

GNOMON

Newsletter of the Association for Astronomy Education

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*This issue of 'Gnomon' has been sponsored by
The Royal Astronomical Society*

This enables the newsletter of the Astronomical Society of the Pacific, 'The Universe in the Classroom', to be included as pages 5-8 of this issue.

EDITORIAL COMMENT

Gnomons are now being printed black on white, in response to such a request, thus making photocopying cleaner.

★ ★ ★

Did anyone see the spectacular show of Northern Lights (Aurora Borealis) in the early part of November? If so, why not let us have an account of what you saw (or even, perhaps, photographed). There must be many readers who would be interested.

★ ★ ★

The AAE is maintaining links with ESTA (Earth Sciences Teachers' Association). Both organisations share similar views on the proposed changes to the National Curriculum. We plan an exchange of journals (*Gnomon* and *Teach Earth Sciences*) and the results of such exchanges will appear in the next (Spring 1992) issue of this Newsletter.

★ ★ ★

I wish all members of the AAE a Merry Christmas and a revitalising New Year.

Eric Zucker

NATIONAL CURRICULUM

Following proposals to dilute the Astronomy element in the National Curriculum, the Astronomer Royal sent the following letter to the Curriculum Chairman:

Dear Chairman,

ASTRONOMY AND THE NATIONAL CURRICULUM

I was surprised to learn from the Secretary for the Association for Astronomy Education, a body of which I am the Patron, that there was a possibility of Astronomy and Space having no distinct identity within the National Curriculum. I understand that it is not too late to reinstate this area, and I should be grateful for your advice as to how to strengthen the resolve of those who wish to see its identity maintained.

As time goes on, the subject of Astronomy is becoming more and more interesting to the whole populace, and children are no exception - in fact, judging by the contacts I have, many youngsters are absolutely fascinated by it. This fascination needs to be maintained and used to interest young people in science in general, and thereby to improve the whole scientific literacy of the nation.

I look forward to your advice.

With kind regards,
Yours sincerely,

A.W. Wolfendale, FRS
Professor of Physics, University of Durham, and Astronomer Royal

26 September 1991

Subscription Rates:

Individual members £7.50
Retired Members 5.00
Corporate Members
(e.g. schools, colleges, etc.) 15.00
Corporate members will receive two copies of *Gnomon*.

Extra Copies:

0 - 11 £1.00 per copy
11 - 50 0.75 per copy
51 - 0.50 per copy

Back numbers, not less than one year old, half these prices.

There will generally be a 10% discount to AAE members on all publications and advertising rates.

Practising teachers may claim their subscriptions as an allowance against income tax, thereby effectively reducing their contributions.

Addresses for Correspondence

Secretary: Bob Kibble, 34 Acland Crescent, Denmark Hill, London SE5 8EQ - for all general enquiries. (Tel: 071-274 0530)

Treasurer: Nik Steggall, 38 Victoria Crescent, Birkdale Road, Dewsbury, West Yorkshire WF13 4HJ - for all financial and subscription enquiries. (Tel: 0924-454718)

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

Advertising Charges

Whole page £120
Half page £60
Quarter page £30
Inserts £75*

* These may be of any size which may conveniently be inserted into the newsletter. There may also be an additional charge for posting if the inserts are heavy.

The prices are for one issue. A 25% reduction is made for advertising in all four issues.

ASTRONOMY IS LOOKING UP

Robert Mills, who represents the British Astronomical Association on the AAE Council, recently gave a talk at the BAA Exhibition Meeting, entitled 'There is more to Astronomy than meets the eye'. He was concerned that educational activities amongst the several astronomical organisations were not well coordinated. There were at least five such organisations: the RAS, the BAA, the JAS, the AAE and the DES. But, as if to challenge these very views, Robert Mills pointed out that he was speaking to the JAS as the BAA Council member of the AAE! Obviously he was underestimating his own rôle in bringing the organisations closer together!

AAE MEMBERSHIP QUESTIONNAIRE

This is a detailed account of the survey which was summarised in the previous issue.

There were 39 responses to this, many with specific and personal requests rather than general answers.
What follows is a summary of categorised responses.

1. INTEREST GROUP	Number	% of the 39
Primary school	6	15%
Secondary school	18	46%
Post-16 education	13	33%
Educational Administration	4	10%
Planetarium related	5	13%
Other*	7	18%

Note that the percentages add up to more than 100%, since many respondents ticked more than one category.

* The 'Other' category included post-18 education such as Universities and Polytechnics, LEA Science Centres, adult education and an astronomy mail order service.

Clearly the main result from all this is the demonstration of our wide diversity. Members are from every conceivable sector of education in its broadest sense, and from education services. The most frequent category, the secondary sector, may well be occasioned by the National Curriculum.

