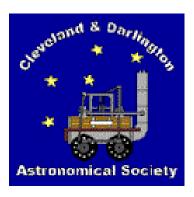


TRANSIT

The Newsletter of



8th April, 2005. Julian Day 2453469



Couldn't resist this image when I found it on the Hubble site (well, I think it was Hubble). Have I read somewhere that barred galaxies are now thought to be the result of a collision of galaxies?

Editorial

March meeting. On Friday, the 11th of March, Neil Haggath talked about "It'll be Alright on the Flight". Neil tells me he has given this talk a few times to other Societies but finds talking to CaDAS that bit special. In Part 1, Neil showed some archive photographs of Russian astronauts, which I hadn't seen before, woven into a story of the risks, close calls and some deaths among them. Part 2 covered the less risky, but still dangerous American manned space programme, as well as the early collaboration between the Americans and the Russians. It was a fascinating revelation of the stories behind the manned space missions.

April meeting. "How to get from There to Here" is the intriguing title of the talk to be given by Andrew Newstead of Derby Astronomy Society. The meeting is on Friday, the 8th of April, in Thorpe Thewles.

Carole Haswell's little girl was born in February. There is an an email from Carole, comparing babies and astrophysics, later in Transit.

Subscriptions. There is still time to pay your annual subscription, assuming you wish to remain a member, with all the advantages, of course. If you wish to pay by post please send the £6 subscription to Ian Miles at 11, Heathfield Park, Middleton St. George, DL2 1LN, making cheques out to Cleveland and Darlington Astronomical Society. There will an opportunity to pay at the meetings as well.

Scarborough Star Party. The dates are Friday, Saturday and Sunday the 5th to 8th August. Anyone interested please contact Neil. He had details and application forms at the March meeting and will have them again at future meetings.

Puzzle Galaxy in the March issue. There are wonderful pictures of galaxies on the Hubble website, of course - this is one place I go for the pictures in Transit. The galaxy on the front page was M83, NGC 5236 in Hydra, a type Sc. One of these days I will include a picture of the famous Hubble "Tuning Fork" diagram, to remind you of his classification of galaxy types.

The Galaxy for April. It would be unreasonable to expect anyone to know this without reference to a picture index but no doubt someone will surprise me. It is not in Messier's catalogue. I chose it because it is such a wonderful example of a barred galaxy.

March's Mad Moon feature. Given the clues, it could only be the North pole or the South pole. A 50/50 guess? In fact it was the Aitken basin at the south pole, site for the apparent frozen water(??).

April Fool Moon Crater? Not one but a group of four to be identified in the Back Page Picture. All very famous in their own right.

Neil's Website success. Neil Haggath has been awarded the "Best Astronomy Website of the Week" by an American group of astronomers. He was praised for his demolition of the "Ridiculous 'Apollo was Faked' Conspiracy Theory". Visit the website at www.spaceandsanity.com

The Astronomical Kitchen. There are rumours of the appearance of large kitchen implements – spoons, ladles, plates etc – at Wynyard Park Planetarium, designed and made by a local artist. The holes in the ladles will be in the pattern of the constellations, the spoon will point to the Pole Star, the rising Summer solstice Sun will be indicated, there will be an Analemma. Obviously, this calls for a Transit article. Watch this space.

Here's some evidence for large craters still being formed on the Moon. It's a bit hair-raising to think about how close this incident was to the Earth. Does anyone know more about it all?

NASA Solves Half-century-old Moon Mystery A NASA press release from Ray Worthy

In the early morning hours of November 15th, 1953, an amateur astronomer in Oklahoma photographed what he believed to be a massive, white-hot fireball of vaporized rock rising from the center of the Moon's face. If his theory was right, Dr. Leon Stuart would be the first and only human in history to witness and document the impact of an asteroid-sized body impacting the Moon's scarred exterior.

Almost a half-century, numerous space probes and six manned lunar landings later, what had become known in astronomy circles, as "Stuart's Event" was still an unproven, controversial theory. Skeptics dismissed Stuart's data as inconclusive and claimed the flash was a result of a meteorite entering Earth's atmosphere. That is, until Dr. Bonnie J. Buratti, a scientist at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, and Lane Johnson of Pomona College, Claremont, California, took a fresh look at the 50-year-old lunar mystery.

