Solar Eclipse date changed!

A special press release was issued announcing that the date of the solar eclipse had been changed from Wednesday 11th August to Sunday 11th April. The times of the eclipse were unchanged and Alderney would still be the best place to view it. The new date would considerably benefit both Alderney and Guernsey tourism as it would encourage people to come during the quieter shoulder months rather than coinciding with the peak tourist season. Holding the eclipse on a Sunday, rather than a weekday would also enable everyone to see it without having to take the morning off work. In view of all the problems with 11th August David Le Conte found it hard to understand why that date was chosen.

The press release was dated 1st April. Apparently one agency did receive a genuine enquiry about travel to see the eclipse on the new date.

Total Eclipse

by Geoff Falla

Let us pray the weather's fine,
On this day in '99;
We will have a rare event,
That is surely heaven sent.

One hour before the time of Noon,
There will come a little gloom,
This will deepen as, quite soon,
The Sun is covered by the Moon.

In olden days there would be fright,
As the day turned almost night;
Astronomers now have our respect,
Knowing what we should expect.

So let's enjoy this awesome sight,
Science, you see, has got it right.

Astronomy Section Officers

Secretary	To be appointed	
Hon Treasurer	Peter Langford	720649
Editor	Peter Langford	720649
Facilities	Geoff Falla	724101
Public Relations	David Le Conte	64847
Imaging	Daniel Cave	64415
Light Pollution	To be appointed	
Research	Frank Dowding	55215
Librarian	Debby Quertier	725760

Observatory:
Rue du Lorier, St Peters,
Guernsey Tel: 64252

Web page:
www.netcomuk.co.uk/~pmlang

Material for, and enquiries about Sagittarius should be sent to the Editor at

3 Cameron Place, Upper St Jacques,
St Peter Port, Guernsey GY1 1SU
Tel: 01481 720649
Fax: 01481 715702
E-mail: pmlang@netcomuk.co.uk

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La Société Guernesiaise, Candie Gardens,
St Peter Port, Guernsey. Tel: 725093

Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

April - June 1999

Forthcoming events

Special Business Meeting
Tuesday, 27th April
8.00 pm at the Observatory

The Millennium Eclipse
by David Le Conte
Wednesday, 19th May
8.00 pm at Les Beaucamps School Hall

The Great Universe
by Patrick Moore
Thursday, 17th June
at Beau Sejour

Open Day
Sunday, 20th June
at Candie Gardens

In this issue

Annual Business Meeting Report
Forget Easter Eggs
Astronomical Quiz
The Ancient Order of Planets

Inside

Centre inserts

Star chart

Sunset, twilight and sunrise times
Moon phases

Ken Staples stands down

Regrettably Ken Staples has resigned as Secretary of the Astronomy Section. In his letter of resignation Ken explained that his time in office has coincided with a difficult time for him and his family and he has decided to reduce his commitments. Ken has resigned as Light Pollution Officer too but will still remain involved as a member of the Section. Sincere thanks to Ken for all the efforts he has made on behalf of the Section. He has been a formidable ambassador for the Section and astronomy generally, particularly through his regular radio talks. Our best wishes to Ken and his family.

Special Business Meeting

In view of Ken Staples' resignation a Special Business Meeting will be held to appoint a successor Secretary. David Le Conte has agreed to chair the meeting. Anyone interested in taking over the post, or who would just like to find out more about what it entails, may wish to contact David. The position of Light Pollution Officer also needs to be filled. It is hoped that as many members as possible will attend the meeting at the Observatory on April 27th at 8 pm.

PPARC award application

The Section has applied to the Particle Physics and Astronomy Research Council for an award to fund the new telescope. PPARC makes awards towards projects for the promotion of public understanding of science and technology. Supporting our application are Dr Patrick Moore and Mr Alan Bisson. The latter is a trustee of the Le Riche Centenary Fund.

The Millennium Eclipse

The Raymond Falla Memorial Lecture, a public lecture organised annually by the WEA on an important topic of the day, will be given this year by David Le Conte and entitled "The Millennium Eclipse". It will take place on Wednesday 19th May 1999 at 8:30 pm at Les Beaucamps School Hall. Places have been reserved for the Astronomy Section and the lecture will be instead of the Section's normal monthly meeting for May.

