Notes and News

Mercury & Venus Section: 1

Venus transits the Sun, 2012 June 5–6

The long-awaited Venus transit arrived on June 5–6, with the British Isles witnessing third and fourth contacts shortly after dawn on June 6. The weather across the UK was generally poor. From Northamptonshire the Director waited in vain for some promising cloud gaps to reveal the rising Sun. He did see the Sun later in the morning and had a fine view in both white light and hydrogen alpha, but Venus had already left the disk. From elsewhere in the UK Mike Foulkes, Alan Heath, Hazel McGee, Peter Parish and Phil Withers also reported no success. Others in the UK caught glimpses of the Sun, often partly obscured by cloud, and Figure 1 shows the result obtained by Peter Edwards, this being one of the better shots received from the UK.

Elsewhere in the world, the Italians had mixed fortune, but generally clearer weather than the UK: a superb series of egress drawings was submitted by Mario Frassati (front cover). John Sussenbach had some excellent views from his trip to Turkey, and Pete Lawrence from Svalbard (front cover and Figure 2). Colin Henshaw observed from sunny Jordan, and Frank Ventura had clear skies over Malta. But Leo Aerts was clouded out in Belgium, Macsymowicz likewise in France, and Melillo was unlucky in the USA. Toshihiko Ikemura (Figure 3) and some others had clear skies from Japan, as did Martin Ratcliffe from Kansas (Figure 4) and Clay Sherrod in Arkansas. Half a dozen observers sent timings of some or all of the contacts, either by using stopwatches or timed videos. Full details will be published later.

The phenomena of the atmosphere of the planet in the shape of cusp extensions were seen in superb professional coronograph images supplied by Paolo Tanga, and in several visual observations. Few amateur images showing the atmospheric ring around the dark emerging limb of Venus have come to hand, however. The visual observers, when they reported it, saw it more as two partial extensions around the darkside of the planet from the Sun's limb, as witnessed for instance by Peter Grego (see below) and Martin Ratcliffe (also see below). Thanks are due to the 28 observers who have already reported their transit data to the Section.

Figure 1. The transit viewed at 04:38 UT with a Canon SX210 compact camera at maximum ×14 zoom. ***Peter Edwards, Horsham, West Sussex.***

For the purpose of the present report it will suffice to quote some transit reports and to show some of the more interesting images. In our first of these, Gianluigi Adamoli (Verona, Italy) compares his observed contact times with theory in a model report:

Gianluigi Adamoli

'I was lucky that the morning of June 6 was clear, with good transparency over the Eastern horizon, save for minor streaks of light clouds passing by. I had set up my 125mm MKT, diaphragmed at an aperture of 60mm, with a 40mm eyepiece (×38); by projection onto a white sheet of paper, this apparatus gave a fairly bright and detailed image of the Sun. I started to observe at 04:08 UT, when the Sun was just 5° above the horizon. I recorded four active areas along with the very big, round, black silhouette of Venus, already approaching the N*p*. limb. All sunspots were far lesser in size than the planet...

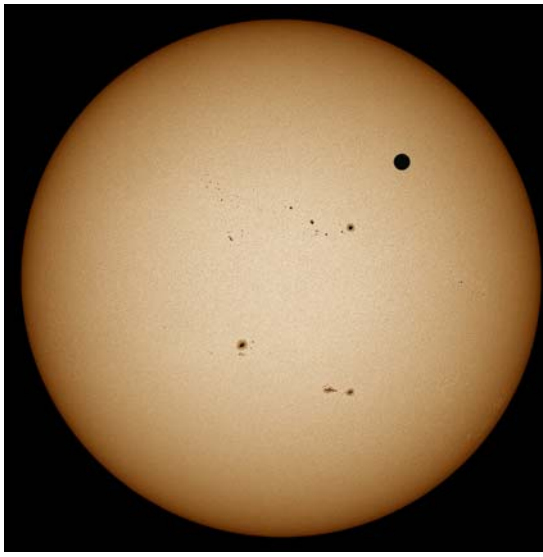

Figure 2. The transit at 02:38 UT with 10cm OG, Baader Astrosolar film and green filter. ***Pete Lawrence, Svalbard, Norway.***

