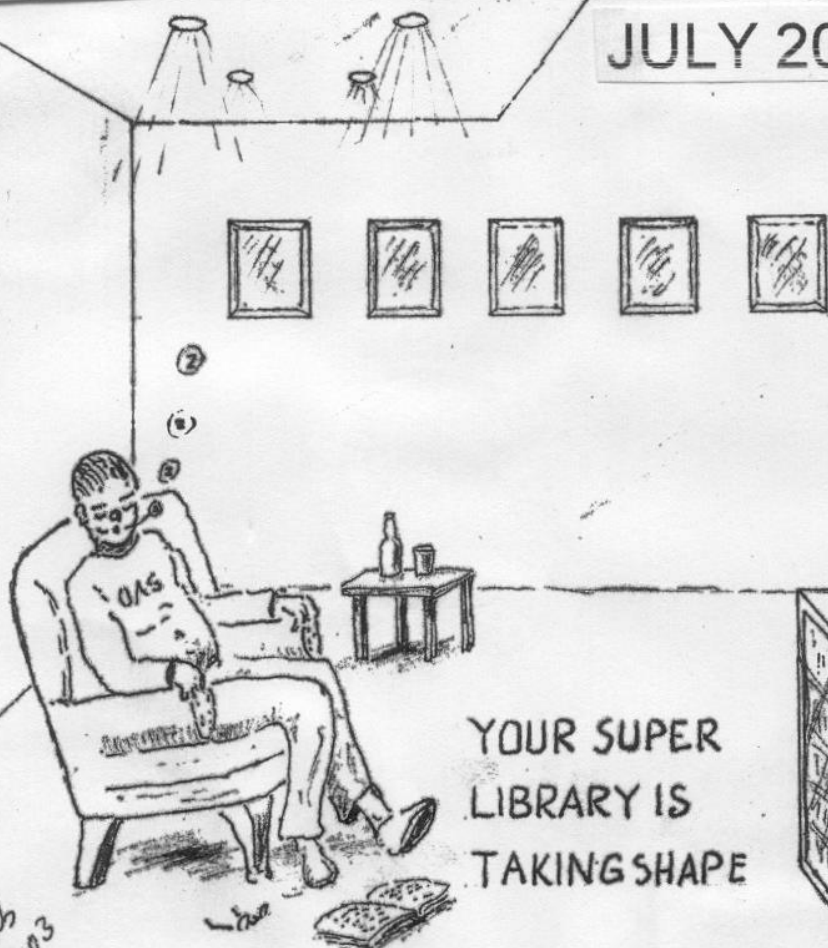


ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313

JULY 2003



YOUR SUPER
LIBRARY IS
TAKING SHAPE

COULD IT LEAD TO THIS?

*Williams
JUNE 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
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	

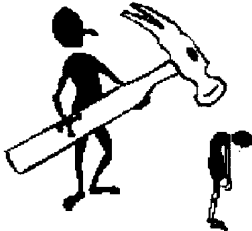
4 Year Three of the Library Rebuild

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	Monica Lustig	
	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 between 03:50 and 04:15

The sun will be setting approximately between 20:20 and 20:00

Moon

1st Quarter	Full Moon	3rd Quarter	New Moon
7 th	13 th	21 st	29 th

Mercury Mercury is at superior conjunction on the 5th. When it returns to the evening sky it will not be observable.

Venus Venus remains in the pre-dawn twilight. It will be rising about an hour before the sun this month and not observable.

Mars Mars will be rising at about 21:00 by the end of the month. It is brightening to magnitude -2.3

Jupiter Jupiter will be setting at about 21:00 by the end of the month. Magnitude -1.7

Saturn Saturn has moved back into the morning sky. It will not be easily seen until the middle of the month., when it will be rising about 2 hours before the sun

Uranus Uranus is in Aquarius will be rising at about sunset by the end of the month
Magnitude 5.7

Neptune Neptune will also be rising at about sunset by the at the end of the month.
Magnitude 7.8

Meteor Showers

Shower	Limits	Maximum	ZHR
Ophiuchids	May 19 th to July	June 9 th June 19 th	5
α Cygnids	July to August	July 21 st to Aug. 21 st	5
Capricornids	July to August	July 8 th July 15 th July 26 th	5
δ Aquarids	July 15 th to August 20 th	July 29 th Aug 6 th	20 10

Meteor source is the BAA Handbook

First Light at New Observatory Imminent

The majority of telescopes are kept either in a garage, shed or in the house. Every time it is decided to use them, there is the chore of transporting it outside and setting it up. Some of my recent experiences are as follows.

