From the President

As I continue in the role of President of your Association, I am learning just how complex an organisation this is. The recent successful recruitment drive has increased our numbers to around 3000. Most commercial organisations would be considered large if they could boast this number of members. For the BAA, it is even more surprising when one considers that it is run almost entirely by volunteers. We do have a full time Assistant Secretary in Pat Barber and, in recent times, the administration headcount has swollen by a mammoth 50% to 1.5. The 'point five' is represented by Ann Davies who works part time and assists Pat in the office. Pat and Ann provide an invaluable interface to our members and take care of all the routine and, sometimes, not so routine tasks in Burlington House.

Other than these two fine stalwarts, the rest of the organisation is run by amateurs, in the very strictest sense of the word as defined by Allan Chapman in his excellent book, *The Victorian Amateur Astronomer*. The work is done out of interest and love for astronomy and for the additional interface that is enjoyed with fellow observers and enthusiasts.

The main decision-making body in the organisation is of course your Council. This is elected by members each year and only elected Council members and Section Directors are eligible to vote on Council business. Although elected even the President has no vote unless a casting vote is required on a tightly contested matter.

A glance inside the back cover of our *Journal* will show the current number of people on Council and the list of other officers including Directors of Sections, coordinators of groups and the other officers and volunteers who assist with their specific talents in many areas outside the Council itself. All these volunteers make contributions which are very much appreciated; without them the Association would not exist.

Running the Association is not dissimilar to running a small company. We need to produce monthly statements recording our assets and liabilities and our income and expenditure. These must be audited each year and formally reported. If anything, reporting our results is more onerous for the Association than the typical business as we need to meet additional criteria set out by the Charities Commission. Being registered as a charity gives us financial advantages such as being able to reclaim VAT and Gift Aid. Despite the additional administrative burden it is well worthwhile to have this status. Each elected member of Council is a trustee of the charity and holds the equivalent status of a director of a company. BAA Councillors' names, addresses and contact details are recorded at Companies House and they are responsible just like company directors for the prudent management of their organisation.

Seeing all this written out might well lead you to suppose that this could be too responsible a position to get involved with. The Association is, however, a very well managed organisation with a diligent volunteer treasurer, and paid accountant and auditors. Insurance protects it from most unforeseen disasters.

What we must never lose sight of is the fact that almost all of these volunteers hold down day jobs as well as making their unpaid contributions to the Association. They have talents that they can bring either from personal experience or their professions. In addition to this, each brings flexibility that allows the undertaking of a task or two outside his/her main area of expertise.

So then, what is your President going on about this month? He has described the workings of Council and said how well things are being managed, which they are. The point that I would like to make is that there are additional activities and services that I would like to encourage the Association to get involved in. These are not necessarily the day to day items involving the Council or even the observing Sections, although all of these are necessary and fun and I encourage them enthusiastically. What I refer to specifically is additional activities that we can either get our members involved in or services that we can provide to them. Despite the long list of names in the *Journal* the main resource that the Association lacks is volunteers. We need more. We need people who are active or experienced in an area that might be useful to us. Is there something that you do routinely in your profession that could benefit the Association? Is there some area where you can add yet more value to what already exists? There might be no specific idea that you can think of at this time – would you still be interested in volunteering to help out?

Today there are two main routes for ideas into the organisation. The first is from correspondence from members, usually commenting on an event and making further suggestions. The second is from an informal planning sub-group of Council and interested people. You won't be surprised to hear that the availability of ideas is not a restricting factor. The means to deliver them is.

With the widespread use of email, and even ordinary post, it is possible to make a contribution from any area of the country. You don't have to be in a position where you are able to travel and attend meetings. If you are interested in what I have said then I would be interested to hear from you. The Association would be pleased to support anyone with a valuable contribution to make of any kind.

Please give it some thought. Drop me a note. If you like we can always have an informal exploratory chat, without any pressure or commitment. You will find that active participation can be very rewarding.

Tom Boles, *President*

The BAA staff and members of Council on the steps of Burlington House, 2003 May 28. *Back row, left to right:* Bob Marriott, Nick James, Richard Miles, Richard Flux, Anthony Kinder, Tom Boles, Roger Dymock. *Centre:* Dominic Ford, John Mason, Gordon Taylor, Patricia Barber, Jonathan Shanklin, Maurice Gavin, Peter Hudson. *Front:* Hazel McGee, Nick Hewitt, Guy Hurst, Ron Johnson, Roger Pickard, Ann Davies, Callum Potter. *(Photo: Ron Wiltshire & Hazel McGee.)*

Campaign for Dark Skies

'Lukewarm' government response to Parliamentary Select Committee report

The British Astronomical Association's Campaign for Dark Skies welcomed the *Report on Light Pollution and Astronomy*, which was published in October 2003 by the Parliamentary Science and Technology Select Committee (see *JBAA*, 2003 December p.315, and ***http://www.parliament.the-stationery-office.co.uk/pa/cm200203/cmselect/cmsctech/747/747.pdf***). The report was based on evidence from the astronomical community, both professional and amateur, PPARC, Government ministries (DfES and ODPU), the Highways Agency, Local Government Officers and others.

The Government of the day is obliged to publish a response to all such reports, and in December 2003 this duly appeared. The main conclusions of the Select Committee are recalled below, with a summary of the official response to each.

The committee concluded that amateur astronomy had a 'valuable input' into professional work and the introduction of young people to science.

Response: the amateur effort is 'a small but significant contribution'. Government support of foreign-based telescopes, PPARC's awards schemes, and support of amateur societies are mentioned, but amateur astronomy is not given recognition as a valuable pursuit in its own right, and there is no declaration of direct intent to help astronomers in the UK.

