Journal of the

# ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

June 1976

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# What's Up? The Solar System as seen from Ipswich, June, 1976.

## SOLAR SECTION.

The Sun will move through the constellations of Taurus and Gemini this month. Sunrise will be about 03hrs 40m U.T. and sunset 20hrs 10m U.T. at the start of the month.

Synodic rotation number 1642 commenced May 27.75d
" " " 1643 commences June 23.95d.

## Heliographic Co-ordinates as at noon U.T.

| | P. | Bo. | Lo | | P | Bo | Lo |
|---|---|---|---|---|---|---|---|
| June 1st | -15.4° | -0.6° | 303.7° | June 16th | -9.3° | +1.2° | 105.2° |
| " 6th | -13.5° | 0.0° | 237.6° | " 21st | -7.1° | +1.8° | 39.0° |
| " 11th | -11.5° | +0.6° | 171.4° | " 26th | -2.6° | +2.9° | 226.7° |

**MERCURY** rises about one hour before the Sun mid-month and will attain maximum western elongation (23°) on the 15th at 09hrs U.T. magnitude +0.7.

**VENUS** is drawing closer to the Sun and will be in superior conjunction on the 18th at 04hrs U.T. so it will not be seen this month.

**EARTH** the longest daylight, shortest night occurrs on the 21st when the Earth reaches the point of it's orbit around the Sun known as the 'Summer Solstice'.

**MARS** is now setting around 00hrs U.T. magnitude +1.7 getting fainter and receding from the Earth. The Moon is near Mars on the evening of the 3rd.

**JUPITER.** is a morning object rising about 40 minutes before the Sun and at magnitude -1.6 the planet will be better placed for observation next month.

**SATURN** now sets before Mars, at around 23hrs 20m U.T. and is running into daylight.

**URANUS** is an evening star in Virgo situated at about R.A. 14hrs 06m, Dec.-12°15'.

## LUNAR SECTION.

Moon Phases for Lunation 661/662*

| | |
|---|---|
| New Moon | May 29th 00hrs 47m U.T. |
| First Quarter | June 5th 12hrs 20m U.T. |
| Full Moon | " 12th 04hrs 15m U.T. |
| Last Quarter | " 19th 13hrs 15m U.T. |
| New Moon | " 27th 14hrs 50m U.T. |

Perigee June 9th 19hrs Apogee June 21st 17hrs.

## OCCULTATIONS.

| | | | | | |
|---|---|---|---|---|---|
| June 4th | ZC 1528 | mag 6.6 | D | 21hrs 47m | U.T. |
| " 6th | ZC 1759* | " 6.5 | D | 22hrs 50m | " |
| " 7th | ZC 1888 | " 6.2 | D | 22hrs 48m | " |
| " 10th | ZC 2302* | " 2.9 | D | 20hrs 31m | " |
| " 10th | ZC 2302* | " 2.9 | R | 21hrs 39m | " |

* Denotes stars are doubles.

Solution to last month's astronomical puzzle.

1. The date - September 21st
2. Time 03hrs 19m U.T.
3. At the zenith is the star Epsilon Cassiopiae.

Question:- Where would you be and what would be the name of the nearest city?

First establish the geocentric co-ordinates for the star Epsilon Cassiopiae RA 1hr 51m, Dec $+64^{\circ}$. The star at the zenith so it must also be on the observer's meridian. The declination of the star being $+64^{\circ}$ means that the latitude of the observer must be $64^{\circ}$ north. All that remains now is to establish the observer's longitude, The date September 21st is a day on which Dideral time and U.T. coincide at Greenwich or the zero meridian. The time of observation being 03hrs 19m U.T. and the star's R.A. being 1hr 51m means the star has crossed the Greenwich meridian 1hr 28m before observation making the point of observation 1hr 28m west ($22^{\circ}$) of Greenwich so the observer would be in the vicinity of Iceland and the city Reykjavik.

Mr. T. Cardot.

Mr. T. Cardot has resigned from the Society as he has moved away from the Ipswich area. Mr. Cardot during his membership with our Society has played an active part in all areas over the last few years especially as being director of our Variable Stars Section, and as a committee member.

Under the Society's Constiution his place on the Committee has been filled by Mr. K. Dye who was nominated to stand on the Committee at the last A.G.M. but was not voted on.

Mr. Dyes appointment to the Committee was effective from 7th May 1976.

FOR SALE 3" O.G. refractor on altazimuth mount (no stand) one eyepiece. This instrument is quite old and very heavy.

Any member interested should contact Mr. C. Durrant, [redacted], Ipswich.

TELESCOPE MAKING

Mr. N.C.C. Barrell, F.R.A.S. has donated to Mr. R.M.Cheesman on the Society's behalf mirror blanks and all the necessary equipment for cutting, grinding and polishing mirrors together with equipment to test mirrors. One of the mirror cutters which Mr. Barrell invented and has given to the Society was featured in an article in 19[illegible] in the 'Scientific American' magazine.