"Stuart's remarkable photograph of the collision gave us an excellent starting point in our search," said Buratti. "We were able to estimate the energy produced by the collision. But we calculated that any crater resulting from the collision would have been too small to be seen by even the best Earth-based telescopes, so we looked elsewhere for proof." Buratti and Lane's reconnaissance of the 35-kilometer (21.75-mile) wide region where the impact was most likely to have occurred led them to observations made by spacecraft orbiting the moon.

First, they dusted off photographs taken from the Lunar Orbiter spacecraft back in 1967, but none of the craters appeared a likely candidate. Then they consulted the more detailed imagery taken from the Clementine spacecraft in 1994. "Using Stuart's photograph of the lunar flash, we estimated the object that hit the moon was approximately 20 meters (65.6 feet) across, and the resulting crater would be in the range of one to two kilometers (0.62 to 1.24 miles) across. We were looking for fresh craters with a non-eroded appearance," Buratti said.

Part of what makes a Moon crater look "fresh" is the appearance of a bluish tinge to the surface. This bluish tinge indicates lunar soil that is relatively untouched by a process called "space weathering," which reddens the soil. Another indicator of a fresh crater is that it reflects distinctly more light than the surrounding area.

Buratti and Lane's search of images from the Clementine mission revealed a 1.5-kilometer (0.93 mile) wide crater. It had a bright blue, fresh-appearing layer of material surrounding the impact site, and it was located in the middle of Stuart's photograph of the 1953 flash. The crater's size is consistent with the energy produced by the observed flash; it has the right color and reflectance, and it is the right shape. Having the vital statistics of Stuart's crater, Buratti and Lane calculated the energy released at impact was about 0.5 megatons (35 times more powerful than the Hiroshima atomic bomb). They estimate such events occur on the lunar surface once every half-century.

"To me this is the celestial equivalent of observing a once-in-a-century hurricane," observed Buratti. "We're taught the moon is geologically dead, but this proves that it is not. Here we can actually see weather on the moon," she said. While Dr. Stuart passed on in 1968, his son Jerry Stuart offered some thoughts about Buratti and Lane's findings. "Astronomy is all about investigation and discovery. It was my father's passion, and I know he would be quite pleased," he said.

Buratti and Lane's study appears in the latest issue of the space journal, Icarus.

More information about NASA's planetary missions, astronomical observations, and laboratory measurements is available on the internet at: http://pds.jpl.nasa.gov

A slightly delayed report of a sighting of The Comet and a very interesting one. Chatting at the last meeting, Brian said he thought for a while he had discovered a comet for himself – which in a way, he had!

Comet Machholz in Brazil From Brian Blakeley

Hi Alex,

I am not long back from Brazil (Lat. 29°South).

With no prior warning of the advent of comet Machholz, I was scanning the (inverted) northern night sky with a pair of 8x30 binoculars on 5 January when I found a curious fuzz above M45. It was not a naked eye object to me even though the 'seeing' was not bad. Just a slightly elongated fuzz with no tail. I could only guess at the position, approx. 3hr.40'-20°. By the 7 January it had moved closer to M45 at 3hr. 35'-23°.

That was my last opportunity for observation as I had moved on and Brazil is not immune to cloud or light pollution. I had hoped for better conditions than I got; even so the display I got on those two nights were marvellous.

Regards

Brian Blakeley

A while ago, Neil wrote a piece on his meeting with "The Greatest visual observer alive today" — Steve O'Meara (Transit October, 2004). Neil's last sentence was "I would describe him as the E.E.Barnard of out time". To my shame, I had to ask him to say something about E.E.Barnard, whom I knew only via "Barnard's Star". Here is what Neil sent.

E.E.Barnard From Neil Haggath

Edward Emerson Barnard (1857-1923) was one of the greatest visual observers of all time - quite possibly THE greatest. He was known for having exceptionally keen sight - which is why I called Steve O'Meara the Barnard of our time. He began as a self-taught

amateur and comet hunter. He discovered 16 comets, and won a number of cash prizes which some rich American was offering for discovering them - so many that he claimed to have built his house on comets.

