

JOURNAL of the
ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

August, 1975

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What's Up? The Solar System as seen from Ipswich, August, 1975.

SOLAR SECTION: The Sun will be in the constellation of Cancer and Leo this month. Sunrise at the beginning of the month about 04h 20m U.T. and sunset 20hrs U.T.

Synodic Rotation number 1630 commenced July 5.34d.
" " " 1631 commences Aug 1.55d
" " " 1632 " Aug. 28.78d.

Heliographic Co-ordinates as at noon U.T.

	P	Bo	Lo		P	Bo	Lo
August 4	+12.0°	+6.0°	321.0°	August 20th	+17.6°	+6.9°	109.4°
" 8	+13.5°	+6.3°	268.1°	" 24th	+18.9°	+7.0°	56.6°
" 12	+14.9°	+6.5°	215.2°	" 28th	+20.0°	+7.1°	3.7°
" 16	+16.3°	+6.7°	162.3°				

PLANETARY SECTION:

Mercury: will be in superior conjunction on the 1st at 09h U.T. On the 11th Mercury will pass 1°2' N of Alpha Leonis (Regulus) and on the 15th 9° N of Venus. Mercury will be setting at maximum only 30 minutes or so after the Sun this month. Magnitude -0.3

Venus: reaches inferior conjunction on the 27th at 13h U.T. On the 3rd Venus will be stationary and then will assume a retrograde motion until around the 27th, thereafter it will become a morning star moving direct once more.

Mars: Rises around 23hrs U.T. and is strikingly notable by its reddish appearance. Mars is in the constellation of Taurus reaching magnitude +0.3 and 85° Western elongation towards the latter part of the month. The Moon will be very close to Mars on the 1st and 30th in fact at 05h U.T. on the 30th Mars will pass within 0°.1 N of the Moon. Though the Sun will be rising about that time.

Jupiter: rises about an hour before Mars (at 22hrs U.T.) magnitude -2.2. Jupiter is in the constellation of Pisces and will reach a stationary point of it's orbit on August 15th at 08hrs U.T. and then assume a retrograde motion among the stars. The Moon will be close to Jupiter on the 26th.

Phenomena of Jupiter's Satellites:

August 2nd	00h 37m	Occultation Disappearance	Sat III
" 2nd	02h 53m	" Reappearance	" III
" 4th	00h 06m	Eclipse Disappearance	" I
" 5th	00h 52m	" "	" II
" 5th	00h 46m	Transit egress	" I
" 7th	01h 05m	" "	" II
" 8th	22h 56m	Eclipse Disappearance	" III
" 9th	01h 38m	" Reappearance	" III
" 11th	23h 13m	Shadow ingress	" I
" 12th	02h 37m	Transit egress	" I
" 12th	23h 57m	Occultation Reappearance	" I
" 13th	22h 23m	Shadow ingress	" II
" 19th	01h 06m	" "	" I
" 19th	02h 18m	Transit ingress	" I
" 20th	01h 46m	Occultation reappearance	" I
" 20th	00h 04m	Transit egress	" III
" 23rd	00h 11m	Occultation reappearance	" II
" 27th	00h 18m	Eclipse disappearance	" I
" 27th	01h 33m	Transit ingress	" III
" 28th	00h 41m	" egress	" I

<u>SATELLITE RECOGNITION.</u>	I	Io
	II	Europa
	III	Ganymede
	IV	Callisto

SATURN is a morning star mag. +0.4 rising in the east an hour before the Sun at around 03hrs 30m U.T. at the beginning of the month and 01hrs 30m by the end of the month. The Moon will be near Saturn on the morning of the 6th.

LUNAR SECTION:

Moon Phases

Lunation 651

New Moon	Aug 7th	11hrs 57m
First Quarter	" 14th	02hrs 24m
Full Moon	" 21st	19hrs 48m
Last Quarter	" 29th	23hrs 20m

Perigee August 8th 20hrs U.T.

Apogee August 24th 04hrs W.T.

METEOR SECTION. Meteors galore!!

