

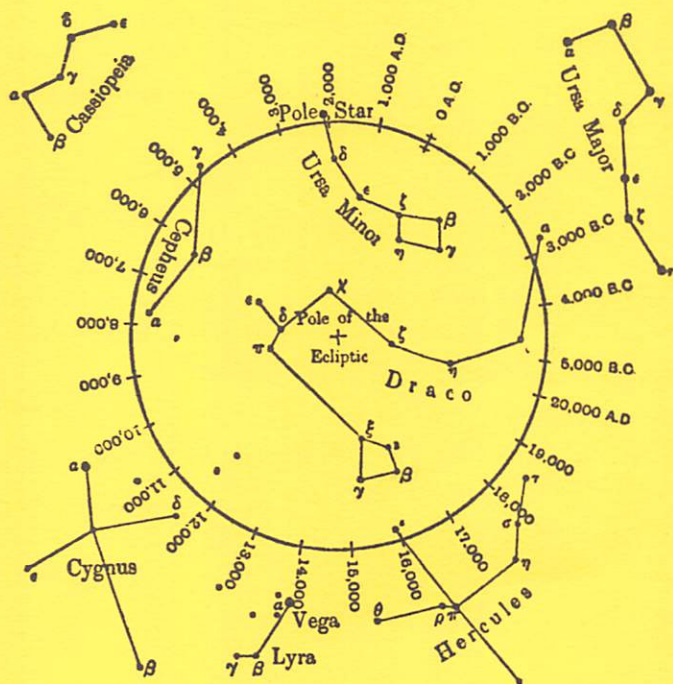
NEWSLETTER

of the

*Association for
Astronomy Education*

Vol.5, No.3

April, 1986



Due to the Earth's precession,
the position of the Celestial Pole moves in a Circle
around the Pole of the Ecliptic.
One complete revolution occurs in 23,000 years.

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EDITORIAL

It is usual for the editorial to be written by the Editor, but this is one exception to the rule. Our Editor, Colin Goodman, has completed about 90% of the work in compiling this issue when, whilst on a visit to Scotland, he was suddenly stricken down by acute appendicitis and had to be rushed off to hospital. Colin was out of action for some time, and that is the reason for the late appearance of the AAE Newsletter. I am glad to say that Colin is now making a good recovery and I am sure all our readers will join with me in sending him our best wishes.

By coincidence, Colin Goodman is resigning the editorship with this issue, and at the last meeting of the AAE Council, I agreed to take over the editorship (starting with the September issue), subject of course to ratification at the A.G.M. on 7th June. Due to Colin's illness, however, I undertook to put the finishing touches to this issue, and to dispatch the copies to members; this has inevitably led to the delay. (Congratulations to Colin, by the way, for the excellent work he has done in producing the Newsletter).

Members should now have received from the Secretary details of the Annual General Meeting on 7th June at Wandsworth School. The Secretary's article in this issue gives more information about the meeting, and this is useful if received before the meeting. It is my hope, whilst writing this editorial on 13th May, that readers do, in fact, receive their copies in good time, but if for some reason this is not possible, I can only apologise and hope members will understand the reason why.

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As our retiring Editor said in the last issue, articles for publication from readers are more than welcome. Please use the Newsletter as a forum for your views. My address and telephone number are given on the back page. It would be helpful, but not essential, if the articles are typed.

*

The future of the Royal Greenwich Observatory (RGO) is in doubt. There was some discussion on this issue at the last Council meeting and this resulted in a letter from our President, Donald Gold, being published in the Daily Telegraph. His letter is reproduced in this issue (another letter from him was published by the Times in April). There is no doubt that a groundswell of opposition to the plan to close down the RGO is well under way. Opposition comes not only from astronomers, but from organisations for which the RGO is a local amenity, such as astronomical societies, MPs, schools, tourist bodies. Petitions opposing the plan to transfer the RGO to a British University have been circulated.

Fellows of the RAS, however, have been sent a reasoned argument by the Astronomer Royal (who is the Patron of the AAE) for attaching the RGO to a University, although he does make it clear he is not discussing the rights and wrongs of the closure itself.

May I take this opportunity of wishing readers a happy summer holiday. The next issue of this Newsletter is scheduled for September.

