NEWSLETTER

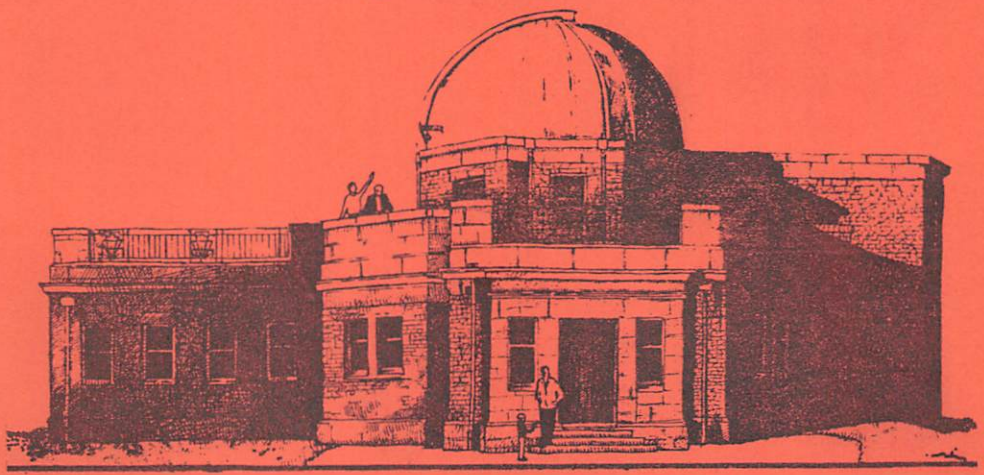
of the

Association for Astronomy Education

Vol. 4, No.3 April, 1985

MILLS OBSERVATORY

Britain's only full-time public observatory



Balgay Park
Dundee

Spacecharts

A WIDELY ACCLAIMED SERIES OF SPACE WALL CHARTS

"Attractive ... well printed ... very inexpensive ... highly recommended." BAA Journal

These new charts present up-to-date information on astronomy and astronautics in an attractive format. The meticulously researched text is by Robin Kerrod, FRAS, FBIS, author of many books on science for children and the general reader. SPACECHARTS are illustrated by superb artwork and brilliant colour photographs. Measuring some 900 x 600mm - about 3 feet x 2 feet - they are printed on artpaper for the best possible reproduction.

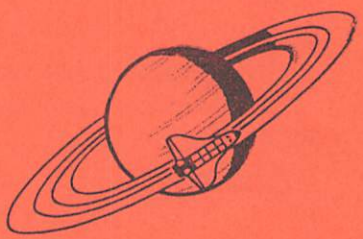
SPACE SHUTTLE features a colour cutaway of orbiter Columbia, together with pictures of its historic maiden flight.

MARS, JUPITER and SATURN include basic astronomical information about the planets and their moons and also the latest data and spectacular photographs returned by the Pioneer, Voyager and Viking probes.

SPACECHARTS are available direct from the publishers and cost only £1.95 each. To ensure that they reach you in perfect condition, they are posted rolled in a strong cardboard tube. Postage and packing costs 60p for 1 chart; 75p for 2-4 charts; and £1.20 for larger orders.

Send your orders, or write for further information to:

SPACECHARTS
Newton Tony
Salisbury
Wilts. SP4 0HF



Contents

ASSOCIATION NEWS - FROM THE SECRETARY

Hello there,

The important item of news this issue is about the Annual General Meeting. Firstly the date and venue have been changed, and now there is not quite so much of a rush to book yourselves in.

It was our intention this year to hold the A.G.M. once again at the North London Polytechnic, under the excellent direction of Eric Zucker. Unfortunately, at the eleventh hour, it was - due to the unsavoury political climate - cancelled. It really is amazing how many of the extreme organisations can intrude into the learning situation. However, following close on the heels of this news, the guest speaker Dr. Derek McNally informed us that his work programme excluded him from the dates offered. So, dear members, after chasing around half the public halls in London only to find them 'non-Saturday' openers, we have finally settled on the 8th JUNE, 1985 at the London Schools' Planetarium, Wandsworth. It is on the District Line and only three minutes from the Underground station (Southfields). Proceedings will commence at approximately 11.00 a.m. and complete at 4.00 p.m. There will, of course, be further news on this as soon as we are organised. But remember the date now!

