Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

January – March 2007

Forthcoming Events

AGM (Business Meeting)
23rd January: 8.00 pm at the Observatory

Public Lecture:

Professor David Hughes:
"Killer Asteroids and the Bombardment of Planet Earth"

18th April: 8.30 pm
(to be confirmed)
Duke of Richmond Hotel

Total Lunar Eclipse

3rd/4th March

WEA Course

Thursdays 8.00 pm
8th February – 15th March
Observatory

In addition, the Section meets at the Observatory every Tuesday evening, and Friday if clear for observing.

Inside

Astronomical Events in 2007	2
Total Lunar Eclipse	5
Cloudy Night Discussion Questions	7
Abstracts from Astronomy periodicals	7
The Remarkable Guernsey 'Meteor' and Earthquake of 1843.	9
Leonid Observations	15
Saturn - Lord of the Rings	15
Section News	16

Inserts

Star chart

Sunset, sunrise, moonset and moonrise times

Open Evenings

Astronomical Events in 2007

This year there will be a total eclipse of the Moon, several good occultations, and favourable circumstances for the major meteor showers.

PLANETS

The dates of maximum elongations of **Mercury** are as follows. It can usually be seen about ten days before and after these dates.

07 February	Evening	
22 March	Morning	Poor
02 June	Evening	
20 July	Morning	
29 September	Evening	Poor
08 November	Morning	

Venus will be the 'Evening Star' in the west from the beginning of the year until July, and the 'Morning Star' in the east from September until the end of the year, its greatest eastern (evening) elongation being on 08 June, and its greatest western (morning) elongation being on 27 October.

Mars becomes visible in July in the east before sunrise, and gradually gets earlier and higher, passing through Aries, Taurus, and Gemini. Its motion will be retrograde from November to the end of the year. It will reach opposition on Christmas Eve, 24 December, when it rises at sunset, and transits the meridian at midnight, at a good altitude of 66 degrees. It will then be at a distance of just under 0.6 astronomical units (89 million kilometres, 55 million miles), and will have an angular diameter of less than 16 seconds of arc. This is, therefore, not a very good opposition, but nevertheless, it will be worth observing. Its north pole will be tilted towards the Earth. (On the morning of 24 December there will be a very close conjunction of Mars and the Moon. For more details, see under the heading "Occultations and conjunctions", below.)

Jupiter remains low in the morning sky from the beginning of the year. Opposition is on 05 June. It will then be visible low in the evening until October. At a declination of -22 degrees, it does not reach an altitude of more than 20 degrees throughout the year. So this is, regretfully, not a good year for observing Jupiter from our northerly latitude. As usual, there will be transit and occultation events involving Jupiter's moons, details of which can be found by following the link to "Chasing the Moons of Jupiter" at *www.skyandtelescope.com/observing/objects/planets.*

Saturn, at a declination of +15 degrees, is more favourable than Jupiter, but not quite as good as recent years. It is at opposition on 10 February, so will be visible in the evenings from the beginning of the year until early July, in Leo. It becomes visible again in the morning sky from September to the end of the year, staying in Leo and getting higher.

Uranus is at opposition in Aquarius on 09 September at magnitude 6, and **Neptune** is at opposition in Capricornus on 13 August at magnitude 8.

DWARF PLANETS

Pluto, which has now been re-designated by the IAU as a dwarf planet since it does not have sufficient mass to have cleared its orbital neighbourhood (the Kuiper Belt), reaches opposition in Sagittarius on 19 June at magnitude 14.

The other two dwarf planets are: **Ceres**, in the asteroid belt, which reaches opposition in Cetus on 09 November at magnitude 7, and **Eris** (formerly temporarily designated as $2003UB_{313}$), a trans-Neptunian object just beyond the Kuiper Belt, which, at magnitude 19 is beyond most amateur telescopes.

ASTEROIDS

The brightest asteroid is **Vesta**, which reaches opposition on 30 May in Ophiuchus at magnitude 5.