* * * * *

SECRETARY'S NOTES

Hello,

It seems only a short while ago that we were discussing the forthcoming Annual General Meeting (last year's I mean), and here we are again a full year later. This year's annual meeting and A.G.M. will be at the same venue as last year's (different one next year) and will be held at the same time, i.e. Saturday, 7th June.

So, to quote almost from last year's note, the venue is the London Schools' Planetarium, Wandsworth. It is on the District Line and the nearest Underground Station is Southfields, about three minutes walk away. There is also plenty of parking space available.

We hope to start the proceedings at 11.00 a.m. after an arrival cup of coffee, and we end by 4.00 p.m. It is hoped that morning coffee, ploughman's lunch and after-

noon tea and biscuits will be available as we had last year. Registration fee will be £3.00, hopefully to cover the refreshments and staffing. This will be payable in advance if a lunch is required as we need to know how many to cater for, of course. So don't forget to reply quickly when you receive the letter which will be sent to all members as soon as arrangements have been finalised. Incidentally members are allowed to bring guests.

With respect to the programme, we will have a guest speaker and shows in the planetarium; the actual business A.G.M. shouldn't take longer than one hour. So do not miss the opportunity of a nice day out and a chatty get-together exchanging ideas and information.

As an Association we appear to be getting closer to that which we hoped to achieve when we were formed - namely to have a network of resource centres throughout the U.K. where members could approach someone locally for information and help. It now looks as though we have some sixteen of these centres scattered from Dundee in the North to Plymouth in the South and Armagh in the West. Quite an achievement. All we need now are more and more members, although the centres do tell me that they are busy helping anyone who approaches them, not just members of course.

I trust that everyone had a nice Easter holiday even if you didn't get abroad. For those at the chalk face, 6.9% isn't all that much but at least I can convey happier greetings than I did last year. So until we meet at the annual meeting, cheerio.

Peter Richards-Jones

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A NOTE FROM THE TREASURER . . .

The present issue of AAE News closes the current Membership Year, and Members will find enclosed with this issue a proforma inviting them to renew their Membership for the year beginning 1st September, 1986. It would be very helpful if members intending to renew would do so by 31st August, 1986. Every year, some

members feign surprise when reminders are issued with the September issue of AAE News, or even later.

Members will be pleased to hear that subscriptions will be kept at the same level in 1986/87 as for the current year, viz:

Ordinary Member	£ 5.00
Retired Member	£ 4.00
Primary School Affiliation	£ 4.00
Secondary School Affiliation	£ 7.00
Other Affiliation (Tertiary, University, Planetarium, Library, etc.	£ 10.00

I would like to remind members that subscriptions paid out of personal income are eligible for tax relief in the U.K.

Raymond Butt

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DUNDEE ASTRONOMY COURSE, 1986

I must make an amended announcement about a planned course at one of the Scottish resource centre, the Mills Observatory at Dundee.

In the Newsletter (Vol.5, No.2, page 7) I wrote about a symposium on amateur astronomy at Dundee. Whereas the details were substantially correct, I was one year out, for that symposium happened last year! I apologise for my hasty research in preparing the note.

The actual event will be a weekend course from September 19th - 21st, 1986, in Dundee. This joint Mills Observatory/British Astronomical Association course will be limited to about sixty people.

Further details may be obtained from the B.A.A. or from Dr. Fiona Vincent, Balgay Park, Glamis Road, Dundee DD2 2UB. It is hoped that this will become an annual event.

Geraint Day

(Public Relations Officer)

