

Transit

The Newsletter of Cleveland And Darlington Astronomical Society



12 Day old Moon – 3rd Jan 2015
Taken by Neil Haggath (Image tweaked by Rod Cuff)

Next Meeting:

Friday 13th February
7:15pm

At Wynyrd Planetarium

Members
Planetarium Show

Presented by

Jurgen Schmoll and Peter Hanna



Contents

Editorial.....	2
Membership Renewal.....	2
Members Photos	3
TASC – Volunteers needed for Wynyrd Planetarium	4
The Universe and Mrs. Hodges.....	5
Terrestrial Impact Craters.....	6
The Town That Declared The Earth Was Flat.	9
The Quiz.....	13
Answers to Last Months Quiz	13
Meeting Calendar (2014-2015)	14



Editorial

Welcome to the first issue of the New Year.

First I would like to thank all of our contributors from last year for their articles, pictures and letters. Without them, there would be no Transit (Keep them coming please), and any new contributions as always would be welcome.

As it's the start of the new year, its also time for membership renewal. Many of you will already have renewed your membership, but for those who have not already done so, you can renew at the next meeting in February, or by sending your form and payment to Sue (Details below). If anyone needs a copy of the renewal form, drop me an email and I can send you a copy.

TASC are also appealing for volunteers from the society to help with running the planetarium and observatory (No previous experience necessary). See page 4 for details.

We have a few new Members photos this month (Please send more as I am running out of ones to use)

This month Neil Haggath has provided us with an interesting article, based on a quiz question (Page 5), Ray Brown talks about Impact Craters (Page 6) and Ray Worthy give us some insight into the Flat Earth (Page 9)

Regards
Jon Mathieson
Address: 12 Rushmere, Marton Middlesbrough, TS8 9XL Email: info@cadas-astro.org.uk

Membership Renewal

Membership renewals are now due for 2015.

Membership Fees:	Individual	£12.00
	Student	£8.00
	Family	£20.00

If you have not already renewed your membership, then you can do so either at the next meeting,
Or by Post: Sue Barnes
 6 Helmsley Way,
 Northallerton,
 DL7 8SP



Members Photos



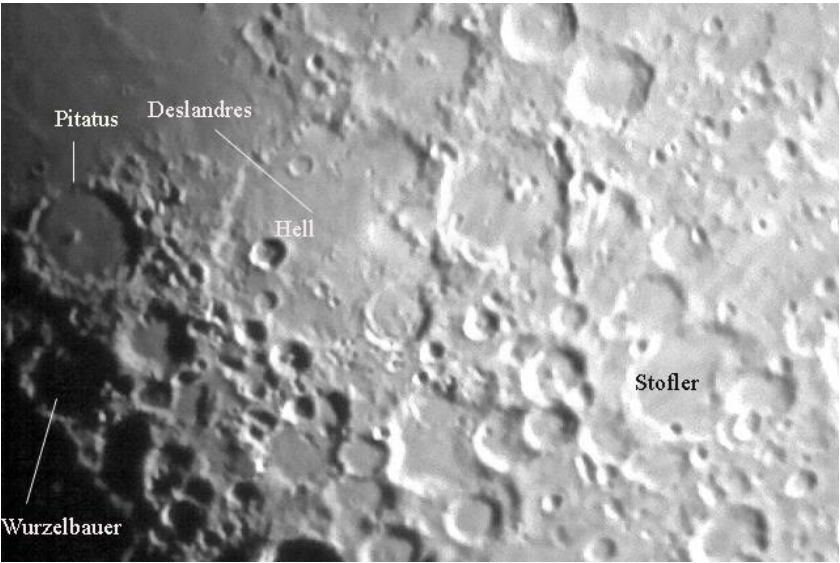
Swan Nebula by David Weldrake



Night Sky (B&W) by David Weldrake



Trifid Nebula) by David Weldrake



The Moon by John McCue



TASC – Volunteers needed for Wynyard Planetarium

We are looking for new volunteers to help us run the Planetarium and Observatory.
If anyone is interested, then please contact our Volunteer Coordinator - Gary Kearney