ECLIPSES

The only eclipse visible in 2007 is a total eclipse of the Moon, on the night of 03/04 March. The Moon will start entering the penumbra at 8.16 pm, and the umbra at 9.30 pm. Totality will last for one and a quarter hours, from 10.43 pm to 11.58 pm, with mid-eclipse being at 11.20 pm. The Moon will have left the umbra by 01.11 am, and the penumbra by 02.25 am. All times are in UT. It will be in Leo during this eclipse, so should make a fine sight.

There are no total solar eclipses anywhere this year, only two partial eclipses: on 19 March in Asia, and 11 September in South America.

OCCULTATIONS AND CONJUNCTIONS

There are some very close encounters of planets and bright stars with the Moon this year, and some occultations. The Moon has several near approaches to Saturn in the early part of the year, which should provide some beautiful sights. On 02 February, at 22.25 UT they are a quarter of a degree apart; on 02 March, at 02.50 UT, they are just one minute of arc apart; and on 22 May Saturn is occulted by the Moon, from 8.13 pm to 9.18 pm BST. Venus and Saturn are ¾ degree apart on 01 July.

On 18 February the 6th magnitude Uranus starts being covered by the New Moon shortly after sunset at 5.57 pm UT, re-emerging just before it sets, at 6.47 pm UT. It is doubtful if this will be visible. On 18 June, however, there is a day-time occultation of the brilliant Venus by the crescent Moon, from 3.02 pm to 4.17 pm BST.

On 24 December at 03.43 am UT Mars is less than 6 arc-minutes from the Moon.

Several stars will be occulted by the Moon, but the brightest ones are: the first-magnitude Regulus, on 30 March, at 04.34 am BST (at an altitude of only 11 degrees); Regulus again on 07 October, at 06.57 am BST, shortly before sunrise; and the 3.5 magnitude

Kappa Geminorum, on 07 September, at 04.57 am BST.

METEORS

New Moon, on 12 August, coincides with the peak of the Perseid meteors, so there will be dark skies, favouring observations of faint meteors and therefore high counts. First-quarter Moon on 17 November will hamper evening observations of the Leonids, but it will have set by 11 pm, long before the peak time of 05.00 UT on 18 November. The December Geminids, peaking on 14 December, will be unaffected by the Moon.

COMETS

Of the short-period comets, Encke (January), Macholz (April – May) and Tuttle (Sep to December) may reach naked-eye visibility. It is, of course, always possible that a new comet may make an unexpected bright appearance.

EQUINOXES AND SOLSTICES

The following are the dates and times (UT) of the equinoxes and solstices in 2007:

Vernal Equinox	20 March	00.07 UT
Summer Solstice	21 June	19.06 BST
Autumnal Equinox	23 September	10.51 BST
Winter Solstice	22 December	06.07 UT

SATELLITES

The International Space Station is regularly visible from Guernsey. Also of interest are flashes from the Iridium satellites. Many other, fainter, satellites appear every night. Details of the times and directions of visibility can be obtained from the Heavens-Above web site, accessible by a direct link from the web site of La Société Guernesiaise Astronomy Section, at www.astronomy.org.gg.

CALENDAR OF ASTRONOMICAL EVENTS

The following calendar should provide a useful day-by-day reference to the above events.

Day	Month	Date	Time	Event
	January			Comet Encke
	February	02	22.25 UT	Moon and Saturn conjunction
Wednesday	February	07	Evening	Mercury maximum elongation
Friday	March	02	02.50 UT	Moon and Saturn close conjunction
Saturday	February	10		Saturn at opposition
Sunday	February	18	17.57 UT	Moon occults Uranus
Saturday	March	03	21.30 UT	Total lunar eclipse
Tuesday	March	20	00.07 UT	Vernal Equinox
Thursday	March	22	Morning	Mercury maximum elongation
Sunday	March	25	01.00 UT	BST begins
Friday	March	30	04.34 BST	Moon occults Regulus
	April-May			Comet Macholz

