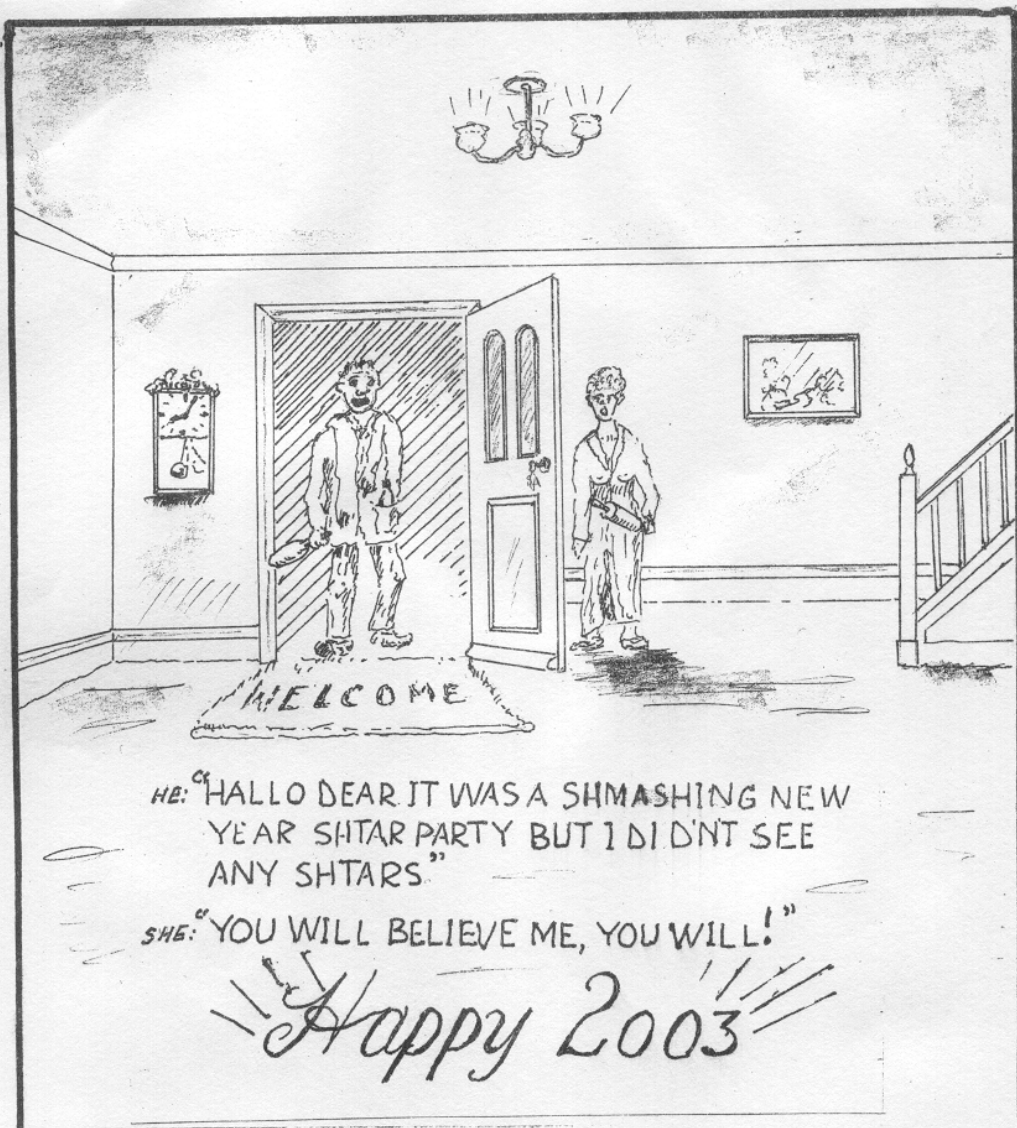


ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313.

JANUARY 2003



Society News

1 AGM 11th January 2003

The 2003 AGM will be held on Saturday 11th January 2003, from 20:00. One of the classrooms in the courtyard will be used. Every member is welcome. As usual the agenda of the AGM will include a review of this years activities, and a look forward to those of the new year.

