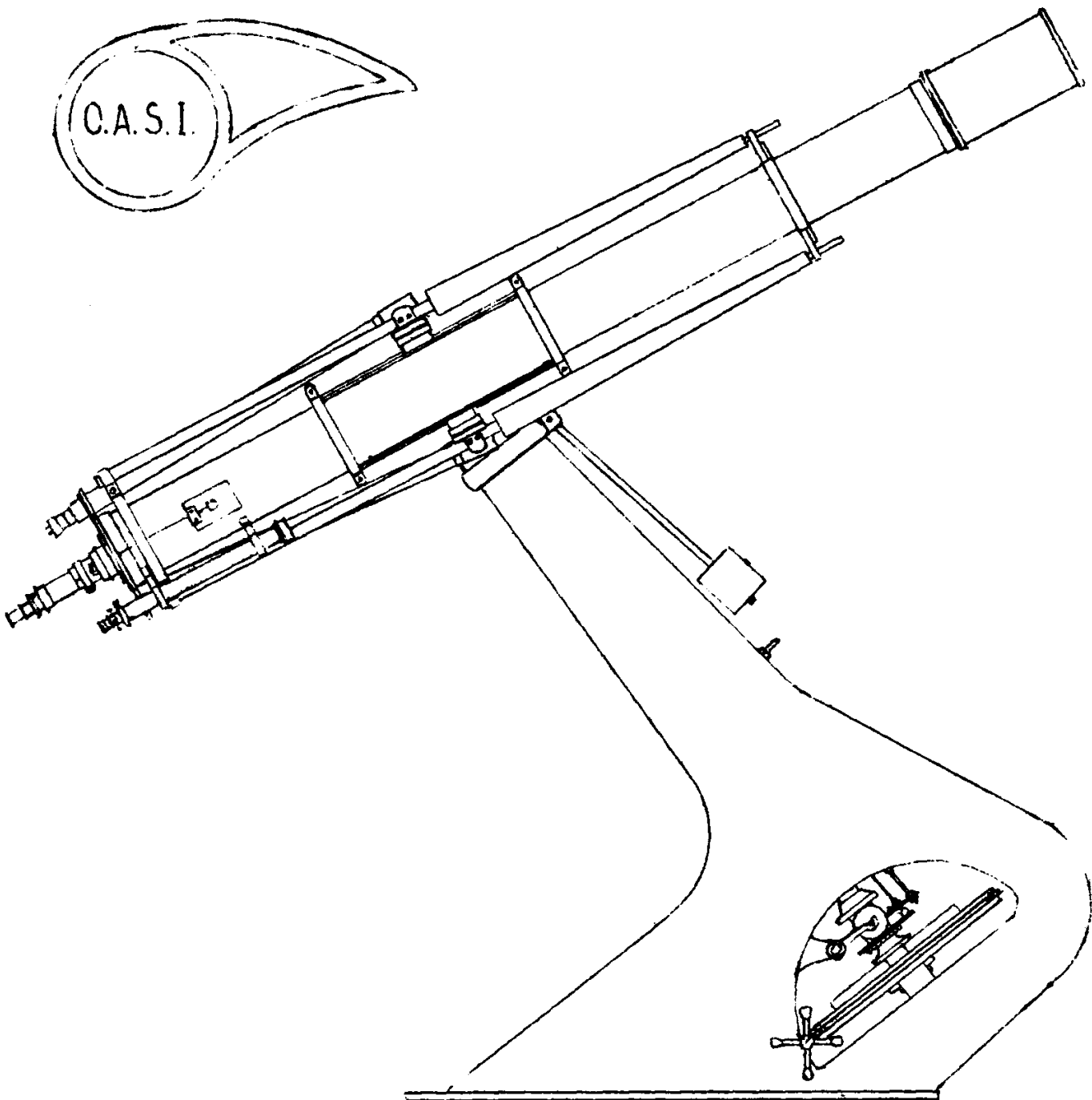
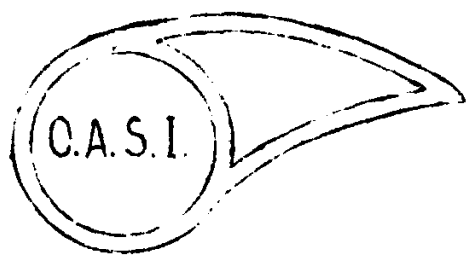


THE JOURNAL OF THE ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

Editor: Mr. Paul Burt, [redacted], Ipswich IP1 6PP 'Phone Ipswich [redacted]

Producer: Roy Adams, [redacted], Ipswich IP2 9ST 'Phone Ipswich [redacted]

Your submissions of items for the Journal will be welcome.



The Orwell Park Observatory 10-inch Astronomical Telescope at Nacton near Ipswich

Cepheus, Lacerta and Cassiopeia are in the zenith area, and the Square of Pegasus is crossing the meridian around midnight. The autumn constellations of Aries and Triangulum are in the east, the latter containing M33, the second brightest spiral galaxy in the sky. It lies a third of the way from Alpha Trianguli to beta Andromedae. Perseus is becoming conspicuous, and Taurus and Auriga will be visible in the east by late evening toward the end of the month. And for anyone with a perfect southern aspect, Fomalhaut (alpha Piscis Austrini) is visible this month just above the horizon.