He later became a professional on his observing merits, and worked at Lick and Yerkes Observatories, with the world's two biggest refractors. He discovered Amalthea (Jupiter's 5th satellite, the first to be discovered since Galileo), and measured the proper motion of the star which bears his name. He also compiled a catalogue of dark nebulae, which also bears his name - e.g. Barnard 33 is the Horsehead Nebula.

In the 1890's, while at Yerkes, he made the first observation of craters on Mars - but never published his observations, for fear of ridicule. One other person, John Mellish, claimed to have seen them in 1917; as far as I know, no-one else ever has done. They weren't proved right until the 1960's and Mariner 4. Steve O'Meara's visual discovery of the spokes in Saturn's rings was a feat comparable to Barnard seeing Martian craters - but unlike Barnard, Steve had the satisfaction of being proved right within his lifetime.

There are some very spectacular pictures of atmospheric phenomena generally on various websites. Rod Cuff has written a summary from his past monthly "Astronomy on the Internet" articles, which includes some of these sites. It may be time for a series of front page pictures of these images. Send me you favourite ones and I will hash something up – maybe even as a brain-bending opportunity.

Atmospheric Phenomena By Rob Peeling

There is a very good website detailing all types of atmospheric phenomena such as sundogs, why they happen and some indication of how likely you are to see them: http://www.sundog.clara.co.uk/halo/parhelia.htm

I noticed a 22 degree circular halo round the sun on the 13th June which appeared as a faint rainbow arc around the position of the sun (about a hand's breadth). The sun itself was just behind the roof of my house and I was wearing polaroid sunglasses. I couldn't see the effect without the sunglasses because of the glare. There was quite a lot of thin high cloud - high cloud is important I think because these optical effects rely on the optical properties of ice crystals. I also noticed the fairly common phenomenon of iridescent clouds seeing pinks, greens, blues and violets changing as the clouds moved by the sun. Again I needed the sun-specs and a physical obstruction (roof) between me and the sun itself to see them. John's sundogs are a less frequently observed phenomenon than the 22 deg circle and iridescent clouds. Regards, Rob

I hope John will forgive me if this doesn't work. We (my photocopier, Flora, at Cockerton Church and I) are trying the text/photo facility to see if black and white, or is it gray-scale, pictures will photocopy properly. It hasn't worked very well in the past!!

The Biggest "Red Herring" Ever? From John Crowther

Many years ago I borrowed from the library Arthur Koestler's book "The Sleepwalkers". After looking at it, I returned it as being too long, too detailed and too difficult a read. Having more spare time now, and hopefully a greater understanding and interest in astronomy, I asked about the book at our Astro-Fest bookstall last year but they couldn't help. Then I received a copy through the post as a gift from a kind member of our Society. "The Sleepwalkers" is a very detailed study of important historical astronomical characters. These are written about in biographies which vary in length. Copernicus, the Timid Canon, has a hundred pages and Kepler has two hundred.

The title, The Sleepwalkers, refers to the first part of the book about Babylonian and Ancient Greek astronomy. This was before the onset of the 1,500 year dark age interlude, which began to fragment with the advent of Copernicus, Kepler and Galileo.

The red herring of my title is Kepler's. It is the dead end coincidence which used up and to our minds, wasted much of his working life. Before Newton, it was thought that God controlled the Universe. His power was at first centred in the Earth and after Copernicus in the Sun. The planets were held in their orbits and angels and other powers moved them. Before we smile too much at these ideas we need to remember tat the force of gravity is still a mystery to most people. We accept Einstein's refinement of Newton's theory but how many of us can fully understand warped space-time, a vacuum being distorted or a black hole, a hole in noting, leading perhaps to another dimension?