The principle items covered will be:

- Report on last year's society activities
- Election of the new committee for 2003
- A provisional list of events for the 2003.
- Members will also be able air any ideas they may have on society activities

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Events for 2003

| | | |
|--|--|--|
| Astronomy Workshop | Collimation of Telescope Optics Presenter St John Robinson | Wednesday 8 th January |
| Lecture Meeting Friend's Meeting House, Fonnereau Road | Provisional meeting on December's eclipse | No date fixed |
| Astronomy Workshop | Transit Telescopes Presented by Bill Barton | Wednesday 5 th February |
| AstroFest | Kensington Town Hall Hornton Street London | 7th & 8th February |
| BAA Observers Workshop | The Institute of Astronomy Madingley Road Cambridge | Saturday 15 th February 11:00 to 17:00 |
| Lecture Meeting Friend's Meeting House, Fonnereau Road | Provisional talk by Martin Lunn | No date fixed |
| Astronomy Workshop | Hertsprung Russell Star Sequences Presented by Paddy O'Sullivan | Wednesday 5 th March |
| First Presidential Lecture | Dr. Allan Chapman The Victorian Amateur Tradition At Orwell Park School | Friday 7th March 2003 |
| Open Weekend | Very provisional Observatory only open | May be around Easter |
| Astronomy Workshop | Comets, Asteroids and Impacts Presented by Richard Lyzinski | Wednesday 2 nd April |
| BAA Winchester | King Alfred College | Friday 25 th to Sunday 27 th |

| Weekend | Winchester | April |
|----------------------------|---|--|
| Astronomy Workshop | Radio Propagation Presented by Paul Whiting | Wednesday 7 th May |
| Web Society Annual Meeting | Sackler Lecture Theatre Institute of Astronomy Cambridge | Saturday 17 th May |
| BAA Exhibition Meeting | The Cavendish Laboratory Madingley Road Cambridge | Saturday 28 th June |
| Summer Excursion | No destination yet decided | No date yet decided |
| Summer Barbecue | No venue yet set | No date yet fixed |
| National Astronomy Week | No programme yet decided | 23 rd to 30 th August |
| Equinox Star Party | Thetford | 26 th to 28 th September |
| Christmas Meal | Provisional dates 10 th or 17 th December | No venue decided |

3 Membership Subscription for 2003

Subscriptions for 2003 are due from 1st of January. If you have already paid please ignore this request.

The rates for 2003 are:

| | |
|------------------------|--------|
| Junior & Concessionary | £11.00 |
| Adult | £15.00 |
| Family | £17.00 |

A renewal form is included with the January newsletter. Return this form with your 2003 subscription, so that the society membership records can kept up to date.

Please make cheques & P.O.'s payable to the: -

ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

Please return all subscriptions **with the renewal form** to

Martin Cook

Ipswich
IP4 5PZ

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Night Sky

All times GMT

Sun

The sun will be rising approximately between 08:10 to 07:50
The sun will be setting approximately between 16:00 to 16:40

Moon

| New Moon | 1 st Quarter | Full Moon | 3 rd Quarter |
|-----------------|-------------------------|------------------|-------------------------|
| 2 nd | 10 th | 18 th | 25 th |

Mercury Mercury will be at inferior conjunction on the 11th, and reappears back in the morning sky. It will remain low down and difficult to see this month.

Venus Venus enters the new year as a very prominent object in the pre dawn. It will be rising at about 04:30 in mid month. Magnitude -4.4.

Mars Mars will be rising a little before 04:00 through the month. It will at magnitude 1.4.

Jupiter Jupiter will be rising about 18:00 in mid month, and will be observable the rest of the night. magnitude -2.6

Saturn Saturn remains well place to observe this month. It will well up at sun set and will not be setting until about 06:00 in mid month. Magnitude -0.

Uranus Uranus will be setting at about 19:15 in mid month, and may be glimpsed after sunset in the western sky. magnitude 5.9

Neptune Neptune will be setting at about 17:40 in mid month, and may be glimpsed after sunset in the western sky. magnitude 8.0

Meteor Showers

| Name | Limits | Max | ZHR |
|-------------|--|-------------------------------|------|
| Quadrantids | January 1 st to 6 th | January 3 rd 22:00 | 100? |

Meteor source is the BAA Handbook

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LUNAR OCCULTATIONS DURING 2003

by James Appleton

This article provides a summary of lunar occultations visible from East Anglia during 2003. The Orwell Park Observatory holds a comprehensive listing, containing full observational details.

