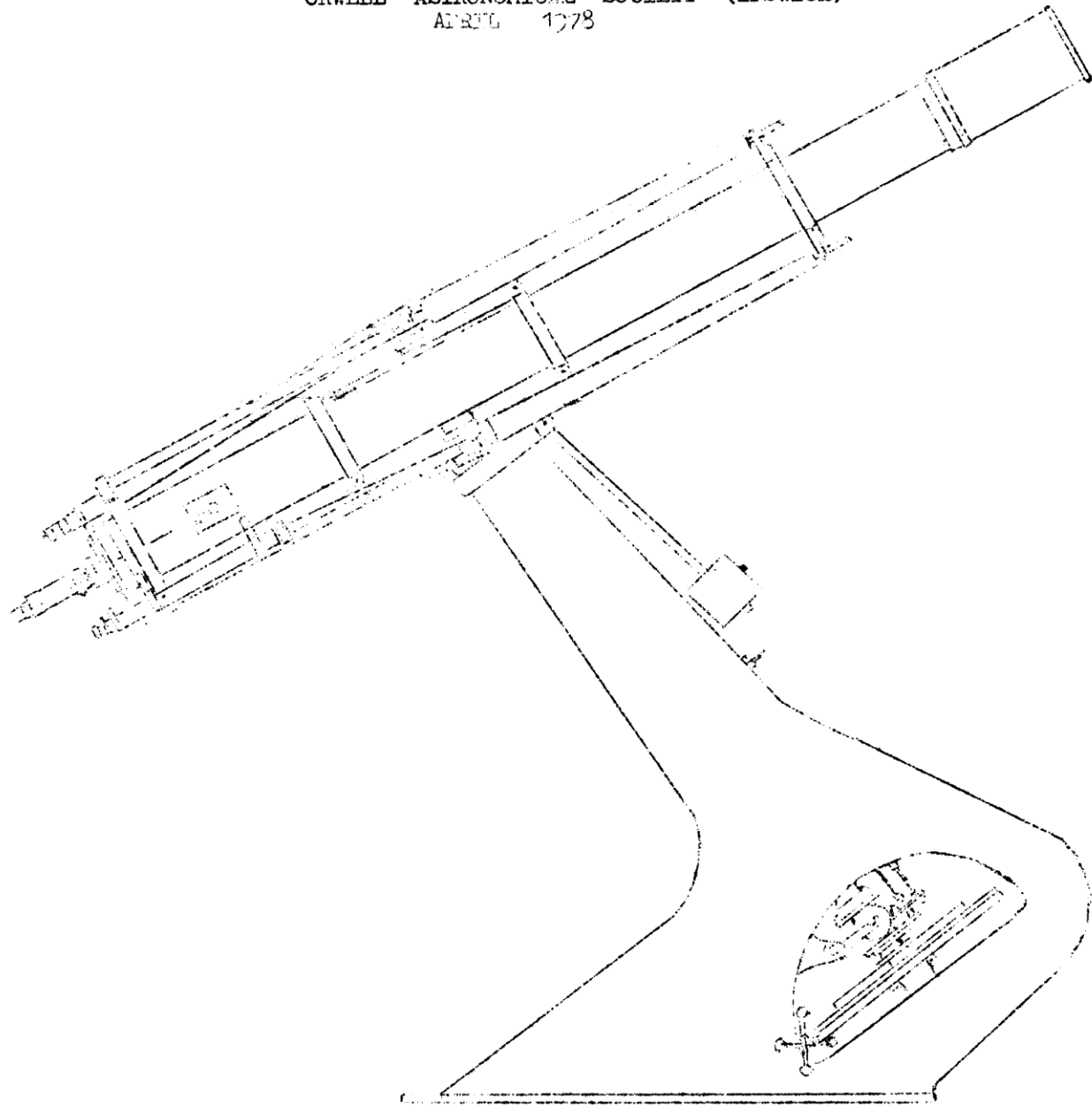




JOURNAL OF THE  
ORWELL ASTRONOMICAL SOCIETY (IPSWICH)  
APRIL 1978



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## THE NIGHT SKY as seen from Orwell Park in April

Coma Berenices, which looks more like a large, scattered star cluster than a constellation, is due South at about midnight UT (not BST). Follow the curve of the handle of the Plough through about  $30^\circ$  and you will come to Arcturus (Alpha Bootis, the second brightest star visible from Britain). Also in Bootes is the double star Epsilon Bootis, a yellow and blue pair which can be separated with a 3-inch refractor or 6-inch reflector. Continuing a further  $30^\circ$  from Arcturus brings you to Spica in Virgo, a star which is 2400 times as luminous as the Sun.