Alpha Capricornids:

Yellow fireballs! are predicted from July 2nd to August 25th maximum August 2nd, the radiant will transit the meridian at 00hrs U.T. on August 2nd (Saturday) no doubt there will be a meteor count that evening.

Iota Aquarids maximum August 6th, very favourable.

Perseids maximum August 13th producing many bright and fragmenting meteors with fine trains, excellent for photography.

Kappa Cygnids maximum August 20th - 21st, transit time 21hrs 25m U.T. not very favourable.

For further information see this month's programme or contact the Section Director, Mr. S. Flory.

LUNAR OCCULTATIONS:

August 17th	133B Sgr	mag 6.9	23hrs 27.1m U.T. D
" 18th	267B Sgr	" 5.9	21hrs 37.2m U.T. D
" 31st	351B Tau	" 6.2	01hrs 02.3m U.T. R

CHANGE OF ADDRESS:

Please note that Mr. G. Collier, Treasurer, has moved to

IPSWICH,
Suffolk.

IP1 3 RN

REDECORATIONS OF THE OBSERVATORY

We need as many members as possible to help in the redecoration of the Observatory ready for the Open Day and Your, yes your, held is desperately needed.

Work will be done on the normal Club Nights before observation through the telescope takes place when it gets dark, unless of course you are doing Solar Work. For further information please contact the Chairman, R.M. Cheesman

With the aid of the Vernier scales which are fitted on the telescope it is possible to set right ascension (RA) to one second and declination (Dec) to within 5" of arc.

To begin with it is best to describe how the RA vernier works, as this is the simpler of the two verniers, also by grasping the basic principles involved one has a better chance of understanding how the Dec vernier works, since it is a little more complex.

First see the illustration of the RA setting circle and vernier scale. The RA setting circle is divided into 24 hourly divisions designated by Roman numerals, the hourly divisions are further sub-divided into minutes of RA. The vernier scale resembles the calibrations on the setting circle apart from one basic fact which is the clue to how the vernier system functions.

You will see that 60 divisions on the vernier scale correspond to 59 divisions on the RA setting circle. As the division on the vernier scale are all equal, each division is one-sixtieth smaller than a division on the setting circle, in other words, one second of RA smaller. Consequently 30 divisions will be 30 seconds smaller than 30 divisions on the circle, 15 divisions will be 15 seconds smaller and so on.

By matching lines on the vernier and setting circle one can set RA to one second, hours and minutes of RA are first set against the zero arrow on the vernier then the required number of divisions to the right of the arrow aligned on the setting circle are matched with the vernier and one has right ascension set in hours, minutes and seconds.

The declination vernier is based upon similar principles but is a little more complex, see illustration. Around the Dec setting circles are divisions marked in degrees 0° indicating the equator 90° the celestial pole, the degree divisions are sub-divided into increments of five minutes (5') of arc or one twelfth of a degree.

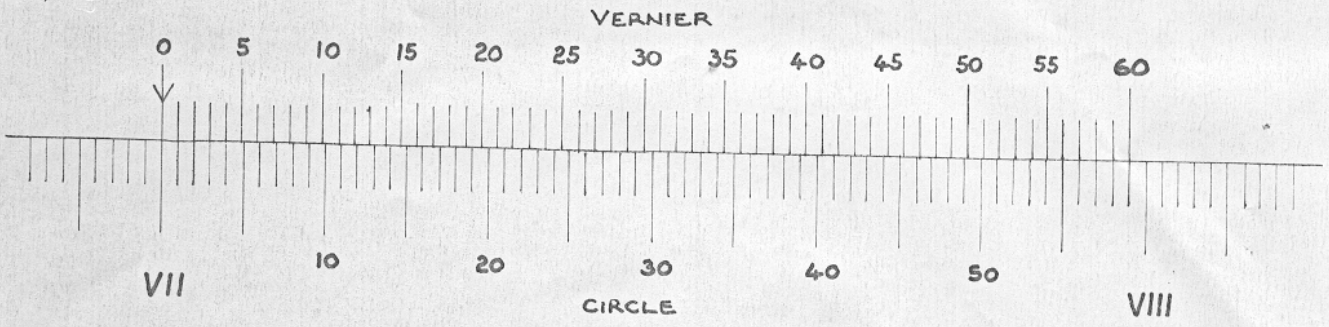
On the Dec. vernier scale are divisions indicated by numbers 3, 4, 1 and 2 or reversed 2, 1, 4 and 3, so the vernier can be used for northerly or southerly declination. The illustration shows the vernier arrow set on 7° . By moving the telescope so that the arrow points to the first divisions on the right of 7° the setting would be $7^{\circ}5'$. If on the other hand one wanted to set $7^{\circ}1'$ the figure 1 to the right of the vernier arrow would have to be aligned with the 8° mark on the setting circle since there is a discrepancy of 1 minute of arc. Similarly to set $7^{\circ}2'$ the figure 2 to the right of the arrow would have to be aligned with the 9° mark as there is a discrepancy of 2 minutes, the separation between the 7° mark on the circle and the arrow on the vernier would be 2 minutes of arc.

