

ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313

JUNE 2003



COMING SOON!
THE GREATEST
SHOW IN
SUFFOLK

W. H. S. T. C.

*K. Chanb
5/03*

Society News

1 Next Committee Meeting

The next committee meeting will be held on Saturday 12th July at 19:30 in a classroom in the court yard. This is an open meeting and any one who is interested is invited to attend.

2 Events for 2003

Meeting	Venue	Date
BAA Exhibition Meeting	The Cavendish Laboratory Madingle Road Cambridge	Saturday 28 th June
Summer Excursion	No destination yet decided	No date yet decided
Summer Barbecue	Note new venue Mike Whybray's garden. His address is [REDACTED] [REDACTED], Nacton, IPSWICH	Saturday 19 th July
National Astronomy Week	No programme arranged	23 rd to 30 th August
FAS Autumn Convention	Venue: Cambridge Institute of Astronomy .	20 th September
Equinox Star Party	Thetford	26 th to 28 th September
Autumn Astro Meeting	St Mary Magdalene church hall in Highfield Approach Ipswich.	Saturday 4 th October
Christmas Meal	Provisional dates 10 th or 17 th December	No venue decided

3 Autumn Astro Meeting

The SPA will be joining us at this meeting as part of their 50th Anniversary year celebrations

The lecture programme for this event has now been finished.

What is now needed is a selection of displays to help fill the hall If you have any displays for this event please contact me (Roy Gooding)

The venue is at St Mary Magdalen Church Hall, in Highfield Approach Ipswich Highfield Approach is off the Norwich Road, 2nd right after the railway bridge going out of town.

Other Societies who receive our Newsletter are invited to attend this event.
If you wish to have a display area please contact me (Roy Gooding)

Email [REDACTED]

Autumn Astro Meeting Programme

Time	Time	Lecture Title
12:00	Access to hall set up hall	
13:00	Doors Open Start videos Refreshments open Displays available	
14:00 - 15:00	1 st lecture Martin Mobberley	Imaging comets
15:00 - 15:30	Break	
15:30 - 16:30	2 nd lecture Martin Lunn	Pre Telescope Astronomy
16:30 - 16:50	3 rd Lecture (short lecture) Neil Morley	Millennium Telescope Update
16:50 - 17:10	4 th Lecture (short lecture) Paul Whiting	Australia eclipse
17:10 - 17:30	5 th Lecture (short lecture) Nigel Evans	Australia eclipse
17:30	Doors close	
17:30 - 18:00	Hall clean up time	
18:00 - 17:30	Evening pub meal ?	
17:30 - 21:00	Orwell Park Observatory open	

4 Year Three of the Library Rebuild

The Observatory will not be closed during the summer.

But

Its that time of year again when the observatory refurbishment commences. Work will restart on completing the new society Library. When you attend Wednesday evenings any helping hand would be appreciated.

Help is requested to man (or woman) the power tools, hammers, and paint brushes.



Once the walls have been finished the new library cabinets will assembled

I will be resuming the observatory painting in May, Probably starting with the walls of the room at the base of the stair well.

Members who attend will be encouraged to lend a hand. If you intend to come along to the observatory during summer period please come in old clothes Volunteers are needed for the following jobs

Observatory Maintenance Jobs for 2003

Location	Jobs	Names	Completed
Computer room	New eyepiece cupboard	Neil Morley	
	Stain floor	Neil Morley	
	Mount either a new or the old heater on the wall		
Transit room	Paint door panels		
	Wash walls		
	Drill ventilation holes in stairs		
	Rebuild telescope pillar		
Observatory	Construct new RA drive control		
	Grease shutter	Martin Cook	Yes
	Replace shutter rope	Martin Cook	Yes
	Repair gutter		
	Paint door frame at the top of the stairs		
	Build set of mobile stairs for telescope	Martin Cook	
Belvedere	Paint all balcony doors. Use white Ranch paint		
	East balcony Paint balcony door, inside and outside.		
	South east balcony Paint balcony door, inside and outside.		
	South balcony Paint balcony door, inside and outside Door needs repairing.	Garry Coleman	
	South west balcony Paint balcony door, inside and outside.		
	West balcony Paint balcony door, inside and outside.		
	Complete painting the stone work		
Library	Complete the library reconstruction	Martin Cook Ken Goward	
	Install new electric circuit	Martin Cook	

		Dave Payne	
Bottom room	Varnish door	Roy Gooding	
	Make good room walls, stabilise and paint	Roy Gooding	
Entrance	Install door bell	Eric Sims Roy Gooding	Yes
Entrance	Obtain entrance direction signs	Roy Gooding	

Night Sky

All times GMT

Sun The sun will be rising approximately 03:40
The sun will be setting approximately 20:15

Moon

1st Quarter	Full Moon	3rd Quarter	New Moon
7 th	14 th	21 st	29 th

Mercury Mercury returns to the morning sky this month, It will not be observable as it will be in a bright pre-dawn sky.

Venus Venus remains in the pre-dawn twilight. It will be rising about an hour before the sun this month.

Mars Mars will be rising at about 23:00 by the end of the month. Magnitude -1.4

Jupiter Jupiter will be setting at about 22:00 by the end of the month. Magnitude -1.8

Saturn Saturn is in conjunction with the sun this month on the 24th The planet will not be observable this month

Uranus Uranus is in Aquarius will be rising about 22:30 by end of the month
Magnitude 5.7

Neptune Neptune will be rising at about 22:00 at the end of the month. Magnitude 7.8

Meteor Showers Meteor source is the BAA Handbook

Shower	Limits	Maximum	ZHR
Ophiuchids	May 19 th to July	June 9 th June 19 th	5

WHY IS THE NIGHT SKY BLACK?

By Dave McCracken

Easy really – the bit of earth I am standing on is turned away from the Sun, end of story, or is it?

Let's consider these commonly held beliefs.

- "There are more stars in the Milky Way than grains of sand on the beach."
- "Light travels in straight lines forever"
- "The universe is infinitely old"

Ok, if all of the above are true why is the night sky not a blaze of bright starlight with light from each of the stars forming into a continuous bright 'ceiling' ?

Well this apparently simple question had perplexed the greatest thinkers through the ages including Kepler (1610), Halley (1720) and de Cheseaux (1744) ⁽¹⁾ however the question gained its own special name when Olbers in 1826 gave it more than a passing thought. Strangely, a poem by Edgar Allan Poe called *Eureka* written in 1848 touched on the truth ⁽¹⁾.

So as they say on that well-known TV program, let's consider the evidence.