THE SUN

Sunrise is at 05h10m at the beginning of the month, changing to 06h10m at month-end. Sunset changes from 18h50m to 17h40m. The Sun moves from Leo to Virgo during the month.

THE MOON - Phases (September)

New Moon	2d16h09m	Full Moon	16d19h01m
First Quarter	10d03h20m	Last Quarter	24d05h07m

Occultations

Star	Phase	Mag.	Time	
2371	D	6.5	11d20h13.2m	D = Disappearance
*2745	D	6.9	11d22h19.8m	R = Reappearance
3188	D	5.4	14d18h49.0m	Stars listed according
219	R	5.1	18d21h00.1m	to Zodiacal Catalog
362	R	6.5	19d23h22.9m	(ZC) numbers.
**626	R	6.4	22d01h04.6m	*denotes double star.
1271	R	5.9	27d02h35.2m	**denotes time is correct
1381	R	6.3	28d03h06.9m	for latitude and longitude
				of Greenwich.

THE PLANETS

Mercury is a morning star reaching greatest elongation of 18° on the 4th at mag. +0.1. For the following week it will be rising an hour and a half before the Sun, brightening to mag. -1.0. Superior conjunction is on the 30th. It will be $0^\circ.5N$ of Regulus on the 9th, and $0^\circ.1N$ of Saturn on the 13th.

Venus will be setting an hour after the Sun this month, increasing in magnitude to reach a peak of -4.3 at month-end.

Mars is still in the evening twilight, setting shortly after the Sun at mag. +1.8, in Virgo.

Jupiter will be rising just after midnight by the end of the month, at mag. -1.5, in Cancer.

Saturn, still in Leo, will be rising three hours before the Sun by the end of the month, at mag. +1.1. (See Mercury.)

Source: BAA Handbook 1978. Please note all times are UT (= BST - 1h).

METEOR NOTES for September 1978

by D. Barnard

There are no major showers active this month. However, there are three minor showers reaching their maxima in September:

1 The delta Piscids. This shower reaches maximum on September 8th, active from September 5th to 11th. Radiant RA 00h32m, Dec $+2^\circ$.

2 The xi Piscids. Maximum occurring on September 30th, active from September 27th to October 3rd. Radiant RA 01h32m, Dec $+2^\circ$.

3 The rho Cygnids. Maximum also on September 30th, normal limits from September 27th to October 2nd. Radiant RA 21h40m, Dec $+45^\circ$.

These three minor showers were found by observations from the period 1946-49. All

these three showers are very weak, giving a ZHR at maximum of ~~only~~ one meteor every one or two hours.

A report on the Perseid meteor count will be in the October OASI Journal.

GUIDE TO OBSERVING METEORS - Part 2 -

OBSERVATION OF SPORADIC METEORS AND MINOR SHOWER METEORS

Long watches are required, and a watch from three and a half to four hours is a minimum for any effective work to be undertaken for minor streams, whilst watches of from six to eight hours are more beneficial.

Accurate determination of magnitude, duration and length of path will be found to be just as necessary in the determination of group radiants as the flight directions.

On a night when there is no major shower active, the path-plotting routine is to obtain three data for each meteor observed:

- 1 Direction of flight.
- 2 Beginning- and end-point of its luminous path.
- 3 Duration of visibility.

When there are more than ten meteors per hour, it will probably be impossible to obtain all this data.

Memorization of the Meteor's Path, and its Transference to a Map

This method is NOT a good one, for two reasons:

- 1 Inconvenience. The path of a meteor being an arc of a great circle passing through its radiant, special maps are required.
- 2 Inaccuracy. It is difficult to determine the direction and end-points of the path with the accuracy that can be obtained by the next method to be described.

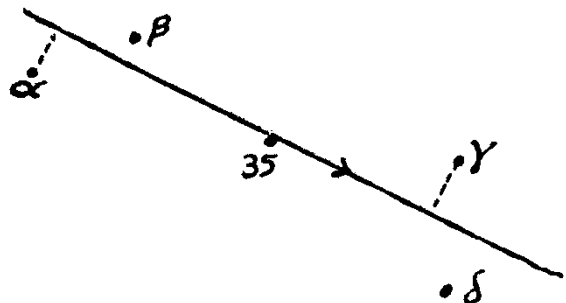
Separate Determination of the Meteor's Flight Direction and of its Beginning-and End-Points

This is the accurate method. These data are recorded in descriptive form:

- 1 Orientation of the path or flight direction. Directly after a meteor has been seen, hold up a piece of stretched string against the sky, and note whether this projection of the luminous path in both directions passes through or near any stars. The flight direction should be defined by three points in order to eliminate (or reveal!) errors of identification or recording. One way of doing this is known as the Fractional Method for which reference stars should be within 30° of flight direction.

In the aside diagram, as an example, $1/2\alpha.\beta//35//1/4\gamma.\delta$ indicates that the point midway between the stars alpha and beta, the star 35, and the point one-quarter of the way from gamma to delta all lie on the flight direction.