Email: Garykearney24@outlook.com



CaDAS Volunteers – Role Description

Where:	Wynyard
When:	All year round
Commitment:	flexible to suit
Duration:	flexible to suit
What's In It For You:	This is the opportunity you've been waiting for to meet a new bunch of people who are interested in Astronomy the same as you. It's also a great way to get some new skills and new experience - employers welcome people with volunteer experience on their CV.
Why We Need You:	We want help from any member of the Astronomical Society as we think it's a great opportunity for members to be involved with the society and want even more people to enjoy being a member, the more we can get the better the experiences can be.
The Skills You Need:	If you're reading this advert, you've probably already got an interest in Volunteering. We want people like you who can inspire others about the CADAS society and tell them the benefits of being a member. You'll need to enjoy talking to members of the public as well as we intend to hold Star events and welcome the public into the Planetarium.
Notes:	<p>All the training necessary and background information will be provided.</p> <p>By volunteering your time and skills, you could make a real difference to the CADAS Society. Space is amazing – help us advertise the society for the general public and hopefully we can get new members.</p>



The Universe and Mrs. Hodges

by Neil Haggath

One of my favourite “obscure” quiz questions, which very few people have ever been able to answer, is “What was the claim to fame of Mrs. Ann Hodges of Sylacauga, Alabama?”. That one has beaten even the best contestants in Yorkshire Astromind.

Well, last month was the sixtieth anniversary of the event which earned an ordinary American housewife a place in astronomical history... Ann Elizabeth Hodges (1920 – 72) was the first human being in history, known to have been hit by a meteorite! It remains the only reliably documented case, though there have been a couple of others claimed in more recent years.

On 30 November 1954, at 2.46 pm local time, a fireball was seen over Alabama. The object broke up into fragments, some of which hit the ground in and around the town of Sylacauga. The biggest chunk, weighing 3.9 kg, crashed through the roof of a house, and hit poor Mrs. Hodges, who was having a nap on her sofa.

Thankfully, though the meteorite had been falling at its terminal velocity of around 200 kilometres per hour, most of its kinetic energy must have been dissipated in its impact with the roof. Mrs. Hodges survived and wasn't seriously injured – though she was left with one belter of a bruise.

The sad part of the story is what happened afterwards. Mrs. Hodges made a modest amount of money by selling her story to the papers – but she missed out on a hell of a lot more.

After a geologist examined the rock and identified it as a meteorite, it was sent to the Smithsonian for analysis, but was later returned to the Hodges. Generally speaking, if a meteorite falls on your property, then you legally own it. You would imagine, then, that Mrs. Hodges would at least have had the consolation of being able to sell her nemesis – which even in those days, would have been regarded as pretty valuable. Unfortunately, she and her husband didn't own their house, but only rented it – so the meteorite legally became the property of their landlady. The latter claimed that she needed the money to repair the house, as it seems she didn't get any insurance payout.

But public opinion, not surprisingly, was that Mrs. Hodges should be allowed to profit from it. A bitter legal dispute ensued, which went on for over a year, before the landlady gave in. By then, interest had waned, and the Hodges, amazingly, couldn't find any museum or institution willing to buy it. (They turned down a modest offer from the Smithsonian in the hope of getting better offers, which never came.) Believe it or not, they used it as a doorstop, before eventually donating it, for free, to the Alabama Museum of Natural History, where it remains to this day.



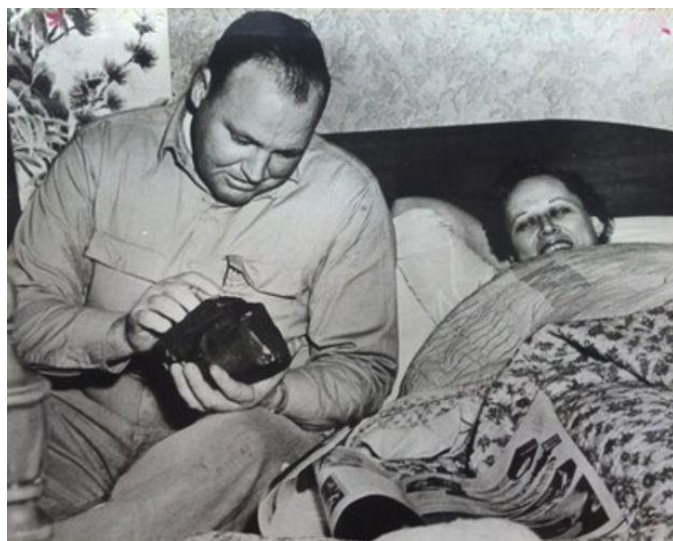
Transit

The Newsletter of Cleveland And Darlington Astronomical Society

Another piece of the meteorite, less than half the size of the Hodges', was found on the land of a neighbouring farmer. He was able to buy a new house and a car with the proceeds. So the Hodges' piece, with its unique heritage, should have been worth a substantial fortune. That they ended up with nothing defies belief. If only they and the landlady had simply come to a friendly agreement to share the proceeds, all of their lives might have turned out very differently.