This is the tenth year in which I have calculated details of occultations visible from East Anglia and disseminated details in the *Newsletter*. As if by way of recognition of the anniversary, the highlight of 2003 occultation events is a graze of a magnitude 5.4 star for which the track passes within 150m of Orwell Park Observatory!

In addition to the graze passing close to Orwell Park, there are many hundreds of total lunar occultations which are potentially observable from East Anglia during the year. The Moon does not occult any planets during the year as seen from the region.

The remainder of this article summarises the circumstances of the best occultations during the year. It provides details for the location of Orwell Park Observatory; however, differences will in general be negligible for locations throughout East Anglia.

OCCULTATION PREDICTIONS

The Moon occupies a band through the sky lying within $\pm 6.75^\circ$ of the ecliptic. This band therefore defines the area of the sky within which to search for lunar occultations. I use a complex suite of computer software to search for occultations. The software models the motion of the Moon and planets in detail, and by comparing the position of the Moon at each instant with the co-ordinates of planets and stars, it evaluates the precise time at which lunar occultation events occur. Once the time of an event is known, the software runs additional algorithms to calculate other observational details.

The software is based on the algorithm *Occult* in *Astronomy On The Personal Computer*, 2nd edition by O.Montenbruck and T.Pfleger, Springer-Verlag, 1994. However, I have added numerous enhancements to improve accuracy and to filter out predictions occurring under unfavourable circumstances. The software uses the NASA Jet Propulsion Laboratories' ephemeris DE-405 to provide the position of the Moon and planets and the Hipparcos, Tycho2, PPM and XZ94F star catalogues to provide stellar positions. DE-405 and Hipparcos/Tycho2 represent the latest and most accurate sources of astrometric data currently available. The PPM and XZ94F catalogues provide coverage in areas of the sky that

Hipparcos/Tycho2 do not cover in depth. The software uses IOTA's electronic Watts charts to correct predicted timings for the local lunar limb profile. (This typically makes a difference of several seconds.)

OCCULTATION SEASONS FOR 1st MAGNITUDE STARS

The Moon's orbit is defined by a range of periodicities, both short and long term. The short term periodicities mean that the Moon's path through the sky tends to follow a pattern whereby it almost repeats itself every month. However, the longer term periodicities gradually shift the orbit so that no particular pattern of approximate repetition can last more than a few years. This results in so called "occultation seasons", lasting for some years, during which particular stars are repeatedly occulted, or repeated not occulted.

The effect is most obvious for the brightest stars that can be occulted, namely the four first magnitude stars: Aldebaran, Spica, Antares and Regulus. We are currently in an occultation season lasting until 2005 when none of these stars are occulted.

BRIGHT STELLAR OCCULTATIONS

Despite the fact that no first magnitude stars are occulted during 2003, there are 13 occultations during the year involving other stars brighter than magnitude 5.0, and these should be readily visible in binoculars or small telescopes. Table 1 lists the circumstances of these occultations.

| D R | Date & Time (UT) | Lunar Phase | Sun Alt (d) | Star Alt (d) | Min Dist (rad) | Mag | Star |
|--------|-----------------------|----------------|-------------------|--------------------|----------------------|-----|---------------------|
| D R | 16 Jan 03:57 | 0.94+ | -36 | 20 | 0.19N | 4.9 | 132 Tau |
| D R | 17 Jan 02:50 03:49 | 0.98+ | -45 -37 | 39 29 | 0.35S | 3.1 | 27 Gem, epsilon Gem |
| D R | 18 Jan 03:30 04:32 | 1.00+ | -40 -30 | 40 31 | 0.09N | 3.6 | 77 Gem, kappa Gem |
| D R | 23 Feb 04:00 04:26 | 0.56- | -27 -23 | 16 17 | 0.93N | 4.8 | 43 Lib, kappa Lib |
| D R | 12 Apr 19:37 20:32 | 0.79+ | -8 -15 | 53 55 | 0.67N | 3.5 | 30 Leo, eta Leo |
| D R | 18 Apr 00:08 01:08 | 0.98- | -27 -25 | 21 22 | 0.48S | 2.8 | 9 Lib, alpha 2 Lib |

