

From the President

All change at Burlington House

Things have certainly been warming up recently in the BAA office in Burlington House in Piccadilly.

Over recent months we have had a complete changeover of staff. As I mentioned in the June *Journal*, the friendly voice of Ann Davies that everyone admired is no longer there when you call. Ann decided to take up an offer doing a special project much closer to home, which helped considerably on travel time and costs. We very much miss Ann and wish her well in her new venture.

Likewise and even more dramatic because of her long service, is the fact that our Assistant Secretary, Patricia Barber, has also moved on to pastures new, after almost 18 years with the Association. We wish Pat every success in the future. (See the June *Journal*, page 120, for more details.)

Valerie Stoneham is currently helping our new Office Manager, Jean Felles, on a part time basis. Val is also from Crayford Manor. I am hoping that this is not some dastardly plot by Crayford to take over the BAA by stealth!

All of this has happened amid many other changes taking place. Those of you who have visited Burlington House in recent weeks will have noticed that scaffolding has been erected outside all of the buildings on the west side of the square. This includes the Royal Astronomical Society, the Society of Antiquaries and of course the BAA. This is part of the maintenance work being carried out by the Office of the Deputy Prime Minister following an amicable agreement between the present Government and the learned societies in the square. (The BAA's position in Burlington House is no longer under threat but details and locations still have to be agreed.) The brickwork is being cleaned and re-pointed and repair work will be carried out on the roof. The scaffolding will need to remain in place for some time.

When the west side of the square is completed, work will begin on the east side. A poster describing the work being done is attached to the boarding protecting the scaffolding should anyone be interested. Not only are the canvas covers on the walls inconvenient but they also retain heat which is a problem in the warmer weather.

Part of this work has already affected the BAA office. Temporary boarding has been put up inside and has restricted the usable size of the office for some weeks now. This has been necessary while internal improvements have been carried out to the windows. As a result, the office is severely cramped and furniture has had to be relocated to accommodate the changes. It has not been a

good time to introduce Jean and Val into the office. There was even a period in early June where we had to vacate the office completely while scaffolding was erected internally to allow maintenance in the stairwell. Jean and Val have suffered in silence and put up with all this inconvenience.

Following the completion of the external maintenance, the RAS will be undertaking a complete refurbishment of the interior that will retain the character and quality that such a historic building deserves. Architects have been appointed to make recommendations on the layout and facilities in the refurbished building. As these become available I will keep you in touch.

All this has been happening against the backdrop of the Association installing its new computer system. The new membership system is now in place and the remaining task, the most difficult part, is to configure it stage by stage to meet our requirements. There is some way to go in specifying and designing new reports and getting its various modules to deliver what we need to improve our service to members. The application that executes our direct debits also has to change in line with banks' decisions to move their emphasis away from telephone to Internet banking. This necessitates the installation of a totally new application which in turn has to be configured for the new requirements plus its interface with our new membership system.

Once the dirty work of the contractors is complete a replacement for our worn-out photocopier will be delivered as well as some new furniture to give the office a facelift and make it more presentable. After that a skip might be necessary so that an effort can be made to rid it of years of accumulated rubbish! Jean and Val have their work cut out for some time to come.

We did expect some problems with the new system and I did warn in an earlier FTP that some inconvenience would follow. We hadn't anticipated quite so much with the delay in the refurbishment lasting so long that it coincided with the installation of the new applications. I would ask that members be patient with us during this trying period. The new system will provide a better service for you and make the Association a lot more flexible and responsive to your needs.

It's also time to vote again. Ballot papers are included with this *Journal* so that you can vote for your Council and Officers for the coming year. We have a few new names nominated this year and new blood is always healthy to have. Please, please can I ask that you exercise your votes? You may not know all or even any of the names put forward but please take time to read their short resumé. Again I emphasise that these people will be giving up a large slice of their spare time to help your Association; surely you can show your appreciation by taking the five minutes necessary to fill out the ballot form and drop it in the post. We look forward to hearing from you.

