

The medieval astrolabe



A model astrolabe constructed by Prof Chris Kitchin from Dominic Ford's template in the February Journal. © C.J.Kitchin

From Dr Dominic Ford

Several readers have contacted me with their experiences of building model astrolabes based on my article in the 2012 February *Journal* [vol. 122(1), p.33]. Prof Chris Kitchin found that he could use his astrolabe to tell the time to within ten-minute accuracy, but that the cardboard tended to flap in the wind. He later glued the card onto a sheet of lead (pictured) and found the result more satisfactory, but at 450g, rather tiring to hold at arm's length.

Mr Steve Holmes correctly spotted an error on page 40: I incorrectly stated that the Earth rotates clockwise as viewed from above its north

pole; this should read anticlockwise. Conversely, the Earth rotates clockwise as viewed from above its south pole.

Mr Holmes also correctly observed that the rete (star chart) on the astrolabe is a mirror-image of the sky – for example, Orion's sword appears on the right – and differs from modern planispheres in this respect. This is historically authentic, but rather curious. Why did

medieval astronomers put up with a star chart that was the wrong way around? I can only speculate, but can make a suggestion. On medieval astrolabes, only around a dozen stars would have been marked, because each needed its own brass arrow. They were not well suited for constellation spotting. Instead they were practical instruments, used for telling the time and casting horoscopes. For an astrologer sat at a desk, it may have mattered little that the sky was back-to-front.

Dominic Ford

37 Coleridge Road, Cambridge, CB1 3PH [dcf21@dcford.org.uk]

Gems from The Astronomical Register

From Mr Richard Baum

Many years ago I purchased from the secondhand department of Heffers at Cambridge, eighteen volumes of *The Astronomical Register*, quite probably Britain's earliest known magazine for amateur astronomers. Founded in 1863 by Sandford Gordon (1824–1879) and published monthly for almost a quarter of a century (1863–1886), it ran to 24 volumes and ceased publication with the issue for 1886 December.

As Peter Johnson says in his history of the publication 'it provides the best insight we have into the world of amateur astronomy in that period.' Indeed, it 'may almost be regarded as a forerunner of the *B.A.A. Journal*' in that it allowed observers to publish and discuss their results while keeping them up to date on the latest developments and discoveries. Plainly, as Johnson says, it was an important element in the advancement of British amateur astronomy during the mid- to late nineteenth century.¹ It is therefore disappointing to find it has no place in the index to Allan Chapman's magnum opus *The Victorian Amateur Astronomer* (1998).² Even today it is little known, and infrequently referenced.

This perhaps explains why until confronted by their oversight in 1954, selenographers in general were apparently unaware of a statement made in 1868 which diminished the impact of J. F. J. Schmidt's (1825–1884) famous 1866 announcement that the lunar crater Linné had undergone a major change from the time he last observed the formation.³

At the annual meeting of the British Association for the Advancement of Science held at Norwich in 1868 August, the German selenographer J. H. Mädler (1794–1874), co-author of *Der Mond* (1837), delivered an address entitled 'Changes on the Moon' in which he made known, 'on the 10th of May, 1867, I attempted an observation of the crater Linné in the heliometer of the Observatory at Bonn. I found it shaped exactly, and with the same throw of shadow, as I remember to have seen it in 1831.

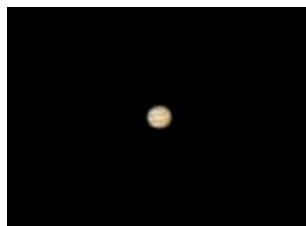
Handheld astrophotography

From Mr Paul Coleman

The attached pictures might be of interest or amusement to readers.

I was testing a mere 400mm Canon lens (100–400mm zoom) with Image Stabilization to see if it even made a recognisable disk image of Jupiter when used completely handheld. (I was standing and not leaning against anything).

The images, taken with a 400mm zoom on Canon 5DMk2 body, were a lot better than might have been expected provided you do not look too closely. They are severe crops from full frame. (The complete frame at this scale



1/180 sec at f/8, ISO1600. About 22:50 BST, 2011 Oct 3.

would be about 3 metres wide.) The shutter speeds are much longer than the usual handholding textbook rule of at least 1/focal length, which would be 1/400.

