Editor’s Report

I have taken over from David Pearson as Editor of the Bulletin of the Environmental Physics Group and intend to circulate briefer documents than in the past but more frequently, probably three times a year.

May I take this opportunity to remind readers of our Tenth Anniversary Meeting on The Diversity of Environmental Physics, to be held at the Institute of Physics on Wednesday 17 May 2000. The Committee hopes that as many members of the Group as possible will attend this all-day event. The attractive and wide-ranging programme has already been circulated to members but more posters would be welcome. Please confirm your attendance at this meeting as soon as possible (and no later than 9 May) so that the catering may be arranged. May I remind you that there is no charge to EPG members for the meeting, which includes a substantial buffet lunch.

Finally, if you have some information likely to be of interest to other members of the Group, please contact me or one of my colleagues on the Committee (see back page for contacts).

Derek Rose

ENVIRONMENTAL PHYSICS GROUP

ANNUAL GENERAL MEETING

London, 19th May 1999

Minutes

(1) Welcome

The Chairman, Edward Youngs welcomed the attendees (approximately 20 people to the meeting.

(2) Chairman’s & Secretary’s Reports

The Chairman and Secretary each gave a report to the meeting (Chairman’s Report published in the last Bulletin, Secretary/Treasurer’s Report follows)

(3) Election of Officers and Committee Members

The following committee was elected (unopposed).

Chair: Professor Edward Youngs
Vice-Chair: Dr. Alastair McCartney
Hon. Sec.: Dr. Peter Hodgson

Committee Members:
John Garland, Dr. Derek Rose, Dr. Douglas Pearson, Dr. Sian Bethan, Dr. Barbara Gabryes, Alexandre Wilson, Dr. Ian Colbeck, Peter Hughes

This leaves one vacancy on the Committee.

(4) The meeting was asked to vote on the adoption of a new Constitution for the Group. Peter Hodgson explained that the reason for the proposed change was the wish of the IoP to further standardise all Group, Branch and Division Constitutions. In fact this meant little change to the EPG Constitution. The committee recommended that the proposed Constitution be adopted.

The meeting voted unanimously that the proposed Constitution should be adopted with immediate effect.
AOB

David Pugh of Southampton Oceanography Centre asked what events were planned for future months. Edward Youngs responded with details of events at Optical Oceanography at the IUGG meeting in July, the BAAS meeting at Sheffield in September, Edinburgh Science Festival in April 2000 and a Member's Day meeting planned for May 2000 to celebrate the tenth anniversary of the founding of the Environmental Physics Group. Other events are also planned.

A point was raised about whether the Group should be voicing opinions on environmental issues through such a vehicle as writing letters to newspapers. Whilst the Constitution prevents the Group acting as a pressure or lobby group, it was pointed out that individual members of the Group are free to express their opinions in this way. The Group should continue to provide a forum in which environmental physics can be discussed and provide expert opinion on various aspects of the subject, in line with IoP guidelines for Group activities. A note will be published in the Bulletin making the position clear.

The meeting then enjoyed an excellent presentation given by Jon Shanklin of the British Antarctic Survey entitled "Environmental Change in Antarctica", organised jointly with the London & South East Branch.

Meeting closed.

Financial Summary 1998-99

1998 Finances

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<tr>
<td>Expenditure</td>
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1999 Finances

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<th>Amount</th>
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<td>Balance b/fwd</td>
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Details of the 1998 expenditure were presented at the AGM.

Secretary's & Treasurer's Report 1998-99

The last year has been another active year for the EPG, with a range of events organised for the membership and often a wider audience too. Attendance at times has been disappointing, but the committee will continue to organise events it feels are of interest and relevant to the membership. As always suggestions for events will be warmly welcomed.

The Group has in recent years been active in contributing to several IoP submissions, including to a House of Lords Select Committee and other Government enquiries. This type of activity is likely to continue. The committee feels that a better knowledge of members' expertise would be of use when compiling these submissions. With this in mind it is our intention to add more relevant detail to the Group member database. The membership will be contacted in due course with a questionnaire. I would encourage every member to respond so that the committee can on future occasions rapidly compile a representative submission.

The new Group funding arrangements are working well and allow the Group a greater freedom and ability to support new initiatives. One such initiative is a Travel Bursary Scheme, aimed at encouraging students and younger researchers to attend EPG meetings. Details of how to apply for a Travel Bursary are published in this issue.

Membership of the Group is for the third year in succession just over 500, the current figure being 509 members. The Group remains one of the larger in the Institute.

I would like to thank the outgoing members of the committee, particularly David Pearson for his tremendous efforts with the Bulletin and John Stewart, who as one of the founding members of the Group and a long-serving committee member, is one of those most responsible for the continued existence of the Group. His enthusiasm for the subject and in particular his commitment to the education and encouragement of young members and researchers is especially inspiring to me. John personally recruited me into the Group and onto the committee and I wish him well in the future.