Arrangements are being made to appoint area chairmen who will help in our recruitment drive for members as, being localised they will be able to run their own meetings and, who knows, maybe their own A.G.M's.

Council are also looking into an idea for providing information sheets which members may obtain on request. However, time can be wasted advising on certain aspects of astronomy education which perhaps are not so important. So again we need your help! Please write in and tell us what topics you would like to see on the information sheets NOW!

Until we meet at the A.G.M., may I wish all of you a happy Springtime, and (for those in teaching) "a quick release from their sufferings" - pocketwise. Cheerio!

P.S. The Editor tells me that the number of letters received from readers has decreased recently. And I thought teachers had a lot to say!!

NOTE FROM THE TREASURER

The present issue closes the current membership year, and members will find enclosed with this issue a pro-forma inviting them to renew their membership for the year beginning in September. It would be very helpful if members intending to renew their subscriptions would do so by the 31st of August.

After keeping subscriptions constant for the last two years, which have seen a large improvement in the printing of the AAE News, it has been decided, regretfully, that to ensure the present standard can be maintained, a rise in all subscriptions and affiliation fees by £1.00 is necessary. Members are reminded that subscriptions are eligible for tax relief.

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News from University of London School Examinations Board

16+ EXAMINATIONS IN ASTRONOMY

The University of London School Examinations Board has administered a GCE Ordinary level examination in Astronomy for many years, and is the only examination board in the United Kingdom to offer such an examination.

During the past two years, the Board has been working with two CSE examination boards to develop a joint O level/CSE examination in Astronomy. The Boards have set up a Joint Subject Committee to undertake this task, which consists of Chief Examiners, Moderators and teacher representatives. At the time of writing, development work for this new examination is still being undertaken.

In view of the Government's decision last June to replace GCE Ordinary level and CSE examinations with a new GCSE examination in 1988, it is hoped that the joint Ordinary level/CSE examination in Astronomy currently being developed by the Boards will form the basis of a new GCSE examination in Astronomy.

* * * *

EDINBURGH ASTRONOMY

Teaching Package For Schools

The Edinburgh Astronomy Educational Teaching Package for Schools consists of film copies made from original photographs taken with the 1.2m UK Schmidt Telescope in Australia.

During the very stringent quality control procedure applied to the film copies made for the blue half of the ESO/SERC Southern Sky Survey, several complete fields have been rejected. Although these films do not meet the very high standards required for Atlas films, the quality is still excellent. We have decided to make these films available to the whole astronomical community in the form of teaching packs. Each pack consists of 10 films of different fields, although some fields will appear in more than one pack. We have tried to ensure that each pack contains films which show all the common astronomical objects including examples of star clusters, planetary nebulae, dark clouds, HII regions and of different types of galaxies. Each film is accompanied by a sheet which lists the more interesting objects which can be seen. Each pack is also accompanied by a brief description of the UK 1.2m Schmidt Telescope and instructions on how to use the films.

We have not attempted to design exercises which could be done using these films, although some suggestions have been made. In some cases these films can be considered as additional material for the exercises described in the Edinburgh Astronomy Teaching Package for Undergraduates, designed by Dr. M. T. Bruck of Edinburch University.

To date four separate packs are available; each pack contains ten films and brief accompanying notes and costs £25.00 (plus postage). Contents, lists and further details can be obtained from:

UKSTU, Royal Observatory, Blackford Hill,
Edinburgh, EH9 3HJ, Scotland

Details of the Teaching Package for Undergraduates are also available from UKSTU.

A.R. Good and S.B. Tritton

EDINBURGH ASTRONOMY

Teaching Package For Undergraduates

United Kingdom Schmidt Telescope Unit,
The Royal Observatory, Blackford Hill, Edinburgh, E 9 3HJ

The Edinburgh Astronomy Teaching Package for Undergraduates can be ordered from the UK Schmidt Telescope Unit at a cost of £40.00 (plus postage).

