



GNOMON

Newsletter of the Association for Astronomy Education

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This enables the newsletter of the Astronomical Society of the Pacific, 'the Universe in the Classroom' to be included as pages 3-6 of this issue.

WE ARE 10 YEARS OLD

Editorial Comments

On 16 May 1981, the AAE was founded. At the inaugural meeting of the Merseyside Museum, the first Council of the Association was

the King's School, Canterbury, became the Treasurer, and the post of Editor was filled by Dr D. Clarke of Glasgow University.

A Message from our Patron

As it appeared in the first Newsletter

Astronomy has a unique part to play in education, both at school and university. It has a direct appeal to scientists and non-scientists alike; for many it may represent an introduction to scientific thought that otherwise have been totally lacking. As a research discipline it is unequalled, bringing together elements of much of physical science. In our daily lives, if we have even only a little understanding of it, astronomy can inspire and uplift us. I commend whole-heartedly the encouragement that the Association is giving to education in Astronomy.

Professor F. Graham Smith

elected. The Patron was Professor Graham Smith from Jodrell Bank Radio Astronomy Laboratories (the Astronomer Royal). The first President was ex-HMI Donald Gold, and the first Secretary was Julian Ravest from the Liverpool Planetarium (our current President). Raymond Butt of

The first newsletter of the Association, edited by David Clarke, appeared in September 1981 (Volume 1, No.1). An inspiring message from our Patron is reproduced here - it is as relevant today as it was 10 years ago!

ASTRONOMY IN THE CLASSROOM

Bob Kibble, AAE Secretary, will give a talk on this subject at *Brighton* on Thursday, 18 April 1991. This will be followed by questions and discussion.

The meeting is organised by the Brighton Astronomical and Scientific Society and is open to everyone.

Full details from the Secretary of the Society, Terri Fearn.

Telephone 0273-581553.

PHYSICS AND ASTRONOMY

The latest edition of Physics Education, the educational journal produced by the Institute of Physics, is devoted to links between physics and astronomy. It includes articles by AAE Council members amongst others. Extra copies are available at the special price of £2.50 per copy from:

Order Processing Department,
IOP Publishing Ltd
Techno House, Redcliffe Way,
Bristol BS1 6NX, UK.

Several items have been left over for the next issue. Apologies to contributors concerned.

1991 Annual Meeting - Saturday, 18 May

The venue for this year's meeting will be the Planetarium, South Tyneside College, St George's Avenue, South Shields.

Our guest speaker will be The Astronomer Royal, Professor Arnold Wolfendale.

It is hoped that Association members from the North of England will find that this location gives them access to an event which has tended in the past to be held in the South.

A meeting programme and travel details will be sent to all members who

register their intention to attend in writing to the Secretary no later than May 3 1991.

Tourist information is included in copies of *Gnomon* sent to members.

The annual meeting will include a workshop on aspects of astronomy in the National Curriculum, together with the Association AGM.

All positions on Council will be submitted for election at the AGM. Nominations, together with seconders, for Council posts must be sent to the Secretary to arrive by 3 May 1991.

The posts are:

President
3 Vice-Presidents
Secretary
2 Assistant Secretaries
Treasurer
3 Resource Centre
Representatives
3 Ordinary Council Members.

[The Editor, who is an *ex officio* member of the Council, is appointed by the Council and is not elected at the AGM]

Earth in Space by Colin Reid. Duckworth, 1991. ISBN 0 7156 23501, pp.128. £7.95 (paperback).

This book contains most of the basic ideas of astronomy. More than half of the 14 chapters are dedicated to individual planets, including a close look at Earth. The remaining chapters cover ideas about the seasons, gravity, measurements of the distances and temperatures of stars and simple cosmology. I found most topics very clearly explained and the material is well illustrated by black-and-white photographs and line drawings. It is certainly up-to-date, as there is a photograph taken by the Hubble Space Telescope of a star cluster. There are also suggestions for practical activities, such as observing sunspots or using a prism to view the spectrum of sunlight.