Olbers thought that dust was the reason for the lack of all-over star light. Dust, but space is an empty vacuum isn't it ? In the context of space, dust is micron size particles of carbon, silicates and iron at a density of 1 per 10^6 m^3 and making up 1% of the total mass of interstellar matter. However as can be observed in areas of star formation, when there is a higher proportion of dust, that dust warms up and re-radiates in the infra-red spectrum. In fact the dust does have an effect, but it is to obscure at visible wavelengths the centre of our own galaxy, the Milky Way. However in directions away from the plane of the galactic disk it is relatively dust free.

Yes, there are more stars in the Milky Way than grains of sand on the beach, about 10^{11} . How far away are they, and how old? And we should also consider the light given out from the other objects – Island Universes as Edwin Hubble termed them in the 1920s. Many of these galaxies dwarf ours in size and star density. There are about as many of those as there are stars in our Milky Way and each one of them has its own similar enormous quota of stars. So, let's assume the universe is finite in size and the same in all directions filled with stars. Each of these 'standard' stars will be uniformly spaced at a density of about 1 star per cubic parsec and each star has a 'brightness' or luminosity L . The amount of 'light' or flux f that reaches us from our standard star at this distance is given by the formula $L / (4 \Pi D^2)$ i.e. if all else is constant, the flux is proportional to $1 / D^2$, the inverse square law. So are stars that are further away just too faint to be seen and so contribute nothing to the total ?

Ok then, consider an imaginary shell of such standard stars round us with a finite thickness and at a fixed distance from us, how much of the light given off by this shell reaches us? Well the total number of stars in this shell is given by the number of stars per unit volume multiplied by the shell thickness and then multiplied by the surface area of the sphere.

Adding more shells, like an onion, means that D , the distance to the shell of stars, increases also but so to does the number of stars contributing to the total light output because the next shell out has a greater surface area i.e. is proportional to D^2 , countering the effect of the flux loss due to the increase in distance. So, and this is the key point, the total light reaching us is independent of distance. ⁽⁴⁾

Considering the nature of light, early astronomers had observed discrepancies in the predictions of the Jovian satellites which were correlated to the distance Jupiter was from the Earth at the time. Ole Romer (1644 -1710), a Danish astronomer, found that by timing the eclipses of Jupiter's satellites he was able to accurately work out a velocity of light ⁽¹⁾ very close to its current value which is a remarkable achievement for the late 1600's, long before computers.

Later, Michelson and others managed to determine the finiteness of light's speed to a much more precise value. Einstein suspected that Space, Time and Matter were all interrelated leading to the famous $E=mc^2$ equation in the 1920's and the eventual birth of the nuclear age. He predicted that massive bodies could affect light purely by gravity. It was found that during a solar eclipse light was indeed seen to bend. Subsequently it has been observed that extremely distant objects can be seen by an effect called gravitation lensing. The light from the distant object is bent by the effect of the gravity of a galaxy size mass acting like a giant magnifying glass.

Is the age, and for that matter the size, of the Universe infinite then? As recently as the 1930s there were two leading schools of thought. In the Blue corner was the steady state group who argued that this was as it was always had been and would go on forever. In the Red corner were the expansionists who argued that the universe was born of a massive explosive event that occurred at the very dawn of time. Researchers Penzias & Wilson working at Bell Laboratories in 1965 detected an unexplained radio signal at a wavelength of 7.35cm. This signal was in every direction and never varied. It seemed to emanate from outside our Milky Way. Theorists had already calculated that if there was some massive explosive event a very, very long time ago, say at the beginning of the universe, then by now the temperature would have dropped to about 3 Kelvin and be detectable as Cosmic Microwave Background Radiation. Penzias & Wilson confirmed this theory and were awarded a Nobel prize. A further milestone was passed when Edwin Hubble using the 100 inch Mt Wilson telescope observed a bright outburst in one of nearest galactic neighbours, the Andromeda galaxy. It had been known for some time that certain types of cataclysmic variable stars, known as cepheids, produced a very predictable light signature. Astronomers are unable to directly measure any stellar distance. They are however able to first calculate with parallax and standard trigonometry the distance to the nearest cepheid to give them a new standard measuring tool. This tool became the standard to calibrate the next distance measuring method

and so on. Hubble found by use of the standard cepheid variable that the distance to Andromeda was far greater than anybody had expected.

Now when light is split it forms a rainbow. If certain elements are present in the source of the light then bright emission lines or dark absorption lines are seen within the rainbow, an effect termed Fraunhofer lines after the 18th century chemist who discovered them and who was able to relate their position to the chemical elements. What Hubble also detected when he used a spectrograph on the Andromeda galaxy was that these lines were shifted towards the red, lower frequency end of the visible electromagnetic spectrum. Now in the well known effect of an approaching train the pitch of the noise is first rising as it moves closer to you and then, as it goes away, the note falls – The Doppler effect. The spectrographic shift of the lines towards red indicated that the Andromeda galaxy was moving away from us. He was able to determine the rate of separation by the degree of offset. He and others subsequently were able to detect movement in many other galaxies and so concluded that the universe was expanding. The rate of expansion became known as the Hubble constant.

Now try a thought experiment. Given that light travels at a finite speed of 300,000 km per second and the distance to our sun is approximately 146,000,000 km this means the sunlight we see now is about 8 minutes old. Imagine if the sun was switched ‘off’ while we were asleep and we woke up with no knowledge of the sun say seven minutes after it was switched ‘on’ again, we would not even know it existed until that first ray of light warmed the earth⁽⁵⁾. And so it is with cosmology. The particular branch of astronomy that deals with the whole cosmos. We can only have knowledge of the universe from the point the light has actually arrived.

Why is the sky black then – the universe is too young at only 15 billion years for Olbers’ expected effect to have happened yet! If we could just hang around for a few more billion years eventually more and more light will arrive to brighten the night sky.

References

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3. “Introductory Astronomy & Astrophysics”, 4th Edition, Zeilik & Gregory, 1998, ISBN 0-03-006228-4.
4. “Cosmology”, Editor Barrie Jones, 1994, ISBN 074925128X.
5. <http://zebu.uoregon.edu/~imamura/123/lecture-5/olbers.html> from published lecture notes.
6. <http://math.ucr.edu/home/baez/physics/Relativity/GR/olbers.html> updated: 24-JAN-1993 by SIC original by Scott I. Chase.

