

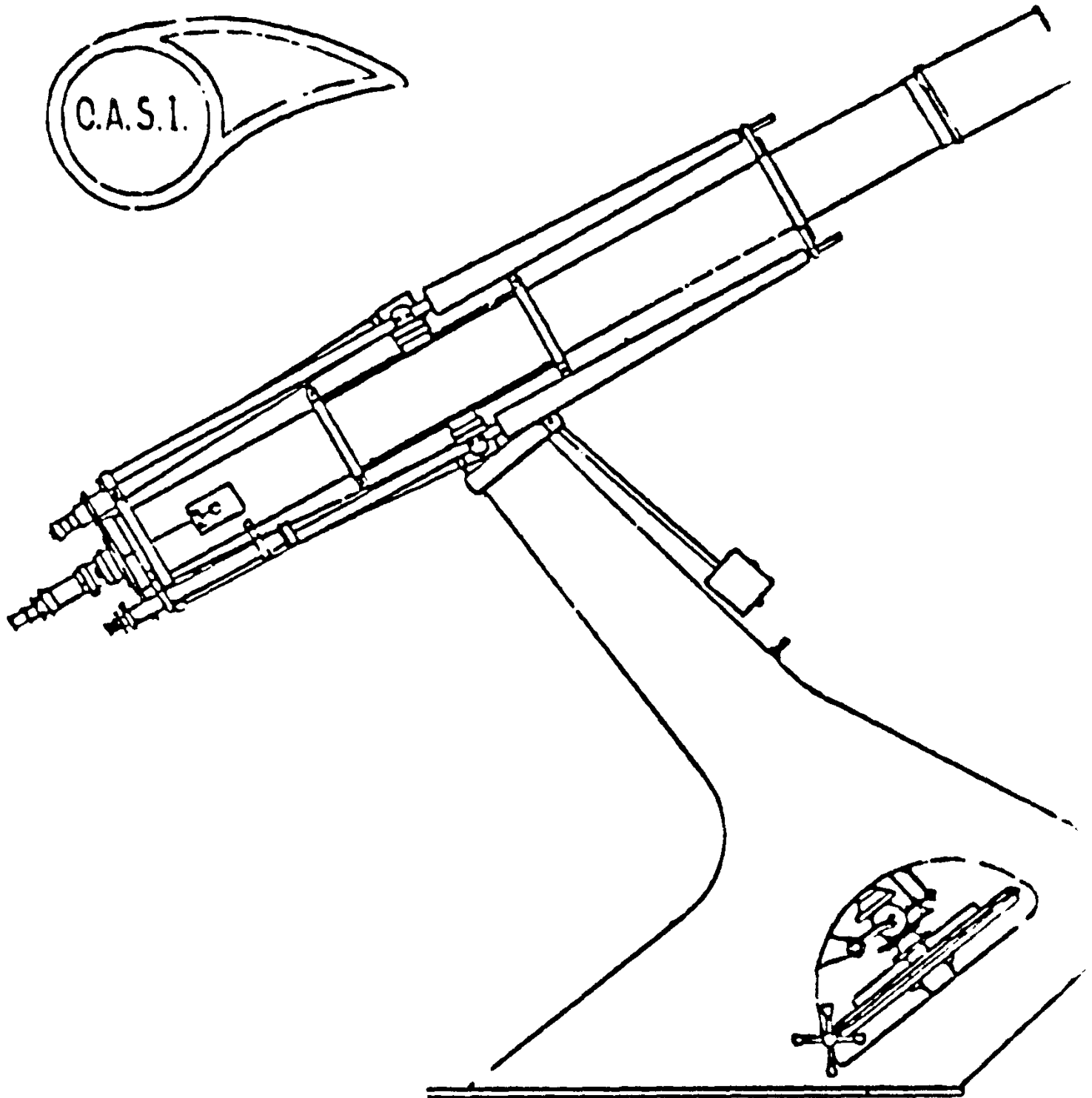
THE JOURNAL OF THE ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

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Producer: Roy Adams, , Ipswich IP2 9ST Phone Ipswich 

Your submissions of items for the Journal will be welcome.

APRIL 1979.