Patrick Moore at Beau Sejour

On 17th June Patrick Moore will be returning to Guernsey to give a lecture at Beau Sejour entitled The Great Universe. On his last visit in January 1997 he proved an extremely popular speaker and the theatre was filled. Jessica Harris has booked a prime block of seats for Section members and their families. Contact Jessica (47193) if you would like one or more places. Don't delay, however, as the numbers are limited. This event will take the place of our usual June meeting.

Eclipse Exhibition

While Patrick Moore is in Guernsey it is hoped that he will open the new Eclipse Exhibition at Candie Museum on June 17th. The exhibition will run until 26th September and will feature special exhibits designed to illustrate aspects of the eclipse. David Le Conte has assisted in setting up the exhibition. The Section is lending its solar mirrors to the museum for the exhibition. A motor drive will be added and the mirrors will project an image of the sun onto a special screen.

"The Channel Islands Millennium Eclipse"

David Le Conte's new book "The Channnel Islands Millennium Eclipse - A Practical Guide to the total eclipse of the Sun on Wednesday 11th August 1999" is now available. There is a foreword by Patrick Moore and a pair of eclipse viewers is included. The book is published by La Société and is available in the shops at £4. Members can obtain a copy at the reduced price of £3.60.

Eclipse viewer sales

Sales of eclipse viewers to date are in excess of 2,500. The special offer for offices, where offices can obtain a 15% discount on the regular retail price when they order 25 viewers or more, has been very successful with several offices placing orders for over 100 viewers. A Reader Offer in conjunction with the Guernsey Evening Press is also getting under way and it is hoped it will generate substantial sales. The take-up from retailers has not been strong so far but it is hoped that this will pick up as we get closer to the eclipse date. If any members are involved in groups or events where it would be appropriate to sell eclipse viewers please contact Peter Langford.

Eclipse Stamps

The Guernsey Post Office is issuing a series of stamps on 27 April 1999 entitled Alderney: Total Eclipse. The six stamps depict the progress of the eclipse from a small "bite" out of the sun at 10:15 am, a larger bite at 10:51 am, Bailey's Beads, total eclipse, the Diamond Ring, then the uncovering of the sun at 11:36 am. The final part of the set is a label showing the sun almost at the end of the eclipse at 12:16 pm. The Post Office has expressed its thanks to David Le Conte for his invaluable information on the subject.

Open Day - 20th June at Candie Gardens

As mentioned in the minutes of the Business Meeting we will be holding an open day at Candie Gardens. We will be there to explain about our solar mirrors and answer questions about the eclipse. This event will be organised by Jessica Harris and Debby Quertier. We are going to have a table set up outside at Candie, near where the mirrors will project the Sun's image. We shall also have a display of some sort and have various items for sale. We shall be there between 2 and 4 pm, though we will stay a little longer if there are plenty of people about. It is hoped that the weather will be good that day (which will help enormously!). Candie Gardens is a lovely setting and, with the draw of the Eclipse Exhibition at Candie, we should have a good turnout. There will be music played on the patio area between 3 and 4pm. Please see the booklet about Guernsey museums for more details of this.

Anyone who wishes to help with this event, please let either Jessica (Tel.47193) or Debby (Tel.725760) know. Any ideas for a display will be most welcome. This should be a great afternoon out for the whole family, so please come along and support your Section.

Report of the Annual Business Meeting
Held at the Observatory on 26th January 1999

Present - Geoff Falla, Frank Dowding, Roger Chandler, Peter Langford, Gareth Coleman, Jessica Harris, David Le Conte, Lawrence Guilbert, Debby Quertier

David Le Conte was elected to be Chairman of the Meeting

1. Election of Officers

Ken Staples was unable to attend the meeting so his positions of Secretary and Light Pollution Officer will need to be confirmed at a later date. Thanks were given to Peter Langford, who is the new Editor of Sagittarius, and he will continue as Treasurer. Geoff Falla and Daniel Cave will continue as Facilities Officer and Imaging Officer respectively. the website was discussed with a view to more items being added to it and maybe some articles from Sagittarius. David Le Conte would continue Public Relations and Frank Dowding to continue as Research Officer. A new position was created of Librarian. Debby Quertier will be responsible for looking after the Section's books.