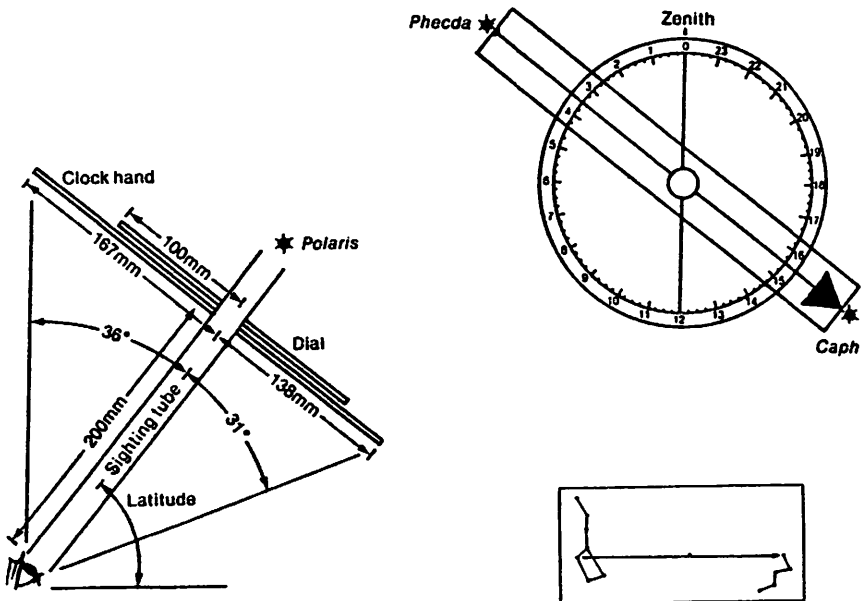
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OBSERVING SIDEREAL TIME

The recent article "A Circumpolar Star Dial" specially interested me (S&T: November 1984, page 464). There, Everett L. Merritt told how to make a nocturnal, the medieval instrument for telling time by circumpolar stars.

Many users find the nocturnal unnecessarily complicated and hard to understand. The simpler device described here reads sidereal time directly, rather than local mean time. Sidereal time is the right ascension of any star on the meridian, so it has many astronomical uses.

My device makes use of the fact that a line between the stars β Cassiopeiae (Caph) and γ Ursae Majoris (Phecda) passes very nearly through the pole star Polaris. This line, imagined to have an arrowhead at Caph, makes an excellent "hand" for the sidereal clock that surrounds the north celestial pole.



While this line misses Polaris by $0^{\circ}.6$ and the true celestial pole by $1^{\circ}.05$ it happens to be very nearly parallel to the equinoctial colure, the great circle passing through the pole and defining 0^h and 12^h of right ascension. As a result of this fact, the error * in using Caph and Phecda as a sidereal clock remains small throughout the year. (* Add 5ms to reading)

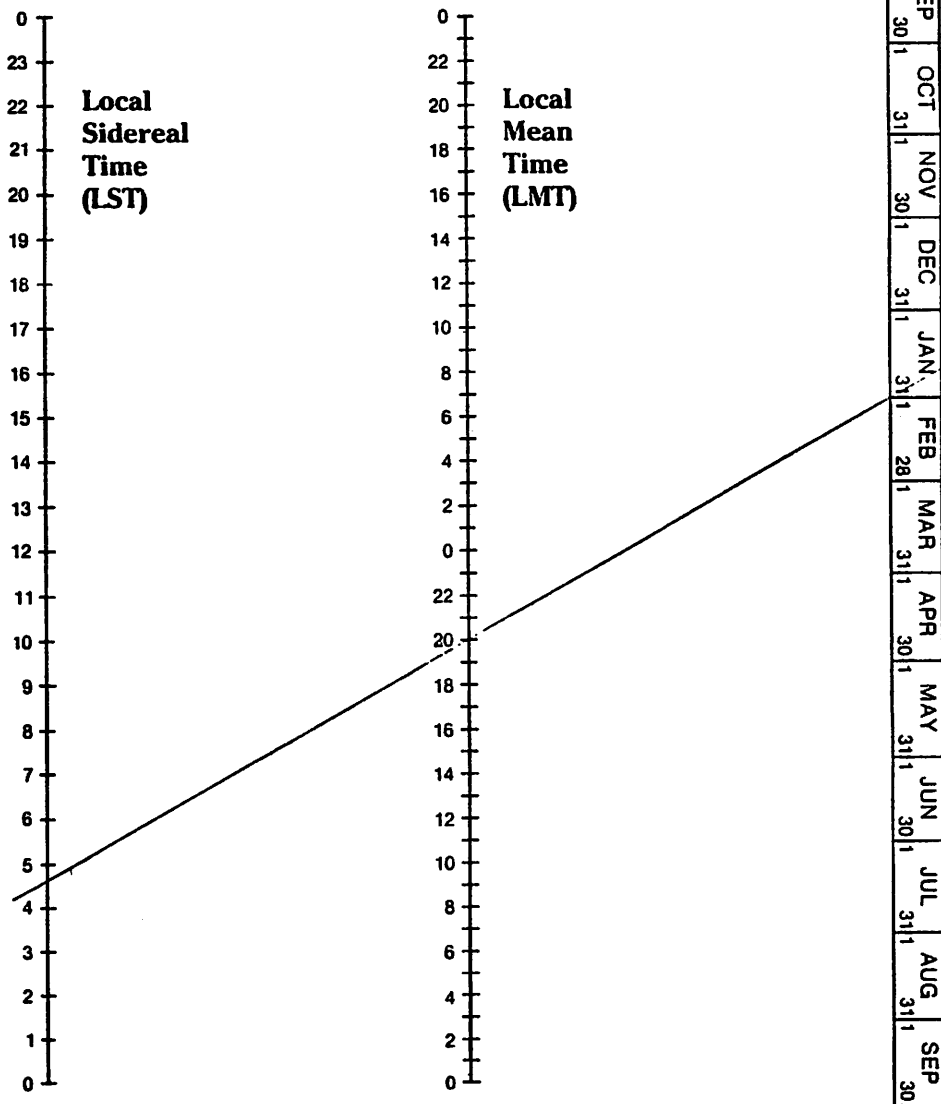
The diagram (see page 6) shows how the clock dial, hand, and sighting tube are assembled. Correct dimensions are given for those who may wish to make their own model. The sighting tube should be fixed perpendicular to the dial and fitted with cross wires. The clock hand is conveniently made of transparent plastic, such as Plexiglas or Perspex, with a line scribed centrally along it. The hole in the middle of this strip should fit snugly on the sight, yet permit smooth rotation.

