



GNOMON

Newsletter of the Association for Astronomy Education

Vol. 7 No. 2

ISSN 0952-326X

January 1988

EDITORIAL COMMENT

Judging by the response, readers seem to like the new format of the Newsletter – also the name (there have been several suggestions as to its origin and significance). I was prompted to look it up in a dictionary, and the first one to come to hand was Chamber's Etymological Dictionary, which rendered the following: "the pin of a dial, whose shadow points to the hour; the index of the hour – circle of a globe" – so far, so good, but then "a parallelogram minus one of the parallelograms about its diagonal." One lives and learns!

Articles for GNOMON

Please continue to send these in. The AAE is concerned with Astronomy Education *at all levels*, so do not worry if you think your contribution may not be wanted because it is "at the wrong level". In this issue, for example, we have articles about school visits to planetaria, and about computer solutions to problems on trajectories.

Advertising in GNOMON

Adverts of reasonable length are *free* to members. The cost of commercial adverts, best included as inserts, depends on the material supplied. Please contact the Editor for details.

Copyright

The AAE waives its rights to copyright as long as (1) the copies are made for educational purposes, (2) the AAE is quoted as the source, and (3) attention is paid to the copyright being possibly vested in other publications (if there is any doubt on this, contact the Editor).

Constitution

A draft version of the constitution of the AAE has been produced by the Council, and at the time of writing it is proposed to include a copy to each member with this Newsletter. Members are asked whether they have any amendments to the draft constitution – if so, they will be debated at the Annual General Meeting of the Association in the summer. The final version will be decided upon at the AGM. Important sections of the draft include: postal voting by all members for officers and other Council members; provision for the appropriate number of Vice-Presidents and of other officers as deemed necessary; precise adherence by Council members to the requisite period of office.

New Secretary

The vacancy for this post (previously held by Capt. Peter Richards-Jones) has now been filled by the Council, in accordance with the "old" constitution; the new secretary is Bob Kibble (for address, see separate item in this Newsletter).

Subscriptions

These were due on 1 September. Please save us from sending out costly reminders by checking you have paid yours. No further Newsletters will be sent out to members in arrears. Subscription rates are: Individuals £5 (£4 if retired); Primary School affiliation £4; Secondary School affiliation £7; other affiliation (University, Polytechnic, College, Library, etc.) £10.

FREE PLANETARIUM LECTURE FOR AAE MEMBERS

The London Planetarium is offering free admission to two lectures in 1988 – on Saturdays March 19 and November 12, both at 10.30 am. More details will be announced in due course, but it will be a good opportunity to meet up with members of the Junior Astronomical Society, which is the body responsible for organising the lectures. The Planetarium Administrator, The London Planetarium, Marylebone Road, London NW1 5LR (Telephone: 01-486-1121).

ADDRESSES FOR CORRESPONDENCE

Secretary: Bob Kibble, 34 Acland Crescent, Denmark Hill, LONDON SE5 8EQ *for all general enquires* (Tel: 01-274-0530).

Treasurer: Laurence Anslow, "Asterion", 18 Wellington Lane, FARNHAM, Surrey. GU9 9BA (Tel: 0252-20588). *For all financial and subscription enquiries.*

Editor: Eric Zucker, 35 Gundreda Road, LEWES, East Sussex. BN7 1PT (Tel: 0273-474347). *For all enquiries concerning the Newsletter.*

DATA PROTECTION ACT

The Association is keeping its membership lists on computer. In order to comply with the law, we are asking all members if they object to this information being stored on the computer – the only information stored is the name and address, membership dates, whether the subscription has been renewed. Such storage greatly simplifies the administrative work of officers. The Association undertakes not to supply this information to any other organization, except possibly to other astronomical bodies for the purpose of circulatory book lists, etc.

If you have no objection to the scheme, there is nothing to do, but if you object and would like your name removed from our list, please let the Secretary know of your objection – your name will then be removed from the list, but you will continue to receive communications in the traditional "non-computer" manner.

THE TEACHING OF ASTRONOMY

The substance of the address to the IAU Colloquium in Paris last June by Cmdr. H. R. Mills, reported in Gnomon Vol. 7 No. 1. Cmdr. Mills represented the AAE.

It is in the world of teaching that the amateur is able to play a vital role in popularising astronomy. Amateurs practice their skills for the love of their subject. This quite wrongly can create the impression that amateurs are not truly expert.

An effective teacher knows that his job is not merely to teach, but is more importantly, to help pupils to understand and learn. Many people believe that if a person knows a subject at an advanced level, then he or she must be able to teach it well. The opposite is often the case. Certainly it is necessary for a teacher to have a sound knowledge but this by itself is not sufficient.