There is enough depth here to provide a good basis for the GCSE astronomy course (as examined by the London and East Anglian Examination Group). Supplementary material would eventually be needed in some topics. As the publishers themselves suggest, it could provide background information for a science teacher who is about to embark on teaching the astronomy component of the National Curriculum. However, the topics range far beyond the requirements of the present Programmes of Scientific Study for 11 to 16 year olds, as they include the Equation of Time, apparent magnitudes, the Doppler Effect and Hertzsprung-Russell diagrams.

Care has obviously been taken with the presentation, and I found only one typographical error. However, there are some minor factual errors. One of these concerns the reason why we have two tides every day. The definition of a parsec on page 96 is also in error.

The final chapter boldly considers the expansion of the Universe and whether there will be a 'Big Crunch': an issue at the forefront of cosmology. We just cannot yet tell if the suggested plot of r against T will be 'a straight line' as asserted in the text, or whether it has curved over either way.

Other conceptual mistakes occur in the explanation of the limb darkening of the Sun on page 90 and in the implication on page 49 that a garden greenhouse does not exhibit the 'greenhouse effect'. (It does!)

The tabular information on the planets should be used with caution: for instance the sidereal rotation periods for the giant planets seem to be a mixture of cloud-top rotation periods (for Jupiter and Saturn) and internal rotation periods (for Uranus and Neptune). Proxima Centauri, the star everyone knows as the one which is nearest to our Sun, is not given its usual name but is listed as 'Centauri C'. However, these are minor quibbles, and do not detract from the usefulness of these data for most purposes.

Many students at secondary level will find the text too dense and the treatment too deep for their needs. Only the more able 15 to 16 year olds will be able to use this book directly. Frequently a knowledge of mathematics is assumed: familiarity with degrees; the trigonometry of a right-angled triangle; the manipulation of simple algebraic expressions; the concept of simple proportionality. Teachers wishing to use the ideas and practical investigations for mixed-ability AT16 work will have much reconstruction to do, shaping worksheets and activity sheets for lessons. Only four pages are photocopyright-free for class use, and one of these is an H-R diagram!

Overall the general clarity of presentation outweighs the minor infelicities outlined above, and I could definitely recommend the book as a basis for a GCSE Astronomy course, backed up by a series of carefully taught lessons, and with other reference material. It could also provide an excellent text for a beginner's adult education class. The material is certainly not suitable for primary schools.

Anne Cohen

Do-it-yourself Astronomy by Sydney G. Brewer. Edinburgh University Press, 1988. ISBN 0 85224 573 4, p.137. £8.95.

Sydney Brewer is a gifted and enthusiastic teacher who devised a series of simple experiments to measure some of the basic dimensions of the solar system, including the length of the sidereal day, the radius of the Earth, and estimates of the astronomical unit, the distance to the Moon, the diameter of the Moon and much more.

He set himself the challenge of making these measurements without the help of optical instruments, and using nothing more elaborate than a foot rule and a stop watch. His achievements are remarkable, even though he did allow himself the luxury of a pocket calculator. What makes this book so attractive is the fact that you feel that you could go out immediately and repeat these same experiments. Everything that is needed can be fabricated on the kitchen table. No need to purchase expensive equipment. If you have a hammer and some nails, the only thing you need wait for is a clear sky.

To give some idea of what can be achieved, the sidereal day is measured as 23h 56m 04.1s. The accuracy comes not from the fine resolution of his stop-watch and optical instruments, but from the averaging of observation over many days of the successive disappearances of a star behind a chimney. What is even more attractive is that the measurements can be done indoors! Just stick a black patch with a central 6mm hole on the kitchen window and use this as your eyepiece.

I am sure that if the experiments are repeated with a group of school children, the most popular project will be to measure the diameter of the Earth, using only a foot rule! Over 2000 years ago Eratosthenes attempted this using a 500 mile north-south baseline along the Nile. Brewer does it along a 26 mile east-west baseline paced out by bicycle wheel. At his latitude in Edinburgh the difference in transit times at the two ends of the baseline is of the order of three miles. When averaged over many transits, Brewer is able to calculate the Earth's diameter as 12,720km compared with the 'correct' value of 12,756km, his greatest error being the uncertainty of his baseline.