Kepler's red herring seems to have a link with Bode's Law, which isn't a scientific explanation as to the spacing of the planets in our solar system. Kepler only knew the first five naked eye planets and in his acceptance of Copernicus' theory, realised that the Earth also orbited the Sun. He was also familiar with the Platonic solids, which are the six when we include the sphere. He imagined that the planetary orbits touched and were controlled by, the corners of these non-existent solids. Kepler gave his invisible and imaginary solids frames of different thickness. Using these he was able to keep "perfect" circular orbits for the planets, as they could move into the frames as they moved around the Sun.

Later, after he had abandoned this dead end theory, he discovered the truth that the planets move in elliptical orbits. It's interesting to note that the Earth, the planet with life, has the most intricate solid, the twenty-sided icosahedron. Kepler was so taken with his theory that he made paper models to illustrate it. He planned to give Frederick the Duke of Wuethemberg, a jewelled cup with the solids inside it. Pipes serving different alcoholic drinks would come out of the platonic solids. The Sun was to give aqua vitae, Mercury brandy, Venus mead, Mars vermouth, Jupiter white wine and Saturn bad old wine or beer.

All this came to nothing, the Duke flattered at first by the idea, wouldn't finance the jewelled solids, which included diamonds, jacinths and pearls. One wonders if a red herring would have been an apt breakfast for Kepler after this disappointment. Like

Stephen Hawking, Kepler thought he was getting close to the mind of God. But there was a happy ending when he finally got to the truth of the planetary laws.

Kepler's Theory

Mercury – a sphere

Venus – the octahedron, 8 sides, two four-sided pyramids joined at their bases

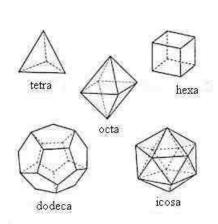
Earth – the icosahedron, 20 sides, equilateral triangles

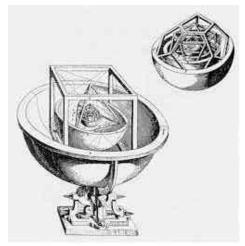
Mars – the dodecahedron. The sides are 12 pentagons.

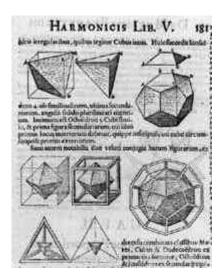
Jupiter – the tetrahedron, a pyramid of four sides, each an equilateral triangle.

Saturn – the cube, six sides, each a square.

The drawings below are the five regular "hedrons", Kepler's Model and page from one of his books.







Mike Gregory sent me this article a long time ago and it has languished in my files, waiting to be published. My apologies, Mike. Making contact with other Astronomy Societies is a great idea and I feel we should do it more. If we can persuade Americans, Frenchmen and others to find out where Middlesbrough is, who knows where it will all end. Maybe they will give us a lecture on their next UK holiday, or one of us to them? I hope one of our members with an internet connection can re-establish contact with Westborough.

Westborough, USA From Mike Gregory

I found the January, 2002, issue of Sky & Telescope most interesting as it contained two separate articles on double stars. Additionally, there was an interesting article by Dr Alan Bodnar, a clinical psychologist at Westborough State Hospital in Massachusetts. In his article Dr Bodnar explained how an interest in astronomy was helping in-patients and out-patients at his hospital, and with this in mind, he had started up the Westborough Astronomy Club.

Having read the article, it was quite clear that I qualified to be a member even though I have never travelled much west of Barnard Castle. Therefore, I sent a letter to Westborough Astronomy Club telling them of my astronomical experiences and how the wonders of the night sky were a great help to me. When I wrote the letter I was not sure whether to put down my own address, but did so in the end. Furthermore, I had no clear address for the Westborough Astronomy Club, so I simply addressed the envelope to Dr Alan Bodnar, c/o Westborough State Hospital, Massachusetts, USA. I never dreamt that I would receive a reply!

About six weeks later a large buff coloured envelope arrived through our letterbox. It was a letter from Dr Bodnar together with photos of the 'Westborough solar system'. These were wooden cut-outs of all the planets which were displayed through the extensive grounds of Westborough State Hospital. The letter explained that the members were amazed that anyone should write to them from some four thousand miles away and they had got out a globe and atlases to find out just where Middlesbrough might be.

