

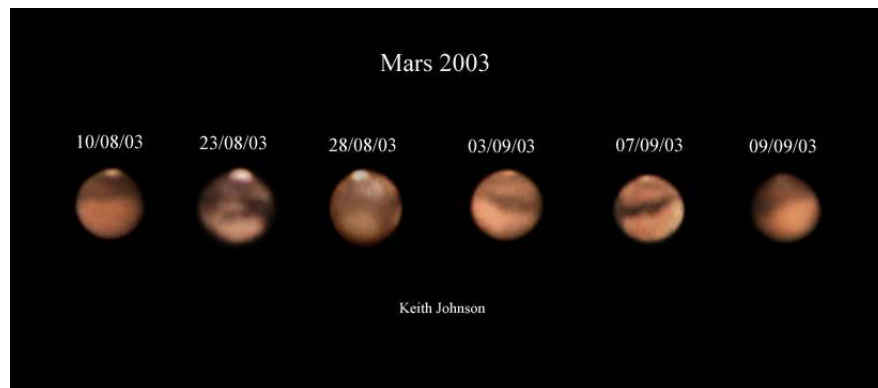


TRANSIT

The Newsletter of

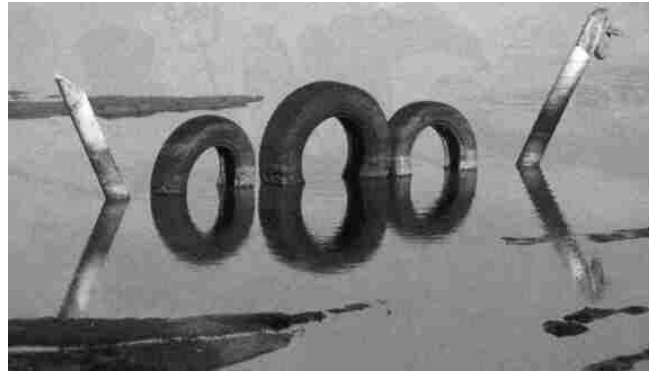


14th November, 2003. Julian Day 2452958



Couldn't resist showing everyone these images of Mars taken by Keith Johnson.
How about telling us about them on Member's Night, Keith?

reality monsters appearing on films, TV documentaries and adverts and the novelty has disappeared. Yet mysteries attract attention and bring in money, as does the Apollo Hoax drivel as it appears in way out magazines.



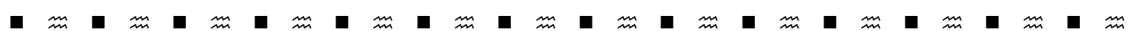
The Loch Ness Monster never has existed in Loch Ness. For reptilian animals to survive they need to breed, have enough food and they need to surface to obtain oxygen. Nessy has been seen crossing a road but if such a creature left the water it would suffocate under its own body weight, as does a beached whale. Every part of the loch has been carefully scanned by radar and yet nothing was found. When a weighted fence post was unexpectedly pulled upright by a length of string, it was seen as a monster's head by some tourists when they drew what they had seen.

Another 1930's hoax which worked happened when an updated version of H. G. Wells' "War of the Worlds" was broadcast as if happening in real time. Panic spread over much of the state of New York. More recently we remember that nun telling us that comet Shoemaker-Levy was an indicator of the end of the World.

Yet I disagree with Neil's overall condemnation of the film "Capricorn I". To me it was good entertainment, although unbelievable to anyone with the slightest knowledge of science. There was the power-mad senator demanding the free binoculars for all his family. So perhaps to beat the god-damned-Russkies and Reds- under-our-beds to the Moon, a Kennedy type of government might just have thoughts about faking a Moon landing. It would have been an ultimate spin, being economical with the truth. Similar to the way an administration we're familiar with behaves. But then the sheer impossibility of it all would be realized.