(About twenty years ago in New York City, a small meteorite hit a parked car. As the car was an old banger, it was a write-off. The car belonged to an 18-year-old student, who had bought it for \$500. A museum bought it from her, with the meteorite still embedded in its boot, for \$50000! Had Mrs. Hodges' story occurred in the present day, she would probably have made many times that sum.)

Mrs. Hodges suffered health problems later in life, and died in 1972, aged only 52. It's impossible to say whether her unique experience, and the resultant stress, was a contributing factor.



Terrestrial Impact Craters

By Ray Brown

Craters on the surface of the Moon are a focus of interest to many astronomers, especially to astro-photographers. It is now generally accepted that volcanic activity on our Moon ended quite early in its lifetime, probably by 3 billion years ago, so the craters now peppering the lunar surface have been almost exclusively caused by impacts since that time. The absence of water and atmosphere on the Moon allow its topography to remain unchanged except by subsequent impacts. Impacts there take place "cold", as there is no atmospheric heating and fragmentation of the meteoroid, asteroid or comet.

By contrast volcanism on Earth is alive and well whereas surface erosion by wind, running water, glaciers and freeze-thaw cycles, supplemented by tectonic movements and volcanic activity, has produced an ever-changing vista in which most ancient impact sites have been obliterated and obscured. At any instant about 20 volcanoes are now active and during any one year some 60 or so make their presence clear. Some 550 volcanoes are said to have been active during recorded history and there is geological evidence for 1500 being active during the past 10,000 years. But these are just the land-based volcanoes, so one might triple those estimates by including under-sea vents.



The Vredefort Dome south-west of Johannesburg is the residual centre (about 50 km diameter) of an impact crater created 2 billion years ago with a diameter of 300 km



Transit

The Newsletter of Cleveland And Darlington Astronomical Society

By contrast the Earth Impact Database (<http://www.passc.net/EarthImpactDatabase/index.html>) lists only 19 confirmed meteor craters in Africa, 18 in Asia, 26 in Australia, 48 in Europe, 32 in North America and 8 in South America: a total of 151 on



Roter Kamm in the Namibian desert with a diameter of 2.5 km is less than 4 million years old

land. There are about half this number of other formations widely believed to be impact craters but as yet unconfirmed by sufficient geological evidence. Rarely were the confirmed craters formed more than a billion years ago, although the granddaddy of them all, the 300km diameter Vredefort Dome in South Africa, has been dated at 2023 million years old. Craters dated to be less than 10 million years are mainly below 1km in diameter, such as Kamil in Egypt, Almiros in Greece, Kaali in Estonia and Morasko in Poland. However Tenoumer (Mauretania), Amguid (Algeria), Lonar (India) and Rio Cuarto (Argentina) are all rather larger craters, caused by impacts during human history. See <http://geology.com/meteor-impact-craters.shtml>

The younger a crater is the more likely it is still to be detectable. Regions of Earth which have been relatively free from disturbance also

favour crater survival: hence the relatively high number in desert regions such as Australia.

Many impact craters are established as such only on the basis of geological evidence and would not be recognised by the passing traveller. These are better described as impact structures or astroblemes which can sometimes be identified by the presence of unusually high concentrations of iridium and other platinum group metals and by examples of shock metamorphism (rare minerals such as shocked quartz formed under the unique conditions of temperature and pressure produced in the impact). Many impact sites, especially in Canada, are lakes. A few impact craters can be discerned in Google Earth but I find it more effective to use PC-based flight simulator software with hi-resolution NASA digital topography under the glancing incidence of twilight; this facility enables me to recognise the characteristic features of more than 60 of the listed impact sites.



The Barringer crater formed about 50,000 years ago when a large meteorite landed east of Flagstaff in Arizona producing a crater one mile across and 750 feet deep

Aerial or satellite surveys occasionally bring to notice previously unknown craters; in 2008 the Kamil crater (diameter 147ft, depth 52ft) was located by means of Google Earth. The parent meteorite, estimated to have had a diameter of 1.3 metres and to have weighed several metric tons, arrived less than 5,000 years ago.