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

The Plough is directly overhead this month, the handle pointing away eastwards from the zenith toward Bootes and Corona Borealis. To the east of these constellations lies Hercules, well up in the sky by the end of the month. To the south, Coma Berenices can be found crossing the meridian around midnight. Still further south below Virgo and Leo, lie Corvus the quadrilateral crow and Crater the 'tipped-up' cup. Below these two, and just above the southern horizon, the entire length of Hydra can be seen snaking its way westwards up to Cancer. Also in the western sky lie Canis Minor, Gemini and Auriga, with Orion and Taurus now slipping below the western horizon during late evening.

THE SUN

Sunrise is at 05h40m at the beginning of the month, changing to 04h50m at month-end. Sunset changes from 18h30m to 19h30m. The Sun moves from Pisces to Aries during the month.

THE MOON - Phases

First Quarter	4d09h57m	Last Quarter	19d18h30m
Full Moon	12d13h15m	New Moon	26d13h15m

Occultations

Star	Phase	Mag.	Time	
*1003	D	7.2	3d21h17.5m	D = Disappearance
1011	D	7.4	3d23h09.7m	Stars listed according to
*1660	D	6.2	10d00h20.5m	Zodiacal Catalog (ZC) numbers.
1663	D	5.2	10d01h11.0m	*Denotes double star.
994	D	5.7	30d21h51.3m	

An occultation of Mercury is listed for Edinburgh on April 24th, but not for Greenwich. Whether Ipswich is far enough north to get a 'graze' is hard to tell with little time to make enquiries and calculations. Edinburgh times listed are:

D 13h01.3m; R 13h15.5m. (R = Reappearance)

On quick '1st appraisal' calculation, noting the time occulted at Edinburgh is only 14 minutes, I would say that we are 200 miles too far south of Edinburgh for this, and as it is a daytime affair, and Mercury Mag. +0.7 or so, we'd need a fair aperture rich-field 'scope and filters to see it - and have to be real good at that! (Moonset 16h38m.)

THE PLANETS

Mercury is a morning star all this month, increasing in magnitude from +1.9 to +0.3. Greatest elongation (27°) is on the 21st, but the planet will be rising only half-an-hour before the Sun.

Venus is also a morning star, at mag. -3.4, rising about an hour before the Sun. On the 24th the crescent Moon will lie between Mercury and Venus.

Mars is another morning star at mag. +1.4, but too near the Sun for observation.

Jupiter is visible until early morning, at mag. -1.8 in Cancer.

Saturn is also visible until early morning, in Leo at mag. +0.6.

Source: BAA Handbook 1979. All times are U.T. (= B.S.T. minus 1 hour).

METEORS

April Lyrids should be with us again, with an hourly rate of about 12, maximum on 22nd. A METEOR WATCH will be held at the back of the 'Ship' (Levington) at 8 pm on April 21st, irrespective of weather conditions. If drowned-off, drowning the sorrows in the requisit volume(s) of licenced liquid is possible.

UPLIFTING NEWS re the ORWELL PARK LIFT

It was agreed at the last Committee meeting that it would be a good thing if the O.A.S.I. by any of its members, could act as a catalyst in gaining the interest of any organization/s in seeing what could be done to better it, without any responsibility

Page 4) being incurred by the Society at this stage. One of our newer members in a position to make approaches has now contacted a representative of a well-known company specialising in lifts, the person contacted also being someone with a feeling for the older type of 'industrial architecture mechanism'. A look at the lift as far as possible in first instance, will be taken imminently. RCA

FROM OTHER JOURNALS

Cosmic Giants - Recent study has found the largest object yet discovered in the Universe. It is a galaxy containing about two trillion stars, and measures over 600 000 light-years in diameter, ten times as massive as our own galaxy. It is 250m l.y. distant.

