

Annual General Meeting, 2007 October 31**held at New Hunts House, Guys Hospital, London Bridge, London SE1****Dr Richard Miles, President****Ron Johnson, Hazel Collett and Nick James, Secretaries**

The President opened the 2007 Annual General Meeting and invited Dr Nick Hewitt to read the minutes of the previous AGM on behalf of the Meetings Secretary. These were approved by the audience and duly signed. The President welcomed Mr David Freedman, of the Association's auditors, and Mr Roy Dowsett, its Accountant, to the meeting, and invited Dr David Boyd, Treasurer, to speak.

Dr Boyd said that the Association's accounts had been published in the October *Journal*. In summary, they showed an operational surplus of £11,909; financially, this had been the Association's strongest session for several years. Dr Boyd invited questions from the audience, but there were none. He thus proposed that the accounts be adopted, and this motion was seconded and passed *nem con*.

The President expressed his thanks to Messrs Boyd, Dowsett and Freedman for once again ensuring the smooth running of the Association's financial affairs. He wished especially to thank Mr Dowsett, who would be retiring from his post as Accountant at the end of the calendar year. Members applauded. The President then presented his traditional Annual Report of the Association's activities.

Annual report 2006–2007

The President said that just as the Association's finances were in good shape, so too was its membership; on 2007 July 31 we

had 2,967 members, up from 2,904 a year previously. Sadly, however, he nonetheless had to report the deaths of some notable friends of the Association. In 2006 December, we mourned the loss of Edward Ellis, one of our most talented planetary observers. We also noted with sadness the passing of New Zealander Dr Frank Bateson, who, though never a BAA member, would be remembered by the Variable Star Section for his keen support of its pro-am activities.

Turning to the Association's publications, the President said that the *Journal* had maintained its high standard over the past year, for which he extended his thanks to Mrs Hazel McGee, Editor. He was pleased to report that following vigorous negotiation with the printers by Mrs McGee, every page of future issues could now carry illustrations in full colour, without significant extra cost to the Association. The *Handbook* had again been compiled by Gordon Taylor and edited by Mrs Valerie White. There was an ongoing debate about the future rôle of this publication, in an age when much of its content was duplicated on the World Wide Web, and many of its historical functions seemed to have been superseded by planetarium software packages. Comments and suggestions were welcomed, and the President said that all members would shortly be receiving a questionnaire inviting discussion about its future.

The Association's website was ever-expanding as a source of information, and the President thanked Callum Potter for his work as webmaster over the past year. The website now included an extensive discussion board as well as a members-only section from which electronic copies of publications could be downloaded.

The past year had been one of upheaval for the Association's Office, which had to move out of Burlington House for the duration of lengthy renovation work; temporary accommodation was found on Hallam Street in Bloomsbury. This work would shortly be completed, and so over the next few weeks, the Office would be moving back into Burlington House. (It would be closed for the duration of the move.) The newly renovated accommodation would unfortunately have limited space to house the Association's Library, and a committee had been formed to rationalise its contents. Some items had been sold, while others were offered to the membership at no or nominal cost. The President also noted that the Office had recruited a second employee in July – Mrs Madeleine Crow – to whom he extended a warm welcome on behalf of the Association.

The recipients of the Awards and Medals for 2007 were announced at the Exhibition Meeting at the National Space Centre in Leicester in June. The Horace Dall Medal and Gift was awarded to Mr Peter Wise, the Merlin Medal and Gift to Hans-Jörg Mettig, and the Steavenson Award to Mr Peter Birtwhistle. The President extended his warmest congratulations to all.

Earlier in the year, the Campaign for Dark Skies (CfDS) collaborated with the Campaign to Protect Rural England (CPRE) in a project to map the extent of light pollution across the UK. During the moonless evenings of 2006 December 20–24 and 2007 January 14–21, members of the public were invited to count the number of stars visible to the naked eye in an easily-recognisable rectangle of sky in Orion, enclosed at its four corners by the stars Betelgeuse, Bellatrix, Rigel and Saiph. They were asked to send their results to the CfDS, together with the latitude and longitude of their observation site. The President showed a map of the results returned, commenting that the geographic coverage had been very good. The star counts received were well correlated with satellite images of light pollution produced by the US *Defense Meteorological Satellite Program* (DMSP): fewer stars were visible where the DMSP had revealed the greatest light pollution. The CfDS planned to repeat the experiment in coming years to measure how the issues of light pollution were evolving.