Finally my thanks go to Edward Youngs for his dedicated efforts as Chairman.

Peter Hodgson
Honorary Secretary/Treasurer
CONFERENCE ANNOUNCEMENTS

Tenth Anniversary Meeting of the Environmental Physics Group – The Diversity of Environmental Physics

The Institute of Physics, 76 Portland Place, London W1N 3DH, Wednesday, 17 May 2000

To celebrate the tenth anniversary of the formation of the Environmental Physics Group, a “Members’ Day” is being held at the Institute of Physics on 17 May. The programme has still to be finalised, but we intend to have talks, posters and a photographic exhibition to illustrate the diverse interests and activities of environmental physicists. We have had offers of talks and/or posters on the following subjects:

- Passive microwave remote sensing and soil hydrology
- Emerging technologies in emissions and VOC analysis
- Greenhouse – catastrophe or miracle? – an experimental approach
- Environmental physics in the construction industry
- Air pollution
- The role of hydrogen as a fuel for the world’s economy
- Groundwater pollution from landfill sites
- Dispersion of spores in the atmosphere

We have also had an offer of photographs on historical evaporation studies for the photographic display.

In order to make this a special occasion, we will be pleased to receive more offers of posters to illustrate the diversity of environmental physics. We also need more interesting photographs for the display that will run for a week in the foyer of the Institute.

E.G. Youngs
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The Sixth International Conference on Air-Surface Exchange of Gases and Particles

3rd – 7th July 2000, Edinburgh, UK
http://www.nbdu.ac.uk/bionoz/EdConf.htm

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NEWS ITEMS

The Charles Chree Medal and Prize

This award was instituted in 1939 as a memorial to Dr Charles Chree who was President of the Physical Society 1908-10. It is made by the Institute of Physics each year for distinguished research in branches of physics in which Dr Chree was particularly interested. Environmental physics was recently included in the citation for this award, and it is now given “for distinguished research in environmental physics, terrestrial magnetism, atmospheric electricity and related subjects, such as other aspects of geophysics comprising the Earth, oceans, atmosphere and solar-terrestrial problems”.

Members of the Institute of Physics are invited to submit candidate nominations for this award (and others) for the year 2001. As this is the first time that environmental physics is specifically mentioned in an Institute of Physics award, it is hoped that a suitable candidate (or candidates) distinguished for their work in environmental physics will be nominated. (See Physics World, November 1999, page 52).

New Book


John Wiley is offering this book to Members of the Environmental Physics Group at the discounted price of £20.

The diverse interests of environmental physicists have resulted in different definitions of “environmental physics” in the few books on the subject. Boeker and van Grondelle in this second edition of Environmental Physics open with their definition: “Environmental physics is defined in a broad sense as the physics concerning the identification and measurement of environmental problems”. This is to be compared with John Monteith’s definition, given in his book Principles of Environmental Physics, as “the measurement and analysis of interactions between organisms and their physical environment”. The contents of these two books, whose titles both imply a comprehensive treatment of the same broad subject, is very different. Boeker and van Grondelle do not include discussions on such matters as, for example, the soil-plant-atmosphere continuum that is prominent in Monteith’s book. Instead it concentrates on the physics concerned with the effects of man’s activities on the environment. A better title perhaps would have been Environmental Physics: the Measurement and Identification of Environmental Problems.

The book is divided into eight chapters. The first chapter is an introductory essay on the essentials of environmental physics that the authors opine as dealing with problems "concerned with society in general and its economic system in particular". Three areas of environmental physics are selected to illustrate the physical context of the subject in relation to the economic system of production and consumption: the greenhouse effect,
solar energy as a renewable source of energy, and transport physics that describes the
movement of pollutants. This short chapter ends with a discussion on the influence of a
scientific understanding of environmental problems on social and political behaviour.
The next six chapters are devoted to selected topics rather than to a comprehensive
treatment of the whole subject. Throughout, the basic physics is explained in depth. The
last chapter puts environmental physics into the context of society and points to the
contributions that it can make in the quest for sustainable development.