Teaching has been described as the mystification of the ignorant by the indolent but a devoted and successful teacher can never be indolent and his pupils need never be mystified, because the true amateur communicates both his knowledge and enthusiasm, which are contagious. The history of astronomy reflects the history of mankind as astronomy has had a profound influence on the development of civilisation. An amateur astronomer has several characteristics of a religious person, who, according to Brother Lawrence, is one who practices the presence of God, the creator of the Universe.

The astronomer practices the presence of the Universe, and finds a satisfying wonder and mystery that passes all understanding. The teaching of astronomy in schools is not always easy or welcomed by teachers as a subject in the syllabus. The essential condition for successful teaching in astronomy, or in any subject, is that the learners must *want* to learn. Without

this pupils lose interest, become mystified and learn nothing. A good teacher should devote much thought and time to promoting the desire to learn by rousing curiosity through current events in astronomy, by drawing on the many resources now available through the radio, television and magazines, dealing with space missions to the planets, and the galaxies beyond our own Galaxy.

The teaching of astronomy in schools particularly demands much good common sense and sound child psychology, although pedagogical psychology has been described as telling people what they know already in words that they do not understand. Good teachers know the importance of making sure that their pupils fully understand what is being taught. Here is an example of the effect of bad teaching, that is teaching that does not produce understanding, on a pupil who consequently has muddled concepts. After a few lessons on geography, the Moon, the force of gravity and the tides, a pupil was asked the question "What causes the tides?" The pupil replied, "The tides are caused by the rays of the Moon striking the surface of the sea at an angle of 23½ degrees Fahrenheit!"

Many schools do not have astronomy as a formal subject of study leading to a recognised examination; even so the cause of astronomy can best be served by teachers being encouraged and trained to enrich and enliven their science lessons and project work with examples from astronomy. It is difficult to conceive of a subject in the school curriculum that cannot be made more interesting and enjoyable by drawing on the vast resources available in astronomy. Examples abound under gravitational forces, the orbits of planets, the colours of the stars, spectroscopy, our own magnificent star, the Sun, and its lifegiving nuclear energy, organic molecules in space, our Earth considered as a splendid space ship in orbit round the Sun and having all the modern comforts of water, air, food and a comfortable gravity. In my view there is a need for a comprehensive source book for the use of science teachers, giving helpful information relating science teaching with astronomy. UNESCO has published a manual at an elementary level entitled "UNESCO source book for Science Teaching", which has a section devoted to astronomy. A manual for secondary schools would help pupils to learn with advantage both science and astronomy. It is widely acknowledged that astronomy draws upon all the sciences for its progress towards our understanding of the universe and inevitably astronomy feeds back a valuable and stimulating contribution to the advancement of science. Such a manual would serve to facilitate the cooperation between the numerous national organisations which are keen to develop their programme for astronomy education. In the United Kingdom, we have an Association for Astronomy Education which has largely contributed to a booklet entitled "The Teaching of Astronomy", and also a Newsletter published three times a year with articles on various methods for presenting astronomy in schools by integrating it into the normal science courses. Teachers of astronomy have to keep up to date in their subject, to keep abreast of the numerous discoveries. This is necessary for all teachers. An anecdote may be appropriate here. A teacher at an interview with his headmaster asked for promotion on the grounds that he had had 20 years experience. The headmaster replied that this was *not correct, and pointed out that "You have not had 20 years of experience, you had initially one year's experience which you have used for 19 years!"*

The healthy development of astronomy depends on teachers of science and indeed on amateur astronomers, being given every encouragement and incentive for promoting in young people a keen interest in and a desire to learn about astronomy so that even if they do not ultimately rise to the dizzy heights of becoming professional astronomers (and so earning their living by it) they will achieve a lifelong cultural interest or hobby and enjoy observing the heavens with a sense of wonder and mystery.

Commander Mills illustrated his talk with slides, some of which are listed below.

A celestial sphere with altitude and azimuth circles; an easily made mounting for binoculars equipped with circles for measuring altitude and azimuth; a simulated mini-planetary; a planisphere; a direct altitude and azimuth measuring device; a simple school-made sextant; a slide illustrating some simple mathematical formulae; a do-it-yourself equatorial sundial made from the rim of an old bicycle wheel; a device for telling the time using the altitude of the Sun; a device for finding Local Sidereal Time.

Any member of AAE requiring further information on these devices should contact Cmdr. Mills at 83 Firs Road, Firsdown, Salisbury, Wilts. SP5 1SW. Please enclose a reasonably-sized stamped and addressed envelope for the reply.