In "Capricorn I" I enjoyed seeing the astronauts scattering north, south, east and west from the Mars film set. Three were murdered but one survivor found Telly Sevalas with his string-bag type, multi-coloured crop-dusting biplane. The pilot's skill caused the pursuing jets to crash. Then the lone surviving astronaut ran across the grass to join his own faked funeral, to the joy of family and friends and the confusion of the F.B.I.. If the film had been scientifically accurate it would have been unwatchable and the astronauts would have survived. For there was no gap in time in the Earth to Mars conversations, so the hoax wouldn't have worked.

How many minutes does it take to receive an answer from Mars? A good question for an astronomy quiz.



A History of the Cleveland and Darlington Astronomy Society

Part 8

This extract concludes the series from Barry Hetherington's history - but history is always moving on. When travelling to the meetings, we have deep philosophical discussions on the nature of time, whether the present ever exists, where is the past and all that sort of thing. Historians go like this, you know. Someone once said that time is needed to prevent everything happening at once. It must be true that history is always expanding to fill the time available, so there will always be work for historians. Any comments and corrections for this particular history to Barry or me, please.

* * * * *

Fall of a Meteorite near Middlesbrough

Mr. A.S. Herschel, writing to the Newcastle Chronicle, says that an unusual natural phenomenon was observed near Middlesbrough on Monday afternoon, March 14, at a point known as Pennyman's Siding, on the North-Eastern Railway Company's branch line from Middlesbrough to Guisbrough about a mile and three-quarters from Middlesbrough.

On the afternoon of a particularly bright day, the air being calm and the sun shining, three platelayers were at work with the permanent way inspector (Mr. W.E. Ellinor), near the signal-box of the above siding, which one of them had just entered, when Mr. Ellinor drew their attention to a rushing or roaring sound overhead, which they had scarcely time to notice when it ceased, and a thud in the ground near them following it almost immediately convinced them that a heavy body of some sort had flown down through the air and struck the earth at no great distance from them.

The platelayer in the signal-house, the window of which were open, also heard the sound, and thought that something had been thrown at the signal-box by his companions outside to recall him, or to attract his attention. The men strayed together towards the point where the ground seemed to have been struck, into the siding-field and along the line some paces past the signal-box.

At a distance of forty-eight yards from where they stood, one of the men, Frank Henwood, saw from the field at the foot of the slight embankment of the line the mouth of a round vertical hole, into which a man's arm might be thrust. His companion, H. Obren, sounded the hole with his hand; but he withdrew it immediately on feeling the hole and the body at the bottom of it to be heated. But relying on the body's obvious fall and penetration from the air, Obren again dived for the object with his hand, and loosening it easily with his fingers drew out the occupant from the hole.

It is a beautifully perfect meteorite, of a low pyramidal or shell-like shape, measuring about five inches by six inches, and about three inches high, and weighing about three and a half pounds. The grey basaltic stone of which it consists internally is, as

usual, completely swathed and enveloped in a thin black molten crust, which hides from the eye its true stony character, the latter being visible only here and there at its frayed edges.

The peculiar looking stone was laid for a time on a neighbouring ballast heap under the impression that it was a slag fragment accidentally projected from some blasting operation in the vicinity. Careful attention was nevertheless bestowed upon its preservation by Mr. Ellinor, who forwarded it on the following day, with a circumstantial account of the particulars of its fall to the chief engineer of the North-Eastern Railway Company, Darlington district, Mr. W.J. Cudworth.

At Mr. Jas. I'Anson's advice, of Fairfield House, Darlington, it was submitted to me for examination by Mr. Cudworth on Friday last, and I have had the pleasure fully to confirm these two gentlemen's opinions, both from a brief inspection of the stone and from an equally brief, and yet conclusive, visit to the locality of its fall, that the unusual-looking stone fragment is really a genuine meteorite of an exceptionally perfect description and appearance.

It is very remarkable in the external characters, both by its general form and by the unusual depth and regularity of the indentations which its surface has received by heat and fusion in the flames, fiercer than any forge's, which these astronomical quarry-blocks or wandering missiles of the sky undergo in the fireballs that mark their rigorous course in the first moments of their collision with the earth's atmosphere.

No sounds of detonation, or visible phenomenon of a smoke cloud in the sky, such as usually accompany the appearance of an aerolitic fireball, are reported in this case to have been observed.