And astronomers at the Anglo-Australian observatory at Siding Spring have found what could be a giant black hole, 100 million times larger than the Sun. One of the investigative team, Dr. Alan Wright, has said that it is possibly one of the most energetic objects ever discovered. It lies 10 000 million light-years away and is 100m miles across. It appears so brilliant because it is swallowing-up stars at an estimated rate of one per week! (Telegraph)

New Jupiter Mission - On March 7th NASA announced plans to explore Jupiter's moons with an even more advanced spacecraft than Voyager. The new spacecraft, named Galileo, will visit ELEVEN of the thirteen Jovian moons by using the gravitational pull of each to speed it on to the next one. It will also send a spaceprobe into Jupiter's atmosphere to analyze its chemical composition. (New Scientist)

Volcano on Io - Photographs sent back from Voyager on March 7th have revealed a large volcano on Io, the innermost Galilean moon. The slopes of the volcano are lacking in meteorite craters, indicating that it is very young. This means that the rocky surface of Io probably contains an active molten interior similar to that of the Earth. NASA scientists have suggested that this may be the result of dissipation of energy from the tides induced on the moon by Jupiter, producing a runaway melting process. The volcanic nature of Io also provides an explanation for its surprisingly smooth surface, which scientists had previously assumed would be heavily cratered like our own Moon's. Instead, Io is probably covered with a smooth layer of volcanic salts, which also give it a dark red and yellow appearance. (See News Review for more on Voyager.) (New Scientist)

ARTICLES TO READ

"A Modern Look at Ancient Eclipses" - New Scientist, Feb. 22nd. The author, Dr. F. Stephen Richardson, compares computed paths for total eclipses of hundreds of years ago, with old writings of eye-witness accounts, and uses the discrepancies to calculate the rate of change of the length of day, and of the Moon's orbit.

"The Life and Times of Albert Einstein", "Cosmology After Einstein" and "Relativity Today". - New Scientist, March 8th. A mammoth eleven-page tribute to Albert Einstein on his centenary. Heavy going in places, but highly informative.

NEWS REVIEW

by S.G.H.

Solar Eclipse - Spode Steps in On Feb. 26th Americans witnessed a total solar eclipse lasting between 2 minutes 5 seconds and 2 minutes 43 seconds depending on location. Totality extended from Manitoba (Canada) in the east, through Washington State in the west of the continent. Unfortunately, the eclipse, not to be repeated for Americans for 38 years, was largely blocked-out by cloud. However, several universities and institutes, together with the Wallops Flight Center and several satellites, ascertained that the event wasn't a total washout. Sounding rockets took photographs and returned information about effects on the Earth's atmosphere. The eclipse results are being co-ordinated by four bodies centred in Canada. (NASA/Telegraph)

GARP - Off to a good start The Global Atmospheric Research Programme is continuing well. The aim of the 147-nation project is to gather the greatest amount of data

possible to enable 'model' to be built up of how the Earth's weather can* (Page 5 be predicted and modelled. Although results are, of course, lacking, the 40 000 ground observations, 10 satellites, 50 research vessels, 110 aircraft, 300 high-altitude balloons and 300 experimental buoys must be producing enough data to keep somebody busy! (NASA)

Columbia - First Shuttle to Orbit Columbia, the name of the first shuttle that should travel into orbit on November 9th this year, has prompted Dr. Robert Frosch, NASA administrator, to think back to Neil Armstrong's immortal words, "one small leap for Man, one giant leap for mankind". In this retrospective view, the Roman numeral II might now be added to each craft, giving weight to the fact that prophecies are coming true. The Columbia shuttle was moved on March 9th from Rockwell's plant at Downey to the Dryden research centre, where it was mounted on a Jumbo-jet for transport to Cape Canaveral. (Rockwell)

SpaceLab ESA has shipped the first of two spacelab pallets to KSC, Florida. Major electrical equipment and 'sub-systems' will be fitted while the spacelab awaits its first shuttle flight. (Rockwell)

Soyuz 32 Russia launched this manned spacecraft during February. Cosmonauts Vladimir Lyakhov and Valerg Ryumin linked-up with the already orbiting Salyut space station. (Telegraph)

China-Vietnam The war between China and Vietnam is inevitably being watched closely by the superpowers. The Americans have in orbit their 'Big Bird' satellites for photographic surveillance. Russia, in her attempt to analyze the 'war' situation, has launched a few more Cosmos satellites than usual, with orbits that take them over the conflict area. The Russians seem to prefer the short-lived satellite for their 'spying' purposes, by using film that is ejected at certain points in its orbit. America favours 'televised' pictures, although these are of a lower resolution. Spy satellites are now so advanced that they can reputedly resolve a man from a height of 500 km. (Guardian)

Background Radiation Temperature An American Airforce U-2 so-called 'spy-plane' is operating from Jorge Chavez airport in Peru, detecting the background radiation from space. The plane flies at night and contains a 'differential microwave radiometer', which measures temperatures, 600 apart, of the background radiation. The experiment is based on the '3K' theory in which two astronomers detected a 3° Kelvin background radiation which had previously been predicted and implied a Big Bang theory for the creation of the Universe. A similar experiment in 1976-77 found that our galaxy is travelling at about a million m.p.h. However, police have remarked that speeding summonses will not be issued to motorists in the light of this fact.