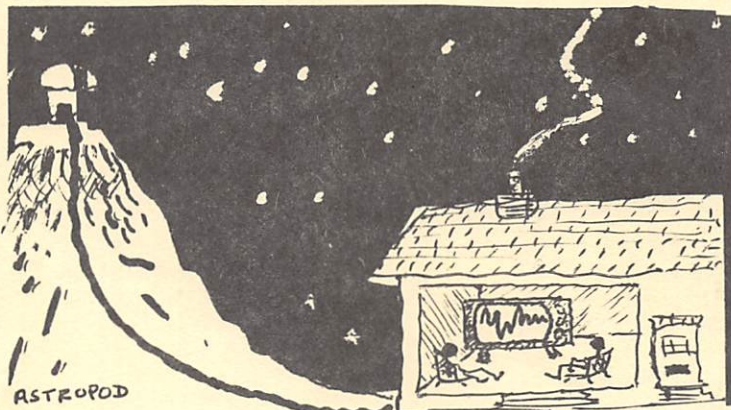
ASTRONOMICAL VIDEO TAPES FOR TEACHERS

The AAE is now compiling a catalogue of these. As the list runs into several hundreds of tapes, the catalogue is quite comprehensive (it will include the date of production, the producer and hirer, a brief abstract of the subject, and its suitability at different levels). Many videos ostensibly for further education may be profitably used at a lower level by turning off the sound, the teacher adding his own commentary.

The catalogue will be produced quite separately from this Newsletter, and a charge will be made for those members requiring a copy. In order to keep down costs, photocopies will be made on request for those placing orders for the catalogue, plus a charge for postage and packing. The cost will probably be in the order of £2.50, but this is just an estimate at the moment.

Details will be given in the *next* issue of GNOMON; please send no money until then.

Eric Zucker



"THEY SHOULD HAVE GONE
TO RADIO RENTALS"

BOOK REVIEW:

Observational Astronomy, by S. J. Lubbock (Federation of Astronomical Societies, 1987)

This is a useful introductory handbook for the beginner in observation (as opposed to the beginner in the armchair!!). The author rather assumes, however, that the beginner already has his telescope mounted and aligned, ready to observe, since, apart from the usual caveat about cheap instruments of dubious origin, the section on mounting and aligning is very poor.

He rightly emphasises the danger of looking at the sun (DON'T, at least directly, and also beware of inadvertently catching reflections of it in a reflector), but this warning would also have been useful had it been stated right at the beginning of the book where the scope of the work is outlined in the introduction.

The explanation of object-finding without a finder on an altazimuthally-mounted reflector is decidedly woolly – I think many beginners would be little wiser after reading it.

I was disappointed not to see the AAE among the list of organisations and publications useful to the amateur observer, and, incidentally, of the publications, Norton's Star Atlas is no longer published by Gall & Inglis.

The section on lunar observations was a little muddled. In the first of two consecutive sentences, the Moon is said to pass along the ecliptic, and in the next sentence one is enjoined to estimate the difference between the plane of the lunar orbit and the ecliptic. Later on, he fails to distinguish between physical libration (described as a 'wobble', and which accounts for hardly any of the lunar surface in excess of 50% which is visible from Earth), and optical libration (which isn't due to any wobble, and which accounts for almost all the aforementioned excess).

In the section of Jupiter, the author fails to mention that mutual eclipses and occultations of the Jovian satellites only occur every 5.93 years, when Jupiter's equatorial plane passes through the Sun, so an observer just missing one such occasion will be in for a long wait.

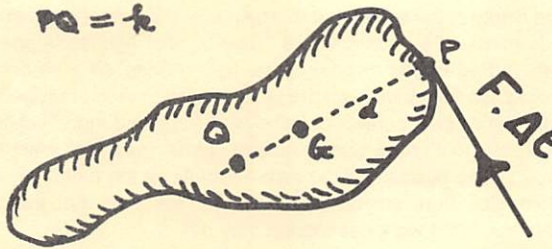
Despite these criticisms, however, the book is nevertheless a useful reference source, detailing over 200 objects, of varying degrees of difficulty, at which the observational novice may usefully direct his instrument.

R. V. J. Butt

THE ASTEROID PROBLEM

A number of replies to the Asteroid problem (GNOMON, Vol. 7, No. 1) have been received. There were some ambiguities in the problem (eg does the force F maintain constant magnitude and direction, or does it rotate with the asteroid, if this really does rotate?). One suggestion is from Cmdr. H. R. Mills, who assumes that the force is constant in magnitude and direction. In a short time Δt , the asteroid experiences an impulse $F\Delta t$. The change in momentum is also $F\Delta t$.

By the conservation of momentum principle, this momentum will be divided between an instantaneous angular momentum about a point Q where $PQ=k$ the radius of gyration about Q, and the linear momentum of the centre of gravity G, in the direction of the Force F. Suppose the angular velocity produced by the impulse to be ω and let I be the moment of inertia of the whole body, then $F.\Delta t = I\omega + M\omega(k-d)$. The position of Q, and the value of k depend on the shape of the asteroid. The impulse on the asteroid could be given by an encounter with a meteorite.



The solution to the problem is that under an impulsive force the asteroid will rotate about its centre of inertia, while its centre of gravity moves at a constant velocity in the direction of the original impulsive force.