History of Orwell Park Observatory

Roy Gooding

This is the third part of my Orwell Park History that has been laying dormant for many years

Owners of Orwell Park since 1848

Name	Relationship	From	Till
George Tomline		1848	1889
Capt. E. Pretyman	Tomline's Cousin	1889	1931
G. M. Pretyman-Tomline	Pretyman's Son	1931	1936
Orwell Park School		1936	Date

"Colonel" George Tomline (1813 - 1889)

George Tomline was born on 3rd March 1813, on his fathers estate at Riby Grove, in Lincolnshire. He was the eldest son of William Tomline, the first of five children. Tomline was educated at Eton, being in the preceding year to William Gladstone.

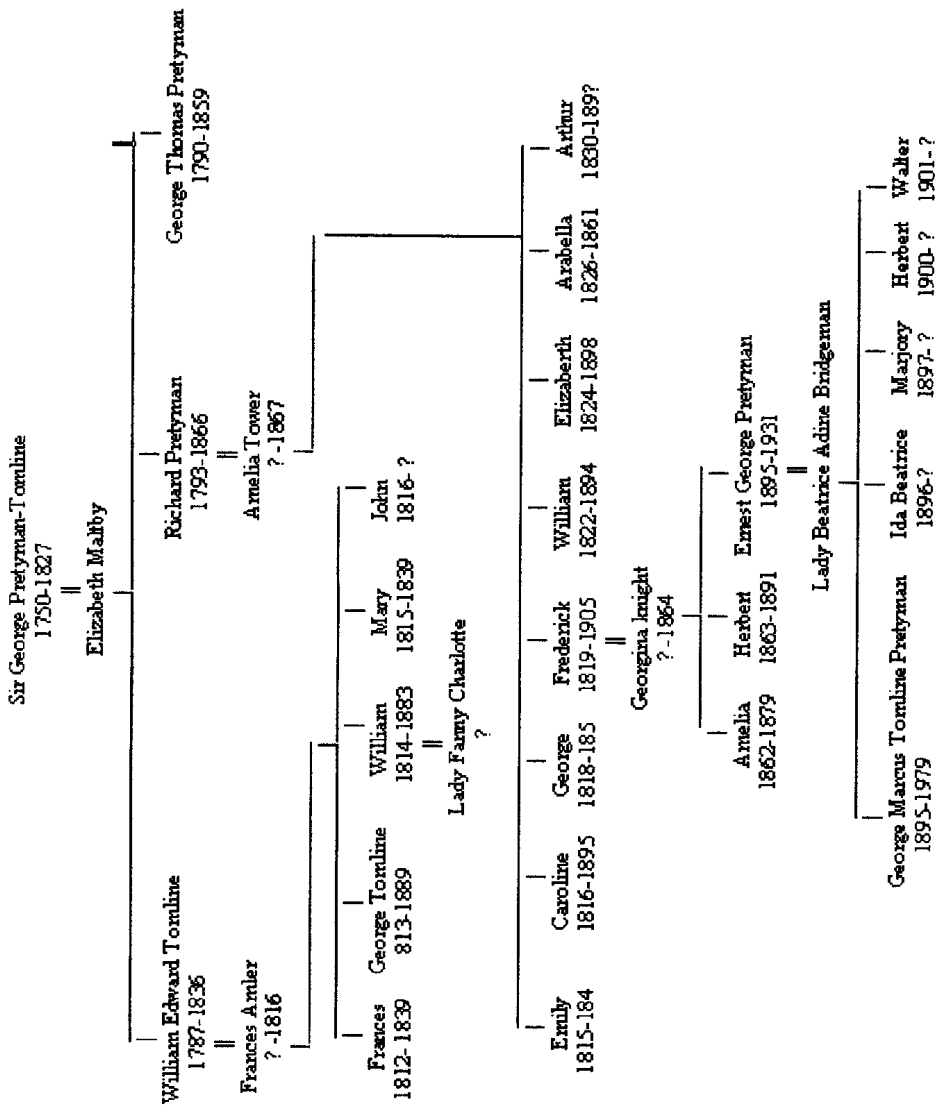
Very little is known of Tomline's youth, while he was living at Riby Grove. One anecdotal story recalled by an unknown acquaintance gives an impression of his personality. While young Tomline considered himself something of an athlete, and was held in high esteem by the locals for his genial manners and helpful attitude. While out one day he met Matthew Cunningham, a well known character of the neighbourhood, delivering sacks of grain and flour to Riby. Tomline offered to help unload the cart, seizing the 20 stone sacks with as little effort as if they were only 20lbs.

No evidence has been found whether Tomline went to university. Both his father and grandfather went to Cambridge, a path that Tomline may have been influenced to follow. As was the custom at this period Tomline undertook the Grand Tour route through Europe. This involved visiting all the major cities on the continent, and was believed to contribute to the final part of a persons education. In later life Tomline had a reputation for being a linguist of some standing. His interest in languages may have developed during this period. He described this tour as having driven through Europe in a gig.

In his early years while living at Riby, Tomline became an enthusiastic musician. He never mastered any instrument, but was able read musical scores. Tomline was well versed with the work of the English and continental composers of the early nineteenth century, and would often stage concerts at Riby Grove, having hired outside musicians and choirs to entertain himself and friends.

The title of Colonel was attached to George Tomline's name, a distinction to which he had no right as he was never in the army. The only military connection he had was in an honorary position to the Lincolnshire Militia. He must have liked this title as he never discouraged people from using it, except when at home where he preferred to be known as Mr. Tomline.

The Pretym-Tomline Family Tree



George Tomline's principal career was in public life, serving as a member of Parliament for three constituencies over a period of 29 years, 22 of which were at Shrewsbury.

Constituency	Election Year	Candidates	Votes	Comments
Sudbury	1840	Mr. G. Tomline		Elected unopposed
Shrewsbury	1841	Mr. G. Tomline Mr. B. Disraeli Sir Love Parry Mr. Temple	790 780 604 574	
Shrewsbury	1847	Mr. E. H. Baldock Mr. R. A. Slaney Mr. G. Tomline	759 743 732	
Shrewsbury	1852	Mr. G. Tomline Mr. E. H. Baldock Mr. A. Robinson	1164 745 440	
Shrewsbury	1857	Mr. G. Tomline		Elected unopposed
Shrewsbury	1859	Mr. G. Tomline		Elected unopposed
Shrewsbury	1863	Mr. G. Tomline		Elected unopposed
Great Grimsby	1868	Mr. G. Tomline		Elected unopposed
East Suffolk	1874	Lord Rendlesham Viscount Mahon Mr. G. Tomline	4136 3896 3041	
Harwich	1880	Sir H. Tyler Mr. G. Tomline	368 310	
North Lincolnshire	1881	Mr. J. Lowther Mr. G. Tomline	4200 3729	

Tomline started his political career for the constituency of Sudbury, a place to which up to that time, he had never had any connections. His election had dubious undertones. The constituency had a reputation, not uncommon at this time, for being able to buy votes. It was well known that Tomline had considerable financial resources, and was elected unopposed without even having to make a speech. His tenure at Sudbury was short lived, lasting for just one year.

