

# ORWELL ASTRONOMICAL

# SOCIETY IPSWICH

Charity No 271313

## MAY 1999

WEDNESDAY 31<sup>ST</sup> MARCH  
VARIOUS MEMBERS  
SHOWED THEIR SKILL  
OPENING THE DOME DOOR



## Society News

- 1 **Bristol Astronomical Society Visit**  
Pete Richards will be hosting a visit by Bristol AS on Saturday 22<sup>nd</sup> May and on the 23<sup>rd</sup> May if Saturday is cloudy. If you are able to help please contact Pete.

### Events for 1999

Event	Details	Date
Oxford Astronomy Weekend	Cost £132	9 <sup>th</sup> May
Summer Excursion	Will probable be to Greenwich	Date to be fixed
Summer Barbecue	To be arranged	Date to be fixed
BAA Exhibition Meeting	London Guildhall University Calcutta House	26 <sup>th</sup> June
Eclipse	Members to make own arrangements	11 <sup>th</sup> August
Astro Camp	Mid August	
Loughton Sky Camp	Phone Mike Cook [redacted] Venue is near Thetford	10 <sup>th</sup> to 19 <sup>th</sup> September
FAS meeting Cambridge		2 <sup>nd</sup> October
Open Weekend	To be arranged	15 <sup>th</sup> , 16 <sup>th</sup> 17 <sup>th</sup> October
Christmas Meal	To be arranged	10 <sup>th</sup> December

Other events will be added to this list throughout the year

### Night Sky

All times GMT

#### Sun

The sun will be rising approximately between 04:40 to 04:00  
The sun will be setting approximately between 19:30 to 20:10

#### Moon

3 <sup>rd</sup> Quarter	New Moon	1 <sup>st</sup> Quarter	Full Moon
8 <sup>th</sup>	15 <sup>th</sup>	22 <sup>nd</sup>	30 <sup>th</sup>

#### Mercury

Mercury will be at superior conjunction on the 25<sup>th</sup>. It will be too close to the sun in the sky to be observable.

#### Venus

Venus remains very prominent in the evening sky. It will be setting at about 23:30 in mid month. Magnitude -4.2

#### Mars

Mars will be setting 02:00 by the end of the month. It is in Virgo this month. Magnitude -1.4

#### Jupiter

Jupiter will be rising by 02:00 at the end of the month. Magnitude -2.1.

#### Saturn

Saturn will be to near to the sun this month to be observable.

#### Uranus

Uranus will be rising at mid night by the end of the month. Magnitude 5.8

#### Neptune

Neptune will be rising about 30 minutes before Uranus in mid month. Magnitude 7.8

## Meteor Showers

Shower	Limits	Maximum	ZHR
$\eta$ Aquarids	April 24 <sup>th</sup> to May 20 <sup>th</sup>	May 4 <sup>th</sup>	40
$\alpha$ Scorpids	April 20 <sup>th</sup> to May 19 <sup>th</sup>	April 27 <sup>th</sup> May 12 <sup>th</sup>	5

Meteor source is the BAA Handbook

Roy Gooding

### OCCULTATIONS DURING MAY 1999

The table lists stellar occultation disappearance events which occur during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

D or R	Date & Time (UT)	Lunar Phase	Sun Alt (d)	Star Alt (d)	Min Dist (rad)	Star	Mag
D	18 May 21:36	.16+	-13	12	.11N	ZC 1076	7.5
D	21 May 23:24	.47+	-17	15	.25S	nu Leo	5.3
R	22 May 00:18		-17	6			
D	25 May 00:26	.76+	-17	16	.95N	T 282-0753-1	7.3

James Appleton

### Observatory Maintenance Log since 1981 (part 2)

By Roy Gooding

1982 to 1987

After all the hard work in 1981, 1982 was taken more leisurely. Very little work of any note was undertaken. The biggest job undertaken in 1983 was repairing the roofs above the stairwell, lift shaft and the transit room. A pair of new wheels were fitted to the bottom of the dome shutter. Opening and closing the shutter was greatly improved. The gutter around the base of the dome had almost rusted away, so several coats of resin were applied to the gutter walls.