(To be continued next month)



PROJECT CAMEO - ION RESEARCH - OBSERVERS NEEDED

A cloud of lithium vapour will be released from the last stage of the 'Delta' rocket of NASA's Nimbus G met. satellite in late September or early October this year, into sunlit space above NW Europe, at about 0100UT on the chosen day, and 950 km from the Earth's surface. This should result in a really spectacular event.

The cloud will and rapidly after release over somewhere near 250E, 750N, follow satellite trajectory southward, and then disappear into the Earth's shadow south of the U.K. The expansion of the bright, deep red cloud should take five minutes or so to reach a near-full-sky diameter of a few thousand kilometres.

The main aim of the Project appears to be to find out more about the ways in which ions are transported and accelerated within the magnetosphere - lithium ions produced from the cloud by photo-ionization will be observed by GEOS II and hopefully a large number of ground-based observers in a correlating network, preferably using cameras but visual observations will also be helpful. 35mm cameras with a fast, fairly wide angle lens should be quite suitable using high speed colour film on 2 to 5-sec exposure.

For further details and who to contact to take part, see the BAA Circular No 588, a copy of which is at the Observatory, and/or ask round about others who are interested.

FROM OTHER JOURNALS - A Moon for Pluto and a Tenth Planet?

Recent photographs of Pluto have shown a marked elongation of the planet, which points to the probable existence of a moon orbiting at a centre-to-centre distance of 17 000 km, with a diameter of as much as 40% that of Pluto. Its orbital period is 6.4 days, the same as Pluto's rotation. Various calculations and a new theory of Pluto's formation have been derived from these observations.

Pluto's mass turns out to be 40 times less than currently accepted, and combined with a diameter of 3 000 km as estimated from infra-red observations made last year, this means that the planet has a density lower than that of water, and is nothing more than a snowball of frozen gases.

According to the new theory of Pluto's genesis, the planet was once a satellite of Neptune orbiting every 6.4 days (as in the standard theory) and was ejected into its own solar orbit by the infamous 'tenth planet', which passed through Neptune's system, violently disrupting it. Tidal forces ripped a chunk off Pluto, producing a moon with an orbital period of 6.4 days. The intruding 'tenth' planet was thrown out into an orbit 50 to 100 astronomical units from the Sun, and is still out there waiting to be found (according to the theory). For more details, see the 'New Scientist', 27th July.

The Continuing Saga of Skylab

It was incorrectly reported in last month's journal that Skylab was successfully put back on course a couple of months ago (from the beginning of August). It was not, in fact, until the third attempt in three months, on July 19th, that sufficient success appears to have been achieved.

The 85-tonne space station was directed into the 'solar inertial' position, with all its solar panels facing the Sun. This has stopped the pitching and rolling movements which caused atmospheric drag pulling the craft towards Earth. ('New Scientist')