Tuesday	May	22	20.13 BST	Moon occults Saturn
Monday	May	30		Vesta at opposition
Saturday	June	02	Evening	Mercury maximum elongation
Tuesday	June	05		Jupiter at opposition
Friday	June	08	Evening	Venus maximum elongation
Monday	June	18	15.02 BST	Moon occults Venus
Tuesday	June	19		Pluto at opposition
Thursday	June	21	19.06 BST	Summer Solstice
Sunday	July	01		Venus and Saturn conjunction
Friday	July	20	Morning	Mercury maximum elongation
Sat/Sun	August	11/12		Perseid meteor shower
Monday	August	13		Neptune at opposition
	Sep - Dec			Comet Tuttle
Friday	September	07	04.57 BST	Moon occults Kappa Geminorum
Sunday	September	09		Uranus at opposition
Sunday	September	23	10.51 BST	Autumnal Equinox
Saturday	September	29	Evening	Mercury maximum elongation
Sunday	October	07	06.57 BST	Moon occults Regulus
Saturday	October	27	Morning	Venus maximum elongation
Sunday	October	28	02.00 BST	BST ends
Thursday	November	08	Morning	Mercury maximum elongation
Friday	November	09		Ceres at opposition
Saturday	November	17		Leonid meteor shower
Wednesday	December	14		Geminid meteor shower
Saturday	December	22	06.07 UT	Winter Solstice
Monday	December	24	03.43 UT	Moon and Mars conjunction
Monday	December	24		Mars at opposition

REFERENCES

SkyMap Pro and *Starry Night Pro* software

RAS diary BAA Comet Section web site

David Le Conte

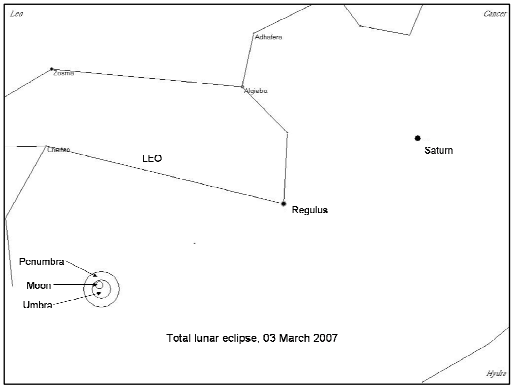
Total Lunar Eclipse

In the article in this issue on astronomical highlights for 2007 I have provided details of the total lunar eclipse which will take place on Saturday, 03 March, the umbral phase starting at 9.30 pm. This is a very convenient time and day of the week, and the eclipse should, therefore, be widely observed, especially as we will see (weather permitting, of course) the entire eclipse. During this event the Moon will be at an altitude of 33-46 degrees, just below the familiar form of Leo, and Saturn will be in the same constellation, some 20 degrees away.

When, I wondered, will be the next time we have such a convenient total lunar eclipse?

In the July/August 1994 issue of *Sagittarius*, I published a list of total

lunar eclipses visible from Guernsey for 101 years, from 1940 to 2040. This followed an article in the previous issue of 101 years of solar eclipses (the next one, by the way, will be on 01August 2008, with just 15% of the Sun being eclipsed).



I have revisited the list of total lunar eclipses, and have here provided some details of the ones we can expect for the next 34 years, to 2040 (including a couple of corrections to the 1994 list). The times are the start and end of the umbral phase, and the source of the data is the SkyMap Pro 10 software.

The interesting point that comes out of this is that we will have to wait 22 years, until 2029, before we have another eclipse to match the one this March. All the rest are either in the morning hours, or are only visible for part of the event.

So do make the most of this year's eclipse, and pray for clear skies!

David Le Conte

Total lunar eclipses visible from Guernsey, 2007-2040
(All times in UT)

2007 Mar 03	21.20 - 01.11	All visible
2008 Feb 21	01.42 - 05.08	All visible
2010 Dec 21	06.22 - 10.01	Moon sets 08.11
2011 Jun 15	18.22 - 22.02	Moon rises 20.12
2011 Dec 10	12.45 - 16.18	Moon rises 16.11
2015 Sep 28	01.06 - 04.27	All visible
2018 Jul 27	18.24 - 22.19	Moon rises 19.51
2019 Jan 21	04.40 - 06.50	All visible
2022 May 16	02.27 - 05.55	Moon sets 04.29
2025 Mar 14	05.09 - 08.48	Moon sets 06.32
2025 Sep 07	16.26 - 19.56	Moon rises 18.38
2026 Aug 28	02.33 - 05.55	Moon sets 05.30 (Not quite total)
2028 Dec 31	15.07 - 18.36	Moon rises 16.12
2029 Jun 26	01.31 - 05.11	Moon sets 04.13
2029 Dec 20	20.54 - 00.28	All visible
2033 Apr 14	17.24 - 21.00	Moon rises 18.55
2036 Feb 11	20.30 - 23.52	All visible
2036 Aug 07	00.54 - 04.46	All visible
2040 Nov 18	17.12 - 20.53	All visible