On April 24, the BBC's *Sky at Night* series celebrated the fiftieth anniversary of its first broadcast. Sir Patrick Moore had presented all but one of the monthly pro-

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grammes over those 50 years, and was now the longest-serving presenter of any television series in the world, by a considerable margin. On the day of the anniversary, the Association presented him with a card containing 269 personal messages from members; a film of the presentation was broadcast on the *Sky at Night* on May 3.

The President then summarised some of the observations made by Association members in the past year. Among special commendations, Gary Poyner was congratulated upon having submitted his 200,000th visual magnitude estimate to the Variable Star Section on April 17. (Members applauded.) Tom Boles had made six supernova discoveries, and Ron Arbour had made two supernova discoveries in quick succession – 2007av on March 20 and 2007ax on March 22 – his first for two years.

There had been two fine comets – 2006 P1 (McNaught) and 17P/Holmes – both of which had outburst in quite unexpected ways. The speaker would say nothing about the latter, which would be discussed in detail by Nick James in his *Sky Notes* at the Ordinary Meeting later in the evening. Comet McNaught, however, had been a fine naked-eye sight from the UK in early January, though by the time it reached its best, it was too far south for observation from these shores. Observers in the southern hemisphere had seen



Dr Richard Miles (left) hands over to the new President, Roger Pickard. (Photo: Martin Crow)

its naked-eye tail grow in length to 15° and take on a curved, filamentary appearance. From the UK, it had only been visible for a few days after perihelion on January 12, and even then, only for a few minutes after sunset. Despite these restrictions many UK observers had captured some fine images.

The President closed by expressing his thanks to all who had supported him through-out his presidency. Mr Ron Johnson, Business Secretary, was then invited to announce the results of the ballot for Council. He reported that 475 votes were received, cast as follows: President, Roger Pickard (428); Treasurer, Dr David Boyd (428); Meetings Secretary, Hazel Collett (334); Papers Secretary, Nick James (351); Business Secretary, Ron Johnson (338). Other members of Council: Dr Nick Hewitt (361), Ann Davies (358), Valerie White (357), Sheridan Williams (333), Alan Dowdell (331), Peter Hudson (324), Geoffrey Johnstone (307), Mike Maunder (278), Mike Harlow (266), Dick Chambers (257). The four remaining candidates had not been elected, but were urged to consider standing again next year. Three votes were declared invalid. Mr Johnson closed by proposing a vote of thanks to the scrutineers of the ballot, and members applauded.

Dr Miles then gave his second Presidential Address, entitled *Asteroids: past, present and future*, which appears on page 187 of this *Journal*.

Following substantial applause for his Address, Dr Miles adjourned the AGM until 2008 October 29 and invited the Association's new President, Mr Roger Pickard, to take the chair for the first Ordinary Meeting of the new session.

Dominic Ford

Ordinary Meeting, 2007 October 31

held at New Hunts House, Guys Hospital, London Bridge, London SE1

Roger Pickard, President

Ron Johnson, Hazel Collett and Nick James, Secretaries

Taking the chair from Dr Richard Miles, the new President opened the first meeting of the 118th session and expressed his honour at having been elected to the post. Mrs Hazel Collett, Meetings Secretary, read the minutes of the final meeting of the previous Session, which were approved by the audience and duly signed. The President announced that 60 new members were proposed for election, and, in keeping with tradition, said that their names would be displayed for the coming month in the Association's office. (He noted, however, that the office was currently closed for the duration of its move back into Burlington House.) The election of the 82 new members who were proposed at the previous meeting was put to members, and they were approved and declared duly elected. The President encouraged any new members present to introduce themselves to him at the end of the evening.

Mr Nick James, Papers Secretary, said that three papers had been approved for publication in the *Journal*:

Jay Brausch and the North Dakotan aurorae, 1981 to 2006, by Ron Livesey
Total penumbral lunar eclipses, by Darren Beard

The orbital and superhump periods of the deeply eclipsing dwarf nova SDSS J22740.83+513925.9, by Jeremy Shears et al.

