Grant application

We have submitted an application for a grant in the amount of £18,000 from the Le Riche Centenary Fund. The application is specifically for the acquisition of a modern, 16-inch Meade telescope. We have pointed out that this instrument, which incorporates a computerised pointing system, will provide a marked gain in image quality and the number of objects which can be observed. It would be particularly useful for public viewing, especially for school-children and other youth groups, as well as providing a much improved facility for the Section's own work.

We have said that the Section's aim is to stimulate interest in Astronomy in Guernsey, and that our objects are: to provide a means for people, especially the young, to appreciate the extent and content of the universe and the Earth's place in it, to assist an understanding of Astronomy, to provide observing facilities for the community, and to act as a forum for discussion and scientific study.

We have emphasised the benefits to the community and to tourism, and have estimated that in 1997 some 1600 people looked through our telescopes.

We expect to hear further about our application around the end of April. In the meantime, we would be grateful for further suggestions for sources of funds for this project. The Jersey Astronomy Club recently received a grant of £15,000 largely from the States of Jersey. However, the States of Guernsey accounting rules do not allow for such a donation. ☆ *DLC*

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The next newsletter will be published early in July 1998. The deadline for publication copy is the 15th June.

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Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

April - June 1998

Forthcoming events

Advances in Astrophysics
by Dr David Falla
Tuesday, 14th April
8.00 pm at the Observatory

Mysteries of Space and Time
by Geoff Falla
Tuesday, 12th May
8.00 pm at the Observatory

Summer Solstice Day
Solar projection and sundials
Sunday, 21st June
2.00 pm to 5.00 pm
at the Observatory

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Star chart

Sunset, twilight, and sunrise times and Moon phases

Advances in astrophysics

On Tuesday, 14th April, at 8.00 pm, at the Observatory, David Falla will talk about Advances in Astrophysics.

Please note the change of date.

This talk will review a number of subjects in which recent progress has been made: solar activity, in relation to both a recent 'geospace storm' and the general climate of the Earth;

the observation of aurorae on Saturn; some early results from SCUBA, the detector that can produce astronomical instruments in the millimetre-wavelength region of the spectrum;

infrared observations of stellar objects at the centre of our Galaxy;

and, in cosmology, the study of distant supernovae to improve our knowledge of the scale of the universe. ☆

Mysteries of space and time

Geoff Falla will be our speaker, on Tuesday, 12th May, at 8.00 pm at the Observatory, when the subject will be Mysteries of Time and Space, a selection of astronomical mysteries – some of these linked with events on the Earth, and spread over the course of history.

There will not be as much mystery if we give too many clues, so for now here are a few dates for the events: 65 million BC, AD1178, 1877, 1908 and 1955. You may recognise some of these. The location of some of the mysteries will include the Moon and Mars, and incidents will also include observations by several notable astronomers. ☆

Summer Solstice Day

Sunday, 21st June is Summer solstice Day. We plan to take the opportunity of demonstrating our solar mirror projection system. The accuracy of the mirror system has already been established, but we have not yet had much opportunity to use it for the study of sunspots, as we have just gone through a period of minimum solar activity. Now that sunspots are starting to increase again towards an anticipated maximum next year or in the year 2000, this seems a good time to start displaying sunspots on the screen inside the Observatory.

We are also planning to make a sundial for the Observatory in the near future, and some practical demonstrations will be arranged for the day.

As this is a Sunday, it will also be a suitable occasion for us to be open to the public for visits to the Observatory in the afternoon **(2.00 pm to 5.00 pm)**. ☆

Eclipse expeditions

On the 24th March members heard several reports of expeditions to the total solar eclipse on the 26th February.

George Le Couteur went on a cruise round the Galapagos Islands, and observed the eclipse from the Paraguana Peninsula in Venezuela. Stephen Sweet went to Curaçao, after spending some days diving off Bonaire. David and Chris Le Conte, and Maureen Pitman, observed from an Army Base in Venezuela, near the Colombian border, after a couple of days in the Andes.

All the expeditions were, therefore, different, but experiences of the eclipse itself were similar. Many beautiful pictures were shown and anecdotes told. ☆

Annual Business Meeting

The annual business meeting was held at the Observatory on the 20th January 1998, and attended by 8 members. The meeting was productive, with many items being covered.

1. Officers

Ken Staples was elected as the new Secretary. He will continue as the Light Pollution Officer, but the position of Education Officer is abolished, its duties being picked up under other positions.

The officers are as follows:-

Secretary	Ken Staples
Honorary Treasurer	Peter Langford
Light Pollution Officer	Ken Staples
Editor	David Le Conte
Imaging Officer	Daniel Cave
Facilities Officer	Geoff Falla
Research Officer	Frank Dowding

The last two positions are new. Geoff will be responsible for keeping the building tidy, looking after the library, and keeping the grass cut. Frank will keep up to date with astronomical developments and the latest from NASA, so that should anyone have a query, or would like him to find something out for them, please let him know and he will do his best to find an answer.

