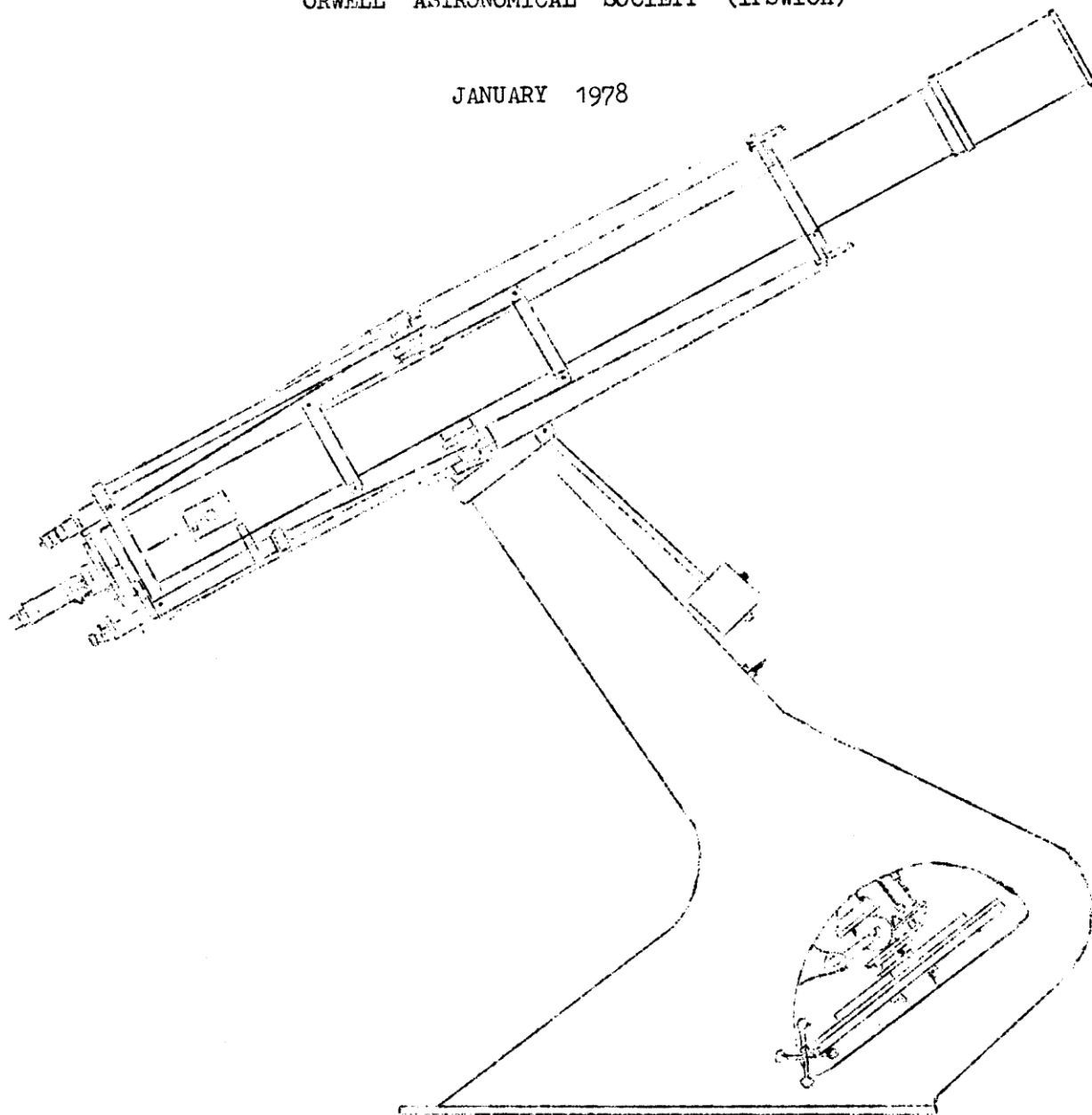




JOURNAL OF THE
ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

JANUARY 1978



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THE NIGHT SKY as seen from Orwell Park this month.