## THE SUN

The Sun spends most of the month in Pisces, then progressing into Aries. Sunrise is at 05h10m and Sunset at 1900 at mid-month.

## THE MOON - Phases

Full Moon	Apr. 7d15h15m
Last Quarter	Apr. 15d13h56m
New Moon	Apr. 23d04h11m
First Quarter	Apr. 29d21h02m

## Occultations

Star	Phase	Mag.	Time
2826	D	4.0	1d05h02.7m
* 692	D	1.1	11d18h52.5m
* 692	R	1.1	11d19h34.2m
961	D	6.2	13d20h06.9m
*975	D	6.8	13d22h03.5m
1212	D	7.1	15d22h33.7m
1320	D	6.8	16d20h55.6m
1635	D	5.4	19d22h09.0m
1652	D	5.5	20d02h07.4m
-2271	D	4.3	25d00h14.4m
2271	R	4.3	25d01h15.4m
2764	R	6.3	28d02h23.3m

D=disappearance, R=reappearance, \* denotes star is double. Stars listed according to Zodiacal Catalog (ZC) numbers.

## THE PLANETS

Mercury is in inferior conjunction on the 11th this month and will thus not be well seen.

Venus, an evening star, reaches a minimum magnitude of  $-3.3$  at mid-month.

Mars is still decreasing in magnitude (0.5 to 1.0), and remains in Cancer during April.

Jupiter decreases from mag.  $-1.7$  to  $-1.6$  this month and passes from Taurus into Gemini.

Saturn is in Leo at mag. 0.5 (decreasing).

Pluto comes to opposition on the 5th, when its magnitude will be  $+14$ . This lonely little planet on the fringes of the Solar System should be visible through the 10-inch at Orwell Park.

## COMETS - Comet Bradfield 1978c

This new comet was discovered by WA Bradfield of Adelaide on Feb 4th., and attained a maximum magnitude of 3.9 on March 13. Unfortunately I did not hear of this comet 'till after March's Journal had gone to press. However, although the comet is now fading rapidly, it is also moving towards the North so that it should be more easily visible from our latitude (declination at discovery approx.  $-50^\circ$ ). The following predictions, the most recent available, were made by SW Milbourn of Crawley.

	Date	RA / (h,m)	Dec. / (°,')	Elongation/°	Mag.
Apr.	2	00,21.96	21,03.1	17.2	5.5
	7	00,54.94	24,01.1		
	12	01,25.35	26,04.5	17.7	6.9
	17	01,53.04	27,27.4		
	22	02,18.10	28,20.8	17.3	8.1
	29	02,45.09	29,08.7		

### Comet Schwassmann-Wachmann

Apr.	2	5,07	29,16
	12	5,13	29,10

Sources: BAA Handbook 1978, BAA Circulars nos. 584, 585.  
Please note all times UT (=BST - 1h).

### FROM OTHER JOURNALS

#### Skylab

Skylab, NASA's orbiting space station, is in danger of colliding with the Earth late next year, if something radical is not done. In the 5 years since its launch, its orbit has degenerated from a height of 273 miles to about 250 miles due to interaction with the Earth's atmosphere, which has slowed it down.

NASA plan to use the Space-Shuttle, due to go into operation next Spring, to attach booster engines to Skylab, which will then use those to increase its height above the Earth's surface. In the meantime, attempts at radio contact are being made - the aim being to reorientate Skylab so that drag has less effect on it. At the moment it is tumbling and this causes drag to be greater than it could be. (New Scientist)

#### Black Holes, Galactic Jets and Quasars

There is now slight evidence that speculation of a link between black holes, radio galaxies and quasars, are correct. This comes from observations of a small (less than 10 l.y. long), narrow jet within the nucleus of the giant galaxy NGC 6251, by radio-astronomers at the California Institute of Technology.