This book should be compulsory reading for all teachers of maths and physics. Only the simplest elements of geometry and trigonometry are referred to and the experimenter is not overloaded with the burden of too much mathematics. The experiments demonstrate how averaging techniques can improve the measurement resolution enormously, even when using the most simple apparatus.

What a refreshing change to find a maths book which is devoted to achieving useful practical results rather than force-feeding the student with equations and proofs. Thoroughly recommended.

Gordon Roberts

Exercises in Practical Astronomy using Photographs: with solutions by M.T. Bruck. Published by Adam Hilger (IOP Publishing Ltd). ISBN 0 7503 0061 2. Price £18.50.

This book provides meaningful practical work for courses in elementary astronomy and astrophysics. It does this through the use of authentic astronomical photographs of very high quality on which different types of objects can be studied with equipment as simple as rulers and protractors.

Some of the exercises contained in this book arose out of the Edinburgh University Teaching Packages, produced by the author with the co-operation of the Royal Observatory Edinburgh, which make use of copies of photographs taken by the UK 1.2m Schmidt Telescope in Australia. Selected astronomical material from this package is included in the book, accompanied by many new photographs and exercises.

The set of exercises covers 12 topics such as the Sun, asteroids, Halley's Comet, the Milky Way, stars in motion, open star clusters, globular star clusters, interstellar extinction, supernova remnants, types of galaxies, nearby galaxies and clusters of galaxies. Sufficient for a one year course, the exercises in the book are best not rushed. With the ample hints and worked solutions, the book can be designed to enable students to work independently. SI units are used for physical data and in conversions of astronomical quantities. Although the exercises do not require advanced mathematics, some knowledge is required.

This book fills a need in astronomy for 'more advanced' resources using real data and it will appeal to teachers as well as students.

Nicholas Steggall

Observational Astronomy by D. Scott Birney. Published by Cambridge University Press, February 1991, hardback, ISBN 0 521, 381991 £35.00 and paperback, ISBN 0 521 39693 X, £13.95.

This new book is published in two forms, hardback and paperback, simultaneously. The author is at Wellesley College, USA, where he has taught observational astronomy for several years. It is basically a book for undergraduate students, but may be read with profit by serious amateur astronomers. Members of the AAE concerned with higher education will find this a useful text.

Fundamental astronomy is dealt with very satisfactorily in chapters 1, 2 and 4. It is refreshing to see the basic equations of the spherical triangle proved so clearly – many other texts require a careful read of Smart in order to accomplish this task.

The chapter on the charts and catalogues list and explain twelve different classifications. Photographic and visual observations are dealt with clearly in two chapters, and there are three chapters on different aspects of photometry. There are three chapters on spectroscopy. A special section deals with solar observation, and the final chapter is concerned with radio astronomy.

A very clearly presented and comprehensive textbook and a delight to read, this text will appeal to all those who are interested in the practical side of astronomy.

Eric Zucker

Continued on page 7

BOOKS

Guide to Amateur Astronomy by Jack Newton and Philip Teece. Cambridge University Press, 1988. Hardback £17.50, p.327, ISBN 0 521 34028 4.

The authors of this book are both based in Victoria, Canada. The book was unknown to me when I recently spent some time in Victoria, otherwise I would have made a special effort to meet the authors and congratulate them on producing such an inspiring work. My belated congratulations must therefore reside in this review.

The book very much emphasizes the practical side, including suggestions for constructing your own telescope, an observatory to house it, and how to take astronomical photographs.

Some of the topics dealt with are: time and timekeeping, observing the Sun and Moon, Mars, Jupiter and Saturn, the asteroids and meteors. There is a section on stars (doubles and variables). Among the instruments described are photometers and micro-computers, with special emphasis on the use by astronomers of computers.

The many diagrams are crystal-clear (no doubt partly due to the high quality paper on which the book is printed). The book is lavishly illustrated with photographs, both black-and-white and colour.

The book is a must for amateur astronomers and Astronomical Societies. It is also useful background material for teachers involved with astronomy in the National Curriculum, as it requires no previous knowledge of the subject.

As prices go, £17.50 is a very reasonable amount to pay for such an excellent production.