David is continuing as Editor, and, as already advised, the newsletter will be published quarterly. Contributions are always welcome, so should anyone have a favourite subject they would like to write about, please feel free.

It was decided that the load would be spread more evenly amongst the members, with those present at the meeting (Ken, Geoff, Peter, Roger, David, Lawrence and Frank) to discuss changes, developments, etc, within the Section.

2. Treasurer's Report

Peter presented the Treasurer's Report. The financial position of the Section is a good one. Expenses were discussed as follows:-

(a) It was agreed to purchase a wide-field eyepiece for the C14, the cost of which is expected to be around £140.

(b) A motorised winch was discussed for the C14 building. This would certainly ease operation. As a first step a quotation will be obtained.

(c) We have been offered a 3-inch refracting telescope, with us to meet the £177 repair bill. No decision has been made on this as the telescope has not yet been seen.

(d) An application is being made to the Le Riche Centenary Fund for a contribution towards the cost of a 16-inch Meade telescope. , We are going to obtain a quotation, which is likely to be in the region of £18,000.

3. Sunspots

As the number of sunspots is likely to peak over the next year or so, it was decided to arrange a regular period to observe them, probably on a Saturday or Sunday. The use of the solar mirrors and solar projection would be run through prior to setting up the programme.

4. Sundial

Various sundial designs were discussed, but it was agreed that we would have a vertical sundial on the Observatory wall. Lawrence is obtaining suitable designs.

5. Public visits

The public visits will continue. It was generally agreed that better publicity was needed. Enquiries will be made about a leaflet to put in schools, the Guille-Allès Library, Candie, etc. The suggestion was made that we put an article in the *In Flight* magazines. Geoff also suggested that we have a Summer Solstice visit, and show the solar telescopes to the public.

6. 1999 Solar eclipse

There may be as many as 500 people coming to the Island for the RAS National Astronomy Meeting (NAM99). The Section may be called upon to man a desk at Beau Sejour Centre during the Conference. There will be a trip to Alderney on the day of the eclipse, probably with a barbecue to follow. The extent of La Société's and the Section's involvement is not yet certain, but is being worked out by the NAM Local Organising Committee, of which David is a member.

A major exhibition on eclipses is being planned for the Guernsey Museum, in association with the RAS. It is hoped that this will include a coelostat giving live images of the Sun, hands-on displays, and exhibits about Warren de la Rue. The Guernsey Post Office is planning a special eclipse stamp issue, and the Section is involved in the stamp designs.

David is a member of the UK National Eclipse Coordinating Group, which is planning arrangements for the eclipse in the UK, especially in the areas of totality. David is planning to hold an awareness meeting in Guernsey in March, to inform everyone concerned about the eclipse, and to facilitate coordination.

The Section will have to decide if it is going to organise something special in Guernsey and/or Alderney. We can expect a number of visiting amateur astronomers, and could play a coordinating role.

The meeting lasted quite a while, but the time was well spent, with all that needed to be discussed being given attention. ☆

DB (with DLC)

Mir sightings

Members have watched Mir cross the sky on several evenings in February. It takes about 10 minutes to cross the sky at an altitude of 248 nautical miles. It is at least as bright as the brightest star, and is well worth looking out for.

At the time of issue of this edition of Sagittarius, it is hoped that there will be a current list of Mir times at the Observatory. The lists are issued for a short period of time only, as Mir is often moved to dock with the Space Shuttle and Russian Supply Vehicles. The next scheduled Shuttle Mission to Mir is on the 21st May 1998.

There are at least two numbers you can call to hear a recorded message giving current Mir times, and a list can be obtained by sending an s.a.e. to: *Mir Sightings, PO Box 7, London W12 8UD.* ☆

Debby Quertier

Certificate in Astronomy

We have received a notice from the University of Central Lancashire about a Certificate course by distance learning, and the development of further distance learning astronomy courses, including the use of the World wide Web, as well as by correspondence. Full details can be obtained from Ken Staples. ☆

Zodiac constellations

The discussion and exchange of information on the twelve constellations of the Zodiac was held on the 17th February 1998, and attended by about 15 members and guests. Each constellation was illustrated and discussed in detail as to what objects of interest each contained.

The constellations were dealt with in order of their appearance along the ecliptic, starting with *Aries*. This constellation has historical importance because it once contained the point along the ecliptic where the Sun passed from south to north of the the celestial equator, marking the start of the northern hemisphere spring, the Vernal Equinox. Although this point has now moved over into Pisces, due to the effects of precession, it is still often referred to as the *First Point of Aries*.

The constellations are as follows, noting items of interest:-

1. *Aries* – the Ram

This is a small constellation near the Pleiades. Its brightest two stars, *Hamal* (magnitude 2) and *Sheraton* (magnitude 2.6) stand out against a background of much fainter stars. Aries contains some double stars: γ, λ, ε and π, the latter two being a challenge to separate.