In June of 1982 a number of dead bees began to accumulate on the floor of the dome. By the summer of 1983 we had a major insect infestation. Throughout that summer there was the constant accumulation of dead and dying bees in the observatory. Every week these had to be swept up, numbering many hundreds at a time. A bee's nest was eventually discovered inside the top of the shutter.

The bees were evicted a week after Christmas of that year, with the help of a local beekeeper. There is a well documented account of removing the nest, in February's edition of the 1984 newsletter by Alan Smith, under the title of "Search for the Beehive" Some of the highlights were: -

A 30ft ladder was firstly manhandled up the 60ft side of the observatory, the spiral stairs were not designed to admit such a long object, together with circular saw, hammers, crow bars etc. Colin Button was persuaded that he should ascend the ladder. It had been estimate in the summer of 1983, about 60,000 bees were living in the dome and they could increase by 30,000 per year. The mahogany planks lining the dome shutter were cut and, removed, revealing, the whole honeycomb plus a football sized huddle of 25,000 - 40,000 bees. The beekeeper, Mr Drew, took over at this point, arriving with a large box equipped with special frames on which to tie the honeycomb. He cut each of the 20-24 inch long tongues of the honeycomb away from the copper clad outer skin of the dome and tied them onto the specially constructed frames that acted as the new home for the bees over the winter period.

Other work done in 1984 included completing the bench seating in the clubroom, replacing two floorboards in the dome and painting the dome walls again. The 10" refractor was upgraded with the addition of a new 4" refractor. This was to be used as a finder, when the main telescope was in use for photography.

The 10" telescope received most of the attention in 1985. The periscopes were removed and the mirrors re-aluminised. A camera bracket was made, and the telescope's Dec and RA axes were lubricated. Another dome floorboard was replaced.

In the summer of 1986 another major structure failure occurred. The School had scheduled to have the flat roofs of the transit room, lift shaft and stair well releaded. The rolls of lead were winched up the lift shaft and left in a single heap in the middle of the dome floor. We were very lucky that the floor did not callapse under the weight. When the lead rolls were lifted to the outside of the dome, they were rested on the dome shutter step. The cast iron dome rotation ring fractured under the weight. New shutter support brackets were made and a 10ft steel strengthening bar was bolted onto the inside of the dome track under the shutter step. Other work included taking the 10" lens from its cell, in June for cleaning, and inspecting the shutter's top track

This was taken from the observatory log book

Date	Description
06-Apr-83	Painted notice boards
26-Jun-83	Bees found in dome
03-Jul-83	Bees nest discovered in the shutter
02-Jan-84	Removed bees nest from shutter
27-Mar-84	Fitted new 4" refractor to main telescope tube
11-Jun-86	10" lens taken out for cleaning
18-Jun-86	Lens refitted
	Dome shutter catching on dome
29-Jun-86	Inspected shutter top track. Needed adjusting
16-Jul-86	Work on shutter track
30-Jul-86	More work on shutter track

As with all the other articles in this series the information has been obtained from the observatory logbook, newsletter articles, Committee meeting reports and personal reminiscences

## Society Visit to Norwich Astronomical Society's Observatory Roy Gooding

It is several years since we last visited Norwich's observatory, at Seething. Last autumn it was decided to rectify this and arrange another visit. Friday 16<sup>th</sup> April was chosen as the suitable evening. The observatory is situated on the edge of the Seething airfield, about 10 miles south from Norwich. The journey from Ipswich takes about an hour, with the last six miles or so along country lanes. All pre arranged astronomical events that include looking at the sky usually heralds any passing monsoon to deposit its entire contents on top of any unsuspecting astronomers. However, this evening the clouds had decided to take a rare holiday. The evening remained completely clear!

Seething is a much darker site than ours at Nacton. The glow from Norwich, Yarmouth and Lowestoft are visible, but only as a thin line near the horizon.

The Norwich observatory is a very well equipped site. It contains a large meeting hall with kitchen facilities, a dome containing a 30" reflector, a dome containing a 10" reflector, a roll off hut containing two telescopes and several concrete pads for members to stand their own telescopes. This evening two of their members brought along a 10" Meade and a 10" reflector.

