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 $B - e \rightarrow A$

JOURNAL of the
ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

MAY, 1974

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RECENT ASSAULTS ON THE PLANETS

(A)

Here is yet another review of the progress of some space probes!! I shall continue to publish these reviews until I get some complaint.

MARS The August 1972 Mars launch window saw four Russian Mars probe launches, and February/March saw four Russian Mars probes failures.

Let me recap on the USSR's history of Mars probes. Their programme can be summed up as "unlucky". Mars-1 launched in 1961 scheduled to reach Mars in 1962 was lost before arrival, but only after breaking several current endurance records.

Zond-2, launched during the same launch window as Mariner-3 and the famous Mariner-4 in November 1964, failed at an earlier stage than Mars-1. The USSR since then concentrated on Venus until the very favourable 1971 launch window, when they launched Mars-2 & 3. Both went into orbit around the planet in November 1971. Mars-2 attempted a landing. Landing on Mars involves both parachute and rocket braking. The parachute seemed to work on Mars-2, but the rocket didn't, it crashed. Mars-3 was more lucky,

On December-2nd 1971, Mars-3 became the first spacecraft to soft land on Mars, at co-ordinates Latitude 45°S, Long 158°W. It transmitted from the surface for 90 seconds, then mysteriously the signals stopped. The orbiter sections of Mars-2 & 3 remained in orbit and obtained much interesting data about the planet before being shut down after a few months.

Mars-4 reached the vicinity of Mars on 1974 February 10th. But its retro-rocket failed to ignite, and instead of entering orbit it shot straight past at a distance of 2200 kilometres (1600 miles) taking pictures as it went.

Mars-5 reached the vicinity of Mars on February 12th, and successfully entered areocentric orbit. The USSR say it "is conducting research into the space in the vicinity of Mars and into the planet's surface and atmosphere". Other than that they refuse to comment on the probes degree of success or failure.

Mars-6 reached Mars on March 12th 1974, after Mars-7 which on 9th March, according to the USSR, approached Mars; however, "because of a hitch in the operation of one of the on-board systems" the descent module was released, but because the probe's velocity was too large the capsule did not get nearer the Martian surface than 1,300km (800 miles). Mars-7 joined Mars-4 in heliocentric orbit.

Mars-6 met with some success.

It landed a capsule on to the surface of Mars. "For the first time information about the Martian atmosphere, obtained by direct measurement during the module's descent, was transmitted back to the Earth", say the USSR. Several times more water vapour than originally thought, was detected.

Mars-6 touched down at co-ordinates Latitude 24°S Longitude 25°W, and like Mars-3 over two years earlier, mysteriously shut-down.

So, unless the USSR release some more data from Mars-5 orbiter which still orbits about the planet, after an 7 month wait the USSR's assault on Mars has been something of an anticlimax.

The assault on Mars will continue with the USA launching two Viking probes to land on Mars, lift-off during the September 5-20th window, touchdown a couple of weeks after arrival in March/April 1976. The average pressure on the surface of Mars is around 6mb. The minimum pressure for water to exist as a liquid is 6mb. Viking-B will land in Cydonia (with any luck) where the pressure is 7.6mb. Cydonia is not far from the north polar cap, and therefore liquid water and possible life may exist there.

Let us wait and see. Will the Russians try more Mars shots in the 1975 window also?

(continued on next sheet!!)

STOP PRESS Mars-5 went into orbit around Mars at 6.45pm Moscow Time, 15h45m UT. The retroburn went almost perfectly with Mars-5 giving the planned orbital parameters of 32,500km (20,300 miles) apareon, 1,760km (1,100 miles) periareon. Period is 25 hours, inclination to Martian...
xxxxxxx

MARINER-10 As if to rub salt in the wound of Russia's failed Mars probes, Mariner-10 worked almost perfectly. The pictures of Venus in Ultra-violet were interesting, with swirling clouds visible. The pictures of Mercury were fabulous, if a little blurred at first. (B)

Since Mariner-10 and Mercury are both in a heliocentric orbit close to the Sun, they both have short periods, and will re-encounter from time to time. The first re-encounter is scheduled for this September. hopefully the probe will be able to take more pictures than. I wonder what those white spots on Mercury are. 22nd September is the second encounter date. The third encounter will be on 17th March 1975, but whether the probe will be still operational is yet to be seen.