In the letter Dr. Bodnar explained how the club worked and asked if I would like correspond with them. With this in mind he had given me his e-mail address as well as his home address. An incredible coincidence was that Dr. Bodnar said that he has a friend called Tom who lives in Sedgefield. When my letter arrived postmarked 'Middlesbrough' he had thought it was from his friend.

As I do not have access to the Internet, I sent a reply by airmail to Dr. Bodnar's private address. This contained a lengthy letter about myself and telescope, plus photos, two issues of 'Transit' magazine, and literature regarding CaDAS, the Observatory, and the Planetarium. Unfortunately, even after many weeks, no reply from Westborough Astronomy Club. With help from my brother, we sent an e-mail to Dr. Bodnar, but again, no reply. So after a period of several weeks, we sent another e-mail. This time my brother received a message saying that Dr. Bodnar's e-mail address had not been recognised. Hence I have had to give the correspondence idea up. Most disappointing, though it would have been a long trip for the club nights.

News of Carole Haswell and baby

Charlotte is now 4½ weeks old and is, on the whole, a very sweettempered, easy baby. We've only had one night where she cried for a significant length of time - usually (touch wood) we wake, feed, and go back to sleep - something astronomer-parents find relatively easy to deal with. We've had a number of the normal minor worries: failure to gain weight at first, but now she's gaining 10 oz a week; two colds; and an infected hangnail. The health visitor said she'd never seen the last in a newborn before! Recently she's been a bit colicky, but I hope (touch wood) I've adjusted my diet to fix that. In summary: (i) babies are much damper and more wriggley than astrophysics (ii) in 4½ weeks she's caused me as much joy as my entire career has to date!

Hope all's well with CaDAS,

cheers,

Carole

mp aa mp

BBC Sky at Night Magazine

From Neil Haggath

A new monthly magazine is being launched in June, BBC Sky at Night magazine. This will include details of society meetings and events; naturally, I'll be sending them our meetings programmes.

Some of our imaging experts may be interested to know that they plan to run a monthly astrophotography competition, with the best photos each month printed in the magazine, and a prize for the winning entry. Photos should be as recent as possible, dated no more than five months before the month of the issue.

Entries can be e-mailed to skyatnight@originpublishing.co.uk.

To be of acceptable quality, they must be at least $15 \times 15 \text{ cm}$, at a resolution of 300 dpi. Any common file format is acceptable, and any file size up to 7 MB. Old-fashioned slides can be considered by prior arrangement (sign of the times, or what?); please contact them first, if you wish to send photos by post.

Neil M. Haggath

Armagh Telescopes Restored

From Jack Youdale FRAS

INTRODUCTION

The Armagh Observatory, in Northern Ireland, was founded in 1791 by the Archbishop Robinson. Recently, two large telescopes, which are part of the history of this observatory, have been carefully restored to their original condition after many years

of neglect. This work has been undertaken by the Sinden Optical Company at Newcastle. David Sinden and his small team had to research for information to ensure the instruments are as authentic to the originals as possible. The telescopes will be available to the general public for viewing the night sky at Armagh Observatory.

HISTORY OF THE TELESCOPES

Thomas Grubb FRS (1801 – 1878) founded a telescope making works in Dublin and by 1834 he made a 15 inch reflecting telescope (Newtonian/Cassegrain) for the Armagh Observatory. This instrument had speculum metal optics and was one of the first reflecting telescopes to be mounted on a driven equatorial mounting. Its main mirror was also the first to have a multi-point support system built into its mirror cell. There are other unique features on the mounting's polar axis. The restored telescope will have modern optics (glass) and the original optics will be displayed for visitors.

The sixth director of the AO was the Rev. W.F.A.Ellison, who took office in 1918. Ellison was a keen telescope maker in his own right and published one of the first books on telescope making. The book was entitled "The Amateur's Telescope" and it paved the way in the U.S.A to the publishing of the telescope making bibles "Amateur Telescope Making", Vols I, II and III.