I am not suggesting much of a future for handheld astrophotography, but it is a remarkable demonstration of the sophisticated technology available in today's digital cameras.

Paul Coleman

[paul@ppcoleman.co.uk]



1/45 sec at f/5.6, ISO 6400. 22:43 BST, 2011 Oct 4.



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The event, of whatever nature it may have been, must have passed away without leaving any trace observable by me.⁴

Mädler's paper was published *in extenso* in the 'Reports on the State of Science' section of the *Report of the Thirty-Eighth Meeting of the British Association for the Advancement of Science* (1869), but more to the point, reprinted in full in *The Astronomical Register* of 1868 November.⁵ If researchers had been familiar with the *Register*, the myth that accreted around Schmidt's claim could have been exploded much sooner than it was. Yet not until I came upon Mädler's statement early in 1954 and relayed it to Patrick Moore in February of that year, was the matter finally put to rest, even then with reluctance. Moore's response on the 15th of the month was, 'To say that your letter shattered me is to put it mildly.'⁶

Much later the *Register* yielded another interesting but little known facet of history of equal import, though at a different level.

Working through the set of *Registers* I came across an inserted sheet of flimsy paper bound in after page 264 of volume 7 (1869). It was a 'List of Officers and Members of the Observing Astronomical Society (OAS) as of November 1st, 1869', the year of its initiation. The OAS thus predates the formation of both the Liverpool Astronomical Society and the Association.

I published a short history of this short-lived

group in 1998.⁷ It owed its existence to enthusiasm and youthful aspiration but little else, and when the pressures of life began to impinge and circumstances changed, it ceased to function. From the absence of reports beyond 1873 we can assume that was the year of its demise.

Following a recent discussion with Dr Jeremy Shears the value of this single sheet was seen in a different light. Given its ephemeral character it can be surmised few copies have survived the ravages of time. So the document I found may be the only one of its kind in existence, and thus the only source of information available to us about the membership of the group or circle in its early phase. Most of the names will be familiar from textbooks and observational reports; indeed the list amounts to 'a veritable Who's Who of British amateur astronomers of the period.'⁸ Two names in particular stand out: David Gill (1843–1914) and Oliver Lodge (1851–1940), both of whom were knighted for their contributions to science.

Interest is not just confined to the names on the list but the insight it gives into the demography of amateurs at that time. As Dr Shears remarked, 'I am struck both by how few are from London and how many are from our Victorian industrial centres.'

The whereabouts of the OAS records is not known, at least to me. Long accounts of planetary observations, especially of Venus, will be found in the volumes of *The Astronomical Register* for the period the OAS existed. These were compiled by the doyen of

British amateur astronomers William Frederick Denning (1848–1931), who acted as Secretary.

Richard Baum

25 Whitchurch Road, Chester, CH3 5QA. [richard@take27.co.uk]

References & notes

- 1 Johnson P., *J. Brit. Astron. Assoc.*, **100**(2), 62–66 (1990)
- 2 Chapman A., *The Victorian Amateur Astronomer: Independent Astronomical Research in Britain 1820–1920*, John Wiley & Sons/Praxis Publishing, Chichester, 1998
- 3 The literature on Linné is voluminous. One of the better accounts is to be found in Edmund Neison, *The Moon and the Condition and Configurations of Its Surface*, London: Longmans, Green & Co., 1876, pp.185–193. A modern account is Sheehan W. P. & Dobbins T. A., *Epic Moon: A history of lunar exploration in the age of the telescope*, Willmann–Bell, 2001, Ch.11
- 4 Mädler Baron von, 'Changes of the Moon's Surface', in *Report of the Thirty-Eighth Meeting of the British Association for the Advancement of Science; held at Norwich in August 1868*, London: John Murray, 1869; Report on the State of Science, pp. 514–518
- 5 Mädler Baron von, 'Changes of the Moon's Surface', *The Astronomical Register* **6**(71), 238242 (1869)
- 6 Private communication Patrick Moore to Richard Baum, 1954 Feb 15
- 7 Baum Richard, *J. Brit. Astron. Assoc.*, **108**(1), 42–43 (1998)
- 8 Williams T. R. & Saladyga M., *Advancing Variable Star Astronomy: The Centennial History of the American Association of Variable Star Observers*, Cambridge University Press, 2011