Skies seem clear lets take the telescope outside. The first stage is to carry out the tripod and equatorial head. Even with the tripod legs at their most compact it is a juggling act in getting it through the back door. The assembly is moved to a suitable location in the garden. The next stage is to raise the tripod legs. Raising the tripod legs can only be carried out by undertaking a balancing act. The counter weight has to be supported on ones back, while at the same time the tripod leg clamps have to be loosened and retightened in turn.. Great fun!

The next stage is to bring out the telescope. Mating the telescope with the end of the declination axis, being sure not to drop it before the cradle clamps have been fully tightened, and checking that it is fully balanced. This normally has to be done by fumbling around in the dark with cold hands. The finder scope is then checked for alignment. The final step is to check that the RA axis is pointing north.

If the telescope has been stored in a warm room it will now have to be left for an arbitrary time to cool down to the outside temperature. After half an hour or so I venture outside again to begin observing. This stage can be set with numerous pitfalls. A bank of cloud could have appeared, causing the whole process to be reversed. The neighbour may have just put the cat out, and its movement to have caused the whole area to be lit up by their garden flood light. Alternative causes of light may even come from the sky! The local Copper Chopper has become a regular feature of the Ipswich night sky. One evening I was outside and in the distance I heard the characteristic drone of this machine. Having spent a time hovering around my end of town, it eventually stopped about 200 feet above me. Some one outside at night with a telescope must have attracted their attention. Pointing my torch skyward. I proceeded to disassemble the telescope having just finished what I was observing.

Many members must have experienced similar problems. There must be an alternative and better way to do things than this. Most of the above problems can be eliminated with a permanently mounted telescope inside its own structure, namely an observatory. Home observatories come in various forms. Shed variations come in two principle with either a run off roof or the whole shed is rails. Some people accept the challenge of building the walls with either wood or brick and construct the rotating dome themselves. In recent years complete glass fibre domes have become available. this is the option I decided to go for.

There several considerations on constructing an observatory

- 1 Location I am able to see over 60% of the sky from the bottom of my garden, this includes a clear southerly view, even though it is looking towards the town centre

- 2 The platform for the observatory pier and dome will need to be as stable as possible. I have the freight trains travelling to and from Felixstowe about 150 yards away. They do cause considerable vibrations.
- 3 This leaves the choice of telescope. At the present time there is a bewildering selection of telescopes available. I decided on 12" f4 reflector. This size gives about 44% more light grasp than the Tomline refractor and it is the cheapest option per inch of aperture. Examples gained from Adverts in Astronomy Now

Telescope	Price per inch
Mead 12" LX200GPS	£333
Celestron Nextstar 11 GPS	£272
Orion 12" f4 reflector	£166

An observatory has several advantages:

- 1 A permanently setup telescope which can be in use in only a few minutes without any equipment humping.
- 2 Shelter from wind and light

Construction of the Observatory base

The diameter of the dome is about 7 feet. This gave the starting point for the base. I decide to make the base 9 feet square.

Fig 1



Marking out the observatory base

Fig 2



Digging out the base

Fig 3



Marking out the hole for telescope pier

Fig 4



The telescope support pier

The telescope support pier was a 6" diameter aluminium pipe, 67" long. It was sunk in the ground for 3 feet. The tape on the pipe marks the top of the concrete base.

Fig 5

The pier hole



The telescope pier was placed in plastic pot.. The crossed strings gave the centre of the whole base.

Fig 6



Supporting the pier before concreting in

Fig 7



The Pier in its hole

Fig 8



Installing two plastic conduit pipes

Fig 9



Completed Pier foundation

Fig 10



The completed base

The Glass fibre dome was delivered and installed on Saturday 7th June
Fitting out the dome should take a few weeks. First light should be by the end of July

Roy Gooding

OCCULTATIONS DURING JULY

Only one stellar occultation occurs during the month under favourable circumstances. The table provides details for Orwell Park Observatory; these will be similar at nearby locations.

