

Ordinary Meeting and Exhibition Meeting, 2004 June 26 held at The Cavendish Laboratory, Madingley Road, Cambridge

Tom Boles, President

Ron Johnson, Nick Hewitt and Nick James, Secretaries

The President opened the seventh meeting of the 114th session, and invited Dr Nick Hewitt to read the minutes of the previous meeting. These were approved by members. There having been no meeting of Council since the previous meeting, the President reported that there were no new members or papers to announce. However, any newcomers were invited to introduce themselves to him after the meeting. Mr Boles reported that the next meeting would be the Out of London Meeting, held this year in Douglas, on the Isle of Man, on September 10-12. It was requested that any members planning to attend should let the Association know within the next few days whether they required accommodation.

Mr Boles then explained that it was his most pleasant duty to present the Association's awards. This year, two awards were to be made: the Steavenson Award and the Merlin Medal and Gift. He was delighted to award the former to John Toone, an active member of the Variable Star Section for over twenty years, having submitted in excess of 100,000 observations since his first in 1975. He had served this Section in recent years in the arduous capacity of Chart Secretary, and was particularly noted as one of the rare breed of early morning observers. He had also made the observation of active galactic nuclei his speciality. There was prolonged applause. In accepting the award, Mr Toone wished to thank his parents first of all – who, though never into astronomy themselves, had bought him his first refractor. In addition, he had always seen Colin Henshaw as a mentor in his early years. Mr Toone also thanked all of the Section Directors and the VSS officers. These knowledgeable people had helped him a great deal over the years. Finally, he thanked the Association itself, whose combination of 19th-century standards and 21st-century observing techniques he felt made it the active institution it was.

Following further applause, the President announced that the Merlin Medal and Gift was to be awarded to Mr Neil Bone. This name would surely be familiar to all as a tireless promoter of the cause of amateur astronomy. As well as travelling widely to give talks, he was also the author of a great number of books, and wrote the regular *Sky Notes* column for the Association's Journal. Mr Bone had served the BAA as Director of the Meteor Section for twelve years to date, and had published a great many papers in that capacity. After lengthy applause, Mr Bone expressed his great honour at receiving this award. Casting back to his childhood he remembered the individuals who had inspired him into astronomy and sustained his enthusiasm in the early years, expressing his thanks to Howard Miles for replying to his letters, Ian Ridpath, Melvyn Taylor, Robin Scagell and Michael Gainsford, though there were many others. From these individuals, he had learnt the importance of replying to queries and providing encouragement to newcomers, and as Section Director he endeavoured to be as welcoming as they had been. Finally, Mr Bone expressed his gratitude to David Gavine and to his wife and family.

When the applause died down, Mr Boles introduced the first speaker, Mr David Graham, Director of the Saturn Section, and invited him to deliver the first talk of the afternoon.

Observing Saturn in the Age of the Cassini Mission

The title of the talk, Mr Graham began by explaining, referred to the spacecraft bearing the name *Cassini*, now returning superb images of Saturn as it neared the date of an orbital insertion manoeuvre. It was anticipated that over the forthcoming four-year mission, extensive observation of the planet and its moons would be undertaken, and some very fine images were sure to be seen in that time. Cassini, the probe, was of course named after the man, Giovanni Domenico Cassini (1625-1712), onetime head of the Paris Observatory, and whose pioneering observations of the planet were commemorated by the naming of the prominent 'Cassini Division' in the ring system. The subject of this latter individual would, however, be left for another day.

Visual observations by Dr William Sheehan from 2003 September, during the previous apparition, opened the talk. Dr Sheehan had been working at the 36" refractor at the Lick Observatory on Mount Hamilton, primarily to observe the perihelic opposition of Mars, but had also found time to make some superb sketches of Saturn. In the same month, high-resolution CCD images from Christophe Pellier had revealed a vague feature in the South Tropical Zone (STrZ) which appeared to be a faint white spot. This was one of several similar features which had been noted by various observers during the apparition.