In 1841 Tomline stood for Shrewsbury, which he won. Both George Tomline and Benjamin Disraeli were elected. Tomline lost his parliamentary seat at the next election in 1847. It was during this period out of Parliament that he purchased Orwell Park Estate. George Tomline returned to Parliament 1852, after standing for the Shrewsbury constituency. Here he polled the highest vote yet recorded for that constituency. He remained the MP for Shrewsbury for the next three elections. Tomline's final eight years as a MP were for Great Grimsby, however his fortunes after 1874 were unsuccessful, losing the next three elections in which he stood as a candidate.

He started his political career as a Conservative, but by the election in 1852 had changed allegiances to the Liberal party. Through his Parliamentary career Tomline took a great interest in coinage.

When Parliament was in session Tomline spent much of his time at his London residence at No.1 Carlton Terrace. His social contacts and connections were considerable. He amassed club memberships with much enthusiasm, joining all of the following:-

The Athenaeum.
The Carlton.
The Travellers.
The United Services.
Booldles.
The Junior Athenaeum

Tomline was also awarded an Honorary D.L.
Other posts he held were.

Magistrate for Suffolk.
High Sheriff of Suffolk in 1838.
High Sheriff of Lincolnshire in 1852.
Magistrate for Lincolnshire

On his fathers death in 1836 Tomline inherited the family estates at Riby Grove in Lincolnshire with his brother William. George Tomline eventually bought his brothers share in 1875, after a family quarrel at Orwell Park. The Riby Grove estate totalled 8439 acres. He later inherited an estate in Shropshire that was left to him by his mother. Probably the most convenient property left to George Tomline was his father's London residence at Carlton House Terrace. Tomlins's farther had used this residence when he attended Parliament. This house had been designed by Nash and over looks the Mall. Tomline's London residence is still standing.

Tomline had the same enthusiasm for buying land as his Grandfather had. His purchase of Orwell Park in 1848 was only the start of his land ownership in Suffolk. When ever any land became available for purchase Tomline would not be very far away. Between 1848 and his death in 1889 by way of purchase, Tomline increased his ownership to 18479 acres. This made him the second largest land owner in Suffolk. He owned the majority of the land in the Colneis Hundred, which was the old designation of the land between the Rivers Orwell and Deben, from Ipswich to Felixstowe.

Known Land Owned by Tomline in the Colneis Hundred

Land at Nacton Parish
Levington Manor.
Brightwell Manor
Falkenham Manor.
A Manor at Kirton
Kesgrave Manor
Martlesham Manor
Seckford Hall Manor
Grimstone Hall with Marston Manor
Land at Felixstowe at Manor House

Tomline also owned land in west Suffolk, which had been the ancestral home of the Pretymans for many centuries. These were at Old Newton and Bacton.

Details of some of Tomline's purchases are known

Date	Land	Acres	Cost
	Wadgate Farm, Felixstowe	434	
	East End Farm, Felixstowe	500	
1856	Grange Farm, Felixstowe	365	
1856	Peewit Farm, Walton	152	£6500
1862	Old Hall Farm, Felixstowe	210	
1869	Misc. land at Felixstowe:- copyhold land	3000	
	shore & saltings	1000	
	enclosed land	2400	
1874	Cottage Farm, Walton	51	£8250

Tomline's purchases included six miles of sea frontage. Between 1872 and 1876 he spent £156,000 on land and property in the Felixstowe, Walton and Harwich areas.

George Tomline was a very well read person, and probably epitomised the self taught Victorian gentleman. He reputedly, had one of the finest private libraries in the country. Tomline was at ease in any circle of acquaintances, on all subjects as diverse as literature and science, with special emphases on astronomy. His library also included works in many European languages. Sir Robert Peel was once reported to have remarked that in his opinion, the two cleverest young men in the country were William Gladstone and George Tomline.

As well as books Tomline was a keen collector of paintings, which were housed in a specially constructed picture gallery at Orwell Park. It is reported that the Duke of Wellington, upon hearing of Tomline's purchases, remarked, " what would his Grandfather the Bishop have said". Tomline's Grandfather was evidently no lover of the arts.

An impression of Tomline's art collection can be gleaned from a report in the Suffolk Chronicle about a visit of the Science Gossip Society to Orwell Park in July 1874. In the drawing room Tomline had a portrait of Napoleon by Paul de la Roche, which was flanked by paintings by two English artists, Sohold and Stanfield. The central piece of the room was a white marble mantelpiece. In the picture gallery were paintings by:- Caracci, Murillo, Caraccio, Cuyp and Rembrandt. Throughout the mansion there were oak cabinets, bronzes, China vases and other sculptures, including a marble head of Napoleon. The billiard room housed a cabinet containing many carved specimens of birds and flowers. There was an extensive collection of flowers and ferns in the conservatory. On this visit the library was not available for inspection, so unfortunately there is no description of it.

Soon after Tomline came into property he began to receive many hundreds of begging letters especially near Christmas. In the early years he would read each application quite seriously, but this resulted in many sleepless nights. Tomline was very sympathetic towards the poor and less well off, and had strong views as to how to improve their lives. After a while he simply ignored all pleas for help, and resolved not to give any money away, but to employ as many people as he could on all his estates.

George Tomline's principal monument was the building of the Ipswich to Felixstowe railway and Felixstowe Docks. The railway project was thwarted several times before final permission was given to build it. In 1871 Tomline started negotiations with a Mr. Weston for the idea of building a tramway. The route was surveyed and much money was spent, but the plan fell through. Everything remained quiet until May 1874 when the Ipswich and Felixstowe Railway and Pier Bill came before the Committee of the House of Commons. Prominent people in Ipswich were enthusiastic for the Bill, but two people were equally against it. These were Mr. Weston who had lost considerable monies from the first scheme and Sir George Broke-Middleton, Tomline's neighbour at Broke Hall Nacton. The proposed route would cross a portion of Sir George's land and he objected most strongly. However in July the Bill was thrown out by the House of Lords. This was met locally with much surprise and anger, which was principally directed towards Sir George. A partition was prepared, with about 7000 people signing it in the first thirty hours. Before the document was sent to London nearly 10000 signatures had been obtained, giving it a final length of nearly sixty yards.