/... Table continued overleaf

| D R | Date & Time (UT) | Lunar Phase | Sun Alt (d) | Star Alt (d) | Min Dist (rad) | Mag | Star |
|--------|-----------------------|----------------|-------------------|--------------------|----------------------|-----|--------------------|
| D R | 11 Jun 21:24 22:31 | 0.91+ | -8 -13 | 22 20 | 0.25S | 2.8 | 9 Lib, alpha 2 Lib |
| D | 06 Sep 19:50 | 0.84+ | -12 | 11 | 0.01S | 4.8 | 60 Sgr, A Sgr |
| D | 10 Sep 00:23 | 0.99+ | -32 | 23 | 0.49S | 4.1 | 71 Aqr, tau 2 Aqr |
| D R | 19 Sep 01:49 02:56 | 0.47- | -31 -23 | 36 47 | 0.28S | 4.8 | 139 Tau |
| R | 21 Oct 01:18 | 0.24- | -44 | 6 | 0.65N | 3.5 | 30 Leo, eta Leo |
| D R | 30 Nov 18:37 19:49 | 0.50+ | -25 -36 | 24 21 | 0.22N | 4.1 | 71 Aqr, tau 2 Aqr |
| D | 08 Dec 05:39 | 1.00+ | -19 | 14 | 0.09N | 4.3 | 69 Tau, ups Tau |

Table 1. Occultations of stars brighter than magnitude 5.0.

The first column of table 1 denotes the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. Both D and R times are listed for all occultations except where one or the other would occur at too low an altitude to be easily visible. Column two gives the date and time (UT) of the occultation. Column three details the lunar phase as a fraction of unity ('+' denoting waxing and '-' denoting waning). Columns four and five give the altitude of the Sun and the star, both in degrees. (A negative solar altitude implies that the sun is below the horizon.) Column six gives the minimum distance, in lunar radii, of the star from the centre of the Moon, at the time of closest approach (midway between D and R events). Here 'N' indicates a North passage of the star and 'S' a South passage. Columns seven and eight provide the star's name or catalogue number and magnitude.

NIGHTS WITH MANY OCCULTATION EVENTS

During the year, the Moon traverses some rich star fields. When this happens, a large number of occultations can occur during a single evening. Table 2 lists all evenings throughout the year when the Moon occults 10 or more stars.

The large numbers of occultations in early April and early May are associated with the Moon's passage through rich star fields in Taurus and Gemini respectively. The precise number of occultations which an observer will record during any of the evenings listed in table 2 will depend in large part on their skill and observing conditions.

| Date | No. occs. | Date | No. occs. | Date | No. occs. |
|--------|-----------|--------|-----------|--------|-----------|
| 07 Jan | 12 | 10 Feb | 13 | 07 Mar | 11 |
| 08 Mar | 17 | 09 Mar | 10 | 10 Mar | 11 |
| 06 Apr | 20 | 07 Apr | 10 | 08 Apr | 13 |
| 09 Apr | 11 | 05 May | 43 | 06 May | 46 |
| 07 May | 11 | 08 May | 12 | 03 Jun | 11 |
| 06 Jun | 10 | 26 Dec | 10 | 27 Dec | 16 |

Table 2. Evenings with 10 or more occultations.

GRAZING OCCULTATION

The track of one grazing occultation passes through East Anglia during 2003. Table 3 summarises the circumstances.