Tom Boles, *President*

Jupiter Section

The face of Jupiter in 2005

The images on the front cover show the appearance of Jupiter shortly after opposition in 2005 April. The planet is fairly quiet but many interesting spots can be tracked in hi-res images. Here, the central images show the Great Red Spot. Other features of interest are labelled: SPR-1 is a long-lived yellowish spot in the south polar region. A1 to A5 are long-lived anticyclonic white ovals in the S.S. Temperate domain. BA is the last great anticyclonic white oval on the STB. 'STB ss.' denotes a spot prograding in the STBn jetstream, and a small remnant of a former STB segment; the STB is otherwise faint here. 'Q' denotes an anticyclonic ring in the STropZ, temporarily fringed by a dark South Tropical Band.

To the right of the GRS, turbulent white spots in the SEB comprise the post-GRS disturbance as usual. A new white spot erupted in the SEB on April 21 (green arrowhead); it had expanded by April 25 (last image).

The NEB underwent a classical northwards expansion in 2004, followed as usual by the appearance of many small brown 'barges' (red arrowheads) and white ovals. White spot Z is the brightest of these and the only one which is more than a year old. The NTB is absent; the dark belt in the north is NNTB, which has become strikingly orange in this sector. This colour may be an aftermath of recent activity in the NNTBs jetstream. 'N.jet.s.' denotes a pair of dark spots prograding in the NNTBs jetstream.

Note that images (b) (Vandebergh) and (h) (Mobberley) use red (b) or infrared (h) for luminosity, plus RGB for colour; therefore they show the NEBs dark projections with high contrast, but do not show the reddish barges nor NNTB.

John Rogers, *Director*



Meteor Section

A favourable year for the Perseids

A favourite of both regular meteor observers and those with a more casual interest, the Perseid meteors have a well-placed return in 2005. Active from late July until August 20, the shower is expected to reach maximum around 13h UT – during daylight hours for observers in the British Isles – on August 12. Perseid rates should be particularly high late on the night of Aug 11–12, and the evening of Aug 12–13 (the latter, conveniently, a Friday–Saturday). The 2005 Perseids are favoured by absence of moonlight during their most active phase. The Moon is new on August 5, and even as late as Aug 15–16 will be setting before midnight local time, giving dark skies for the

small hours which are generally the most productive for meteor observing.

The Perseid radiant, near the ‘Sword Handle’ at the northern end of Perseus where the constellation borders onto Cassiopeia, is relatively low in the northeast at dusk on an August evening. Through midnight and into the hours before dawn, however, it climbs high into the eastern sky, and by daybreak is around 60° up in UK skies. In general, meteor showers will produce their best observed rates when their radiant is high in the sky; fewer meteors are then lost in the haze near the horizon, for example.

Typically, the Perseids will produce only a handful of meteors per hour in early Au-



A Perseid meteor recorded from Leeds on 2004 August 13–14 by Alex Pratt, using a Mintron video camera with a 12mm *f*/1.2 lens. *A. Pratt.*

gust, with activity increasing slowly during the first week of the month. For regular meteor observers, the concurrent activity of the North and South Delta Aquarids, Alpha Capricornids, Capricornids, North and South Iota Aquarids and Alpha Cygnids, along with reasonably high background sporadic rates, augments the Perseids to make this a very productive time. An experienced watcher at a dark location might notch up a combined total of about 20 meteors/hr from these other showers late in the night during early August.

Perseid activity begins to take off somewhat around August 8–9, roughly doubling nightly until peak on Aug 12–13, when observed rates may reach 60/hr under good conditions. A sharp decline follows, but watches on Aug 13–14, 14–15 and even 15–16 can still be very productive: don’t forget that even if maximum night is clouded out, the nights immediately beforehand and afterwards are still a lot more rewarding in terms of meteor numbers than much of the rest of the year.