Eric Zucker

The Teaching of Astronomy, Proceedings of the 105th colloquium of the International Astronomical Union, Massachusetts, July 1988. Edited by Jay M. Pasachoff and John R. Percy. ISBN 0 521 35331 9, p.445. Cambridge University Press, 1990. \$54.50.

This book is a collection of over a hundred papers and other contributions to the IAU Colloquium on the Teaching of Astronomy. In that lay both its strength and weakness. The

strength lay in diversity, drawing on the experience of some 162 participants from 31 countries, and covering all astronomy teaching from primary through to University level. An enthusiasm for the subject and the rôle it can play in education is universally echoed. Unfortunately, in four pages or less, few papers are more than superficial, almost anecdotal. To take one example: three pages on the teaching of astronomy in China can only present a most limited picture, and is the fact that two schools have telescopes, even large ones, really such powerful evidence for the improvement in the spread of astronomical knowledge in the vast country?

There are other difficulties with this type of book: there is the repetition as each author states the obvious, there are the bland papers that had to be given to justify the travel grant, and there are the papers written to establish a position. There is a consequent lack of coherence, in content and style, with no feel for this being a comprehensive or definitive work. Indeed, by their very nature such colloquia are necessarily highly selective, both in participants and in topics covered. Doubtless the colloquium was exciting and stimulating to attend, mostly through the contacts made with others working in the same field, but the pre-prepared papers published here cannot share that experience. There is clearly much innovative and thoughtful work being done, but tantalizingly few papers can do more than hint.

The very scope of the book makes it difficult to identify those who find it useful, or whose teaching would improve because they had read it. Most teachers of astronomy will find something in this book to interest them, but for teachers in British schools there are, unfortunately, few relevant papers. There is a meal made up of hors-d'oeuvre, some tasty, but leaving one still hungry.

Julian Ravest

Universe by Michael Rowan-Robinson, Longmans Academic Scientific and Technical. x + p.180, ISBN 0 582 044 38 3. £17.75.

'Universe' is neither a reference nor a resource book. Whatever the title may suggest, it is not intended to be a history of the Universe or a comprehensive survey of the type of objects to

be found within it. What it is, however, is a well-presented work on elements of modern astronomical research using some of the more easily accessible objects in the heavens as 'pegs' onto which the chapters are hung.

In 20 chapters the author discusses 20 objects of interest. The chapter headings give an idea of the scope: Sirius, The Orion nebula, Hyades and Pleiades, 3C273 and the Andromeda Galaxy, for instance. The result is a pleasant and valuable patchwork of interesting astronomical objects, a set of 'bite-sized' pieces that can be dipped into almost at random. I find it ideal bedtime reading.

Teachers looking for resource materials and information for AT16 should not expect much information on Earth and Moon, Solar System and gravity. In line with the main thrusts of modern astronomical research, and Rowan-Robinson's in particular, this is largely a star-based book. Solar Systems in general are represented by Vega and its possible accretion disk. A chapter on Halley's Comet is the only significant reference to our own Solar System.

The cross-cultural, historical and modern approach running through much of the book sets it apart from the majority of modern astronomy books for the interested layman. Starting with naked-eye objects, constellations and items that have been observed since antiquity, the book moves on to areas of more modern research such as variable stars, clusters and galaxies. The antiquity of astronomical observation of the Chinese, the temple illustrations of the Egyptians and some of the western cultural traditions are well represented.

The title, presentation and rather irrelevant artwork accompanying chapter headings is geared towards attracting the casual bookshop browser. It is well presented and well produced but I suspect the casual buyer will find some of the text hard work. Rowan-Robinson has produced a good readable book for the interested reader and the treatment is totally non-mathematical, but information about modern multi-spectral research is phenomenally difficult to simplify.

As one would expect from the price, the paper is of good quality and the illustrations are well reproduced.

Martin Suggett

THE YORK OBSERVATORY

by Martin Lunn

The York observatory was established in 1832 by the Yorkshire Philosophical Society which itself had been established ten years earlier. The observatory is located in the Museum Gardens, in the centre of York.

The main instrument in the observatory today is not the original telescope, but one which was made in 1850. It is a 4½ inch refracting telescope and was made by Thomas Cooke of York who was one of the world's great instrument maker.