In the speaker's experience, astronomy books were frequently found to say that white spots erupted in the North Equatorial Zone around every 30 years, lasting only for a few months. However, it would now seem that high-resolution images such as those by Pellier, Peach, and others, were revealing that similar, but much smaller, features frequently erupted in the South Equatorial Zone between the large events which had been noted previously. Both phenomena appeared to be season dependent, occurring only in the summer of the respective

hemisphere. It was perhaps counterintuitive that the smaller eruptions should be found in the southern hemisphere, the summer of which lay closer to the perihelion of the planet, and thus where the solar flux was stronger. However, the speaker pointed out that whilst the solar flux was indeed stronger at perihelion, the rate of orbital rotation was slower at aphelion, and so northern summer was a little longer than southern summer. In the case of spot formation, this effect appeared to dominate the closer proximity of the planet to the Sun.

On 2003 November 15, Saturn had occulted mag 8.4 star SAO 78867. The C-ring ingress had been at around 4h30 UT, and ingress and egress with the ball of the planet at 6h10 and 8h30 respectively, the occultation finishing with final A-ring egress at 11h20. In a brief window of around 5 minutes at 5h00, the star had been predicted to appear through the Cassini division, and the speaker displayed a successful observation of this brief appearance by Alan Heath. The star had also been visible as it passed through the Crepe Ring, a near-invisible ring of material beside the B-ring, as well as making an appearance in the gap between the inner edge of the ring system and the ball of the planet. Mr Graham showed a series of superb CCD observations by Jim Phillips, and an animated sequence by Ed Grafton in Houston. Particularly notable among Grafton's observations, made at around midnight local time, was the translucent appearance of the Crepe Ring as the star passed behind it, and the speaker complemented him on the quality of his work.

Later in the same month, around November 30, several observers had noted an outbreak of white spots in the STrZ. This activity seemed to mirror what had been seen during the 2002 apparition. A type of observation that the speaker wished particularly to recommend was the construction of photometric profiles of the rings. Presently, Damian Peach was the only observer apparently making such measurements. Once measurements had been amassed over several apparitions, it would be interesting to monitor the time-variation of the ring-components. Showing Peach's results, the speaker pointed out the clear dip in the profile which was the Cassini division, and a smaller dip which was the Encke division. It was hoped that these observations might prove scientifically interesting in due course.

The speaker noted that on one occasion in the previous apparition, a dark spot had been detected in *Hubble Space Telescope* (HST) images from the *International Outer Planets Watch*, and confirmation had come ten days later from Damian Peach. It was amazing that amateur planetary imagers could now see features which were previously exclusive to the HST. It seemed that these dark spots were most prominent when viewed in red light, whilst bright spots were most conspicuous in blue light because they were known to exhibit methane emission.

In the second part of his talk, Mr Graham moved onto the progress of the Cassini Mission itself. He was pleased to see another probe observing the Saturn system again, as Mars seemed to have got more than its fair share of attention in recent years. The probe had already started to return superb images, although it was still heading through the solar system on its way to Saturn, and would not enter a bound gravitational orbit of it until an orbital insertion manoeuvre on July 1. All the images were available on the Cassini website, and the speaker recommended all to have a look through them. Over the next four years – the estimated lifetime of the mission – it seemed likely that a rich array of images of the planet and its moons would be on offer.

The speaker first showed one of Cassini's images from February 9, when it had still been many millions of miles distant from the planet, but which was one of the first to show it in an orientation distinctly different from the view seen from Earth. Whereas the Earth's relative proximity to the Sun meant that terrestrial observers saw no visible phase to Saturn's disk, and any shadow cast by it onto the ring system lay hidden behind it, Cassini's approach trajectory now gave it a superb view of the day/night terminator, and the shadow of the ball cast onto the rings.