The Perseids are noted for their fast, often bright meteors. A healthy proportion of shower members are in the magnitude 0 or brighter range, making this an ideal target for photography, especially in the week or so centred on maximum. Thanks to their high, 60 km/sec, entry velocity, Perseids (particularly the brighter ones) quite often leave behind briefly-lingering persistent ionisation trains.

When last seen well, in 2002, the Perseids produced peak sky- and radiant altitude-corrected Zenithal Hourly Rates (ZHR) of 80–100 on Aug 12–13, and much the same can be expected this time round. The enhanced activity associated with the 1992 perihelion return of the meteor stream parent, Comet 109P/Swift–Tuttle, has now gone, but observations are still required on every possible clear moonless night during the whole Perseid interval to improve our picture of the shower’s current behaviour. Detailed visual observation instructions can be found on the Meteor Section webpages at <http://www.britastro.com/meteor>.

Photographers hoping to catch Perseids on film may succeed in doing so using

The solar eclipse of 2005 October 3

The second solar eclipse of 2005 is on Monday, October 3, but this time, unlike the rare hybrid eclipse of April 8, the Moon’s umbral shadow never reaches the ground and so, at best, observers will see only an annular eclipse, where the Moon appears smaller than the Sun as it passes centrally across the solar disk. A bright ring, or ‘annulus’, of sunlight – the so-called ‘ring of fire’ – will be seen at greatest eclipse. From the UK, weather permitting, observers will see a rather nice partial eclipse; from southern England almost 60% of the Sun’s disk will be covered by the Moon at maximum eclipse.

The table gives the circumstances of the partial eclipse from four locations within the UK. Note that the times given are UT; local times will be one hour later than those given here since British Summer Time will still be in force. When astronomers refer to the eclipse magnitude, they are referring to how much of the Sun’s diameter will appear covered at maximum eclipse. Eclipse obscuration refers to the percentage of the Sun’s disk which is covered by the Moon. During a partial eclipse, the eclipse obscuration is always less than the eclipse magnitude.

Many BAA members may wish to travel to view the annular eclipse; cheap flights are

readily available from the UK to suitable locations in Spain. The path of annularity first reaches land near the border of northern Portugal and Spain, and crosses the Iberian Peninsula, passing right over Spain’s capital city Madrid. It then traverses the Mediterranean Sea (crossing the southernmost part of the island of Ibiza) making landfall again in Algeria, and tracks south-eastwards through north Africa, ending in the Indian Ocean, south of the Seychelles. Greatest eclipse with 4m 31s of annularity occurs in the Sudan.

On the Iberian Peninsula, the path of annularity crosses a number of Spanish cities including Vigo, Pontevedra, Ourense, Zamora, Salamanca, Valladolid, Segovia, Madrid, Toledo, Guadalajara, Albacete and Valencia. Madrid will see an annular eclipse lasting 4m 11s; from Valencia on the Mediterranean coast, where the weather prospects are rather better, the annular phase lasts 3m 42s.

All observers MUST take adequate precautions to protect their eyes at all times when observing either the partial or annular phases of this eclipse. Solar viewers may be obtained from the BAA – see page 231.

John W. Mason

Circumstances in the UK of the partial eclipse of 2005 October 3

| | Eclipse begins h:m (UT) | Maximum eclipse h:m (UT) | Eclipse ends h:m (UT) | Sun’s altitude ° | Sun’s azimuth ° | Eclipse mag. % | Eclipse obsc. % |
|------------|-------------------------------|--------------------------------|-----------------------------|------------------------|-----------------------|----------------------|-----------------------|
| Glasgow | 07:52 | 09:00 | 10:12 | 19 | 130 | 0.59 | 0.49 |
| Manchester | 07:50 | 09:00 | 10:15 | 22 | 131 | 0.63 | 0.54 |
| Birmingham | 07:49 | 09:00 | 10:16 | 22 | 131 | 0.65 | 0.56 |
| London | 07:49 | 09:01 | 10:18 | 24 | 133 | 0.66 | 0.57 |

Extracted from Fred Espenak’s Eclipse page: <http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html>



undriven exposures of 10–15 minutes' duration on ISO 400–800 film, taken through standard 50mm or wide-angle 28mm lenses at f/2.8 or faster. Good aiming directions are towards Cygnus/Aquila in early evening, the Square of Pegasus in the post-midnight hours, or towards Polaris throughout the night.