The committee concluded that the Government fails to take seriously the energy waste and 'disquiet and annoyance' caused by light pollution.

Response: the Government does not respond directly, but states that it is already committed to various energy saving programmes and to 'raising awareness' (strategies which have as yet had no positive effect on light pollution).

The committee concluded that there is incontrovertible evidence that light pollution is getting worse; it calls for a commitment to tackling the problem.

Response: the Government recognises that light pollution has increased, but questions the reliability of the satellite imagery upon which much of the argument is based.

The committee concluded that 'the correlation between lighting and crime is inconclusive'.

Response: the Government counters this by relying on the work of Farrington and Welsh (*Effects of Improved Street Lighting on Crime: a Systematic Review*), the methodology of which has already been called into question with the Home Office by Dr Paul Marchant.

The committee concluded that both locally and nationally, the authorities should be moving towards better-controlled light sources.

Response: The Government still relies mostly on the willingness of local authorities to follow published guidelines (which most authorities manifestly do not). The Highways Agency and UK Lighting Board 'will promulgate good practice in conjunction with local authorities, the lighting industry and the lighting profession'. An 'imminent' European Standard 'with restrictions on the amount of light emitted directly upward' should filter into British Standards soon.

'What were stars, Mum?' Skyglow from Poole and Bournemouth seen from 20 miles. *(Bob Mizon.)*

The committee concluded that there should be special protection for dark rural areas, National Parks, and observatories fulfilling an educational rôle.

Response: The Government does not directly address this recommendation in its response.

The committee concluded that significant energy savings can be made in the area of security lighting and that '500W lights are energy-inefficient and liable to cause a nuisance'.

Response: the government does not address this issue directly and hints at future research by DEFRA and a future advisory leaflet. Public consultation on this matter is proceeding.

The committee concluded that curfews should be imposed on lighting sports facilities, car parks etc, and conditions imposed on positioning and timing.

Response: the government still intends to rely on guidelines rather than directives in this area (a policy which has failed so far to decrease light pollution generally).

The committee concluded that a new Planning Policy Guidance document (PPG) on light pollution is needed.

Response: the government will use the new Planning Policy Statements (PPS) to 'update its advice on the desirability of minimising light pollution'.

The committee concluded that light pollution should be declared a statutory nuisance.

Response: the government is ' considering how best to tackle this issue' and DEFRA is at present considering this in its response to the consultation paper 'Living Places – Powers, Rights, Responsibilities'.

The committee concluded that the government should monitor the situation over the next 5 to 10 years and adopt legislation similar to that in other countries if sky-glow levels are not reduced.

Response: no direct answer was given to this recommendation.

The committee concluded finally that 'if the government accepts this report's recommendations it will start the process of reducing light pollution…'

Response: 'The government endorses the committee's observations that amateur astronomers can make a valuable contribution to the work of professional astronomers, and that astronomy and space can be used to stimulate young peoples' interest in science... we have explained in this note our policies for enhancing young peoples' experiences of astronomy and for tackling the issue of light pollution.'

A disappointing response

The Campaign for Dark Skies is disappointed with the government's response. It is lukewarm and addresses far too few of the main issues. There is some encouragement, in that we are perhaps closer now to having light included on the list of potential pollutants under the Control of Pollution Act. Light

would thereby attain the status of an actionable nuisance, alongside noise, smoke and other intrusions.

However, the Government does not recognise a need to protect amateur astronomy as a worthwhile pursuit in its own right, and it does not accord the night sky the status it deserves as a part of the environment which needs to be protected. The real problem here is that no government department includes the stars in its environmental brief: DEFRA, supposed guardian of our environment, does not cast its gaze above the horizon. The response leads CfDS to believe that the government intends to stress continuing reliance on 'raising awareness', guidelines and mere recommendations to counter light pollution.

This policy will lead to the loss of the night sky in any detail for most of the UK population, if current trends persist. We welcome the existing good lighting practice of the Highways Agency, and moves within DEFRA and the Office of the Deputy Prime Minister towards more control of excessive private lighting. CfDS will continue to call for much more positive action to save the night-time environment from the continuing depredations of badly designed and misdirected lamps, and of poor lighting practice. It would be a great boost to the campaign if more amateur astronomers thought the same, and acted accordingly.

This is not a lost battle. Directing light where it belongs, and in appropriate amounts, is not rocket science. There are NO arguments in favour of wasting energy and assaulting the environment with glare. To misquote John Paul Jones: 'We have hardly begun to fight'.

Bob Mizon, *Coordinator, Campaign for Dark Skies* [http://www.dark-skies.org]

Mars Section

Mars in 2003 – Final interim report

More spacecraft arrive at Mars

Beagle 2 landed in Isidis Planitia (telescopic Isidis Regio) on Christmas morning 2003. Earlier, the Director had kept Prof Colin Pillinger and his team up to date with day by day news of the large regional dust storm in the southern hemisphere of the planet (see below). There had always been the danger that a resonant dust cloud could have arisen over Isidis, but – as the writer predicted – this did not occur.

Unfortunately no signal was received from *Beagle* on the planet's surface. At a press conference Prof Pillinger quoted the Director's view that the probe had not been blown off course by a dust storm. (More likely it crash-landed as a result of some malfunction.) This does not diminish the success of the ongoing ESA *Mars Express* mission of which *Beagle* represented but one part. The orbiting craft will continue a programme of high resolution photo-geology, conduct a search for subsurface water ice and perform mineralogical mapping. Early results are spectacular. We hope there will be a *Beagle 3*.