Darlington and Stockton Times, 1881 April 2

Committee Members

President	Jack Youdale, F.R.A.S.
Vice-President	Dr. John McCue, F.R.A.S.
Chairman	Barry Hetherington
Secretary	Neil M. Haggath, B.Sc., F.R.A.S.
Treasurer	Ian A. Miles
Publicity Officer	David L. Graham
Magazine Editor	Malcolm Johnson
Observing Coordinator/Local Group Director	Chris Walker

CAS – The First Two Years by Richard Blackburn, Polaris, November 1981.

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Deep and Dark

By Alex Menarry

Surely astronomy looks outwards from the Earth as far as possible? Why should eight astronomers from your very own Society go 1300 metres below the surface of the Earth? Perhaps because it's there. Boulby, near the east coast and close by Skelton, is a salt and potash mine. It was first opened in the 1970's to exploit the deposits laid down 250 million years ago, roughly when the dinosaurs were being zapped by the famous asteroid. These thick beds of evaporites underlie Britain, the North Sea and Germany. Two shafts were dug and now the mine workings go 5 kilometres out under the North Sea. Although very little water finds it's way into the mine, we managed to experience some of that which did.

Who were we? Eight brave souls prepared to risk all in the pursuit of knowledge. Prepared to strip to the buff and don the overalls, helmet and boots provided by Cleveland Potash Ltd, keeping on our own socks – remember that important fact. Innocents, not allowed to take our cameras to record the event, taken down the shaft by a mining engineer and a physicist, packed tight like sardines into a mine cage and dropped 1300 metres. It took ages and was almost as bad as flying. The temperature rose and rose as we descended, reaching 36°C as we emerged into the tunnels, excavated by the huge salt-eating machines digging like huge moles. The tunnels are about 10 metres wide by 5 metres high, dug in a square, room-and-stoop pattern, to leave a massive pillar to hold up the roof against the unimaginable pressure of the rock above.

Why go there? For a Dark Secret; the pursuit of Dark Matter. Here are the laboratories of the Particle Physics and Astronomy Research Council – the famous PPARC. An international collaboration of Universities from Los Angeles, Turin, Moscow, Texas, Wayne State and the Lawrence Livermore National Laboratory as well as UK Universities, running the exotic equipment at the bottom of the mine. The search for Dark Matter is one of the most important tasks in astronomy and particle physics at the present time.

What is Dark Matter and how do you look for it? Those of us who heard Fred Stevenson's lecture on 12th September will know all about Dark Matter. The stuff that's missing but which must be present to explain the manner in which galaxies and groups of galaxies rotate. There simply isn't enough visible stuff to hold the visible matter together. 90% of the what-ever-it-is, needed to explain how the Universe is expanding and how the galaxies are holding together, is missing. It's dark and invisible. It's been missing since the 1930's, when Kepler's Laws and the Virial Theorem were applied to the problem and revealed the missing material. The known few percent is baryonic matter, the atoms and molecules as we know them, Jim. The non-baryonic stuff is very strange.

MACHOs (massive compact halo objects) is the general name given to a lot of what's missing because they are probably in the haloes of galaxies. The cold dark matter could be WIMPs (weakly interacting massive particles) and the hot dark matter could be neutrinos (do they have a small mass?). The laboratories in Boulby Mine are looking for WIMPs. The Standard Model Theory of the Big Bang allows for particles of many hundreds of thousand of times the mass of a proton. There are billions of them passing through you and me every second but they rarely interact with the nuclei in the atoms of

our bodies. Or any other atoms, for that matter (no pun intended!). The occasional impact of a WIMP with a nucleus betrays its presence.

In the Boulby labs are several different types of detectors looking for evidence that the elusive dark matter is there. Zeplin I, to be followed by the more sensitive Zeplins II and III, holds a small quantity of liquid xenon, surrounded by photo-multipliers. If a WIMP hits a nucleus it will recoil and then give out a photon, detected by the photo-multipliers. Another detector is an array of Sodium Iodide crystals, called NAI AID, doing roughly the same thing. The third instrument we saw was the DRIFT detector, producing ionisation tracks caused by the passage of particles. The Earth moves through a “wind” of WIMPS, so if the tracks are in the right direction, they may well be WIMPS.