2. NEWSLETTER

Replies to this question fell into the following four broad categories:

A Those who felt that Gnomon fills its purpose adequately (but this does not preclude further suggestions as Below)	10
B Those who wanted more 'Down to Earth' classroom material, i.e. for AT16	13
C Those who felt there could be more news-items or notices of regional events	4
D Those who would like to see more letters and articles from the members	4

The largest category, B, reflects the growing concern about presenting astronomy in the classroom. Requests were specific, eg they want 'tips for the classroom teacher', 'basic information connected with AT16', 'pedagogic rather than academic' material, 'more examples of teaching materials', 'realistic classroom experiments' and 'simple devices to demonstrate astronomical principles, especially for children'. People who made these replies were, as expected, mainly those who ticked the first two categories in the INTEREST GROUP question.

Two people commented on the usefulness of the insert 'The Universe in the Classroom'.

Two people thought that Gnomon would need to evolve as the AAE and its aims evolve.

One practical suggestion was to print on a more easily photocopied colour!

3. SERVICES

Again replies concerning extra services fell into broad groups:

A Organise regional meetings/activities	20
B Join with or collaborate with ASE/RAS/BAA	3
C Provide more practical help, eg more work-packs, local planetarium visits, discounts on equipment	7

Comments about regional meetings also included suggestions for visits to LOCAL planetaria, universities or polytechnics. Several replies realised the difficulty of keeping regional meetings going, given only limited numbers of members in a region.

A few people were surprised to read of the services already on offer, having not heard about them before!

Some specific suggestions were:

Commission an inflatable Moon globe
 Run a Video library
 More workpacks
 Teacher training days
 Discount at Jodrell Bank
 Help with National Curriculum INSET

4. FUTURE PUBLICATIONS

Not everyone answered this section, but the general feeling from those who did is that almost anything will be welcomed.

Specific suggestions were:

As many publications as possible which stimulate teaching of astronomy.

A teachers' pack for Further Education

Lists of reviews of videos or TV suitable for AT16

Reports of successful projects in schools

GCSE coursework and project ideas

Ideas for cross-curricular ideas, eg in Maths, History, Art, Computing

A handout for the general public

A series of single sheets on the Moon, Eclipses, etc.

Several people mentioned the late appearance of the Secondary Pack!

5. POLICY

There were plenty of suggestions for further areas which might benefit from AAE effort:

More workshops/teacher training sessions	7
Liaison between schools and Higher Education	1
Astronomy in support of green policies	1
Adult Education	2
Pressure for astronomy on sixth form courses	1
Improve links with the media	1
Star parties and practical observing	1
Support for Liverpool AS Young Astronomer Days	1
World-wide promotion	2

6. REASON FOR MEMBERSHIP

Categories were provided for these responses but there was no category specifically for 'Pressure under National Curriculum'! Perhaps there should have been.

* I support its efforts in promoting astronomy education	31
* I value its publications and keep in touch with developments	13
* I value its discounts and other benefits	1
* Other	5

The last category, 'Other', contains three people who explained that they joined because of the National Curriculum.

7. COMMENTS

Again, not everyone filled in this box, but those who did made suggestions that are as widely varied as the other comments above. They include:

A list of AAE members in the area, for contacts
 Adult Education
 Improve service to members (*sic*)
 Forming a network of contacts and ideas for INSET providers
 Light pollution
 More advertising in *Gnomon*

Anne Cohen
 Education Committee, AAE

THE MATTER MYTH by Paul Davies and John Gribbin, Viking (Penguin Group), October 1991. ISBN 0-670-83585-4, hardback £16.99.

Someone recently told me about the '16 Club'. I confessed I had never heard of it. It turned out that the Club was made up of members who had got as far as page 16 of Stephen Hawking's best seller, 'A Brief History of Time'. I would like to forecast that this book, from the pens of two of the world's foremost popularisers, will also merit the title 'bestseller', and that most readers will get well past page 16.

The book deals with all the exotic ideas which have so recently come to the fore: black holes, worm-holes, the Big Bang. Those readers who enjoy a good fantasy will be delighted with questions such as: what happened before the Big Bang? But this is no fantasy – it is the application of physical ideas to processes which appear to us very strange. The book follows a historical development, dealing with Newton's laws of motion, determinism, the origins of the ideas of relativity (including how even now there are some scientists who challenge the very basis of the theory). But perhaps we are wrong about the way we *apply* these ideas in the domain of human affairs. Even the blurred ideas of Heisenberg's Uncertainty Principle in the realm of the subatomic could be regarded as deterministic. (In a dividing process, the Principle gives quite accurately the relative proportions along the dividing paths.)

There is a long and easy-to-understand chapter on chaos theory, originally put forward by Poincaré about a hundred years ago, but only now returned to prominence because of the use of modern, high speed computers.