Pioneer-11 should reach Jupiter in December 1974/January 1975 inbetween the two Mercury encounters.

Meanwhile the Russians will be sitting waiting until September 1975 doing nothing in the way of planetary probes, unless they launch a moonshot, which is well on the cards.

June 1975 will see the USSR(Soyuz)/USA(Apollo) docking flight, more political than scientific, but very promising for hopes of USA/USSR co-operation in space at least, in the future.

CONTINUATION OF MARS-5 STOP PRESS

....equator of 35° . The period of Mars-5 is slightly longer than the Martian day which is 24h37m23s long. This means that it will be not quite synchronous, recessing round the planet 5° per martian day, thus if its cameras are working, it will be able to photograph every feature on Mars at close range once every 75 Martian days, 75 Mars-5 orbits.

It is not usually my practice to write purely technical details about space probes, I prefer to publish the more astronomical aspects. With the NASA space probes technical details are readily available and I never need to publish much. With Soviet probes, details are less readily available and I publish details by way of "revealing" them to the "West". I compiled this article using the Russian reports, and interpretations of western rocket experts of these reports. The information about this most recent Mars attempt has been particularly confused, but I think I have peiced it all together with the aid of my study of the history of spaceflight.

Mars-4 & 5 were orbiter vehicles only, artificial Mars satellites to perform similar experiments to Mariner-9. Mars-6 & 7 are lander vehicle with a flight programme more like that of the Soviet VENERA probes than the projected American VIKING probes. VIKING will be similar to Mars 2/3, ie enter Mars orbit, split into separate orbiter & lander capsules, with the lander landing. Mars-6 & 7 never actually enter Mars orbit (they were not intended to). They, like the USSR Venus probes, separate into two parts at a distance from the target planet. The "Main Bus" consisting of maintenance equipment for the interplanetary haul, and the "Descent Capsule" which is solely for landing on the planet. The flight plan calls for the "Main Bus" to fly past Mars, and for the "Descent Capsule" to be slowed and aimed at the target spot by a retrorocket, hit the atmosphere and slow down aerodynamically, and then to descend by parachute to the surface itself. Mars-6 the flight programme went exactly as planned, but for some inexplicable reason at touchdown the transmitter failed. Mars-7, separation went as planned, but the timing retroburn must have failed, and the descent capsule missed the planet by a small but big enough margin.

Mars-6 actually took photographs of the surface of the planet as it descended, the first close-up photographs of the planet!! Mars-6, separation happened at a distance of 55,000 miles from Mars, and the descent through the atmosphere took 148 seconds. The approach speed was 5.7 kilometres per second. The pictures from this probe may be released.

The photographs taken by Mars-5 from orbit are being released. I have seen one, and you can see it for yourself in the magazine "Flight International" Volume 105, Number 3395, 4th April 1974, page 440. It is a picture not of good quality, slightly better than the quality obtained by Mariner-4 ten years ago, showing some craters which have obviously suffered erosion by wind and sand.

on page 440. It is a picture not of good quality, but rather better than the quality of the Mariner-4 pictures of ten years ago. Its shows some craters which have been eroded by wind and sand. C

PIONEER-11 Pioneer emerged from the asteroid belt on March 20th. It will reach Jupiter on 5th December 1974. Since Pioneer-10 was so successful, the Pioneer-11 flight programme has been changed to a more ambitious one. A mid-course correction was performed at the end of March to allow the spacecraft to pass within 26,000 miles of Jupiter, Pioneer-10 passed at a distance of 81,000 miles.