Tomline renewed his application the following year. He had the route resurveyed, this time by Mr. E. Wilson, an engineer who had undertaken previous work with the Great Eastern Railway. Three separate Bills were prepared to cover all eventualities, with three separate lines; the Felixstowe line, the Orwell Line and the Ipswich & Felixstowe Line. George Tomline had so much confidence that one of these routes would be passed that he had work started in November 1874. Many local manufacturers, merchants and private residents formed a committee to influence the scheme. This time the Bill was opposed, again by Sir George Broke Middleton and by the Harwich Harbour Conservancy Board. The Bill to build the railway was finally approved by the House of Lords on 24th January 1875.

Messrs Lucas Brothers of Lowestoft were contracted to build the line within twenty two months. The line was completed two months earlier than planned, with the opening ceremony in May 1877. The line started from Westerfield station and ended at Beach and Pier stations, Felixstowe. Tomline believed that Felixstowe would develop around the Beach station area. A spur line was constructed to the town station in the following year, opening on 1st July. In the first two months the line carried 24000 passengers. The line cost Tomline about £187,000 to build, which he sold a few years later to the Great Eastern Railway Company for a small profit.

In 1876 Tomline obtained permission from Parliament to build a wet dock at Felixstowe. The excavations for the dock were started in 1881 and completed in 1886. With these two projects complete Tomline set in motion the transformation of Felixstowe from a small seaside village to the present prosperous town. The small dock has since been expanded in several phases, making Felixstowe now one of the busiest container ports in the country.

After Tomline had purchased the Manor of Walton-cum-Trimley there started a long legal wrangle with the War Office. The War Office owned about 100 acres of land adjacent to Tomline's, which they had a 999 year lease on, at a rent of £10 a year. On January 6th 1875 Tomline received a notice that he would be offered 10/- (50p) per acre for his land with an option towards future purchase. Colonel Tomline's reply to the War Office stated that he would be prepared to sell the property for £360,000. This offer was immediately rejected. An arbitration court was convened in January 1876 in Ipswich, to assess the value of the land under question under the compulsory powers of the Defence Act. Tomline's new assessment for the Manor was £40,000, this included items for wreckage, seaweed, minerals and bathing machines. An additional £22,000 was asked for Langer Common. The Jury assessed the value of Tomline's 200 acres at £11,039. This amount was refused by Tomline and

he took it to appeal to the London Law Courts. The outcome of the appeal was to increase the value to £15,000, and was accepted. A local paper dubbed this protracted case "The Civil War". In subsequent years George Tomline had several more legal tussles with the War Office concerning, the extraction of coprolites, shingle and water supply. Only a person with Tomline's financial resources could have taken a government department on. He must have taken much pleasure in doing battle with such a strong opponent.

In the shooting season Tomline entertained many guests at Orwell Park for the estate shoots. At one time there was also pack of harriers kept at Orwell park. An anecdotal story concerning a school inspector and Colonel Tomline may be of interest. During the shooting season the children of the estate tenants were employed as beaters. A school inspector called on Tomline and had a fiery interview with him, probably to deplore this practice. The inspector soon retired, badly shaken. He returned the following day for an appointment with the Mr.Glass, the school manager. Both men believing that Tomline was away spent some time in the observatory. On coming down the stairs the voice of Tomline was heard roaring up the stairs "Is that you Glass?".

A second anecdotal story concerns a lecture meeting he was to chair at Harwich. The talk was to be given by his astronomer John Plummer on the Transit of Venus. Plummer had recently returned from an expedition to the West Indies, to observe the transit of Venus On arriving at Harwich station Tomline was in a great fury as at Manningtree he had lost Plummer, while changing carriages. Tomline's reported reply to this occurrence was "Oh yes, astronomer like, you know, I expect he was watching the stars instead of looking at the train when it started. Its devilish awkward, isn't it?". A friend with him asked what he would do if Plummer could not arrange alternative transport. "Oh, I shall have to get some Harwich Venus to give us an address on the Transit of an Astronomer" replied Tomline. John Plummer eventually arrived.

George Tomline made use of the river both for pleasure and for an unsuccessful business venture. For the former he owned a steam yacht, named the Gazelle, and the latter he set up an oyster farm.

George Tomline died at 4.00 on Sunday 25th August 1889 at his London residence 1 Carlton Terrace, after an illness that had lasted several months. In his will Tomline stated that his body should be cremated. In 1889 cremation was still frowned upon by the Church. There was only one crematorium in the country which was at Woking. Tomline was the 93rd person in the country to be cremated. The news was reported in the local papers as follows:- The cremation of Colonel Tomline set the crown to his eccentric life by what was regarded as even greater eccentricity in death. Tomline requested that his ashes should be taken to Riby Church in Lincolnshire.

Ernest George Pretyman (1857- 1931)

Ernest Pretyman was educated at Eton and at the Royal Military Academy Woolwich. In 1880 he joined the Royal Artillery and was promoted to Captain in 1888. This position was short lived , as he resigned his commission the following year after his inheritance of Orwell Park. Ernest Pretyman retained the title of captain through his life. He was also the Honorary Colonel of the 1st Suffolk Volunteer Artillery.

Ernest Pretyman started a career in politics in 1895, representing the Chelmsford and Woodbridge constituencies of until 1906. He was a member of the Conservative Party. In 1900 was appointed Civil Lord of the Admiralty, and to the post of Financial Secretary to the Admiralty three years later.

One source states that Captain Pretyman had a great interest in astronomy and made full use of the observatory. The accuracy of this remark is debatable as it also says that the observatory is equipped with a 12" refractor.

Notes on Other Members of George Tomline's Family

Sir George Pretyman-Tomline (1750-1827)

George Pretyman was George Tomline's grandfather. He was the son of George and Susan Pretyman, an old established Suffolk family, whose home was at Bacton near Bury St. Edmunds. George Pretyman was born at Bury St. Edmunds on 9th October 1750. He was educated at Bury Grammar School and at Pembroke Hall Cambridge, where he read mathematics.

After graduating he became a close friend and tutor to William Pitt. When Pitt became the 1st Lord of the Treasury, Pretyman was his private secretary, from 1783 to 1787.

George Pretyman was created a Doctor of Divinity in 1784 and elected as a Fellow of the Royal Society in the following year. In 1787 he was appointed as the Bishop of Lincoln and Dean of St. Pauls. He wrote a book entitled "Elements of Christian Theology" which was published in 1799

In 1803 he was left an estate at Riby in Lincolnshire by Marmaduke Tomline. This was quite unexpected as he had only met Marmaduke Tomline a handful of times. After this George Pretyman changed his name to George Pretyman-Tomline.