D	Date & Time	Lunar	Sun	Star	Star	Mag
R	(UT)	Phase	Alt	Alt		
			(°)	(°)		
D	04 Jul 21:10	0.26+	-7	18	ZC 1612	7.3
D	07 Jul 20:56	0.59+	-5	23	81 Vir	7.1

James Appleton

TRANSIT OF MERCURY, 07 MAY 2003

By James Appleton

A transit of Mercury visible from the UK occurred on 07 May 2003. This was the first to be visible from the UK since 10 November 1973.

BACKGROUND TO TRANSITS OF MERCURY

The orbit of Mercury is tilted at 7.0° to the ecliptic (the plane of the Earth's orbit around the Sun) so transits of Mercury can only be seen when the planet is near the nodes of its orbits (the points where its orbit crosses the ecliptic) as follows:

- Ascending node: 10 November (Mercury passes South \rightarrow North of ecliptic)
- Descending node: 08 May (Mercury passes North \rightarrow South of ecliptic)

Of course, a transit can be seen only when the planet is at inferior conjunction.

Mercury's orbit is noticeably eccentric (in fact it is the most eccentric of all the planets except for Pluto). Perihelion occurs on 09 December, and aphelion on 18 May. This means that when a transit occurs close to Mercury's ascending node, the planet is close to its nearest point to the Sun so appears relatively small; conversely, when a transit occurs close to Mercury's descending node, the planet is close to its furthest from the Sun so appears relatively large. The average apparent diameters of the planetary disk are 10.0 and 12.0 arcseconds respectively. The effect of perspective means that transits of Mercury in November (near perihelion) are visible over a wider range of dates than those in May; this results in there being 1.8 times as many transits in November as in May, in the long run.

Note that the above considerations are valid for epochs close to 2003. In the long term, secular variations in the orbit of Mercury mean that the nodes, aphelion and perihelion of the orbit of Mercury gradually rotate with respect to the Earth meaning that the key dates and relative frequencies slowly shift.

OBSERVATIONS AT ORWELL PARK OBSERVATORY

On 07 May, first contact (the disk of Mercury begins ingress against the solar disk) occurred at 05:11 UT and fourth contact (the disk of Mercury completes egress against the solar disk) occurred at 10:33 UT. (Note that UT is one hour ahead of BST.) OASI opened Orwell Park Observatory for observation of the transit. James Appleton, Bill Barton, Garry Coleman and Martin Cook were first to arrive, meeting at Orwell Park and opening the observatory at 04:45 UT (05:45 BST). When the four first arrived, and for some time after, weather conditions were very poor with unbroken thick cloud

completely blotting out the Sun – see figure 1. Because of the cloud, observers at Orwell Park were unable to observe first contact.

While the observers at Orwell Park waited to see if the cloud would clear, discussion centred around the report published by John Isaac Plummer, Tomline's observer, of the transit of Mercury on 06 May 1876. Tomline reported his observations in the May 1878 MNRAS (Monthly Notices of the Royal Astronomical Society) as follows:

My wife [Marion Plummer], who assisted me at the observation, first detected the planet against the solar corona, though I had previously looked for it in vain.

On taking my station at the telescope a minute later I also detected it, dimly visible, but sufficiently so to direct my attention to the exact point where contact was to take place, and to lead me to suppose that, but for the clouds through which the observation was made, it would have been fairly conspicuous[¶].

The four would-be observers at Orwell Park some 125 years later were incredulous as to how visual observers could discern Mercury against the solar corona, given that the latter is generally invisible through being completely drowned out by the solar photosphere. We noted this as an area for potential future research....



Figure 1. View from Orwell Park Observatory towards the rising Sun at 05:00 UT – note the unbroken cloud cover. By J Appleton.

[¶] See the excellent article by Ken Goward in the May Newsletter for further details of Plummer's observations.

As the Sun continued to rise in the sky, the cloud cover gradually diminished. It was possible to obtain images intermittently during breaks in the cloud – e.g. see figure 2, obtained at 05:15 UT by using the Orwell Park Refractor to project the image of the Sun onto a piece of white card. Figure 2 shows Mercury shortly after ingress onto the solar disk together with a large sunspot group.