Another suggestion is made by Keith Atkin, and his contribution is as follows:

Application of a single force at the edge of the asteroid will result in motion which is quite interesting!

The situation in Fig 1 is unaltered by adding two equal and opposite forces at the centre of mass. Fig 2 now reveals that we have (a) a force F at the centre of mass together with (b) a couple of value $F.r$.

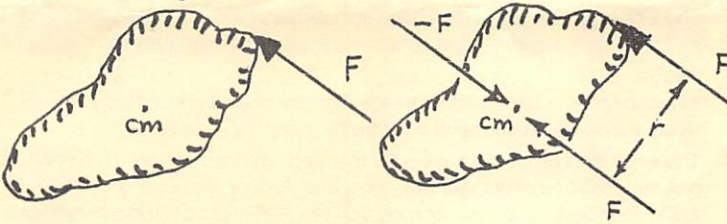
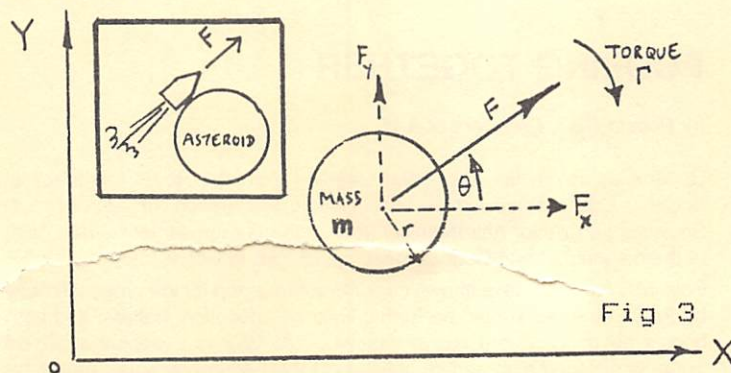


Fig 1

Fig 2

It follows that the resulting motion will be translation of the asteroid as a whole with a superposed rotation. The really interesting question is - what does the motion look like in detail? We can answer this by considering the slightly simplified case of a spherical asteroid to which a constant edge force is applied. Fig 3 shows the system of forces and the frame of reference XY.



Now the torque on the asteroid is given by $\Gamma = -(2/3)mr^2(d^2\theta/dt^2)$ where $\Gamma = F.r$

The solution of this is:

$$\theta = -(5F.t^2)/4mr$$

giving the angular displacement as a function of time.

The force components are:

$$m(dv/dt)_x = F.\cos\theta \quad \text{and} \quad m(dv/dt)_y = F.\sin\theta$$

We thus end up with the system of equations below.

$$\begin{cases} \theta = -5F/4mr.t^2 \\ (dv/dt)_x = F.\cos\theta/m \\ (dv/dt)_y = F.\sin\theta/m \\ dx/dt = v_x \\ dy/dt = v_y \end{cases}$$

Using a computer modelling program, I performed a numerical integration of these equations for the following scenario.

- Asteroid mass = 1×10^{13} kg
- Asteroid radius = 1 km
- Edge force = 7 MN

The chosen force is equivalent to the thrust of the Saturn V first stage!

Fig 4 shows the initial state of the asteroid in our frame of reference.