To use this device, observe Polaris through the tube and align it with the cross wires. The 0^h -to- 12^h line of the dial should lie in a vertical plane, as determined by a plumb bob. For best results the device should be clamped in position, most parallel to the Earth's axis, and the dial lies in the equatorial plane. When you turn the arrow to point at Caph, with the other end on Phecda, local sidereal time can be read directly off the dial. The nomogram (p.9) quickly converts sidereal to local mean time, if desired.

The angular distances of Caph and Phecda from the pole are 31° and 36° , respectively. The eye can easily see these stars and Polaris at the same time without appreciably changing position. To make and use this simple device can be an instructive and worthwhile project, particularly for young people, who are always attracted to the idea of telling time by the stars.

H. Robert Mills
Winterslow, Salisbury,
Wilts.

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The author's nomogram relates the date, local mean time, and local sidereal time. Any one of these values can be found when the other two are known, by laying a straight edge across the three scales. The example shows that on January 31st, when the sidereal time is $4^{\text{h}} 40^{\text{m}}$, the local mean time is 20^{h} (8:00 p.m.). The additional correction (usually small) to convert local mean time to standard time was explained on page 62 of the January issue.

THE PERILS OF SIMPLE PROJECTS

Just a small, simple project to get you out actually doing some astronomy, they said.

They could have left out the simple part since in retrospect that adjective seemed somewhat inaccurate, at least to my naive view. The whole episode was rather more of a marathon with unexpected cross-country diversions and "return to go" signs - a three dimensional 'Monopoly' with the added intrigue of needing fine weather.

Basically (ahem) I had to load a film in my camera, point it at some stars and leave the shutter open. The analysis we had to do on the prints was the final straw but at two o'clock on the morning of the deadline this particular camel was past caring: I think I concluded I had wasted my time (only tried to phrase this a little more politely!). The purpose was to find some form of calibration of star magnitudes from the width of an image on a print. Enough said.

We were supplied with a short length of film. Being enthusiastic I in fact shot off three films. I started the first roll over Christmas, initially being in North London. Having to contend with street lighting and the neighbour's kitchen / Blackpool illuminations was not funny. The weather was awful but I guess that was only to be expected.

New Year's Eve was an excellent opportunity, so in between drinks I finished off the first film wondering if a layer of ice on the lens would drastically alter the results, and cursing whoever thought of planting trees in suburban back gardens. Well that was the start of '86, and shows you how keen I was - at first.