By 06:00 UT the cloud cover had much reduced, and the remaining haze rapidly disappeared. As sky conditions improved, the difference between Mercury and sunspot became increasingly obvious: the sunspot had a distinctly elongated shape and both the umbra and penumbra were visible; conversely Mercury appeared as single, round spot that was positively black, much darker than the umbra of the sunspot. By approximately 06:15 UT cloud cover had diminished sufficiently that it was possible to use a Baader filter over the OG of the Tomline Refractor and to experiment with photographing the eyepiece (*afocal* method). Figure 3 shows a typical example of this type of image – it shows clearly the difference between Mercury and the sunspot.

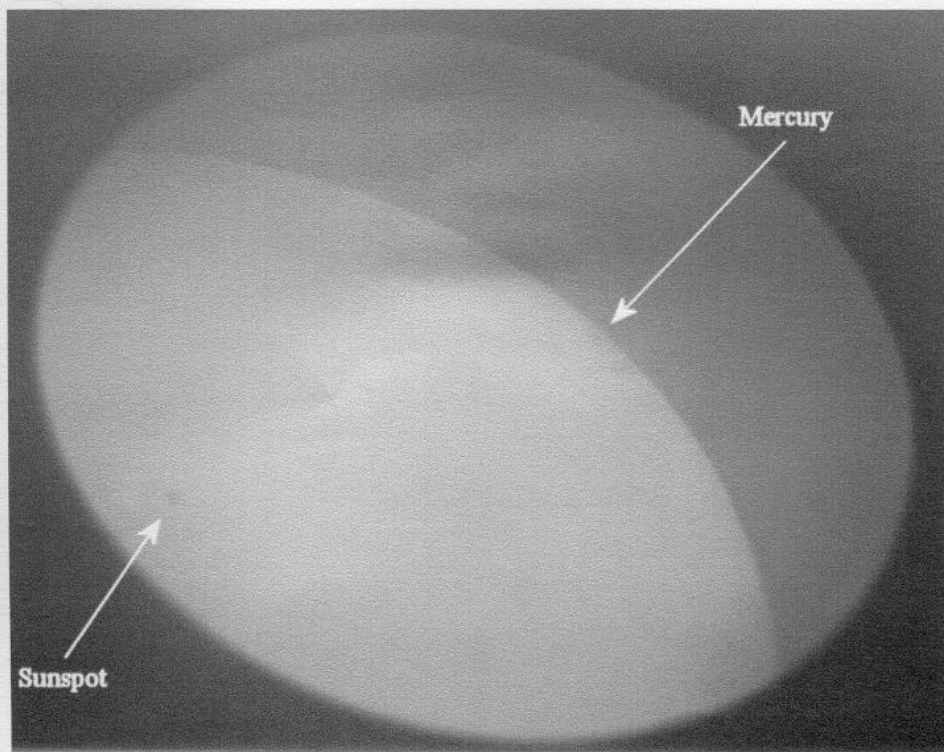


Figure 2. Early image of Mercury in transit, 05:15 UT, projection from Tomline Refractor. By James Appleton.

By 06:30 UT (07:30 BST) a steady stream of members of OASI began arriving at Orwell Park Observatory. Members brought with them a variety of digital and traditional cameras and video recorders and experimented with imaging in afocal and

projection modes and with a video eyepiece displaying through a TV screen. Figure 4 shows Martin Cook struggling to attach a digital stills camera to a bracket mounted on the Tomline Refractor for afocal imaging.

Throughout the morning some 17 members of OASI and 40 schoolchildren and teachers observed the transit. In order to impress upon the pupils the danger of observing the sun through a telescope without a solar filter, David Payne used the Tomline Refractor to focus the Sun's rays onto a piece of newspaper causing it to smoulder and burn within a few seconds – see figure 5.