Cloudy Night Discussion Questions

I am so pleased that the Editor whilst suggesting articles for Sagittarius, included a possible list of discussion questions for those cloudy nights I am certain we will endure this winter. These discussions are something from which we all benefit.

Here are my suggestions:

- Was the inflationary period real or did it just fit the theory?
- What exactly are gravitons and how do they behave?
- Can photons travel through anything? If they do we should be able to see with our eyes closed?
- Most mountains on the Earth were caused by plate tectonics but how were they caused on the Moon?
- How did Greek Mythology arrive at the star patterns, which do not easily seem to resemble the characters in their stories?
- Can anyone build an infrared or ultraviolet telescope?
- Can anyone build a radio telescope?
- Are there any original hydrogen and helium gas clouds left, or are they now all formed from supernovas?
- Our Sun and other stars evolved from the same gas cloud. Which are the other stars?
- What causes a star to be variable?
- What do we know about dark matter?

Frank Dowding

Geoff Falla's regular roundup of articles from popular Astronomy and Space Journals

New Search for Extrasolar Planets. Since 1995, around 200 planets have been identified in orbits around other stars. Planets seem to be even more common in our galaxy than previously thought, not to mention evidence of 'free-floating' planets in space, not tied to stars at all. A set of articles. (Astronomy, October 2006)

Where is Life Hiding? The search for life elsewhere, and the concept of the habitable zone which exists around stars. An examination of the present situation, and the most likely places where evidence of life may be found. (Astronomy, October 2006)

Binocular Astronomy. A set of articles as a guide to the use of binoculars. A look at some of the best for this purpose, and a feature on the world's largest - the Large Binocular Telescope in Arizona, with 8 metre mirrors now being completed. (Astronomy Now, October 2006)

Pluto - To be, or not to be? The recent decisions of the International Astronomical Union in Prague on the redefinition of planets. Pluto has been declared to be a dwarf planet, but decisions on what will in future qualify as a planet is still arousing

controversy. (Astronomy Now, October 2006)

Pluto Demoted. A detailed summary of the IAU's recent decisions on the definition of a planet, and that Pluto is now to be the first in a new class of 'dwarf planets'. (Astronomy and Space, October 2006)

The Space Science work of Herman Noordung. A 1928 pioneering book by the Slovenian scientist Herman Noordung included the principles of space stations, and geostationary satellite orbits - later inspiring the further work of Arthur C. Clarke. (Astronomy and Space, October 2006)

Skywatch 2007. A full year of celestial sights and highlights on what can be expected, including observing tips and projects. (Sky and Telescope, Skywatch 2007 Special Issue, Autumn 2006)

Footprints on the Moon. A detailed look at all of the six Apollo landing sites on the Moon, and notes on each of these missions from the first, Apollo 11 in July 1969, to the final Apollo 17. During these missions, much was learned about the Moon, and many rock samples returned to Earth for further study. (Sky and Telescope, Skywatch 2007 Special Issue, Autumn 2006)

Pattern in the Planets. The formula commonly known as Bode's Law sets out accurately the orbital spacing of most of the major planets. Although many scientists have dismissed this as a coincidence, similar regularity in the orbital periods of planetary moons has also been noted. (Focus BBC Science Magazine, October 2006)

The Hunt for Magnetars. In the last ten years the existence of magnetars has been established. They are a type of pulsar having intense magnetism, and producing huge bursts of energy. As a new development in high energy astrophysics, many questions still exist. (Astronomy, November 2006)

Does Life really need Water? It has usually been claimed that for the development of life anywhere, the presence of water is essential. New research suggests that in the absence of water, the activity of developing life slows down but is not an absolute requirement. (Astronomy, November 2006.)