The Perseids in 2004

Poor weather severely restricted observations of the Perseids last August, with much of the British Isles under cloud and rain around the shower maximum – a great disappointment given predictions indicating possible interludes of enhanced activity due to a filament of recently-ejected material from the parent comet, and resonance effects of Jupiter's gravity on the main meteoroid stream.¹

Best conditions in the UK were found over the weekend of 6–7 and 7–8 August, at which time the Moon restricted productive watches to the earlier parts of the night when the Perseid radiant was still low. ZHR in the range 15–20 were found, with observed rates still rather low. Some UK-based observers were luckier on 10–11 August, although patchy cloud was still a problem on this night, by which time the ZHR was starting its climb towards maximum, having reached about 45.

August 11–12 had very poor weather over the UK. Dave Gavine and Jamie Shepherd had some success from southern Scotland: after much driving in pursuit of gaps in the overcast, their three hours' total watch time netted 8 sporadics and 143 Perseids, including a magnificent flaring mag –8 Perseid with a 45-second train at Aug 12d 01h 47m UT. The bulk of coverage for this night comes from members based in mainland Europe. Callum Potter and Michael Stephens provided valuable data from southern France, while Bill Greer submitted counts based on video and visual observations from Spain. Activity was respectable in early evening, with ZHR 40–60 around 23h UT. Low radiant elevation makes reliable determination of ZHR around the critical 21h UT timepoint difficult. ZHR was perhaps as high as 90–120 in the early morning hours.

High observed rates were reported between 02:16–03:16 UT by Michael Stephens (58 Perseids in LM 4.5 skies with occasionally-extensive patchy cloud).

Reports elsewhere, from the Dutch Meteor Society, suggest that the strong early peak did occur, while Perseid activity was indeed elevated throughout the early morning hours of August 12, with numerous bright meteors in evidence.²

The wet weather of the previous 24 hours began to clear eastwards from the UK on

12–13 August, and observers in the west of the country had some decent skies on this night. Activity does seem to have been lower than on 11–12 August, though there is a fair amount of scatter in the reductions; ZHR between 50–95 are found from reports by experienced observers. Steve Evans at Moreton-in-March, Glos., ran his low-light video system (a Watec 902H camera with 8mm f/0.8 lens, 46°×34° field of view, capturing meteors to mag. +3.5), recording 20 sporadics, 74 Perseids and 8 other meteors in 6.0 hours of operating time on this night. By 13–14 Aug, when observers in Scotland and the north of England had some reasonable skies, activity had certainly fallen back, to a ZHR of perhaps 20–25.

Relatively few very bright events were seen over the shower as a whole. From observers' estimates, mean Perseid magnitude

was +1.33 relative to +2.24 for sporadics in the same interval – values very much in keeping with recent previous years. Persistent trains were reported for 30.6% of Perseids compared with 12.2% of sporadics, again consistent with past results.

Given the rather poor conditions last year, and the consistently good activity of the Perseids close to their maximum, observers will be hoping for very much better fortune with the weather in 2005. Reports will be welcomed by the Meteor Section Director at the address given at the back of this *Journal*.