The second film, I'm convinced, would have been excellent material. I was staying down in Horsham in the first week of January, overwhelmed by the clear skies (quite a culture shock being able to see the Andromeda Galaxy with the naked-eye after the London pollution). Luckily it was Moonless over that period, so I froze for a few hours for some nights taking pictures, daring longer and longer exposures and really savouring the scar-

city of street lights (as well as showing some heathens just what Orion looked like and where the Seven Sisters were - a duty every astronomer all too often performs). So, the second film neatly labelled and sent off for processing, I moved back to home-base in Bristol hoping for some good prints.

I'm still hoping. An empty envelope was returned with a note saying that my film had not been received. The Post Office are dealing with my complaint but I suppose that film two is a write-off.

After a week of moaning and despair (directed at the weather too) film three was started as a last resort. First of all I took shots from near the Suspension Bridge (wondering if all the lights might coincidentally fuse) - not ideal but it was the best chance I had.

Now my equipment proved untrustworthy: collapsible tripods should not, I'm sure, collapse into many pieces and shutter release cords should not act independently of the photographer. Once these minor mechanical problems were solved in true 'Blue Peter' style with sticky tape and string, the weather was beginning to change - luckily Orion was clear so I actually managed to take some pictures.

A bright flash of light halted my efforts. Unaware of any highly localised thunder storms and seeing that the Bridge was still shining away gloriously, I looked for the source of this disturbance and found some enthusiastic tourists snapping away at the Bridge. Convinced that four shots would be all they took, I wound on and started up again, only to have to abandon that exposure. Yes, the Bridge is very pretty and we all take photos of it, but the sky is much prettier and also does not require flash. Teeth gritted I waited 'til the merry band had wandered off. Looking at the sky it was now that dreaded silvery colour that meant no more work could be done. I gave up and took a photo of the Bridge.

Finally a group of us went onto the local Downs - a group of us all feeling the same way about our projects and the British weather. The photographic stuff had to be done quickly to give us a chance to get the prints processed (from the start I'd decided to get all the

processing done professionally, not trusting myself in a darkroom; I've not decided if that was the right decision and don't really want to think about it). Anyway, that night nothing went wrong - yes there was a full Moon and a few planes but nothing collapsed or exploded, got stolen or fogged. The suspected cases of frostbite were false alarms so we went away quite satisfied, relatively speaking, of course.

This time the film was sent registered post and I actually saw the fruits of my labours. Not bad, considering the prevailing conditions. I then had a few days to measure the trail widths and plot a vast number of graphs to try to guess (pronounced 'establish') what sort of relationship applied. Now that really was a chore and did nothing except prove the old axiom that the rate of working increases as the deadline approaches.

I suppose it did get us out doing some astronomy; we did freeze, curse the weather and have a few additional little thorns to deal with. It would have been genuinely simpler to have chosen to have made a sundial, but would that have been a taste of real astronomy?

K. C. Parker,
Bristol

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GREENWICH MEAN ASTRONOMICAL TIME ?

Avid readers of the English language paper "Athens News" were doubtless amused to read in the 2nd October issue the following note on Halley's Comet . . .

"British Airways is offering a sky-high seat for the great Halley's Comet show, we learn from the Associated Press.

For £30 the state-owned airline is promising to take passengers on an hour-long trip over the ocean at 35,000 feet (10,700 metres) on a moonless night ... the windows of the 99 seater BAC-111 aircraft to be used for its flights will be 'as clean as possible'".

* * * * *

ASTRONOMICAL COMPUTER PROGRAMS IN B.B.C. BASIC

Somebody recently remarked that the B.B.C. BASIC language was rather like the computer equivalent of Latin. If that is so, it would help explain the name of the latest computer to run programs written in B.B.C. BASIC; the Master. I could, of course, be biased - having an Amstrad PCW8256 and an Atari 800XL.

Whatever the merits of the language, there is a vast range of software available for B.B.C. microcomputers. There are several meant for astronomy education. I list some below, with due acknowledgement to the magazine, Acorn User (Issue 46, 1986 May, page 170).