The Pingualuit crater formed 1.4 million years ago near to Nunavik in Northern Quebec is now host to a 2 mile diameter lake

The small Kaali crater in Estonia is only the main one arising from about 9 meteorite fragments which landed within a small area. Indeed it is quite common for craters to occur in nearby pairs: examples include the Rio Cuarto group near Cordoba, Argentina, the Oasis and Gebel Dalma duo in Libya, the pair of Clearwater Lakes in Canada and also the Crawford and Flaxman craters in Western Australia. For details see <http://www.johnstonsarchive.net/astro/doubletcraters.html>

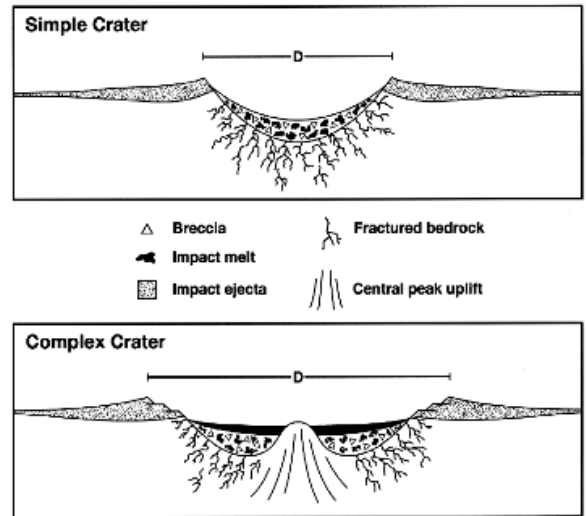
Many smaller craters have had the familiar simple form, common on the Moon, of a central depressed bowl surrounded by a raised near-circular rim. The Barringer crater seen by many tourists in Arizona is a



Transit

The Newsletter of Cleveland And Darlington Astronomical Society

classic example. In others, usually larger and known as complex craters, the central depression has undergone subsequent modification whereby the weak materials rearrange under the effects of gravity giving rise to uplift which in extreme cases produces a central dome exemplified by the Vredefort Dome in South Africa and by the Upheaval Dome in Utah. In less extreme cases the region within the rim becomes quite flat, although such a feature might have arisen as the bed of a lake, long since disappeared; a crater rim provides a natural trap for water before the rim is eventually breached. Many craters have within the flattish basin area a central hump, redolent of the lunar crater Tycho. The higher gravity of Earth compared with the Moon causes complex craters to form more readily on Earth; as a rough guide the diameter D of the transition from simple to complex is about 2-4 km on Earth and 15 – 20 km on the Moon. Another common morphological feature of large craters is outer concentric raised rings of ejected material.



For more detail see

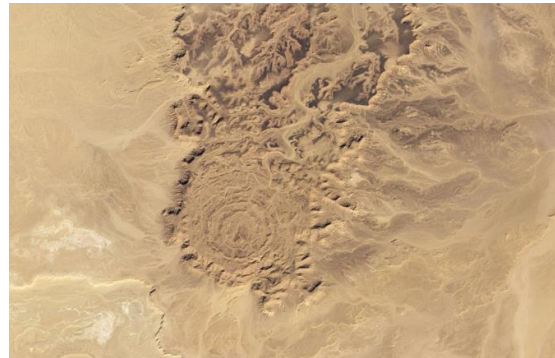
<http://www.lpi.usra.edu/exploration/training/illustrations/craterMorphology/>

<http://www.solarviews.com/eng/tercrate.htm>

<http://www.lpi.usra.edu/exploration/education/hsResearch/crateringLab/lab/part1/background/>



The Kaali meteorite crater in Estonia is only 110 metres in diameter and is several thousand years old



Satellite image of the 6 km diameter Tin Bider crater in Algeria, put down within the past 70 million years and situated at the edge of a range of hills



Transit

The Newsletter of Cleveland And Darlington Astronomical Society

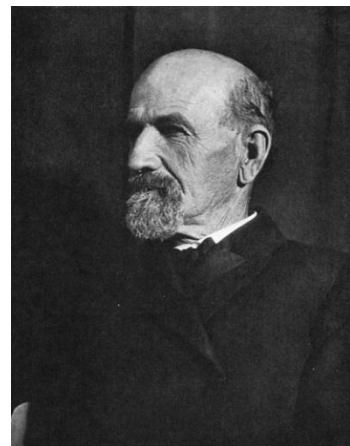
The Town That Declared The Earth Was Flat.