The safe landing of NASA's twin rovers *Spirit* (on January 4 in Gusev crater (in western Memnonia: –15°, 176°)) and *Opportunity* (January 25, Meridiani Planum (telescopic Meridiani Sinus: –2°, 354°)) coincided with the announcement by President George Bush that the United States intends to carry out a manned Mars mission (albeit dependent upon first establishing a permanent base upon the Moon). This announcement, in the spirit of President Kennedy's famous promise that Man would reach the Moon within the decade of the 1960s, sets a worthy third millennium challenge to humankind. Meanwhile, in addition to providing realistic eye-level imagery, the twin Martian rovers will analyse rocks and soils using various spectroscopic techniques.

BAA observations

This sixth and final report for the present apparition covers the period 2003 December 01 (D= 11.0 arcsec; Ls= 308°) to 2004 February 15 (D= 6.2 arcsec., Ls=350°) The planet's declination changed from –4 to +15°, and the sub-Earth latitude varied from –25 to –19°.

South polar cap

The SPC has remained visible, though it was for a time apparently obscured by the regional dust storm to be described below. By January it was very hard to see visually on the tiny disk, but on Jan 18 Don Parker caught it visually with a power of ×700, and Damian Peach just managed to image it as late as Jan 27 as a nearly dimensionless point. By February 2 it seemed that the S polar hood was forming.

The Director has made over 150 drawings to date during this apparition. He measured the latitude of the N edge of the SPC on the best ones between 2003 May 10 and December 18 (Ls= 183–318°), and plotted latitude as a function of CM longitude (Figure 1). The resulting 'polar spiral' nicely shows the recession of the cap, though some scatter is inevitable with visual data. (Some averaging of points has been done to avoid overcrowding.) It may be compared with results for 1988 (Ls= 232–281°) published in the *Journal*, **99**(2), 52–53 (April 1989). No attempt has been made to map interior details or detached parts of the cap.

Regional dust storm, 2003 December–2004 January

On December 13 (Ls= 315°) Parker took CCD images which showed that a significant dust storm had arisen over southern Chryse (telescopic southern Xanthe) and the eastern part of Valles Marineris. Smaller, secondary dust cores were seen in northern Argyre and over Aram. It seems that this really was the first day of the storm.

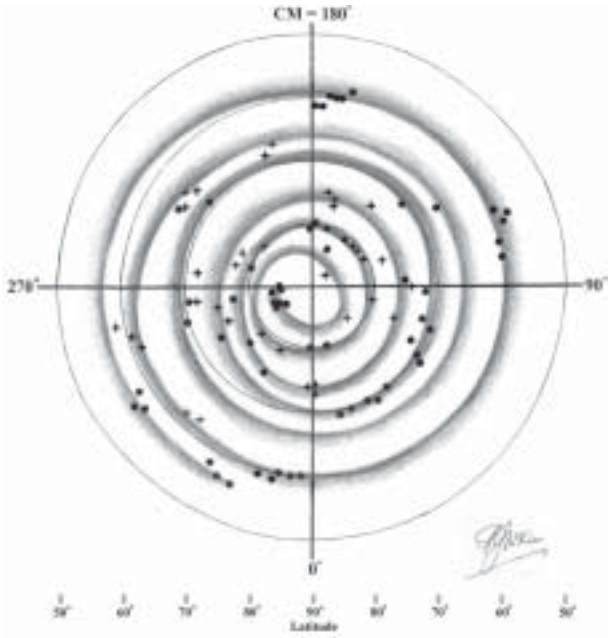

Figure 1. SPC latitude as a function of CM longitude plotted for the martian southern spring and summer. The outermost point of the polar spiral is at Ls= 183°, and the innermost at Ls= 318°. Dots (Ls= 183–202, 230–245, 271–291 and 316–318°) and crosses (Ls= 203–211, 250–269 and 292–306°) are used to denote alternating circuits of the pole. *After drawings by R. J. McKim.*

By December 13/14 a band of dust had extended SW from Argyre to higher latitudes and westward across Thaumasia to the south of Solis Lacus (with the latter feature somewhat obscured). There was a general expansion of the original cloud to veil Eos–Aurorae Sinus–Mare Erythraeum. On December 15/16, further images showed a belt of dust crossing Noachis and Pandorae Fretum–Deucalionis Regio diagonally from Argyre, and impinging upon Sinus Sabaeus. (Indeed, the Meridiani Sinus area was later affected by dust for a time.)

By December 17/18, activity was observed in Hellas in the form of a secondary bright core in the vicinity of the NW of the basin, its deepest part. However, the dust did not develop any further, probably having reached its maximum extent on this date. Observing visually, the Director (December 17 and 18, 41cm Dall–Kirkham Cass., ×410) detected a small projection of part of the Noachis dust cloud beyond the morning terminator.

A series of images by Ed Grafton at similar CML nicely demonstrated the progressive decline of the E end of the storm during December 18–21. By December 22 little suspended dust remained over Noachis, and the NW Hellas dust core was smaller and weaker. On the same date, images by T. Akutsu (CML= 63–85°) showed that the W end of the activity had significantly declined, with the very little remaining dust in E Thaumasia connected to a bright persistent core in Argyre. Solis Lacus was again dark and well defined. In mid-January images continued to show small patches of dust around Aurorae Sinus and over Argyre. On January 16 Damian Peach, and on January 24 Martin Taylor and the Director, found the Hellas basin normal in red light and free from dust.