Displaying an image from a few weeks later, the speaker remarked that more detail had now come into view as Cassini drew closer, though the orientation was similar. Taken in the different passband, closer to the methane absorption wavelength, cold high-altitude clouds were visible as dark markings. A small south polar cap (SPC) was also visible.

In a series of images at 700nm, taken over a four-week period starting in late February, a number of white spots were apparent in the STrZ. These were moving at different speeds, and appeared to merge into a single spot between images. Turning its camera to Saturn's moon Titan, hazy images began to reveal the first signs of features being resolved on the disk. Much better images would come during a close fly-by shortly after orbital insertion, and it was into the atmosphere of this moon that the Huygens probe would descend on 2005 January 14.

Recent amateur images by Richard McKim and Christophe Pellier had been suggestive of the presence of indentation-like features on the northern edge of the South Equatorial Belt. Close inspection of some of Cassini's first images appeared to hint at a similar conclusion. The speaker was confident that the features seen by Cassini would turn out to correspond to those which amateur observers had seen previously.

Zooming in on the shadow cast by the ball onto the rings revealed a view reminiscent of that seen during the *Voyager I* flyby, and which had not been seen since. However, the Cassini images had so far revealed no hint of the spoke-like features which had been apparent in the images returned by this earlier mission. It would be interesting to see whether they would make an appearance at some point during the four-year mission.

Perhaps the most striking image of all those returned thus far was from the probe's close encounter with Saturn's distant moon Phoebe on June 11. Orbiting at a distance of eight million miles, and a mere 100 miles across, this moon was unusual in a number of respects. Its orbit was retrograde as compared to that of the other moons, and the plane much closer to the ecliptic than to that of the rest of the Saturn system. Furthermore, its albedo was very low – suggestive of an unusual composition. It was interesting that six years after its discovery in 1898 by William H. Pickering, the then BAA President had proposed that Phoebe might have had its origins outside the system, and have become gravitationally captured. Though this was now widely believed to be the case, it remained without decisive confirmation, and would be investigated by Cassini. Finally, the speaker once again urged members to download Cassini's images for home viewing – at half a megabyte the download time would be reasonable on even a dialup connection – yet the amount of detail was phenomenal, and could not be done proper justice on a projection screen. He noted in particular that the image of Phoebe was 2,000 pixels square, but despite being a mosaic of several smaller images, the stacking was so good that it was not possible to make out the edges of the individual frames.

Following the applause for Mr Graham's talk, the President invited Mr Martin Mobberley to once again present his regular Sky Notes.

The Summer Sky

Opening with the supernova scene, Mr Mobberley explained that preparing this month's Sky Notes had been a somewhat frustrating business, as every time he thought he had finished, another discovery would come in. Since the previous meeting, Mark Armstrong had contributed four discoveries, his latest confirmed on the evening before the meeting. One further discovery by Tom Boles landed the two rivals neck and neck with 66 discoveries apiece. Having surpassed the record of 100 UK supernova discoveries last year, it now seemed very likely that both the Association's leading hunters would have 100 each by early next year.

The speaker then showed the latest images of comet C/2001 Q4 (NEAT), including a mosaic of eight two-minute exposures taken on May 16, close to perihelion, by Mike Holloway in Van Buren, Arkansas. Mr Mobberley went on to show one of his own mosaics from a week later. Throughout July and August, C/2001 Q4 would be passing through Ursa Major at mag 7-8, skirting close by a series of galaxies in the first half of August: NGCs 3613, 3610, 3642, 3945 and 4036. Most of these close approaches would be within around 30', and so they would be fine photographic opportunities. In September it would cut across Draconis, heading on into Ursa Minor in October, fading to around mag 10 by November.

Comet C/2004 F4 (Bradfield) was now passing through Cassiopeia, and fading from mag 10 at the start of June to mag 12 by the end of July. An intrinsically compact comet, a CCD would soon be required to observe it, though it would remain a northern object in coming months. Similarly, Comet Tabur was fading at around mag 11, and passing through Auriga and Lynx in July and August respectively. This too was essentially confined to the realm of CCD observation now.