From the President

As members will have read in recent *From the President* columns, Council has embarked upon a phased programme of strategic reforms designed to enhance the BAA's position, increase its membership and improve the services it offers. Some of these reforms are already making themselves felt, and the recent appointment of a new Web Manager, Tom Kerss, will soon begin to show in a redesign of the Association's website, which is one of its main windows on the world. Other developments in train will hopefully see improvements in how we relate to other players in the amateur astronomy world, such as local societies, internet forums and star parties.

But as we contemplate future changes, we should not lose sight of our past. Of all the many institutions, organisations and publications that serve the amateur astronomy community in the UK, the BAA has the longest history and the richest heritage. While we cannot afford to live in our past, we do have a duty to respect and preserve it, and here the Association's Archivist, Dick Chambers, has been doing sterling work. Dick has been concentrating the BAA's most important historical material in Burlington House, where it can be properly catalogued and safeguarded. Delicate items are being professionally renovated and, where possible, scanned into electronic format so that they may eventually be made available to a wider audience. Similarly, Sheridan Williams has undertaken the huge task of creating electronic versions of the full run of the BAA *Journal*, a matchless resource for observers and historians alike that is now available for purchase (see page 221). Plans are also being made to scan the BAA *Memoirs*, another rich resource.

Important archival material is also held at Section level. To cite just one example, the Variable Star Section's database comprises more than two million observations of over 2,000 variable stars stretching back nearly 125 years. This is a unique source of data for both amateurs and professionals, and it is good to see that in addition to Roger Pickard's article in the June *Journal*, it was also featured in the June 2012 issue of the Royal Astronomical Society's review *Astronomy & Geophysics*.

However, it is important not only to preserve such resources, but also to ensure that they are properly available to those who might make productive use of them. With this in mind we shall be exploring how best to use the restructuring of our website in order to expedite the submission and dissemination of members' observations, both current and historical.

Finally, voting papers for the 2012 Council ballot are bundled with this issue of the *Journal*. We now have over 3,000 members, but often only a small fraction of that membership returns completed ballot papers. Elected officers and members of Council willingly devote considerable unpaid time and energy to the service of the Association, and it is important that they should feel they have the support of the membership at large. I would therefore urge you to take a moment or two to complete and return your ballot papers.

With best wishes for the summer, and in anticipation of darker nights to come!

Bill Leatherbarrow, *President*

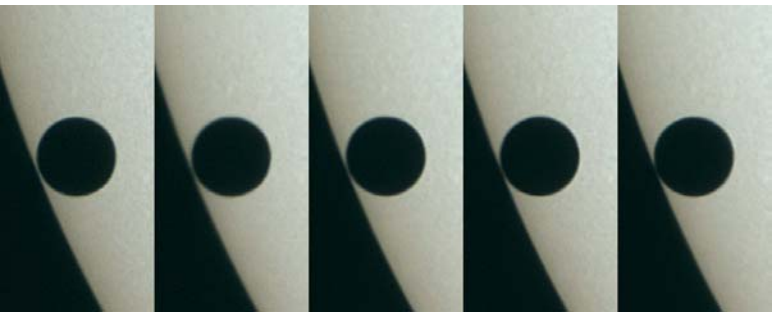

Figure 3. Third contact at (left to right) 04:29.41 UT, 04:29.46 UT, 04:29.52 UT, 04:29.57 UT and 04:30.03 UT. Each image is a stacked 3-second long video clip at 12 fps with 38cm refl. (18cm stop) and DFK 51AU02 camera. *Toshihiko Ikemura, Japan*.