There were several albedo changes associated with the storm, though the affected areas were once again normal by mid-January. The Pandorae Fretum area looked for a time broader and darker, and Noachis was somewhat less bright than before the event. The terrain about Depressiones Hellesponticae (which marked the southern boundary of the Noachis dust) became much darker than before. A similar albedo change occurred at the time of the planet-encircling dust storm of 1956, and more recently during the S hemisphere regional event of 1988 November (see below).

The general E–W extent of the storm at maximum was similar to that mapped by the writer for the 1988 November event (which had begun in Thaumasia to the south of Solis Lacus at Ls= 313°). However, in 1988 the activity ultimately did not quite extend as far east as Hellas. In its initial development, the present event began more like the regional storm of 1990 November at Ls= 326°. The Director cannot recall any historical event beginning in the location of the present one (S Chryse–Xanthe/E Valles Marineris) which showed such a considerable expansion in longitude, or which was of such long duration. (Both the 1988 and 1990 events are illustrated and charted in the writer's *Telescopic martian dust storms: a narrative and catalogue*, published in *Memoirs* of the British Astronomical Association, **44** (1999): see the Mars Section website for more details.) The Director (in BAA *E-Circular* No. 127) predicted that the event would not exceed regional status. This prediction was based upon the fact that the seasonally latest encircling storm ever observed had begun at Ls= 311° (in 1924 December).

Concluding remarks

Although a few observers continue to observe the planet successfully with larger apertures, it is not anticipated that there will be a need for a further interim report prior to solar conjunction on September 15. A more complete analysis will be prepared later.

Mars will next be in opposition on 2005 November 7.

Richard McKim, *Director*

Solar Section

2003 November

November saw a small rise in the sunspot MDF. Both northern and southern hemispheres saw a small increase but the south was more active. No high latitude spots were reported but there were several at low latitude.

The first two days saw the two naked eye sunspot groups at +8°/291° and –20°/284° approaching the W limb and they remained active until they crossed the W limb on Nov 3 & 4. Both were still visible to the unaided eye. Sunspot activity then declined. On Nov 5 & 6 no spots were seen on the north but there was one group at –22°/243°. The Sun was seen as spotless on Nov 7 by most of our Section members.

There were however three groups on the southern hemisphere at –4°/167°, –17°/160° and –9°/151°. These went over the W limb by Nov 13 and the south was spotless until about Nov 18. The sunspot group at +8°/291° then reappeared on the E limb, but now at +10°/296° due to differential rotation. This group had reduced in size and had an area of 580 msh. It was estimated to be type Eki on Nov 21. It was on the CM by Nov 24 and was visible to the naked eye until Nov 27. It decreased to 430 msh by Nov 28 and reached the W limb on Nov 30.

In contrast, the northern hemisphere was spotless until Nov 13. On that day a near equatorial group seen last month returned over the E limb, now at +3°/002°. It showed a bipolar structure and was type Dki. It was seen with the naked eye on Nov 16 even though it should have been below naked eye visibility. It crossed the CM and gradually decayed to a small type Hsx spot and went over the W limb on Nov 25.

The southern group at –20°/284°, which is understood to be the largest group of this sunspot cycle, had reappeared on the E limb by Nov 21. Unusually, this group developed into a ring of small sunspots that could be seen from Nov 24 onwards for several days. It was type Dac and was seen with the naked eye on Nov 24. Once across the CM on Nov 26 it began to decay to just 160 msh on Nov 27. By the end of the month the southern hemisphere showed many small sunspots and the MDF rose accordingly.

Hydrogen alpha

Prominence MDF for November 6.11 (7 observers). A small increase in the prominence MDF this month. Although some days showed few or no countable prominences there was H-alpha activity associated with the sunspot groups observed this month.

As the sunspot group at +8°/291° approached the W limb, Ken Medway observed bright plages enveloping it. Later on Nov 3 loop prominences were observed as the group passed over the W limb. Eric Strach reported constant change within these loops between 13.13 to 13.21 UT on that day.

A high latitude prominence was seen at latitude +60° on the W limb on Nov 6. By the following day it had extended from lat. +57° to +66°. By Nov 9 it was seen connected to a small filament on the disk, and by Nov 12 it was a low dense arch extending southwards to lat. +45°. It was not seen thereafter.

2003 Nov 3. Loop prominences associated with the spot group at +8°/291° as it went over the W limb. *Eric Strach.*

Ernie Richardson reported two detached prominences on Nov 13. The first separated from the limb at

0925 UT and was ejected to about 45° from the limb before fading from view. The second became detached at 09.40 UT and reached 40° from the limb before fading. Both prominences lasted 15 to 20 minutes.

Filaments were seen on most days. This includes a long north polar filament on Nov 7, almost-circular filaments around the near equatorial group at +3°/002°, and a multitude of filaments associated with the group at –20°/284°.

2003 December

There was a slight fall in the sunspot MDF in December. The MDF for the northern and southern hemisphere were nearly the same. The north was spotless on Dec 14 while the south was spotless on Dec 9. Overall, in 2003 the level of activity was much lower than in 2002. There was a sustained peak in mid-2003 but it did not reach the levels recorded in 2000 and 2001.

At the end of November the MDF was at moderate levels and this was due to a number of small spots that were visible on the southern hemisphere. At the beginning of December, poor weather prevented many in the UK from observing but observations received from overseas members show the south remained quite active. On Dec 2 a near equatorial group was seen at –2°/175° but there is no indication what happened after that date. Also visible was a bipolar group at –6°/140°. This was over the CM on Dec 6 having developed several satellite spots. On Dec 7 this group started to decline and by Dec 8 the follower spot had lost its penumbra. Dec 9 saw the MDF at a low level with two spots nearing the W limb.