There is quite a lot of space and time. (Did space exist before the Universe was created? *Where* did the Big Bang occur? Answer – everywhere!) If you want to know about *antigravity*, you must read this book.

There is a good bibliography and a comprehensive index. If I have any criticism, it is that the quality of the paper could be improved.

This is an excellent book, and I recommend it to everybody.

Eric Zucker

A CONCISE DICTIONARY OF ASTRONOMY by Jacqueline Mitton, Oxford University Press, 1991, ISBN 0-19-853967, hardback, £12.95.

This book is the successor to the now out-of-print 'A Dictionary of Astronomy', by Valerie Illingworth, published in 1979 by Pan. But, whereas the Pan book is probably aimed at the science specialist, Jacqueline Mitton has produced a book which will be understood by a much wider readership. She emphasises that it is a dictionary, not an encyclopedia; this is borne out by a useful bibliography.

There are numerous cross-references among the 2400-odd entries. I couldn't find any mainstream terms that were missing from the dictionary (except, curiously, the AAE, although other astronomical organisations are listed!).

The book is likely to be well thumbed, and I wonder how long it will survive such rough treatment. However, £12.95 is a reasonable price for this production. As a work of reference, it should appeal to all members of the AAE, and astronomers generally at all levels.

Eric Zucker

THE TIME AND SPACE OF UNCLE ALBERT by Russell Stannard, Faber and Faber, London 1990. ISBN 0-571-14282-6, paperback £2.50.

This book was sent to me for my opinion by a young teacher who found the book of great interest and help, particularly in dealing with her class of 30 ten-year-olds in this modern age of television, video, and space-ships, when teachers are expected to be as well informed on these topics as are the children. This paperback is well presented in the form of a rather amusing story and told without any trace of school atmosphere or restraints of formal classroom teaching.

The main character, *Gedanken*, has to do a project for Turnip (her teacher Mr Turner) and asks her kind uncle Albert for ideas. Her friends are doing exciting projects on such topics as Dinosaurs, Volcanoes, and Energy in the Home. Uncle Albert, who has the vivid imagination of (you can guess it) Albert Einstein, was just then contemplating the night sky studded with stars. Together they chatted about the vastness of the Universe, which has to be measured in light years. Uncle Albert then asks *Gedanken* for her help in arranging a trip in a space ship equipped with computer controls and clocks that, operating in a special think bubble, could reach a speed approaching that of light. They then agree that the results and account of the trip could be written up as her project.

Uncle Albert is throughout the story clearly in touch with the feelings and outlook of young people as he guides her through the incredible happenings and dangers that beset space travellers. This is done by a skilful process of questions and answers designed to meet youthful curiosity and to promote a desire to learn.

Although the book is written for junior school pupils, it can be used to elucidate further some problems in modern astronomy, such as how space and time are interwoven and that when we look into space we are looking back in time. The book also helps to explain how Einstein's Special Theory of Relativity predicts how the ordinary laws of physics have to be modified when the speeds involved are comparable with the speed of light. The way the speed of light is constant and how it effects length and mass is demon-

strated. The equivalence of mass and energy is explained.

Chapter 7 is real fun: *Gedanken* attempts to score off her teacher, and at the same time to summarise the main findings of her researches. Mr Turner apparently took the joke in good spirit, awarded *Gedanken* a 'B' and gave her a Commendation for Originality. I unhesitatingly give this commendation to the author, Professor Russell Stannard, for his excellent little book.

Robert Mills

THE URBAN ASTRONOMER, Gregory Matloff, J.Wiley and Sons Inc., 1991. ISBN 0-471-53143 X, \$14.95.

With such a large proportion of our population living in towns and cities it is a surprise that it has taken so long for this book to appear. Gregory Matloff has spent much of his observing life in New York and has organised an urban astronomy programme for the Parks and Recreation Department in New York. In this book he presents a host of ideas for practical projects. Although many projects require the use of a telescope they are well within the reach of interested amateurs or secondary school pupils who own a pair of binoculars.

The written style is accessible and contains no supporting theory or mathematics. Sadly, there are few illustrations or photographs in the book. Those few photographs which are included are real gems for the amateur. It is a pity that the poor quality of paper cannot do them justice.

The presentation and production is not particularly appetising. Enthusiasts will find much to interest them and no doubt much that they already know. The novice may decide not to delve deeply enough at first glance to spend his or her money when there are many other more enticing tomes available. However, if you are looking for ideas for projects or should you need some stimulation to send you packing, torch and binoculars in hand, to the local park then this is for you.

Bob Kibble

JOURNEY THROUGH THE UNIVERSE by Jay M. Pasachoff, to be published in 1992 by Saunders College Publishing, London. ISBN 0-03-075037-7. Price £21. pp.392, paperback.