A discussion then followed about more forward planning of jobs that need doing at the Observatory. Jobs have often got left to the clean-up day in July, when there is not always the time to see them through to completion. Publicity was discussed and it was agreed that we should get our meetings advertised on Radio Guernsey and maybe an article in the Press about the observatory. Geoff Falla to find out about maybe producing star charts for the Press again.

2. Treasurers Report

Peter Langford presented his report for 1998. The Section is in a good position, subscriptions are up, we now have 48 members. Our fund raising has raised £567.52. The generous donation of £3,500 from Le Riche Centenary Fund brings the total in our Telescope Fund to £5,000. The sale of eclipse viewers is going well and we hope to raise the remainder by the year end to purchase the £18,000 telescope. In 1998 we purchased a new finder scope and a sidereal clock.

3. Projects for the Year

The sundial and solar projection/telescope are both completed and successful. We are hoping to monitor sunspot activity, the peak is due around the end of the year. Around noon is generally the best time of day to do this, if this isn't possible the monitoring should be done at the same time each day. Lawrence, Geoff and Gareth are particularly involved/interested in this. We could then join the appropriate section of the BAA and send our results in.

David Le Conte has filter material available for use with cameras, telescopes etc when viewing the sun. If interested please let him know.

Looking for Pluto was mentioned but this may not be possible due to the workload with other events this year.

The main event of 1999 is the Eclipse which will be dealt with under a later heading.

4. Programme for 1999

i) Patrick Moore will be coming in June, he will be giving a talk at Beau Sejour on Thursday the 17th, the subject will be the Universe.

ii) there will be an Eclipse Exhibition at Candie Museum and it is hoped that it will be opened by Patrick Moore on the same day as his talk. The museum will be using our solar mirrors for the duration of the exhibition (which will run to September). The mirrors will be mounted on the flat roof near the cafe and motor driven to project the sun's image onto a screen on the patio area. This should be quite a draw at the museum. We shall get the mirrors back at the end of the exhibition complete with the drive.

iii) David Le Conte is planning a scale model of the sun, moon and earth so you can do your own DIY eclipse. Again this will be at Candie.

iv) There is planning underway for the exhibition itself in conjunction with the RAA and the Science Museum. David is writing a book about Warren De La Rue and the 1860 eclipse which will be published by the museum. We will need some members to help at Candie in assisting with the public's enquiries.

v) Geoff Falla suggested an Open Day to explain to the public about the eclipse, possibly a Sunday. It was suggested Sunday the 20th June at Candie Museum where the mirrors would be. David will speak to the museum and also check that we would be able to sell booklets, eclipse viewers on a Sunday. Debby Quertier and Jessica Harris will organise this Open Day. If successful it can be repeated.

5. Public Talks

David Le Conte has so far agreed to do 15 or 16 talks on both the eclipse and astronomy in general. David is meeting the schools and there may well be more. We will use these talks to advertise the Section. Is anyone willing to assist or do talks?

6. Theatre Show

David Le Conte was in Cardiff recently and heard about the Sunshade eclipse show. It is aimed at children between 6-13 years and is given by a Mr Adam Senior. The show is about an hour long and costs £250 per show plus expenses and venue hire. A discussion followed about whether this show could come over here and how/where it could be organised. David will explore this.

7. NAM99 and the eclipse

NAM99 runs from the 9th to the 13th August and preparations are well in hand. CLBS are organising transport, accommodation, registrations etc. The conference will be at Beau Sejour and there may be a role for us in having a stand there. It was agreed that this was a good idea and we would need to organise a stand and display. Gareth Coleman will assist with this with help from Peter Langford. Debby Quertier will also assist. Any further offers of help or ideas, please let the people concerned know.

David Le Conte will be in Alderney on eclipse day with the NAM99 party and most of the members present at the meeting hoped to be there too. David Williams and Daniel Cave will also be there. Live images of the eclipse will be projected at Candie, it is not necessary to have someone there. The best place to view the eclipse from Guernsey will be from the north of the island, though any open space is suitable. It is expected that many people will make their way to L'Ancresse Common, and traffic could be a problem. Please do not park on the common itself. A prolonged display of Bailey's Beads should be visible from Guernsey. We need to decide how much involvement the Section will have on eclipse day, answering the public's questions etc.