9 OASI members made up our visiting group. These augmented about 30 members from the Norwich society.

Once it became dark people were spoilt for choice, with people meandered between every telescope in use and forming small discussion groups across the site. The highlight of the evening was being able to make out the spiral structure of M51, using the 30" reflector.

The hospitality we received from Norwich AS was very much appreciated. Coffee and tea was served at regular intervals throughout the evening. Our group did not leave Seething until after 22:00, having had a very successful evening.

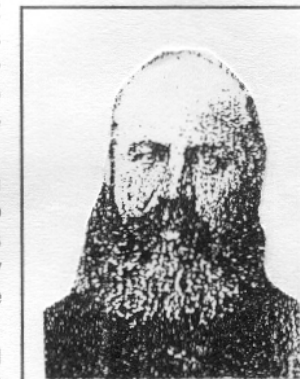
### Extra Opening

The first "other telescopes" night was held at the observatory on the evening of Monday April 19<sup>th</sup>, with the idea of giving members, especially those new to astronomy, an opportunity to use our 4 inch Refractor, and 10inch Dobsonian. Eleven members took part, and with the good fortune of a clear night, and a three day-old moon, the general reaction was of a useful and enjoyable session. The key to its value was, as it has been with the workshops, the presence of members from across the spectrum of the society, such that knowledge could be shared. Venus and Mars added to the event. The next night will be on Monday 17<sup>th</sup> May, the Monday after the final workshop.

### GEORGE CALVER, MASTER MIRROR MAKER

It wouldn't take a genius to realise that some of the most revered members of the astronomical community, over the years and up to modern times, either had their roots in or worked in East Anglia. In this article we examine the story of one such native of our region (*George Calver, Master Mirror Maker*) who - if you will - became the 'Meade Co equivalent of the late Victorian and Edwardian era'.

A Suffolk man, Calver was born at Walpole NR Halesworth in 1834 July, the son of farm labourers who died when George was very young (*Although census records at various dates give him birth places as far apart as Ipswich and Gt Yarmouth!*) By the 1850s he was apprenticed to a local shoemaker, eventually moving on and setting himself up in business at Gt Yarmouth where he met his wife to be, Hannah. His latent astronomical interest was fired by his local non conformist clergyman, the Rev Mr Matthews, who showed him the splendours of the night sky through his excellent Reflecting Telescope, the mirror of which had been ground by the leading maker of the day, Mr G.H. With of Hereford. With, a college Professor of Science, was a pioneer in the manufacture of silver on glass mirrors, which were rapidly gaining popularity over speculum mirrors (made from a mix of copper & tin).



George Calver  
1834 - 1927

Calver was deeply impressed with the optical performance of the instrument and, when challenged by Matthews to try and produce a mirror of equal or better quality, he rose to the bait embarking upon what proved to be a lifetime's work. That very challenge would seem to indicate that Calver was already dabbling in mirror making by then and, indeed, he began a regular correspondence in a leading scientific magazine of the day 'The English Mechanic'. His many letters at first sought to question other correspondents on their mirror making techniques but, at length, his own experience began to show through and his later letters were full of experienced advice for the benefit of others. Perhaps his best move was to write to With directly and tax the 'maestro' on his methods. A frequent exchange of letters began between the two men who, one may argue, were rivals\* in the supply of mirrors - but always on the most cordial of terms and always ready to share ideas. At the outset, With sent Calver a comprehensive account of his production methods, informing him that he polished his mirrors on a device which he described as 'a simple form of Lord Rosse's machine, with stroke and slide motion' \*\*

\* With produced mirrors on an amateur basis and made around 200 in his lifetime. Calver by comparison, however, produced on an industrial scale.