The trouble is that what is detected may or may not be a WIMP. Hence the reason for the detectors being 1300 metres down, protected from cosmic rays and other confusing things. The mine is also quite low in natural radio-activity, which also helps. Even so, it is considered necessary to add lead shielding around the detectors.

After a most enjoyable time walking through the mine from laboratory to laboratory and looking at these state-of-the-art detectors, it was time to go up again. But first, pick up a few crystals as souvenirs. We obviously went a different way back to the bottom of the shaft because here we were, plodging through water. Water!! I thought this didn’t happen. But it does occasionally. So plodge on, up to one’s calves in warm salty water. Then remember you have got your own socks on to travel home in. Oh, no! Against all expectations, the lift cage did work and we emerged, blinking in the light at the surface and tasting of salt.

What an excellent visit this was, combining the experience of going down the deepest mine in Europe with discussing the most important problem in current astronomy and particle physics with someone who is actually tackling the problem. It was worth getting your socks wet. Our physicist guide was confident that they would detect their WIMPS in the next few years, despite the competition from Super-Kamiokande in Japan, the Italian detectors under the Gran Sasso and the French Edelweiss cryogenic experiment in the Feizer Tunnel in France. When the Large Hadron Collider starts operating at CERN in Geneva in a few years time, it may well generate these particles, as well as them being detected coming in from space. Then everybody will begin to believe they actually do exist.



Eclipses and Occultations

Neil Haggath emailed this letter he had sent to the editor of Collins dictionaries.

8 June 2003

Editorial Staff, Collins Dictionaries,
HarperCollins Publishers,

Dear Sir/Madam,

I am writing to draw your attention to an error in one or more of the Collins dictionaries, namely a word which is incorrectly defined. The word in question is

eclipse. In the Collins Paperback English Dictionary, Fourth Edition, one of the definitions given for the word – that pertaining to astronomical bodies – reads as follows: “The obscuring of one star or planet by another. A **solar eclipse** occurs when the Moon passes between the Sun and the Earth; a **lunar eclipse** occurs when the Earth passes between the Sun and the Moon.”

The first sentence of this definition is completely incorrect. In astronomy, an eclipse is defined as the obscuration or dimming of a body, due to its *passing through the shadow* of another. The phenomenon whereby one body passes in front of another and hides it from view is called an *occultation*. These are two distinct phenomena, which usually do not occur simultaneously. (The passage of one body directly behind another and its passage through its shadow are obviously not simultaneous, except in the rare case in which both bodies, the Earth and the Sun, all happen to form a straight line).

An example of the correct definition of *eclipse* is given in *A Dictionary of Astronomy* (Pan Books Ltd., 1981), which reads as follows:

“The total or partial obscuration of light from a celestial body as it passes through the shadow of another body. A planetary satellite is eclipsed when it passes through the shadow of its primary or another satellite. An eclipse of the Sun is strictly an occultation.”

Allow me to elaborate. Astronomers define three distinct types of “obscuration” phenomena, as follows:

An *occultation* is the passage of one body directly in front of another, such that it totally or partially obscures it from view.

A *transit* is the passage of a smaller body in front of a larger one (in terms of apparent angular size), such that it is seen moving across the face of the larger body, e.g. a transit of Mercury or Venus in front of the Sun. (Note that the word *transit* also has another use in astronomy, meaning the passage of a celestial body across the meridian; this use of the word is defined in your dictionary).

An *eclipse* is the passage of one body through the shadow of another.

It follows, therefore, that the term “solar eclipse” or “eclipse of the Sun”, though in widespread use, is a misnomer; it is obvious that the Sun cannot possibly pass through the shadow of anything! The term “lunar eclipse” or “eclipse of the Moon” is of course correct; this phenomenon *does* consist of the Moon passing through the shadow of the Earth. However, a “total solar eclipse” should correctly be called an “occultation of the Sun by the Moon”, while an “annular eclipse” – one where the Moon is smaller in apparent size than the Sun, and leaves a ring of sunlight around its dark disc – is really a “transit of the Moon”.