Gemini is due South at midnight this month and earlier on in the evening the South gives us a glittering ("all star") cast of characters. Below Gemini is Canis Minor and then - beyond Monoceros } there is Canis Major; these two constellations represent the hunting dogs belonging to Orion in Greek fables. Their major stars, Procyon and Sirius, respectively, are in fact two of the closest stars to us. Procyon is an F-type yellow dwarf (rather like the Sun, only with a larger mass, so that it is brighter) at a distance of 11 light years from us. Sirius, although the brightest star in our skies, is only $8\frac{1}{2}$ l.y. from us and so is not intrinsically bright, its proximity only making it appear luminous; it's absolute magnitude - the magnitude it would have if viewed from a distance of 10 pc } is actually less than, for instance, that of Vega, which is 26 l.y. distant. Sirius is a white main sequence star (spectrum A0). To the West of the two dogs is the magnificent Orion. Now the two brightest stars there are real celestial powerhouses. The red giant Betelgeuse is over 500 l.y. away; while Rigel, a blue giant, is about 900 l.y. distant and is 2700 times as luminous as Sirius. To the North of Orion is Auriga, the Charioteer, with it's brightest star Capella (whose spectral type is exactly the same as the Sun's).

THE SUN

Sunrise is at 08h00m and Sunset at 16h05m at mid-month, the Sun passing through Sagittarius and Capricornus during January.

THE MOON - Phases

Last Quarter	2d12h07m
New Moon	9d04h00m
First Quarter	16d03h03m
Fall Moon	24d07h55m
Last Quarter	31d23h51m

Occultations

Star	Phase	Mag.	Time
215	D	6.7	15d23h07.7m
729	D	7.2	20d02h16.9m
*814	D	5.3	20d18h10.0m
970	D	6.5	21d20h36.9m
1652	R	5.5	28d02h48.8m

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

THE PLANETS

Mercury is a mornign star reaching greatest elongation of 23° on Jan 11 at mag 0.0.

Venus is in Superior Conjunction this month and will not therefore be visible

Earth is at perihelion on New Year's Day (distance 147 000 000 km).

Mars comes to opposition on the 22nd January, when it will be in Cancer. Its opposition magnitude is -1.1 and the opposition diameter is 14.3 arc-seconds.

Jupiter passes from Gemini to Taurus this month at mag -2.3.

Saturn is a morning star at mag. 0.6-0.4 and a distance of $8\frac{1}{2}$ AU (decreasing).

FIREBALL

A mag. -15 fireball was observed travelling roughly East to West, twenty minutes after midnight on the morning of Nov. 4 1977. The fireball underwent several flares during it's passage across the sky.

COMET KOHLER 1977m.

The following ephemeris has been prepared by SW Milbourn of the British Astronomical Association.

		R.A. (h,m)	Dec. (°,')	Mag.
Jan	2	23,54.23	-34,15.7	8.9
	7	00,15.74	-34,06.4	
	12	00,35.92	-33,43.1	9.4
	17	00,54.87	-33,08.9	
	22	01,12.69	-32,26.2	10.0
	27	01,29.48	-31,37.0	

NOTICE

As usual, the BAA is organising a weekend Astronomy Course at Winchester this year, covering subjects including:

Observation of Messier and deep sky objects, construction of telescopes, observing Saturn, occultations and the setting-up of 'graze' stations.

The Course, which is open to non-BAA members, will be held, at the King Alfred Training College in Winchester, Hampshire, from Friday, March 31, to Sunday tea-time, April 2. The inclusive fee is £15.00, and a non-returnable deposit of \$5.00 should be sent to: The Deputy Assistant Secretary, the British Astronomical Association, Burlington House, Piccadilly, London, W1V 0NL, together with sae, before 1978 Jan 31. Applicants should be aged 16 or over.

FROM OTHER JOURNALS

Is Our Sun Part of a Binary?

It is possible that the Sun has a companion star at a distance of approximately 1000 AU, ie 25 times the distance of Pluto. The companion star would have to be very faint, but such stars are common, and it is not impossible that the companion is a black hole.