A larger jet 720 000 l.y. long is already known, and the newly-discovered jet is lined up along the same axis. What is most interesting is that flow in the jet appears to be supersonic; in that case, it would seem most likely that the jet emanates from near a black hole with a mass of  $10^8$  (100 million) solar masses. The theory by which this is arrived at can also explain the energy output of quasars: thus it appears likely that quasars and other radio galaxies (in most cases) have the same energy sources. (Nature)

UV Astronomy The joint Science Research Council, NASA and European Space Agency project, International Ultraviolet Explorer (IUE), is already bearing fruits. It was launched by NASA on Jan 26 and since then has made observations using a 45 cm (18-inch) Cassegrain reflector. These include:

The UV spectra of both Mars and Venus (the latter for the first time ever), emission lines in Capella's UV spectrum, Cygnus X-1 (a probable black hole), Seyfert galaxies and quasars. (New Scientist)

**Snippets** - The long-beloved concept of science fiction writers, that of the space-bridge connecting our Universe with others, will have to be abandoned. This is the conclusion of Birrell and Davies of King's College, London, arrived at theoretically. (Nature-Times News Service)

Molecules of cyano-octatetrayne,  $\text{HC}_8\text{N}$ , have been discovered in gas clouds in Taurus. With a molecular weight of 123, this is therefore the largest molecule yet detected in Space. (New Scientist)

#### THE CHEESMAN PLANETARIUM.

The latest milestone to be added to the annals of great astronomical achievements took place on Wednesday, March 8 at the Orwell Park Observatory, when the Cheesman Planetarium received its first public unveiling. The 7 o'clock performance was totally lost amid the shrieks, screams and constant comings and goings of the resident school pupils, but after ejecting them through the nearest convenient windows we were treated to a superb  $\frac{1}{2}$  hour astronomical display on the Observatory ceiling.

We were taken from the silhouetted skyline of Ipswich Civic Centre into open countryside with trees outlined against the horizon. As the Sun set and daylight faded into darkness, a myriad of 5000 stars (every star visible at Ipswich down the 9th magnitude) came into view, completing one revolution round the Pole Star in 16 minutes. The Moon and planets in turn were projected onto the Stellar background to the accompaniment of close-up slides and pre-taped explanatory dialogue. Distant strains of '2001 - A Space Odyssey' perfectly completed the illusion of being surrounded by the Heavens.

At the flick of a switch on the Control console the Milky Way stretched across the sky, to be dimmed or brightened to the required luminosity. Roy flicked some of the numerous other switches to project declination and right ascension graduations onto the dome, and the months of the year alongside the appropriate zodiacal constellations.

Finally, the stars faded and the Sun rose, and we found ourselves back amongst the town centre office blocks.

The lights went up and Roy explained some of the problems he encountered in putting together this mass of wires and bits of previously unused junk.

- How he had spent 80 hours burning some 5000 holes through an old oil tank ballcock, with a pin attached to an electric soldering iron, each hole varying in size according to the magnitude of the star it represented, and then realising that the projected image was inside out. Who else would have coated the copper ball with glass fibre, rubbed it down smooth, and started again?

- How he spent 10 hours making each separate planet projector out of old lipstick tubes, and scrapping the lot because someone gave him a better idea.

We thought we'd heard and seen everything, until he told us that he'd put the whole thing together for under £10. (Similar planetariums have been advertised in Sky and Telescope for some \$25 000.) By this time we were all completely convinced that the man was a completely diabolical genius. Perhaps I can give some idea of the effort and detail Roy has put into it by saying that I was somewhat disappointed to find that Mira Ceti didn't fluctuate from 2nd to 10th magnitude.

The following article was written by Prudence Maxfield of Woodbridge, who is a meteor observer of many years experience. As well as being amusing, it points out the sort of small problems that amateur astronomers have to face.

1977, October 10/11, 0300-0400hrs, and a long cold watch. There was nothing exciting at all until a little one, a +1 sporadic, came down like a bolt, persistent trained. The tiny bright pebble of a head in a sudden and, left far behind on its path, the pale train hanging in the sky. Less than half a second but it sunk deep in my mind, as in the sky.

Gosh, it was cold. No cats. But a few geese - the single call now and again, then another, or not. The seeing was excellent, approximate limiting magnitude 6 but the sky sanded by multiples just beyond my personal limiting magnitude, 8s, and fainter. There was a man whistling - well, he whistled a phrase; perhaps he was on the river wall, perhaps in Station Road. Then he farted. And a bat came to explore my face, passing back and forth. A bit late for bats? Well, it was so cold. You would not expect to see a bat somehow. It's interesting how ~~X~~ some meteors shunt through the sky, pushing, making a business of it.; some sweep, some glide, some fall; they cruise, bolt, even, I have seen them wander. I saw an Ursid last year wander. It's path was vertically down to about 30° altitude and it wandered as it went, the effect of mist or some disturbance, I suppose.