Neil Bone, Director

- 1 Bone N., *J. Brit. Astron. Assoc.* **114**(4), 181 (2004)
- 2 Miskotte K. & Johannink C., *WGN* **32**(6), 151–153 (2004)

Aurora Section

2005 March

There was a period of magnetic activity from March 05 to 10 which was a 27-day repeat of the period from 06 to 11 February. Some of our observers reported that March was relatively quiet, but observations generally accorded with the British Geological Survey records at Eskdalemuir Observatory in Dumfriesshire. Further activity was noted on March 25 to 27 and disturbed conditions on 01 to 03 and 13 to 14.

A quiet auroral glow was detected from Alness in the morning of March 01/02. An active rayed arc was noted from near Wick on the morning of 04/05. On 05/06, aurorae with glows, arcs, bands and rays were observed in spite of cloudy conditions by four observers between Alness and Wigtown. On 06/07 active glows, bands and rayed arcs were seen by four observers from Wick to Glengarnock. Further aurorae were recorded by one or two observers in Scotland, comprising active rays on 07/08, 08/09, 09/10 and 13/14.

While in flight from 49°N/95°30'W to 50°N/92°30'W a BA pilot observed a white homogeneous band and active coronal rays on March 24/25.

At Glen Ullin in North Dakota quiet glows and arcs were noted on 04/05 and 13/14. Glows, arcs, rays and pulsating patches were seen on 05/06, and without rays on 09/10. Quiet glows and a single ray appeared on March 29/30. None of these appearances exceeded an elevation of 15° and the quiet diffuse aurorae only 4°.

At Ummannaq in Greenland active rayed arcs showed on 06/07 and coronal rays to an elevation of 90° on 07/08. On 12/13, active and flickering rayed bands reached to the zenith.

The summer twilight now makes the sighting of minor auroral activity very difficult but active transient storms have been observed in the past in midsummer. Laars Poort in Greenland has lost the auroral sky due to the midnight Sun. On the other hand Jay



Noctilucent clouds imaged from Worcester Park, Surrey by Maurice Gavin on 2005 June 14 at 22:13 UT. Minolta D7 digital camera, 4s exposure. M. Gavin.



Brausch in North Dakota is nearer to the auroral oval and the north magnetic pole than observers in the UK, and also has darker skies due to his lower geographic latitude. Consequently he can continue to look for aurorae throughout the summer. However the season for observing noctilucent clouds opens in the UK to keep observers active for the summertime.

2005 April

There was a magnetic storm covering April 04 and 05 which our geomagnetic observers detected when the planetary magnetic index Kp reached a maximum value of 7. The period 08 to 10 was very quiet. Further periods of significant activity took place on April 11 to 15 and April 20 and 30. A second period of very quiet conditions covered 26 to 28.

Currently there are self-recording magnetometers at Saltash, Carlisle, Kincardine O'Neil and Ullapool, with suspended magnet (jamjar) magnetometers at Pityme, Trelogan and Edinburgh. In spite of variations in latitude, local conditions and types of instrument it is normally possible to form a coherent picture of the geomagnetic conditions prevailing.

Cloud has been hindering observation of the aurora. Many observers only report in as a result of recording a major storm. The regular team comprises fifteen observers in Scot-

land, two in north England, one in Wales, two in Denmark, one in each of Canada, Greenland and North Dakota and one airline pilot.

On the night of 04/05 April, six observers in Scotland and north England recorded glows, arcs and rays between 19:00 and 03:10 UT. A similar apparition was noted on 11/12 by six Scottish observers between 22:00 and 00:55 UT. On 12/13 glows, arcs and a few rays at a low elevation were seen by four Scottish observers between 22:00 and 23:30 UT. Ian Brantingham near Banff reported an active rayed aurora to a maximum elevation of 30° on 29/30 between 22:30 and 01:40 UT. These apparitions tied in well with magnetic activity. Diffuse aurorae comprising glows or unspecified forms, sometimes in cloudy skies, were detected by individual observers on April 02/03, 06/07, 10/11, 15/16 and 16/17.