George Pretyman-Tomline. was appointed the Bishop of Winchester in 1820. During 1823 he established a claim to a Nova Scotia Baronetcy A title that had remained unclaimed since the death of Sir Thomas Pretyman in 1749. From this time he was known as Sir George Pretyman-Tomline. Sir George married Elizabeth Maltby in 1784, they had three sons. He died on 14th November 1827 at Wimborn.

William Edward Tomline (1787-1836)

William Tomline was George Tomline's father. He was born on 27th February 1787 at Riby Hall. Tomline was educated at Westminster School and at Trinity College Cambridge.

During 1826 he began his Parliamentary career, representing the constituency of Truro in Cornwall until 1830, after which he held the seat for Minehead. To give himself an easily accessible home in London he purchased a house that overlooked the Mall, no.1 Charlton Terrace. This house was in a terrace that had been designed by Nash.

William Tomline married Frances Amler on 18th April 1811, they had five children, three boys and two girls. For a time he was the Honorary Colonel of the Royal Naval Lincolnshire Militia. After the death of his father George Tomline inherited property at Riby Lincolnshire and at Bacton in West Suffolk.

William Tomline died on 28th May 1836.

Millennium Telescope Nearing Completion (!!)

Mirror update

Having delivered an oil drum to Mike Harlow for the purposes of final figuring and polishing, work commenced on the secondary elliptical flat. Initial figuring achieved an accuracy of approximately $10 \times \lambda/2$. Subsequently Mike reduced this to an error of about $\lambda/2$ over most of the usable area. There is some edge roll-off to be corrected although the secondary holder will hide the extreme edges.

Figure 1 (LHS) shows the secondary under test in contact with an optical flat ($\lambda/8$) and illuminated with monochromatic light from a helium-neon laser (632.8nm). It shows the secondary to be about 3 micron (10 fringes of $\lambda/2$ each) convex from centre to edge and fairly uniform. This is an excellent starting point for figuring to a flat surface. **Figure 1 (RHS)** shows the secondary after subsequent figuring.

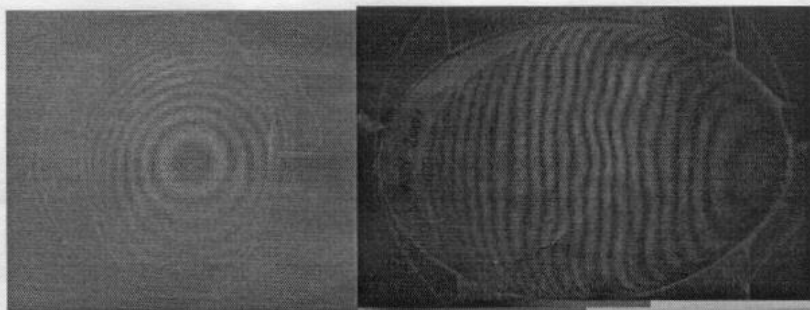


Figure 1 – MMT Secondary before and after subsequent figuring

Telescope construction update

The telescope construction is now largely complete (!!) with a few steps remaining as described here.

A couple of evening meetings resolved the assembly procedure. The following sequence of photos illustrates the assembly “in practice”. Once again, thanks to Gary for allowing access to his garage and extensive facilities! Construction commenced by securely bolting the metal primary mirror cell assembly to each wooden “sledge-runner” side bearing to form an overall mirror support system.



Figure 1 – Checking correct orientation of side bearings and holes correctly marked prior to drilling.



Figure 2 – The mirror cell assembly clamped on the “lower” side bearing on the work surface. Three holes are drilled in the side bearing corresponding to the mirror cell hole positions. A long drill passed through the pre-drilled mirror cell assembly!



Figure 3 – The mirror cell is now securely bolted to the lower side bearing using three carriage bolts, which hold it firmly in place. Martin is attaching an additional tubular bracing strut to enhance the structural integrity of the entire mirror support system once assembled.

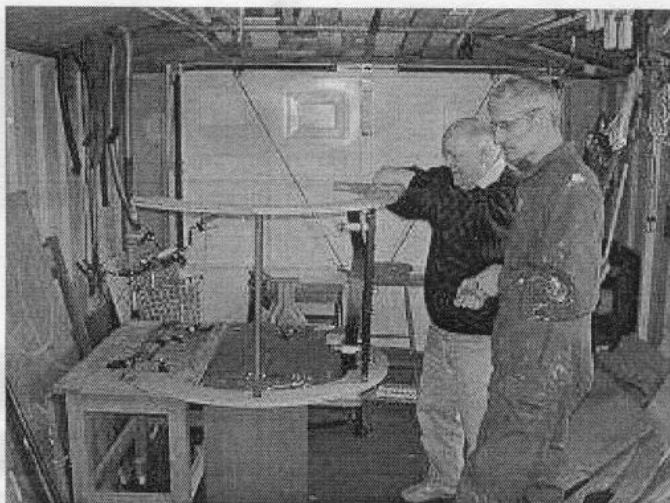


Figure 4 – As if by magic, the mirror support system is starting to materialise! Paddy has attached the upper side bearing to two points; the support brace and a

“central hole” within the mirror cell assembly (already drilled) This allows adjustment between the relatively movable upper side bearing and fixed lower side bearing. The sledge runner side bearings can then be correctly aligned with one another once the entire assembly was placed on a level surface as shown below.



Figure 5 – Martin then used a spirit level to adjust the relative position of the side bearings. Note the garage floor was not completely level, so the assembly was placed on top of an additional board levelled by inserting wedges at the corners. Accuracy was paramount!

The spirit level was placed across the mirror cell between side bearings both at the near end as shown here and the far end. The movable side bearing was adjusted until the spirit level bubble indicated level both ends. Once this had been achieved, the upper side bearing was securely clamped in place in preparation for drilling the last two remaining holes. These very important steps took some time to complete and were critical towards ensuring a smooth movement of the telescope in the elevation axis. Time well spent!

Movement of the telescope in azimuth and elevation will be assisted using needle roller bearings within the base assembly. A full description of the telescope base will be included in a future newsletter article. Construction has commenced and is ongoing at the time of writing.

Optical encoders and motor drives are seen as enhancements for a later time.



Figure 6 – The upper side bearing has been securely clamped in place and Martin is starting to drill the two remaining holes. The drill passes all the way through!



Figure 7 – The mirror cell has been securely bolted to the side bearings using carriage bolts and the metal support-bracing strut has also been fitted. In this photo, two wooden “end battens” and eight wooden Serrurier truss pole clamps holding the

secondary are clamped in position. Gary and Martin are discussing the positioning of two of the lower pole clamps. This was seen as a problem at the time due to them partly over-riding aluminium L brackets but was subsequently resolved.