THE VOYAGER PROJECT Part 7 - Voyager Science (Last part) by S.G. Harvey

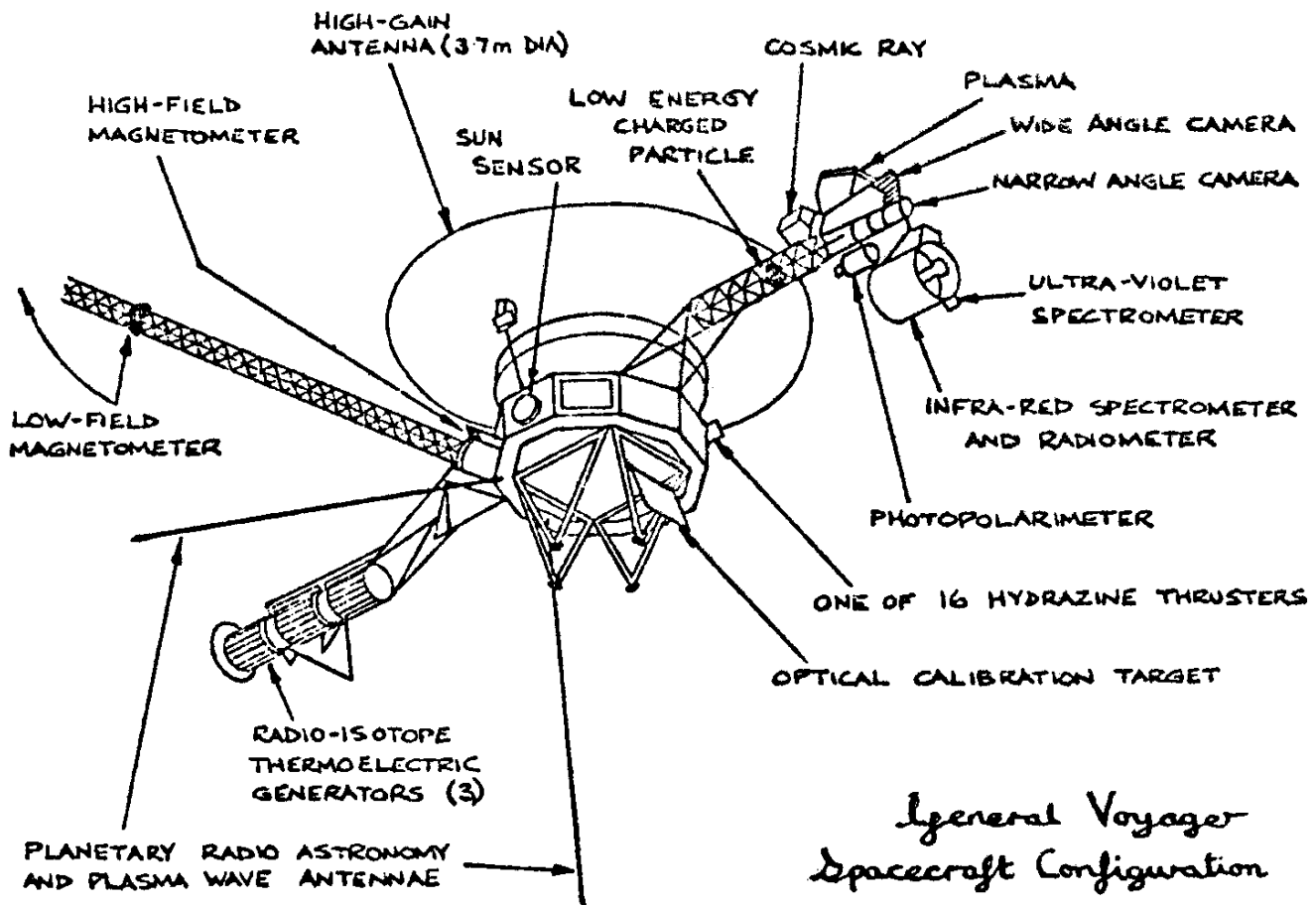
Originally, the Voyager mission was concerned with the two giant planets Saturn and Jupiter. However, a new and growing interest was brewing with their satellites and so the mission was also aimed at them. In the mission, five bodies about the size of our Moon will be investigated. Titan, as most astronomers know, has an atmosphere, thought to consist mainly of methane, and apparently if the temperature were raised by as little as 380C, its atmosphere would escape.

The science instruments are quite varied:

Imaging science (2 TV cameras)
 Infra-red Interferometry (Spectrometer and Radiometer)
 Ultra-violet Spectrometer
 Photopolarimeter
 Plasma (dual Plasma Detectors)
 Magnetometer
 Radio Science

and instruments for
 low-energy charged
 particles
 Cosmic rays
 Plasma waves
 Planetary radio
 astronomy

Cameras will photograph the planets to a detail never before possible, using the latest cameras and techniques available. Other instruments, for example, the plasma experiment, will give us an idea of what it is like in these miniature solar systems. The cameras and spectrometers (the spectrometers analyze light from a body, which yields details of its composition) are mounted on a science boom, away from the large, high gain antenna, to facilitate the greatest possible area of clear vision. A narrow-angle camera system of 1 500 mm focal length acts like a telephoto lens to show as fine a detail as possible.



A completely new wide-angle camera system was developed for the mission, which has a small telescope of 200 mm focal length, giving a wide field of view. Both cameras have eight colour filters, so that several pictures may be taken of the same object, using one filter at a time, and by superimposing the different wavelength views, a colour picture can be sent back to Earth.