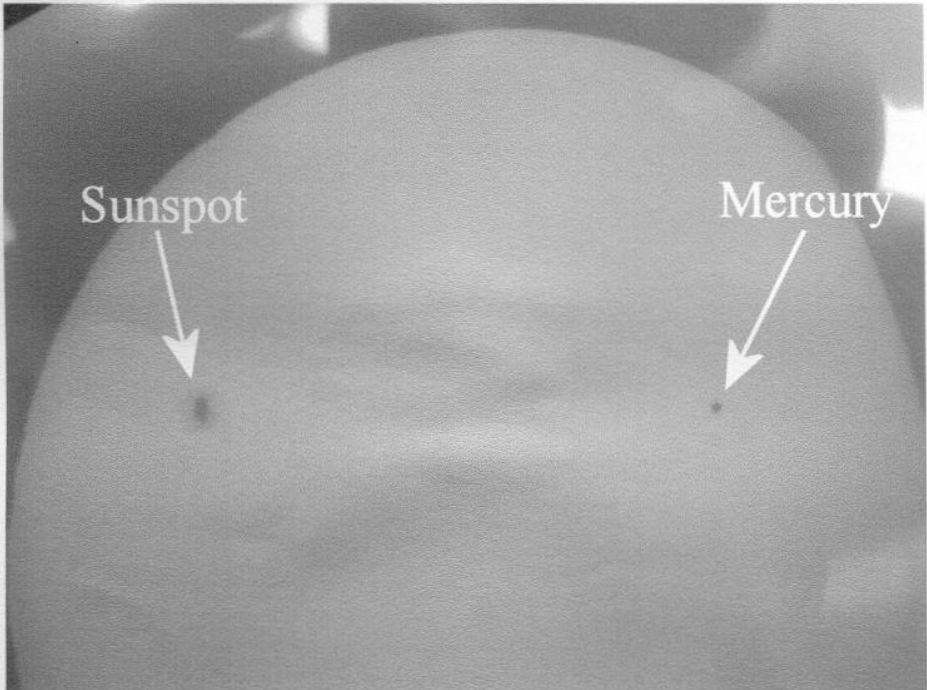


Figure 3: Afocal image of Mercury and large sunspot. By Martin Cook.

As time drew near to third and fourth contact, the observers present decided, based on experience of the event thus far, that the best method to observe the egress of Mercury would be by projecting the image using a 50mm eyepiece onto a piece of white card. The observers estimated the times of third and fourth contact from the projected image (see times below). Figure 6 shows an image by Martin Cook of Mercury close to egress (actually captured by afocal method rather than projection).

During most of the event, Bill Barton observed using his $H\alpha$ equipment on one of the balconies at Orwell Park Observatory. The $H\alpha$ equipment gave a fine view of a solar prominence in addition to the transit. Figure 7 shows Bill observing.

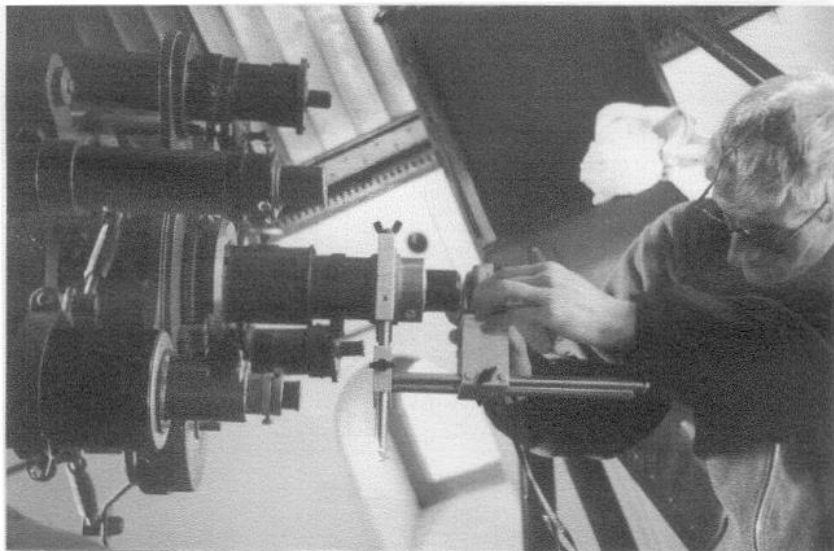


Figure 4. Martin Cook attaching a digital camera to a bracket on the Tomline Refractor for an afocal shot. By James Appleton.