Fig 5 shows the resulting trajectory and Fig 6 shows the speed of the centre of mass as a function of time.

```
L.8000,
8000REM ASTEROID MODEL
8010DN OA GOTO 8020,8060,8110,8140
8020PRINT" tumbling-asteroid Model":PRINT
8025 C$="R":T$="L"
8030INPUT"Mass",M
8040INPUT"Radius",R
8050INPUT"Edge force",F
8060 H=-5*F*D*D/(4*M*R)
8070 US=SQR(U1*U1+U2*U2)
8080 D1=F*COS(H)/M
8090 D2=F*SIN(H)/M
8100RETURN
8110 D3=U1
8120 D4=U2
8130RETURN
8140 PRINT TAB(2,29);"M=";M;" kg R=";R;" m"
8150 PRINT TAB(2,30);"F=";F;" N";
8160RETURN
8170END
Computer model. 'RETURN's call an integrator and plotter.
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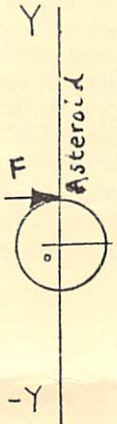


Fig 4

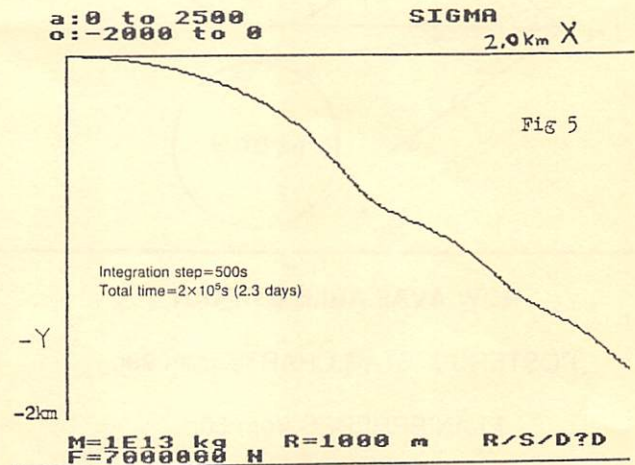


Fig 5

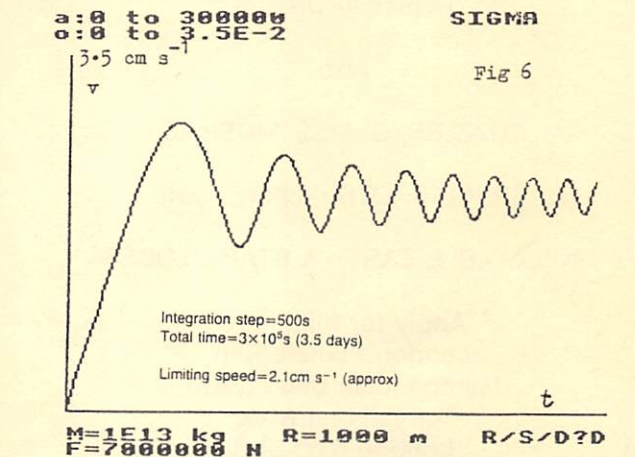


Fig 6

Points to note

- (i) The trajectory shows some initial wandering but becomes more and more linear.
- (ii) The speed of the centre of mass exhibits interesting oscillations which die away as time progresses. Yes, the asteroid would keep speeding up and slowing down in its trajectory! However, the speed of the centre of mass tends to a limiting value with more and more of the kinetic energy becoming *rotational* and less and less of the kinetic energy becoming translational. The speeding up and slowing down should not surprise us as the edge force periodically points in opposite directions.

Readers have indicated that they enjoyed this problem, and requested more in the same vein. We are pleased to say that we hope to continue producing them, but we would like members to send us problems like this. We cannot guarantee that we will print them all, but please send them to the Editor, nevertheless.

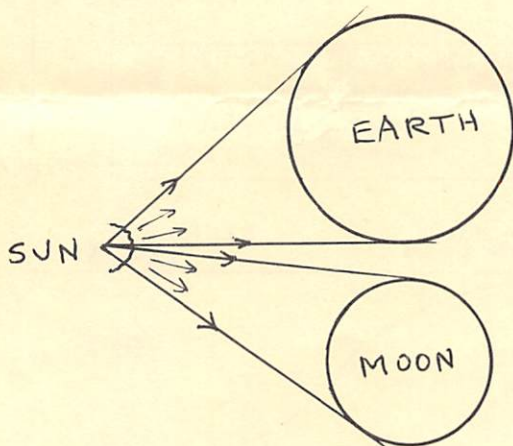
For the sake of reference, the problem will be numbered. The last problem becomes Gnomon Problem No. 1 – we will abbreviate this to GNOBLEM 1.

GNOBLEM 2

The diagram shows charged particles emitted by the Sun (the solar wind). Some of the particles strike the Earth and the Moon. These bodies therefore acquire electric charges, the Earth more than the Moon, as the Earth subtends a larger solid angle, at the Sun, than the Moon. The acquisition of these electric charges raises the electric potentials of the Earth and Moon, due to their capacitances. Thus there should exist a potential difference between the Earth and Moon.

When an astronaut from Earth lands on the Moon, does this potential difference cause him to experience an "electric shock"?

Comments, please to the Editor.



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THE GREENWICH STAR DISC

This disc is definitely a competitor to the Philips' Planisphere which has held the market for a long time. It is a precise instrument which will enable one to identify "what star is that?" immediately, just by lining up the date and time on the edge of the discs. It may be used anywhere in the UK and with certain limitations in the Mediterranean.

Design

It is made of two fairly durable plastic discs about 10" in diameter (250mm), with blue and white as the colours. The stars are etched in blue on a white background. North and South are printed in full view, a welcome addition for the beginner. The artist is Mike Swan, the well known celestial cartographer; the author and radio personality Ian Ridpath is responsible for the text and general idea.

Use

I like the clarity of the layout, but this gain is at the loss of a few star names, and I do miss old friends such as "Diphda" in Cephus, "Alpheratz" and "Markab" in Pegasus and certainly "Hamal" in Aries. All of them navigation stars of old. On the other hand the small reduction in the number of names is insignificant when considering the white background. That is really a winner. Although it has a glossy surface, it took my pencil mark and I was able to plot in the positions of the visible planets for this month, having taken the information from the newspaper. I am not sure that the producers intended this, but it works as though they did.

General

I have had in my possession since the end of the last war, a Star Finder and Identifier, by courtesy of the US Navy which I have literally used to help me navigate all over the world, by pencilling in the positions of the planets. It even came out of its dust cover a while ago to plot Comet Halley's path amongst the stars. The same is true for the Greenwich Disc, it is functional. I have checked it out of doors at night and with a decreased light source it was easily readable.

Summary

The clarity of the disc will appeal to the beginner, and apart from some problems with pronunciation of names (which is normal) children will read it easily.

At a comfortable price it could be ideal for the school and school journeys. I would therefore recommend it for those purposes.

The white background is a must for teachers and yachtsmen. To be able to plot the positions of planets with ease and without the need for skills, is an asset for those who are headed for the RYA yachtmaster certificates. Offshore or Ocean. Be one jump ahead and know "what star is that?"