Venus's limb appeared quite sharp, sharper than the limb of the Sun, which was undulating because of unsteady air, to be expected at this low altitude. A quick look with protecting screened eye-glasses confirmed that Venus was readily visible with the naked eye, a black spot almost touching the Sun's upper limb.

3rd contact: I saw no 'black drop' or other effect of note; however, the slow motion of Venus, coupled with the relatively poor resolution of my apparatus, rendered very hard to fix the moment of tangency. I guessed it was around 04:37:50, with an uncertainty of many seconds.

4th contact: a little passing cloud interfered at the crucial moment, so I failed to fix the instant of external tangency. I can say a thin slice of the planet was still projected onto the Sun's disk at 04:53:20, while I couldn't see a trace of it at 04:53:45, and thereafter. So, I tentatively estimate the contact was sometime near 04:53:30.

My observing site is at 11° 02' 04"E longitude, +45° 27' 05" latitude, 70m above sea level. *WinJUPOS* simulations suggest the times of 3rd and 4th contacts were about 04:37:00 and 04:54:30, respectively (give or take a few seconds). So, it appears that I perceived internal tangency when about 1/20 of Venus's diameter was already out of the Sun, and external tangency when there was still 1/20 of the planet's diameter over the Sun. That translates to about 3 arcseconds. My apparatus had a resolution of about 2 arcseconds, and seeing tremors may have worsened the situation, so I suppose I couldn't have made estimates much better than these.'

Figure 4. Between first and second contact with 36cm SCT, solar filter and Canon 60D camera. *Martin Ratcliffe, Kansas, USA.*

Next, some quotes from the English at home:

Paul Abel

Paul was in Selsey, as were several other BAA members: 'We went down to east beach at 4 a.m. and the clouds parted for a short time to allow us all a glimpse of the transit in a solar scope. There wasn't time to make a drawing, but it was incredible to see the black disk against the Sun (especially as I missed the 2004 transit).'

Peter Grego

'On setting up at our site, a muddy field in Long Marston (Warwickshire) with a superb horizon, a bar of cloud was obscuring the Sun and quite frankly we weren't expecting it to clear. But this slowly lowered as the Sun rose, bringing the glorious spectacle in sight, with Venus a good diameter from the solar limb. The backdrop of an active solar disk was amazing. Through the 100mm MKT (filtered, in integrated light) and another Newtonian we watched as Venus made its way to the edge and cleared the disk. There was intermittent cloud at times, but some really great, clear views of the whole Sun were had at times, with great seeing. I noticed (very subtle) refraction effects around the dark Venusian limb, initially with two 'horns' projecting, but the complete ring was just about seen by me. Paul Stephens confirmed – just about the visibility of the 'horns'. These effects seemed much less obvious than they appeared at ingress during the 2004 transit, but then I was looking through a 200mm SCT.'

Ron Johnson

'Although the sky was cloudy throughout the period of the transit it did thin out for about five minutes which enabled me to obtain the attached images from a site in Burgh Heath in Surrey.' (Figure 5 and front cover)

And now the English abroad:

Richard Buckley

'The site was at Flottskar, Vaddo, Sweden (90km NE of Stockholm, close to the Baltic coast).

I used a Canon EOS5 on a tripod with a 300mm lens, operating at f/5.6 and ISO100, with Baader ND5 astrosolar filter foil. Original RAW exposures were from 1/4 to 1/400 second, which I later altered up to +/– four stops as necessary to get the best detail. These pictures are crops from three of the originals. The clouds added to the atmosphere and a few were of the one-eyed-monster type (Figure 6) with Venus visible in a narrow strip on the solar disk. At one point a swan flew in for a territorial fight with two others in front of us, and in the woods there was a cuckoo calling. I just missed a shot at the beginning with the low Sun + Venus reflected in the glass-like sea inlet before the clouds interfered and the wind got up. Unforgettable.'

One observer who did manage to get some water into a truly atmospheric shot was Cristian Fattinnanzi from Montecassiano, Italy, with a sea horizon (Figure 7).