Figure 5. David Payne demonstrating the danger of looking at the Sun through a telescope not fitted with a solar filter. By Martin Cook.

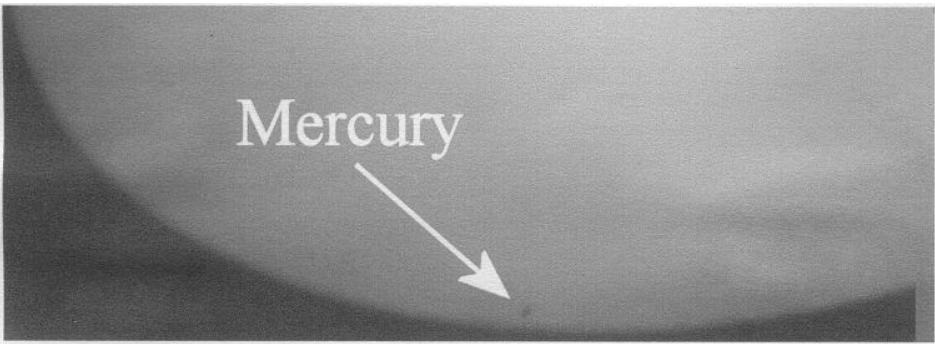


Figure 6: Afocal image by Martin Cook of Mercury near to egress.



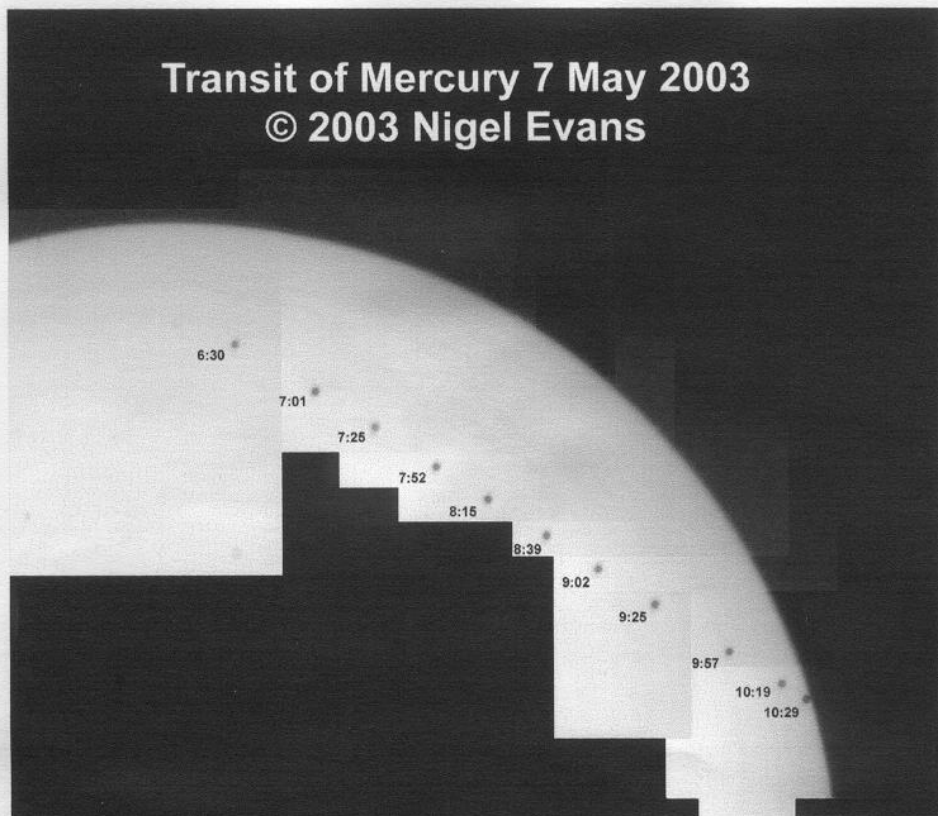
Figure 7. Bill Barton observing the transit in H α . By Ken Goward.

REPORTS OF OBSERVATIONS ELSEWHERE

Several members of OASI sent me details of observations made at other locations than Orwell Park – these are summarised here.