2. *Taurus* – The Bull

This constellation is quite distinct, containing the red giant *Aldebaran*, the V-shaped *Hyades cluster*, the *Pleaides* (Seven Sisters), and *M1*, the remnant of a supernova explosion in 1054. The Pleaides is a group of young stars, formed about 50 million years ago. About seven stars are visible to the naked eye, and binoculars bring many more into view. The cluster contains about 250 stars, surrounded by a faint nebulosity, the remnant of the cloud from which they formed. The ancient people knew that when the Pleiades were visible for a short while before sunrise (the *Heliacal Rising*) it was time to plant their crops.

3. *Gemini* – The Twins

Castor and *Pollux* (the brighter) are the brightest stars of this constellation. Castor is a system of six stars. Gemini contains *M35*, a binocular cluster of about 100 stars, which appears as a misty patch. There is also *NGC 2392*, an 8th magnitude planetary nebula, known as the *Clown Nebula*. The December meteor shower, the *Geminids*, radiates from near Castor. This is usually a rich shower, often with explosive meteors.

4. *Cancer* – The Crab

This is a faint constellation, shaped like an upside-down Y. Cancer contains double stars and two star clusters, *M44* and *M67*, which are both binocular objects, M44 being a particularly good object.

5. *Leo* – The Lion

This is a large constellation, its stars forming the shape of a crouching lion, the one said to have been slain by Hercules for the first of his 12 labours. Its brightest star is *Regulus*, a blue-white star with a companion visible in binoculars. γ *Leonis* is also a double, consisting of a pair of yellow giants 100 light-years away. It is this shower that we are hoping will provide a spectacular display in 1999, as it did in 1966, with over 100,000 meteors in one hour. Leo contains *Wolf 359*, a faint Red Dwarf star of magnitude 13.5, and the ➡

third closest star to our Sun. There are also the galaxies *M65*, *M66*, *M95*, *M96* and *M105*, all between 8th and 10th magnitude.

6. *Virgo* – The Virgin

This is the second largest constellation in the sky (*Hydra* being the largest). The sun is here at the time of the Autumnal Equinox, the 23rd September. The brightest star is *Spica*, an eclipsing spectroscopic binary, varying in brightness by 0.1 magnitude every four days. The constellation is rich in galaxies, mainly situated at the top of Virgo, near to *Coma Berenices*. The galaxies are: *M49*, *M58*, *M59*, *M60*, *M61*, *M84*, *M86*, *M87*, *M89*, *M90* and *M104*. It also contains *3C273*, the brightest quasar. This appears as a magnitude 13 blue star, and is estimated to be about 3000 million light-years away.

7. *Libra* – The Scales

This is a small, faint constellation, through which the Sun passes in November. It was considered to be the claws of the Scorpion by the ancient Greeks, but later made into a separate constellation by the Romans at the time of Julius Cæsar. β *Librae* is one of the few stars to show a greenish tinge, and δ *Librae* is an eclipsing variable of the Algol type.

8. *Scorpio* – The Scorpion

This is another constellation which resembles the creature it represents – a curve of stars forming its stinging tail.

The red, semi-variable supergiant *Antares* (meaning the Rival of Mars) is at the heart of the constellation. Antares is 300 times the Sun's diameter, with a millionth of its mass. Antares has a 6th-magnitude companion, so close that conditions need to be near perfect to separate them. Scorpio contains the clusters *M4* (a 7th-magnitude globular, one of the nearest to us, at 7500 light-years away), *M6* and *M7*, both large and visible in binoculars, and *M80*, a small, 8th-magnitude cluster, needing binoculars or a small telescope to see. There is also *NGC 6302*, the *Bug Nebula*. Scorpio is quite low down in the sky, almost underneath Ophiuchus.

9. *Sagittarius* – The Archer

The Sun passes through this constellation from mid-December to mid-January, thus being in Sagittarius for the *Winter Solstice*, the Sun's furthest point south of the equator. The centre of our Galaxy lies in Sagittarius, and the constellation is rich with nebulae and clusters. It contains more Messier objects than any other constellation. these are: *M8*, *M17*, *M18*, *M20*, *M21*, *M22*, *M23*, *M24*, *M25*, *M28*, *M54*, *M55*, *M69*, *M70* and *M75*. *M8* is the *Lagoon Nebula*, a binocular object. This nebula contains *Bok Globules*, which may condense into stars. *M22* is also a binocular object, and one of the finest globular clusters in the sky. There is also the *Horseshoe* and the *Swan Nebula*. This summer constellation is low down, but a very good area for binocular viewing.