Although no major discoveries were made, most of the important celestial events were witnessed. This was certainly true of the period between 1840 to the late 1930s.

Since 1989, under the present Honorary Curator of Astronomy, the observatory has been provided with a new role, the education of young children on the subject of space and

astronomy, which is now featured on the schools' science curriculum. Following a week-long exhibition of lectures and demonstrations (in September 1999), which attracted over 1500 school children from all over the north of England, a larger event is now being planned for October 1991.

After almost 160 years since the establishment of the York observatory, it is now going from strength to strength, and with the many plans which have already been laid down for the future, it is hoped that the observatory will continue to play a key role in the growing interest and awareness in astronomy.

If you would like to obtain further information regarding the York observatory, please contact Martin Lunn, Honorary Curator of Astronomy, Yorkshire Museum, Museum Gardens, York YO1 2DR (Tel: 0904-629745).

GNOBLEM 13

It has been said that Einstein's opened umbrella catches enough radiant energy on a clear day to run a washing machine. Use this to calculate the approximate rate of loss of mass by the Sun.

This problem, supplied by a reader, is adapted from 'Special Relativity' by A.P. French.

For solutions to Gnoblem 12 see the letters column.

LETTERS

Dear Editor,

After reading how the Webb Society failed to give you enough warning of their weekend meeting, I will take this opportunity to tell you that the 1991 Scottish Astronomy Weekend will be held at St Andrews, September 6-8th, 1991! Details will be available later.

Recently I gave a lecture concerning the relationship of astronomy and astrology (entitled 'It's not all in the Stars', it was part of our National Astronomy Week events). To check the validity of newspaper horoscopes, I bought three different daily papers and selected one horoscope from each. I read them out to the audience of 40, and asked who recognised that as a prediction for the day.

The 'Leo' prediction was claimed by two people: one Gemini and one Scorpio; none of the four Leos present recognised it. The 'Aquarius' horoscope wasn't claimed by anyone, even though six of those present were Aquarius. The 'Scorpio' prediction wasn't recognised by the only Scorpio present (she had opted for the Leo one), but one Cancer confidently claimed it.

Perhaps the most amusing aspect of the exercise for me was noting the three different versions of my own horoscope for that day. The first said: 'You'll go from strength to strength in a financial sense, if you allow your feelings to override comment and guidance from others'. The next one said: 'You'll be useless with money today, so do let a partner have a say!' - which seems to be the exact opposite of the first. So I turned to the third paper for a casting vote: 'The next day or so may coincide with some minor ups and downs when handling financial issues'.

Yours sincerely

Dr Fiona Vincent, Mills Observatory, Dundee

Dear Editor,

Some time ago I sent you information about the Stargazers Trust Competition and you were kind enough to mention it in your journal.

Although we have had a good response, concern has been expressed that many potential entrants may not have come forward for fear that their work would not be considered worthy of consideration as serious astronomical research.

Entries to date have covered topics such as photoelectric and CCD photometry of variable stars, naked eye observations of variables, photographic studies of galactic and extragalactic objects and searches for transient lunar phenomena. Please note that, unless the equipment has been specifically developed for the observations presented, the judges will be more concerned with the quality, timeliness and promise of the data obtained than with the sophistication of the equipment used. Indeed it is the Trustees' hope that the prizes will allow the winners to develop their observing potential by providing funds to augment their existing equipment.

Could I, therefore, ask you to encourage your readers to cast aside any false modesty that might be deterring them and seriously to consider entering the competition no matter how humble their own view of their observations might be? In this regard, following a number of requests from interested parties, the Trustees have agreed to extend the final date for the receipt of entries to **15 September 1991**.

If you would like any further details, please contact me at the address given below, or contact John Watson (Chairman of the Trust) on 0424-83226 for an informal chat on the suitability of any entries you might be considering.

Yours faithfully

Dr C.D. Pike, Secretary, Stargazers Trust
P.O. Box 337, Hailsham,
E. Sussex BN27 1PT.

Dear Editor,

I write regarding the problem of whether tidal power schemes could cause the Moon to drift away from the Earth and eventually be lost (Gnoble 12).