Voyager-Jupiter Encounter Magnificent pictures of Jupiter have been received from Voyager I as it passed by Jupiter on March 5th. Curious plumes can be seen in the Jovian atmosphere, and the Galilean satellites seem to exhibit very different albedos and visual properties. Pre-encounter measurements of radiation have found that there is an extremely strong radio emission (one billion watts) from the region of Io. If you saw the Voyager pictures on TV last month, you will have seen the four-day time-lapse cycle of photographs taken from Jan. 20th onwards, illustrating Jupiter's moons travelling in orbit. The spacecraft, travelling at over 80 000 m.p.h., passed within 170 000 miles of Jupiter, surviving radiation levels 1 000 times greater than those allowed in nuclear power stations. (J.P.L.)

Voyager (Encounter T-4 Days) Photographs of Jupiter taken four days before closest encounter have shown a combination of perfectly straight bands, combined with other, much larger belts containing swirling vortices of gases. The Great Red Spot seems in particular to have an effect similar to that of air moving over and behind an aircraft wing on the gases. Several smaller 'white spots' were also visible. A recent photograph of Jupiter taken in the infra-red part of the spectrum, using the Hale 200" telescope, shows 'hot spots' on Jupiter's visible face, and indicate when examined in conj-

unction with a Voyager photo that the 'vortex' regions of Jupiter are much hotter than surroundings, and that the Great Red Spot is considerably cooler.

(J.P.L.)

Shuttle - NASA Puts Out the Cloth Cap NASA is asking the U.S. Congress for an extra \$185 million. Dr. Yardley told the American Senate that without the money, the first launching of Columbia would be delayed four to six months. He also said production of other shuttles would be disrupted causing an eventual increase in costs of \$1 billion. (Flight International)

European Communications Satellites The European Space Agency has given a £73 million contract to what is called the MESH consortium, of which British Aerospace Dynamics is leader. MESH will build two European communications satellites and two maritime communications satellites. (Flight International)

Ariane Ariane's second stage undertook a 'burn' of more than 140 seconds at Germany's space centre in Hardthausen in late February. The engine used is called 'Viking IV' and produces a thrust in vacuo of 725 000 Newtons. (Flight International)

Jupiter/Io Mystery After Voyager's passing Jupiter on its way to Saturn, Voyager scientists are still baffled about the absence of craters on Io. Dr. Stone, one of the Project scientists, has suggested that Jupiter could have some kind of 'shield' which keeps meteors from reaching its moons. However, the later Io photographs have revealed active volcanoes there, with dust and ash being ejected at about 2 000 m.p.h. It would seem possible, therefore, that Io could be continually 'recycling' its inside to the surface, perhaps covering-up any craters.

Cargo Ship Russia recently launched Progress 5, a cargo vessel, to link up with the Salyut 6 Space Station.

Thunder and Lightning Bolts of lightning have been registered in the atmosphere of Jupiter. Flashes nearly 20 000 miles long were photographed by Voyager I. The only other planets known to exhibit lightning are Earth and Venus. (Telegraph)

Galileo Would Be Proud As mentioned briefly in the 'From Other Journals' column, (of which this could be considered partly an extension, RCA) NASA's even more extensive Jupiter's Moons Study is in the pipeline. Planned for 1982, project Galileo, named, of course, in memory of Galileo Galilei, will go round eleven of the thirteen Jovian moons taking all sorts of measurements. The main aim will be to map the satellites extensively, as well as to measure magnetic field strengths. Part of the spacecraft will contain a sort of 'suicide probe' which will travel down through Jupiter's atmosphere radioing back the same type of information as the Pioneer Venus probes did earlier this year. Jupiter, though, is enormous, and having no solid surface known, it is inevitable that the probe will be crushed by the colossal atmospheric pressure. (Telegraph)

SKYLAB DE-ORBIT John F. Yardley, NASA Associate Administrator for Space Transportation Systems said at a recent U.S. House Science and Technology sub-committee hearing:

"On the day Skylab drops out of orbit, the odds on being hit by lightning will be about 3 000 times higher than those on being hurt by surviving Skylab debris. The odds on sustaining a gunshot wound will be about 200 000 times higher."