The President said that the next Ordinary Meeting would be held on Saturday November 24 at 2.30pm at the Mermaid Centre in Blackfriars, London. Before then, a meeting of the Instruments and Imaging Section would be taking place in Northampton on November 17.

The President then invited Mr Sheridan Williams to present the evening's first talk.

Where to go for the 2008 total solar eclipse

Mr Williams explained that, of the total solar eclipses which would be taking place over the next few years, the one which he would most readily recommend members to travel to see was that of 2008 August 1, despite its comparatively short duration of only 2m27s. The principal reason for this recommendation was that the statistical chances of getting clear skies along its track were significantly higher than for any other eclipse in the coming decade.

The eclipse would begin in northern Canada, track northwards into the Arctic, pass over the North Pole, head south into Russia, and skirt along the border between Mongolia and China before terminating in China. In the NASA 2008 *Eclipse Bul-*

letin,¹ Espenak & Anderson had calculated the statistical probability of cloud cover for each location along this line in August. The prospects in Canada and the Arctic were not good: Cambridge Bay, at the start of the eclipse track, had a 65% chance of cloud. This rose to 75–85% at more northerly latitudes. However, the prospects in Russia and China were better: the chance of cloud cover reached a minimum of 30–35% around Hami in the Gobi Desert in China.

With this in mind, the speaker had set out on an expedition in 2007 August, exactly one year before the eclipse, to explore possible observing sights in this vicinity. His findings were presented in a recent *Journal* paper.² In summary, of three sites surveyed – Novosibirsk in Russia, the Gobi Desert in China, and the Altai Mountains in Mongolia – the Gobi Desert seemed the best choice, offering both good weather prospects and some dramatic scenery.

Mr Williams went on to compare these prospects with those for the eclipse of 2009 July 22, which had a much longer duration of 6m39s, but which would be taking place over cloudier parts of the globe. This eclipse's path would start in India, cross Nepal, Bangladesh, Bhutan and China, and then move into the East China Sea before terminating in the Pacific Ocean. The first portion of this track had a 65–85% chance of cloud cover; the eclipse would be taking place during the summer monsoon season. Even in China and on the small islands to the south of Japan, the chance of cloud cover would never be below 50%. The best chances of seeing this eclipse would come to those on Pacific cruises, who could sail to find breaks in the cloud.

The next total eclipse after this would take place on 2010 July 11, and would have a duration of 5m20s. Its path would be almost entirely over the Pacific Ocean; apart from a few islands, the only landfall would be a brief touch upon Chile and western Argentina at its termination. The best land-based observing location would be Easter Island, but even here there was a 50% chance of cloud. The prospects were little better for the 4m02s eclipse of 2012 November 13, whose track would also be over the Pacific Ocean for most of its length; it would be observable from north-eastern Australia, but there was a 40–50% chance of cloud cover there.

Looking further ahead, however, the speaker could strongly recommend the eclipse of 2027 August 21 to those who liked to plan ahead. It would have a maximum duration of 6m23s, and its track would pass through northern Africa, where the chance of cloud cover reached a minimum of only a few per cent at Luxor in Egypt.

Following the applause, the President welcomed Mr Nick James to present the monthly *Sky Notes*.

The appearance of Comet 17P/Holmes

Mr James explained that his *Sky Notes* this month would be dominated by one object, Comet 17P/Holmes, which had unexpectedly and dramatically appeared as a naked-eye comet a week previously. He apologised to those members whose fine images of other objects he would not have time to show as a result; all astronomical news stories at present were overshadowed by this one remarkable object.

As its name implied, Comet 17P/Holmes was historically the 17th comet to have been shown to be periodic. Its discoverer, Edwin Holmes, was a founder member of the BAA; the comet's discovery had come two years after the Association's foundation, on 1892 November 6. The comet's nucleus was now known to measure around 4km across and to be in an orbit lying entirely between that of Mars and Jupiter; its perihelion and aphelion distances were 2.1 and 5.2AU respectively, and its period was 6.9 years. At perihelion, it typically brightened no further than to mag 16, and so under normal conditions it posed a serious challenge to even the most dedicated members of the Comet Section. It had passed its latest perihelion five months ago, on 2007 May 4. An image from the Nazaret Observatory on 2007 October 23 00h25 UT revealed its appearance to be much as would be expected at such a point in its orbit: the speaker described its appearance at mag 17 as 'resplendent in its cometary nothingness'.