The package consists of eight specially selected film copies, made from UK 1.2m Schmidt Telescope original plates, together with a set of notes suggesting exercises by Dr. M.T. Bruck and used as part of the undergraduate teaching programme at Edinburgh University over the past few years.

The suggested exercises and chosen films are . . .

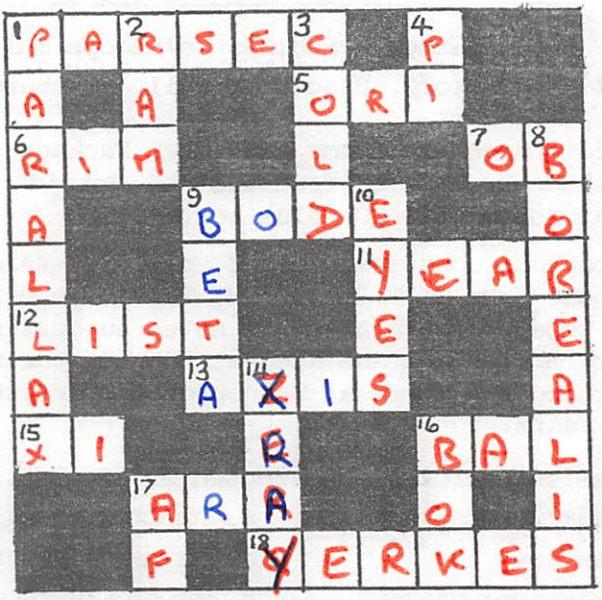
1 - ASTEROIDS
2 - COMET WEST
3 - GLOBULAR STAR CLUSTERS
4 - THE GALACTIC PLANE
5 - THE VELA SUPERNOVA REMNANT
6 - THE LARGE MAGELLANIC CLOUD
7 - THE VIRGO CLUSTER OF GALAXIES
8 - ABELL 1060

ORIGINAL PLATE NO.	RA (1950)	DEC (1950)	DESCRIPTION	USED IN EXERCISE
J2137	12^h27^m	$+13°30'$	VIRGO CLUSTER	1 and 7
J2140	20^h53^m	$+13°01'$	COMET WEST	2
J1935	00^h00^m	$-75°00'$	FIELD 28	3
J2155	13^h56^m	$-65°00'$	FIELD 97	4
Hα 1355	08^h40^m	$-44°47'$	VELA SUPERNOVA	5
J1953	06^h04^m	$-70°00'$	FIELD 57	6
U1152	05^h21^m	$-69°06'$	LMC	6
J7442	10^h34^m	$-27°22'$	ABELL 1060	8
(J3410	19^h57^m	$-20°06'$	FIELD 595	1)

The last film, of a field in the ecliptic, is available for work on asteroids. This film can be ordered, in addition to the normal package, at an additional cost of £5.00.

Additional copies of the notes are available at a cost of £3.00 a set.

CRUXWORD Number 1



C L U E S

ACROSS

1 Scrape apart a measure of astronomical distance (6)
5 Conventionally shortened hunter (3)
6 Top of a crater (3)
7 A Siberian river gives the first two spectral types (2)
9 Originator of empirical law of planetary distances (4)
11 Once round the sun (4)
12 Star catalogue is this, in effect (4)
13 Planets revolve around last war's enemy (4)
15 Black hole in Cygnus (or 14th brightest star) (2)
16 Take away Roman date from fireballs to leave this (3)
17 Heavenly southern altar (3)
18 Famous American refractor (6)

DOWN

1 Can be used to measure star's distance (8)
2 Starry tup (3)
3 Pluto is this (4)
4 Bite the end off a Melton Mowbray delicacy for the 16th brightest star (2)
8 Be Sailor for Northern Lights or Crown (8)
9 Rigel is this in Orion (4)
10 Very useful organs for observing (4)
14 Wavelength emitted by black hole (4)
16 Bart J ..... a famous astronomer (3)
17 Spectral types following B