By Dec 13 the only sunspots visible west of the CM were a Bxo type group at +18°/89°. Between the CM and the E limb were three small AAs, the largest being a sunspot lying near the equator at +2°/8°, of type Hso. This group seems to have survived two previous solar rotations. It was seen before on October 21 as a flare active group at +4°/354° and again on November 13 at +3°/1°. It now consisted of two spots, the follower being larger in size with penumbra. It crossed the CM on Dec 16 with three small spots preceding the main penumbral sunspot. On Dec 21 this group had become a single spot and it was nearing the W limb by Dec 22. There was a small sharp rise in MDF from Dec 16 to 18 caused by the sudden appearance of several pores on the disk on Dec17.

Meanwhile, on Dec 18 a sunspot had appeared over the E limb at +10°/268°. This was the leader of a more extensive Eao type group at mean position +10°/260° that was fully on view by Dec 21. The group's area was 350 msh and it was surprisingly visible to the naked eye from Dec 21 to 27 by which time its area was more than 500 msh. It crossed the CM on Dec 24 and reached the W limb on Dec 31. As this group was carried westwards by the Sun's rotation, the eastern part of it developed. This was especially noticeable as the follower sunspot at +11°/251° showed more penumbra than the leader spots on Dec 27. The group extended some 17° in longitude. Despite the appearance of this group the MDF steadily declined until the end of the month.

Hydrogen alpha

Prominence MDF for December 6.46 (7 observers). There was anther small rise in MDF. Overall the level of activity in 2003 was lower than it was in 2002. Poor weather prevented many from observing but some interesting features were seen.

2003 December 28. The group at +10°/260° as it neared the W limb. *Peter Paice.*

Dec 8 saw a quiescent hedgerow type prominence on the E limb and also a highly active prominence on the W limb from latitude –17° to –25°. Eric Strach reported that during his observation the prominence size increased towards the south with a large knot forming at 10.30 UT. Poor weather prevented him observing further but he suspected a prominence eruption was about to take place. A CCD image was taken at 11.04 UT and shows this extension, which seemed to be directed to a small prominence further south. Lyn Smith observed the same event but as an eruptive prominence that showed a main column and arms expanding north and south between 11.30 and 11.50 UT. Between 11.50 and 12.20 UT only the main column and the southern arm were visible. However by 12.30 UT Lyn observed the main column clearly detached from the limb.

Brian Mitchell observed a detached prominence on the E limb from lat. –50° to –60° on December 14 & 15. He also saw a series of arched prominences on Dec 27 from the equator to lat. +30° on the W limb.

A dark filament was seen on Dec 5 on the SE quadrant, slightly slanting to and along the –40° parallel. Its leading edge reached the CM the following day and the CM bisected it on Dec 7. On Dec 8 this filament was observed on the SW quadrant.

Geoff Elston, *Director*

BAA sunspot data, 2003 November–December

	November		December	
Day	*g*	*R*	*g*	*R*
1	6	132	5	64
2	5	108	6	90
3	4	75	6	87
4	3	41	5	74
5	1	13	4	66
6	1	11	3	49
7	1	12	3	41
8	2	21	3	33
9	3	43	2	22
10	3	42	3	32
11	3	37	3	31
12	1	16	3	33
13	2	20	3	39
14	1	24	3	39
15	2	30	3	39
16	2	36	3	45
17	2	38	6	85
18	3	56	7	88
19	4	69	6	87
20	4	75	4	69
21	5	94	5	73
22	5	118	5	82
23	5	102	5	85
24	6	110	4	77
25	7	125	2	52
26	7	134	3	55
27	7	123	2	42
28	8	134	3	42
29	8	121	2	32
30	8	113	2	22
31			1	12
MDFg		3.88 (53)		3.63 (58)
Mean R		69.05 (48)		54.36 (53)

North & south MDF of active areas g

	MDFNg	*MDFSg*
November	1.58	2.43 (34)
December	1.83	1.93 (36)

g = active areas (AAs)
MDF = mean daily frequency
R = relative sunspot number
The number of observers is given in brackets.

Saturn Section

Saturn, 2003–'04 apparition: First interim report

Introduction

Saturn emerged from solar conjunction into the dawn sky during August, and the first good quality observations were received by the Section in 2003 September. This report covers the period from the first observations received, to the date of opposition. This occurred on the final day of 2003, when the planet reached its closest to Earth since 1974, and was favourably placed for Northern observers at +22° declination.

The ring system continued to be very favourably presented to us, though having closed up slightly since earlier in 2003. The ring presentation angle closed from –25°.8 on 2003 August 1, to –24°.8 on October 15, and opened again to –25°.5 by opposition day. The visual magnitude peaked at –0.5 on December 31, and the apparent diameter of the disk was 20"6.

This interim report is based mainly on CCD images from the following observers: C. Fattinnanzi (Italy), E. Grafton (USA), T. Ikemura (Japan), E. Ng (Hong Kong), D. Peach (UK), C. Pellier (France) and J. Sanchez (Spain). Also much data was communicated to the Section by International Outer Planets Watch director Agustin Sanchez Lavega, who relayed several drift charts, and images from the Hubble Space Telescope obtained on 2003 August 25 and December 5.

General appearance of the belts and zones

The belts and zones had changed very little in appearance compared to images obtained before solar conjunction. The SEB(N) component remained the darkest belt on the planet, appearing decidedly reddish in hue. The SEB(S) component remained faint, and the SEB(Z) bright coloured. A series of bright spots recorded within the zone are discussed later in this report. Latitudes further south showed a distinct pattern of belts and zones, with the boundary of the dark SPC located at –75°S (Saturnigraphic). The immediate zone surrounding the SPC appeared a dull red colour, with a tiny 2000km diameter dark cap marking the exact south pole of the planet. This cap was surrounded by a narrow bright 'collar', especially well marked in red filtered imagery. Overall, the appearance of the belts and zones of the planet has changed very little during the past two years, aside from the white spot outbreaks at –41°S.