By Ray Worthy

Long long ago, when I was twelve or thirteen, someone gave me a book, a marvellous true adventure story by a man called Joshua Slocum. It was he who, in the last decade of the nineteenth century, sailed single-handedly around the world. Captain Slocum had retired, but the sea was in his blood and he fitted out a yacht and set off, calling at port after port. He regularly sent copy to an American magazine. Although the process was slow by our present day standards, the whole world was appraised of the progress of his voyage.

There was one incident which has stood in my memory all these years and that was when he called into Cape Town in South Africa.

Captain Slocum was invited to pay a visit to meet the President of the South African Republic, a man called Paul Kruger. When the Captain was introduced as the man who was sailing round the world, the President interrupted and declared that what the captain meant was that "He was sailing around IN the world. He could not do as he said because the world was flat and not spherical. Slocum was non-plussed, as I was those many years later when I read the account.



Joshua Slocum in 1906



Paul Kruger

How could it come about that a man who was intelligent enough to become the leader of a Nation, believe that the world was flat? Kruger had not taken this idea to its logical conclusion and reasoned that if the world was flat, what happened at the edges? Did he not see all the photographs of other celestial bodies and see their sphericity. Did he never take a telescope to a shore and watch a ship vanish over the horizon. Had all the magnificent work of Isaac Newton been for naught.

The date of my reading this marvellous book and forming these questions was most certainly before the end of the Second World War, when the beaches at Tees Mouth were still enshrouded with barbed wire and minefields. I would cycle there and use the old telescope which my grandfather had bequeathed me. I marvelled at the clarity by which I could see the mast tops of ships whose main decks were already over the horizon.

I resolved at the time to do something about this question, "How had such a prominent person held such an idea?" However, I did not do anything about it, that is until this year of 2014.

What triggered off this new search was my coming across another fascinating incident from the past, this time in the life of the man who, parallel with Charles Darwin, worked out the theory of "Natural Selection of the Fittest" as the cause of transmutation of the species. I refer, of course to Alfred Russell Wallace, who published his ideas alongside Darwin, but remained eclipsed in history.

Wallace had read an article in a magazine called

"The Field" in which a "Flat Earther" had wagered a large sum of money which would be handed over to anyone who could show by experiment that the Earth was round.

Now, Wallace was short of cash, and as he had been a surveyor in his younger days, he reckoned he had enough savvy to manage the demonstration quite easily.

In this he was correct. The demonstration was to take place along a six mile stretch of a ruler straight canal- like river called the Bedford levels, a few miles to the east of Peterborough. The flat earther had previously performed an experiment



backing up his contention, but unfortunately for him he was no “Scientist” and had got it wrong. He had ignored the fact that, at nine inches above the water level, there was a factor which he should have taken into account, that of the “Mirage” effect.

The judge, the editor of “The Field” magazine, agreed to by both parties, received the ante from each demonstrator.

There was a six mile distance between two stone bridges. Wallace fixed up a barge on which there was a vertical pole with height markings on it. The barge was towed to the first bridge and a telescope was fixed up at the height of thirteen feet above the water level. The barge was then towed the six miles to the second bridge on which was fixed a marked line at that same height. All this was seen and checked by the judge. This was followed by towing the barge to the three mile point, half way along the waterway. The judge, looking through the telescope, could see the mark on the barge's upright pole was three feet above the direct line between the telescope and the mark on the six mile bridge.

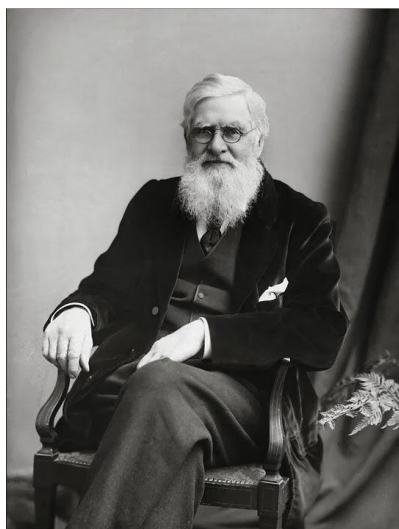
Wallace, by lifting the marks and the telescope thirteen feet high had overcome the deleterious “ Mirage” effect and had won the day - - - or at least he thought he had.