Students should not be put off by the apparent emphasis on spectroscopy when
looking at the chapter titles. Much of Chapter 2 (Basic Environmental Spectroscopy) that
discusses the solar energy reaching the earth, would have been better included in Chapter
3 (The Global Climate), and Chapter 7 (Spectra and Examples of Environmental
Spectroscopy) that gives the fundamental physics on the use of spectra in the quantitative
analysis of the composition of the soil, the surface water and the atmosphere, would have
been better included in an expanded chapter on remote sensing. An extra chapter dealing
with light pollution would be a welcome addition and would complement Chapter 6 on
Noise. The latter addresses particularly the problem of noise pollution in buildings; while
the authors state that the best action is to reduce the sound level at source, little is said
about reducing such levels, for example from road traffic. Chapter 4 (Energy for Human
Use) starts with the basic physics of heat transfer before discussing the physics associated
with the different methods of producing and managing energy for man's consumption.
The chapter discusses the use of fossil fuels, of renewable energy sources (solar heat and
electricity, wind energy, energy from waves, bioenergy, hydropower and fuel cells) and
of nuclear energy (including safety aspects) in the production of energy. Chapter 5
addresses the problem of the transport of pollutants in rivers, in groundwater and in the
atmosphere, and opens with the admonishment: "the best way to deal with pollutants is to
prevent their coming into existence". This chapter gives a good introduction to the basic
physics of the transport processes and how an understanding is applied in practice.
However, there is only a brief mention of the physics associated with the transport
through the unsaturated soil zone, through plants and into the atmosphere.

The book is well presented with good diagrams and figures. A feature of the book is the
use of excursions on special topics that can be read separately and provide interest.
The book is intended for students of environmental physics and environmental science at
both undergraduate and graduate levels with a good grounding in physics and
mathematics and will be invaluable to such students. Each chapter contains useful
student exercises with notes to help with their solution. A manual with worked exercises
is available for teachers from the publishers. However, it is not just a textbook for
students. It usefully brings together and explains the basic physics of many processes
that are encountered in the modern world and will be invaluable to those concerned with
environmental matters who are reminded of the constraints imposed by an industrialised
society.

E.G. Youngs

Consultations

The EPG committee has been consulted at short notice by the Institute during the past
year on a number of matters. These consultations were in support of submissions to be
made by the Institute on the following topics:

1. "Energy and the Environment" - Royal Commission on Environmental Pollution
   (7/12/98).
2. "UK Climate Change Programme" - Department of the Environment, Transport
   and the Regions (15/2/99).

Members of the EPG may obtain copies of the submissions from the Public Affairs
department at the Institute. Any members who feel able to contribute promptly to these
and similar topics in the future, should notify the Secretary, Peter Hodgson.

Douglas Peirson

Travel Bursaries

The committee of the Environmental Physics Group is pleased to announce a new Travel
Bursary scheme for members of the Group. The bursaries (£50 - £100 typically) are
aimed at enabling members to attend Group meetings. Preference will be given to
students and postdoctoral researchers. Authentication of status will be required.
Recipients will be encouraged to submit a relevant article for publication in the Bulletin.

Several awards will be made each year. Applications should be made in writing or by
e-mail to the Honorary Secretary of the organiser of the meeting in question, ideally at
least one month before the meeting date.

Peter Hodgson
Ph.D. Abstract

An Assessment of the Health Benefits of Radon Mitigation of Buildings in Radon Affected Areas

Antony Roger Denman, May 1999, Leeds Metropolitan University

Excessive concentrations of radon are known to cause lung cancers in miners, but it is only recently that evidence has accumulated that raised radon levels in the built environment may also be a risk. It is possible to reduce such levels, and so efforts have continued to locate affected areas both in the United Kingdom, and elsewhere.

Northamptonshire was declared a Radon Affected Area in 1992. As Radiation Protection Adviser, I initiated routine radon surveys of all National Health Services (NHS) premises in Northamptonshire. It was clear from the literature that no major workplace study had been published. This started a programme of published research, which forms the basis of this Ph.D. submission. The research remains the only body of published results of actual remediation programmes.

The research programme first estimated doses to occupants in affected rooms, and showed that individual doses were higher, and the number of staff affected greater, than staff exposure during the clinical use of X-Rays in the same hospitals. The costs of remediation of each affected room, together with measurements of radon levels afterwards, were recorded, permitting the first analysis of the costs and benefits of an actual remediation programme. Only predicted costs of proposed domestic remediation programmes had been published, and it was shown that remediation in the NHS workplace was more costly than these predictions, but still comparable with the National Radiological Protection Board (NRPPB) initiative to reduce patient dose from dental X-Rays.

The work was then extended to remediation programmes in schools and houses in Northamptonshire, permitting the first published comparison of such programmes. It proved most cost effective to remediate schools, and almost as cost-effective to remediate houses, but only if all house-holders could be encouraged to remediate their houses, once raised radon levels were found. To date only 10% had done so.

The research has made a major and unique contribution to the evaluation of the risks of radon and the benefits of remediation programmes, which has been recognised by the acceptance of papers for presentation at two international conferences in 1999. The research provides a framework which permits evaluation of future radon remediation policy and of the value of remediation programmes elsewhere. For example, it may be appropriate to consider remediation of only the schools in a mildly affected area, and only initiate a programme for houses if a high uptake was guaranteed.

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