All this speculation comes from anomalous observations of pulsars, which may be explained by assuming that the Sun is accelerating towards the pulsars in question. This in turn suggests that the Sun may be rotating around a companion star. (Nature-Times News Service)

EXO BIOLOGY pt.7

The Galaxy

A discussion of the occurrence of life in the Galaxy must be very speculative, since we know very little about the conditions which may exist 'out there'. Since there is an unlimited scope of what types of life might be found, a more complete discussion of this will be deferred until later. The present section deals with the possible distribution of life in our Galaxy rather than the form it might take.

Not all stars are suitable for our purpose. Some are young, and would not have n in existence long enough to have planets which hold life. Others, the Red Giants, are grotesquely enlarged stars which will have swallowed up any inhabited planets which once circled them. Similarly, white dwarfs are not suitable since they represent the next stage in a typical star's career after the Red Giant stage. It is nearly always said that very dim or very bright stars would not be suitable either, although I can see no reason why this should be true for the former. Variable or multiple stars would not be suitable since a planet orbiting one would be alternately frozen and fried.

From spectroscopic observations the speed at which a star is rotating can be calculated; it has been found that most stars are rotating fairly slowly like the Sun, and hence have small angular momenta. This small angular momentum is most easily explained by the presence of planets orbiting round the star and sharing some of its angular momentum. It seems likely from present beliefs about the Solar System that all stars form solar systems, and so the two lines of evidence bring us to the same conclusion: ie, all stars have solar systems at one time or another.

But not every star which has planets will have one which is the right distance from its primary. This, as we have seen, depends on the type of atmosphere present: yet an atmosphere containing compounds like ammonia and methane would seem to be a natural consequence as long as the planet is massive enough to hold on to an atmosphere of sufficient density. Hence this factor really only depends on the planet being of great enough mass.

If we multiply out the factors associated with the probabilities associated with the factors and then multiply the result by the number of stars in the Galaxy we should have some sort of estimate of the number of life-bearing planets in it.

The number of stars in the Galaxy is something like 100 000 million (10^{11}). The fraction of these which are suitable (in terms of age, brightness, etc.) is about one twenty-fifth. We may take the number of suitable stars which have planetary systems as being quite high, say 50%. The next factor again has quite a high value, probably, although we will cut the previous estimate of one or two down to, say, one half. The next factor is quite difficult to evaluate, although, although we have some evidence to go on from our own Solar System; here we have one out of three planets (Earth, Venus and Mars) which has the required atmosphere: so we may take this factor as being about 0.3. We can assume, as most estimates do, that all planets with suitable atmospheres will develop life.

Hence the likely number of inhabited planets in the Galaxy is approximately

$$N = 10^{11} \times 0.04 \times 0.5 \times 0.5 \times 0.3 \\ = 3 \times 10^8$$

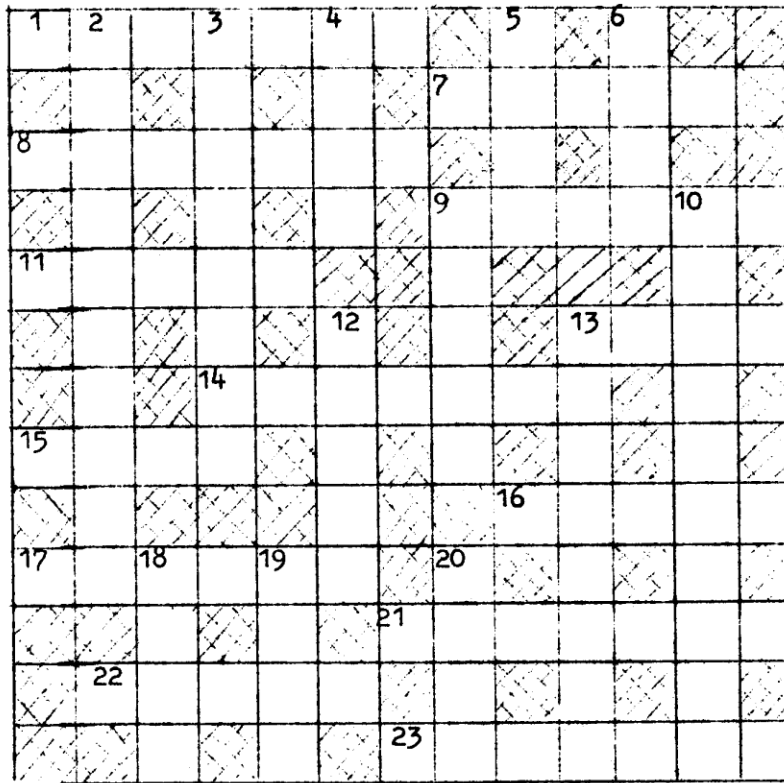
ie there may be as many as 300 million life-bearing planets in the Galaxy. However, this is a rather optimistic estimate and other estimates have been made as low as 200 000.