This tells us as much about American society as it does about Skylab!!

C.F. Radley (Source: Aviation Week and Space Technology)

HUMOR - the just-discovered new planet with a vibrating shell - hopefully not empty...

Extra-Solar-System robot teacher reporting to robot inventor on performance of robot pupil: (Translated into English with distance-caused discrepancies) "He's very good with his vile sounds and sights but very poor on his continents."

Jovian spaceman teaching Jovial boy to fly: "Your co-ordination is very pre-Icarus at the moment." With any due apologies from someones who shall be nameless...

The Pioneer spacecraft have sent back a tremendous amount of information about Venus' atmosphere, and several major findings have been uncovered. Despite recent speculation to the contrary, evidence now seems to confirm that the extremely hot atmosphere is due to the so-called 'runaway greenhouse' effect. There appear to be three atmospheric layers, resulting from a possible sulphur-hydrogen-oxygen reaction. Instruments aboard the probes have found the main constituents of the atmosphere to be oxygen, steam and sulphur dioxide. Although the orbiter's imaging radar has a poor resolving power compared with terrestrial instruments, it has shown that Venus has mountain ranges and flat plains similar to the type of topography found on Earth.

One unexpected result to come from the atmospheric probes was that argon and neon were found to be several hundred times more abundant in Venus' atmosphere than in the Earth's. This finding conflicts with current theories concerning Solar System formation. The currently favoured theory is, of course, the 'primordial gas cloud' model, whereby the planets and Sun formed at about the same time. The theory says that the inner planets are much more rocky because the early Sun had a much stronger solar wind, 'pushing' the lighter elements (hydrogen, helium, neon and argon) further out to eventually form the giant planets such as Jupiter and Saturn. Any lighter elements that had been trapped in the inner planet formations 'degassed' from the surface thus giving them atmospheres. The story also is that temperature dropped with increasing distance from the centre of the solar nebula. The Pioneer findings may postulate that the temperature distribution was even throughout the solar nebula. Gravity would then bring the lighter elements toward the proto-sun region, collecting on dust-grains in the process. The pressure, however, would be high, so planets would form and subsequent 'outgassing' would occur.

This is just one of the many findings of Pioneer Venus, so many that I cannot write them all here. NASA suggests that one reads the Feb. 15th edition of SCIENCE, and as mentioned in last month's 'Articles to Read', New Scientist contains a great deal on the Project findings.

TWO CENTENARIES

We must all by now know that we are transitting the Centenary of Albert Einstein, whose mathematical genius, though to some perhaps questionable, has indeed shaken the scientific 'world'. His theories have apparently been so far-reaching that even after many decades from his youth and later work, we still have not caught-up with him with discoveries of sufficient concreteness to absolutely prove him wrong. Perhaps we will have to wait for his next centenary for this!

I have also noticed that March 30th is the centenary of Bernhard Schmidt, who gave to the people of science (not to mention photography) the wonderful Schmidt camera, now employed in many different forms and ratios according to the work needed to be done.

I should state that this is the centenary of his birth - on a small island (Hargen) in Estonia - to Lutheran parents. Several of us must have heard how at the age of about eleven, he lost his right forearm and hand while testing some gunpowder of his own making - on a Sunday and in his best Sunday suit, and how he was more afraid of rebuke over the spoilt Sunday suit than over the loss of part of himself!

It is amazing that Bernhard managed to accomplish the making of such exquisite optical components as he did - he made countless reflector telescope mirrors for which he was in great demand.

Saying goes that he worked only when the fancy took him - but it seems fancy took him most of the time, or he at least made up during evenings and nights for daytime 'muses' in 'walkabout' of Hamburg's Bergedorf suburb and presumably other places. He was inevitably thinking 'technics' and eventually came up with his corrector plate idea for a fast, wide-field reflector camera, the plate to be figured while held as the top

of a partial-vacuum chamber. Schmidt's idea was to so that it presented a slightly concave surface at the start of work, then this surface would be ground and polished to a virtually flat plane. When the vacuum was released, the plate had the necessary curvature for placing at the front of the telescope camera to correct the ultra-short-focus mirror to go with it.