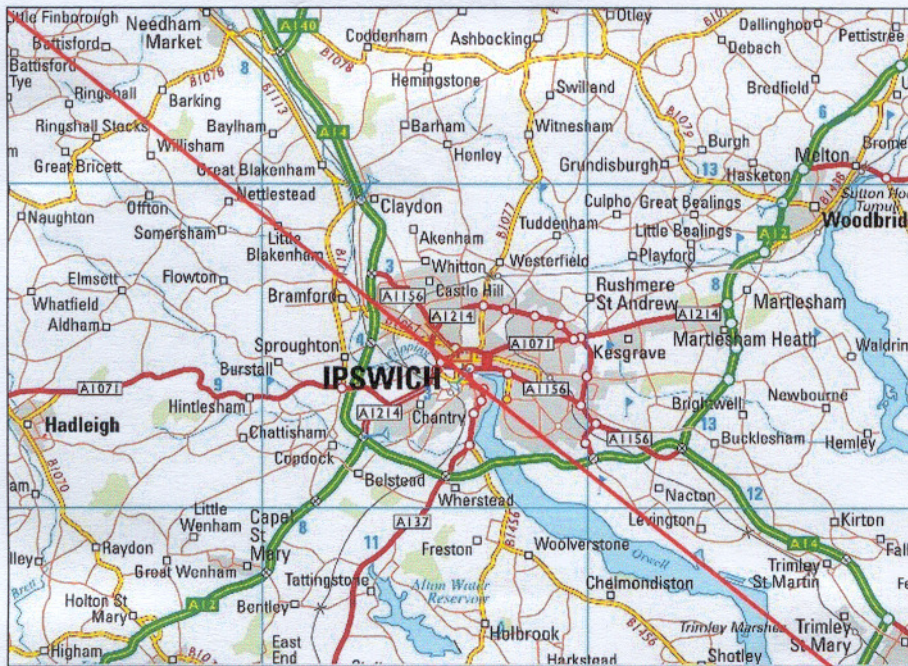
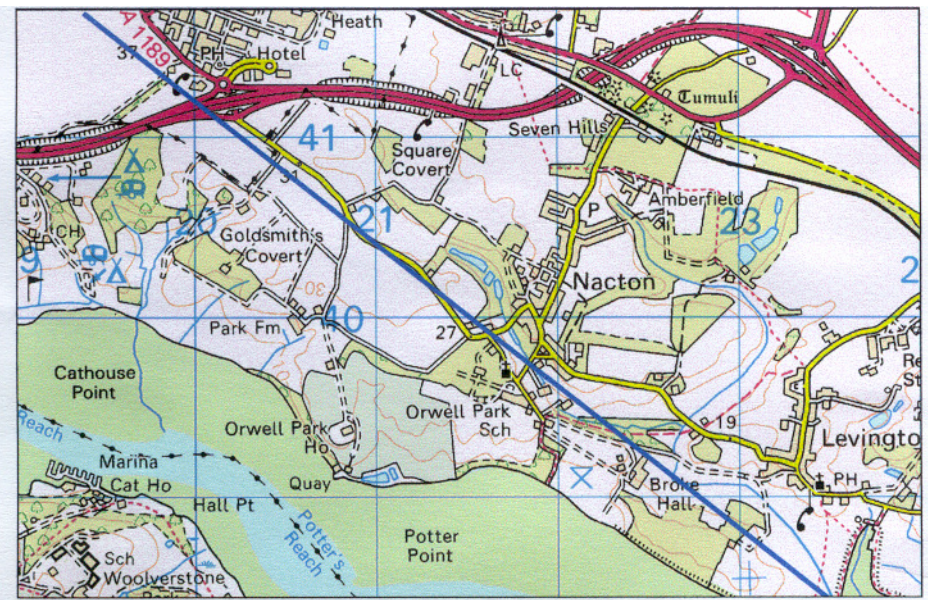
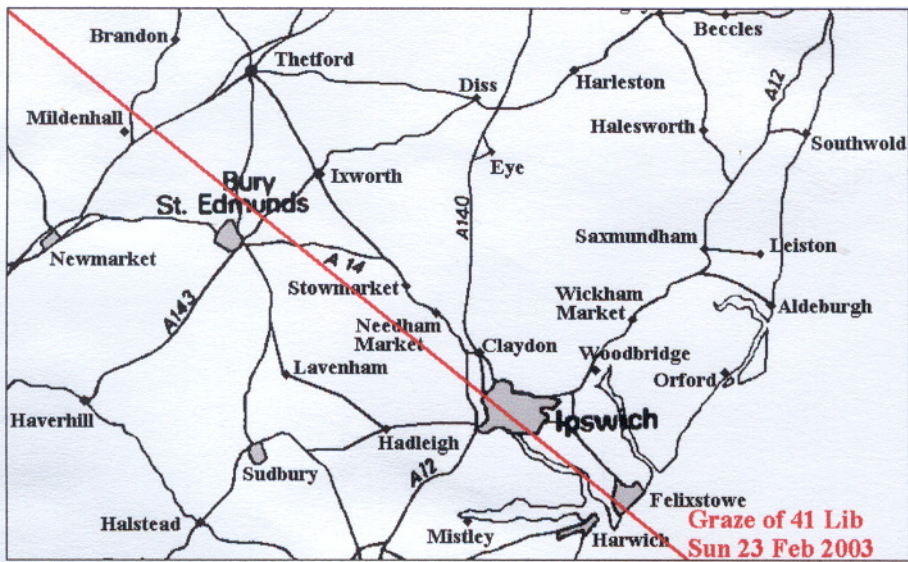
| Date | Time (UT) | Lunar Phase | Sun Alt (°) | Star Alt (°) | Star Azi (°) | Limb | Star | Mag |
|--------|--------------|----------------|-------------------|--------------------|--------------------|------|-----------|-----|
| 23 Feb | 02:30 | 0.57- | -39 | 9 | 139 | N | 41 Librae | 5.4 |