<u>Program Title</u>	<u>Publisher</u>	<u>Price</u> £ p	<u>Computer</u> <u>Suitable</u>	<u>Level</u>
Astronomy	B.B.C.	9.20	BBC model B, Acorn Electron	S*
Constellation	Micro Power	6.95	B	S
Night Sky	Bridge	9.90	B, B+	S
Planet Patrol	MacMillan	6.95	B	J/S*
Planetary Motion	Longman	20.13	B	S
Satellite Orbits	Edward Arnold	16.00	B	S
Space Scan	MacMillan	10.50	B	I/J*
Starfinder	Century	12.95	B	J/S
Starmap	Heinemann	18.40	B	J*
Stars	AUCBE	13.80	B, Econet	S
Starseeker	Mirrorsoft	9.95	B, Electron	S

* Key: under Level, S stands for secondary, J/S for junior to secondary, I/J for infant to junior, and J for junior.

Geraint Day

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FUTURE OF ASTRONOMY IN THE U.K.

The following letter from the AAE President was published in the Daily Telegraph on 19th March, 1986.

SIR - Your correspondent, Mr. John Watson (March 12) is quite right to lament the increasingly precarious state of British observational astronomy; and to regret the announcement of the closure of the Royal Greenwich Observatory at Herstmonceux and what is involved in that action. As he comments; it appears to be happening without even a sigh of regret.

I do not know of anyone who "controls the overall balance of British astronomical strategy". Decisions appear to be taken but it is not always clear who takes them! Fortunately, there are individuals and organisations in Britain which try to encourage and develop the study of astronomy.

The Association for Astronomy Education was founded in 1980 to promote the teaching of astronomy at all levels in our educational system. We are hoping that by encouraging the teaching and study of astronomy in schools and colleges, societies and associations, the fascination of the subject will be opened up to a much wider public than hitherto.

It is clear that Halley's comet has aroused a great deal of interest; and it is vital that in the space age everyone should have an opportunity of learning about the Universe in which we find ourselves.

Amateur astronomers can still make contributions by observing comets, satellites, our moon, and other aspects of the night sky. It is a highly rewarding experience for its own sake in any case.

We hope that the time would come when it would be impossible to announce the closure of an institution such as the Royal Greenwich Observatory. An educated public that was aware of what astronomy was all about would never let it happen.

DONALD J. GOLD
President, Association for Astronomy Education,
Reading, Berks.

Letter

Dear Sir,

One way in which those opposed to the threatened closure of the Royal Greenwich Observatory could voice their protests, is to write to their MPs and to persuade their friends to do likewise. The following points are relevant . . .

1 - The prime meridian through Greenwich and the creation of the Royal Observatory was the result of a command by King Charles II, over three hundred years ago. It is an interesting legal question whether such a decree can be revoked by the SERC, or even the government.

2 - The Greenwich meridian is accepted all over the world, despite claims by France for it to pass through Paris, and by Greece for it to go through Athens. If the Royal Greenwich Observatory goes, what will become of Greenwich Mean Time? Will it be replaced by PMT or AMT?

3 - Links between the RGO and British Universities are to be encouraged, but is not a link with Sussex University, about forty minutes drive away from Herstmonceux, more logical?

4 - Purely financial considerations resulting in the destruction of part of our natural heritage are to be deplored. We might hear next of plans to dismantle Nelson's column and Stonehenge as their maintenance costs are too high.

Eric Zucker

* * * * *

CELESTIAL OBJECTS VISUALLY NEAR THE SUN

On 9th February, 1986 Comet Halley reached its nearest point to the sun. For several days around this date Comet Halley was only a few degrees from "King Sol". It is naturally assumed that celestial objects, such as comets and planets, within a few degrees of the sun, will be masked by our luminary's light, and hence will not be observable in daylight. But is this always the case? Apparently not.

John Bortle, in an excellent article in International Comet Quarterly (January, 1985) states that 100 or more years ago astronomers routinely followed the planets Mercury and Venus to within a degree of the solar limb. He reports that W. R. Dawes considered that Venus could be observed when no more than one arc minute from the solar limb!

Bortle himself has observed Mercury and Venus only 62 and 39 arc minutes respectively from the sun's photospheric limb. His results were achieved by using very modest equipment, which could be anything from 20 x 80mm binoculars up to 9 inch (225mm) diameter telescopes. In addition, a solar occulting device is used; this could be something as simple as the edge of an observatory dome or some distant building. In addition, a weak filter, such as a neutral-density filter, can reduce sky brightness.