Figure 8 – Martin demonstrating the structural integrity of the primary assembly!



Figure 9 – Carriage of the primary mirror system (no problem without the mirror!)



Figure 9 – A cause for celebration!! Truss poles have been inserted into the wooden clamps in the primary mirror system, and secondary ring and spider attached for the first time! This was an incredible and memorable occasion after all the hard work that went into the design and construction. The scope was assembled within 10 minutes. [One key component awaiting final construction and not shown in the photo is the base providing azimuth and elevation movement].

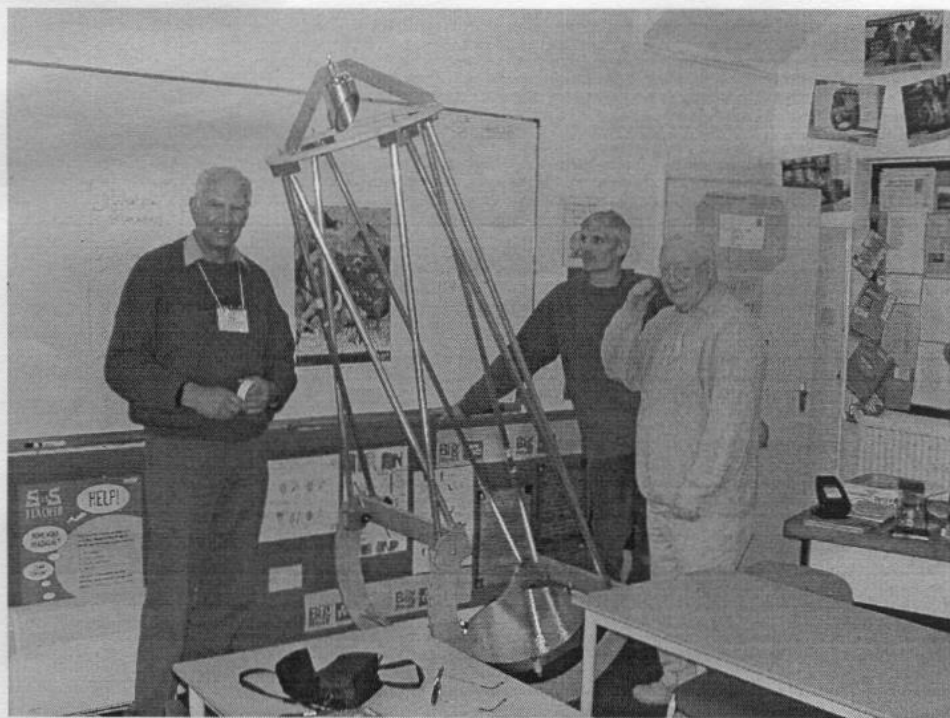


Figure 10 – Telescope assembled in Orwell Park school classroom prior to OASI committee meeting on 26th April. The disassembled scope easily fitted into Paddy's Volkswagen Golf hatchback and assembly took less than five minutes once unloaded!! The three major components are the mirror support system, truss tubes and secondary cage. Four pairs of tubes attach the secondary cage to the primary assembly and wooden clamps and wedges attach the tops of the poles to the secondary cage via a single bolt through each of the four wedges. The three-vane pyramid spider and secondary holder can be clearly seen. This photo provides an indication of the size of the completed scope when assembled. Tube lengths have been oversized by around 150mm / 6" at present but once cut down to the correct lengths and allowing for a similar height base, the scope will be similar in height. A stepladder is required for viewing objects at or near Zenith. Fabulous team effort!!

Further steps include fine-tuning the scope assembly so as to protect the primary mirror against falling objects, overall weatherproofing, a focuser and the base.

Neil Morley – 27th April 2003.

Summary of Committee Meeting Held 2003 April 26

Present: Ken Goward, Garry Coleman, Ted Sampson, James Appleton, Neil Morley, Eric Sims, Martin Cook, Paddy O'Sullivan, Roy Gooding, Pete Richards, Nikki Gillard

Apologies: Paul Whiting, Mike Whybray

Chairman's Report – Ken Goward

Discussions have begun with Orwell Park School to renew the Observatory License.

Roy Cheesman wants to stand down as trustee (the other trustees are happy to continue). The committee will offer Roy Cheesman honorary membership of OASI and invite David Payne to become a trustee to replace Roy.

Ken had hoped that Sir Patrick Moore would be able to visit Orwell Park on 07 May to observe the transit of Mercury but it is not possible because of Patrick's busy schedule on the day.

Secretary's Report – Roy Gooding

Roy has received several enquiries from prospective members. This has resulted in some prospective visits to Orwell Park and at least one new member joining OASI.

Roy has put in place arrangements for an SPA meeting supported by OASI to mark the 50th Anniversary of the SPA. He has booked a venue in Ipswich and has organised a programme including talks by external speakers and members of OASI and SPA. So far, the SPA has provided no support to Roy in making the arrangements. If the SPA does not begin to actively support Roy the committee will consider changing the event into an OASI-only convention.

OASI is not holding a specific event to mark NAW. However, we aim to observe Mars later in the year when it is better placed for astronomical observation.

Treasurer's Report – Garry Coleman

Finances are currently very healthy - the current balance is £2546.18. There are sufficient funds to cover the current major projects: library refurbishment, lift shaft refurbishment and completion of the Millennium Telescope.

The committee agreed to follow previous practice and aim to keep a contingency of approx one year's membership fees (circa £1000).

Ken Goward will write to the leader of a Scout Pack who recently visited Orwell Park Observatory to thank him for the most generous donation which the Scouts made. The committee will agree new guidelines on donations expected/requested from visiting groups.

At the beginning of March, Garry submitted an application to *Awards for All* for £5000 covering a laptop PC, video projector and associated equipment. We should get the result within three months.

The standard of service provided by OASI's existing bankers, Lloyds TSB, has been wholly unacceptable in recent months. Garry is therefore transferring OASI's banking to Abbey National Bank.

Membership – Martin Cook

OASI currently has 101 members including 7 honoraries. Fifteen previous members who have not renewed their subscriptions have been lapsed.

Training - Ted Sampson

Training in use of the Tomline Refractor is ongoing for a group of four trainees (five people started but one dropped out due to work commitments). The training is proceeding well and Ted expects the trainees to achieve the necessary standard by the end of May. Ted has names for the next group of potential trainees and hopes to start their training during the Summer.

The last workshop of the current series (5th series) of astronomy workshops will be held on 07 May. Ted is asking for indications of interest for a possible 6th series.