And now a +2 sporadic came shunting along, and I was eating Murray Mints - I'll miss a tooth one night, leaving only a crumble in my jaw. But I was cold and a bit lonely, concentrating with nothing to do at 0330 UT. I came in a bit thankfully at 0400hrs and made coffee. But when I strolled out at 0425 I saw a very good -3 sporadic, persistent trained again, non-fragmenting, very nice. Somewhere along the line far off a diesel was pulling out from <sup>some</sup> nowhere, just a soft tugging pull in the distance. And it was nearly 0400 before I went out again. Then ducks were clacking and a cock persistently crowing. A sound very close in the bushes, some creature shifting. And the stars were fading slightly - only less bright, not quite on their way out.. But I was tired and went in and chopped some cheese, tomato and cucumber, put Worcester sauce on them for breakfast, and went out again. 0505hrs and about astronomical dawn - well, Phi-1 and Phi-2 Orionis were visible, and the Pleiades, though fading. A distant hum of cars from the by-pass. A footstep. All getting light round the sky. Too many planets about; Venus just risen at -3.4, Jupiter -2. Planets confuse me - spoil my attention, draw my eyes and I may lose a meteor. So I went in and accidentally tipped over my plate of breakfast off the table onto the tiles. The yellow plate I bought in 1956. And now I trod on the tomato. So outdoors was a better bet. Cars busy, clanks, lights climbing visibly to take over the night - a few stars still to be seen. Sirius, of course, Jupiter, Rigel, Betelgeuse. And Venus a great lamp, over by itself on the other side. But I was cold and went in and ate a cold potato and a lump of cheese and went out. But it was getting into day now, and I was tired for day. It has been three nights in succession, nearly all night each time. It sounds as if it may rain tonight, from the forecast. Good. Eventhe bright Sirius had gone now. There is a deep depression in the Atlantic, and the mess on the floor has to be cleared up, but I shall sleep tonight.

## THE VOYAGER MISSION, Part 2

At Saturn, V1 first makes a close approach ~~XX~~ to Titan. Sixteen hours later it will make its closest approach to Saturn. At 1.00 am GMT on November 13, 1980, V1 will be 3.3 Saturn radii from the centre of Saturn, and should have ~~X~~ magnificent (fingers crossed) views of Saturn's ring system and the South Polar Regions. Then it will make close passes of Mimas, Enceladus, Dione and Rhea.

This will be the first time that that these satellites will be seen as solid 3-dimensional bodies rather than the poor fuzzy points of light available from our Earth-based telescope at the moment. The spacecraft will pass behind the Rings as seen from Earth, through their shadow, passing behind the planet and through its shadow. Meanwhile V2, if the Uranus option is chosen, first encounters Titan at a distance of 353 000 km above Titan. V2 then approaches Rhea, and then Tethys at about half the distance. As the Voyager swings round the planet it will pass within 0.1 million miles of Enceladus, make a very close approach of Mimas and finally on past Dione. V2 will then be occulted by the planet, and pass out again from behind, with its cameras full on Saturn, until the end of September 1981. It will then be well on the way to Uranus for a rendezvous 4½ years later.

Both Saturn fly-bys will be from outside the Rings but will nonetheless give us a good view of their constituents. V2 will not see the Rings as well as V1. The dark side of the Rings should be seen at 1.00 pm GMT on August 27, 1982 when it will be within 2.7 Saturn radii.

As V2 approaches Uranus non-essential equipment on board will be re-activated and will be prepared for this new encounter which is quite different to the previous encounters with Saturn and Jupiter. The technique and capability of being able to control the spacecraft's equipment many millions of miles away is a powerful new tool for exploring many planets on one mission. The technique utilizes pre-programmed computers which can have its existing instructions changed from Earth. Spacecraft use can then be altered to suit the different planetary encounters. The capability also enables controllers at Mission Control to work around equipment failures on board and combat any systems failures that might result from the large amounts of radiation emitted by Jupiter and Saturn.