Schmidt worked, it seems, very close to the limits imposed by breaking strain of the glass for his first Schmidt camera, completed in 1930. This original camera had a correcting plate of 14 inches diameter, with a mirror of over 17 inches diameter and 49 inches radius of curvature, effective ratio F1.7. The camera was well used, and soon, astronomers at Mount Wilson in America became practically interested.

Bernhard became worried that his invention would be employed in warlike enterprises with World War II looming. He died doubtless with such thoughts on his mind, in December, 1935. His 'baby' was in fact used much as he feared, but recently, the proper uses he intended for the principle have been rapidly increasing. Schmidt never married, but he 'lives on' round the world in the Schmidt camera family now so well adopted by amateurs and professionals alike.

RCA

(Helped in detail by Amateur Telescope Making, Book Three, pub. Scientific American, Inc. which is one of a set of three ATMs which should be in every astroperson's home library. Perhaps we could do a direct bulk deal with Scientific American?)

And here is our regular NOTABLE ASTRONOMICAL ANNIVERSARIES FEATURE by Roy Gooding

FRIEDRICH STRUVE was born on April 5th, 1793, in Altona, Germany. In 1808, at the age of 15, Struve was forced either to stay in Germany and risk being conscripted into Napoleon's armies, who were then in occupation, or flee the country. Struve decided on the latter, leaving to stay for a short time in Denmark before moving on to Russia where he settled for the remainder of his life.

Once in Russia Struve enrolled at the University of Dorpat (now known as Tartu). During 1815 he became the director of the Dorpat Observatory. This observatory was very well equipped for the period, housing a ten-inch refractor made by Fraunhofer. This telescope was equatorially mounted, and driven by one of the first clock-drives ever used. The refractor was installed during 1824; upon completion of the work, Struve commenced the research for which he became famous, the study of double stars.

Struve started a complete survey of the sky, ending at -15° Declination. At the end of the survey he had catalogued about 120 000 stars, including some 2 200 doubles. This catalogue was published in 1827. The positions of the various components of the double and multiple stars Struve discovered, he accurately measured with a travelling-wire micrometer. The micrometer was made by Struve during the years 1825-1827. After the publication of his first catalogue he wrote two subsequent books on double and multiple stars, these being published in 1837 and 1852. The 1837 catalogue included some additional entries, which increased the number to 3 112 entries.

Between 1834 and 1837 he determined the parallax of Vega, arriving at a parallactic angle of 0.26" of arc. (The modern value is somewhat under half this value, 0.123" of arc.) Bessel is usually credited with determination of the first stellar parallax, of 61 Cygni in 1837, though it is probable that Struve may have preceded this date by a year or so. Bessel's result, though, gained a quicker acceptance by the astronomical community than did Struve's.

After holding the post of Director of the Dorpat Observatory for 24 years, Struve was invited to take over the directorship of a new observatory at Pulkovo, by Nicholas I of Russia. The observatory was situated about ten miles south of St. Petersburg (now known as Leningrad), being built and equipped to Struve's own specifications. Struve worked at the observatory for over 20 years, concentrating on more double star studies. Before retiring from the post in 1861, his son, Otto, assisted him during observations. Otto Struve succeeded his father as director of the observatory.

Friedrich Struve lived to the age of 71, dying in November, 1864.

Our author-speaker at the last lecture gave us some hope for ameliorating the possible boredom from a sometimes thought-to-be-endlessly-expanding Universe. He told a good attendance including some folk from Colchester, how it appeared that instead of the Universe expanding for ever and getting generally less and less dense (so anyone would have farther and farther to travel between stars in the distant future) the boredom may be broken by a reversal of such a process - that the edge or shell of the Universe may not be able to escape from the centre. This would bring it all crashing back again at some later-to-be-foreseen time. When all our fuel resources have run out, including solar energy (which should last as it is now for many millions of years, the odds are) such compression may even be welcome, with increased entropy and less distance to travel, and less heat needed for our homes. The later comments are partly what I read into it, admittedly. One major point brought out by Iain was that life may have originated in outer space, and not necessarily on Earth. All the materials and situations are there, it seems, between the stars and galaxies, for this to have happened, and indeed to happen again. People who didn't turn up missed a jolly good show and food for thought - not too technical - even though the slides were the wrong way round and the 'non-smoking' notice shut off some air-passage to the epidiascope (overhead projector) somewhat defeating the issue. I must agree with Iain that there seems enough of various sorts of obscuring (but perhaps otherwise USEFUL) smoke in and around the galaxies to be able to do without it at lectures, but the notice in front of my nose was like preaching to the converted! But thanks, anyway, Iain! RCA