Nigel Evans observing at Ipswich

The first hour or so of the transit was not visible as the Sun was obscured by a neighbouring house and the sky was too hazy. I made the following mosaic using a Meade ETX90 and a Philips ToUcam. Every so often I recorded a movie clip and then later stacked the best frames using Registax to make a still. I then mosaiced these using Photoshop.



Pete Richards, observing initially at Nacton and later at Martlesham

Yes I saw it! At least some of it. I projected the Sun with a 90mm instrument when I got up this morning at 8.30 BST - a bit later than some keener observers I know. With a crack in the curtain of a bedroom window I projected onto the ceiling. I was tricked

momentarily by the large sunspot: wow, Mercury looks bigger than I expected! Then I woke up a bit and looked for and found the small dot that was the real Mercury. I then went into work. At about 10.45 BST I went into the car park and tried projection with 10 x 50 binoculars. I decided not to drag any colleagues out to squint at a tiny dot that they might or might not see. It was only just visible on the 140mm disc I projected but it was there. It was a more exciting tea break than usual.

Dave McCracken observing at Skellingthorpe, Lincs

Dave observed using an equatorially mounted Meade ETX 70 refractor fitted with full aperture solar filter. He recorded the times of third and fourth contact using a digital stopwatch synchronised to an Oregon radio controlled clock.

ESTIMATES OF TRANSIT TIMES

Members of OASI estimated transit timings as follows:

Observer	Third Contact (UT)	Fourth Contact (UT)
Various observers at Orwell Park Observatory	10.28.23	10.32.23. Timing was unsure and may vary by a second or two.
Dave McCracken observing at Skellingthorpe, Lincs	10:28:20 (adjusted for observer's personal equation). Timing not accurate as the image was not very crisp at the solar limb.	10:31:28 (adjusted for observer's personal equation). Timing not accurate as the image was not very crisp at the solar limb.

I am currently researching mathematical techniques to estimate the solar parallax (and hence the scale of the solar system) from timings of transits, and aim to report on this in a later article in the Newsletter. If any other members of OASI estimated times of the transit please forward them to me.

OUTLOOK

The next transit of Mercury occurs on 08 November 2006 but it is not visible from the UK; the next transit of Mercury visible from the UK occurs on 09 May 2016, when (weather permitting) the full event from ingress to egress will unfold throughout the course of the afternoon.

In the interim, the next transit of Venus occurs on 08 June 2004 and will be visible in its entirety (weather permitting) from the UK. First contact will occur at 05:15 UT and fourth contact at 11:27 UT.



Orwell Astronomical
Society(Ipswich)



Summer Barbecue

On 19th July 2:30pm till about 8pm

At [redacted], Nacton

Bring whatever you fancy to barbecue (meat, fish, veggies, bananas etc.). Rolls, salads, soft drinks and plates, cutlery, glasses will be provided. Bring your own alcohol!

We've got a slide, swing and sandpit for the kids.

Note - there is a small pond, well overlooked.

We have 10 garden chairs but
to guarantee a seat bring your own!

Mike & Andrea Whybray. [redacted]



Directions:

From the Old Felixstowe Road, turn into Nacton Village, go under the railway bridge and after half a mile we are [redacted]