Looking at the illustration as it is set at 7° one can see that to the left of the vernier arrow are the numbers 4 and 3 respectively, the separation between 4 and 6° on the circle is 1 minute 3 and 5° 2 minutes of arc. This means that the separation between 3 on the vernier scale and $5^{\circ}5'$ will amount to 3 minutes of arc., and the separation between 4 on the vernier and $6^{\circ}5'$ will be 4 minutes of arc.

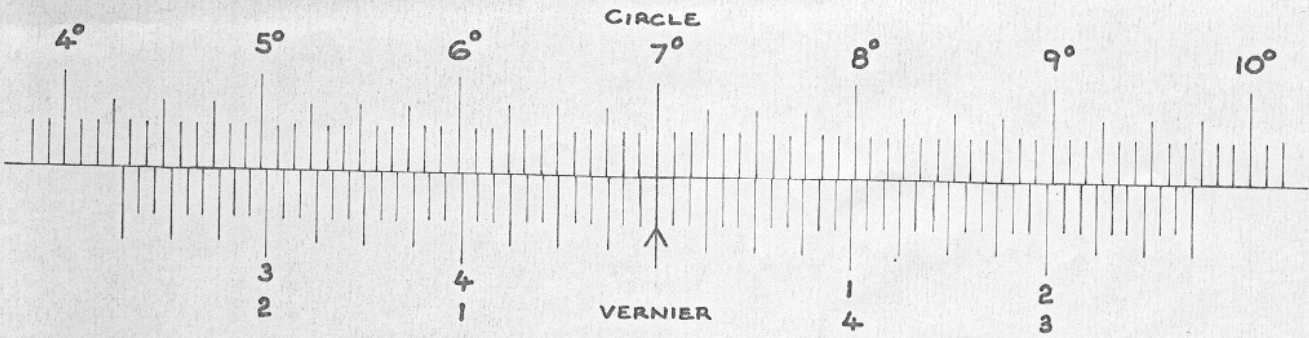
Consequently if we wish to set $7^{\circ}3'$ against the vernier pointer we have to align the 3 to the left of the vernier arrow with $5^{\circ}5'$ on the setting circle and for $7^{\circ}4'$ align the 4 with the $6^{\circ}5'$ division.

We have now reached the stage whereby we can set the Dec to degrees and minutes of arc. I hope that you have grasped the facts so far. To set declination to 5" of arc, i.e. one twelfth of a minute of arc we must continue.

As we saw in the explanation of setting RA, by matching lines on the vernier and setting circle, we could obtain very fine calibration. The Dec vernier scale is sub-divided between the numbers 3, 4 arrow 1 and 2 by 12 divisions. We have seen how to set Dec to 1, 2, 3, and 4 minutes of arc, each division on the vernier scale represents one-twelfth of a minute
 + a 5" of arc



RIGHT ASCENSION



DECLINATION

To set a given declination first set the arrow against the appropriate degree and number of 5' divisions, next align numbers on vernier scale for sub-dividing the 5' divisions and finally count in 5" multiples along the vernier after the number indicating minutes and align the vernier after the number indicating minutes, and align with a corresponding number of divisions on the setting circle.

Example:- set $7^{\circ} 3' 15''$ declination.