Approaching Uranus, V2 will be prepared for the unusual axial inclination of Uranus, which is 98°. Uranus' satellites orbit in its equatorial plane, the orbits of the satellites face-on to Voyager, so the whole system looks rather like a bullseye with associated target rings. The flyby could take place when all the satellites are on one side of the planet, but no more than one can be close to the spacecraft if Voyager is to pass close to the planet (Uranus had 5 satellites at the last count). Details will be worked out on the way to Uranus. All the satellites will, however, be photographed well enough so that surface detail can be worked out, as well as sizes - a near impossibility from Earth. The same condition applies to Neptune and its satellites.

Thus, if all goes well, by 1990 the planets of the Solar System and their respective satellites may be known in detail comparable to our current knowledge about Mercury, Venus, & Mars (before Viking) AND THIS WEALTH OF INFORMATION WILL HAVE BEEN GATHERED BY THESE TWO SPACECRAFT, SMALL THOUGH THEY MAY BE, TAKING ADVANTAGE OF AN UNIQUE CONFIGURATION THAT WILL BE NOT REPEATED FOR GENERATIONS TO COME.

SG Harvey

### THIS MONTH'S JOURNAL.

Because the stencils were damaged in the post and I did not have time to retypeset them the printing of this month's Journal may have a lot to be desired.

many apologies.

R.M. Cheesman.

I am very sad to report that as from Monday 3rd April, 1978 I will be working away from Ipswich and that sooner or later may move house away from Ipswich. Although I will be coming home at the weekends for the next few months I will not be able to play such an active part in the Society's affairs and as from about August may have to sever my active roll in the Society and become an ordinary member. The future for me is somewhat obscure at the moment and as soon as possible a new Chairman must be elected. Mr. Stow who wished to resign as Secretary at the last A.G.M. is still acting Secretary until Mr. David Barnard takes over in August and with my going also in August I sincerely hope that the Society will still play a major roll in Astronomical Studies and that the Society continues to grow in strength.

I can still be contacted at [REDACTED], Ipswich at weekends and as developments take place in my move away from Ipswich I will advise you through the monthly Journal.

#### CORRESPONDENCE COURSE IN ASTRONOMY.

According to Edmund Orwell of the East Anglian Daily Times (9th March 1978) Pitmans Correspondence College is running a home study course in Astronomy. The course is divided into ten lessons, covering the history of astronomy, practical aspects of observations (with do-it-yourself instructions for making a telescope), and present day knowledge of the Universe. There are individual lessons on the Sun, the Moon, the stars and the planets.

I will write to Pitmans to get full details and publish them in the next Journal.

#### PRACTICAL USE OF THE GENNELL PARK TELESCOPE.

At the last A.G.M. I suggested that instead of just 'bombing' around the sky and saying 'don't that look nice' that we engage ourselves into an aspect of astronomy which we could all be involved in so at the end of the year we could say 'look what we have done'.

On February 17th the Society held a Directors meeting to discuss this proposal and after a great deal of deliberation it was decided to concentrate on variable stars under the directorship of Mr. R.S. Manning. Mr. Manning will sort out three stars for observation, one easy, one fairly difficult and one which we can only observe with the 10" O.G. at Orwell Park.

All Directors of sections have been instructed to spend some of their observational programme at the observatory in observing and recording the magnitudes of these chosen stars. Mr. Manning will take charge of all the observational records and make up the necessary graphs to plot the variations in magnitudes of these stars.

After doing Variables it was suggested that we cover Lunar & planetary observations with drawings.

#### COMMITTEE MEETING held on Friday 10th March.

1. At the above meeting, in the light of Mr. Cheesman being unable to play such an active roll in our Society's affairs, the Committee invited Mr. A.J. Smith to join the Committee. Mr. Smith, who had the highest amount of votes of the unsuccessful nominations to be committee members at the last A.G.M. Mr. Smith will continue as the Society's Librarian and will take on the extra responsibility of Assistant Chairman and will, if necessary, take over as Chairman of the Society if Mr. Cheesman fully resigns the post.
2. Mr. R. Adams, [REDACTED], Ipswich will from the 1st April take over the responsibility of printing and distributing the Monthly Journal. YOU can help him by sending any material for publishing in the Journal as early as possible; offering him assistance to distribute Journals in your area; and to save him (and others) a lot of time delivering Journals by sending him a supply of stamps to post the Journal to you.  
Mr. M. Howe will continue to be editor until about August time but dates of the change of editor to Mr. P. Burt will be advised at a later date.