Of course, the term “solar eclipse” or “eclipse of the Sun” is almost universally used, even by astronomers; presumably the term was in common usage long before astronomers formally defined the three types of phenomenon listed above. It is therefore entirely reasonable to include the definition of this term in the dictionary; however, a caveat should be added to the effect that the term is a misnomer.

I therefore suggest that the definition in your dictionary, as quoted above, should be replaced with something along the following lines:

“The obscuring or dimming of one astronomical body, due to its passage through the shadow of another. A **lunar eclipse** occurs when the Moon passes through the shadow of the Earth. The commonly-used term **solar eclipse**, to describe the passage of the Moon

between the Sun and the Earth, is a misnomer; this phenomenon is not strictly an eclipse, but rather an **occultation**.”

Note that:

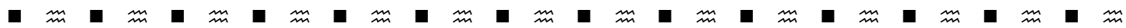
1. The phrase “or dimming” should be included. As is well known, during a lunar eclipse, the Moon is not completely obscured from view, but merely dimmed; it is still illuminated to a certain degree, by sunlight which is refracted through the Earth’s atmosphere.
2. The phrase “star or planet” should definitely be replaced by “astronomical body”, since
 - a. a star cannot be eclipsed, and
 - b. other bodies besides planets *can*, i.e. the satellites of planets. Planetary satellites, e.g. those of Jupiter, are frequently eclipsed by the planet itself, and those of Jupiter sometimes mutually eclipse each other.

Yours faithfully,

Neil M. Haggath

John McCue responded to Neil’s email as follows:

Thanks for your message, and a nice piece of detective work. Funnily enough, the Collins Dictionary of Astronomy gets it right, but just to muddy the waters a bit, the Penguin Dictionary of Astronomy (Jacqueline Mitton) says "There is some confusion of usage between the terms eclipse and occultation. If eclipse is reserved for the cutting off of sunlight by shadow, solar eclipses and the phenomena observed in eclipsing binaries are, strictly speaking, occultations. *However, the use of eclipse in these contexts is firmly established and normal* (my italics).



Light Pollution Issues

Ian Miles sent this in the hope that we may have contacts in Newcastle who can persuade someone to lobby on astronomy’s behalf.

GEORDIES SHED LIGHT ON BIDDERS

Newcastle City Council and North Tyneside Council have announced preferred bidders for their pioneering £245m joint street lighting project. Scottish & Southern Energy and Royal Bank Leasing are preferred bidders. SEC Lighting Services, a wholly owned subsidiary of Scottish & Southern, will carry out replacement, repairs and maintenance. The scheme, which includes £79m of government funding, will replace more than 50,000 street columns and improve energy efficiency for street lighting across the two councils within the first five years, with maintenance and repair work continuing for a further 20 years.



Transit Tailpiece

Quote/Unquote

The preface is the most important part of a book. Even reviewers read a preface.

Philip Guedalla

The meaning of the world is the separation of wish and fact.

Kurt Godel

Valve Radios Gareth Morris has a collection of valve radios for any enthusiast who wants them. If you want his contact address, please let the editor know.

Custom Telescopes UK. 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.freemove.co.uk. Glen also supplies Astronomy and Space books of all kinds. Don't forget to visit his website soon.

CaDAS Website Now at www.planetarium.btinternet.co.uk and the society email address is planetarium@btopenworld.com. Everyone is encouraged to visit the site and tell your friends about it.

Sunderland AS Contact them at www.sunderlandastrosoc.com to see how they are progressing with the new Observatory at Washington Wildlife Centre. If you wish to attend their meetings you are assured of a friendly welcome.

York AS have a website at www.yorkastro.freemove.co.uk and an excellent programme of lectures, if you wish to go along.

Post and Email 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.

Articles 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 is the 1st of each month.

The Back Page Picture(s)

The November Portrait Gallery



President Jack Youdale



Vice President John McCue.



Secretary Neil Haggath



Treasurer Ian Miles

To start the portrait gallery (or is it a rogues gallery?) here are four officers of the Society, who have featured in previous Interviews.