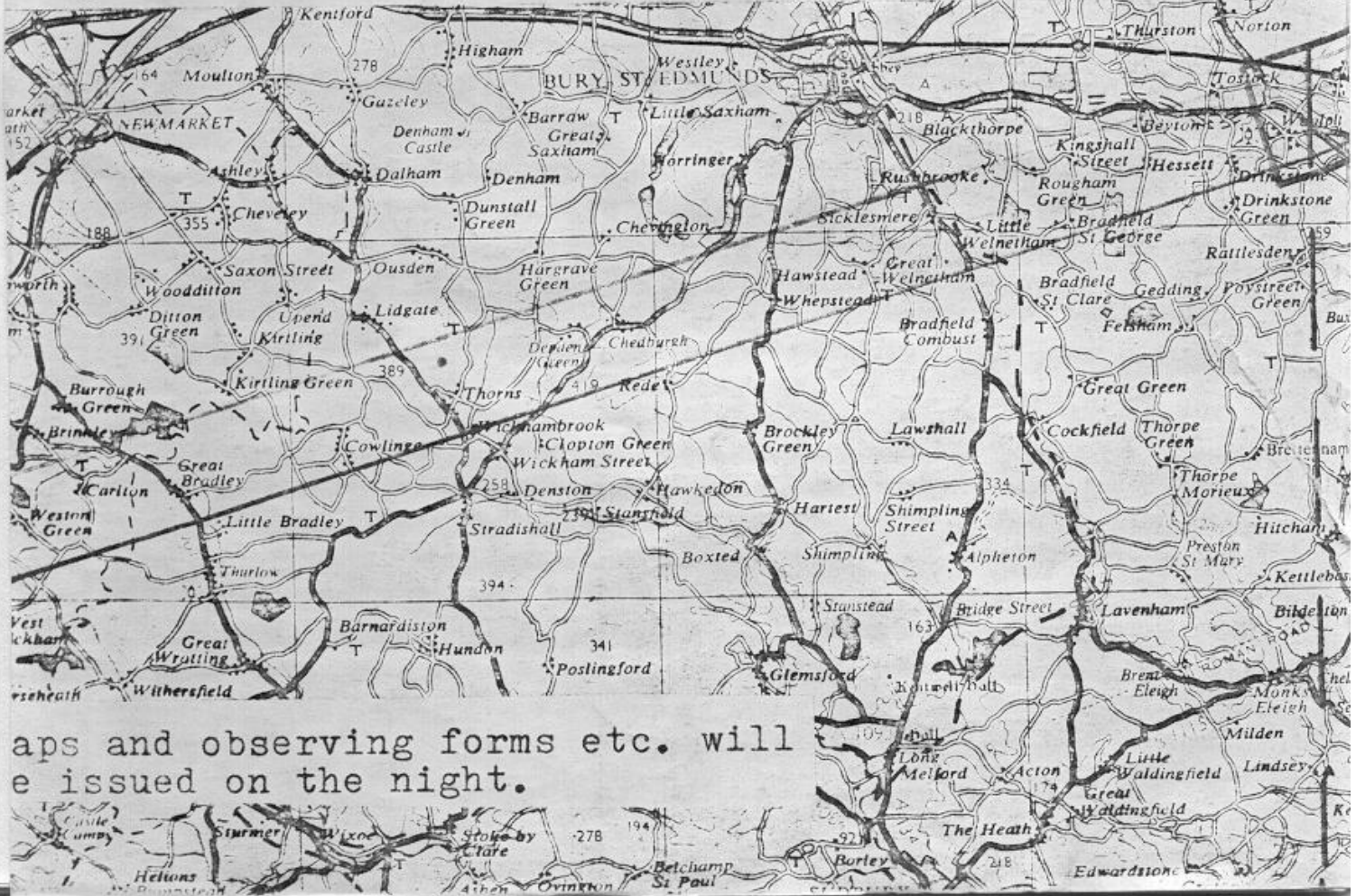
Also on the moveable platform of the science boom are the ultra-violet and infra-red spectrometers, a radiometer, and a photopolarimeter. The experiments for measuring the interplanetary particles are also on the boom, though not on the moveable platform. Magnetic fields are measured from another boom 13 metres long. Two long antennae detect radio waves emitted from the planets as well as the extremely rarified gases between the planets.

On 25th Oct at 0125 hrs a grazing occultation will take place, visible from a only a small part of the country just North of Ipswich.

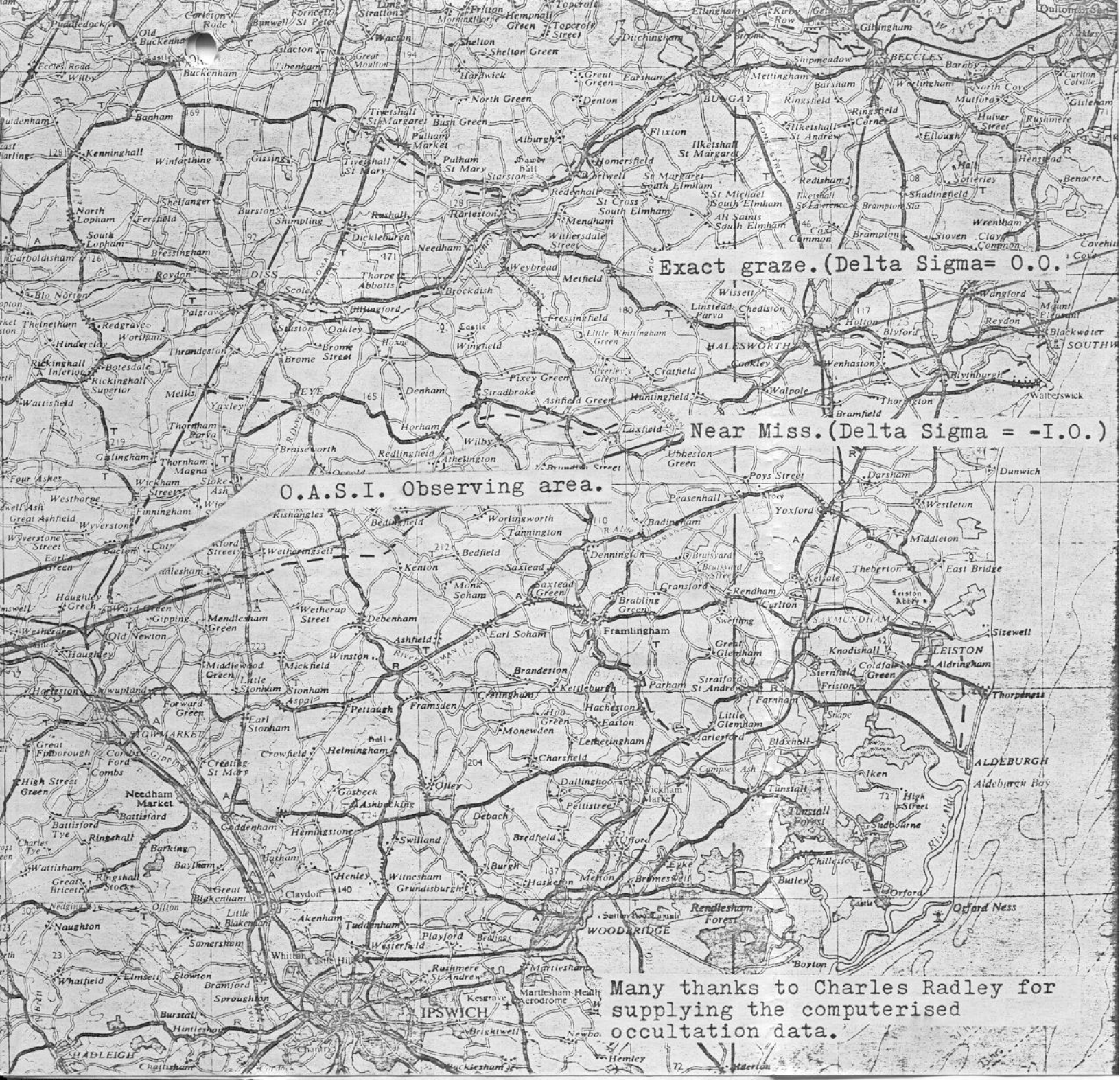
A grazing occultation happens when the moon seems to pass just in front of a star, the edge of the moon with its mountains and valleys alternately blocking the light and then allowing the light from the star to shine past. Astronomically, observations of a graze serve two functions: firstly it is quite a spectacular occurrence, and secondly (and far more importantly) it helps to establish the precise positions of the Earth and Moon in space.