The next good northern comet would be C/2003 K4, brightening through the summer, having passed from Cygnus into Lyra at around mag 9 in late May, and passing on into Hercules in mid-June at mag 8. By mid-August, it might reach mag 6, passing 8° north-west of Arcturus. But then it would plunge west into evening twilight, being lost around the first week of September. Another comet of interest was C/2004 H6 (SWAN), the discovery of which had been announced on May 27. This had come an unusually long time after the first reported observations, which had come to the attention of the *Central Bureau for Astronomical Telegrams* some two weeks earlier on May 13, based on images taken by the SWAN instrument on the SOHO satellite on April 29. The delay seemed to have been caused by dubious astrometry in some of the follow-up observations, which made it impossible to fit an orbit to them. The speaker also noted that the comet had been called 'SWAN', not 'SOHO' as had previous discoveries with the same instrument.

Starting with an image by Michael Mazziato, one of the comet's co-discoverers on May 13, the speaker discussed amateur observing prospects. It would pass through Cetus between mid-June and mid-July, at around mag 8, appearing in the pre-dawn UK sky around the second week of July. It would be easiest to observe in late July and early August, when it would be passing through Aquarius, before spending much of the autumn in Aquila, fading out of sight.

The most easily observable planets – Mars, Jupiter and Saturn – would be absent from the night's sky over the summer, but Mr Mobberley urged members to take advantage of the summer oppositions of Uranus and Neptune on August 27 at mag 5.7, and on August 6 at mag 7.8 respectively. He wondered, given the ever-increasing level of detail that amateurs were able to resolve on the nearer planets, whether it might soon be possible to resolve detail on the disks of these also, having diameters of 3"9 and 2"5 respectively. The speaker also noted that the Association's own asteroid, 4522 *Britastra*, would pass within 6' of Neptune on August 1 in Capricornus at mag 14.5.

The coming months would bring two occultations of binocular stars by minor planets. Firstly, on September 16, mag 8.8 star TYC1286-00191-1 would be occulted by mag 15.6 minor planet 638 Moira for a maximum duration

of 6.2 seconds at 04h32 UT. This event would be visible on a track passing through southern Britain. Then, on October 15, mag 9.7 star TYC1921-02606-1 would be occulted by mag 12.5 minor planet 63 Ausonia for a maximum duration of 8.6 seconds at 02h01 UT, this time visible in more northerly parts of England. On both occasions, the Moon would be helpfully near-new.

Mr Mobberley briefly reviewed the progress of the *Cassini* mission to Saturn, already mentioned by the preceding speaker. One of his favourite images thus far was of the ring system, taken on May 10. The filamentary shadows of each ring on the surface of the planet could be seen through the inter-ring spaces, having an appearance similar to a spider's web. Though these images had been taken while the probe was still a considerable distance from Saturn, the speaker noted that each pixel represented a distance of only 100 miles on the surface. On May 23, Cassini had turned its cameras upon Titan for the first time, one of the most curious moons in the system, and to be the ultimate destination of the European *Huygens* probe, scheduled to be released from mothership Cassini on Christmas Day, and to descend into the Moon's atmosphere on 2005 January 14. Perhaps the most stunning images of all were those from the close fly-by of Phoebe on June 14, already mentioned by Mr Graham.

The speaker went on to discuss the orbital insertion process that would take place on July 1. The beginning of the manoeuvre would be marked at 00h47 UT, when the probe would ascend through the plane of the rings, passing between the F-ring and the G-ring at an altitude of 60,000 miles above the planet's cloud tops. Though the probe was likely to encounter some small particles of debris between these two rings, the risk posed by them was minimal. The insertion burn itself would take place over a 96-minute period between 01h12 and 02h48, during which time Cassini would dip to a minimum altitude of 11,000 miles above the cloud tops. The speaker noted that this was the lowest altitude that Cassini would attain at any point during its forthcoming four-year mission. At 04h34, all going to plan, the probe would descend back through the ring plane, once again passing between the F-ring and the G-ring. This would mark the end of the critical orbital-insertion period. However, the light travel time between Saturn and Earth being 85 minutes, mission controllers would only be sure of the success of each step after a considerable delay.