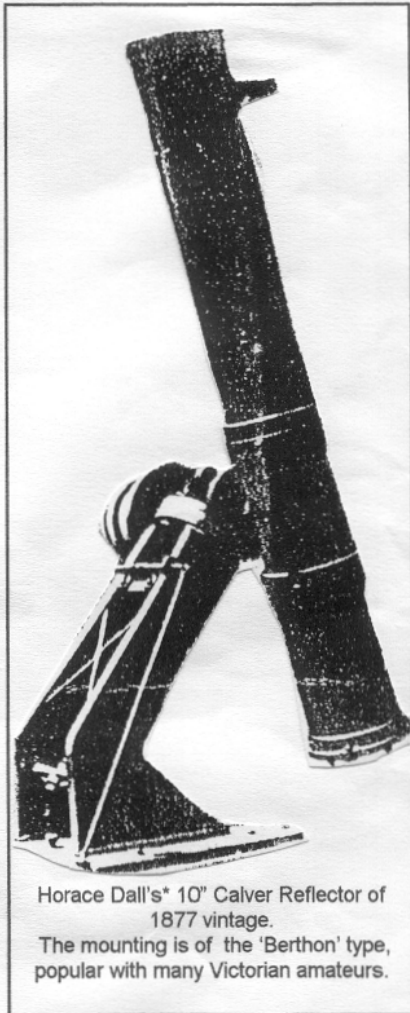
\*\* The 3rd Earl of Rosse, at his family home in Parsonstown, Ireland, was a Victorian Grand Amateur Astronomer whose employees produced ever larger speculum mirrors, to his specification, up to his 'tour-de-force' a 72" reflector (Nicknamed the Leviathan of Parsonstown) of 1845 with which he was to resolve the spiral nature of certain nebulae (independent galaxies).

as it was later discovered). The mirrors were polished on a steam powered reciprocating device that the Earl had designed after consulting the top engineers of the day.

One of Calver's first telescopes was a 10" Newtonian for his own use and with which he became a proficient observer of Jupiter and Double Stars. By 1871 his mirrors were beginning to be noticed by the 'market' of the day and a move was made to new premises at Widford, just outside Chelmsford. His business began to grow and a small staff was taken on to cope with the heavy order book. Machinery was used for grinding and polishing but the figuring work was always by his own hand. Workshop testing was by pinhole, knife edge and eyepiece. He also used a highly polished black glass ball to pick up an image of the sun and this was usually placed between 100 & 500 yards distant to provide an artificial star, a method developed by With. But Calver insisted on final tests being made on 'nighttime' stars, using high powered eyepieces. A 'hallmark' of his mirrors was that most were slightly under corrected to allow for evening cooling effects. Although always to his design, the construction of a number of his telescope mounts was subcontracted to a firm he became familiar with back in his days at Gt Yarmouth, Messrs T Lepard & Sons. The efficacy of Calver's mirrors made them a 'must have' for a very great number of astronomers, both amateur and professional, not only in the UK, but throughout the colonies and beyond. This expansion of business inevitably brought its own financial rewards (Calver optics & telescopes were always priced at the higher end of the market).

George & Hannah were able to move from a modest home, 'Little Hylands' in Widford Street somewhat 'up market' to "Hill House" in Widford End and they were sufficiently well heeled to engage a servant, a young girl from Hannah's native Gt Yarmouth..

\* The late Horace Dall, who lived in Luton, has a direct connection to OASI as he was given the job of refiguring & cleaning the 10" OG from our Orwell Park Refractor in 1973. So excellent was his work, he even managed to correct some original manufacturers errors!



Horace Dall's\* 10" Calver Reflector of 1877 vintage.  
The mounting is of the 'Berthon' type, popular with many Victorian amateurs.

Most of Calver's mirrors were of the size range of 5" to 8", f/9 to f/12, in both the Newtonian and Cassegrain type on the sturdiest of mounts. He also made somewhat larger mirrors to order from 10", 12", 15", 18" and up to 37", one of the latter is in use to this day on the Crossley Reflector (1895) at the Lick Observatory.