The first South Tropical white spot (WS1)

The activity reported in the Section's last report[1] continued, when on 2003 September 13, a small white spot was recorded in images by Christophe Pellier, using a tel-

Figure 1. The first spot of the 2003–'04 apparition was confirmed in this image obtained by Christophe Pellier. The spot can be seen in the STrZ on the central meridian. Image by C. Pellier, 180mm reflector, modified BW ToUcam Pro webcam, 2003 Sep.17d 04h 05m UT, CM1= 56º, CM3= 200º.

Aurora Section

There were no major transient magnetospheric events in 2003 December, and no storm sudden commencements. Solar wind streams generated a period of geomagnetic disturbance between December 5 and 16. Particularly disturbed conditions prevailed on Dec 05, 08, 10, 11, 12, 14, 20, 27 and 31. At Carlisle David Pettitt recorded stormy conditions on Dec 08, 10, 14 and 21.

Auroral activity also was not particularly strong. Quiet glows and arcs were seen from the north of Scotland on the nights of December 05/06, 08/09 and 27/28. Apparitions including rays were visible on 04/05, 07/08, 10/11, 12/13 and 14/15. Quiet glows, arcs and bands were recorded by Jay Brausch at Glen Ullin, North Dakota on 10/11, 13/14, 20/21, 21/22 and 30/31. A low elevation event with rays was seen on 19/20.

In 2004 January a recurrent period of disturbed geomagnetic activity which began in 2003 July was declining. The full series of recurrences, each of which began after a day of very low activity, was as follows:

2003	July 26	to	August 04
	August 20	to	August 31
	September 16	to	September 26
	October 13	to	October 23
	November 09	to	November 19
	December 05	to	December 16
	December 31	to	2004 January 12

This was a typical case of a long-lived source of solar wind stream activity in the declining stage of the sunspot cycle, that sprayed the magnetosphere with energetic particles with each rotation of the Sun.

There were two storm sudden commencements in January, on 06 and 22, both of which generated magnetically stormy conditions, on Jan 06, 07, 22 and 23. By consensus our own magnetic observers in the UK reported very disturbed conditions on Jan 01, 02, 03, 04, 11, 12, 13 and 18. Stormy activity was noted on 06, 07, 10, 16, 18, 22, 23 and 25. Unless magnetic activity reaches major storm proportions it is difficult to obtain full agreement among amateur magnetometers with a variety of designs spread out over a range of geomagnetic latitudes.

Generally speaking in 2004 January aurorae in the UK were relatively quiet affairs comprising glows, arcs or bands, detected from Scotland on the nights of 13/14, 15/16, 21/22, 24/25, 26/27 (seen also from Denmark) and 27/28. Aurorae which included rays were recorded on 09/10, 22/23, 23/24 and 25/26. The clustering of auroral activity between January 21/22 and 27/28reflected the geomagnetic disturbances that followed the storm sudden commencement reported from Germany at 01.36 UT on January 22.

Stephen Martin, flying west across the Atlantic on the night of January 09/10, encountered low elevation activity comprising glows, bands and rays from 19.33 to 20.55 UT, between 59°00'N 30°00'W and 56°00'N 50°00'W. On his return flight on 16/17 he observed an all-sky aurora comprising glows, bands, rays, veils and active coronal structures from 03.50 to 08.03 UT between 51°45'N 95°45'W and 61°00'N and 30°00'W. Flight paths between North America and the UK cross the auroral zone, so that auroral activity is frequently encountered over Hudson's Bay, Labrador and the North Atlantic south of Greenland. The apparition of January 16/17 took place as a magnetic storm declined.

Alastair Murray at Staxigoe by Wick reported an interesting aurora seen on January 09/10 at 23.15 to 23.20 UT. It consisted of seven bundles of rays, with elevations of base and top respectively at 3° and 6° above the northern horizon. The bundles, green in colour, changed very quickly, sometimes lasting only twenty to thirty seconds. This was during a period of variable geomagnetic activity.

R. J. Livesey, *Director*

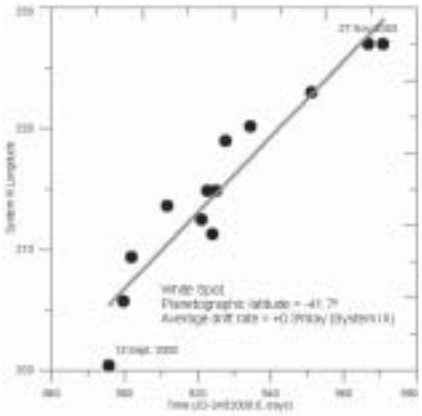

Figure 2. A drift chart of WS1 compiled by A. Sanchez–Lavega from CCD images obtained between Sep–Nov 2003, and measurements by D. Peach. The average drift of the spot was +9.0°/month (System III). Chart courtesy A. Sanchez–Lavega, IOPW.