Professor Pasachoff has aimed this text at American college students whose main subject is in the arts or humanities. Such students are often able to satisfy their requirement to study some science by taking a one-term or two-term course in astronomy. The main material is in twenty short chapters which are easy to read straight through since all the mathematics is banished to a five page appendix. The layout is attractive, with full colour illustrations on every page and four sky-maps by

Continued on page 4

Will Tirion at the end.

As we progress through the book we move outwards from the Earth and solar system to the stars and their life cycles. The last four chapters look at galaxies and quasars, and consider the evidence for the Big Bang. Each chapter ends in time-honoured fashion with a list of key words, some questions to test the student's understanding, and some ideas for class discussion or essay topics. There is also available an 'Instructor's Resource Manual with Laboratory Exercises' to accompany the textbook, although this was not sent for review. Full-colour overhead transparencies may also be ordered, and a 'Test Bank' of questions. Thus the book can be used as part of an off-the-shelf self-contained astronomy course.

Unfortunately in Britain at the moment there are few students on this kind of introductory course. Our undergraduates require a treatment with far greater academic depth since the astronomy they study will normally be part of their main degree subject. However, the above-average GCSE astronomy student, or a mature student, could find this a very useful resource book. The material is very up-to-date, including images from the Hubble Space Telescope and COBE. The whole package would also be a valuable tool for

anyone giving an adult education evening class, since it is so attractive and readable.

There are a few minor irritations, the worst for me being on p.207 where a trillion is erroneously defined as a thousand million! Also the paper that the book is printed on is thin and this gives the whole volume the appearance and feel of a very thin glossy magazine. This is especially surprising considering the price which is quite high for a student text.

If you ignore the questions and key words, then the book would serve almost anyone with a broad introduction to the subject. There is much added interest in the five interviews with professional astronomers who convey some of the excitement for making discoveries at the forefront of their fields: for me these were easily the best parts of an otherwise middle-of-the-road text.

Anne Cohen

ASTROPHOTOGRAPHY FOR THE AMATEUR by Michael Covington, Cambridge University Press 1991 (revised). ISBN 0-521-40984-5, £13.95.

Here is the book which is likely to entice the buyer away from titles like 'the Urban Astronomer', also reviewed in this issue. The production reflects the increased price and for my money it is worth the

extra. It is not long before the amateur astronomer turns towards making permanent records of the skies, especially when so many good images abound on library shelves. A little advice can save many wasted hours shivering by a tripod, fumbling for the pencil as you count the seconds by.

Michael Covington devotes the first section of his book to getting started. For many amateurs this is all the help you will need. Plenty of good shots, well reproduced, illustrate the potential results whilst the text gives advice on film choice, exposure tables and other practical hints. The more advanced section which follows includes piggy-backing for deep sky objects, filters, optical techniques and the use of prime focus. The final section delves into equipment, materials, dark-room technique and film technology. There are technical appendices for those who enjoy reading film data curves and exposure tables for the major solar system targets as well as computational computer programmes and advice on electronic guide circuitry.

This must be the definitive guide for the amateur. If you haven't tried astrophotography before, you will by the time you have reached chapter two of *Astrophotography for the Amateur*.

Bob Kibble

BRITISH INTERPLANETARY SOCIETY : recent list of videos

All videos are VHS PAL format

The Eagle has Landed: The Flight of Apollo 11	£11	STS 41-C: The Repair of Solar Max	£15
Apollo 12: Pinpoint for Science	£11	STS-31: The Hubble Deployment	£15
Apollo 13: Houston... We've got a problem	£11	STS-32: The Recovery of LDEF	£15
Apollo 14: Mission to Frau Mauro	£11	The Space Shuttle: Remarkable Flying Machine	£11
Apollo 15: In the Mountains of the Moon	£11	Space Shuttle Challenger: Accident Investigation	£11
Apollo 16: Nothing So Hidden	£11	STS-26: The Return to Flight	£15
Apollo 17: On the Shoulders of Giants	£11	STS-37: Post-Flight Press Conference	£15
The Apollo Collection (7 videos)	£60	A Collection of 'The Movies'	£15

Playing times range from 28 minutes to 57 minutes

Further details from the BIS, 27-29 South Lambeth Road, London SW8 1SZ (Tel: 071-735-3160)

Postage & Packing per cassette: £1 in the UK — Postage & Packing for the Apollo Collection: £4 in the UK

NEW DRAWING INSTRUMENTS FROM WELLGATE

We have received two products from this firm: an 'Anglemaster', which is a combination of protractor, set square and centre finder, which enables the user to construct or find angles and points with accuracy and simplicity; and a 'Circlemaster', which enables circles of given radii to be constructed, rather than a pair of compasses.

We thought that there was quite an overlap between the functions of these devices. To be able to construct circles without the use of a dangerous pair of compasses is a definite improvement. Both instruments are constructed out of strong plastic.