Coming this close to Jupiter will necessitate the probe passing even deeper into the planets radiation belts than Pioneer-10. However, the probe will be accelerated to 110,000 m.p.h., and will pass through the belts more quickly than Pioneer-10, so the actual dose of radiation received will be within acceptable limits. The probe will approach Jupiter at a much steeper angle passing closer to the planets pole, and thus enable a greater range of latitudes to be covered than with Pioneer-10. The information received will pave the way for the 1981 Jupiter orbiter probe. This close approach to the planet will accelerate the probe a great deal and bend its trajectory sharply, enabling the probe to encounter the planet SATURN on the 5th September 1979 (yes they've established the programme as accurately as that). After passing Jupiter the probe will move at an angle INWARDS to the Sun, reaching perihelion in 1976, then moving outwards recrossing Jupiter's orbit (but with a planet a long way behind) in 1977, and reaching Saturn in 1979, 6½ years after its launch. In 1976 the probe will probably be at the outer fringes of the asteroid belt again.

The probe is not designed to be operational after 6½ years, but there is a good chance that at least some information about the planet will be obtained, and possibly some TV pictures.

MITERINT! In last month's edition there was a reference to the meeting of the "Junior Astronomical Association"!!! We, of course meant "The JUNIOR Astronomical SOCIETY". Hope everybody will be able to come to this gathering, which promises to make for a very interesting and enjoyable occasion. The Meeting is in the afternoon of Saturday May 4th. The meeting will be in the main hall of the Orwell Park School, officially opened at 2.30pm. However, if you arrive before that time go to the observatory and club room, NOT the main hall, as that will be in use by the school until the meeting. There will be some people in the club room and observatory, and you will be taken to the meeting at the right time, when the hall is ready.

NEW MEMBERS The society welcomes the following new members. Most of you by now know Tom Cardot, but here we officially welcome him to the society as a new member.

Mr. Thomas J. Cardot, [redacted], Ipswich, Tel Ips [redacted], owns an 8cm OG, with a 101 things besides!!

John R. Sparks, [redacted], Forward Green, Earl Stonham, Stowmarket, telephone Stonham [redacted]. Building 8½" refl, owns photo' shop.

S.J.J. Macfarlane, [redacted], Ipswich IP4 4BP,

M. & Mrs. B. Garrod, [redacted], Straight Road, Battisford, near Stowmarket, IP14 2EZ., Telephone, Stowmarket [redacted].

Keith Cook, [redacted], Ipswich, IP2 OSX.

Ronald D. Forley, [redacted], Ipswich, IP3 9DQ. Tel [redacted].

Mr. & Mrs., M.R. Mills, [redacted], Ipswich, Tel Ips [redacted].

Martin Cook, [redacted], Ipswich, Suffolk, Telephone Ips [redacted]

Philip Worthington, [redacted], Ipswich, IP 3 8RQ., telephone: Ipswich [redacted].

Upon a pleasant sunny spring morning at the Electric House an enthusiastic band of astronomers gathered to visit the legendary centre of astronomical activity at Cambridge. Eventually the engine of the coach sprang to life and we thundered up the A 45 in the general direction of Cambridge. After three hours the rumour was spreading that despite the expert driving by David Brown (who supplied his services free out of love for the society) we were hopelessly lost. But after we had completed a few of the ever-decreasing circles the cry went up that a radio telescope had appeared.

All at once from behind a tree dozens of vast dishes and ariels of every conceivable shape and size were seen dotted over several square miles of flat Cambridgeshire. After squeezing the bus through a tiny gate ("this is a grazing occultation!!" declared David Bearcroft who at once received several disapproving stares) we arrived at a disused railway station which had been converted to the British headquarters for probing the universe. We were met by Bruce Elsmore who spoke about the technique of ariel synthesis (or how to turn the British rail Bedford to Cambridge line into a radio telescope with an aperture the diameter of the Earth), and the discovery of pulsars.

He then showed us round some of the Mullard Radio Observatory's complement of telescopes. Of particular interest was the 5 kilometre telescope, consisting of eight fully steerable dishes linked together and strung out along a disused railway track. An impressive sight. The control centre of this observatory was fully computerised and resembled something out of Dr. Who or Star Trek, with flashing lights everywhere.