10. *Capricornus* – the Sea-Goat

This is another faint constellation. Capricornus used to contain (about 2500 years ago) the Winter Solstice, and the *Tropic of Capricorn* bears its name. Although the Winter Solstice point is now in Sagittarius, due to precession, the Tropic still bears its name. α *Capricornus* is a naked-eye double. The two stars are not related, but each is a true double, with one of the companions itself having a companion. Further objects of interest are: *M30*, an 8th-magnitude globular cluster, and *NGC 6907*, a barred spiral galaxy. ➠

11. *Aquarius* – the Water Carrier

The Babylonians called this area of sky after the sea, and the Egyptian hieroglyph for this is the same as for water. The constellation is almost under Pegasus and above the bright star Fomalhaut. The most distinct part of the constellation is Y-shaped, at the constellation's top. Aquarius will contain the Vernal Equinox in about 600 years time.

The constellation contains *M2*, a globular cluster *M72*, a fainter globular cluster *NGC 7009*, the *Saturn Nebula*, and *NGC 7293*, the *Helix Nebula* and the closest planetary nebula to our Sun. Although *M2* and *NGC 7293* can be found in binoculars, a telescope is needed to see them properly. *M73* is another Messier object in Aquarius, although it is only an asterism of four stars. There are three meteor showers that radiate from Aquarius. they are: the *Eta Aquarids*, the *Delta Aquarids*, and the *Iota Aquarids*.

12. *Pisces* – the Fishes

This faint constellation contains the Vernal Equinox on the 21st March. Objects of interest are: *M74*, a 10th-magnitude spiral galaxy, *19 Piscis*, a red giant variable star, and *Van Maanens Star*. This is the nearest white dwarf to us. At magnitude 12.4, it has the same mass as our Sun and a diameter of 7800 miles. Its density is a million times that of water. The brightest star in this constellation is η, at a magnitude of 3.6.

This list does not cover all the objects in the Zodiac constellations, but it covers the majority that are visible to us, either in telescopes or in binoculars. ☆

Debby Quertier

Recent visitors

On Friday, 6th February, Mary Perrio once again brought a group of about 20 children from Blanchelande College, and once again the weather was unkind! The only sighting was a beautiful halo around the Moon. The evening was spent showing and discussing the optical instruments at the Observatory.

On Friday, 13th February, Mary Ferguson accompanied a group of about 10 Sea Scouts from the 1st Guernsey Company to the Observatory. They looked at the C14, but without using it to observe. We did use the C14 telescope to observe a number of objects, including the Moon and Jupiter. We also explained how to find Polaris using Ursa Major, and used the link of astral navigation with Polaris.

Another visit was arranged for the 10th March, but was postponed due to the weather. We now look forward to the visit of Val Kilby and the Vale Wives Social Club on Friday, 20th March, and hope that the weather will be kind. ☆ ***KS***

Eclipse awareness meeting

On the 26th March, David Le Conte held an *"Eclipse Awareness Meeting"* for emergency services, tourism sector, public information and education bodies, in order to inform them about what is likely to happen in August 1999, and to facilitate coordination. ☆

Eclipse stamp designs

We have submitted a number of suggestions for the special eclipse stamps which the Guernsey Post Office is proposing to issue in 1999. ☆

The 1998 total solar eclipse expedition by David Le Conte

"O dark, dark, dark, amid the blaze of noon,
Irrecoverably dark, total eclipse
Without all hope of day!"

- John Milton *Samson Agonistes*

On the flight out to Venezuela to see the total eclipse, Jack Lemmon and Walter Matthau joined us in a film called *Out at Sea*, a story of two old men going on a cruise ship to view a total eclipse of the Sun. Despite the fact that the film showed a Full Moon on the night before the eclipse and the night of the eclipse (!), it was an enjoyable comedy, and the coincidence of an eclipse film on an eclipse trip put us in the right frame of mind when we landed in Venezuela after a tiring nine-hour flight. A further domestic flight took us to the oil town of Maracaibo, right in the path of totality for the eclipse four days later.

We met our friends and hosts, Roger Tuthill and his wife Nancy, along with a group of some two dozen Americans, including a number of amateur astronomers intent on viewing what was to be a most spectacular eclipse. During the two nights and three days after arrival we went high up into the Andes, staying at a hotel in the small town of La Mesa at an altitude of 7,000 feet, where it was hoped to view the night sky. Unfortunately, this was not to be, as the conditions were too cloudy on the first night, especially in the southern part of the sky which we were interested in, being that part which is not visible from Guernsey. And on the second night it was totally cloudy, so it dashed our hopes of seeing such wonders as the *Large Magellanic Cloud*, the *Tarantula Nebula*, the *Southern Cross*, the *Jewel Box*, the *Coalsack*, the *Eta Carina Nebula*, and other southern sky wonders totally invisible from Guernsey latitudes.

However, in the intervening day we ascended even higher, well above 13,000 feet, to the Eagle's Peak Pass, the *Pico el Áquila*. Being Carnival time, and a holiday, this place was crowded, despite its remoteness. Nevertheless, we were able to find a secluded spot from which one of our party set up an 80 mm telescope, with which, protected by a *Solar Skreen* filter which I provided, we were able to get a beautiful view of the Sun, and were excited to note that there were two good groups of sunspots, which would make the ensuing eclipse even more enjoyable.