The flat earth loser refused to concede defeat. He even refused to look at the evidence through the telescope when the judge invited him to do so.

The flat earther declared that he had been cheated and that he would take up the matter in the courts. He made himself such a nuisance that one judge put him away for a while in prison. Even so, to his dying breath, he never conceded defeat.

So, for the second time in my life I was made to wonder what convictions drove a particular man to take this “Flat Earth “ position and defend it against what others would call “All reason”. The first time, in 1944 or thereabouts, I made little headway, but this time however there was at my disposal the Internet and all its amazing possibilities.

The name of this particular flat earther was one John Hampden and I endeavoured to find out where his conviction came from. It did not take long because it took only one step backwards up the chain.



Samuel Birley Rowbotham

At only one remove, I hit pay dirt. I am convinced I have discovered the origin of modern day Flat Earth-ism. I am sad to declare that modern Flat Earth theory was generated simply to part gullible folk from their hard earned money.

Indeed, this man, whose name was Samuel Birley Rowbotham, and whose life on Earth roughly paralleled that of Charles Dickens, was a London snake-oil salesman of the first water. This is a good description of what he did in his early life, because he sold coloured water as cures for common ailments. Apparently he did well at it, from a financial point of view, because his address at the time was quite a respectable one.

He spent some time at an Owenesque settlement near Peterborough where an “Ideal” workers' housing establishment was set up. He had to leave there under a cloud, but, before he did so, he took note of some astronomical experiments which were taking place along the “Bedford Levels.”

I have to acknowledge that Rowbotham must have had tremendous charisma and personality, because he began arranging meetings in which he advocated the “Flat

Earth” viewpoint and invited local astronomers and dignitaries to argue against him. These meetings became very popular and he went on tour with them, advertising them in advance rather like a circus. People paid something like sixpence a shot, which, in the mid nineteenth century was quite a considerable outlay. He had no competition from the telly or even the radio.



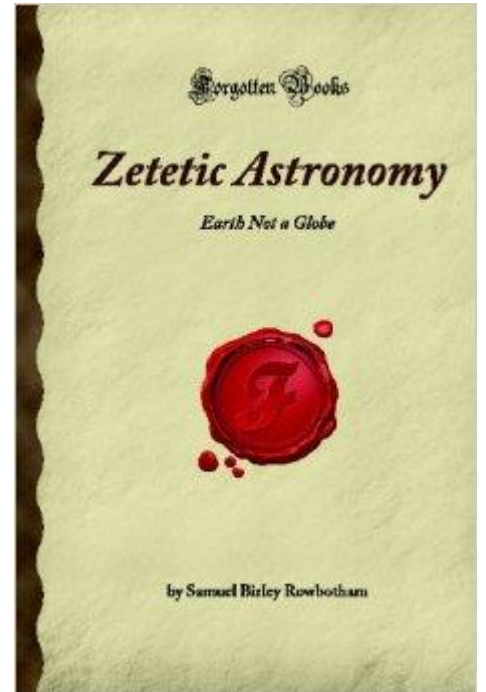
Transit

The Newsletter of Cleveland And Darlington Astronomical Society

He even started a magazine devoted to his “Zetetic” astronomy, which of course was a load of old guff, being based on his “Flat Earth” rubbish. (Do you think my bias is showing?) It was all done with tongue in cheek. People queued up to have a go at him in arguments and debates. Apparently his charisma carried the day. He must have laughed all the way to the bank.

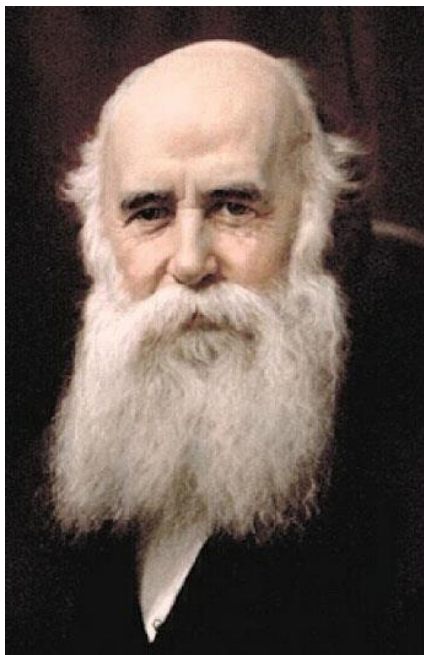
My self-imposed task was to discover any link between this charlatan Rowbotham and the President of the South African Republic and I thought for a while that I had found one, because a man in America, yet another charismatic “Messiah” with a large following adopted this “Zetetic” point of view and later sent a missionary out to South Africa to “Spread the word”. Unfortunately for my linkage search, the timing was not right. The missionary arrived too late to influence “Uncle Paul Kruger”.