Table 3. Grazing occultation.

The first two columns of table 3 give the date and time of the graze. Column three gives the lunar phase ('+' for waxing and '-' for waning), while column four gives the altitude of the Sun (below the horizon). Columns five and six give the position of the star. Column seven details the lunar limb which grazes the star, while the final two columns detail the star and its visual magnitude. Note that the star is at low altitude (only 9°) at the time of the graze so an unobstructed southern horizon will be necessary to observe it.

The graze is remarkable in that the track passes within 150m of Orwell Park Observatory at its closest approach. This means that it will be worthwhile to attempt to observe the graze from the Observatory itself (weather permitting!)

The maps below illustrate the graze track over the whole of East Anglia and in close-up over Ipswich and in the area close to Orwell Park Observatory.



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OCCULTATIONS DURING JANUARY

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 | Date & Time (UT) | Lunar Phase | Sun Alt (°) | Star Alt (°) | Star | Mag |
|---|------------------|-------------|-------------|--------------|---------------------|-----|
| D | 08 Jan 16:49 | 0.33+ | -7 | 32 | ZC 3529 | 6.6 |
| D | 16 Jan 03:57 | 0.94+ | -36 | 20 | 132 Tau | 4.9 |
| D | 17 Jan 02:50 | 0.98+ | -45 | 39 | 27 Gem, epsilon Gem | 3.1 |
| R | 03:49 | | -37 | 29 | | |
| D | 17 Jan 17:16 | 0.99+ | -9 | 17 | 57 Gem, A Gem | 5.0 |
| D | 18 Jan 03:30 | 1.00+ | -40 | 40 | 77 Gem, kappa Gem | 3.6 |
| R | 04:32 | | -30 | 31 | | |
| D | 27 Jan 05:09 | 0.29- | -23 | 11 | ZC 2282 | 5.8 |
| R | 06:00 | | -16 | 14 | | |

James Appleton

10

An extra night.

Recent conversations amongst members, and a discussion at the last committee meeting has resulted in plans being made to open the observatory for an extra night, once per month. It will be a Monday night, and will be two weeks after the small telescopes night, also a Monday. It will initially run from January to April, and then be reviewed. The sequence each month will be as follows:-

Astronomy workshop, usually the first Wednesday of the month, except for January when it is the second: Small telescopes night the following Monday, taking its theme from the workshop where appropriate: Extra Monday night two weeks later. The Extra Night will be dedicated to the theory and practice of observing. It will follow a pre advertised theme – maybe a constellation, a nebula or cluster, or an event, and members will take it in turns to give a gentle lead on the theme– if they wish. There will be time spent at the beginning of the session to make some plans and preparations for the viewing, and probably a few minutes afterwards to consider results or factors which came up. The sessions are aimed at members who wish to further their skills at observing, and would like to do so in the company of others. But will have value for those who are new to the art. The sessions would clearly benefit from any experienced observers who could give the benefit of that experience to those who wish to improve. Initially the sessions will be with the small telescopes, but the use of the Tomlin is anticipated once we have got going. This will give an extra opportunity for members to gain operating experience and practice.