ANSWERS IN NEXT NEWSLETTER

AN INTRODUCTION TO EXPERIMENTAL ASTRONOMY (2nd Edition)

ROGER B. CULVER 196 pp including appendices

W. H. FREEMAN AND CO. LTD. 1984 soft cover
ISBN 0-7167-1495-7 £9.50

This is an "observational workbook" of 22 laboratory exercises in astronomy, meant for undergraduate introductory astronomy courses. Having stated that, I think that they could be used with Advanced Level students of Physics in Britain. (The practicals were devised by Professor Culver at Colorado State University).

The topics are: The speed of light, positional astronomy, photometry, the orbit of Neptune, the Earth-Sun distance, artificial-satellite motion, planetary atmospheres (Mars and Venus), Jupiter's mass, the solar spectrum, motion of Barnard's star, stellar properties, spectroscopic parallax, Hyades colour-magnitude diagram, nova properties, star counts, properties of the Galaxy from globular-cluster studies, distance to another galaxy, rotation and mass of M. 31, determination of the Hubble constant, gravitational bending of starlight, the Crab pulsar and observations of a quasar.

Instructions for each are included with each investigation. No special equipment, other than the book (and ruler and calculator) is needed. For institutions that can afford it, the book can be issued as a true "workbook" for it contains not only spaces to write down measurements and calculated values, but also blank sheets of graph paper.

There are seven appendices at the end of the set of exercises, although two of those referred to in the text are not actually included (appendices 8 and 9). These deal with: some physical and astronomical constants, scientific notation (standard form), trigonometric ratios, arc lengths, graphs, scaling of diagrams and photographs, and wavelength determination from spectra. Some of these might not be thought necessary for students approaching the work with even "O" level standard mathematics knowledge, but they certainly do no harm, and assist the book to be self-contained.

It is a pity that c.g.s. units are used throughout,

even if many astronomers do not yet use S.I. unity. In my review copy the star images needed to work out the lunar parallax are missing from figures 1.2 and 1.3. The standard of presentation is high, though (the book is in typescript: as very many instruction sheets to be found in laboratories are typed, this does not make it unusual).

This book could make a welcome supplement to a basic astronomy course, especially if it is desired to show some real methods of data reduction in the science.

*

THE SUB-DIVISION OF CONSTELLATIONS INTO TELESCOPIC STARFIELDS

Recently I received, unexpectedly, some star charts. Produced by Otto C. Langmark of the Board of Education for the City of Toronto, they propose a sub-division of constellations into telescopic starfields.

Since 1976, Mr. Langmark has been engaged upon the task of drawing up star charts which show star groups as seen in a telescope, rather than the larger, more familiar constellation patterns, which anyway become meaningless when one focuses in on an area of night sky. He has made charts of 11 of the 88 constellations and is working on another 15.

The results so far are fascinating and could doubtless be of help to the stellar observer. Thus, in Cygnus for example, we are given such groups as Uhuru, Nile Delta, Bambi and Handwagon.

To judge for yourself, you need to see the charts. Mr. Langmark may be contacted at the above mentioned Board of Education, 155 College Street, Toronto, Ontario, Canada, M5T 1P6.

*

"MAPPING THE WEATHER"

Wallchart with four pages of notes. Pictorial Charts Educational Trust, 27 Kirchen Road, London, W13 0UD. £3.60 plus V.A.T. - post free - 1985.

The Association was sent a wallchart and accompanying

notes to review. Not about astronomy, but about the not-unrelated topic of the weather. An informative 76 cm x 100 cm colourful chart with photographs and diagrams, together with notes for use in class (containing student exercises). Probably mainly for schools.

Perhaps the Trust will be producing some charts on astronomy and space travel?

GERAINT DAY

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PLACES TO VISIT . . .

THE MILLS OBSERVATORY, DUNDEE

Many people are surprised to learn that Britain's only full-time public observatory is situated in Dundee. It takes its name from John Mills, a wealthy Victorian, who left his estate to build a public observatory in his home city. Although he died in 1889, the building was not constructed until the 1930s, and it is now approaching its fiftieth anniversary.