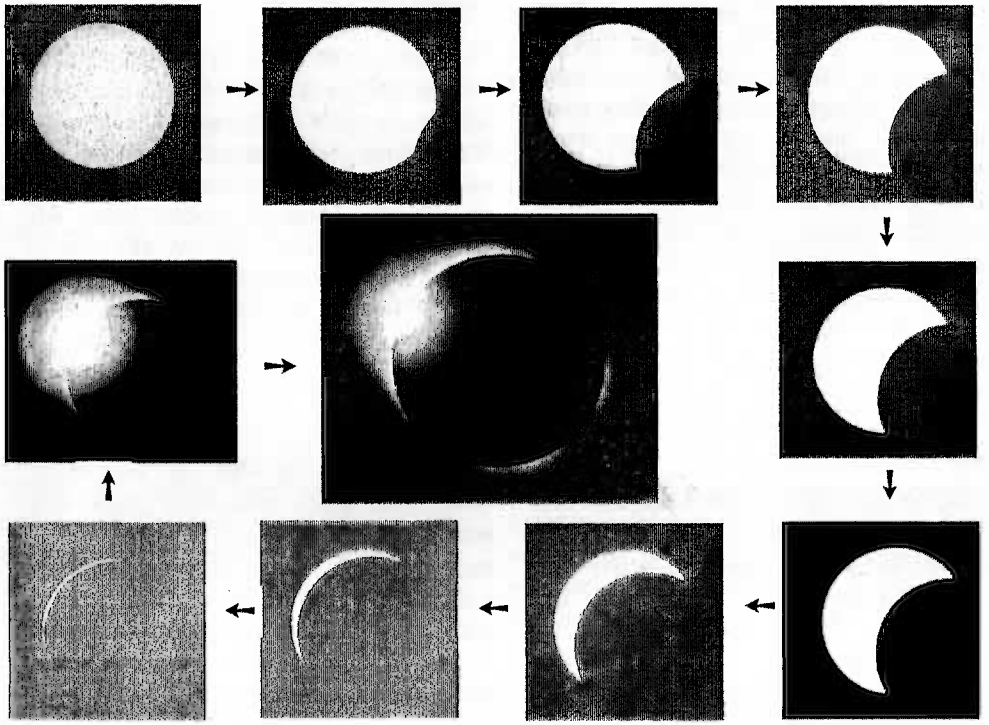
As indeed it proved to be, when Thursday, the 26th of February came, after much preparation and excitement, our group set off for the 45-minute drive to *Fuerta Mara*, or Fort Mara. This was an army base, just 20 minutes from the Colombian border, a very sensitive and rather dangerous area. We were fortunate, therefore, to be well guarded, and in fact had to go through military procedures in order to gain access to and egress from the base. On the way to the base we passed many people preparing for the eclipse, particularly at the *Planetarium Simon Bolivar*, where there were to be ➡

organised observations of the eclipse. There was much excitement in the air, as well as music provided by local guitar bands.

We set up over three hours before the eclipse, and had plenty of time to check and re-check our equipment. Besides our group there was a number of other groups, including Germans and Swiss, as well as Venezuelan and American, all with telescopic and photographic instrumentation. There was an excited buzz in the air, being accompanied by some music, and an increasing interest by the soldiers.

We were just setting up our cameras, tripods and binoculars, as well as equipment for testing safe methods for observing the eclipse, when we were suddenly swamped by crowds of people, including many children and media representatives, television cameras and journalists, some of them accompanying the Governor of Zulia State, who was touring all the major eclipse observation sites. We were pressed with questions, as well as being so physically pressed that it was hard to move from time to time, and we were in danger of having tripods knocked. There were groups of Boy Scouts and Girl Guides, and other youngsters, and they loved the eclipse viewers which we gave to them to see the eclipse safely.

The site was a recreational field used for football and baseball, as well as for army manoeuvres. Indeed, right next to it was an assault course, including macabre hanging dummies, which no doubt ➡



These photographs by the author show the progression of the eclipse from first contact to the Diamond ring

got bayonetted and shot at many times during army exercises. In some respects it was a little unnerving, having military men all around us, some carrying guns, but in other respects, knowing how close we were to the Colombian border, and the danger that presented, we were quite fortunate in being well protected by a sympathetic guard force, led by a Base Commandant who was himself an amateur astronomer. We were indeed made very welcome, and the local community laid on refreshments in the form of cooling drinks, which were so necessary on such a hot day. Temperatures reached as high as 40°C. The Army had also damped down the field before we arrived; otherwise, conditions would have been unbearably dusty, as there was a slight wind.