Mr Mobberley drew members' attention to some of the most exciting highlights of the mission which would be coming up in the autumn, including the first close fly-by of Titan on July 2. A second close pass would follow on October 26, at an altitude of a mere 750-miles from Titan's cloud tops. A third flypast of Titan would come on December 13, at a distance of 1,400-miles, to be followed by the separation of the Huygens probe on December 25. In the meantime, high-resolution imaging of several other moons would also be undertaken, including Enceladus, Mimas, Phoebe and Iapetus.

Closer to home, meteor spotters were reminded of the Bootid Pons-Winneckeds storm, which might return on that very evening. Rates of 50-100 ZHR had been reported in 1998 after a 70-year dormant period, and a return this year was possible, though the speaker noted that this was likely to be hampered by a ten-day-old Moon, evening twilight, and the forecast of rain across the UK. A better-known summer meteor shower would come in the form of the Perseids, spread between July 23 and August 20, peaking on August 12 with a likely ZHR of 80, four-days prior to New Moon.

On September 29, asteroid Toutatis would pass within 1.5 million km of the Earth. Though this pass did not pose a threat, the speaker noted that no larger asteroid had passed closer to the Earth for 250 years, and in the long-term, Toutatis was deemed the most hazardous such rock yet discovered. It was believed to be several kilometres across. Mr Mobberley showed images from a previous close approach, at a distance of 5.3 million km, in 1996. Radar ranging had been used in an attempt to map the surface on that occasion, revealing it to have an unusual topography, apparently formed of two large bulges connected by a narrow neck. It remained possible that these were in fact two disconnected components. Though at a bright mag 9, the forthcoming approach would not be readily observable, taking place at declinations inaccessible to northern observers, and where even southern observers would be hampered by the Sun. Toutatis would travel towards perihelion after passing the Earth, fading dramatically immediately after its close approach due to the sudden change in its apparent phase.

Having come to the end of his Sky Notes, Mr Mobberley explained that he had been asked to summarise the observations of the June 8 transit of Venus which had been made from Sir Patrick Moore's garden in Selsey, on the southern-most tip of the Sussex coast. To celebrate the historical occasion, a great many astronomers had descended to join Sir Patrick, including Brian May, former guitarist from the band *Queen*, Damian Peach, the production team of the BBC's *Sky at Night*, as well as the speaker himself and many others. During the course of the morning, Sir Patrick had made a number of appearances on breakfast television to report the progress of Venus across the face of the Sun.

As observers began to arrive, an ever-larger collection of telescopes had filled Sir Patrick's house, though the speaker drew particular attention to a Dobsonian reflector brought by Brian May, which had been his childhood instrument, and to which an eyepiece projection unit had been added for transit observation. The speaker joked that perhaps some would have preferred him to have brought his guitar along instead. On the evening before, an expedition to a local curry house had been arranged, during which a card was signed by all to form a permanent historical record of the occasion.

As the Sun rose on transit day, the weather forecast was to prove good, the south-east of the country enjoying bright sunshine, though the skies of northern Britain were rather more overcast. The observers of Selsey, at least, were promised a good view. As the time of ingress drew near, the assembled gathering congregated in the only small corner of the garden from which the early-morning Sun was visible, peeping a little over 10° above the horizon. The seeing was to prove good, and Sir Patrick was soon able to report to BBC1 audiences that ingress had been observed. The speaker showed animations of some of his own observations, followed by superb high-resolution images by Damian Peach and Dave Tyler.