The heart of an observatory is, of course, its telescope, and the Mills began with a Grubb 18-inch reflector - this has now been replaced by a 10-inch Cooke refractor which just fits inside the dome. The loss of light-gathering power is more than compensated for by the high magnifications available, and visitors are thrilled by the "close-up views" of the moon, planets, star-clusters, nebulae and distant galaxies. A number of smaller telescopes have accumulated over the years, and these are also available for public use. They are normally set out on the large balcony on the first floor.

The Observatory stands on Balgay Hill, a public park within the city of Dundee. The hill is covered by mature woodland and this shelters the Observatory, to a large extent, from the lights of the surrounding city. The visitor can easily reach the park entrance - it is on the bus-route; then a single line of street lights leads up through the park to the Observatory. The lights are controlled from the Observatory, so almost complete darkness can be obtained when necessary. By day, the balcony offers a superb view of the surrounding park, the River Tay and the hills of Central Scotland.

(continued)

The first floor of the Observatory is being developed as a display of old telescopes; the ground floor is already laid out as a permanent exhibition of astronomy and space exploration. This exhibition is constantly being improved and extended; it includes a push-button motorised model of the solar system, and other interactive displays are planned. There is a small shop stocked with astronomical postcards, book, posters and other souvenirs.

Adjacent to this exhibition area lies the lecture-theatre, seating 30-40 visitors. Booked parties of visitors are given illustrated lectures here, either as a general introduction to astronomy, or on some specifically requested topic. A recent addition is an audio-visual unit, to present pre-recorded slide-shows. We have one commercial programme in use at present, and will shortly be adding three or four more written specially for the Mills Observatory. These are available to casual visitors throughout opening hours, provided the lecture-theatre is not in use.

An important addition to the Observatory was made several years ago by the then Curator, Mr. Harry Ford, who constructed a small but extremely effective planetarium. This is still in use, but it is installed in a room which seats only about a dozen people. Within the last year the Observatory has acquired a commercial planetarium which operates in conjunction with a moveable dome in the lecture-theatre. This dome accommodates about twenty adults, on chairs, or up to thirty children sitting on the carpet, and it is used instead of, or after, a lecture.

The planetarium projector provides images of the sun, moon and five planets, together with about 1000 stars - quite sufficient for constellation recognition. Planetarium programmes are not usually pre-planned - the lecturer adapts to the interests shown by the small audience, who often show a marked reluctance to bring the show to an end! Casual visitors may also see planetarium shows, depending on whether a member of staff is free to operate the machine.

The Mills bequest paid only for the building and equipping of the Observatory; its running costs are met by Dundee District Council, and it is administered as part of the Museum's organisation. Only two members of staff are employed, an official Astronomer and an Astronomer's

Assistant, who between them carry out all cleaning, maintenance and clerical work, develop the programmes and exhibits, and man the building for six days a week. On clear evenings, when the telescope is in use and there are large numbers of visitors, it can become rather hectic!, but we try to ensure that every visitor has an opportunity to use the telescope and to ask questions. If the telescope is not too busy, it is occasionally possible for visitors also to attach their cameras to it and photograph the moon or other objects.

During the winter (from October to March), the Observatory is open on weekdays from 3 to 10 p.m. The telescopes are only used if the sky is clear (this averages out at about one night in two); on cloudy nights the slide-show and planetarium are always available. During the summer (April to September) the nights are not dark enough to make it worth opening in the evenings; the Observatory is therefore open from 10 a.m. to 5 p.m. The telescopes can be used on the balcony to study the surrounding landscape, and the main telescope is used, when possible, to observe the sun, by projection onto a screen. On rare occasions, it is possible to observe bright planets during the day. Throughout the year the Observatory is also open on Saturdays from 2 to 5 p.m. The original bequest specifies that it will never be open on Sundays. Admission is free; the only constraint on visitors is that parties are asked to book in advance.