While we were there the telescope was being used to monitor a radio source in Cygnus, and we watched it finish its run and move back into its storage position. We were also shown the one-mile telescope, where two research workers were researching into something or other, whatever they were doing involved miles of punched paper tape. Around 3.30 our visit there ended, so we thanked Bruce Elsmore and continued our journey, arriving at the Institute of Theoretical Astronomy at Madingley Rd. On the way Tom Cardot (who is c/o USAF Bentwaters) was suitably impressed saying "That Mullard Radio observatory is a tribute to man's ingenuity!" "British ingenuity" snapped Bearcroft, to ^{our} ~~our~~ ^{our} of approval. One of the radio ariels had a bullet hole in it, which it received whilst the valiant Tommies were liberating it from the wicked Nazis. I am told that the site for the Mullard Radio Observatory was a bomb dump during the war.

At Madingley Road we were met by Dr. David Dewhirst, who showed us the second edition of Copernicus' "De Revolutionibus Orbis" and a star atlas used by Sir John Herschel complete with what looked like his very own coffee stains. Dr. Dewhirst then showed us the 8" & 12" refractors, a 17" Schmidt Camera, and the 36" reflector.

Following that we proceeded home, whereupon Roy collected the bus fare (I narrowly avoided being ejected from the bus). 50 miles, one can of frothy Cresta, several cigars and chips later, Ipswich hove into sight, and we went our separate ways after a very enjoyable and interesting day. It was, I organised it, so there!!

And all for just 75p.

"WHAT'S UP?" The Solar System from Earth in May 1974

THE MOON Phases etc: First Quarter April 29th, Full Moon May 6th at 08h55m, Last Quarter May 14th, 09h29m, New Moon May 21st 20h34m, First Quarter May 28th, Full Moon June 4th 22h10m.

On May 26th at 21h26.8m (give or take a minute) a star of magnitude +4.3 will be occulted by the Moon. The star is ZC 1341, or Alpha() Cancri, and is a double star, and thus the occultation may appear in two stages, halving in brightness before disappearing. This is an event more watching.

"What's UP?" Continued.....

MERCURY Mercury may be seen as an evening star at the end of this month and the beginning of June. Greatest elongation east from the Sun will be on June 4th, at 24° separation. It will be visible during the apparition of Comet Enke. Mercury should be observable from May 14th until June 19th. On June 4th the planet will set at 22h05m UT, 1 hour 55 minutes after the Sun. It will be above the horizon longest on May 30th when it will set at 22h10m, 2 hours after the Sun. John Deans and Tom Cardot, members with 8cm telescopes and accurate setting circles should have not trouble finding the planet in the evening twilight. It would be worthwhile trying to find the planet in the 10" CG also, since we now have accurate declination circles, and can set Right Ascension.

VENUS is a morning star, not a very spectacular sight.

MARS even worse than Venus at the moment.

JUPITER is a morning star. See last month's newsletter for details of the mutual phenomenon of Jupiter's satellites which will occur on May 2nd, in the early morning.

SATURN is still visible in the evening sky. May will see the departure of this planet from the evening sky, leaving us with a planetless sky to look at until Jupiter comes around in late summer autumn time.

METEOR SHOWER There is a small meteor shower this month which is rather unfavourable. It is the Eta () Aquarid shower, from May 1-8th, Maximum on May 5th. The radiant rises at around 01h, transit at 07h35m, sets at about 13h. The Moon is nearly Full, for the duration of this shower, and if you are observing the shower after midnight, and in the early morning, the Moon causes little interference in the early stages of the shower until maximum is reached. After maximum the Moon causes much interference. At maximum, the Moon sets at 03h32m. The maximum should be 21 meteors per hour, one every 3 minutes.

COMETS We have this month two comets, the New Comet Bradfield 1974b and the old well known Comet Enke 1786I. The Comet will be in Taurus at the beginning of this month, moving into Cetus on May 15th. The co-ordinates for Comet Enke 1786I are in the BAA Handbook. If it is a clear twilight evening, telephone me and I will tell you the co-ordinates for that evening. Maximum brightness of about 4th or 5th magnitude will be on May 3rd. Unfortunately the Comet is rather close to the Sun, and may not be observable by the instruments at our disposal.

Comet Bradfield is fading, I have not seen it yet. The Moon and weather have thwarted me. The ~~xxx~~ last three weeks of April were the best time to see the Comet, it is unlikely that it will be observable now due to the Full Moon. It is by now too dim to be seen in amateur instruments anyway.