A BA pilot flying in the auroral zone over mid-Canada between 48°N/90°W and 53°40'N/77°W noted bands and active coronal rays between 05:30 and 06:20 UT.

In North Dakota at Glen Ullin glows, arcs and rays to an elevation of 38° were observed on April 04/05. A pulsating series of glows and arcs to an elevation of 14° was noted on 15/16 while pulsating glows and patches were seen on April 30/May 01. These observations coincided with magnetic activity.

Ron Livesey, Director

Campaign for Dark Skies

Fifth European Dark-Sky symposium



Members of the Light Pollution Working Group of the VVS (Flanders Astronomical Union) who organised the Symposium, led by Friedel Pas (centre back).

The fifth annual European Dark-Sky Symposium, 2005 May 29–30, was held at the Europlanetarium in Genk, east of Brussels, Belgium. Bob Mizon and David Paul attended for the BAA Campaign for Dark Skies.

Delegates from several European countries, joined by International Dark-Sky Association members from the USA and Argentina, met to compare notes on progress

in the fight against light pollution. Proceedings started with the presentation of various IDA awards, details of which can be found on www.darksky.org.

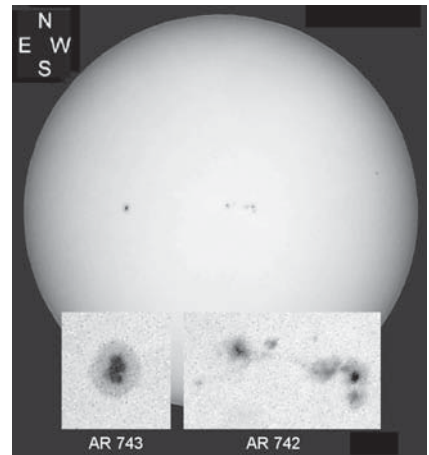
Themes of the varied programme of talks included: new lighting technologies, effects of light pollution on the environment and human health, projects raising public awareness, and technical discussions on subjects as different as the nesting habits of the black-tailed godwit near roads, and the phasing out of obtrusive lighting from golf driving ranges through luminous-ball technology.

Delegates were treated to an excellent star show at the Europlanetarium itself, and the real clouds parted later in the evening to allow observations of Saturn and Jupiter through the large refractor of the nearby Genk observatory.

The next Symposium will be hosted by the CfDS on 2006 September 15–16 in Portsmouth. Full details will appear in due course on the CfDS website, www.darkskies.org.

Bob Mizon, Coordinator

Solar Section



Composite white light image taken on March 13 by Peter Paice showing AR742 and AR743.

2005 March

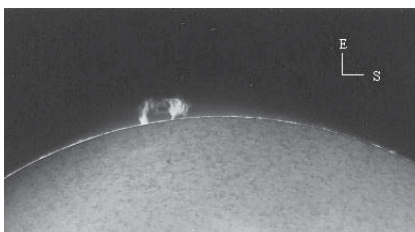
Sunspot activity in March continued its downward trend with an MDF of 1.82, with the southern hemisphere being the most active as it has been since 2004 September. The middle of the month was the most active time as it has been all this year.

On March 04 a spot rotated onto the disk at +12°/194°. It was the return of the active area seen during the last rotation. On March 07 it was a type Cao but by the 9th it had developed into a bipolar group type Dsi. It crossed the CM on 9/10 and was last seen approaching the W limb on March 14.

On March 05 and 06 just a single Hax spot was seen at +12°/196°. On March 06 the area covered was 90 millionths. By March 10 this group had adjacent spots to make it a type Csi and by March 12 it was a type Hsx.