On the other hand, 300 million may not seem such a large number when compared with the size of the Galaxy, which is 100 000 l.y. in diameter. It is not a very easy shape for me to estimate its true volume, so I will take it as being a cylinder of radius 50 000 l.y. and height 15 000 l.y.

Its volume is therefore

$$h r^2 = 15\,000 \times 50\,000^2 \\ = 1.8 \times 10^{14} \text{ cubic l.y.}$$

Dividing into this the number of life-bearing planets we get the figure $390\,000 \text{ ly}^3$, which is the volume of space in which an average of one such planet might be found. So it appears that the Galaxy is not as thickly populated as we had first thought!



ACROSS.

DOWN

- | | |
|--|---|
| <p>1. Constellation near Achernar (7)
 2. See 13 across
 8. Annual event at Orwell Park (4-3)
 9. Astronomical unit of measurement (6)
 11. Well-known member of Solar System (5)
 13 & 7 Type of meteorite (9)
 14. One of Saturn's larger moons (7)
 15. Tenuous (4)
 16. Inconspicuous constellation adjoining the small Magellanic Cloud (5)
 17. Velocity required to overcome gravity (6)
 21. Orbital period of a body relative to the Sun and Earth (7)
 22. Form of electromagnetic wave (5)
 23. A star burns with the power of several billion! (7)</p> | <p>2. Greek astronomer who initiated the Stellar magnitude scale (10)
 3. Famous scientist of the 20th century (8)
 4. Triple star in Bootes (4)
 5. Well known variable which ranges from 2nd to 10th magnitude (4)
 6. Essential part of any optical instrument (4)
 9. Conspicuous moon crater (5)
 10. Lunar phenomenon visible at crescent stage (10)
 12. Medium through which we view the stars (5)
 13. The first was discovered by Piazzi in 1801 (8)
 18. A strong source of 22 across (4)
 19. Astronomer's jargon for a double star (4)
 20. Small, but notable, summer constellation (4)</p> |
|--|---|

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ANSWERS:

ACROSS. 1. Phoenix. 8. Open Day. 9. Parsec 11. Earth
 13 & 7 Aerolites 14. Iapetus 15. Thin 16 Mensa
 17. Escape 21. Synodic 22. Radio 23. Candles

DOWN. 2. Hipparchus 3. Einstein 4. Izar 5. Mira 6. Lens
 9. Plato 10. Earthshine 12. Space 13. Asteroid
 18. Crab 19. Pair 20. Lyra

METEOR NOTES: by David Barnard, [redacted], Ipswich 'Phone [redacted]

Reminder:

There will be a Meteor Count on December 23rd at 8.30 p.m. to observe the URSIDS SHOWER. Meet outside the Golf Hotel, Foxhall Road, Ipswich. As many as possible observers required to this meeting please as this shower badly needs observation. Max, Dec 22nd, Normal limits December 17th to 24th. Z.H.R. about 5 - this is uncertain as there is insufficient observations as it is too near Christmas! R.A. 14hrs 28min. Dec. +78°.