WOULDN'T IT BE GOOD TO HAVE SOME FRESH CONTRIBUTORS AS WELL?

I enjoy - as in fact, other regular article writers do - writing for this Journal, but out of our considerable membership, surely there are some more writers somewhere? Astronomy and the related sciences and arts are so vast in field that not even us OASI 'regulars' can cover it all? We do try our best, and it 'don't really come out bad' but come on, some of you others, HAVE A GO! You may surprise yourselves. That is partly what YOUR journal is for! RCA

ORWELL PARK 10-INCH (AND OTHER) TELESCOPE DRIVE OPTIONS

by Roy Adams

Part IV FURTHER ELECTROMECHANICAL SYSTEMS

To avoid prolonging the basics too much, I'll try and wind them up this issue. (This is something I don't need an electric drive for - wait - who's that saying my typing muscles are driven by small electric impulses?)

If one wants a degree of accuracy that can match the ultra-best and most costly telescopes, one can incorporate a quartz crystal oscillator as source regulator for the drive system. For a person also interested in electronics, the system can be a fairly cheap increment, and if one has gone to the trouble to make a very rigid telescope mounting (and tight gearing and rigid 'scope itself) then the reward in freedom from guiding or much less strain in guiding on long exposure photography or tedious (otherwise) measurements is worth it. The anything from 10 megahertz to say 100 000 hertz (10m or 100 000 cycles of vibration per second) of the crystal are divided-down by electronic transistor switches (integrated circuits for over 20 division-by-2 stages are now available at low cost) and applied to an 'ordinary' stepper motor. Those very clever and ambitious at electronics can even make a sub-system which enables the strictly regular pulses of the divider 'chain' to be over-ridden with fidelity by a fine or coarse adjustable train of pulses when desired for guiding or slow slewing. The quartz crystal can be made to order with any reasonable frequency for little extra cost, and rather than be bound to a small selection of frequencies, one can choose one's own for the gearing or divider (or both) rather than the opposite way round. One can not alter the chosen vibes by more than about 20 parts per million except for use of harmonics (say half of the set frequency) but accuracy can be maintained to about 10 parts per million or less.

TUESDAYS from 7 pm: Planetary Section Apr. 3rd, 17th; May 1st
Directors Mr. J. Hood, [redacted], Ipswich. Official 'Extra' required, soon.
Tuesdays from 7 pm: Solar, Lunar & Planetary Section Apr. 10th, 24th; May 10th
Directors Mr. J. Hood, [redacted], Ipswich
and Mr. M. Barritt, [redacted], Ipswich

WEDNESDAYS from 8 pm: Nebulae & Faint Objects Section Apr. 4th, 11th, 18th, 25th;
Directors Mr. D. Payne, [redacted], Wickham Market, May 2nd &
Suffolk 'Phone Wickham Market [redacted] 9th

and Mr. M. Cook, [redacted], Ipswich 'Phone Ipswich [redacted]
THURSDAYS from 8 pm: Double Stars Section Apr. 12th, 26th; May 10th
Directors Mr. J. Ranson, [redacted], Ipswich 'Phone Ipswich [redacted]
and Mr. D. Bearcroft, who wishes a replacement shortly.

FRIDAYS from 8 pm: Variable Stars Section Apr. 13th? 27th; May 11th
Directors Mr. R.S. Manning (confirmation of new address/phone awaited)
and Mr. M. Siggers, [redacted], Ipswich

SATURDAYS from 8 pm: General Section Apr. 14th, 28th?; May 12th
Directors Mr. M. Barriskill, [redacted], Ipswich 'Phone Ipswich [redacted]*
and Mr. R. Adams, [redacted], Ipswich 'Phone Ipswich [redacted]

*Mike works nights, 'phone times somewhat restricted.