On March 08, a small type Bxo spot was seen on the disk at -04°/156°. On March 09 it had spread out and consisted of 15 individual spots spanning over 10° of longitude and covered an area of 140 millionths. By March 13 the total area had increased slightly to 170 millionths. On March 16 a more dominant leading penumbral spot had developed. It is likely that this group was the return of AR733 seen during the last rotation. Also on March 09 a unipolar penumbral spot was seen on the E limb at -07°/121°. This is also likely to be the return of a spot seen during the previous rotation (AR734). The Bxo spot seen on March 08 crossed the CM on March 13 having developed four penumbral spots and many smaller spots. It started to fade after March 14 and was last seen approaching the W limb on March 18.

A new group formed on the disk on March 20 at -13°/52°. It was bipolar of type Dso



Active prominence going to an estimated height of 56,000km, 2005 March 24, 21:20 UT. 2500mm SCT, Daystar H-alpha filter. *Monty Leventhal, Sydney, Australia.*

and became a single spot on March 23. It died on the disk on March 25.

A group of small spots of type Cao were seen in the N on March 23 at mean position $+11^\circ/347^\circ$. On March 24 it was clearly bipolar, and the leader had a marked penumbra. On March 25 most of the spots between the leader and follower had disappeared and it became a type Dai.

Hydrogen alpha

On March 04 a dense filament was seen close to the E limb from -03° to -12° , its southerly half being bifurcated. On March 06 it was very dense and the shape resembled a leaping dolphin. It became a single winding filament as it crossed the CM on

BAA sunspot data, 2005 March–April

| Day | March | | April | |
|--------|------------|----|------------|----|
| | g | R | g | R |
| 1 | 0 | 1 | 1 | 17 |
| 2 | 1 | 7 | 2 | 38 |
| 3 | 0 | 2 | 3 | 39 |
| 4 | 1 | 9 | 3 | 39 |
| 5 | 1 | 13 | 3 | 41 |
| 6 | 1 | 14 | 3 | 39 |
| 7 | 2 | 21 | 3 | 36 |
| 8 | 2 | 34 | 2 | 31 |
| 9 | 3 | 46 | 3 | 37 |
| 10 | 3 | 53 | 2 | 30 |
| 11 | 3 | 50 | 1 | 17 |
| 12 | 3 | 52 | 2 | 29 |
| 13 | 3 | 54 | 3 | 36 |
| 14 | 3 | 46 | 3 | 43 |
| 15 | 3 | 49 | 3 | 38 |
| 16 | 2 | 35 | 3 | 36 |
| 17 | 2 | 28 | 2 | 26 |
| 18 | 2 | 30 | 3 | 35 |
| 19 | 2 | 26 | 3 | 30 |
| 20 | 2 | 30 | 2 | 28 |
| 21 | 2 | 36 | 2 | 21 |
| 22 | 2 | 31 | 1 | 17 |
| 23 | 2 | 36 | 1 | 16 |
| 24 | 3 | 45 | 0 | 0 |
| 25 | 3 | 44 | 1 | 12 |
| 26 | 2 | 32 | 1 | 15 |
| 27 | 2 | 23 | 1 | 22 |
| 28 | 1 | 16 | 2 | 36 |
| 29 | 1 | 7 | 2 | 42 |
| 30 | 0 | 3 | 2 | 43 |
| 31 | 1 | 14 | | |
| MDFg | 1.82 (53) | | 2.12 (51) | |
| Mean R | 28.65 (47) | | 29.32 (44) | |

March 09. It fragmented as it elongated on March 10 and became dense as it approached the W limb.

2005 April

Although the sunspot activity for April was slightly up on last month, the general trend is still declining. The marked predominance of spots in the southern hemisphere continued and most spots were at lower latitudes, varying between $\pm 3^\circ$ and 10° .

On April 05 an Hsx spot was seen close to the eastern limb at $-06^\circ/126^\circ$. On April 07 the penumbral spot was asymmetrical and its area was estimated to be 110 millionths. By April 11 it was close to the CM and consisted of several small spots surrounding the penumbral spot which had an area of 60 millionths. It was the only group on the solar disk. By April 16 a small Hsx spot was all that remained of this group, and it had disappeared by April 17.