We propose that we start a mirror making section and any member who is interested should contact Mr. R.M. Cheesman, [redacted], Ipswich who will be starting the section off.

The mirrors we have for distribution to members range in size from 6" to 12½"+ and will be allocated to those members who are definitely going to make reflectors. The 12 mirror blanks will be allocated as requested but if we have more than 12 requests for mirrors (or of any specified size) then the Committee will allocate them as they think best.

Mr. Barrell has also donated to the Society a large semi-portable reflector on an altazimuth stand with a focal length ranging from 6' to 12' of his own design weighing about 7 cwt. This instrument with be collected from Mr. Barrells within the next few months and set up on a suitable site.

Our thanks go to Mr. Barrell for these mirror disks, equipment and the reflector and we hope that as many members as possible will be albe to use them.
On Wed 9th June at 8p.m. at the Observatory we will meet to start this section off.

CLUB NIGHTS AT THE OBSERVATORY.

As the nights are now pulling out only two sections will be run at the Observatory during June, July and August. We hope that as many members as possible will continue to come to the Observatory during these months for apart from doing Solar observations and a little night sky viewing when it gets dark we hope to re-decorate the Observatory ready for our Open Day which we hope to hold in September.

Also these nights at the observatory would be ideal for members to get together to start making their own reflectors ready for when the dark nights come again.

METEOR NOTES. by Mr. D. Barnard, Meteor & Fireball Section Director.

The April Lyrids count was mostly spent in finding a temporary meteor observing site, as Foxhall Stadium was locked up. A site was finally found near Martlesham. The watch started a little after 10p.m. and ended at 11.30p.m. Only eight meteors were seen, four shower and four sporadic, though it has to be remembered that the watch was held after the main stream had finished. Only three members attended this count, and that was including myself!!

The sporadic watch on May 22nd will be reported in the July Journal.

This month sees two major showers, 1. the June Draconids, maximum on June 29th . be a meteor count to observe this shower, as the limits of the stream occur within twenty-four hours, an extremely intense maximum. The max. date is on the Thursday. This shower is associated with Comet Pons-Winnecke with a ZHR of 50 (1916)

2. The June Lyrids- normal limits June 10th to the 21st, Max on June 15, Blue meteors, Radiant 15hrs.32m R.A. and +35° Dec. The radiant transits the meridian at 1000hrs. Moon age will be nineteen days which will rise at 2252hrs, setting c841hrs. Dusk will occur at 2212hrs. ZHR of 6 so generally favourable. A meteor count will be held to observe this shower on SATURDAY, 12th JUNE, COMMENCING AT 10p.m.

If anybody would like to come to these meetings they are very welcome as the more the merrier. Our new Meteor Count site is still on Foxhall Heath but to get to it follow the road opposite the Golf Hotel on Foxhall Road. This road is Bixley Drive and leads onto the heath via Ryan's Riding Stables.

There are three daylight meteor showers this month which are of course exclusive to radar observations techniques.

1. June 8th, Epsilon Arieds, ZHR 60, Normal limits May 29th - June 8th
2. June 8th, Zeta Perseids, ZHR 40, " " June 1st to 16th
3. June 27th, Beta Taurids, ZHR 25 " " June 24th to July 5th.

The Society has just purchased an all sky camera for the Meteor Section which is being used to photograph, we hope, fireballs. Also this camera will be used in conjuntion with the meteor watches.

DON'T FORGET. the next meteor watch on Saturday 12th June at 10.p.m.

CLUB NIGHTS AT OBSERVATORY.
June, 1976.

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

June ~~3rd~~ 9th
" 16th
" 23rd
" 30th

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

June 3rd
" 17th
July 1st.

METEOR SECTION. Director Mr. D. Barnard, [redacted], Ipswich, Tel. [redacted]

JUNE LYRID METEOR COUNT SATURDAY 12th JUNE
Meet at 10p.m. OUTSIDE the Golf Hotel, Foxhall Road, irrespective of weather conditions

# The Greek Alphabet.

by Mark Howes.

Whilst writing the article on astronomical photography, I started doodling letters of the Greek Alphabet on my first draft. It occurred to me that most of the people I was writing the article for would not be able to write them: it is one thing to recognise them when you see them written; another to have the ability to write them fluently.

The letters of the Greek Aphabet are, of course, significant to astronomers as the means by which we distinguish two stars in the same constellation, but they are also used to a great extent in the other scientific disciplines. The following is a brief account of the twenty-four Greek letters and their use in science; I also hope that it will enable readers of the Journal to write them as they are normally handwritten.