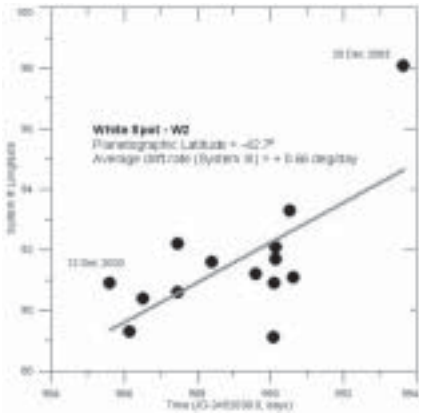

Figure 4. A drift chart showing the movement of WS2. The average drift was +19.8°/month (System III). This spot was retrograding twice as fast as WS1, which was observed to move at +9.0°/month (System III). Chart courtesy A. Sanchez–Lavega, IOPW.

escope of only 180mm. The spot's existence was confirmed in images taken by Pellier on September 17 (Figure 1). A drift rate was quickly established, and the spot showed a slowed retrograding motion, now typical of these features.

This spot was very well tracked by observers, and Peach caught the feature on September 29 under excellent seeing conditions, followed by Grafton on October 8. As it turned out, this spot persisted until December. When the Hubble Space Telescope captured the feature on 2003 December 5 at high resolution, it appeared to have split into two parts. No amateur images obtained during December showed the feature and it is presumed to have faded away.

The second South Tropical white spot (WS2)

This spot was discovered in images by Japanese observer Toshihiko Ikemura on 2003 December 12. It appeared brighter than WS1, and was quickly confirmed in images the same night by fellow Japanese amateur K. Yunoki. This spot persisted for only three weeks before it disappeared from view. Drift rates were obtained for this feature and it appeared to be moving faster than WS1 (Figures 2 & 4).

Figure 3. The second WS of the apparition appeared on December 12, close to system III longitude 95º. This image taken 8 days later on December 20 clearly shows the new spot, appearing somewhat brighter than WS1, which by this time had greatly faded. Image by J. Sanchez, 280mm Schmidt–Cass., Phillips ToUcam pro webcam, 2003 Dec.20d 00h 18m UT, CM1= 303º, CM3= 57º.

Bright spots observed at –29°S

As well as the South Tropical white spots continuing to persist this apparition, a notable outbreak of bright spots in the bright South Equatorial Belt Zone at –29° S was observed in several images. In total six such spots were followed, all very similar in appearance, and most could be detected in images even under mediocre conditions. The first two such features were discovered in HST images obtained on August 25, and later recorded by amateur imagery. These two spots were also the longest lived, lasting around four months in all. Others were much shorter lived features lasting only weeks.

These spots also displayed a distinct drift rate, and were moving at a rapidly prograding rate relative to System III. The average drift of all the spots was –225°/month (System III), meaning the longest lived of the features had circled the planet almost four times by opposition (Figure 5). These features at times were also accompanied by dark material close to them.

Small dark spots at various latitudes

As well as the above features and activity, several small dark spots have also been tracked in the planet's atmosphere at various latitudes. Images by E. Grafton, D. Peach, J. Sanchez and T. Ikemura have all imaged small dark spots at one time or another, very much like those seen in 650nm (red) HST imagery.

The first such image showing the features was by Grafton on 2003 October 19. This image reveals a small dark spot at –45°S close to the meridian, and another at –31°S. On October 28, Peach caught a dark spot at –45°S that rotated with the planet.

Further dark spots were recorded as the apparition progressed. Peach, imaging under excellent seeing on the night of December 15–16, recorded two small dark spots that rotated with the planet in 600nm+ red wavelengths. One was located at –31°S and the other close to the polar cap at –75°S. The spot at –31°S was possibly still present at the end of the year, and measurements suggested it was drifting at –9.9°/month in System III (Figure 1).

The other spot at –75°S was possibly the same spot as imaged by HST on December 5 in red light, as it appears at exactly the same latitude, and of similar appearance.

The view from Mount Hamilton

Dr William Sheehan spent a week at the Lick Observatory in California during September

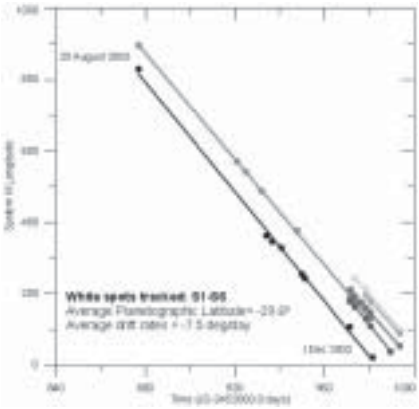

Figure 5. A drift chart showing the movements of all six spots tracked at –29°S. Note the first two spots discovered by HST appear to have been by far the longest lived of these features. Chart courtesy A. Sanchez–Lavega, IOPW.

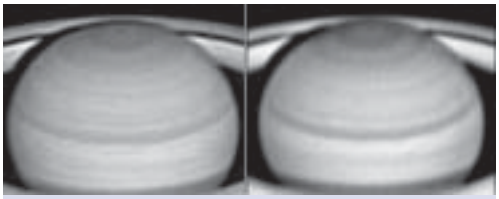

Figure 6. Two views of Saturn showing small dark spots, (left) by Ed Grafton showing the two small spots mentioned in the text, and (right) by Damian Peach, showing a small dark spot close to the meridian. *Left:* E. Grafton, 355mm Schmidt–Cass., ST5C CCD, 2003 Oct.19d 11h 14m UT, CM1= 332º, CM3= 107º. *Right:* D. Peach, 280mm Schmidt–Cass., Phillips ToUcam Pro webcam, 2003 Oct.28d 04h 32m UT, CM1= 130º, CM3= 339º.