There was one near-equatorial spot group which appeared on the E limb on April 12 at $+0.5^\circ/40^\circ$ (AR 752) as a bipolar group of three spots (Dao). During its passage across the disk, its latitude varied between 0° and 1.5° North. On approaching the CM on April 17 it condensed into a single penumbral spot with one minor follower. It was last seen on April 23 at $+1.5^\circ/47^\circ$.

On April 25 a new spot appeared near the E limb at $-7.5^\circ/229^\circ$. On April 27 this

spot had an area of 530 millionths; the main umbra was towards the leading part of the spot while several small umbrae were seen towards the following part of the penumbral spot which was quite irregular in shape. By April 29 the Hsx spot had grown to 890 millionths and became a naked eye object. A region of photosphere was also seen within the penumbra. Although several umbrae were seen, there was still just one main umbra. On April 30 the group was of type Dkc and had become more asymmetric with regions of penumbra extending northwards and southwards. The region of photosphere within the penumbra had grown slightly while the area of the group was similar to the previous day. It was also close to the central meridian and remained a naked eye object. This remarkable spot was preceded by a separate group consisting of a pair of spots at $-5.5^\circ/259^\circ$.

Hydrogen alpha

The prominence MDF for April was 5.19 (7 observers); this figure has not changed much since November last year. The northern hemisphere predominated, contrary to that of sunspots.

A rather short hedgerow prominence was seen on the NE limb on April 07, extending from $+13^\circ$ to $+23^\circ$. On April 08 only two prominences persisted in the area. A more extensive hedgerow type was seen on the W limb on April 17 extending from $+06^\circ$ to $+34^\circ$.

A high-latitude prominence was observed on April 11 at $+54^\circ$ on the E limb. It remained in this or similar position for the following 11 days as a small spike or pyramidal shape. On April 19 it consisted of two pyramidal shaped structures at $+54^\circ$ and $+57^\circ$. On April 23 it was more massive and slightly higher, connecting with the limb with two extensions at $+53^\circ$ and $+58^\circ$. On April 24 at 11:50 UT it was much higher and dense at $+57$ to $+61^\circ$, but by 14.30 there was no trace of it. It must have been ejected.

A filament was hugging the SE limb on the April 07, extending from -12° to -23° . On the next day it extended as far as -40° on the limb where a small prominence was seen. Its northerly end was inclined towards sunspot $-07^\circ/125^\circ$ (AR 750). The filament was still seen on April 13 after crossing the CM. On the same day three dense filaments were seen in the N. hemisphere, the most westerly giving rise to the hedgerow prominence seen on April 17.

Strange filaments emanated from the large spot ($-7.5^\circ/229^\circ$) on April 27. They were relatively small curved filaments to the N of the large umbra, resembling the mass of straight radiating fibrils to the NW of the umbra. More obvious was the curved filament to the E and the far filament to the W.

North & south MDF of active areas g

| | MDFNg | MDFSg |
|-------|-------|-----------|
| March | 0.86 | 1.13 (35) |
| April | 0.58 | 1.54 (31) |

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

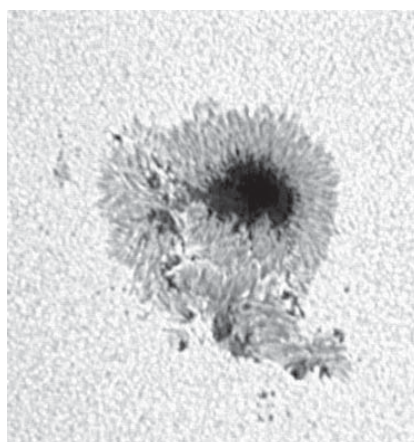


Image by Dave Storey of the large sunspot on April 29. 150mm OG with ToUcam webcam, Isle of Man Observatory.

Mike Beales, Director