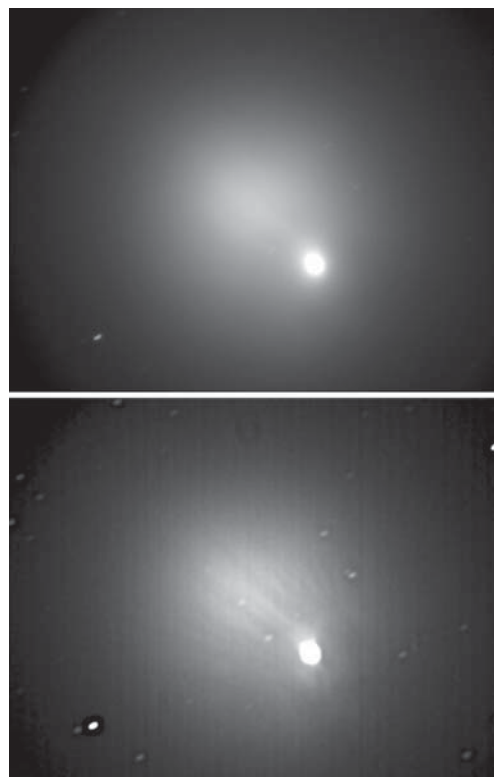
However, only 24 hours after this image was taken, on October 24 at midnight UT, Juan Antonio Henriquez Santana – a Spanish amateur – observed it had brightened to mag 10. A few hours later, on October 24 at 13h UT, Seiichi Yoshida reported it to have brightened still further, to mag 3; he described it as stellar in appearance. This brightening, all the way from mag 17 to mag 3 in under 48 hours, represented a one-million-fold increase in the comet's luminosity. Very few astronomical objects exhibit such rapid changes: this was akin to the behaviour of supernovae and gamma ray bursters (GRBs). It was unprecedented to see such a rapid rise in the brightness of a solar system object.

There had, however, been some prior indication that this comet was prone to dramatic outbursts. Edwin Holmes' discovery of the comet had come five months after its perihelion of 1892 June 13, and as soon as its orbit had been determined, it was

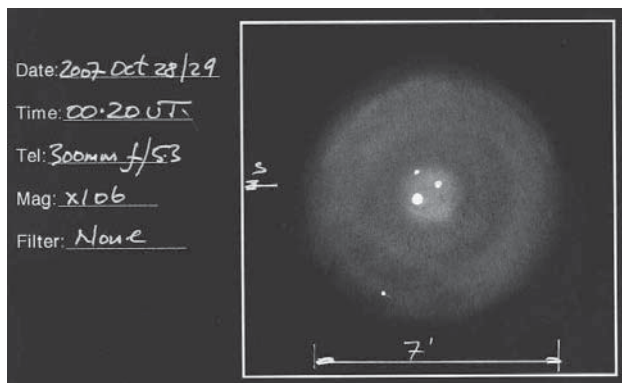
apparent even in 1892 that, given its conspicuous location (close to M31) and brightness (magnitude 6) it would not have gone unnoticed prior to Holmes' observations unless it had brightened very rapidly immediately beforehand. An *Astrophysical Journal* paper³ by Edward Barnard from 1896 summarised its behaviour at that apparition, and the speaker recommended members to download this from the NASA *Astrophysics Data Service* (ADS); this piece of history provided a fair guess at how the comet might behave in its present outburst.

Presently, the comet was in Perseus, placed very conveniently for UK observers; it passed close to the zenith at around 01h30 UT. Its proper motion was small on account of its distance from the Sun; it moved by only around 10 arcminutes per day and would remain in Perseus throughout the winter. The speaker thought that it would be readily visible from the street outside Burlington House after the meeting.

Following its dramatic brightening over October 23–24, it had appeared as a stellar object at around mag 2.5. It had looked rather like a new nova, and so the Variable Star Section had published a note to forestall any members who might mistake it as such. Already on Oct 24, however, a slight coma had begun to be apparent. On account of this, it was thought that the comet's sud-



Comet Holmes imaged on 2007 Oct 31 at 04:12 to 04:22 by David Arditti. *Top*: 281 frames of 2s each aligned on the nucleus, stacked and contrast-stretched. *Bottom*: the same, wavelet-sharpened. 355mm SCT with Lumenera SkyNYX 2-0 camera, unfiltered.