Next from the USA:

Martin Ratcliffe

'I was blessed with perfectly clear skies here in Wichita KS, and had a group of about 30 people including two local news crews. Four telescopes were in use, a C14 with 75mm solar filter, a 102mm Televue, a small 80mm spotting scope, and the most interesting one, a 102mm Cooke refractor built in the 1880s, used to project the Sun's image. I observed the transit directly with the C14 until midway between first and second contact, then took some images. I went back to visual viewing, watching carefully for any unusual phenomena around 2nd contact, and saw a pair of pincer-like extensions leading away from the solar limb along the curve of the Venusian disk. They were extremely fine, very short, and I wanted to confirm with photography. To confirm that I was not seeing things, I re-attached the Canon 60D camera and began video recording through and beyond second contact – but visually at least this appears to confirm what Jay Pasachoff observed in 2004. This video is still being analysed. In

Figure 5. The transit at 04:35 UT with 10cm OG, solar filter and Nikon Coolpix 4500 camera. *Ron Johnson, Burgh Heath, Surrey*.

Figure 6. Venus upon the Sun through heavy cloud, taken with a Canon EOS5 camera with a 300mm lens and Baader Astrosolar film. *Richard Buckley, Vaddo, Sweden*.

Figure 7. The transit at 03:29 UT, with Venus upon the low Sun reflected in water. Canon EOS 5D mark II and 400mm f/5.6 lens. *Cristian Fattinnanzi, Porto Recanati (MC), Italy.*

Wichita we observed through to nearly sunset, a few minutes beyond mid-transit.'

And finally, an account which reminds us of what it is to be British; how we wait patiently, and stoically accept the worst that our wonderful British weather can offer us:

Peter Parish

'On June 6 at 4:15 a.m. (BST) the Mid-Kent Astronomical Society were positioned at the extreme end of the Isle of Grain in Kent hoping to see the last part of Venus' transit across the Sun as it rose out of the sea. There was considerable public interest and almost 80 people were there.

At 4:15 a.m. the sky was totally overcast. At 4:45 a.m. BST (sunrise) the sky looked brighter in the far west, the exact opposite direction from where we wanted to observe. At 5 a.m. our hopes were really raised as the blue sky approached with agonising slowness. The Moon low in the west was now clearly visible (it was the only astronomical object we could see). At 5:15 a.m. the blue sky was overhead but the all-important Sun was still completely hidden.

Venus was still on the Sun, our hopes were still alive. By 5:30 a.m. three quarters of the sky was now clear but still the Sun was hidden by a massive cloud bank. A high flying aeroplane passing at that time which was bright with sunlight did not make us feel better. At 5:35 a.m. a tiny starpoint chink of the Sun appeared but almost immediately vanished. The blue mass of sky was still approaching, the clouds were getting thinner; would we see something after all?

At 5:55 a.m. a tiny chink of Sun showed, then at 5:59 a.m., the cloud suddenly cleared allowing us an uninterrupted view of the Sun for the first time. We were all bathed in sunshine but the transit was over! With the white light filters on our telescopes we viewed some nice sunspots and there were several prominences. One was a layered cedar tree shape.'

Mercury & Venus Section: II

Venus 2011–'12: Fifth interim report

Before the transit: Venus close to inferior conjunction

Many infrared images exhibited some darker patches on the night side of the planet. Frank Melillo drew attention to some patches which appeared in the same relative positions to those witnessed at earlier elongations: this is because the planet shows the same hemisphere towards Earth at each inferior conjunction. He identified *Beta Regio* upon his May 12, 19 and 20 images. Willem Kivits points out that these images of the planet's thermal emission can be taken in full daylight when Venus is observable at higher altitude.