Mr Mobberley also took the opportunity of showing an image of egress taken by Paolo Lazzarotti from his Italian observatory. Stacking 1/100 second frames over a 15 second period, Lazzarotti had achieved such high resolution that the solar granulation could clearly be seen, as could the refractive effect of Venus' atmosphere on this granulation around the sharp edge of the disk of the planet. Finally, the speaker wished to dispel one popular myth: there would in fact be another chance to observe a transit of Venus from the UK in 2012. On 2012 June 6, the Sun would rise at 03h36 UT, at which time the transit would be approaching egress, which would occur an hour later at 04h37 UT. So dedicated observers with flat horizons would be sure to make some observations in eight years time.

Following the applause for another lively instalment from Mr Mobberley, the President explained that the rest of the meeting would consist of a number of members presenting their observations of the transit from other observing sites. Mr Nick James was invited to chair the discussion.

Members' Observations of the Transit of Venus, 2004 June 8

Mr James began by describing his own observations from Sharm el-Sheikh in Egypt, where he had been accompanied by BAA members including Mrs Hazel McGee, John Mason and Nick Hewitt. Having selected Cornwall as his observing site for the 1999 solar eclipse, he chose this site for the transit on the grounds that it had not seen a cloud in years, and rain perhaps only twice in the past decade. Whilst the heat of the Egyptian climate was quite formidable, and the seeing consequently rather poor, some observations were assured. In addition, accommodation was reasonably priced, Sharm el-Sheikh being a prominent diving resort.

Before showing his own images, the speaker showed a selection of his favourite observations from around the world – perhaps greatest of all a series of drawings by Mario Frassati, Director of the Mercury and Venus Section, showing what he saw at his eyepiece. Most notable were those of the appearance of egress, during which he saw light refracted by the atmosphere of Venus shortly after interior egress, generating a momentary bright outline to the dark limb of the disk of the planet. Another fine image was that by Tomas Maruska in Slovakia, who had been observing within a narrow track of locations which would see the International Space Station (ISS) transit Venus whilst it was transiting the Sun. The speaker explained that the ISS, whilst visible only infrequently in any one location, was always visible somewhere on Earth. Thus the transit of Venus by the ISS was not in itself rare, but merely required the observer to be in a very precise geographic location. The ISS took a mere 0.6 seconds to cross the solar disk, however, and so high-speed photography was essential if this was to be caught on camera. At his own observing site near Sinai, he was 70 miles to the south of the track where this phenomenon could be seen.

The speaker's own observations included a gripping six-hour video of the whole event, available on request on DVD. Owing to the time constraints of the meeting, however, there was sadly only time to show a time-lapse version of this video, compressed down to 45 seconds. It was noted that during the course of the transit, an unidentified object had briefly passed across the Sun. It did not appear to be any known satellite, and he invited members to get in touch if they thought they could identify it. The speaker also remarked that during the transit, he had taken his BAA Solar Viewer, as provided with the June Journal, into a swimming pool, but it had disintegrated in the water. It was noted with some humour that the meticulous safety instructions provided by the Public Relations Officer before the event had failed to warn observers of this hazard.

Sharm el-Sheikh had also been chosen by the BBC as an observing location, and professional observers were sent to provide footage to accompany that from Selsey. Mr James showed images of the setup they had used, which included Coronado solar telescopes fitted with cameras. Around a tonne of satellite uplink hardware was used to relay footage to London. However, he noted that the equipment was operated not by astronomers, but by experts in the filming of scientific events, without specialist astronomical expertise. As a possible result of this, they appeared to have missed first contact after initially training their cameras on the wrong limb of the Sun.