The conundrum arises from the false assumption that existing tidal effects do not involve frictional dissipation of energy. But tides dissipate enormous amounts of energy through friction every day when the tidal bulges run up against the edges of continents. (Even without continents there would be viscosity effects.) This results in a net loss of energy from the Earth-Moon system, which takes the form of radiated heat from the oceanic surfaces and coastlines. The source of energy is the Earth's rotation, which is slowing down gradually due to tidal interactions. Of course we need to consider not just kinetic energy but the total sum of kinetic and potential energy, but the point is that some of this total energy of the Earth-Moon system is lost through radiation.

However, the total angular momentum of the Earth-Moon system is conserved, and as the Earth slows down the Moon gains angular momentum and its orbit increases in size. The torque required for this orbital acceleration comes from the tidal bulges on the Earth, which lag behind the Earth-Moon axis due to friction and land masses.

The slowing down of the Earth's rotation and the increasing size of the Moon's orbit have both been measured. Eventually, the Earth-Moon system will reach a state where both bodies are tidally locked into synchronous rotation, as the Moon is now. Various textbooks cite an expected synchronous period of between 40 and 50 days. This situation will not occur for many hundreds or thousands of millions of years. But the Moon will still orbit the Earth.

Even the most ambitious tidal power schemes would tap only a small fraction of one per cent of the total energy now being dissipated naturally. The net result of such schemes would be, therefore, to increase minutely the rate at which these effects already act.

Yours sincerely

Dr M.M. Dworetzky
Tutor to Astronomy Students
University College, London

Dear Editor,

Thank you very much for producing such an interesting publication.

1. Gnoble 12:

If the Moon were to slow down, it would approach us, not recede. In the extreme case that it stopped orbiting entirely, it would rush straight at us. However, we shall only ever be able to capture extremely small fractions of the energy concerned.

The Moon is really pulling a huge wave round the Earth, and tidal power is just preventing the water moving towards the Moon (whether ebbing or flowing). To compensate for this recession of the Earth's centre of gravity, the Moon will presumably edge closer to the solid part of the Earth.

Alternatively, if the Moon is prevented from pulling the water wave round, it may pull the whole Earth slightly more, causing the Earth's rotational rate to increase. Conservation of Angular Momentum will then demand that the Moon slows down and/or approaches the Earth. We must distinguish here, however, between pulling the wave round and pulling water round.

2. Boötes is usually spelt with two dots (called a dieresis) over the second 'o' to show that the two vowels are pronounced separately, not as in 'boot'. Other words with this mark are noel and naïve, in both of which it is optional.

Subscription Rates:

Individual members £7.50
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Affiliated institutions
(e.g. schools, colleges, etc.) 15.00

Affiliated members will receive several copies of *Gnomon*.

Practicing 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: Nick 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.

3. There is no justification for putting a circumflex over the 'o' of 'rota', as it is a word of Latin origin (rota = wheel), not French; perhaps you are confusing it with roster, a word of Dutch origin (rooster = grid). The spelling 'fete', with no circumflex, is quite acceptable to my dictionary. Are you sure you should be correcting it?

4. In the letter from Ian Ridpath, presumably Adrian Room agrees with the DERIVATIONS, or is Ian saying that John Ebdon and R.H. Allen are deviations, and that he agrees with them?

5. Advertising is normally spelt thus in Britain. It looks extremely odd to have it spelt the American (-z-) way in a heading and the British way in the following text.

I hope this is of some interest.

Yours sincerely

Graham Dane, Edinburgh

Footnote: I thank Mr Dane for his comments on the use of the circumflex on the word *rota*. The Concise Oxford Dictionary confirms the Dutch origin of the word *roster*, but one meaning of *rota* is given as: *roster*!

On the -ize or -ise controversy, Fowler in *Modern English Usage* says: "You will be safe if you make every verb... noun or participial adjective conform to the -z type." He gives etymological reasons for this. See Partridge, *Usage and Abuse*. Mr Dane is correct to point out the inconsistency in using the -z ending in the title, but the -s in the text.

Readers may have read that the proposed changes in the French spellings, including accents, have been abandoned! (*Editor*)