Figure 7. Saturn on 2003 December 16. One of the highest resolution images ever obtained of Saturn by the use of an amateur size telescope reveals a tremendous amount of fine detail across the planet's globe and ring system, including a small dark spot at –31°S. Image by Damian Peach, 280mm Schmidt–Cass., ATK-1HS CCD camera, 2003 Dec.16d 00h 21m UT, CM1= 318°, CM3= 332°.

to observe Mars at its close approach. At the request of the Director, he stayed up on the morning of September 12, to catch Saturn rising in the dawn sky. His drawing of the planet made with the venerable 36 inch Lick refractor is reproduced as Figure 10.

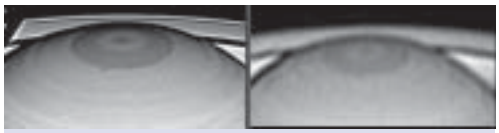

Figure 8. *Left:* A small dark spot on the boundary of the South Polar Cap was caught in images by the HST on 2003 December 5. *Right:* an image by Peach on December 15 showing a small dark spot at the same latitude on the meridian. This feature is clearly seen to rotate in the full sequence of images. Both images are in red light (600nm.) HST image courtesy Agustin Sanchez–Lavega, IOPW. Right image by D. Peach, 280mm Schmidt–Cass., 2003 Dec.15d 23h 42m UT, ATK-1HS CCD, CM1= 295º, CM3= 310º.

Summary

Overall the high level of activity we saw during 2002–'03 has continued, and in fact perhaps increased, especially with the many bright spots in the mid-SEB latitudes. This apparition is also the first when amateur imagery has followed the discrete darker spots previously only recorded by the HST. These dark features are best seen in red wavelengths, and are completely invisible in shorter wavelength imagery (blue for example.) The small white spots in the South Tropical Zone are most clearly seen in V and B wavelengths, and poorly in red light. This indicates the darker features reside deeper in the Saturnian atmosphere, while the brighter spots are at higher altitudes, though these are invisible in 890nm methane band imagery from HST due to the hazes present high above the Saturnian atmosphere.

The Section continues to track and analyse these features with interest. Special thanks are due to Dr Agustin Sanchez–Lavega of the IOPW for his continued analysis, and providing access to the most recent HST imagery, and to all the observers contributing to this report. A second report dealing with the continued observation of these features in the second half of the apparition will appear at a later date.

The occultation of SAO 78867 by Saturn on 2003 November 15

The Saturn system was predicted to occult the 8.6 magnitude star SAO 78867 on the morning of 2003 November 15 as seen from the United Kingdom, the event commencing at about 05h30m UT. Given the awkward location of Saturn as seen at that time from his site at Long Eaton, Alan Heath used both his 250mm Newtonian and 200mm Schmidt–Cassegrain to follow the event. Alan judged the star to be in contact with the north, preceding ansa of the ring at about 05h20m UT, appearing briefly about 17 minutes later, in approximately the position of Encke's Division. Interference from cloud prevented the star being visible inside Cassini's Division and in the poor seeing prevailing, the star was not seen again from Long Eaton.

Dr Richard McKim also ventured to the observatory that morning and using a magnification of ×250 on his 410mm Dall–Kirkham Cassegrain at Upper Benefield, succeeded in glimpsing the star as it passed behind Cassini's Division between 05h51m to 05h52m UT. Conditions being little better at Upper Benefield than those encountered by Alan Heath at Long Eaton, no further glimpses of the star were to be had.

Meanwhile, higher above the horizon in a calmer North American sky, Dr Jim Phillips, resident of Charleston, South Carolina, recorded the event using a combination of a 230mm apochromatic refractor and Philips ToUcam Pro webcam. His remarkable sequence of images was recently reproduced in the *Journal*[2] and clearly shows the passage of the star from the initial contact with the outer edge of Ring A, to the subsequent contact with the preceding limb of the ball of Saturn.

Figure 9. Saturn showing two spots. WS1 is visible toward the right limb, while a SEB(Z) bright spot is seen close to the planet's meridian. Image by C. Fattinnanzi, 250mm Schmidt–Cass., Phillips ToUcam pro, 2003 Dec.02d 22h 58m UT, CM1= 91º, CM3= 182º.

David Graham, *Director*
Damian Peach, *Assistant Director & Imaging Coordinator*

1 Graham D. & Peach D., 'Spots on Saturn in visual wavelengths', *J. Brit. Astron. Assoc.*, **113**(6), 322–324 (2003)
2 'Occultation by Saturn of the star SAO 78867 on 2003 November 15', *J. Brit. Astron. Assoc.*, **114**(1), 39 (2004)

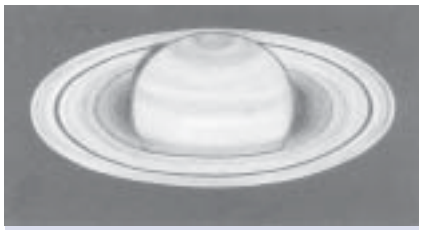

Figure 10. Drawing of Saturn by William Sheehan, 910mm refr. (Lick Observatory) ×655, 2003 Sep.12d 11h 30m UT, CM1= 55º, CM3= 356º.

Special announcement

Solar viewers for the transit of Venus

We are pleased to announce that the Association has arranged to import CE-certified black polymer solar viewers from Thousand Oaks Optical Inc. of California, for safe and convenient non-telescopic viewing of the transit of Venus on 2004 June 8. A free viewer will be distributed with the June *Journal* to every member of the Association.

Additional viewers for family and friends may be purchased from the BAA office for £1.00 each inclusive of first class postage. *(Quantities of 5 or more: 75p each).* Please send your cheque with order as soon as possible **(do not wait until June!)** to the **British Astronomical Association, Burlington House, Piccadilly, London W1J 0DU**.

(Background image of last May's Mercury transit, courtesy of Lee Macdonald)