A special eclipse stamp will be issued in April. David has been working with the artist to ensure accuracy. There will be a first day cover with our logo on it. There will be at least five stamps with one stick-on label.

8. Fund raising

Although the eclipse viewers are selling, we need to get them in as many outlets as we can. They will be taken to the talks for sales. Any member who can sell some to friends, family etc, please do so. Ken Staples is dealing with this aspect.

David Le Conte is writing a book about the eclipse from the Channel Islands, it will be priced to include a viewer. Profits will go to the section and La Société. David is working with La Société on this. It will be on sale throughout the Channel Islands.

T-shirts may be sold at the open day and talks. La Société has a stand at Floral Guernsey in early June and this may be a possible outlet for viewers, T-shirts etc.

9. Final Note

Gareth Coleman said he would like the Section to consider the purchase of a reasonable refractor at some point in the future. It was agreed that this would be given consideration after the purchase of the large telescope.

There was no other business and the meeting closed at 10.30pm.

Debby Quertier

New Web Page

The January issue of Sagittarius can be found on the web at:

www.netcomuk.co.uk/~pmlang

This issue will be posted there too in due course.

Forget the Easter Eggs, they only melt - Stars last longer

by Jessica Harris

Last Easter I was looking in the shops at chocolate eggs to buy for my young nephew, they seemed over-priced and I knew that he was probably going to end up with about six from various other doting relatives.

Then a thought struck me, instead of giving him a chocolate egg, I would give something more fun, interesting, practical and educational. So off I went to the La Société Guernesiaise and joined him up, and then I contacted the Secretary of the Astronomy Section and arranged a visit to show him around, and enrol him at the club.

When I went round on Easter Day and told him what I had done, he was "over the moon", and wanted to go and see the club there and then. I explained to him about meeting the Secretary one night and that I would take him up, but he was still very excited. His parents were impressed by the gift I had chosen, I explained to them what it was all about and what went on at the club. Albeit a little old for my nephew's entire understanding yet, he's very interested and comes up to the club with me on occasions.

It's a shame there are not more junior members of the Astronomy Section, but that is the purpose of this article, to encourage all you other members out there to promote, and let younger people know about, our club. Reasons why it would be a great gift to give at Easter (or any other time for that matter), it costs about the same as a good size chocolate egg, it doesn't melt in your hand, it won't make you put on any weight, and it lasts a whole year. Seriously though, the cost of joining the La Société Guernesiaise for junior members is £3.50 and membership to the Astronomy Section is £3.00 for juniors.

It's a shame there are not more junior members of the Astronomy Section, but that is the purpose of this article, to encourage all you other members out there to promote, and let younger people know about, our club.

We have excellent facilities, a clubhouse to meet and regular meeting times each week with talks and activities once a month. There is quite an extensive library of books and videos that can be borrowed by section members, and we subscribe to most of the top astronomy magazines, which can also be borrowed or read at the club. The equipment is also very good, we have the main 14 inch observation telescope in its own purpose-built housing connected to a CCD camera for imaging, and an 11 inch portable telescope for general observation also equipped with sun filters for solar observation. A computer in the clubhouse is connected to the Internet for research and for finding out information. Our project at the moment is to raise enough money to

buy a new 16 inch telescope to replace our older 14 inch one, and will be capable of tracking via computer. Members receive the quarterly club newsletter Sagittarius, which has information, articles as well as quarterly moon and star charts to tell you what to look out for in the coming months. At the clubhouse on meeting nights, there is always an "old hand" or two to give the new budding astronomer help and advice, and with the solar eclipse coming up in August it's a very exciting time to join the Section.

So I hope this has given you some "food for thought", if you need to contact anyone of the Section Officers for more information, their names and numbers are all on the back page of your Sagittarius Newsletter.