During the latter part of the 19th century, George Calver, of Widford, Chelmsford, established a telescope making firm. He made many large reflecting telescopes, with silver on glass optics. Ellison had acquired an 18 inch Calver telescope and brought it with him to Armagh. After Ellison's death in 1936, Eric Lindsay took over as director of the observatory. He was to make many innovative changes to the observatory and brought new vision and energy to Irish astronomy.

By the end of the second World War, Lindsay applied for funding to convert the Ellison telescope into a 12/18 inch Schmidt camera. This was the first Schmidt optical system to be erected in the British Isles.

In recent years, both the Grubb and Calver telescopes had suffered greatly from neglect. The current administration in Armagh decided to have both instruments restored to their original working condition. This work was entrusted to the Sinden Optical Company, Newcastle. David Sinden had been Chief Optician at Grubb Parsons optical Company. Grubb Parsons was founded in 1925 at Walkergate, Newcastle. This optical company designed and produced some of the largest astronomical telescopes for the world, during its almost 60 years of manufacturing. The last great telescopes were the 153 inch Anglo-Australian and the 165 inch William Herschel telescope at La Palma. Grubb Parsons ceased to operate in the early 1980's and by this time David Sinden had established his own optical shop in Newcastle in 1979.

The two photographs on the next page show the completed telescopes in the Sinden optical shop prior to their shipment to the Armagh Observatory. The fully restored instruments will be working telescopes for use by the general public. They will also serve as a reminder of the history of the Armagh Observatory and some of its early telescopes. Sounds to me like it's going to be worth a visit!

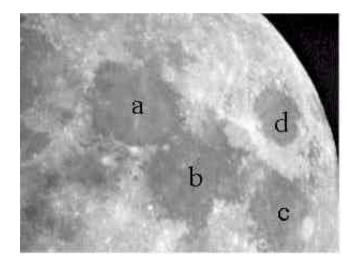
The (Next to) Back Page Pictures



The T.Grubb 15 inch, made in 1834



The Calver 18 inch, brought to Armagh in 1918 by Ellison Photos by Malcolm Bannister



Name the four mare (lettered a, b, c and d in the picture), clustered in a group in the north-west quarter of the full Moon.

Transit Tailpiece

Don't ask why but I present for your enjoyment another series of very modern quotes on the subject of eclipses of the Sun

Quote/Unquote

Now eclipses are elusive and provoking things . . . visiting the same locality only once in centuries. Consequently, it will not do to sit down quietly at home and wait for one to come but a person must be up and doing and on the chase.

*Rebecca R. Joslin (1929)

Shadow and Sun – so too our lives are made – Here learn how great the Sun, how small the shade. *Richard Le Gallienne (1920)*

Each eclipse has at least one phenomenon that makes it special. *Stephen J. Edberg (1990)*

The general phenomenon is perhaps the most awfully grand which man can witness. *George B. Airy* (1851)

A total eclipse of the Sun is the most sublime and awe-inspiring sight that nature affords. *Isabel Martin Lewis* (1924)

<u>Custom Telescopes UK</u>. For your telescopes, binoculars and accessories of all kinds, go to Glen Oliver, a long-time member of the Society. He operates from Hartlepool and has a website www.goliver.freeserve.co.uk. Glen also supplies Astronomy and Space books of all kinds. Don't forget to visit his website soon.

<u>CaDAS Website</u> Now at <u>www.wynyard-planetarium.net</u> and the webmaster, Ed Restall, can be contacted at <u>webmaster@wynyard-planetarium.net</u>. Everyone is encouraged to visit the site and tell your friends about it. There is an opportunity on the site to find that piece of equipment you were looking for or to advertise the things you want to sell. There are links to all sorts of other interesting sites and information about the Society.

<u>Post and Email</u> If anyone wishes to change the way they receive their Transit, please let me know. If any member is not receiving a copy, please let me know.

<u>Articles</u> Please send contributions for the newsletter to Alex Menarry, 23, Abbey Road, Darlington, DL3 7RD, 01325 482597 (a.menarry@virgin.net) or to John McCue, 01642 892446 (john.mccue@ntlworld.com). Copy deadline date is the 1st of each month