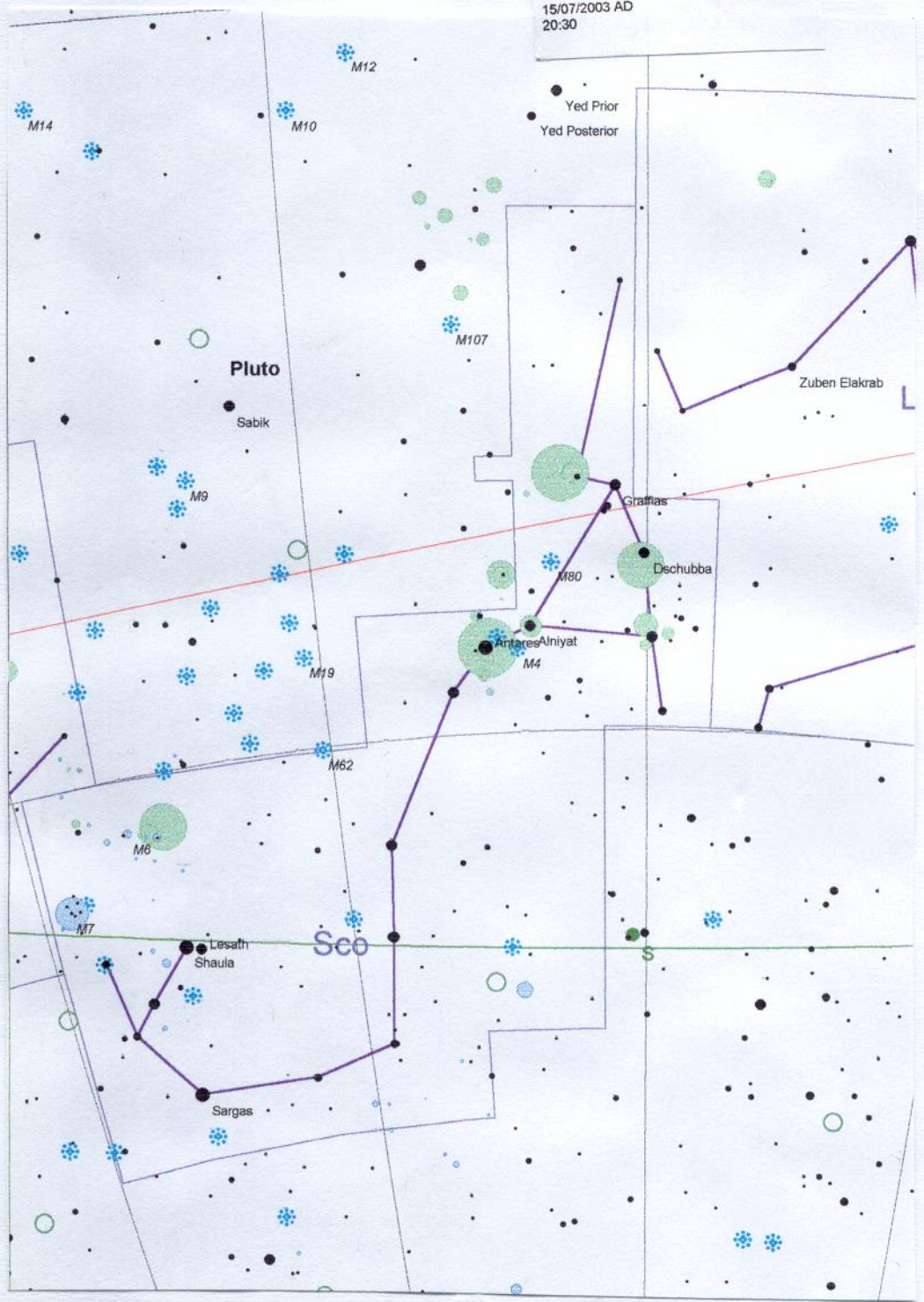
[redacted]. It is a [redacted]

From the Observatory, if that is your reference point, go straight out of Orwell Park gates, down and up the hill, turn left at the top then bear right at the war memorial. Carry on [redacted]

Parking:

One or two cars can squeeze onto the drive. Other will have to park on the road – best position is on the opposite side to the house, along a bit in the direction away from the shop. Alternatively, there is a [redacted] space or two in his driveway (if you know where to find it!).

Local Time:
15/07/2003 AD
20:30



Awards for All

I'm disappointed to have to announce that the society was unsuccessful in its application for a grant from Awards for All. The purpose of the grant was to enable the society to acquire a Laptop Computer and a Video Projector. Awards for All encourage us to make another attempt, so anybody who would like to take up that challenge please contact Garry Coleman for further details.

2003 COMMITTEE

		Home Phone	Work Phone
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 CORRESPONDENCE ADDRESS	E Sims		Ipswich Suffolk IP1 4HA
	R Gooding	OASI Secretary	
			Ipswich Suffolk IP1 6AE
MEMBERSHIP	M. Cook		Ipswich IP4 5PZ

Observing Programme For July

Dates	Observing Director	Activities
Monday		Nothing Booked
Tuesday		Nothing Booked
Wednesdays 2nd 9th 16th 23rd 30th 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/>