For details of the Greenwich Star Disc, contact Ian Ridpath, PO Box 88, Brentford, Middlesex, TW8 8PD. The price is £2.99.

Capt. Peter Richards-Jones

POOLING TOGETHER

by Donald Gold, President of AAE

General approval has now been received from the Royal Astronomical Society, British Astronomical Association, Federation of Astronomical Societies and Junior Astronomical Society that a representative from each of them should attend Council meetings of AAE in liaison capacity.

Both JAS and FAS have shown considerable support for the proposal made by AAE that there should be formal links on education matters, and both bodies have nominated representatives. The JAS representative will be Tony Sizer (subject to confirmation), and the FAS representatives will be Robert Owens, FAS President and Eric Zucker. The BAA has nominated Martin Ratcliffe.

RAS has reported that it has re-activated its Education Committee under the Chairmanship of Dr. K. A. Whaler, its Vice President, and that he will be contacting AAE on the matter of representation shortly.

It is therefore hoped that the task of promoting astronomy education will be given additional impetus by establishing formal liaison between the major bodies and AAE.

ASTRONOMY COURSES FOR TEACHERS

By Dave Harris, AAE Courses Organizer

The AAE ran two courses for teachers sometime ago. For various reasons they were very poorly attended and we were discouraged from running any others.

In the field of amateur astronomy however, things have been progressing steadily. Residential weekend courses are regularly held at various locations by other organisers such as the BAA, Lancashire Polytechnic, Dundee Observatory and Wolverhampton Astronomical Society. At these gatherings amateurs spend only 35-40% of the available time in formal lectures; for the remainder of the time they "talk astronomy" at all levels, being only too happy to help a beginner.

I would like to encourage teachers who want to learn a little about astronomy to come to such courses. By mixing in with the amateurs, they will learn a great deal upon which to base any astronomy that they would like to include from time to time in their teaching.

As a teacher, I feel that it is not our job to "teach teachers how to teach" but to provide opportunities for them to acquire basic information which they can use as they wish.

There are two courses booked to take place in 1988 at Alston Hall, near Longridge, about nine miles up the Ribble valley from Preston. They are 4-6 March, 1988 and 4-6 November 1988.

As you read Mike Gainsford's account of the weekend in October, 1987, consider how joining in on such a course could be of interest to you.

Cost would be about £40 for full board, with a large telescope for use, weather permitting, by courtesy of Lancashire Polytechnic Astronomy Department.

For further details please enquire by using, or photocopying, the form below and sending it to: Dave Harris, Bilston Community College, Westfield Road, Bilston, Wolverhampton WV14 6ER

both such opportunities, and what's more in very pleasant surroundings, at Alston Hall, in the beautiful Ribble Valley, in a lovely part of Lancashire.

The October weekend was formerly a BAA meeting, owing much to Dr. V. Barocas, who still lives nearby. However, it is now organised by Dr. Mike Bode of Lancashire Polytechnic. The writer has been attending these weekends for about twenty years, and that of 2-4 October maintained the very high standard set in previous years. Unfortunately the weather was not so kind this time, so a mere glimpse of the Moon through the 15 inch Grubb Parsons refractor was all that could be achieved. In the past, the writer has managed even a few estimates for the Variable Star Section!

'Variable Star Research' was the subject of this year's course, the lecturers being BAA's own Melvyn Taylor and Denis Buczinski, together with Dr. Mike Bode and Mr. Mike Peel (Lancashire Polytechnic), and Dr. John Davies of the Royal Observatory, Edinburgh.

Dr. Bode opened the course on the Saturday with a talk on the amateur/professional interface. It was pleasing to hear 'from the horse's mouth' that amateurs can and do carry out work that is of use to the professionals. This is particularly so in the cases of variable star work, in particular the discovery and monitoring of novæ, and keeping an eye on the activities of objects like dwarf novæ and R. Coronæ Borealis stars. Dr. Bode also closed the weekend with an update on the LMC Supernova (1987a). This is still somewhat of a mystery object, not displaying all the characteristics of a classical Type II supernova. It is predicted that it will leave a pulsar rotating at about 200 revs/sec, detectable in around two year's time.

Melvyn Taylor (BAA's Variable Star Section Secretary) gave a talk on the observation of variable stars, covering the techniques as well as the problems, a number of those in attendance being so inspired that they took away copies of VSS charts to try it out for themselves. Variable star work is a field open to virtually anybody, and does not depend upon the possession of an impressive telescope. After Mr. Taylor, Mr. Peel presided over a members' session on computer software for variable star research. He presented several programs he has written himself for the analysis of VS lightcurves.