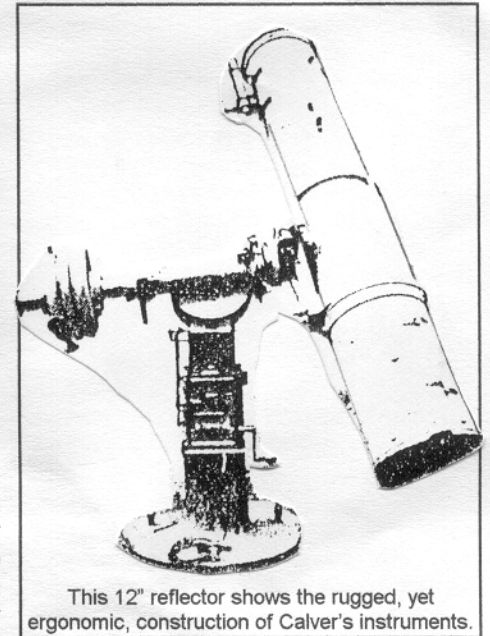
It wasn't all success and, in 1884, one of his manufacturing efforts failed spectacularly when he was commissioned by Sir Henry Bessemer (Of Bessemer Furnace fame) to make a 50" mirror to Bessemer's design. Bessemer had conceived the idea of a cut price large mirror by applying suction to a thin glass spherical and polishing same over a 'pressure cup'. The mirror was never mounted in a telescope and its eventual fate is unclear, although there is a school of thought that it may have been cut up into several smaller mirrors.

That failure did not dent Calver's confidence when, some time later, a Mr James Lick offered a prize for a world record sized mirror. Calver caused a sensation in the telescope building world by offering to produce a mirror of 100". His offer was never taken up!

One should bear in mind that this was some considerable time before a 100" mirror was finally produced by G.W.Richley and his team in 1917, after six years of figuring work for the giant reflector at Mount Wilson Observatory, California.

1884 was not, perhaps, all failure as one of Calver's 10" Reflectors won a bronze medal when exhibited at an international science exhibition at Crystal Palace. It was also about this period that he published a widely applauded catalogue, 'Hints on silvered glass reflecting telescopes' which illustrated his various products and was replete with glowing testimonials from many of the leading amateur astronomers of the day.

The coming of the railway, coupled with increasing urbanisation and dust from Chelmsford's roads (Widford stands on what we now would call the old A12) forced Calver to cease telescope production there in 1904 and return to the rural tranquillity of his native Walpole. He purchased a large house in the village (The Manse) and carried on producing mirrors, full telescopes and the re silvering of other peoples mirrors, although on a much reduced scale and with just one assistant working from a wooden outbuilding on the property. Calver continued working into his nineties and died 1927 July 4th. Hannah passed away just a year later. In his long lifetime, Calver is thought to have produced around 4,000 mirrors, many of which have stood the test of time and are still in use to this day.



This 12" reflector shows the rugged, yet ergonomic, construction of Calver's instruments.

As late as the 1950s Horace Dall\* visited the Manse and found Calver's workshop, by then a private garage, still in existence and with many detailed scribbings & optics calculations still adorning the walls along with a number of unused mirrors scattered about. George and Hannah are buried in the local churchyard and no mention of his lifetimes work appears on the gravestone beyond the words 'Kind to the poor and little children'. His name will always be remembered in the field of optical excellence and - with the exciting news of our society project to build a large reflector for a 'Millennium Telescope' - we will surely, at least, be perpetuating a great East Anglian skill.

\*Dall regularly corresponded with Calver after WW1.

Ken Goward

## Final Workshop

[in this series]

The final workshop in this first series will take place on Wednesday May 12<sup>th</sup> at the usual venue. The topical subject of Eclipse Photography will be lead by our member Nigel Evans. The subject will, as before, have the beginner in mind, but will also give everyone the opportunity to raise queries about how to make the most out of this wonderful natural event. Starting time 7.30 pm. Come early to get a seat!

## Articles For Journal

Every month I am looking for articles for the journal. If you can help in any way it would be very much appreciated. What we need is any items of astronomical interest that you have had while observing, events you have been to, things you have planned for the future, or even what you would like to do no matter how impossible it might seem at the moment.

Building your own telescope, building an observatory, improving on the equipment that that you already have or just getting more use out of what you have.

Meeting your hero's in the astronomical world who could be inventors, scientists, astronauts, or any one of thousands of people who have contributed to our knowledge and interest in things astronomical.

As we move into the next millennium ( which wont really start until 2001 if you think about it) almost any thing is possible. Holidays abroad could be any where in the universe. The only thing holding you back is your imagination.