Visitors regularly come to the Mills Observatory from all over Scotland, and it is to be hoped that English people with an interest in astronomy will also seek it out. Dundee is on the main East Coast railway-line! We will be glad to offer further information - telephone: Dundee (0382) 67138.

Dr. Fiona Vincent,
Astronomer, Mills Observatory

THE TELESCOPE

The magnificent 10-inch refractor now in use is on permanent loan from St.Andrews. This telescope, built in York by the celebrated firm of Thomas Cooke and Sons, in 1871, has been used by experienced astronomers in different parts of Britain. While in Winchester, in the ownership of Walter Goodacre, it was used extensively for mapping the moon, on which he was an authority. Some of the finest ground-based views of the distant planet Uranus have also been obtained with it.

The telescope still has its original clockwork drive motor, which will keep it locked on to any given point in the sky, despite the earth's rotation.

THE BATLEY AND SPENBOROUGH ASTRONOMICAL SOCIETY

Founded in 1966, the Society began thinking about an Observatory and, indeed, a suitable site. After a while looking around, the present site was found and plans were made for the building to start. The Observatory was finally opened in November 1969.

The building and telescope were constructed on a limited budget. The Observatory now houses a 15" Newtonian Reflecting telescope with a secondary scope. This, a 4" Refractor, is a telescope in its own right. The 15" reflector has a clutch drive system to lock the telescope onto any celestial object in view. In addition to the drive system there is a frequency mode oscillator which is capable of making very fine adjustments. A Hydrogen Alpha filter can also be fitted to view the Solar corona.

The Society holds public viewing nights every Friday during the winter from 7.30 to 9.00, starting from the first Friday in October until the last Friday in March. Observing sessions for interested groups can be arranged for other nights - weather permitting. Please give us at least a fortnight's notice. Members' nights are held each Thursday from 7.30 p.m. onwards throughout the year.

The Observatory is situated approximately 50 yards south of the upper entrance to Wilton Park, Batley, near to the Bagshaw Museum. Car Park outside gates.

Letter to the Editor - BAA COMET SECTION KEEDY AWARD

Dear Sir,

In the September 1984 issue of the AAE's Newsletter (Vol.4, No.1) I mentioned methods I had personally tried to encourage an interest in astronomy, such as written articles, quisses, public and private exhibitions, and awards. Based on comments from the general public, I believe I have had a small measure of success in all of these areas. However, the area that has given me most satisfaction is the British Astronomical Association Comet Section Keedy Award, which last year was presented to the famous comet discoverer, George Alcock. This year this small financial Award has been given to Andrew Pearce for his extensive and accurate comet work during 1984. Andrew recently informed me that the Award is "a tremendous way to get more amateur astronomers to visually observe comets". Whilst I do hope it encourages some people, it is most satisfying to know that the Award has now taken on an international flavour, since Andrew Pearce hails from distant Perth in Australia!

D. R. KEEDY, South Shields

NOTE ON SUNDIAL FIXING

(Complimentary to Article on Sundials, Newsletter 4 (1), Page 15)

It is not easy to secure a completed sundial to a pillar or to a wall so that it meets the designed condition. The trick is first to mount the plain tablet so that it can be easily demounted and remounted in exactly the same position each time. Use three fixings and three locating surfaces. Set a horizontal tablet horizontal and a vertical tablet vertical. Exercise removal and replacement until you are certain that the position of the tablet can always be recovered accurately. Now determine and mark the central vertical on a vertical dial and determine the azimuth of its face. For the horizontal dial determine and mark the meridian. The tablet can now be demounted, figured and returned to its exact place.

It is prudent to arrange vertical dials so that the supporting bolts and spacers set them clear of irregularities in the masonry or brickwork.

L. M. DOUGHERTY, Director, Solar Section, BAA

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Articles, ideas, views and letters to the Editor for publication, should be sent to the Editor:-

Mr. C. S. GOODMAN
Hastings High School
St. Catherine's Close
Burbage
HINCKLEY
Leics. LE10 2QE

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NEXT ISSUE - SEPTEMBER, 1985

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