Prices are: Anglemaster £3.95 each, post free
Circlemaster £2.55 each, post free

(There are reductions for quantity ordered)

Further information from the manufacturers:

The Marketing Director, Wellgate Drawing Instruments, 37 Blackwellgate,
Darlington, Co Durham DL1 5HW. (tel: 0325-282146/7)



ASTRONOMICAL CROSSWORD

The following has been concocted by John Flynn of Armagh Planetarium, to whom acknowledgements are made. A book prize, 'Understanding the Universe', by P. Flower, will be awarded to the first correct solution opened on 31 January 1992.

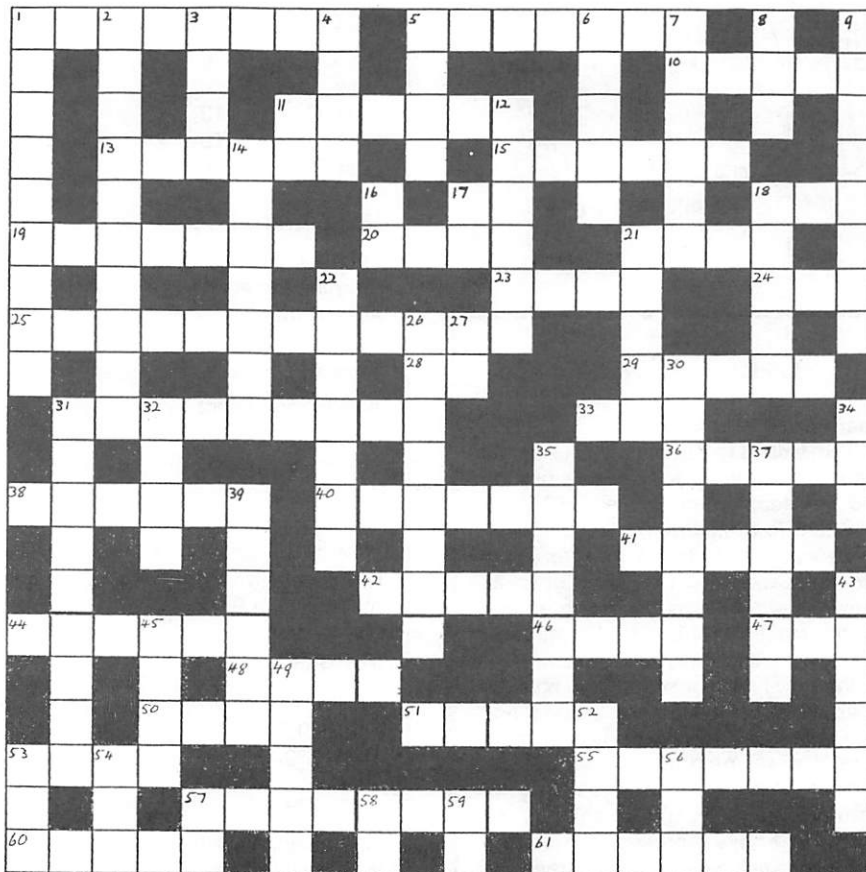
Please send *photocopies* of your solutions, together with your name and address, to the Editor (address on page 1). The solutions will appear in the Spring issue.

Clues Across

1. Wanderer not yet come of age.
5. In orbit around 7 down.
10. Today's scepticism means that demons are in eclipse.
11. This is not found in North America but North America is found in it.
13. Early Christian symbol.
15. Jupiter's grandfather.
17. After an important meridian transit.
18. Not surrounded by fools but by clocks, swordfish and water snakes.
19. A nomadic Poseidon.
20. An anagrammatic dome found on Mars.
21. Cosmologists worry about the abundance of this matter.
23. Minor nomad in love with the Sun.
24. A down to earth prefix.
25. I hailed a large reflection on a hill.
28. '77 Sunset Strip' was a program I watched periodically.
29. We know that life exists there but is it intelligent?
31. Deserted ship related to an orb.
33. A rather unique prime divisor.
36. Measurably bright North European called on by Spanish bullfighters.
38. Common factor of hot angles.
40. Mythological fields visited by Mars.
41. Wait Disney character.
42. Chaldean method of predicting where Moon's shadow would fall.
44. A speed limit of 1.126×10^4 m/s.
46. Where clever gentlemen and stars come from.
47. Three dimensional equivalent of a circle.
48. Gravitationally bound hot gas.
50. Singular points in round about path.
51. Gentleman who discovered spherical trinkets on the Moon.
53. The theory that this item was indivisible was exploded.
55. Choice of air, earth, fire or water.
57. Image of Apollo's path.
60. Pillar of the world common to Earth and Moon.
61. Where Dreyer worked from 1883 to 1916.