THIS MONTH (JANUARY)

The best meteor shower this month is on January 3rd - THE QUADRANTIDS SHOWER - in the constellation of Ursa Major. This shower has a sharp maximum which is on January 3rd at 2200hrs. Normal limits January 1st to 6th. Z.H.R. 110 so at least we are guaranteed of seeing a lot of meteors this time (Spade permitting) R.A. 15hrs 28min Dec. +50.

Notes: Blue meteors with fine trains, very rich in faint meteors, No Moon either so this watch will be very favourable. Time of transit 0835. Velocity of meteors 41.5 kms/Sec. Moon age at max. = 23days. Twilight commences 17.00hrs and terminates at 7.10 hrs. Altitude of radiant at 2000hrs = 12°.

MISS OUT ON THIS METEOR COUNT IF YOU DARE!!!

Obviously, as the maximum occurs on January 3rd at 2200 hours a special meteor count will be held to observe this shower at 8p.m.

so

QUADRANTIDS METEOR WATCH on TUESDAY 3rd JANUARY, 1978

Meet as usual OUTSIDE the Golf Hotel, Foxhall Road, Ipswich.

OTHER NOTES.

Any observations of the 1977 Geminids will be welcome. For those going to the occultation of Uranus at the Observatory on Saturday 23rd December, 1977 we may observe some Ursid meteors there at 5.30 A.M., and then of course going to the official count that following night.

The fireball camera should be operating in the not too distant future. It has been loaned to Mr. M. Cook of [redacted], Ipswich

LEONIDS METEOR SHOWER REPORT November, 1977.

Only two people turned up for this count which is not surprising as the sky was completely clouded over (as usual).

SOCIETY'S NEWS by R.M. Cheesman.

REMINDERS:

1. A.G.M. at 8p.m. on FRIDAY 6th January, 1978 in the Library of Orwell Park School, Nacton. Nomination forms for committee members to represent you for 1978 should be sent to the Secretary as soon as possible please.
2. SUBSCRIPTIONS FOR 1978. All membership subscriptions to our Society become due on 1st January, 1978 and should be sent to the Treasurer.
3. SUFFOLK COLLEGE course on Astronomy 1978/79. Mr. C. Radley reports that he has only received a handful of replies to his questionnaire in last month's Journal. If you are interested in taking this course, which Mr. Radley has been trying to organise for the last three or four years, please send the form off to him as soon as possible.

U.F.O.s

Our illustrated talk (full details in February's Journal) is on U.F.O.s but if you would like to go to Murrayside Youth Club on the Sundays 22nd and 29th January they are holding a general talk on U.F.O.s from 8p.m. I think these meetings which will last for two hours are being held in the bar and the cost of entrance, which goes towards their funds is 10p. Some of our members are involved in these talks together with their members and other invited guests.

ASTRONOMY FOR BEGINNERS

The first Wednesday evening in January devoted to astronomy for beginners is on Meteors and Comets. This illustrated talk, starting at 7.15p.m. in the Observatory will be given by one of our members. On Wednesday 4th January.

Through the columns of our Journal may I wish everybody a Happy Christmas and a Prosperous New Year.

R.M. Cheesman.

WHAT WAS THE OBJECT SEEN IN AUGUST 1921?

by Roy Gooding

On Sunday August 7th 1921 the following telegraph message was received at the Harvard College Observatory:

'Star like object certainly brighter than Venus three degrees east one degree south of Sun seen several minutes before and at Sunset by naked eye. Five observers. Set behind low clouds. Unquestionably celestial object. Chances favour nucleus bright comet, less probably nova.'

The telegram was sent by the then Director of the Lick Observatory, Professor Campbell and Professor Henry Russell (of H.R. Diagram fame). Prof. Campbell along with his wife and four guests including Henry Russell had been watching the sunset at his official residence on Mount Hamilton. Just before the sunset one of his guests (Major Chambers) inquired, "what star is that to the left of the sun?" A second guest commented that he had been looking at the object for several minutes, but had not mentioned it, having believed it to be a well known object. Campbell's and Russell's attention was now drawn to it. Campbell thought it was Mercury, Russell disagreed. Prof. Russell then proceeded to look up the position of Mercury, thus proving his statement as being correct. No one was able to offer an explanation as to what the object was.