These events occur infrequently and the two previous O.A.S.I. expeditions (1974 and 1976) of the last two grazes within striking distance of Ipswich have met with failure because of the weather (in 1976 cloud intervened only 8 mins before the event, and cleared 10 mins after.)

If you are interested in taking part in this years expedition (please note the time, 0125 UT.) please contact your Vice Chairman, Mr. A.J. Smith, IPS [redacted]. You need not bring anything with you, but any of the following would be useful: a car, (to get you there) an accurate timepiece (a stopwatch or digital watch is good enough) pencil and notepad.



Maps and observing forms etc. will be issued on the night.



Exact graze. (Delta Sigma = 0.0.)

Near Miss. (Delta Sigma = -1.0.)

O.A.S.I. Observing area.

Many thanks to Charles Radley for supplying the computerised occultation data.

At this moment there are two space probes on a multi-million mile journey to Venus. These probes, with their smaller 'baby' capsules, should tell us much about the planet's atmosphere and weather conditions.

Pioneer Venus (PV) is the first probe to make a prolonged observation of Venus as a planet with an unusual atmosphere. As with most missions classified under the heading 'Interplanetary', it is logical to assume a set list of work, beginning with reconnaissance, then exploration, and lastly, extensive study, or intensive study. At this time we have more or less finished the reconnaissance of the inner planets and are concerning ourselves with the exploration. Viking began the exploration, with Mars, and Pioneer Venus continues this exploration to the Planet Venus.

The first reconnaissance of the planet was through the sensors of Mariner 10, which flew past Venus in February 1974 at a distance of 5 300 km. Its main task was to study the oscillatory movement of the Venusian atmosphere - a 1 km up and down movement caused by the Solar Wind.

The first of the two PV spacecraft, the Orbiter, was launched by Atlas Centaur rocket on May 20th of this year, and is expected to arrive at Venus on December 4th, while the second part of the mission, the Multiprobe, is due to arrive 5 days later. The Multiprobe was launched on August 8th.

Once at Venus, the Orbiter is due to go into a 24-hour orbit, with periapsis about 200 km and apeapsis 67 000 km, and at 105° to the ecliptic. It is expected to have a lifetime of at least 243 days (one Venusian day). Objectives are as follows:

- 1 To map the clouds and ionosphere of Venus globally, using remote sensing techniques.
- 2 To obtain measurements of the upper atmosphere and ionosphere and solar wind interaction.
- 3 To examine the surface using a side-looking radar.
- 4 To determine irregularities in Venus' gravitational field.

In all, the Orbiter carries 11 scientific experiments, as well as one designed to pin-point gamma-ray sources in space.

The Multiprobe consists of four smaller probes, together with the main part, called the 'bus'. Separation of all four probes will occur at the same time, about three weeks before orbital insertion. Each of the probes will traverse separate but similar paths, and plunge into the atmosphere within eleven minutes of each other, impacting with the surface within a 20-minute period. Each will transmit data for about an hour. The bus is expected to enter the atmosphere 90 minutes after the last small probe. Whatever happens to the bus, it will not be wasted, but will transmit data all the time right up to impact.