Meeting of the Historical Section

'Astronomy in the industrial age (1700–1900)'

Saturday May 5 at Soho House, Handsworth, Birmingham

The next Historical Section meeting will be held at Soho House, Handsworth, Birmingham B18 5LB, on Saturday 2012 May 5. Soho House was the home of Matthew Boulton, the 18th-century factory owner who brought the Industrial Revolution to Birmingham. He lived there between 1766 and 1809. Soho House was also the meeting place of the Lunar Society, whose members included James Watt, Josiah Wedgwood, Erasmus Darwin and Joseph Priestley. The Society received its name because its members travelled to Soho House every month by the light of the full Moon.

Programme

- 10:00 Registration and refreshments
- 10:30 Welcome
- 10:40 Mike Maunder – The early days of astrophotography
- 11:35 Mike Leggett – Bryan Donkin FRS: Engineer, industrialist and astronomer
- 12:30–14:00 Break
- 14:00 Kevin Kilburn – The forgotten star atlas: Bevis's *Uranographia Britannica*, c.1750
- 14:55 Stuart Williams – William Henry Robinson: from Red Books to the Red Planet
- 15:50–16:20 Break
- 16:20 Dr Allan Chapman – James Nasmyth: Astronomer of Fire
- 17:20 Conclusion

A number of poster papers should also be on display.

Admission (at the door) is £10 for BAA members, £12 non-members. Soho House itself is currently closed to the public but it may be possible to join a guided tour during the lunch break for a small additional cost. Tea & biscuits will be provided on arrival and at the afternoon break; a nearby public house is recommended for lunch, or you may wish to bring a picnic (the gardens will be open). For full details including transport information and a map see <http://www.britastro.org/history/meeting.120505.upcoming.html>.



Secondhand large, manual telephoto lenses

From Prof. John Vetterlein

Due to continuous development in camera lens manufacture tending towards fully automatic versions, it is now possible to pick up for a relative song their manual equivalents. Some of these lenses are ideally suited to medium field astrophotography. For example, a 400mm f/2.8 attached to a Nikon D100 (also obtainable secondhand for a fraction of its original price) will have a field of approximately 2.3×3.4 arc-degrees. At f/2.8 such a lens will capture M31 in



Comet C/2009 P1 Garradd imaged with distant galaxy NGC 6408 in the same field (middle/right): 2011 Oct 26, 19h 52m UT. Nikkor 600mm f/4 & D300 SLR camera. 90 sec., ISO 1000.

less than 60 seconds, producing a result comparable to images once only obtainable on film with large telescopes.

I have been fortunate recently to have tested a number of such lenses (mostly Nikon or Nikkor) ranging from the ultra fast 200mm f/2 to the massive, relatively fast, 600mm f/4. The latter, with an aperture of 150mm, will perform as well as many modern expensive short focus apochromatic triplet telescopes. My own examples of the aforementioned pair cost a little under £3000.

The 400mm and 600mm lenses are too heavy and cumbersome to mount alongside a standard small to medium refractor, unless, of course, one has a really substantial observatory-housed equatorial mounting. However, by fitting a dovetail bar the lenses may attach directly to an EQ6 mount or similar. The much shorter exposures possible with these fast lenses relieves some of the necessity for highly refined equatorial alignment.

The ability to capture faint astronomical subjects in fast time is an obvious advantage in locations where clear nights are at a premium. Here in Orkney one seldom has the luxury of a good, clear sky lasting through to the small hours. The series of observations I have made of Comet Garradd over the past six months had to be snatched in cloud breaks sometimes lasting but a few minutes.

Without these fast lenses the task would have been impossible.

For a brief account by the writer in the use of these lenses please go to the following link: <http://www.graysowestminster.co.uk/pdf/gazette/gaz64.pdf>, page 23.

J. C. Vetterlein

Springfield, Rousay, Orkney KW17 2PR. [springast@supanet.com]



C/2009 P1 Garradd imaged on 2012 Feb 22, 22h 01m UT. Nikkor 400mm f/2.8 & D300 SLR. 45 sec., ISO 1600. The bright, orange star close to the comet is TYC 3883-1542-1, mag. 5.45. (Field dia. 2° approx.)

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