As the moment of first contact was reached there was an increasing buzz of activity, as people carried out final checks on their equipment, and settled in to watch an eclipse in the most perfect of conditions. Earlier in the morning there had been some cloud, but, true to the previous days' experience, the cloud soon cleared away to give a perfectly blue sky, with the searing hot Sun beating down on a totally unshaded area. Fortunately, we were well prepared, with lashings of sun cream and mosquito repellent, as well as floppy hats, cool shirts and shorts. Elegance was not the main concern – it was to be as comfortable as possible on this long-awaited day.

Although this was my first experience of a total solar eclipse, I have seen many partial eclipses, and so the initial hour or so of the eclipse was very familiar, as, just after first contact, one could see through filtered telescopes, binoculars and telephoto lenses, a tiny niche taken out of the Sun, and growing amazingly rapidly as one watched. This was, of course, the cold, dark New Moon occulting the Sun's glowing hot disc.

We had set up a thermometer in the shade, in order to measure air temperature changes during the progress of the eclipse, and recorded a remarkable 10° C drop. We had prepared a sequence of photographic observations, which was carried out with reasonable faithfulness, despite occasional problems with cameras. This involved taking a series of exposures to record the progress of the eclipse. So far, during the partial phase, this was relatively routine, but as time progressed and the amount of the Sun's disk visible became smaller and smaller, the excitement grew, until a few minutes before the total part of the eclipse the excitement and emotion was almost unbearable.

We knew from many previous readings and discussions exactly what was going to happen – or at least we thought we did. But nothing could prepare us for the few minutes before and during the total part of the eclipse. About 15 minutes before this moment we could sense the sky getting darker. The darkening increased rapidly, until in the last few seconds it descended upon us like a huge dark blanket. The air grew noticeably cooler. The background voices of the two or three hundred people present grew louder as people drew each other's attention to what was happening. There was much excitement about five minutes before totality when Venus became clearly visible. At the same time I noticed that the image of the Sun which I could see through the camera became much clearer and much more easy to focus, as the sky background became darker. ➠

The final minute or 90 seconds of partial eclipse was extraordinary, as so much happened so quickly. It was impossible to take it all in.

Someone shouted: "Look at the shadow bands!" We had laid a white towel on the ground, and racing across it were wavy dark bands of light moving westwards at a rapid rate. These dark bands, which looked like an interference effect, but may be an atmospheric one, are not wholly understood, and many people said that the bands on this eclipse were the clearest that they had ever seen. They were certainly much more evident, much faster moving, and moving in a different direction than I had expected. Someone said that they saw two lots of bands crossing each other from different directions.

Immediately then, all eyes were skyward, filters removed from cameras and telescopes, as, within just seconds, *Baily's Beads* and then a beautiful, brilliant *Diamond Ring* were visible. This was one of the most extraordinary sights, lasting as it did just a couple of seconds.

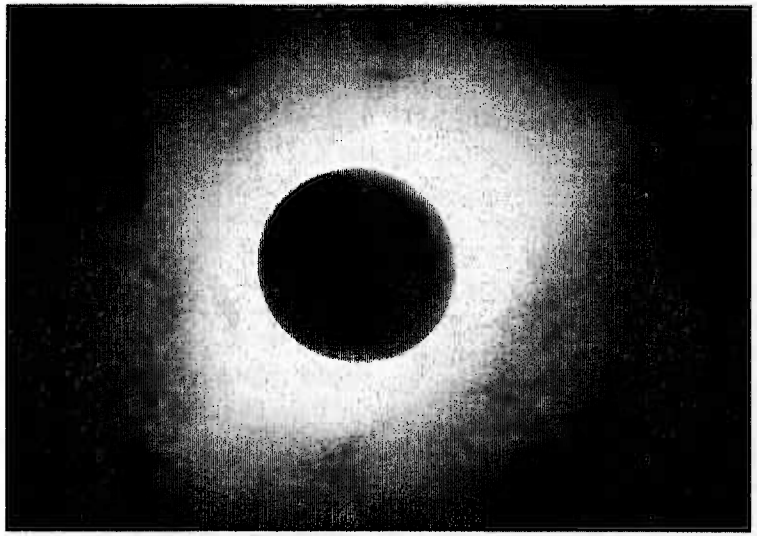
Now we were plunged into totality, the sky as dark as twilight, and an extraordinary colour – indescribable, except that the main element of it was blue, lightening around the horizon, but of a most vivid effect not evident in any photograph I have ever seen. Here was the Sun, with its planets, hanging in the sky. Mercury, Venus and Jupiter were clearly visible, and, for the first time in my life I saw the Solar System. One could sense the three-dimensional depth of space, ourselves journeying on planet Earth, accompanied by the Sun as the centre of our System, surrounded by brilliant planets.

To my surprise, no bright stars were visible, although stars such as *Fomalhaut*, *Altair* and *Deneb* were indeed in the sky at the time. Experienced eclipse watchers said that this was a dark eclipse; indeed some of them said that it was the darkest they had ever seen. Nevertheless, I could not see Mars or Saturn, or any bright stars – just three planets: Mercury, Venus and Jupiter, in their appointed places in their orbits, circling around the Sun. This was the Solar System in real life, as it is impossible to see during any other time than a total eclipse.