The first **Extra Night** will therefore be held on **Monday January 27th, 8.00 – 10.30.** or later if appropriate. The topic will be **The Orion Nebula** Whoever leads a session will get a lot out of it! The first one will be led by Dave Robinson. But it would be obviously beneficial if members came a bit prepared, and could join in more positively if they knew what to expect. Best benefit would also be gained by getting there in time to take part in the preliminary planning. If cloudy, the sessions **will take place**, and there will be more attention to planning, telescope familiarization, or Tomlin training. Hope to see you there. Woolly hats, scarves, gloves and LJs necessary. Ted Sampson, Paddy O'Sullivan, Gerry Pilling, and Dave Robinson.

Astronomy on a shoestring – Early days – Part One

I think I was about twelve years of age – and just into secondary schooling – when heavenly matters first crossed my consciousness. I find it quite difficult to remember having had many real learning experiences at school up to that point – being one of a generation of children who suffered from both war-time and immediate post war education rationing.

Scientific and mathematical subjects had provided very little of interest or stimulation for me or any of my peers up to the age of ten.

Then, suddenly, like switching on the electric light, along came two teachers who took hold of my imagination. One – in trying to make geometry and arithmetic relevant to a bunch of yawning adolescents – gave us an introduction to navigation in the air. This was the real stuff. The pen, pencil and protractor way (he had been a navigator in the Royal Air Force during the Second World War). What war did I hear you say? Yes, I know it was light-years ago, but you will have to bear with me. Was this what geometry and arithmetic was all about? Wow, how exciting!

Then came the second teacher. He gave us an introductory look at how physics and maths played such a crucial part in the material universe. By then I knew the majority of the Group One air navigation stars listed in the Air Almanack and could recite the Greek alphabet. Most of us didn't know the difference between planets and stars up to that point (things haven't changed much since then I fear, even amongst the adult population). This was real science – and there was no stopping me then. I wanted to know more, and quickly.

A few months later, I saw an article in the local newspaper about the Ipswich and District Astronomical Society – and very soon at age thirteen I was its' youngest member. Two shillings for annual membership (ten pence to you) seemed good value even to me.

What with the influence of a few of the Society's 'old hands' who took me under their wing, and an excellent series of local lectures on Astronomy and Astrophysics run by Cambridge University that first winter, I soaked it up like blotting paper.

My observing had up to then been with the aid of a mounted x10 pocket telescope. I was captivated by the sheer beauty of the universe, and had soon learned off by heart the names of most of the northern constellations and the principle stars in them, together with their mythology. I could trot out the majority of the entries in Messier's catalogue. This was however, not good enough for me.

Having had my appetite really wetted, first by a chance introduction to the subject at school, and a little later by the early influence of the original Ipswich Astronomical Society, I now needed some better instrument to help me explore the heavens.

Buying a telescope in the immediate post war days – and at only thirteen years of age with limited pocket money – was obviously out of the question. The solution was to build one. There was one member of the Ipswich Society – Norman Whatling – who sowed the seeds for me and gave me the initial ideas as to how it could be done. Norman had already made at least one six inch mirror and was in the process of grinding an eight inch disk. Indeed, he gave me a badly chipped six-inch blank broken mirror disk to play with. The back of this was soon to become the tool for my own mirror grinding.

When I was not at school or doing homework, I was in the shed at home putting together all the equipment I would need to do the job.

Although my father was an engineer, he watched me with some puzzlement – especially as I began to commandeer his tools and wanted to be shown how to use them.

Most people I spoke to could not understand how a telescope could work if it didn't have a big lens at the top end that the light passed through. They seemed to know even less about astronomy and thought that I must be sickening for something. I remember being perched on a step-ladder (on which my little telescope was mounted) in our garden late at night and seeing neighbours peeping through cracks in their bedroom curtains to see 'what this strange lad was up to'.