Magnetic Fields. It has been found that magnetism plays a crucial role in many phenomena, not only in our solar system but in our galaxy and beyond. A set of articles focusing on Earth's magnetism, the giant magnetic fields of Jupiter and the Sun, and the probability that the largest explosions in the universe are also powered by magnetic fields. (Astronomy Now, November 2006)

What Happened to Pluto? The background to what happened at the IAU committee meeting in Paris, and at the General Assembly gathering in Prague which changed the status of Pluto to a dwarf planet, explained by the chairman of the IAU's planet definition committee. (Sky and Telescope, November 2006)

The Most Dangerous Asteroid. Discovered in June 2004, it has been found that the asteroid Apophis will make a close pass to Earth - probably within a few diameters' distance, in April 2036. If it becomes a real danger, there are hopes that by then means will have been developed for it to be deflected in some way. (Sky and Telescope, November 2006)

NASA Saves Hubble. An earlier decision to abandon further servicing of the Hubble Space Telescope has now been reversed. A new mission, due for launch in 2008, will also upgrade the telescope with new instrumentation which will extend its capability in further scientific discoveries. (Astronomy Now, December 2006)

The Future of Cosmology. The past year has produced uncertainties in the present understanding of cosmology. More detailed observations have shown problems with present theory, which may result in solutions being found, or may even lead to some major revisions. A set of articles. (Astronomy Now, December 2006)

Where did our Universe come from? It seems impossible that our universe could have been created from nothing, but current understanding is that 'nothing' can have energy, and that the 'vacuum energy' at the beginning transformed itself into matter and radiation. (Sky and Telescope, December 2006)

The Remarkable Guernsey 'Meteor' and Earthquake of 1843.

Meteors or 'shooting stars' are not that uncommon, and most of us must have seen these at some time or another. Those of us who are interested in astronomy, and look at the night sky more often, will have seen meteors quite frequently. Usually seen as just a brief streak of light, lasting perhaps for a second or so, a meteor can easily be missed perhaps if we happen to be looking in just a slightly different direction at that instant.

Some meteors are much more spectacular, very bright and leaving a luminous trail in the sky, fading away after a short time. Even these occasional, much brighter meteors are not expected to be in view for more than perhaps five or ten seconds at most.

Meteors are not usually thought of as being related to earthquakes in any way. After all, meteors are a phenomenon of the sky, with only some of the larger ones continuing down to the ground as meteorites. Earthquakes are a result of movements in the Earth's crust, mostly happening near ocean margins and in areas of geological fault lines.

Earthquakes or earth tremors of any intensity are fortunately rare in the Channel Islands, but they do happen very occasionally. The most significant event of this kind was recorded in Guernsey in 1843, and was preceded by what was thought to

be a large and very slow moving meteor. However, all meteors travel at great speed as they burn away in the atmosphere. There is occasionally a report of a large 'fireball' type of meteor which remains visible for longer than normal, because of its size and the time taken to burn away, but meteors of any kind are certainly not known for slow progress across the sky.

The luminous object seen over Guernsey in December 1843 was something really exceptional. A book on the islands and local history by D.T.Ansted, *'The Channel Islands'* describes the object as a very remarkable meteor. The newspaper Guernsey Star, in a report published on December 25th, 1843, describes the appearance as a round luminous object 'like a clouded Moon'. It was seen at 7 pm on Wednesday, December 20th, and continued to be visible for an extraordinary length of time - ten to fifteen minutes. No tail was mentioned behind the moving object, which would normally be observed in the case of any large, swiftly moving meteor.

The major subject of this Guernsey Star report was that, two days after this remarkable object was seen in the sky, the island was shaken by an earthquake, at just after 3.50 p.m. on Friday, December 22nd. Buildings were reported to have swayed, and there was a considerable amount of minor damage. Many people rushed out of doors for safety. The earthquake was noted as being of very considerable violence, and the movement was such that the Town Church bell struck twice. A loud rumbling or undulating noise was heard in every part of the island at the same time, and there was a second tremor about an hour later.