1. Set 7° against arrow on the vernier
2. Set 3' on vernier against $5^{\circ} 5'$ on setting circle.
3. Set $3' 15''$ on vernier against $5^{\circ} 20'$ on setting circle.

RESULT the arrow on the vernier will be indicating $7^{\circ} 3' 15''$ on the setting circle.

Example:- Set 7hrs 25mins 32 sec right ascension

1. Set zero on vernier against VII hours
2. Move zero on vernier against 25m division on setting circle.
3. Count 32 divisions along the vernier from the zero arrow and align with VII hours 57m on the setting circle.

To conclude although the article is intended to give a broader understanding of how the 10" O.G. verniers work for those who seriously indulge in observation at the observatory, it should also give an insight into the general principles of verniers used on telescope setting circles, thus enabling you to construct similar verniers on your own instruments if you have setting circles

LUNAR OBSERVATION JUNE 18/19th

'A ten story block of flats' is how the strange object seen on the Moon on June 18th/19th was described by R.M. Cheesman when he first sighted it through the 10" at Orwell Park.

The object pictured near the crater Clavius stood prominent like something out of 2001 Space Odyssey casting a large shadow towards Calvius. So intrigued by the strange object Roy made another observation the following night together with S. Flory through Roy's $8\frac{1}{2}''$ feflector. Although the object was still there it had developed dark radiating arms as though some eruption had occurred and lava had poured out. After about half an hour the Moon had moved behind ^{the houses} out of view and Stephen and Roy had to dismantle the telescope at gone one in the morning and move it together with stand into the front garden.

A member of the T.E.P. network was alerted, Comm Hatfield who was having a cup of tea at the time (one in the morning!) who was waiting for the clouds to clear in his area.

If the object was merely a formation on the Lunar surface we may see it materialise again under similar illuminated conditions. The Selenographic Colongitude, which means the relative position of the Sun/Moon as seen from Earth is given against the drawings made.

This month the same conditions will occur again

Colongitude 15.45°	August 16th 21hrs 30m U.T.
" 27.3°	" 17th 20hrs 45m U.T.

Would anyone who sights the object please made a sketch of it and either notify R.M. Cheesman or J. Deans.