But let me return to the Sun itself. The first most noticeable thing about the totally eclipsed Sun was the wonderful *Corona*. We were not yet at sunspot maximum, although there were sunspots on the disc of the Sun. So the structure of the Corona was perhaps at its most interesting – filaments streaming from the equatorial regions, with beautiful spikes sticking up from its north and south magnetic poles.

To add to the spectacle, prominences were clearly visible on the limb of the Sun, being then covered up as the Moon progressed in its orbit, while others became uncovered.

I was rapidly taking photographs for all I was worth, trying occasionally to get a good view of what was happening around me. The emotion and excitement were indescribable. My son Christopher was calling out exposures and running a video camera. Maureen was describing the scene, and looking through binoculars at the Sun. Everyone at the moment of totality cried out with delight. Looking through the camera, fitted with its 1000 mm telephoto lens, I was clearly able to see every detail of the Sun. ➠



The magnificent solar corona

I was determined to get photographs if at all possible. Despite all my preparations and planning for photographic sequences, it was impossible to stick to it, and I just shot away at as many different exposures I could manage, changing lenses in the middle to a 500 mm lens in order to get the outer Corona with longer exposures.

Although I had planned for this event for a year, had read everything I could on the subject, had spoken to many, many people who were experienced eclipse watchers, nothing had prepared me for this experience! Those of you who will be in Alderney for the eclipse on the 11th August 1999 have no idea what a treat will be in store for you. But oh, what a short treat, and so soon over. I was astonished when Christopher said that there was just one minute to go before the end of totality. This eclipse was 3 minutes 45 seconds long – more than twice as long as the 1999 eclipse – but it seemed to flash by in seconds. It was both the longest four minutes and the shortest in my lifetime. It was long because so much was happening, and there was so much to take in, that I have never had such a visual and emotional experience crammed into just four minutes. And it was short because it was so soon over. The Diamond Ring reappeared, Baily's Beads reappeared, the crescent of the Sun reappeared, and suddenly a light was switched on over the whole area as the Sun's rays once more touched the Earth.

Extraordinarily, and again despite all our preparations, we had no idea what to do next. What we had seen had been so overwhelming that it seemed that our whole life, let alone the next few minutes, would never be normal. We knew that millions of people in Venezuela were sharing that experience, and that in a number of Caribbean islands that experience and those emotions were being repeated time and time again over the next 20 or 30 minutes. ➠

We were eventually able to pull ourselves together and return to our photographic programme, to conduct experiments on pinhole projection and mirror projection, to take photographs of crescents formed under trees by the pinhole effect of the gaps between the leaves, and take photographic evidence of shadow sharpening. Gradually life returned to a semblance of normality, but all of us exchanged our feelings about the experience, and tried to describe, ineffectually, what we had seen.

Slowly, the equipment was dismantled and loaded onto the bus. We paid a visit to the delightfully supportive Base Commandant, and made our way out of the Base. At the exit we were stopped by the guards, and two stern-looking soldiers with machine guns came on board, and walked menacingly up and down the aisle, inspecting our group. Eventually, smiles were exchanged, and we were waved on our way.

What a delight it was to relax in the hotel pool later in the afternoon, enjoying a drink and discussing how our pictures might turn out, what we had done right and what we had done wrong.

I shall remember that day for the rest of my life. I was particularly pleased to see the young people enjoy the whole experience. They were fascinated by the pinhole projection; they were delighted by the eclipse, and after it they sang and danced. What a wonderful experience for such youngsters. I wish that I had had such an experience early in my life.

I was just their age when I first read about the 1999 eclipse, and thought, all those decades ago, how exciting it would be when eclipse day finally comes.

Well, it will at last come to us next year – the first total solar eclipse in the Channel Islands for over a thousand years. How fortunate we all are.

As I am now dictating these memories, I am on the 'plane returning to Europe. Sitting on the right side, I have a view of the southern sky from an altitude of 37,000 feet, much higher than that which we reached in the Andes. The sky is brilliant with bright stars. The Southern Cross is visible at a good altitude. Stars which I have never seen before are hanging there in space. I am flying above an Earth which itself is speeding through space, and, despite my theoretical understanding of our position in the universe, it is all so much more visually clear now that I have had the experience of a total solar eclipse. It is as if I am in a space-ship, circling round the Sun, keeping within the shadow of the Earth, as it is a dark, dark night. If I were really out in space I would not need an eclipse to be able to see the day-time planets, as there would, in effect, be no day-time or night-time; just a perpetual star-studded sky. I cannot believe the eclipse has ended, as it re-runs and re-runs through my mind. I want to repeat the experience, but I know that each eclipse experience is different, and that the first cannot, in any case, ever be repeated. I am just so thankful that my first eclipse was such a spectacular one, and in such perfect conditions, and that I could share it with such a wonderful group of people. No, life will never be the same, and how relatively empty my life would have been without such an experience. I urge everyone to make sure that they are in the centre of the path of totality on the 11th August 1999, so that they too can experience this once-in-a-millenium phenomenon. ✰