Monday observing nights have been going well. Monday 12 May will be last Monday observing night of this season. Ted aims to rationalise Monday night opening at Orwell Park for the next season.

Newsletter – Eric Sims

Eric has received a lot of material for the Newsletter recently. However, new material is always welcome and all members of OASI are encouraged to contribute articles on any astronomical subject.

Web Site – James Appleton

Thanks are due to members of OASI who recently providing material for the Web site. Especial thanks are due to the following members who provided a very large amount of material: Roy Gooding for archive material; Neil Morley for progress reports on the Millennium Telescope; Nigel Evans for observing reports.

Development of the Web site over the next few months will concentrate on improving presentation and visual appeal.

The web site is accessible at: <http://www.ast.cam.ac.uk/~ipswich/index.html>

Equipment & Maintenance – P O'Sullivan, M Cook & R Gooding

Repairs to the RA drive of the Tomline Refractor are ongoing.

Purchased two new eyepieces (40mm and 50mm focal length).

The Tomline Refractor object glass has been cleaned. Paddy will organise cleaning of the mirrors of the balcony telescopes during the Summer.

It is hoped to complete refurbishment of the library this summer.

Roy and Martin have created a comprehensive list of maintenance work needed to maintain the fabric of the Observatory and its facilities. Roy will publish the list in the Newsletter. The committee encourages all members of OASI to contribute to the maintenance work, which is essential to ensure the continued operation of the Observatory. The committee will discuss before the Winter observing season the relative priorities of maintenance work versus astronomical activities.

Security & Safety – Paddy O'Sullivan, Mike Whybray

Members of OASI are discouraged from visiting Orwell Park Observatory alone. However, if they do so, they must take appropriate care over their personal safety.

Paddy has begun to purchase additional safety equipment for use during maintenance work on the Observatory.

Library – Mike Whybray

When subscriptions to the BAA, SPA, FAS and TA come up for renewal Mike will renew by standing order – this should simplify paperwork in the future.

Visits – Paul Whiting

We have now concluded the 2002/2003 season of visits, having hosted 11 visits since Christmas. The range of visitors continues to vary from schools and youth organisations to adult groups and of course our annual visit from Frank Flynn's Astronomy Class.

Many thanks are due to all members of OASI who hosted visits. Paul is now taking names of hosts for the 2003/2004 season of visits. The committee encourages all members of OASI to volunteer to host visits.

Lectures – Pete Richards

Pete is organising a small programme of lectures (just one or two talks) for the coming Winter Season. This could include a local speaker on the Gemini Telescopes and a possible second lecture by members or a visiting speaker, possibly Gillian Bence-Jones (a relative of Colonel Tomline who lived at Orwell Park in her childhood.)

Observing Strategy

Orwell Park Observatory will be open for members to observe the transit of Mercury on 07 May 2003 (ingress 05:13 UT, egress 10:32 UT).

Although individual members of OASI would be encouraged to make observations of Mars later in the year (around the time of its closest approach to Earth) successful observing of Mars requires a high level of skill and is not a subject that is suitable for an observing project aimed at members of OASI in general.

Any members of OASI with ideas for possible observing projects should contact James Appleton, Garry Coleman or Ted Sampson.

Dark Skies

The Science and Technology Committee of the House of Commons is conducting an inquiry into light pollution and astronomy. Ken Goward has sent a letter to the Committee on behalf of OASI.

Any Other Business

Neil Morley demonstrated the frame of the Millennium Telescope. The frame could be assembled/dis-assembled in circa five minutes – a most impressive achievement! Neil hopes to achieve first light later in 2003.

Date of Next Meeting

Saturday 12 July 2003 at 19:30 in the School science classroom. All members are welcome to attend.

Full minutes of committee meetings are posted on the noticeboard in Orwell Park Observatory. Please contact any member of the committee if you require any further information about the above committee meeting or any other aspect of the running of OASI.

James Appleton
29 April 2003

OCCULTATIONS DURING JUNE

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

D / R	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star	Mag
D	02 Jun 20:53	0.07+	-6	13	ZC 1049	6.8
D	03 Jun 21:56	0.13+	-11	11	ZC 1180	7.1
D	06 Jun 21:22	0.39+	-8	30	ZC 1535	6.8
D R	06 Jun 23:11 23:36	0.40+	-15 -15	14 10	46 Leo, ES Leo	5.4
D	08 Jun 23:23	0.62+	-15	17	ZC 1758	6.9
D	09 Jun 22:35	0.73+	-13	24	48 Vir	6.6
D	11 Jun 21:16	0.91+	-7	22	8 Lib, alpha 1 Lib	5.2
D R	11 Jun 21:24 22:31	0.91+	-8 -13	22 20	9 Lib, alpha 2 Lib	2.8
D	14 Jun 00:25	1.00+	-14	12	ZC 2442	5.9

James Appleton

2003 COMMITTEE

CHAIRMAN & PUBLICITY

K Goward

SECRETARY &

WORK PARTY ORGANISER

R Gooding

TREASURER

G Coleman

MECHANICS & MEMBERSHIP

M Cook

NEWSLETTER CO-ORDINATOR

E Sims

ASTRONOMY WORKSHOP

T Sampson

WEB SITE & MEETING MINUTES

J Appleton

EQUIPMENT CURATOR

P O'Sullivan

LIBRARIAN

M Whybray

CO-OPTED MEMBERS

LECTURE CO-ORDINATOR

P Richards

VISITS BY OUTSIDE GROUPS

Paul Whiting

JOURNAL ARTICLES TO

E Sims Ipswich Suffolk IP1 4HA

CORRESPONDENCE ADDRESS

R Gooding OASI Secretary

MEMBERSHIP

M. Cook Ipswich Suffolk IP1 6AE

Ipswich Suffolk IP4 5PZ

Home Phone Work Phone



Observing Programme For June

Dates	Observing Director	Activities
Monday		Nothing Booked
Tuesday		Nothing Booked
Wednesdays 4th 11th 18th 25th June from 8.00	M Cook D Payne	Nebular & Faint Objects
Thursday		Nothing Booked
Friday		Nothing Booked

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 12th JULY

The next Committee Meeting is to be held on Saturday the 12th of July at 7.30pm in the class room at Orwell Park School. All members are welcome to attend.

Society Contact Details

Chairman	K Goward	<u>Home Phone</u>	<u>Work Phone</u>
Secretary	R Gooding		

Contact details for the full committee are inside the back page.

e-mail queries: ipswich@ast.cam.ac.uk
WWW address: <http://www.ast.cam.ac.uk/~ipswich/>