Mr James then proceeded to invite a series of members to present their own observations:

Nigel Evans had also observed from Sharm el-Sheikh, and showed a mosaic he had generated from a series of images taken with a webcam at intervals throughout the transit. As an intermission, he also showed images of the Milky Way he had taken in the desert, taking advantage of the dark skies. Using a Canon Digital SLR f/4 camera, and stacking six five-minute exposures, he had obtained a fine image. There was often debate as to how long film would remain useful to astronomers, and it seemed on the grounds of these images that it would soon be obsolete. He compared this CCD image with one of higher magnification taken on film, zooming in on Scutum. A little more detail was apparent, and so at present it seemed that film was marginally superior, but the difference was so small that it seemed unlikely to remain that way for long.

Mike Foulkes presented the results of his own observing trip to Egypt, on which he had been accompanied by Derek Hatch. He had sought to obtain high-resolution images of the black drop effect, but on the day, the seeing had been too poor to allow this. Though he had anticipated that it would be poor, it was to prove even worse than expected. At second contact, he noted that he could clearly see an arc of light around the dark limb of Venus, where sunlight was diffracting around its atmosphere. The black drop effect could be seen standing back, but was not apparent in the highest resolution images, suggesting it to be a seeing-related effect. In summary, he reported that his visual observations had been good, but his imaging less successful. Seeing had deteriorated during the transit, and become very poor by third and fourth contact.

Richard McKim reported on his observations from Northamptonshire, showing three still frames from an AVI video he had made. He had used a H α filter. He remarked that his 14-month-old daughter's first reaction to being shown the transit was to try to rub out the blemish on the Sun's disk with her finger.

Neil Bone reported on his observations from Chichester, West Sussex, where he had used an unstopped 60mm aperture for solar projection. He had always previously been of the view that dictophones were a superb way to lose observations, but on this occasion had used one with great success to time ingress. At second contact he was unsure whether there had been a black-drop effect – if so it had been minimal. He recalled that a few years ago he had dreamt of observing three events: the Leonids of 1999, the total solar eclipse of 1999, and the transit of Venus of 2004. He was glad that clouds had spared him one of the three.

Stewart Moore had observed from East Anglia. He had found the weather so favourable, that not only had the seeing been superb throughout the transit, but it had also allowed for a full practice the previous morning. He had used an 8¼" aperture stopped down to 6", and noted that the seeing had been crystal clear at 6am. Rather than displaying more images, he wished to make three summary remarks: firstly how beautiful it had appeared through the eyepiece, secondly how huge Venus had appeared, and thirdly the lack of black-drop effect. With reference to the latter, he had perhaps been able to discern a fuzzy hair-like connection at second contact, rather like a meniscus effect. However, it had been much lighter than the dark disk of Venus, and did not interfere at all with his timing. He anticipated there would be much debate in coming months as to the origin of the effect which had so dogged historical observations.

Noting how fine the seeing had been, Mr Moore wondered whether amateurs ought perhaps to try solar observing at 6am more often. Finally, he reported that he had seen an effect similar to Bailey's Beads around the disk of Venus during the transit. This did not seem to have been seen by any of the other observers presenting reports, but he was curious to hear from anyone else who had seen a similar phenomenon.

Mr James concluded the presentation by showing images by a number of other UK observers, including Maurice Gavin, Lyn Smith, Martin Taylor, David Strange and Damian Peach. In Martin Taylor's images, it was noted that the black drop effect was seen in some of the webcam images. Normally only those images with good seeing were selected, and when this was done, the black drop disappeared. But when the opposite was done, and only the images with the poorest seeing selected, the black drop effect was clear. Mr James concluded from this that the black drop effect was very likely to be a seeing-related phenomenon.

The President concluded the proceedings by thanking the afternoon's speakers. He also expressed his gratitude to Nick Hewitt and Jonathan Shanklin for organising the meeting, and to Geoffrey Johnstone and Peter Hudson for providing assistance. Thanks also went to those members of the Cavendish staff who had been present: Harry Druiff, Bill Badcock and David Woosey, also to those who had helped in preparing the lunches. The meeting was then adjourned until the Out of London Meeting on Saturday September 10 in Douglas, on the Isle of Man.

Dominic Ford