It was also mentioned in this report that the sky had an unusual appearance at the time of the earthquake. It had been a fine, bright day until around 3 pm but the clouds were then noted as being tinted with colours of pale green, red, and purple. These strange luminous effects suggest that the earlier object in the sky was probably not a meteor, since it was far too slow in its movement. It seems more likely that these appearances were, indeed, directly associated with the earthquake activity, as other reports also seem to confirm.

Luminous Phenomena and Earthquakes.

The British Isles do not suffer from earthquakes to the same extent as many other countries, but the most destructive one to be recorded in Britain was centred near Colchester in Essex, on April 22nd, 1884. The earthquake, at 9.18 am lasted only five or ten seconds, but was felt strongly over a wide area including London, and damaged over a thousand houses in the Colchester area and on Mersea Island. Here, as in Guernsey about forty years earlier, an unusual luminous effect was seen, as it was noted that there was a red appearance in the sky over Colchester at the time of the earthquake.

Something similar to the round luminous object or 'clouded Moon' as described moving over Guernsey in 1843, has also been seen elsewhere on other occasions, also at the time of earthquakes.

One of the earliest of these reports was in the 18th century. On June 7th, 1779, the day of an earthquake at Boulogne, on the Channel coast of France, it was reported that a large number of luminous globes also filled the air.

Another example was when there were earth tremors at Bucharest in Romania, on December 27th, 1793, at 7.30 pm. In a description of this event, it was noted that *'the ground trembled three times, and on the following evening at the same time the Moon performed a miracle, as it transited through the sky for half an hour.'*

These reports seem very relevant to what was seen over Guernsey, shortly before the earthquake of 1843. A catalogue of earthquakes felt in the Channel Islands was compiled by A.E.Mourant, of Jersey, and was published by La Societe Guernesiaise in the Transactions of 1930. A supplement was also produced, and published in 1937. This describes the Guernsey event of December 22nd, 1843, and its effects in some detail, noting that it was by far the most intense of those recorded with a centre in or near Guernsey, and the only one to be felt beyond Guernsey and Sark. It was also reported from St Malo, the Normandy coast, and as far away as Brixham in Devon.

This description of the Guernsey earthquake did not mention the round luminous object seen moving across the sky on the evening of December 20th, or the strange colour effects noted in the sky at the time of the earthquake on the afternoon of December 22nd, as recorded in the Guernsey Star report. Perhaps this was because, even if known, the author of the catalogue did not draw any connection between the luminous appearances and the earthquake itself.

Two reports from Italy in 1887 both described unexplained red glows in the sky at the time of earthquakes, similar to what was reported from Colchester just three years earlier. At 6 am on February 23rd, 1887, an earthquake was felt in the city of Genoa, with a red glow of light in the sky. At other places along the nearby Riviera the earthquake was noted as being more severe, with a fiery appearance in the sky also described. On December 3rd at Roggiano, another earthquake destroyed almost a thousand houses, and there were descriptions again of fiery appearances in the sky at the time. These luminous appearances were attributed by scientists to being merely a coincidence, also concluding that glows in the sky could not possibly be connected with geological disturbances.

At Worcester in England on December 17th, 1896, an earthquake with several shocks at 5.30 am was described as being accompanied by 'a strange meteoric light'. An extraordinary

meteor, at the time of the largest shock, traversed a large part of the disturbed area, completely lighting up the ground. This was the second most significant British earthquake of the 19th century, only exceeded in intensity by the 1884 Colchester earthquake.

On August 16th, 1906, Valparaiso in Chile had an earthquake which was accompanied by 'a terrible darkness', and a flaming glow in the sky as if the whole sky was on fire. However, a seismologist who examined more than a hundred reports of lights seen in the sky at the time, stated that people had perhaps seen lights from the city's tramcars, or searchlights from warships. As in many kinds of unexplained phenomena, scientists have in the past often dismissed such reports without further investigation, mainly because no acceptable physical mechanisms have been available to explain the observations.

On the same night as a severe earthquake in Mexico in 1907, the captains of several ocean ships in the tropics reported seeing strong glows in the sky, and described as resembling the auroral displays of northern latitudes. These glowing effects were not, however, reported from anywhere further north.

The occurrence of glowing effects in the sky, as well as luminous objects appearing at around the same time as earthquakes has become well established, and has led more recently to these phenomena becoming known as 'earthquake lights'. These may be seen before, during, or after the earthquake activity.