METEOR SECTION MEET, April 21st - See PAGE 3. Meteor Section info. from Mr. D. Barnard,
[redacted], Ipswich ('Phone Ipswich [redacted]) or from Mike Barriskill.

LECTURE PROGRAMME - The next meeting is on MAY 25th, at the FRIENDS' MEETING HOUSE, 39
Fonnereau Road, Ipswich, when Heather Couper will be talking about EXPLODING GALAXIES.
OTHER MEETINGS, such as visits of other clubs to us, and of us to them, occur. We have
a couple of visits under arrangement - one to Greenwich - near Midsummer. Our expected
date for OPEN DAY is September 29th. Special observing projects are sometimes run.
MORE DETAILS can be gained from Observatory Directors, Editor Paul Burt, or
Assistant Chairman, Mr. Alan Smith, [redacted], Ipswich, 'Phone Ipswich [redacted], or
Treasurer, Mrs. P. Long, [redacted], Ipswich, 'Phone Ipswich [redacted], (to whom,
PLEASE, ANY OVERDUE SUBS. SHOULD NOW BE PAID). ALL GROUP VISITS MUST BE ARRANGED ONLY
through Chairman, Roy Cheesman, [redacted], Ipswich, but ones and twos can be 'acc-
ommodated' by simple arrangement (Section evenings or not). NEW MEMBERS ALWAYS WELCOME!
DRIVE OPTIONS, Part IV, contd.

Shortt clocks with a pendulum 'in vacuo' can attain much higher accuracies (better than
1 part in 100m) but using one as a basis for a zebra-ed photoelectric pulse reseau to
get fast-enough pulses would be unnecessary effort. Such a system is possible, though,
for a pendulum clock of simpler sort to be used. Chattering a hand-switch for speed-up
or another 'off' switch for slow-down is a fair over-ride and some have used differential
gears with the cage normally held fast, and rotated by another pulse-train- or simple
motor or motors for guiding and slewing (reversible). If the regular pulses from a
photoelectric sensor from a source too weak to directly drive the telescope are used in a
stepper motor, the shorter the pendulum, the faster the pulse for smoother running. One
small motor could be 'slaved-off' to drive the 'scope with a much larger motor by photo-
cell link, which does nothing to spoil the regulation of the small unit as there's no
load on it. It can be possible to 'gang' several smaller motors together, but better to
use one stronger one as less cost and 'fiddle'. With electronic components today able
to handle more power, use of one motor for one axis is simpler and cheaper.

The Declination axis can also be fitted out with a guidemotor - near-comet, near-
horizon and occultation work could benefit especially from this, though Lunar pics may
not need it (or any drive at all) unless very contrasty slow film is used. One might
even fit-up auto. anti-hit devices to stop the 'scope grinding the pier under drive just
when you've gone for a 'cuppa'...which reminds me - OBSERVATORY ELECTRIC KETTLE NEEDED -

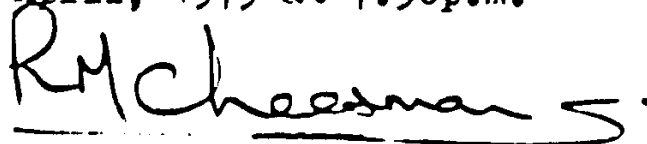
MEMBER'S ADVERT: © FOR ALL CLOCK REPAIRS big or S M A L L , ancient or modern, by comp-
etent craftsman Society member, 'phone Ipswich [redacted] (evenings) for all inquiries.

ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

EXTRAORDINARY GENERAL MEETING

At the Annual General Meeting of our Society held on Saturday 6th January, 1979 concern was expressed by members present of the cost of producing the Monthly Journal. It was proposed and seconded that an Extra-Ordinary General Meeting should be called on Saturday 7th April, 1979 at the Observatory to discuss what measures the Committee had taken during the first three months of 1979 to reduce the costs of the Monthly Journal to an acceptable level.

You are accordingly invited to attend this Extra-Ordinary Meeting which will be held at the Observatory, Orwell Park School, Nacton on Saturday 7th April, 1979 at 7.30p.m.



R.M. CHEESMAN

CHAIRMAN, ORWELL ASTRONOMICAL SOCIETY (IPSWICH)