As you can see we need more people to help keeping the journal in articles as the more of you that contribute, it would make it so much easier on the few who have given so much of there time in the past.

So now I hope to hear from a lot more of you in the future which make my job much easier and the journal much more interesting.

All entries need to be in A5 format which will save me having to retype any articles and stop me making any mistakes or misinterpretation of any thing I don't understand.

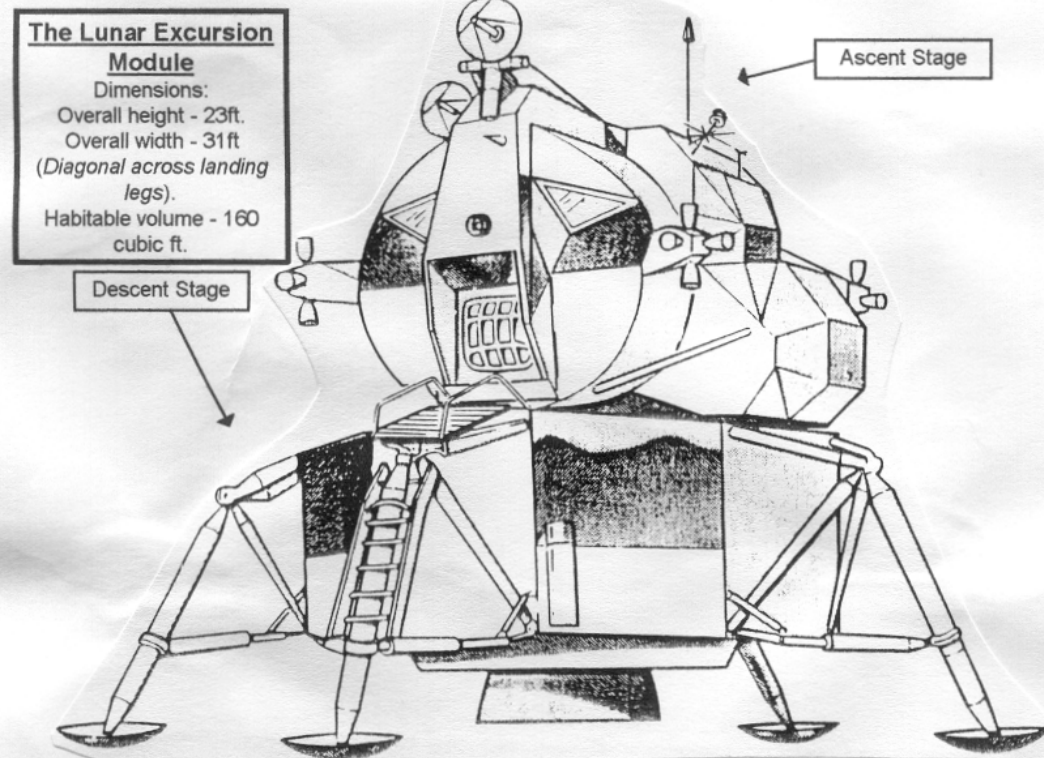
Journal co-ordinator  
E. Sims

## ONE SMALL STEP - THIRTY YEARS ON

The final stepping stone before a manned moon landing began at 12.49pm on 18th May, 1969, with the lift-off of Apollo 10 on an 8 day mission which would involve orbiting the moon whilst the LEM crew tested out the ship in a full dress rehearsal landing & redocking exercise. The crew consisted of Col Tom Stafford (Commander), Cdr John Young (Command Module Pilot) and Cdr Eugene Cernan (Lunar Module Pilot). The CM and LM were nicknamed Charlie Brown & Snoopy respectively. For the crew there was a slight tinge of 'what might have been' in as much that Apollo 10 was originally conceived to be the first actual landing mission but the chain of events, described in our previous articles, conspired against that plan and left Apollo 10 with an LEM which wasn't completely equipped for such a landing owing to difficulties with production schedules.

There was a great deal of publicity surrounding the mission and no less than 19 TV shows were transmitted over the lifetime of the flight. The transmissions were mostly light hearted, often extended beyond schedule and clearly intended to show the average American what all those 'tax dollars' were paying for!