The largest 'baby' probe will carry seven instruments to obtain data on the composition and structure of the atmosphere and clouds and temperature of the planet. Each of the other three baby probes will carry three experiments to obtain data on the radiation and structure of the atmosphere and clouds. The spacecraft should explain why Venus has such a high atmospheric temperature and pressure, as the so-called Greenhouse Effect does not account for such high temperatures, given that Venus' atmosphere consists principally of carbon dioxide (97%).

The baby probes are designed to withstand impact with Venus, and even if they last for only a few seconds afterwards, they should provide data on the rotation of the planet, utilizing the doppler shift in frequency.

Each integral part of the mission will transmit its data direct to the NASA Deep Space Network. The Orbiter and Multiprobe are virtually the same, with 75% of equip-

ment common to both. The temperature of the equipment is controlled by louvres which keep the internal temperature of the spacecraft constant. Solar cells on the outside of the spacecraft provide electrical power in the form of 28 Volts d.c., and this is augmented by two 7.5 amp-hour nickel-cadmium batteries.

To date, all problems with the Orbiter and Multiprobe have been overcome, including the 15 r.p.m. rotation of the spacecraft required for stabilization. So everything seems set for the December 4th and 9th encounters.

VISIT TO MR. P. MOORE on June 14th this year By Mr. Nigel Gage

It was whilst I was on holiday at Pontins near Selsey that I took it upon myself to partake in a solo visit to the great man.

After several telephone calls only to contact Mr. Moore's ansaphone, I called at his home and made arrangements for a further visit during the hours of darkness. It was decided between 'Woody' (Mr. Moore's housekeeper) and myself that it was to be after 2100 hours on Wednesday, 14th June.

Upon my arrival I was met at the door by Mr. Moore and was then escorted into his study, which I instantly recognized from the "Sky at Night" programme. After a short conversation I was taken out into the garden and introduced to all his magnificent telescopes.

First of all was the 15-inch reflector which is housed in a 'homemade' observatory constructed by the local blacksmith. The operation of this dome is by hand and after the operating method for the opening and closing of our dome, it was a joy to watch. This instrument is used mainly for lunar work, and many lunar maps have been made with use of it. Even the Russians have used results of work with this telescope - so I was informed - when their first Lunar landers touched-down on the dark side of the Moon, it required sketches of the terminator craters and mare, and these were supplied by Patrick Moore.

Next, we moved on to the 10-inch refractor which is housed in an observatory composed mainly of corrugated perspex with a quite ingenious system of moving the roof forward by means of a series of bicycle chains connected to a bicycle gear sprocket. (It occurred to me that this sort of thing would be an ideal home for the Barrell Telescope. It is very cheap and can be constructed in next-to-no-time.)

Next on the agenda was the 12-inch refractor, housed in what looks like a garden shed, and last but not least was the 12½-inch reflector in a single run-off shed - incidentally, the original telescope of Mr. Moore's collection. In addition to all his telescopes there are also three other items - nothing really to do with astronomy but expectedly interesting to members: a rain level indicator and two sun clocks. One of these sun clocks, Mr. Moore calls his trade union sun clock because it only operates for six months of the year - the rest of the time its on strike. A description of the other sun clock would be too difficult, as it is very unusual. In Patrick Moore's own words, he is the Selsey Unofficial Weather Station.

We then adjourned to the living room where I was entertained by Mr. Moore playing the xylophone, and listened to his latest composition, a waltz. I was astonished to hear that he has composed military marches, a wedding march and numerous other compositions. If you wish to hear any of these, Mr. Moore is going into the Polydor recording studios to record an L.P. of all his compositions very shortly. In addition he has been approached to release a 'single' but he laughed that off as a big joke.

I must state that I was very surprised at the seeming ease with which he plays the

xylophone. Later we went on to his study for a further chat about various astronomical subjects. It was so strange to be sitting in his study where so many distinguished members of the scientific fraternity have also sat. We were surrounded by Mr. Moore's books and many of his mementoes from his past close cooperation with NASA.

Unfortunately, it was soon time for me to leave. Time passes so quickly when you are in the company of a man of such stature and wealth of experience astronomically. So sadly I made my farewells and returned to my lowly world. But before I left I was told that if any other member of OASI was in the Selsey area they were to call in and see Mr. Moore.

HOME GROUND ('Incidentally,' has anyone any plans for mirror grinding this winter?)

Our last issue was photocopied by Ewevale Limited at short notice and at special low price, and we are indebted to them for their services. This issue is the start of a regular run with Ewevale which has been negotiated, their supplying a 4-side cover sheet printed in bulk gives us the front cover side extra, and allows spare room for the possible extra printing that could occur (with ample planning time and at some extra cost) or maybe for 'stop-press' items, or pictures from other sources. It certainly gives us a nine-page journal at minimum, for a realistic cost.

I would like to thank committee and other members for their support in regard to Journal publication, sending in news items and suggestions, and in backing the method of issue and format.