Besides founding the “Zetetic” astronomy magazine, Rowbotham also started the “Zetetic Society” and it had quite a large list of subscribers. Hampden was not the only prominent follower. There was a lady who, upon the death of Rowbotham, founded the “Universal Zetetic Society” which became the forerunner of the “Flat Earth Society”. She was indeed a lady. Lady Elizabeth Blount, wife of (Wait for it!) Sir Walter Sodington Blount.



The “Zetetic Astronomy” magazine was published over the Atlantic and found followers in the United States and Canada.

It has to be said that most of these people were not so much concerned with astronomy, but were seeking to uphold the literal words of the Bible, come what may. For example, in Revelations 7:1, the writer and translators used an expression “To the four corners of the Earth”, meaning the news was spread far and wide. However, this wording was taken literally and some of these fundamentalists envisage a square or rectangular flat earth with huge mountains at each corner and round the edges to keep the seas in place.



John Alexander Dowie

For some reason or other, the United States has always been a happy hunting ground for charismatic religious leaders and John Alexander Dowie was an outstanding example. The reason this group caught my attention was that it published tracts in English, German and Dutch and these tracts found their way to South Africa.

Dowie founded the “Zion Tabernacle of the Christian Catholic Apostolic Church” and on behalf of his flock, he adopted the preachings of Samuel Rowbotham and the “Universal Zetetic Society.”

John Alexander Dowie (1847 -1907), whose roots were Scottish and then Australian, suddenly decided to become a faith healer and headed for California. He had great visions and these great visions attracted many followers. He seemed to have great persuasive power over his followers. Calling himself “Elijah the Second” and dressing as such in eastern costume, Dowie organised several “Faith Healing” sessions, during which he was accused of rigging the results, having planted his “Miracles” in the audience. The members of his flock were, at the start, spread all over the place, you could say “Over the four corners of the Earth “. Dowie persuaded them to give up their current ways of life and come together in one place. To which purpose he designed a town for them from scratch.



Transit

The Newsletter of Cleveland And Darlington Astronomical Society

This town was (and still is) located on the western shore of Lake Michigan, some forty miles north of Chicago. It was christened "Zion." Zion had its own police force, all members of the faith. If ever an itinerant preacher came around trying to persuade the citizens to renege on their faith, they were railroaded out of town and given the bum's rush. No other church was allowed within the town's perimeter.

Any citizen who took up abode in Zion had to forego a whole list of things. The catalogue included medical doctors, medicines from pharmacists, alcohol and tobacco, eating pork, swearing, dancing, spitting, and wearing tan coloured shoes.



MAYOR, ALDERMEN, AND CITY OFFICIALS, CITY OF ZION, ILLINOIS, JULY 15, 1901.
 Top Row, from left to right—Alderman Rose, Alderman Kistner, Alderman Schuchman, Alderman Jensen, Alderman Cline, Alderman Smith.
 Second Row, from left to right—Alderman Ely, Alderman Brister, Page Krenner, Assistant Comptroller Kessler, City Collector Karam, Clerk of Court Schroder, Police Magistrate Lamm, Clerk Heath, Alderman Mann, Alderman Fulton.
 Third Row, from left to right—City Attorney Lander, Comptroller Barnard, City Clerk DeFoe, Health Commissioner Spilcher, Chaplain Dinkel, Mayor Harper, City Judge Barker, Marshal Young, City Treasurer Fickham, Commissioner of Public Works Judd.

The particular item which caught my eye was the no shop in Zion was allowed to sell globes.

The town of Zion was founded in 1901 and the President of South Africa made his amazing statement in 1897. I have read that the Zion group, even in its pre Zion years, sent "Missionaries" far and wide, including South Africa. However, I can find no definitive link, naming the Zionists as the source of "Oom Paul's" ideas.

In essence then, the position taken by the "Flat Earthers" is the same as the position taken by today's Creationists. The words of the Bible are to be taken literally and they do not allow acknowledgement of figures of speech and such like to get in the way of their understanding.