## NEW SECTION STARTING UP AT OBSERVATORY.

As Mr. Cheesman will no longer be able to run his Wednesday evenings at the Observatory Mr. J. Hood and Mr. M. Barritt will take over the Solar, Lunar and Planetary Section. Their first meeting at the Observatory will be on TUESDAY 11th April starting at 7p.m. Those members who attended regularly on a Wednesday night are encouraged to now move their nights at the observatory to a TUESDAY.

### ANY MORE NEW SECTIONS:

As you can see from this month's programme the number of nights which the Observatory is being opened is getting less because of a. Mr. Gage not being able to continue his Monday nights and b. Mr. Cheesman now working away from Ipswich.

IF YOU WOULD LIKE to hold a regular meeting at the Observatory please contact Mr. Cheesman, Mr. A. Smith or Mr. M. Stow.

### VARIABLE STARS

Mr. R.S. Manning, director of the Variable Stars Section has now sorted out ~~Four~~ variables which will be observed during the coming months by all directors.

They are:-

1. SS HERCULIS
2. X AURIGAE
3. ~~8~~ CASSIOPEIAE
4. R.V. TAURI

### METEOR NOTES by Mr. D. Barnard, Director Meteor Section

#### SPORADIC METEOR COUNT held on Saturday 11th March.

The above meteor count was a total wash out again as the clouds arrived as we arrived on site! To rub salt in the wound it had been a brilliant day with clear skies during the day and perfect observing conditions for the four previous nights. A total of five members turned up for this non-event!

#### MAJOR SHOWERS THIS MONTH

This month sees the April Lyrids shower with the maximum on April 21st. The normal limits are between April 19th and 24th with a Z.H.R. at maximum of twelve. The radiant is 1808hours and Declination  $+32^{\circ}$ . This shower gives bright meteors with velocities of about 47.6km per second but unfortunately the Moon will interfere this year.

Never-the-less we will be holding a meteor watch to observe this shower, Spode permitting, on SATURDAY 22nd APRIL at 8p.m. Meet as usual OUTSIDE the Golf Hotel, Foxhall Road, Ipswich. As the evenings are now getting warmer (?) we hope that more members will attend these meteor watches. We are not fussy who comes along even if it is only for an hour or so. Remember, meteor shower observations are one of the most important aspects of astronomy the amateur with no optical aids can do.

Make a note in your diary now!

Looking forward to seeing you on Saturday 21st April at 8p.m.

David Barnard.



ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

Programme for April, 1978.

AT ORWELL PARK OBSERVATORY, NACTON.

TUESDAYS from 7 p.m. Planetary Section  
Directors Mr. J. Deans, [REDACTED] Capel St. Mary, 'phone GT. WENHAM [REDACTED]  
and Mr. J. Hood, [REDACTED], Ipswich.

4th April  
8th "

TUESDAYS from 7 p.m. Solar Lunar & Planetary Section  
Directors Mr. J. Hood, [REDACTED], Ipswich  
and Mr. M. Barritt, [REDACTED], Ipswich.

11th April  
25th "

THURSDAYS from 8 p.m. Double Stars Section  
Director Mr. D. Bearcroft, [REDACTED], Ipswich, 'phone [REDACTED]

13th April  
27th "

FRIDAYS from 8 p.m. Variable Stars Section  
Director Mr. R.S. Manning, [REDACTED], Ipswich, 'phone [REDACTED]  
and Mr. M. Siggers, [REDACTED], Ipswich

14th April  
28th "

VISITS TO OBSERVATORY arranged by Mr. R.M. Cheesman

SATURDAY 1st April at 7.30 p.m.  
National Association of Gifted Children.

OTHER MEETINGS AT OBSERVATORY

FRIDAY 14th April at 8 p.m. Directors Meeting  
SATURDAY 15th April at 8 p.m. Committee Meeting

MEETINGS HELD ON FOXHALL HEATH.

METEOR SECTION Director Mr. D. Barnard, [REDACTED], Ipswich  
'phone [REDACTED]

SATURDAY 22nd April at 8 p.m. APRIL LYRIDS METEOR COUNT

Meet OUTSIDE the Golf Hotel, Foxhall Road, Ipswich, irrespective of weather conditions.