Jessica Harris

Astronomy and Space - References for further reading *compiled by Geoff Falla*

Meteor Impacts. Some of the major impact events which have shaped the Earth's history. *Sky and Telescope, December 1998*

Life in the Universe? - The SETI programme. Prospects for the discovery of life elsewhere in the Universe. Development of the SETI programme - the Search for Extraterrestrial Intelligence. *Sky and Telescope, December 1998.* Also SETI use of Aricebo radio telescope, home computers and the Internet. *Astronomy and Space, February 1999*

Habitable Moons. Conditions for the possible evolution of life on moons orbiting giant planets. *Sky and Telescope, December 1998*

Revolution in Cosmology. A changing view of the Universe. Evidence suggests the Universe seems to be accelerating rather than slowing down. *Scientific American, January 1999*

SOHO - The Solar Observatory. The success of the SOHO project, launched in December 1995 to study the Sun. After a communications failure for several months contact was recently established and operations resumed. Comprehensive report and photographs. *Astronomy Now, January 1999*

Eclipses and Occultations. How the changing motion of planets and moons produce eclipses and occultations. *Astronomy Now, January 1999*

Spiral Galaxies. Revealing the hidden structure of spiral galaxies using the wavelength of H-alpha emission in electronic imaging. *Astronomy Now, January 1999*

Neptune's Moon Triton. Triton is changing. Evidence that during the last ten years atmospheric temperature and pressure have increased. *Sky and Telescope, February 1999*

Double Star Observing. Micrometer measurement of binary stars. An amateur's work helping to provide information on stellar evolution. *Sky and Telescope, February 1999*

Mars - Launch of new probes. Two recently launched probes bound for Mars. A Polar Lander will analyse soil samples in the South Polar region while the Mars Climate Orbiter will study atmospheric conditions. *Astronomy Now, February 1999*

The Mars Meteorite (ALH84001). Controversy over evidence for possible life in the meteorite. Indication of biological activity accepted by some scientists, countered by claims that there may be an alternative explanation for what has been found. *Astronomy Now, February 1999*

Black Holes. The nature and strange properties of black holes. Powerful circumstantial evidence seems to prove that they do exist. *Astronomy Now, February 1999*

Astronomer Edwin Hubble. The story of how Edwin Hubble uncovered the true nature of an expanding Universe of galaxies, unknown until his discoveries. *Astronomy, February 1999*

Stellar Evolution. The evolution of stars is usually a gradual process. Dramatic changes which can sometimes happen. *Sky and Telescope, March 1999*

Blue Moon. The occurrence of 'Blue Moons'. Originally the result of exceptional volcanic eruptions or forest fires the term now applies to second Full Moon in any one calendar month. This year is rare with two Blue Moons. *Sky and Telescope, March 1999*

Mars Research *by Geoff Falla*

The pace of discovery in planetary studies, as in the wider field of astronomy, continues to provide a constant source of interest. It was once thought that the red planet Mars was, and probably always had been, a dry planet of sandy deserts, only indicating some frozen moisture at its poles. The advent of space probes, rather than our distant view using Earth-bound telescopes, has changed our understanding of the real Mars. The surface is far from uniform. A volcanic mountain, which has been given the name Olympus Mons, is higher than anything on our own much larger planet, while a huge rift valley is likewise more impressive in scale than the Grand Canyon in the USA. The polar ice, particularly at the North Pole of Mars, is thick and must contain large quantities of water. Evidence suggests that Mars once had a substantial atmosphere with abundant surface water, possibly in the not too distant past. The search for life, past or present, on Mars is set to continue after the inconclusive results of the Viking soil test mission which is still the subject of debate. Mars Global Surveyor is presently photographing the planet from low orbit, while a Polar Lander and a Climate Orbiter are due to arrive at their destination before the end of the year.

NASA has announced a stunning new project, to fly an aircraft over the Martian surface. It will photograph target areas for further study and is due to make its flight in 2003, a hundred years after the Wright brothers' historic flight on Earth.

Astronomical Quiz

***Mark Humphrys** poses some questions to test your astronomical knowledge*

1. If a Light Year is 5.88 trillion miles long, how long is a Galactic Year?

2. The brightest star in Taurus is a 0.85 magnitude orange K type giant. What is it called?

3. What is the closest giant galaxy to our own and how far away is it?

4. Stephen Hawking is famous for his studies of what dense objects?

5. What is parallex and what did Hipparcos do recently?

6. The Sombrero Galaxy, M104, in Virgo has a very distinctive shape, with a dark lane of material through the middle, but what other reason makes it important?