REMEMBER THE J. S. PROVINCIAL MEETING AT ORWELL PARK SCHOOL AND OBSERVATORY ON SATURDAY MAY 4th IN THE AFTERNOON. MEETING SHOULD START AT 2.30 p.m. B.S.T. IT SHOULD BE GREAT FUN.

OBSERVATORY LIBRARY. Please note that Mr. T. Cardot is the new Society's librarian and it would be appreciated if members would return books borrowed as soon as possible in order that they can be classified properly.

Stamped addressed envelopes from people who have not sent me any will be very welcome. Especially since the postal charges have risen to an astronomical sum. Also, will everybody who was kind enough to send me stamped addressed envelopes please send me a supply of 1p stamps, otherwise I shall post them as they are and it will cost you 2p on receiving the newsletters!! Join Charlie's economy newsletter distribution scheme now folks!!

RUSSIAN SPACE ACTIVITY Just a little hint, I have no more information on when the Russian's next space shot will be than anybody else, however there are factors such as weather and launch windows which dictate when manned and planetary probes must be launched. No launch windows in the near future, except the Jupiter and Saturn windows, but Russian space technology is not advanced enough to launch probes there at the moment.

The Russians tend not to launch manned spacecraft in the winter. The normal season is April-September. They have in the past launched spacecraft in October (Voskhod-1 and Soyuz-3) both landed in bad lands, and recovery operations were thus hampered. The cruel Russian winter makes recovery of spacecraft difficult.

Which means that if the USSR intend to launch any manned vehicles they should start to do so soon.

When I visited the Canaries in last December, I heard that one of the big Russian space tracking network ships (probably the Yuri Gagarin or the Vladimir Komarov) had called by Las Palmas a few weeks earlier on its way to USSR, for its hibernation. The Russian space programme tend to go into hibernation for the winter.

Of course, Moon probes can be launched at any time.

AMERICAN SPACE ACTIVITY This is at a low pitch. Mariner-10 the only vehicle of interest astronomically. The pictures it obtained were fantastic, and three are published in the 11th April edition of Flight International. You can see them at the Borough library if you ask them to fish that edition out of the cellar. I understand also that one edition of New Scientist magazine published around that date had a long illustrated article about the Mariner-10 findings which should be interesting.

SOLAR ACTIVITY Last year and this year the Sun is at solar minimum. It will not be at maximum until about 1979. This means that very little solar activity will be seen. So if you want to see Sunspots during this year, it will not be easy. To make things easier I have decided to publish Sunspot reports.

During the second week of April Tom Cardot saw a large group of about ten prominent spots roughly in the middle of the solar disk. He telephoned John Deans who confirmed these spots with a telescope identical to Tom's (80mm/3.12 inches). I also see these spots a few days later. They were well off the centre of the solar disk by then. I used a 6cm refractor and 5 1/2 inch (133mm) reflector.

The Sun has a rotation period of about 30 days. This means that the spots probably leave the solar disk on 18th April, and if they have not faded away, may reappear on the solar disk on about May 3rd.

This means that if you come to the J.A.S. MEETING ON MAY 4TH IN THE AFTERNOON YOU MAY SEE SOME SUNSPOTS ON THE SUN. REMEMBER, THE J.A.S. MEETING IS ON MAY 4th, Saturday, and start at 2.30pm. It will be very interesting and enjoyable. Hope to see lots of members there, at Orwell Park School for the meeting. There will be speakers on astronomical topics. Sunset is at 19h30m UT (8.30pm BST).

THE SOCIETY LIBRARY The new librarian is Mr. Thomas J. Cardot. He wishes ALL the library books which are out to be returned by MAY THE FIRST. If you are unable to return the books by then, telephone him at Ipswich. His address is [redacted], Ipswich. Some copies of the J.A.S. magazine "HERMES" which are confined to the library, are missing, and have not even been signed out. These MUST RETURN. If this abuse of the library continues, Tom regrets that he will have to keep the library locked and books from it will only be issued by him personally. This abuse may be unintentional, but unless members are more careful with the library, control of books will unfortunately have to be tightened.