After a relatively routine journey, Apollo 10 entered lunar orbit on May 21st and, following 11 full orbits, Stafford & Cernan, entered Snoopy and separated it from Charlie Brown. Some months earlier, it had been determined that the Sea of Tranquility offered the best chance of a smooth site for the first actual landing and Apollo 10 had been targeted to overfly the site, whilst practising and perfecting the navigation techniques the next crew would need to exercise. Snoopy's descent engine was burned for 27 seconds, which allowed it to drop



down to just 9 nautical miles (50,000ft) above the surface and, as the craft swept in low over the Sea of Tranquillity, Stafford said "There's enough boulders here to fill up Galveston Bay!" On seeing the proposed landing site he described it as 'having a number of holes, but looking mostly smooth like a very wet clay - apart from the larger craters' (Subsequent analysis of the flight showed planners that they were actually some 4 miles too far south of the landing point at that moment and that error would prove useful in future final course corrections). The explosive bolts holding the descent stage were triggered and, moments before the ascent stage engine was to be fired, Snoopy went into a violent spin for around 8 seconds until Stafford could bring the craft back under control. Cernan obviously thought they were going to crash and his voice tapes indicate so in what one might charitably interpret from the expletives as something like "Oh dear".. (The culprit was an incorrectly set Abort Switch, which caused Snoopy to begin a programmed automatic return to Charlie Brown, whilst in a dangerous downward attitude towards the surface). A successful burn returned Snoopy to a redocking with Charlie Brown and, after a total of 31 orbits, Apollo 10 burned the SPS engine for a homeward flight. After a total 830,000 mile journey, the CM splashed down just 3 miles from USS Princetown. So near and yet so far for the crew, the mission had been a huge success and nothing now stood in the way of a landing by Apollo 11 in two months time.

Ken Goward

## Observing Programme For MAY

Dates	Observing Director	Activities
Mondays from 7.30pm	T Sampson [REDACTED]	General Observation
Tuesdays from 7.30pm	G Coleman [REDACTED]	Group Visits
Wednesdays from 8.00pm	M Cook [REDACTED] D Payne [REDACTED]	Nebular & Faint Objects
Thursdays from 7.30pm	G Coleman [REDACTED]	Group Visits
Fridays from 7.30pm	J Hood [REDACTED]	Double Stars

All members are welcome on any night, but on nights other than Wednesday please check with the appropriate director that the observatory will be open.

## Special Events

### 1. Committee Meeting

The next committee meeting is probably going to be held on Saturday 19th June in the club room at the observatory at 7.30pm. All members are welcome to attend.

### 2. Beginners Night (Eclipse Photography Workshop)

The next beginners night is to be held in the Radio Club Room at Orwell Park School on Wednesday 12th May at 7.30pm.

## 1999 COMMITTEE

	Home Phone	Work Phone
CHAIRMAN	D Payne	[REDACTED]
SECRETARY & WORK PARTY ORGANISER	R Gooding	[REDACTED]
TREASURER	M Harlow	[REDACTED]
MECHANICS	M Cook	[REDACTED]
NEWSLETTER CO-ORDINATOR	E Sims	[REDACTED]
BEGINNERS MEETING CO-ORD	T Sampson	[REDACTED]
DARK SKIES & VISIT CO-ORD	G Coleman	[REDACTED]
EQUIPMENT CURATOR	J Walsh	[REDACTED]
LIBRARIAN	J Appleton	[REDACTED]
CO-OPTED MEMBER		
LECTURE CO-ORDINATOR	P Richards	[REDACTED]
JOURNAL ARTICLES TO	E Sims [REDACTED]	Ipswich Suffolk IP1 4HA
CORRESPONDENCE ADDRESS	R Gooding OASI Secretary	[REDACTED] Ipswich Suffolk IP1 6AE
MEMBERSHIP	M. Cook [REDACTED]	[REDACTED] Ipswich IP4 5PZ

## Society Contact Details

	Home Phone	Work Phone
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Secretary	R Gooding [REDACTED]	[REDACTED]
Contact details for the full committee are on the inside back page.		

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 WWW address: http://www.ast.cam.ac.uk:80/~ipswich/