Observers at the Lick Observatory watched in vain for the next two days to see the object. Over the next few weeks the report was published in several scientific journals. This resulted in confirmation reports of the same object.

A week after the event an English amateur astronomer, Mr. S. Fellows, wrote from Wolverhampton to 'English Mechanic' and 'World of Science'. Mr. Fellows had been looking for Jupiter and Saturn on August 7th. He saw a bright object above the area where the Sun had recently set. The object was about 6° from the Sun, had a reddish tinge and was elongated towards the Sun.

A second report appeared in 'Nature' a month later, having been written by Colonel Markwick. Observers in Dorset had seen a bright object about 4° from the Sun on the evening in question. Further reports came to light during the following weeks. A report from two astronomy students was read at a meeting of the B.A.A. in November. "A bright object was observed before sunrise on the 6th August about 22° west of the Sun. "The objects position was estimated by alignment of distant landmarks. "Subsequent theodolite measurements from the original observation site using these landmarks gave a more accurate estimate of the object's position. The result disproved the theory that the object was Mercury, though a slight doubt exists about this report as it was made some three months after the event."

The exact nature of the object is unknown. Several lines of thought developed. One idea was that the object was a nova. This theory was rejected by Campbell as the object's position was too far from the galactic plane. E.E. Barnard (who became famous from his comet discoveries) had the opinion that the object was a comet, whose orbit was visible only in daylight. A third theory stated that the object may have been a minor planet which happened to make a close approach to the Earth.

Reference: "The Planets (some Myths and Realities)"
by R. Baum

Programme for JANUARY, 1978

AT ORWELL PARK OBSERVATORY, NACTON.MONDAYS from 7.30p.m. General Observations Section.Director Mr. N. Gage, [REDACTED], Felixstowe, 'Phone Felixstowe [REDACTED],
and Mr. S. Flory, [REDACTED], Ipswich, 'Phone [REDACTED]9th January
16th "
23rd "
30th "TUESDAYS from 8p.m. Planetary Section

Director Mr. J. Deans, [REDACTED], Capel St. Mary, 'Phone GT. WENHAM [REDACTED]

and Mr. J. Hood, [REDACTED], Ipswich.

10th January
24th "WEDNESDAYS: from 7p.m. Astronomy for BeginnersThis month's illustrated talk by one of our members on the 4th January
is on 'Comets and Meteorites'WEDNESDAYS from 7p.m. Solar, Lunar & Planetary Section

Director Mr. R.M. Cheesman, [REDACTED], Ipswich.

11th January
18th "
25th "THURSDAYS from 8p.m. Double Stars Section

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

5th January
19th "FRIDAYS: from 8p.m. Variable Stars SectionDirector Mr. R.S. Manning, [REDACTED], Ipswich, 'Phone [REDACTED]
and Mr. M. Siggers, [REDACTED], Ipswich

20th January.

FRIDAY 6th January at 8p.m. Sharp.

Annual General Meeting of our Society at 8p.m. in the Library of
Orwell Park School, Nacton, Ipswich.VISITS TO OBSERVATORY, organised by Mr. R.M. Cheesman, [REDACTED], Ipswich.

FRIDAY 13th January at 8p.m. 1st Kesgrave Venture Scouts.

SATURDAY 28th January at 7.30p.m. Ipswich Young Conservatives.

MEETINGSOTHER MEETINGS:METEOR SECTION, Director Mr. D. Barnard, [REDACTED], Ipswich
'Phone Ipswich [REDACTED]QUADRANTIDS METEOR WATCH on TUESDAY JANUARY 3rd, 1978 at 8p.m.

Meet outside the Golf Hotel, Foxhall Road, Ipswich.

SUNDAYS 22nd & 29th January. General Discussions on U.F.O.s from 8p.m.
at Murreyside Youth Club entrance fee about 10p. (I think these
are held in the bar!)