Drawing of Comet Holmes on 2007 Oct 29 by Dr Stewart Moore, Deep Sky Section Director.

dition brightening could be ascribed to a massive ejection of dust from its surface. This dust was now spreading out at high speed into a spherical volume around the nucleus, giving rise to the perfectly circular observed coma. The principal source of luminosity in such a dust cloud would be the scattering of sunlight from dust particles, and this meant that its spectrum would be expected to mirror that of the Sun. Observations indeed showed that the comet's spectrum was essentially solar. What was not understood was what had triggered this cloud of dust to be released. Its expansion velocity was around 500 m/s, which implied that it must have been released with explosive force.

Mr James then showed a selection of members' images of the comet. He was impressed by the amount of structure which David Arditto's images revealed in its coma. To put this in context, he explained that whilst the eye was quite good at handling objects with large dynamic ranges, film photography had historically been quite restrictive: in the case of this comet, photographers would have had to expose for either the bright stellar nucleus, or for the coma. The other would have been washed out. With the advent of CCDs, it had become possible to produce much better images of such objects. The standard method was to stack a large number of short exposures, and to apply a logarithmic stretch to the brightness profile of the resulting image. In expert hands, this had the potential to mimic the ability of visual observers to pick out high-contrast structures.

The speaker had tried analysing several of these images by plotting the brightness of the comet's coma against radius. Such analysis of images taken by Denis Buczynski on October 24 revealed the coma to have faded into the sky background at a radius of around 30" at that time. The speaker's own images from October 27 03h29 and 04h42 UT showed that by then, the comet had expanded to a radius of 120". Its expansion was even evident within the one-hour interval between these images. By calculating the projected size of these

images at the comet's distance, Mr James was able to calculate the expansion speed of the coma, confirming the widely-published velocity of 500 m/s. Extrapolating the comet's expansion backwards, the speaker calculated that it would have had a size of zero on October 23.

Maurice Gavin used another method to show the coma's expansion. He had subtracted an image that he had taken on October 29 from one taken on October 28. The resulting difference image showed a bright positive ring where the coma had grown.

Many observers had reported seeing short ray-like features emerging from one side of the comet. The speaker explained that these probably represented the comet's tail. Because the comet was so distant – it lay outside the orbit of Mars – an observer standing on the comet would see the Sun and the Earth separated by a mere 15°. Consequently, from the Earth, the comet's tail was directed into the sky background; it was concealed behind the coma. These ray-like features were likely to be severely foreshortened tail.

Long exposures appeared to reveal a faint outer coma of about twice the diameter of the inner coma. Most observers who had tried taking colour images of this were agreed

that it was of a noticeably different colour from the inner coma, suggesting that it might be more gaseous than the inner dusty coma. Pete Lawrence's CCD images and Stewart Moore's visual observations both implied that this outer coma had a bright ring around its outer edge. The speaker questioned whether this was real or an optical illusion or processing artefact, but was inclined to think it real.

Looking to the future, the speaker referred to Barnard's paper³ as an indication of what the comet might do next. In 1892, it had faded away over a period of 6–8 weeks. However, two months later, it had undergone a second outburst, re-appearing for another few weeks. The only way to find out whether it would do the same in its present apparition was to keep observing it. Mr James urged members to send their observations to the Comet Section; Jonathan Shanklin had only received 3,000 images so far, and his inbox could do with some more!

Following applause for Mr James' fascinating talk, the President adjourned the meeting until Saturday November 24 at the Mermaid Conference Centre, Puddle Dock, Blackfriars, London EC4.

Dominic Ford

- 1 Espenak F. & Anderson J., *NASA 2008 Eclipse Bulletin*, NASA/TP-2007-214149, available for download from <http://eclipse.gsfc.nasa.gov/SEpubs/20080801/rp.html> (2007)
- 2 Williams S., *J. Brit. Astron. Assoc.*, **117**(5), 231 (2007)
- 3 Barnard E. E., *ApJ*, **3**, 41 (1896)



Members observing the comet with binoculars and the unaided eye from Piccadilly, Central London, after the BAA meeting. (Photo: Martin Crow)