Clues Down

1. Subject matter of exercise.
2. Elevated gas interface.
3. Marine animals found near lunar craters.



4. Axial rotations.
5. Plural of 53 across with a bit missing.
6. Giant.
7. Sixth child of Ra.
8. The Universe's expansion gives us a clue to its...
9. Lost part of five down.
11. A period of 58.
12. Holiday time.
14. An F.O. object apparently minus 0.9.
16. Abundance exceeded only by one other thing.
17. Group VIIA but also 84th.
18. Useful period for most astronomers.
21. Light of horned goddess.
22. Eye see two flying swans.
26. Path of scared Indian animal in the sky.
27. Useful measure of conditions in early solar system.
30. Common form of shooting star.
31. I am a follower of Apollo.
32. The music of that instrument is truly heavenly.
34. Period of time.
35. Half this graph is mine.
37. This used to be mistaken for an early atmospheric phenomenon.
39. Terminal in transit.
43. Squashed.
45. Discredited forerunner.
49. Magnetic unit.
52. Time period.
53. Sacrifice upon.
54. A flying nebula.
56. First part of early May meteor shower.
57. Name 99 in honour of Albert.
58. A useful mathematical snack.
59. Famous satellite.

NATIONAL MARITIME MUSEUM

Dove Brothers Ltd. have been awarded the contract, over a period of thirty weeks, for the restoration project of Wren's Octagon Room in the Old Royal Observatory - England's first purpose-built scientific institution and now part of the National Maritime Museum. The contract has been partly supported by the Museums' and Galleries' Improvement Fund that was awarded to the Museum in July 1991.

The Old Royal Observatory was formed in 1675 by Charles II and designed by Sir Christopher Wren. Flamsteed House, the main Observatory building looking out over London, has been changed remarkably little

from its original seventeenth century plan. Its Octagon Room is one of the few surviving unaltered interiors by Wren and as such is of outstanding architectural importance.

Dove Brothers Ltd. first undertook construction work at the Old Royal Observatory in 1897.

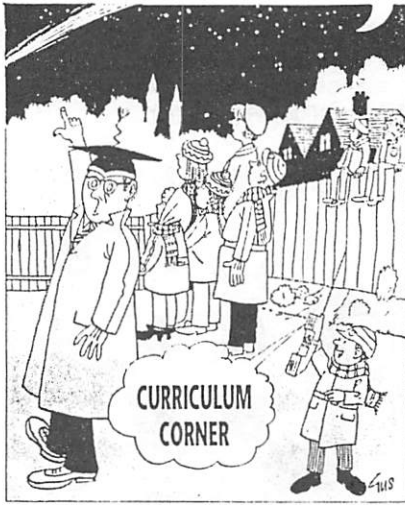
This time round works to the Octagon Room include sensitive restoration to the fibrous plaster moulded cornices and ceiling, redecoration works and repairs, as well as the complex and sensitive work of installing a secondary structural support to the roof in order to remove the existing framework which has become too heavy for

the structure of the building.

Following these preliminary works Dove Brothers Ltd will then install reinforcing steelwork within the roof to transfer the loadings and reinstate the structural integrity of Wren's original roof beams.

The consultant architects to the project are Carden Godfrey, the Quantity Surveyors; the Kensall Partnership, the structural engineers; Price and Myers and the Services Engineers; Klimaat.

Other than the Octagon Room and adjacent areas, the Old Royal Observatory will remain open to the public daily throughout the restoration.



LETTER

Dear Editor,

I am writing to introduce you to United Kingdom Students for the Exploration and Development of Space (UKSEDS). UKSEDS is a student-run organisation which was set up to act as a forum of communication and exchange of ideas between students, industry and educational establishments on all matters of space exploration and development.

We now have some 3000 members in universities, comprehensive schools and sixth forms all over the UK. We also have a great number of members in industry. We have close ties with the Space Education Trust and Space School and have representation on The Parliamentary Space Committee. We produce our own magazine every month, several copies of which I enclose for your information.

We held a conference at Leicester University Space and Astronomy Department over the weekend of 16-17 November, thanks to the efforts of Professor Ken Pounds. The Conference 'Britain in Orbit' featured a programme of 24 lectures given over the 2 days of the conference on various subjects under the headings:

**British Institutes in Space,
International Space Activity
Man in Space
Space Education**

The conference also featured a careers fair and laboratory sessions featuring space-related hardware which allowed the conference attendees to gain hands-on experience.

I have asked our Publications Officer to send regular copies of The UKSEDS Magazine to the AAE. I hope you find them of interest.

Yours sincerely

J. Reale, (Chairman (90-91), UKSEDS,
c/o the Space Education Trust,
The Royal Aeronautical Society,
4 Hamilton Place, London W1V 0BQ

Editor's Note:

Interested members should get in touch with UKSEDS directly.