Roy Adams

INFORMATION SERVICE AND LETTERS SECTION

Some ideas have been generated by my mention in the June OASI Journal of the possibility of a between-journals information service, and the idea of a 'Letters to the Editor or Producer' column has been mooted. The difference between articles and letters can sometimes be small, and of course, phoning-in is a very useful facility. Anyway, on the general subject, I don't think I can do better than publish the main part of a letter to me from Mr. Harvey:

'...While I am writing to you, I have thought of an idea relevant to your 'call' in last month's Journal. I think the concept of a news service is all very well, but you'd have to have very recent news to make the service useful. To do the thing properly you'd have to be in contact with Reuters, UPI, NASA News, Tass/Novesti, ESA etc. This could be costly. Any other information sources are just too slow (no doubt this is said with some reservation about TV or newspaper or local verbal or similar reports - RCA) at best a week out of date. This includes Sky and Telescope, AW/ST, Flight International, The Astronomer, BAA Journal and all major RELIABLE magazines.

'Instead, I would advocate, not a news service, but an information service. This would mean a page in the journal devoted to members' letters to the Editor or you. These questions could then be answered by other members, each allocated a specific region of Astronautics/Astronomy. For instance, a member with a question about Jupiter would send his letter for inclusion in the Journal, which would be put in the coming Journal. This letter would then be passed on to our Planetary expert, so that a reply could be written in the next journal. Alternatively, if the Journal were to come out on the first of each month (this can reasonably be expected to happen - RCA) this would give the specialist time to formulate the answer and pass it on to the Editor. A Letter- or 'Your Views and Questions' column would give ordinary members an all-year voice in their society activities.

'This is my view at present, and, as everything, is not perfect. I therefore leave my views in your hands to correlate with other members. Yours sincerely, S.G.H.'

TUESDAYS from 7 pm: Planetary Section September 5th and 19th

Directors Mr. J. Deans, [REDACTED], Capel St. Mary 'Phone Gt. Wenham [REDACTED]
and Mr. J. Hood, [REDACTED], Ipswich

Tuesdays from 7 pm: Solar, Lunar and Planetary Section September 12th and 26th

Directors Mr. J. Hood, [REDACTED], Ipswich
and Mr. M. Barritt, [REDACTED], Ipswich

WEDNESDAYS from 8 pm: NEW SECTION (Aug. 30th,) Sept. 6th, 13th, 20th, 27th (weekly)

Directors Mr. D. Payne, [REDACTED], Wickham Market, Suffolk
and Mr. M. Cook, [REDACTED], Ipswich, with assistance from
Mr. J. Ranson, [REDACTED], Ipswich, particularly on Aug. 30th/Sept. 6th

THURSDAYS from 8 pm: Double Stars Section (Aug. 31st,) Sept. 14th and 28th

Director Mr. D. Bearcroft, [REDACTED], Ipswich 'Phone Ipswich [REDACTED]

FRIDAYS from 8 pm: Variable Stars Section September 1st, 15th and 29th

Directors Mr. R.S. Manning, [REDACTED], Ipswich 'Phone Ipswich [REDACTED]
and Mr. M. Siggers, [REDACTED], Ipswich

SATURDAYS from 8 pm: NEW General Section September 2nd and 23rd

Directors Mr. M. Barriskill, [REDACTED], Ipswich 'Phone Ipswich [REDACTED]
and Mr. R. Adams, [REDACTED], Ipswich 'Phone Ipswich [REDACTED]

*As Mike works nights and for other reasons, 'phone times are somewhat restricted.

There is a METEOR SECTION, details of which one may still obtain from

Director Mr. D. Barnard, [REDACTED], Ipswich 'Phone Ipswich [REDACTED] (subject
to availability of Mr. D. Barnard) Meteor counts are held on Foxhall Heath (Saturdays)

The next committee meeting is on September 9th at the same place as last time.

SATURDAY, September 30th, subject to further info, is being reserved for Project Cameo.

Other meetings are occasionally held, and for further information about the Orwell
Astronomical Society and activities, please contact any of the persons mentioned above,
or on the front cover, or

Assistant Chairman, Mr. Alan Smith, [REDACTED], Ipswich 'Phone Ipswich [REDACTED], or
Treasurer, Mrs. P. Long, [REDACTED], Ipswich 'Phone Ipswich [REDACTED], or indeed,
any other member you may happen to know. The Society is over 100 strong, but new
members are always welcome.

FIREBALL REPORT 1978 August 22nd, 212320UT

Observers, M. Cook (who saw it first), J. Ranson, J. Deans, J. Hood, M. Barritt.
Location, outside Levington Ship (again!)
Magnitude, -5 to -10 (some tolerance here due to reflections from certain liquids?)
Compass bearing SSW.
Origination, Delphinus, fading out about 20° from the horizon.
Colour, greenish-white, breaking up into about 5 pieces. No train, sparkler-like.
Cloud thin, broken cumulo-stratus.

...This 'Ship' seems a good place to get in more ways than one...

MEMBERS ADS.

Members are reminded that they can have adverts. inserted free in the Journal so
long as they have some connection with astronomy or kindred subjects. I have had at
least two members suggest that other-content ads. might be inserted for a small donat-
ion, to help defray the cost of Journal publication. This matter of ads. is still
under discussion.

* FOR ALL CLOCK REPAIRS, BIG or small, ancient or modern by competent craftsman Society
member, 'phone [REDACTED] (evenings) for all inquiries.