7. The Harvest moon occurs when? It is followed by what?

8. The Georgian planet is what?

9. What stars constitute the summer triangle and who first coined the term?

10. What is the longest running TV show?

11. NGC is a prefix used for objects listed in a catalogue. What is the full title of the catalogue and who compiled it and when?

12. Speculum is made from which metals and what famous telescope was made from this material?

13. A spacecraft's heat shield is eroded by friction as it re-enters the atmosphere, this erosion keeps the spacecraft from melting. What is this process called?

14. Where is the European Southern Observatory?

15. Space time was first considered in what two famous theories?

16. Who was the patents clerk who wrote these two theories?

17. Which planet has the lowest density, so much so that it would float on water?

18. What asteroid did the Galileo spacecraft discover and what was particularly unusual about it?

19. How long did the Galileo probe last as it plunged through the atmosphere of Jupiter?

20. What is the difference between an Amor and an Apollo asteroid?

21. What is the first possible flyby of a star and by what?

22. What is WIRE and what is it supposed to do?

23. What was the name or number given to the lump of rock that was thought to contain evidence of extra terristrial life? Where is this rock thought to come from?

24. What is the largest single element telescope mirror in operation (or close to first light) and where is it?

25. Which member of the San Francisco Sidewalk Astronomers became famous for his easy to design and build telescopes which lead to the increasing popularity of large "light buckets"?

Answers on page 13

The Oldest Computer and the Millennium Bug

by Geoff Falla

According to an article published last year in The Times newspaper the oldest computer in the world is about to suffer from the infamous millennium bug, and there is no cure to put it right. An ancient astronomical calculator has been discovered, made from brass and in the form of a calibrated wheel, called an equatorium. The rare instrument is about 12 inches in diameter and was made by an unknown astronomer in 1600 to chart the positions of the planets and to predict eclipses with great accuracy. Unfortunately it becomes useless after 1999 as the movements of solar system bodies are predicted for a 400 year period from the date of its manufacture. The equatorium is presently on display at Liverpool Museum's Space gallery. Being thought to be the only complete one of its kind in existence it could be worth several million pounds. It is planned to use the equatorium one more time before the end of the century - to indicate the forthcoming total eclipse of the Sun on on the morning of 11th August.

Donation of Books to the Section

The Section has recently received a generous donation of very many astronomical books, maps and slides. They have been kindly donated to us by Steve Molyneux of the Astronomy Society in Jersey. He inherited them from his late uncle, Professor S K Runcorn who was a university science professor in the USA.

We have already received a few boxes of books and there are more to follow. We shall need to review the storage situation at the Observatory to accommodate them all. At present the two shelving units are full but the space could be used better and we shall certainly need additional shelves. Over the next few months and once all the new books have arrived it is planned to properly archive everything. The new books cover a huge range of subjects, from beginner's level to a very advanced stage - more than enough to study for a degree in Astronomy. There is even a book in Russian!! The collection includes a wonderful selection of slides

with Voyager pictures of Jupiter and Saturn. There are also many maps of the Moon in considerable detail plus maps of several other bodies in the Solar System. Thank you very much to Steve Molyneux for this generous donation which is gratefully received by the Section.

Debby Quertier

Following is the In Memoriam notice for Professor Runcorn, whose book collection has been donated to the Section, from the Geophysical Institute, University of Alaska Fairbanks

Stanley Keith Runcorn, who held the Sydney Chapman Endowed Chair in Physical Sciences at UAF, was slain in December in his hotel room in San Diego, California. The apparent victim of a robbery, Runcorn, 73, was visiting the area to lecture at the University of California before attending the annual meeting of the American Geophysical Union in San Francisco. He accepted the position of endowed chair at UAF shortly after he retired from the University of Newcastle upon Tyne in 1988. The chair was named in honor of Chapman, the scientific director of the Geophysical Institute from 1951 to 1970.

Originally from Lancashire, England, Runcorn was highly regarded internationally as a geophysicist. Considered a scientific pioneer in plate tectonics, he is renowned as a central player in two of the major earth science debates in the mid-twentieth century: the origin of Earth's magnetic field and the validity of the theory of continental drift.