Minutes of the Committee Meeting
held on Monday 8th April, 1974.

Present: R.M.Cheesman (Chairman), M.Hadden (Secretary) J. Deans, D. Brown,
C. Radley, D. Bearcroft, V. Wilkes.
Apologies: M. Stow, P. Carroll.

NEW EYEPIECES: The Chairman reported that the suppliers still had not received the orthoscopic eyepieces in.

J.A.S. MEETING. Final arrangements were made for the J.A.S. Meeting to be held at Orwell Park School starting at 2-30p.m. on 4th May.

REPAIRS TO OBSERVATORY DOME WHEELS. The Chairman reported that he, together with Mr. D. Brown had managed to remove the broken dome wheel and that it had been sent away for repairs.

AUTHORISED USERS OF OBSERVATORY. It was agreed that Mr. J. Sparks should be authorised to hold a key to the observatory by the committee. Mr. Sparks will running the Thursday evening club night at the observatory with Mr. Cardot.

VISIT TO CAMBRIDGE. It was agreed that the visit to Cambridge was very successful and the Chairman proposed a vote of thanks to Mr. Radley for organising the trip and to Mr. D. Brown for driving the bus. This vote of thanks was seconded by Mr. D. Bearcroft.

TYPEWRITER. It was reported that the Society had been offered a typewriter for £8 and the Chairman stated that he would look at it before purchasing it.

DONATIONS. The Chairman reported that he had taken £3.50 from the observatory donation box which he would give to the Treasurer.

CLUB NIGHTS. It was proposed that we hold a meeting at the observatory during either June or July to discuss more serious work with the telescope during the winter. The 6th July was proposed but would be confirmed at a later date.

VISIT TO NORWICH. It was proposed that during the Autumn we visit Norwich Astronomical Society to see their 29" reflector. Mr. Radley said that he would try to arrange this for the 9th September.

As there was no other business the Chairman called the meeting to a close.

Next Meeting 6th May, at 8p.m.

ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

PROGRAMME for MAY, 1974.

TUESDAYS: Weather permitting. From 8p.m.
Directors: G. Collier, [REDACTED], Church St. Chelmondiston
Phone Woolverstone [REDACTED]
: A. Farthing, [REDACTED], Ipswich.
May 7th
" 21st

TUESDAYS: From 8p.m.
Director: Mr. D. Bearcroft, [REDACTED], Ipswich,
Phone [REDACTED]
May 14th
" 28th

WEDNESDAYS:
From 7p.m.
Director. R.M. Cheesman, [REDACTED], Ipswich.
May 8th
" 22nd
From 8.30p.m.
May 1st
" 15th

THURSDAYS: From 8p.m.
Directors. T. Cardot, [REDACTED], Ipswich, Phone [REDACTED]
: J. Sparkes, [REDACTED] Forward Green, Earl Stonham,
Phone Stonham [REDACTED]
May 2nd
" 9th
" 16th
" 23rd
" 30th

FRIDAYS: From 8p.m.
Directors: M. Stow, [REDACTED], Ipswich.
: R. Hazlewood, [REDACTED], Ipswich, Phone [REDACTED]
May 10th
" 24th

FRIDAYS: From 8p.m.
Directors: J. Deans, [REDACTED], Capel St. Mary, Phone Ips. [REDACTED]
: K. Dye, [REDACTED], Ipswich, Phone [REDACTED]
May 3rd
" 17th
" 31st.

COMET ENCKE. Comet Encke is now in the sky and reaches maximum magnitude of 4.1 on the 3rd May before going away again to magnitude 13.5 on 22nd July.

SATURDAY 4th May. The J.A.S. are holding their meeting at Orwell Park School starting at 2-3Op.m. The meeting includes a lecture by Dr. Dewhirst of the Institute of Cambridge on 'Any more Planets Out There? Allmembers are invited to this meeting.

SATURDAY 4th May. 8p.m.
Proposed visit to Observatory by Chelmsford & District Astro. Soc.

SATURDAY 11th May 8p.m.
Visit to Observatory by Ipswich Museum Geological Society.