The Ashen Light was again reported by a rather small number of visual observers, and these records will be dealt with in a later report. Kivits was surprised to find that his green and red filter images showed a clear trace of the dark side on several dates, but he also discovered that both filters have a tiny infrared leak. Could this leak be large enough to cause the weak, apparent images of the AL? His work shows that this apparent illumination of the night side in the visual waveband is much weaker than the infrared emission which is, in comparison, easy to image.

By late May the cusps were showing extensions beyond the semicircle of the thin crescent. On June 3 Damian Peach found significant extensions round to *ca*. 270°. Manos Kardasis and John Sussenbach (Figure 8) captured the whole circle on June 4 when the planet was 2.7° from the Sun, but even at that short angular separation a segment of it was still very weak. The image that was secured closest to the Sun was taken by new member Matic Srekar from beneath the transparent skies of Slovenia in a remarkable daylight observation on June 5 (Figure 9) when an obvious full circle was captured, the planet being only 44 arcmin from the Sun's limb (just 1.5 solar diameters!). After the transit, Geoffrey Johnstone imaged cusp extensions on June 9, and on the same date Stanislas Macsymowicz reported a full circle visually.

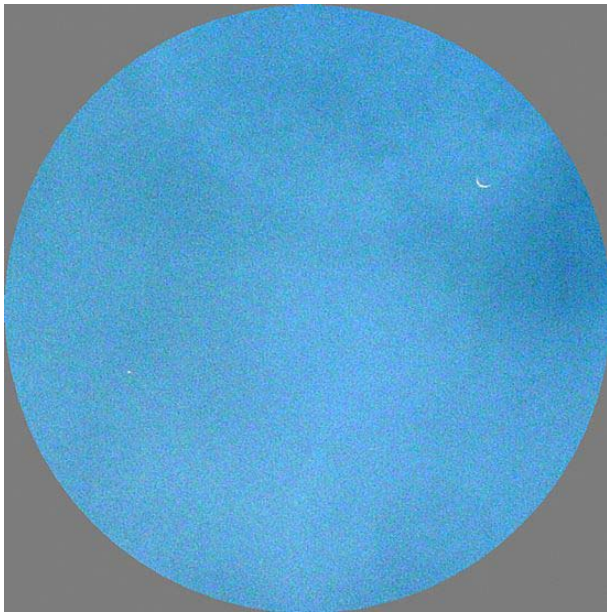

Figure 10. Conjunction between Mercury (at 8 o'clock) and Venus (at 2 o'clock), imaged on 2012 June 1d 17:01 UT with 10cm OG and ISO100 Minolta D200 camera. *John Vetterlein, Orkney.*

In the end, 54 observers sent in observations for the elongation just ended, not counting the many more who observed only the transit.

Conjunction with Mercury

John Vetterlein, observing from Orkney, would have enjoyed a much longer view of the transit than southerners had he not met with clouds: at least he had the pleasure of having caught the close conjunction between Mercury and Venus on June 1 (Figure 10).

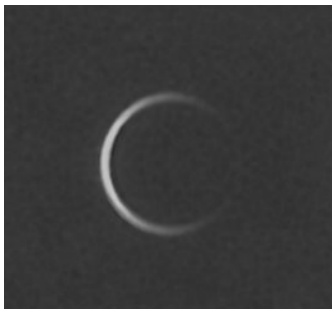

Figure 8. Venus with cusps faintly extended to the full circle, imaged on June 4d 08:28 UT with 28cm SCT, red filter and DMK 21/618 camera. *John Sussenbach, Turkey.*

Figure 9. Venus with cusps extended to the full circle, imaged on June 5d 10:45 UT with 25cm refl. (10cm stop), Astrodon UV filter and Basler Ace ac640-100gm camera. *Matic Srekar & friends, Slovenia.*

Conclusion

As we come to the end of this series of Venus reports, the Director hopes that the energy and enthusiasm of our observers will spill over into the traditionally much less well-followed morning elongation. I would like to thank all contributors for their considerable efforts this year, and those who have not yet sent us their transit observations are invited to do so without further delay.

Richard McKim, *Director*