Professor of Geophysics David Stone calls Runcorn, who remained unmarried, one of the great generalists in geophysics. "He knew a great deal about the various aspects of the moon, the earth, and the origin of planets," Stone said. "Right up until his death, he was working on how magnetic reversals occur." A Fellow of England's Royal Society since 1965, Runcorn held honorary doctoral degrees of science from Utrecht University, Gent University, Paris University and Bergen University. In 1984, he received the Gold Medal from the Royal Astronomical Society, and in 1987, he was awarded the Wegener Medal from the European Geophysical Society, an organization similar to AGU. Runcorn also sat on a committee of scientists overseeing the experimental Biosphere II Space Habitat in Arizona from 1991 to 1993, and he was a member of the Papal Academy of Science, which is Pope John Paul II's science advisory panel.

Runcorn will be missed by many for whom he was both personal friend and mentor. Kenneth Creer with the Department of Geology and Geophysics at the University of Edinburgh wrote: "For all his achievement and many awards, Keith Runcorn remained modest and unpretentious. His reputation as one of the foremost geophysicists of his generation will remain long after his death, as will memories of his warmth and sincerity." One of Runcorn's students, Jim Stuart Runner-Beuning, adds, "Professor Runcorn will always be an inspiration to me as he has been to so many throughout his productive, creative life. He will be missed."

Quiz answers

1. An estimated 200 to 240 million years, it is the length of time for the Sun to make one complete orbit of the Milky Way Galaxy.
2. Aldebaran
3. Andromeda, M31. It lies an estimated 2.4 million light years away.
4. Black holes. A singularity so dense that its gravity prevents light escaping from it. Cygnus X-1 is a likely candidate for a black hole.
5. When a star is viewed from different perspectives as the Earth orbits the Sun so its apparent position will shift. The larger the parallex the nearer the star. The Hipparchos satellite measured the parallaxes of hundreds of thousands of stars to very high accuracy.
6. It was the first galaxy to have its rotation detected.
7. It is the full moon nearest the autumn equinox and is followed by the Hunter's moon.
8. Uranus. The name given to it by its discoverer, William Herschel, in 1782 in honour of his patron, King George III.
9. Altair, Vega and Deneb. Patrick Moore.
10. Sky at Night, it has been running since its first showing in April 1957.
11. New General Catalogue of Clusters and Nebulae. The Danish astronomer J.L.E. Dreyer, published in 1888.
12. Copper and Tin. The 72inch "Leviathan" telescope at Birr Castle, Ireland, built by the Third Earl of Rosse.
13. Ablation.
14. Atacama desert, La Silla, Chile
15. Special Theory of Relativity and the General Theory of Relativity.
16. Albert Einstein, The Special Theory of Relativity was written in 1905 and the General Theory was written in 1916.
17. Saturn, its average density is 0.7 grams per cubic centimetre, water has a density of 1.0 gram per cubic centimetre.
18. It discovered Ida, and its satellite Dactyl, it was the first asteroid found to have a satellite.
19. It lasted about 57 minutes.
20. An Amor has a Mars crossing orbit while an Apollo asteroid has an Earth crossing orbit.
21. It is expected that Pioneer 11 will flyby Lambda Aquila in about 4,000,000 years time.
22. It stands for the "Wide Field Infrared Explorer", and it will study the formation of galaxies.
23. ALH84001 and its origin is thought to be Mars.
24. The Subaru telescope on Mauna Kea, Hawaii. It is 8.3 m in diameter. There is also the 8.2m Very Large Telescope and the 8.1m Gemini series of telescopes.
25. John Dobson made telescopes out of plywood with a simple mount. The mirrors where often made out of plate glass and some large diameters have been created, 30 or more inches are now quite common.

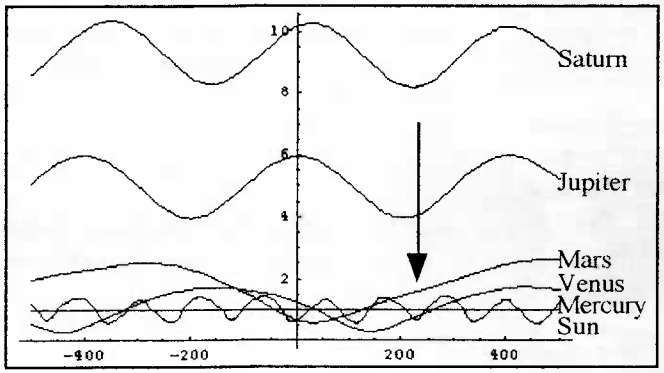
The Ancient Order of the Planets

by Peter Langford

In ancient times, when the Earth was the centre of the Universe, the order in which the solar system bodies were arranged, in terms of distance from the Earth, was understood to be as shown in the table. The Moon was closest to the Earth and Saturn was furthest.