One of the most substantial examples of these strange effects was when an earthquake affected the Idu Peninsula area in Japan, at 4.30 am on November 26th, 1930. About 1,500 reports were collected relating to lights seen accompanying the earthquake. In most of the reports the sky was noted as being lit up as if by sheet lightning, but with the duration of each single flash of light being longer than ordinary lightning. Beams and columns of light were seen at different places, with descriptions also of lights like fireballs. Clouds were illuminated, and a reddish glow was seen in the sky. A most remarkable observation was reported from Hakona-Mati, near the epicentre of the earthquake, when a straight row of round lights was seen while the earthquake was at its strongest. Most observers described the colour of the light during the earthquake as pale blue or white, with many descriptions also of reddish or orange colours. The lights were seen both before the earthquake and for some time afterwards, but were noted as being most conspicuous during the main part of the earthquake. More recently in Japan, many lights in the sky were also seen, and photographs taken, during a series of earthquakes in the Matsushiro area between 1965 and 1967.

In England, just before an earthquake in 1957 which was centred on the Charnwood Forest area of Leicestershire, people in several

counties not far away reported seeing lines of 'tadpole shaped' lights in the sky. On April 26th, 1966, a scientist in the Soviet city of Tashkent reported being awakened soon after 5 am by a brilliant light. At the same time, an engineer who was walking along one of the city streets heard a loud rumbling sound followed by a bright flash of light. Moments later there was a major earthquake which destroyed a great many homes. When residents went out into the streets, they described seeing strange glowing spheres floating through the air, 'like lighted balloons'.

Round luminous objects, described as being like a clouded Moon moving across the sky, as seen before the Guernsey earthquake of 1843, luminous globes seen at Boulogne in 1779, and Bucharest in 1793, or the spheres like lighted balloons as at Tashkent, seem to be all very similar descriptions of the same kind of phenomenon.

As already noted in these and other examples, various glowing effects and meteor-like objects are sometimes reported as accompanying the arrival of an earthquake. How these phenomena are produced is not yet properly understood. It is thought that the effects are associated with varying levels of electrical activity in the Earth's crust, and in particular regions.

One of the most remarkable events was reported from Veracruz, Mexico on March 27th, 1968, when at just after 2 am a strange 'meteor' was followed by earth tremors. The event was first seen from a ship in the Gulf of Mexico, the crew describing two or three objects in the centre of a bright ball of fire. The crew of a Mexican warship also reported seeing a flaming object, and the crews of both ships described the waters of the Gulf as being churned into fountains of spray after the object had passed by. In Veracruz, on the western shore of the Gulf of Mexico, a deafening rumbling noise accompanied a brightening of the sky. It then became as bright as day as the 'meteor' was seen by the alarmed residents, who were awakened and went out into the streets. The object in the sky seemed to dip towards the ground, then rose and moved away.

The Head of the Mexican Department of Meteorology at Veracruz collected all of the reports, and conducted a careful investigation. His official summary concluded that the object was probably not a meteorite, because it had a curved trajectory, and did not fall to Earth. It seemed to have descended before going upwards again, and it was uncertain what the object actually was.

Fatima, Portugal - The Guernsey Connection.

The Fatima area is located about 80 miles north of the Portuguese capital, Lisbon, and was the scene of unprecedented events seen by many thousands of people in 1917. Between May and October of that year, there were monthly apparitions of a luminous figure, with other unexplained phenomena. The events were accompanied by colour changes

in the sky, reflected on to the surroundings, and earth tremors were also noted. The final happening - 'The Miracle of the Sun', was on October 13th when, at around midday, rain clouds cleared to reveal a well defined silvery object in the sky. As described by one of those present: *'We saw a silver veil, round in shape, as if it was the Full Moon. Shortly it turned vivid purple, then to red, then to emerald green, and finally back to its original colour.'* The object, which was evidently not the Sun moved around in the sky for ten minutes or more, then began spinning before it descended towards the ground, producing great heat before returning upwards again. The events on this day were seen by more than 50,000 people at Fatima, and seen also from several towns and villages up to a distance of more than ten miles away.

