonder how many imagers take the care to process their images with the same care as Martin. I applaud his dedication. However, if anyone doubts the contributions made by visual observers they only need read the excellent report in the same *Journal* by Dr Richard McKim of the 1997 apparition of Mars, the paper 'Visibility of the dark side of Venus', and the obituary of Harold Hill, all of which are testimony to visual work. Today we have the excellent drawings by David Gray and Dr McKim, to mention just two, and it would seem that visual observers are not as endangered as I had supposed.

I would like to thank all who have contributed to this debate, including Lorna McCalman, Eric Strach, Walter Haas, Richard Baum *et al*., and it is now time for the membership to decide for themselves. I stand firmly by my original remark that CCD should be in addition to and not in place of visual work, the two working in close harmony and not in opposition.

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[This correspondence is now closed – Ed.]

'Robert Burns and the aurora'

From Dr C. H. Maycock

Further to Mr Livesey's and Mr Farquharson's letters,[1,2] the eighteenth-century Cumberland poet Susanna Blamire (1747–'94) was also one of the few poets in that century to mention the aurora borealis in their poetical works, using the following striking description:

> 'Once, when the sky was up in arms,
> With northern lights at war...[3]

Her powerful martial imagery suggests a major display associated with a time of great magnetic activity. During her time in Scotland this occurred twice; in 1768, and again in 1769.[4] And if the 'deep harebell' mentioned as flowering at that time was indeed associated with this major display, then its season of July to September points to the aurora borealis of August 1768 as the date to which she refers.

Christopher Maycock

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1 Livesey R. J., *J. Brit. Astron. Assoc.,* **115**(5), 295 (2005)
2 Farquharson J., *J. Brit. Astron. Assoc.,* **116**(2), 65 (2006)
3 Maycock C. H., *A Passionate Poet: Susanna Blamire 1747–'94*, Hypatia Publications, 2003, p. 124.
4 Broad C., Information Officer, Royal Society, *pers. comm.:* 'There were two major auroral displays both in August and December 1768, and February and October 1769.'

'The Sky at Night goes South'

From Mr M. S. Ghorbal

I enjoyed reading Damian Peach's interesting and informative paper '*The Sky at Night* goes South' in the 2006 April *Journal*. For the record, may I correct one small geographical error? Mr Peach states: 'We arrived at the platform to be greeted with the crystal clear southeast view of the highest peak of the Andes, Mt Aconcagua (22,841ft [6962m]) which lies over 200km away from Paranal…'

It is not possible to see Mt Aconcagua from Cerro Paranal as it lies approximately 900km south of the observatory. What Mr Peach and his colleagues saw was in all likelihood the Volcan Llullaillaco (22,057ft [6723m], a mere 784ft lower than Mt Aconcagua and almost 200km away from the observatory to the east.

The question of distances to an observer's horizon is an interesting one. The for-