Paul Kruger's parents were farmers and took part in "The Great Trek". They lived essentially in relative isolation. The young Paul was taught to read and write and the family bible must necessarily have dominated his growing horizons.



Transit

The Newsletter of Cleveland And Darlington Astronomical Society

The Quiz

This month all of the answers begin with the letters U or V.

As usual, they are in roughly increasing order of difficulty.

1. One of the constellations into which the former Argo Navis, the Ship, was divided.
2. An unimaginatively named radio observatory in New Mexico.
3. Two US space probes, which achieved the first successful landings on Mars.
4. The common name of the third brightest star in Virgo.
5. The Martian plain in which the second of Question 3 landed.
6. A famous star catalogue, published by Johann Bayer in 1603, which introduced the system of naming stars with Greek letters.
7. The name given by Tycho Brahe to his castle.
8. Two Soviet manned space missions in the mid-1960's, which both achieved apparently impressive "firsts", but were really crude and dangerous propaganda stunts.
9. The non-existent object which Edmonde Lescarbault claimed to have discovered in 1859.
10. The first satellite launched for the purpose of X-ray astronomy.



Answers to Last Months Quiz

1. The Trifid Nebula.
2. Clyde Tombaugh (1906-1997), the discoverer of Pluto.
3. The Trapezium.
4. The Tharsis Ridge.
5. The Trojans.
6. Comet Tempel 1 – the target of NASA's Deep Impact space probe.
7. Well, asking for the first woman in space would have been too easy! Valentina Tereshkova was also the first civilian cosmonaut. She was, however, given an honorary commission in the Soviet Air Force, which is why official photos of her usually show her in uniform.
8. Tunguska.
9. Thuban (Alpha Draconis). The position of the North Celestial Pole moves with respect to the stars due to precession, completing a circle in 25800 years. Thuban was the Pole Star at the time the pyramids were built; the main entrance shaft of the Great Pyramid of Cheops pointed towards it, and was supposed to be the Pharaoh's route to Heaven!
10. Triesnecker.



[Meeting Calendar \(2014-2015\)](#)

All meetings are held at the Wynyard Planetarium (with the exception of the AGM).

Doors open at 19:15 for a 19:30 start

13th February 2015

Members Planetarium Show

Presented by Dr. Jürgen Schmoll and Peter Hanna

13th March 2015

Title to be confirmed

Gary Fildes of Kielder Observatory

10th April 2015

One Small Step

(A Celebration of Apollo)

Neil Haggath, FRAS, CaDAS

8th May 2015

Title to be confirmed

Paul Money FRAS, FBIS

12th June 2015

CaDAS Annual General Meeting and Social Evening

Venue to be confirmed



Transit

The Newsletter of Cleveland And Darlington Astronomical Society

Wynyard Planetarium

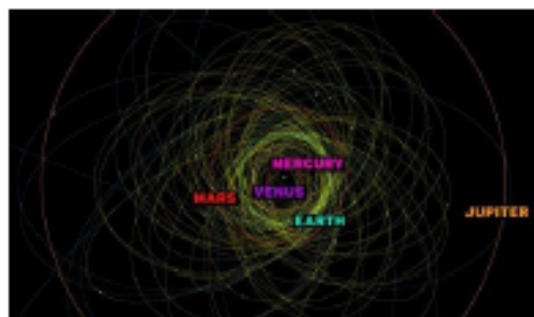
Next Public Show:

Friday 16th January 2015 at 7:30 p.m.

'What's up' : 2015 Highlights

(Suitable for adults and children 6 years old and over)

Asteroids



Solar
Eclipse

Take a tour of the night sky and discover what to look 'up' for in 2015.

Following the show if the skies are clear you can observe the night sky through our telescopes,

Public Show Charges apply at: £5.00 per adult, £3.00 per child/concession and £13.00 per family (2 adults & 2 children). We strongly advise pre-booking to avoid disappointment. Please call the Planetarium on (01740) 630544 to book seats. The Planetarium is accessible to wheelchair users.

The Wynyard Planetarium & Observatory is a joint venture between the Teesside Astronomical Science Centre and the Cleveland and Darlington Astronomical Society, supported by the Durham Astronomical Society. It provides information, education & entertainment about space and science on Teesside and across the Northeast.



Tel: (01740) 630544
e-mail: info@wynyard-planetarium.net
web: www.wynyard-planetarium.net