Although the extent of what was seen at Fatima was clearly of more importance than that experienced in Guernsey, in 1843, much of the description of the main event in Portugal on October 13, 1917, seems to be very similar in both cases. A round luminous object 'like a clouded Moon' seen moving in the sky for ten or fifteen minutes over Guernsey, and a 'silver veil, round in shape as if it was a Full Moon' seen over Fatima, where it was noted to have moved in the sky for ten minutes or more. Earthquakes in the form of sharp earth tremors at around the same time were also reported in both cases. The colours in the sky were noted to be; green, red, and purple which were as described for both Guernsey and Fatima.

Europe's worst earthquake disaster was experienced in Lisbon in 1755, when a series of three major earthquakes destroyed the city. The largest of these earthquakes was reported as being a huge 9^{th} magnitude, and numerous 'meteorites' were also noted as accompanying the earthquake on October 15th that year. Fatima, is located in a geologically active area, and the major earthquake of 1755 passed through this same region.

The whole Fatima event was adopted by the Catholic Church as a supernatural, religious miracle, but the documents including detailed eyewitness descriptions of what was seen were kept secret, hidden from the public for many years. It was not until 1978, more than 70 years after the events of 1917, that access to the documents was granted to two Portuguese historians for the first time. Examination of these documents revealed the full extent of what was experienced, including the luminous apparitions, unexplained objects and other phenomena seen in the sky on several occasions, the strange colour effects, and the major event: the 'Miracle of the Sun'.

The mention of earth tremors noted at Fatima in association with unexplained appearances in the sky, and the similar description of events in Guernsey, in December 1843, clearly suggests some link. Further scientific investigation of such incidents and unknown manifestations is needed, so

that the cause and true nature of these events can perhaps become more fully understood.

Geoff Falla.

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Leonid Observations

A brief increase in activity of Leonid meteors was predicted for 4.45 am UT on 19 November. Gallantly, I set my alarm for 4.25 am, and watched from 4.30 to 5.10 am. Despite quite good skies, with just a few low clouds scudding past, I saw only one Leonid (plus a sporadic). It was, however, a good one, short and bright, with a brief trail, low in the south, directed well away from Leo. This was at 4.53 am. This sighting does accord with reports from Spain, where the peak occurred at 4.55 am, and with 3 to 4 meteors per minute being seen between 4.45 and 5.00 am.

I took 55 30-second photographs during my observing session, but needless to say, no meteors appeared on any of them. I am sure, however, that perseverance will pay, and that someday I will get a picture of a meteor!

David Le Conte

Saturn - Lord of the Rings.

Planet six, from the Sun,
Is a very special one,
Saturn is that planet's name,
With a reason for its fame.

When looking through a telescope,
We cannot hardly fail to note,
That around the planet closely clings,
A system of fantastic rings.

It's thought the rings perhaps consist,
Of ice and rocks that still persist,
From a moon that once fragmented,
Or failed to form quite as intended.

Sometimes we only see the rim,
When the rings look really thin,
But seen from above,or else below,
The rings are a much better show.

Of the many special sights,
To be seen on starry nights,
This most impressive of all things,
Saturn, planet of the rings.

Geoff Falla

Section News

This edition of Sagittarius has extra

pages making up for the shortfall last quarter. Thanks to all for their valued contributions.

The dark winter months bring groups of visitors to the Observatory and in the next few weeks we have visits from Church, Scout and WI groups.

The Astronomy Section is running its annual six-week "Star Gazing" course at the Observatory in February and March. Enrolment is through the Workers Education Association. As usual, it is fully subscribed.

The Observatory will again be open to the public for a number of Tuesday evenings throughout the year and a list of dates is enclosed.

We have been given advance notice of another lecture by Professor David Hughes, who gave a lecture on comets early last year. David Hughes is a highly respected astronomer and an entertaining speaker. The lecture is again being organised by Channel Islands Group of Professional Engineers and is entitled 'Killer Asteroids and the Bombardment of Planet Earth' and will take place at the Duke of Richmond Hotel on 18 April 2007. The format of the night will be similar to his previous lecture with a dinner for those wishing to meet with Professor Hughes followed by the lecture. See website, www.cigpe.gg

Colin Spicer

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