From: Dr M.D. Mannion, Basildon College, Nethermayne,
Basildon, Essex SS16 5NN

SKY QUARTERLY

	JANUARY		FEBRUARY		MARCH	
MOON						
Phase	d	h	d	h	d	h
New	4	23	3	19	4	13
First Q	13	03	11	16	12	02
Full	19	21	18	08	18	18
Last Q	26	15	26	08	26	03
MERCURY						
First few days Morning Object at -0.3 mag.			End of Month Evening Object at -1 mag.		Very favourable Evening apparition in first 3 weeks.	
VENUS						
A Morning Object at -4.0 mag.			Visible at Dawn at -4.0 mag.		Moves steadily closer to the Sun thus becoming a difficult planet to observe	
MARS						
Not visible to observers in Britain			Not visible		Not visible	
JUPITER						
In Leo, a bright morning planet at -2.3 mag.			At opposition this month at -2.5 mag.		After opposition remains at -2.5	
SATURN						
In conjunction with the Sun this month. Not visible in Britain.			Not visible		Not visible	

* * * * *

URANUS

During 1992 Uranus is at longitude 286 degrees in the constellation of Sagittarius and is a telescopic object.

SKY NOTES

Orion is a marvellous starting point to help students find their way in the night sky. From Orion one can see the three stars of his belt to point the way NW to the 'V' of Taurus and SE to Sirius, the brightest star in Canis Major. Also from the stars Rigel and Betelgeuse one can find Castor and Pollux, the brightest stars in Gemini. Capella, the brightest star in Auriga, is found during early evenings in January to be overhead, near the Zenith.

The only major meteor shower during the first quarter of 1992 is the Quadrantids named after a constellation which has become obsolete, Mural Quadrans. The maximum is on January 4th and has a radiant point RA 15h 28m Declination +50 degrees. Why not combine an evening of meteor watching around Jan 1-5th in taking a series of photographs of the North Pole star, Polaris? Exposures should be made with a 35mm camera with medium-fast film (100-400 ASA) black and white or colour slide using a standard lens (f2 or faster, 50mm focal length). This experiment could net you a bright meteor trail (it usually takes more than three rolls of film to get one meteor photograph!)

For those AAE members who are in the Association for Science Education, there will be an AAE presence at the 1992 ASE Conference for Science Teachers to be held at Sheffield University, January 3-6th. The AAE will be giving an INSET workshop on Astronomy in the National Curriculum for secondary teachers on January 5th, 9.30-13.00, in Room H5. I will also be giving a talk on the role of astronomy teaching in schools and colleges.

David Mannion

F O R T H E N E W C O M E R

The Solar System for young people

If you start with a bit of space which you already know about, Planet **Earth** is our home, our own spaceship which we all live on. It is made of rock and has a melted core, a mantle and a crust. It is changing all the time because of earth quakes and volcanoes. Look at a map of the earth – the continents all fitted together once. We have liquid water in large amounts and also living things. We have an atmosphere of nitrogen and oxygen with some carbon dioxide (enough for plants to make food but not too much), and clouds of water vapour. The Earth is at exactly the right temperature for living things to exist. Light from the Sun takes 8 mins to reach the Earth. A **light year** is the distance light travels in a year. How many miles is this if the Sun is 93 million miles from the Earth?

The Earth has a **Moon** circling round it along a definite path. The Moon is also made of rock. It has no water or atmosphere. It always keeps the same face towards us – if you look at it every night for a while you will see that the markings on it are always the same. It seems to change shape, but this is because it reflects sunlight and it depends on its position in its path round the earth how much of the lit-up part you can see. Remember **NEW** – New Evening West. How long is it between new moon and the next new moon? Does it always rise at the same time? Does it always rise in the same position on the horizon?

The other main object in nearby space is the **Sun** – it is hot – a huge ball of hydrogen and helium (two gases) with a nuclear furnace at its centre. Our Sun is our own special **star** as we depend on it for our food and warmth and light. The Sun is an ordinary, small star. The Sun must **NEVER** be looked at directly through binoculars or telescope or by any other method as **INSTANT BLINDNESS** will occur. A projected image can be looked at – see enclosed diagram. **Sunspots** develop on the surface of the Sun, their numbers following an 11 year cycle. They are magnetic disturbances and their centres are cooler than the surrounding material so they look dark. They affect the magnetic field round the Earth, cause disturbance in radio reception, cause visual auroras (northern lights) and radio auroras, and cause the total output of energy from the Sun to increase.

If the shadow of the Earth covers the Moon, then an **eclipse of the Moon** is seen. If the Moon comes between the Earth and the Sun an **eclipse of the Sun** is seen. See diagrams.