Planet Order
Moon
Mercury
Venus
Sun
Mars
Jupiter
Saturn

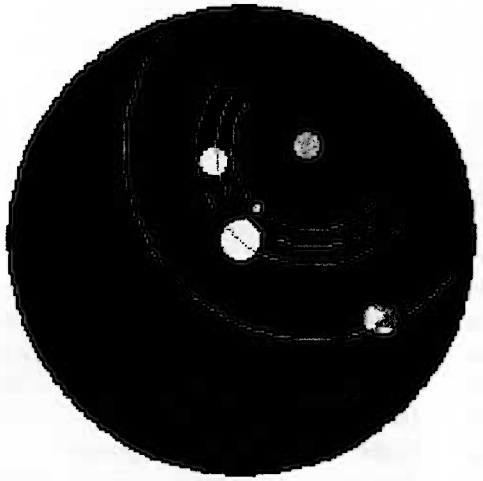
To we who are accustomed to thinking in terms of planets orbiting the Sun it looks a bit cockeyed. The Moon is fine as the closest body to us and Saturn and Jupiter are correct as the two most distant planets but the order of Mercury, Venus, Sun looks wrong. Mars is OK on the list if it is on the opposite side of the Sun to the Earth but what if it is on the same side? Nevertheless, when I thought about it, it seemed that there might be times when the bodies, put in order of distance from Earth, might appear in the ancient order. I decided to investigate.



The first chart shows the distances of the planets and Sun from the Earth over a period of plus and minus 500 days from 1st April 1999. The scale is in Astronomical Units and it can be seen that the Sun is a flat line at a (more or less) constant 1 AU from Earth. Mercury is a high frequency line based around the Sun line. Venus and Mars both dip below the Sun line from time to time. The two upper lines are for Jupiter and Saturn. They never change their order in terms of distance from Earth.

The chart reveals that from time to time, but not very often, we do find the planets and Sun in the ancient order. One such interval, marked by the arrow, occurs about 230 days from 1st April 1999. In fact calculations reveal that the ancient order will be correct for a three week period from the 8th to 28th November 1999.

The chart on the next page shows the positions of the planets in the middle of that period, on the 18th November, with distances from the Earth marked off to show the bodies are indeed in the proper order.



A further interesting aspect of the ancient order of the heavenly bodies is the way that it gave rise to our order of days in a week. The days corresponding to the heavenly bodies are:

Moon -> Monday
Mercury -> Wednesday (French Mercredi)
Venus -> Friday (French Vendredi)
Sun -> Sunday
Mars -> Tuesday (French Mardi)
Jupiter -> Thursday (French Jeudi)
Saturn -> Saturday

The order of the heavenly bodies is nothing like the order of the days of our week, and yet one led directly to the other. How come?

The answer lies in the number of hours in the day. The ancient Mesopotamians divided the day into 24 equal divisions. Each hour of the day was presided over by a planet-god in their ancient order from furthest to closest to Earth. The day was named after the planet presiding over the first hour. Thus if it was Saturday the first hour would be Saturn's. The next hour would be Jupiter's and so on through the day as shown in the table until the 24th hour was presided over by Mars. This meant of course that the first hour of the following day was presided over by the Sun, so after Saturday comes Sunday! The same pattern continues through the week with the first hour of each day presided over by the planet three further on in the list until seven days later the pattern repeats itself.

Saturn	1	8	15	22
Jupiter	2	9	16	23
Mars	3	10	17	24
Sun	4	11	18	
Venus	5	12	19	
Mercury	6	13	20	
Moon	7	14	21	

11-inch telescope to Alderney

On the day of the eclipse we shall be taking the 11-inch Celestron telescope to Alderney to make it available to observers there. If anyone else is intending to take a telescope over can they please contact David Le Conte, particularly if access to an electricity is required. An electricity supply is being set up but in a corner assigned to some fifty members of the media.