After investigating (but dismissing) all the alternatives of ready shaped but rather thin porthole glass disks from which to grind a mirror, I remember vividly going to Smyth Brothers shop in Fore Street (long since closed) and ordering at their glass counter a seven inch square of inch thick plate. They quizzed me as to what it was for. Like most members of the local Astronomical Society, they pronounced that I – at the tender age of 13 – going on 14 – was mad to attempt to cut out and grind a disk myself without very specialised knowledge or equipment. Even my parents were sceptical.

All my mirror grinding would have to be done outside. My father's shed-cum-workshop was simply not big enough and was far too dusty for optical precision work. I had a big drum half full of bricks outside with the mirror grinding jig mounted on top. This permitted me to walk round in a circle – an essential feature of spherical mirror grinding – and I could splash water around without annoying my father.

John Barbrook

Seeing

"There are warnings of gales
in sea areas Humber, Thames, Dover, Wight"
Light off, snugged down, I listen to my late night litany,
my lullaby, my *Sailing By*. I know,
as I drowse off, that I will wake
to wet wheels lashing on the road outside,
see bare trees heave against a sodden sky,
hear the wind in them, and the roar
of broken water by the weir.
A morning to stay indoors,
the dog cowering in her basket
as the angry wind shakes the isobars of its cage,
thumps the doors and shutters, howls down the chimney.

The rain, won't last.
The wind will veer; clouds shred and scatter.
Icy Polar air will scour the sky,
letting chill sunlight flare
from wet grass, coral willows,
jet wings of tumbling rooks.

The sun will set in thin, keen, rose-grey air.
The big stars will seem very near.
The faintest, pinprick sisters of the Pleiades
will be there; swarming bees of Preasepe,
the crusted diamond hilts of Perseus' sword
and glowing star-seed from Orion's loins.

We will watch them dancing in the black night wind -
until the dog grows bored,
and cold, and whines
and drags me home to bed,
in time to listen to tomorrow's forecast....

Kit Bird

Observing Programme For January

| Dates | Observing Director | Activities |
|---|-------------------------------|-------------------------|
| Monday 13th January Monday 27th January | Topic The Orion Nebula | Small Telescopes Night |
| Tuesday | | Nothing Booked |
| Wednesdays 1st -8th -15th - 22nd - 29th from 8.00 | M Cook D Payne | Nebular & Faint Objects |
| Thursday 16th | Bury St Edmunds Young Farmers | Group Visit |
| 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. ASTRONOMY WORKSHOP 8th JANUARY

The Astronomy Workshop starts at 7.45pm on Wednesday 8th January. The topic is " Collimation of Telescope optics ". The Presenter is St John Robinson.

2. ANNUAL GENERAL MEETING 11th JANUARY

The Annual General Meeting is to be held on Saturday 11th of January at 8pm in the class room off the court yard at Orwell Park School. All members are welcome to attend.

2002 COMMITTEE

| | | Home Phone | Work Phone |
|---|------------|------------|---|
| CHAIRMAN | D Payne | | |
| SECRETARY & WORK PARTY ORGANISER | R Gooding | | |
| TREASURER & PUBLICITY | K Goward | | |
| MECHANICS | M Cook | | |
| NEWSLETTER CO-ORDINATOR | E Sims | | |
| ASTRONOMY WORKSHOP | T Sampson | | |
| VISIT CO-ORDINATOR | G Coleman | | |
| EQUIPMENT CURATOR | J Walsh | | |
| LIBRARIAN | M Whybray | | |
| CO-OPTED MEMBER | | | |
| LECTURE CO-ORDINATOR & DARK SKIES | P Richards | | |
| JOURNAL ARTICLES TO CORRESPONDENCE ADDRESS | E Sims | | Ipswich Suffolk IP1 4HA |
| | R Gooding | | OASI Secretary Ipswich Suffolk IP1 6AE |
| MEMBERSHIP | M. Cook | | Ipswich IP4 5PZ |

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Society Contact Details

| | | Home Phone | Work Phone |
|--|-----------|------------|------------|
| Chairman | D Payne | | |
| 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/>