With regard to comets being visible in the vicinity of the sun, I shall mention only one - Comet Halley itself. At the 1910 apparition, according to Joseph Marcus of Comet News Service, there were at least four reports of daylight sightings of Comet Halley. Perhaps the most amazing of these sightings was that of J. B. Bullock from Hobart, Tasmania, on 19th May, 1910. By obliterating the sun with a nearby building, he detected Comet Halley when the sun was between 23 degrees and 28 degrees altitude. With the naked eye Bullock saw the comet until it was only one degree from the solar limb, and with field glasses until it was almost touching the sun's limb! It is possible that the amount of sunlight reflected and scattered in a forward direction by

certain-sized dust particles in the comet increases phenomenally, and consequently enables the comet to be visible in daylight, possibly at a magnitude of minus nine.

On the basis of the previous evidence and other evidence in the literature, together with my own personal observations, I conclude that it is surprising what celestial objects one can see in the sun's vicinity, that is within several angular degrees of the sun.

*

WARNING: Observing celestial objects within a few degrees of the sun, or even searching for such objects, is a highly dangerous activity. The writer does not recommend anyone but the most highly experienced observers to attempt such activity. He will not accept any personal responsibility for any eye damage subsequently caused by such observations!

*

David R. Keedy,
South Shields

(David R. Keedy is an amateur astronomer of long-standing, a member of the British Astronomical Association's Comet Section and of several astronomical societies. More recently, he is making efforts to popularise astronomy.)

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A TRIBUTE TO THE SUN

It rises tantilizingly, each morning,
over a majestic horizon,
from its ordeal with the underworld,
bringing warmth and comfort
once again to a cold world.

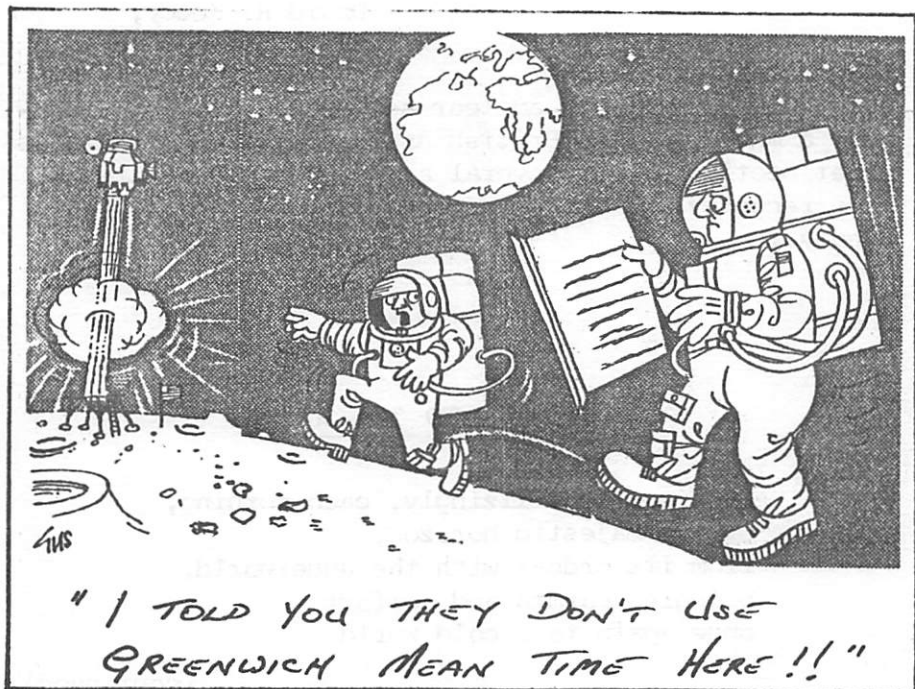
(continued)

This beautiful object,
the harbinger of excellence,
the dismitter of peril,
bathes a hemisphere of the Earth in light
and evicts the terrors of the night.

This fiery ball, as it moves relentlessly
over its ecliptical path through the sky,
declines to shine only to the small,
barren body of the Moon;
plunging the Earth into a deathly darkness.

Dark spots float across the bright
blinding disc, huge prominences
erupt from the violent surface,
and flares spread outward into the solar
system revealing its true awesome power.

H. Kinsman



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