- alpha, denotes Right Ascention, proportionality, alpha radiation (helium nuclei), any angle. Start at the top of the fishe's tail, and write a single, flowing line.


- beta, the name given to another type of radiation (electrons) Start at the bottom and work upwards, but do not join up at the end of the stroke.


- gamma, denotes high frequency electromagnetic radiation. An alpha rotated through 90°, start on the left.


- delta, denotes declination, also used in the calculus. An uncompleted figure 8


- epsilon, obliquity of the ecliptic.


- zeta, an elevated English 'y' with a large kink in the tail.


-eta, an 'n' with a large tail.


- theta, denotes an angle in geometry. Start at the left and write and 'o', as when handwriting, but continuing stroke goes across the middle of the letter.


- iota


- kappa


- lambda, denotes wavelength. An upside-down 'y' starting at the top of the lambda.


- mu, a 'u' with a straight tail prefacing it.


- nu, stands for frequency


- xi, an inverted figure 3.


- omicron


- pi, the one everybody knows, relating radius to circumference and area; also can be used to mean parallax. When writing, do the legs first.


- rho, the symbol denoting density in physics. The same as the English 'p' but is only one stroke, not two.


- sigma, Stefan's constant relating temperature of a black body radiator to total energy output. An 'o', with a tail at the top; Start at the top, and make it a single stroke.


- tau, a pi with one of the legs missing.


- upsilon, same as the English 'u'


- phi, stands for geographical latitude. Start at the top in the middle, and make an 'o' with a stroke through it in one uninterupted line.


- chi


- psi


- omega, denotes longitude of the perihelion, angular momentum. An English 'w', but fuller and write with no tail.

Compare the above symbols with the Greek Alphabet as printed in text books.

N.B. These are the small letters, Capital Greek letters are not often used.

## Discovery of Neptune

After the discovery of Uranus by Herschel in 1781, the motions of the planet were recorded by astronomers of the national observatories in England, France and Germany. After a while the recording of the planets position became routine work and astronomers took less notice of it. The mathematicians were very interested in the planet still, and found that the distance of Uranus fell quite unexpectedly into a peculiar relationship between the planets discovered by Johann Daniel Titius. This relationship is now known as Bode's Law as Bode published it in the introduction of a book he wrote on astronomy.

After some time astronomers noticed that the posi tions of Uranus did not agree with those predicted. Mathematicians were called upon to try to explain this discrepancy. Some thought the erroneous positions of Uranus were due to Newton's gravitational law only operating out to the distance of Saturn, after which a new factor is needed. Another train of thought was that the discrepancy in position was the result of perturbations by another planet further out from the sun than Uranus. Two mathematicians, one in England and the other in France, independently started to work out the probable position of the new planet.

John Couch Adams was born in Cornwall in 1819. At an early age he showed a great talent for mathematics. Adams went to Cambridge University and during his studies he read a report by the then Astronomer Royal, George Air y who had originally sent the report to the British Association. The report was on the anomalous motion of Uranus. Airy believed that this was either due to errors in measuring the planet's position, or the Newtonian theory of Gravity was wrong. Even though he was a good mathematician, Airy dismissed the possibility of there being another planet, believing that it would be impossible to determine an unknown planet's orbit and mass by mathematics alone. Adams disagreed and proceeded to find the position of the unknown planet from the behaviour of Uranus' motion. After about eighteen months, Adams found an answer.

The professor of astronomy at Camrbidge at the time was James Challis. He disregarded Adams' work, thinking that it was just a mathematical exercise and of no importance. Challis gave Adams an introductory letter to see Airy at Greenwich. Adams gave his results of the position of the new planet to Airy, who, like Challis was sceptical of these results and took little notice of them. Airy was quite sure that it was impossible to solve the problem.

Meanwhile the French mathematician Jean Leverrier who had been working on the same problem had reached a similar conclusion to Adams. Airy received a report of Leverrier's work in December 1845. When he realised that Adams and Leverrier agreed to within one degree of position of the new planet, he Airy, requested Challis at Cambridge to start looking for it. Challis was still unwilling to trust Adams' predictions and proceeded to sweep an area of sky of about 300 square degrees. This took him some 300 hours. Had he used Adams' results he would probably have found the new planet in a few nights.

On the Continent, Leverrier had been trying to get any astronomer he could to look for the new planet. After much enquiry he went to the Berlin Academy Observatory. Equipped with a new and accurate star chart, the Berlin astronomers discovered the new planet on 24th September, 1846, within a degree of the predicted position. The discovery was met with bitter resentment by the British astronomers. If Airy and Challis had taken notice of Adams' prediction, they would have discovered the new planet about a year sooner, and they were much criticised by the Royal Astronomical Society for this. During a meeting in November an explanation from Airy and Challis was sort.

The discovery of the new planet subsequently named Neptune was credited to Leverrier instead of Adams.