David Le Conte

Astronomy and Space – References for further reading

Meteor detection: Detecting meteors by VHF radio or antenna electrometer (*Astronomy Now*, January 1998)

Mars Global Surveyor: Descending slowly into a mapping orbit. Excellent photographs already being obtained – one of *Valles Marineris* area with layered bedrock indicating an active geological past not previously recognised. Another large colour photo of an area identified as a dried lake bed. Evidence that extensive water was once present on Mars. (*Astronomy and Space*, December 1997, January 1998)

Isaac Newton: The story of Isaac Newton, gravity and the development of the Newtonian reflecting telescope. (*Astronomy and Space*, January 1998)

Explosions from a black hole in our Galaxy: Detected by MERLIN – Interferometer network of six radio telescopes spread across England, run from Jodrell Bank in Cheshire. (*Astronomy and Space*, January 1998)

Meteor impacts: Impacts and correlations with mass extinctions. (*The Planetary Report*, January/February 1998)

Greenland meteor impact. Major event on 9th December 1997. Early data and photo from weather satellite. (*Astronomy and Space*, February 1998)

International Space Station: First module block of the new Space Station, due for launch in June. Report and construction stages. (*Modern Astronomer*, January/February 1998)

Binary stars: The lives of binary stars. (Part 2 of this article.) (*Sky and Telescope*, January 1998)

Jupiter's Moon Europa: Space probe Galileo at Jupiter. Mission to discover more evidence of water below the icy surface of Europa. (*The Planetary Report*, January/February 1998)

Lunar Prospector: Successful launch on 6th January, to map entire lunar surface, confirm if there is ice in south polar area, and locate valuable elements. (*Daily Telegraph*, 2 January 1998)

Giant planet found: The Hubble Space Telescope has identified a giant planet in orbit around the closest star to our Sun, *Proxima Centauri*, subject to confirmation. (*The Times*, 29 January 1998)

China's Space Programme: Failures in the past, and current success of a developing research programme. (*Astronomy and Space*, February 1998)

Beyond the visible: The importance of the longer wavelengths for infrared astronomy and radio astronomy. (*Astronomy Now*, March 1998)

Messier's Catalogue: Charles Messier and his catalogue of deep sky objects, with a complete photographic presentation of 107 objects – star clusters, nebulae and galaxies. (*Astronomy Now*, March 1998) ➠

Herstmonceux: Herstmonceux, Sussex, former home of the Royal Greenwich Observatory, now redeveloped as a Science Centre. (*Astronomy Now*, March 1998)

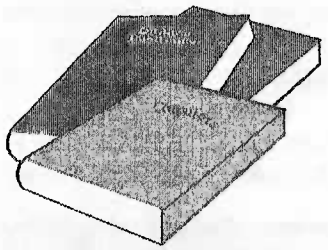
How to view the Sun: Sunspot observation guidelines as solar cycle 23 begins. (*Sky and Telescope*, March 1998)

The Moon revisited: A collection of articles about the Moon, including Moon mapping (by Patrick Moore, with an account of his pre-war discovery of the *Mare Orientale*), lunar photography, transient lunar phenomena, and the recently launched Lunar Prospector mission. (*Modern Astronomer*, March 1998)

Other planetary systems: New worlds – other planetary systems detected during the last three years, as a result of the stellar wobble effects observed. (*Sky and Telescope*, March 1998) ☆

Geoff Falla

Book Reviews



During late 1997 I acquired several astronomy books, two of which are reviewed as follows:-

Universe in Focus:
The Story of the Hubble Telescope

by Stuart Clark

This book tells the story of Hubble from when a space telescope was first proposed through to its launch, how it works, and the much publicised repair mission. There are sections on the Solar System, stars (from birth to their death), galaxies, and the Universe. Each is beautifully illustrated with Hubble's own pictures in full colour. The book includes the magnificent picture of the *Eagle Nebula*, with its strange dust pillars, and the picture of the tiny patch of sky above the Plough, which contains about 3000 galaxies. (Both these pictures were in the national newspapers.) There is a lot of information contained in this book, but probably half the book is pictures, beautifully taken by Hubble, and, in my opinion, what makes the book really worth getting.

Companion to the Cosmos

by John Gribbin

This hardback book is best described as a dictionary, covering a huge range of topics from scientists and astronomers to theories of the universe. Some definitions are dealt with by a line or two, whilst others have a few pages devoted to them. With over 500 pages, the book probably covers most of the subjects that have been discussed at the Observatory, from black holes to life on other planets. The book ends with "*Timelines*", where key dates in Cosmology/Astronomy are listed, alongside key dates in world history.

This is an excellent book, which I shall refer to time and time again, and, I hope, learn a lot from. ☆

Debby Quertier