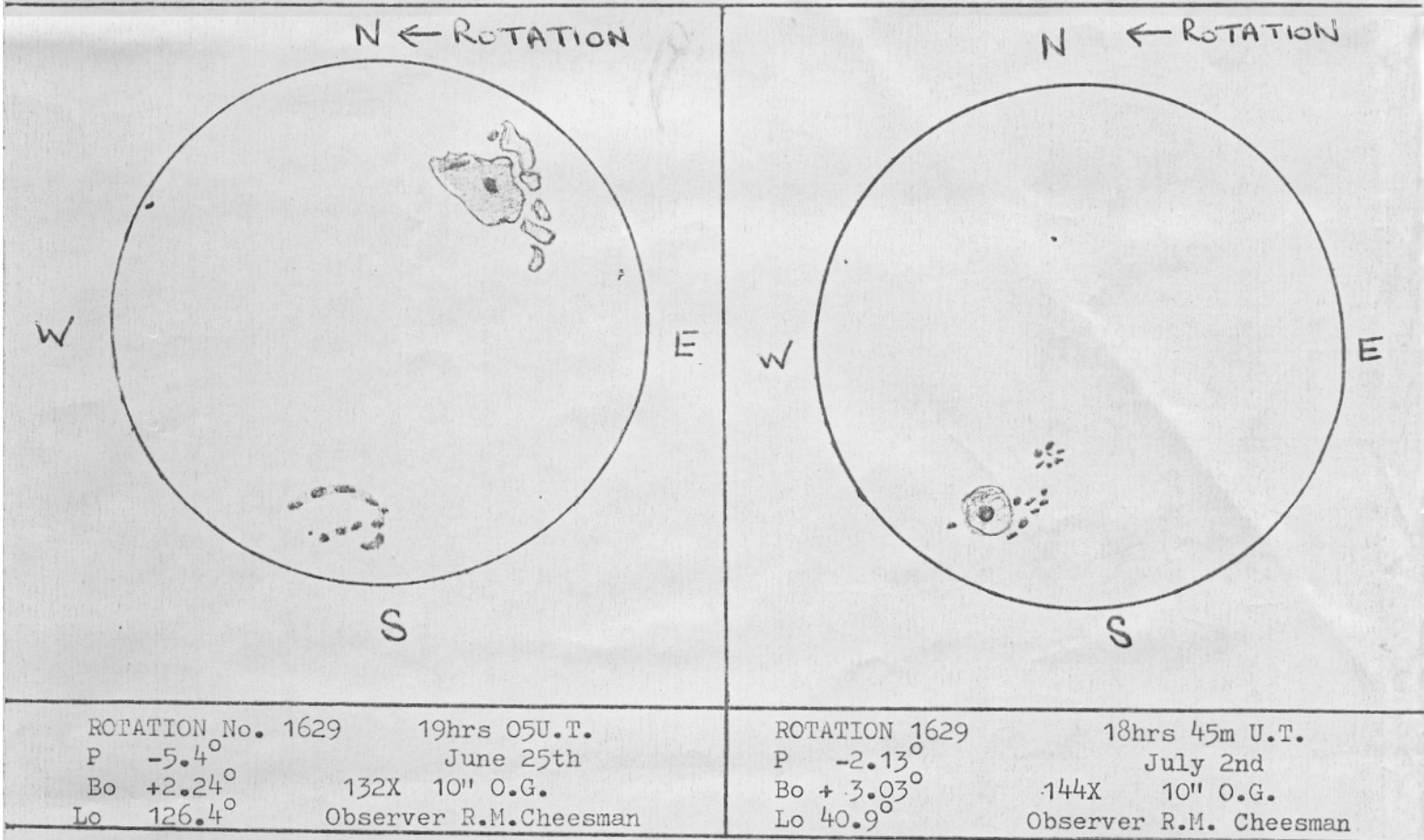
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O.A.S.I SUNSPOTTING PROJECT.

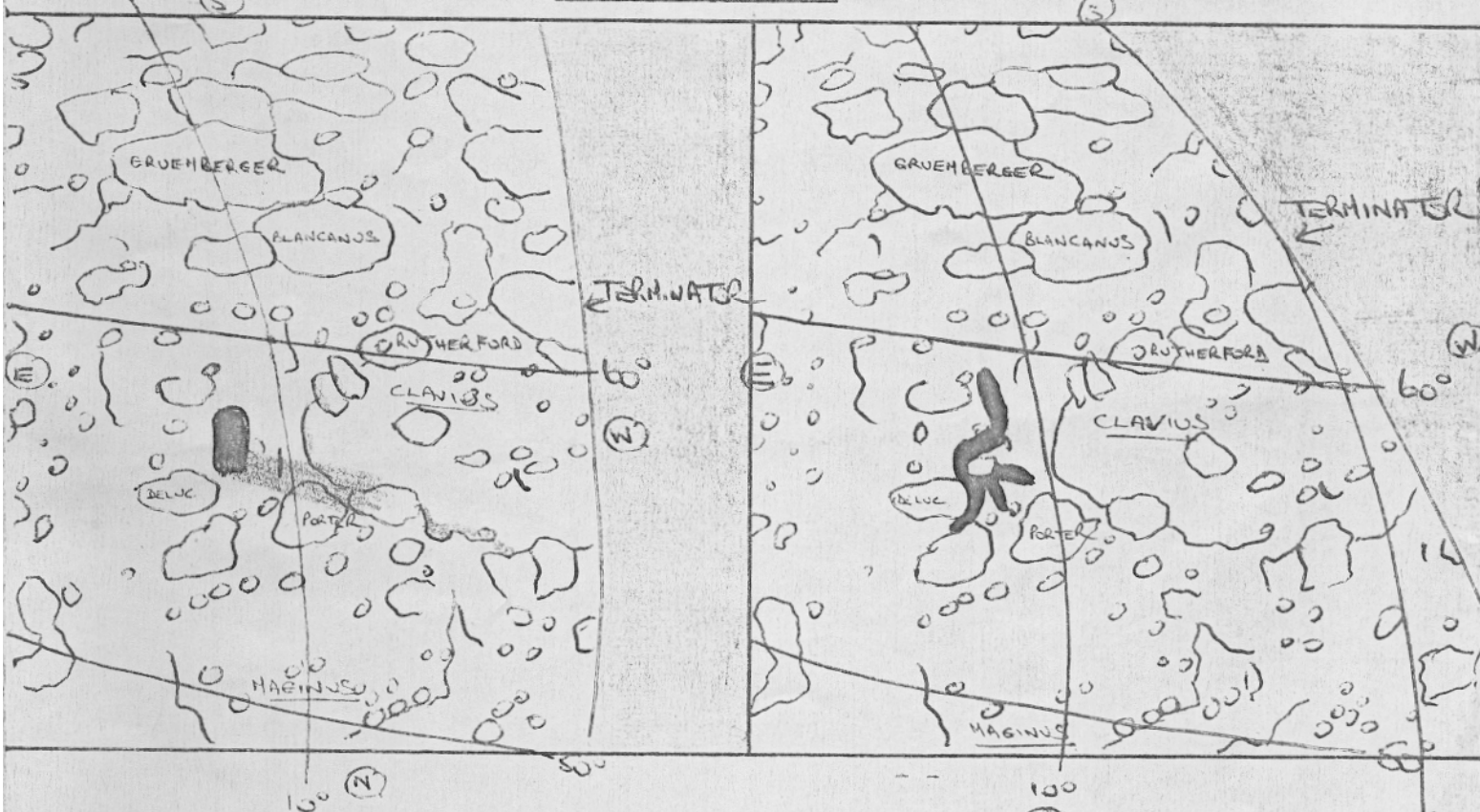
Two observations made show a number of Sunspots and faculae, note the longitudes of the central meridian differ 85.5° indicating how much the Sun's sphere has rotated between observations.