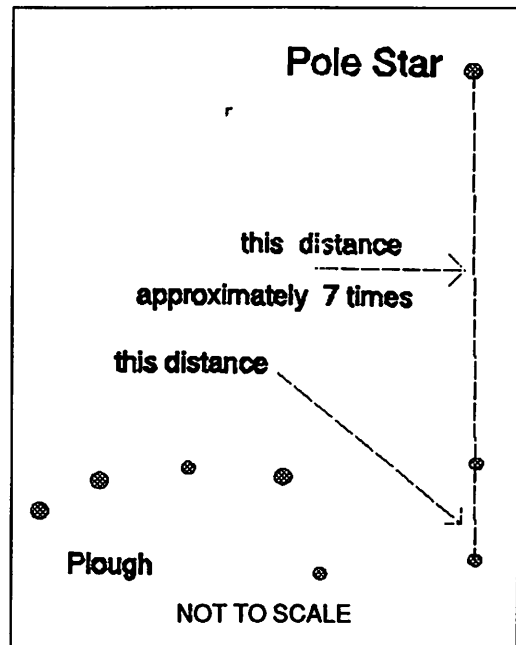
The **Solar system** is a 'family' of planets moving round the Sun. Starting nearest to the Sun are Mercury, Venus, the Earth, Mars (these are all solid and made of rock), then Jupiter, Saturn, Uranus, Neptune (these are called the gas giants) and Pluto which we aren't sure about – it is very small compared with the others. Venus and Jupiter are the bright objects in the east before sunrise just now. Saturn is visible low down in the south after dark. Planets are 'wanderers'; they do not keep the same position among the stars in the sky. Planets do not produce any

light; they shine by reflected sunlight. The Earth takes one year to go round the Sun.

The **Asteroids** are hundreds of rocky bits circling between Mars and Jupiter. Sometimes a stray one leaves its path and enters the earth's atmosphere. It gets so hot that it can be seen as a fireball which is big and bright, or a shooting star (meteor) which is much smaller. If it reaches the earth it is called a **meteorite**.

Also in our Solar System are the **comets**, dirty icy snowballs which move round the sun much further out than any of the planets. Sometimes a passing star causes one to move towards the Sun and take up a new orbit which is very elliptical. When it gets as near in as Jupiter, people can start to see it. A comet which has just whizzed round the Sun loses a lot of its outer surface from which ice will have melted, causing it to leave a long trail of dust and gas – its tail – which always points away from the Sun. In some cases the Earth passes through this debris each year and burning particles, only sand grain size or even smaller, can be seen as **meteor showers**. The best one can be seen a few days on about August 12th. Some of the bigger meteors may fall as **meteorites**.

This article was written by Christine Sheldon, FAS Secretary.



New Software: Stars, Planets, Galaxies (SPG)

This piece of software is an astronomical program developed for IBM PCs and compatible machines running MS-DOS 3 or later versions. It is menu-driven and enables the user to produce star charts for any hour and date from 10,000 BC to 10,000 AD for any position on Earth. The minimum hardware requirement is a PC compatible machine with 512 kbytes of RAM and a single 5.25" or 3.5" floppy disc drive with either a Hercules, CGA, EGA, or VGA monitor. To print out the star chart the printer option requires an Epson or

IBM compatible printer. The program SPG is supplied with four 360 kbyte 5.25" disks or two 720 kbyte 3.5" disks and a very readable manual.

The sky chart options enable the user to show stars down to various limiting magnitudes, plot the whole sky or zoom to smaller and smaller regions, and tag planets, asteroids, and comets. The external data files of SPG include data on more than 8000 stars to magnitude 7, the entire NGC and IC catalogues and includes more than 100 variable stars,

binary stars and pulsars.

The author of this article has recently purchased this excellent package and the contact address is:

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Tel: 0329 286432

At £40 this is an excellent buy.

David Mannion

Curriculum Corner ▶

HAVE YOU SEEN...

CYGNUS (The Swan)

Also known as the Northern Cross.
The bright star Deneb is a giant star, 50,000 times brighter than our Sun. Deneb is 640 light years away. The light which you see when you look at Deneb this month left the star in the year 1351. What is Deneb like now?... we'll have to wait until the year 2631 to find out!

LYRA (The Lyre)

A small constellation which contains the bright star Vega. How many fainter stars can you see around Vega?

Vega is 27 light years from the Earth.

Deneb

Vega



It is hoped to include this kind of article as a regular feature, part of 'Curriculum Corner'

P O L A S C O P E

Interested readers should contact Ben Mayer, 1940 Cotner Avenue, Los Angeles, CA90025, USA

Please Cut Out the PolaScope half-round STELLAPLATE below, spear it on a wire coathanger "Horizon Axis" as shown (or use a knitting needle). Weight the PolaScope with a paperclip and attach the core from a roll of bathroom tissue to the Polar axis as illustrated. Heading approximately north, look through the sighting tube and presto, you will see POLARIS, the North Star in the F.o.V.=

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