Dr. Davies of the Royal Observatory, Edinburgh, outlined the behaviour of pre-main sequence variables, such as T Ori, R CrA, UX Ori, and BF Ori, and postulated some possible reasons for the puzzling light curves. There is much that remains unexplained about these objects, and a good deal of valuable work that the amateur could contribute.

On Sunday Denis Buczinski (BAA Deep Sky Section Director) presented a talk entitled 'Searching for Supernovæ'. This of course means searching for them in nearby galaxies, one of the projects undertaken by the Deep Sky Section. New observers are wanted for this work. All that is needed is a moderate telescope, and of course a degree of patience and dedication. This type of work is of immense value, and sufficient dedication could result in real fame, if that is what one seeks!

But the weekend was not all a matter of formal talks and lectures. Discussions went on over meals and coffee and, (because the skies were overcast of course) over a pint in the bar. And to ensure that things did not become too serious, Arthur Missira presented his usual video show, which by all accounts was not particularly astronomical. (There isn't a constellation 'The Crocodile' is there?)

The date for next year's weekend is already fixed at 4-6 November, 1988, and this should be firmly underlined in your diaries. There is also a Spring weekend on 4-6 March, 1988. This is the annual event organised by Wolverhampton Astronomical Society but in no way limited to their members.

Further details will be announced in BAA Journal and elsewhere in due course, and it is advisable to book early. Attendance is limited, the resultant rather intimate nature of the event being one of its many advantages.

The Preston weekends can be wholeheartedly recommended.

I would like further details of weekend astronomy courses at Alston Hall.

Tick boxes as required

Weekend of 4-6 March, 1988

Weekend of 4-6 November, 1988

Name

Address.....

I am not a teacher, but am still interested in attending

I am a teacher in the area indicated

Primary

Secondary

Further Education

Higher Education

ASTRONOMY TODAY

A brief report on the course held at Alston Hall, Preston, on 2-4 October, 1987.

By M. J. Gainsford, 156 Sapcote Road, Burbage, Hinckley, Leics. LE10 2AY.

There are, perhaps, few opportunities for amateur and professional astronomers to meet together informally over a bite and a pint. Similarly there are few opportunities for the average amateur to have a glimpse through a really large refractor. The bi-annual Preston weekend provides

MEMBERS ADVERTISEMENTS

Members' personal advertisements are free, as long as they are of reasonable length. There is a charge for commercial advertisements (apply to the Editor for details).

COMPUTERS AND THEIR USE IN ASTRONOMY. If you have any information which would be of help to a B.Sc. Computing undergraduate who is writing a thesis on the above subject, please contact Mr. A.C. Mackman, 5 Tredynas Road, FALMOUTH, Cornwall, TR11 4LS.



LETTERS

Dear Editor,

May I be permitted a few words in response to the interesting letters which resulted from my comments on metric units?

(a) D. McNally says "... if he/she knows about miles then use miles ..."

I think we should resist this approach, in that a clear quantitative appreciation of physical science can only come from use of a COHERENT system of units. It is not easy, especially for students, to COMPARE quantities (and therefore appreciate SCALE) if a rag-bag of arbitrary units is encouraged. Moreover, calculations become a positive nightmare! No, it is up to us as educators to set a good example by aiming for consistency and clarity wherever possible.

(b) There is no possible justification in clinging to the use of angstrom units; the nanometre is there for all to use.

(c) I agree that the UK should go metric – it can't come quickly enough for me – but the point is surely spurious as we are discussing the units to be used in SCIENCE (not in joinery, as Martin Black seems to think).

(d) I welcome the support of Trevor Wilson from 'Down Under' but I can see no purpose in quoting Imperial units (even in parentheses) as well as metric ones. What would be the point? This would only serve to clutter the printed page and would do nothing to encourage the Imperial die-hards to change their ways.

(e) I also thank D.J. King for his generally supportive comments but have to point out two things:

(i) Although we are no doubt stuck with the parsec, light year and astronomical unit for a long time to come, there is really no LOGICAL reason for their retention. The SI prefixes giga (G), tera (T), peta (P), and exa (E) will take us quite a long way, e.g.

Earth-sun distance = 150 Gm
Distance to alpha Centauri = 43 Pm
Diameter of galaxy = 900 Em