If anyone has a drawing made around June 28th please send it to the Editor as it would prove very useful.

SUNSPOTS



LUNAR OBSERVATION



LUNATION 649 June 18th 23hrs 50m U.T.
 Magnification 300X 10" O.G.
 Colongitude 15.45°
 Observers. R.M. Cheesman
 D. Barnard

LUNATION 649 June 19th 22hrs 45m U.T.
 Magnification 120X 8 1/2" SPEC.
 Colongitude 27.3°
 Observers: R.M. Cheesman
 D. Barnard
 S. Flory

Programme for August, 1975.

WEDNESDAYS: from 7p.m. Solar, Lunar & Planetary Section
Director, Mr. R.M. Cheesman, [REDACTED], Ipswich.

13th August
20th "
27th "

THURSDAYS: from 8.30p.m. Double Stars Section
Director, Mr. D. Bearcroft, [REDACTED], Ipswich.

7th August 'Phone [REDACTED]
21st "

FRIDAYS: from 8p.m. Lunar & Planetary Section
Directors: Mr. J. Deans, [REDACTED], Capel St. Mary
'Phone GT.WENHAM [REDACTED]
and Mr. K. Dye, [REDACTED], Ipswich, 'Phone [REDACTED]

1st August
29th "

FRIDAYS from 8.30 p.m. Nubular & Faint Object Section
Directors, Mr. M. Stow, [REDACTED], Ipswich
and Mr. R. Hazelwood, [REDACTED], Ipswich
'Phone Ipswich [REDACTED]

8th August.

***** Friday 15th August, at 8.30p.m. Committee Meeting at Observatory to
which all members are invited

SATURDAYS: METEOR SECTION
Director Mr. S. Flory, [REDACTED], Ipswich 'phone [REDACTED]

ALPHA CAPRICORNIDS meteor Count Saturday 2nd August

PERSEIDS Meteor count Saturday 9th August.

For these two meteor counts meet at the entrance to Foxhall Stadium
at 10p.m. irrespective of weather conditions

SATURDAY 30th August from 7.30p.m.

Visit to Observatory by The Ipswich & District Historical
Transport Society

arranged by Mr. R.M. Cheesman