'size' of known universe 10^9 Em

(ii) An SI purist would certainly not have apoplexy over the use of "... light-travel time as a measure of distance ..." as that is exactly the sort of distance unit he/she uses! The definition of the metre is the distance which LIGHT TRAVELS in vacuum in $1/299\,792\,458$ of a second.

In conclusion may I say how refreshing it is to participate in good healthy argument through the pages of *Gnomon*. A bit of controversy never harmed anyone!

Yours sincerely,

Keith Atkin
14 Cortworth Road, Eccleshall,
Sheffield S11 9LP.

Dear Editor,

It may not be generally appreciated that there is a simpler alternative to Commander Mills' nomographic method¹ of converting equatorial to horizon coordinates, requiring only a single operation. All that is needed is a minor modification to the standard Philips planisphere, carried out with a red felt-tipped pen of the type used for writing on Vugraph sheets (e.g. Staedtler 'Lumocolor').

First, note that local sidereal time (LST) can be read directly from the planisphere (a fact which the makers might have been expected to capitalise upon!) by drawing a short radial line outwards from the '12 noon' mark. When the planisphere is set in the normal way by aligning local mean time (LMT) with the date, this line crosses the Right Ascension scale at the corresponding LST.

Of course, the planisphere window now shows the stars visible, at the selected date and time, to an observer at latitude $51\frac{1}{2}$ degrees north. The altitude and azimuth of any object can be read directly from a suitable overlay; this is most easily produced by placing figure 1 (at the correct scale) between the two plastic sheets of the planisphere and tracing the lines on to the front window.

It will be seen that the LST indicator is an incidental bonus – there is no need to know LST in order to use this method. The planisphere already has RA and Declination markings (at 2 hour/30° intervals); the added benefit of a star map makes the conversion process immediately meaningful. A paper copy of the overlay (computed using the standard formulae²) to the correct scale for the 25cm planisphere may be obtained from me on request (s.a.e. please).

For some years I have used home-made planispheres for teaching purposes, designed with a conspicuously labelled LST scale to enable

students to make a quick check on their own calculations. More importantly, they show the stars in black on a white background, and thus lend themselves to much finer graduation of the equatorial and horizon coordinate scales in contrasting colours, giving 'instant conversions' with considerable precision.

References:

1. AAE Newsletter, vol. 7 No. 1, page 4 (September 1987).
2. P. Duffet-Smith, 'Practical Astronomy with your Calculator', (Cambridge University Press, 1981).

Yours faithfully,

George Y. Haig,
35 Dalmahoy Crescent, Bridge of Weir,
Renfrewshire PA11 3JB.

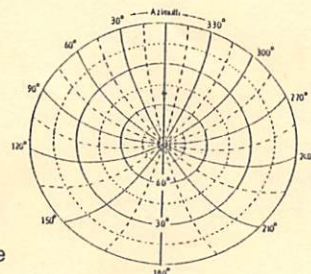


Figure 1: altitude & azimuth
scale for planisphere

CHILDREN'S CORNER

Chevening C.E. Primary School, Chipstead, Sevenoaks, Kent.

Dear Mrs. Hunter,

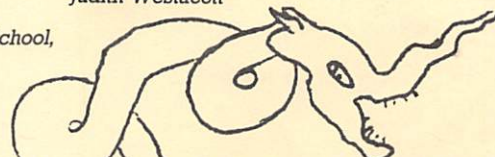
Thank you very much for the very interesting lecture and slides you showed us. I thought the London at night was very real to life, I liked the journey through space because it made you feel that you were really there, it was very realistic as we floated away from the Earth and went deeper into space.

I think that perhaps you could of showed us a few more of the constellations as I find them very interesting. I think that the programme could of been a bit longer as we enjoyed it so much.

I thought that the projector was very clever as it showed so many things. We are doing a project at school on the solar system.

Yours sincerely,
Judith Westacott

William Read Junior School,
Canvey Island,
Essex.



Dear Planetarium,

Thank you for letting our class come to the Planetarium and listen to the lady who was telling us about all the different stars in the sky and teaching us all the different names of them. I liked the way they blacked out the sky and put up the flying horse, Leo the lion, Orion the hunter and many more. I thought the lady was very good at telling us about them. It was very good in there, I would like to go again.

Yours sincerely,
Claire Adams

St., Peters & St. Margarets,
King Street,
Rochester, Kent.

Dear Mr. Ebdon,

Thank you very much for the interesting talk you gave our class. I liked especially the close up filming of the sun and wondered how you film these sort of things? I did not really know how you knew the amount of years it would to cross the galaxy but I suppose you are in the right.

Yours sincerely,
Richard Green

Douglas Junior School,
Ilkeston Road,
Nottingham, NG7 3GR

Dear Sir/Madam,

We are doing a topic about space, I would like to know how I would eat in space? Please could you post some posters or leaflets. Also I would like to know how I would wash my face? etc. Any information will be fine.

Thank you.

Yours sincerely,
Sukhdeep Sanghera