Welcome to Issue number 10.

Industrial activity is often blamed as being almost entirely responsible for the environmental ills of the world. Well whatever your viewpoint it is clear that pollution, waste and inefficiency are all contributing to a heady concoction which is unfortunately an evil made necessary through both the current philosophies underlying our industrial activities and as its position as the major wealth creator of a nation. In our main article, Colin McCarthy describes the Government sponsored UK Technology Foresight initiative which has been designed to identify areas of technological development in the UK which can be exploited and used as a basis for potential industrial growth in the next decade or so. Colin is well qualified to tell us about such matters having spent the past 14 years in industrial R & D with over 11 years spent in the study of flight control and actuation systems such as fly-by-light. He has advised local councils on matters environmental and is active in the IoP at a local level by being Publicity Secretary for the IoP's Midland branch, and at a national level as a member of the IoP Industry Committee. He is also a member of the EPG.

On a lighter note, to some the word “Internet” may mean absolutely nothing: to others it may represent a rapidly expanding network of computer based links to pretty well anywhere in the developed world. It began in the US and is gradually expanding to include any computer connected to a network anywhere one might think of. Of course, most supervisors will probably see this as a very effective way of dissipating the available time of their students or, just possibly, as an emerging opportunity to broaden the horizon of any computer literate research worker with a need for up-to-date and easily accessible information. Regardless of your own impressions the ‘net is here to stay and in future editions of the EPG newsletter 1 will include useful links to archives around the world. Those with access to the World Wide Web (www) might take a look at http://dakota.stanford.edu/yahoo/Environmental_and_nature/ which is a jumping-off point to over 50 other archives, or locations with environmentally oriented information including all aspects of environmental science, and much, much more. If anyone finds a link which may be of interest to other EPG members on the ‘net then let me know and I'll include it in subsequent issues of the newsletter.

Finally, any member with a concern for urban air quality should pay particular note to the announcement of a future EPG meeting based on this topic. Further details can be found in the Future Meetings section but it is planned for this time next year and will cover a wide range of topics relevant to the understanding of air quality in our cities.

Geoff Hassall
Newsletter Editor
UK Technology Foresight and the Options for Environmental Technology Companies
Colin Stephen James McCarthy

The UK economy has suffered from significant trade deficits, with the rest of the world, in most sectors of the economy. Oil production has alleviated the deficit but environmental technology companies may provide hope for a prosperous future based on an improved UK manufacturing base. British environmental technology companies provide an annual trade surplus of £234m at present, with a world market for pollution control equipment and services of £144bn that is expected to grow to £30bn by 2010. Any government initiatives to help predict successful technologies for the future will bring immense benefit to all sectors of the economy.

"Realising our Potential", the White Paper on science and technology, gave a considered and positive Government view on the science and technology in the UK. At least, it seemed, the government was willing to consult those working in science, technology and business to identify areas of strategic research that are likely to give the greatest economic and social benefit to the nation. The technology foresight exercises are to play a key role in identifying those areas suitable for exploitation. Fifteen expert panels are being set up to predict developments in a range of areas: agriculture, natural resources and environment; chemicals; communications; construction; defence and aerospace; energy; financial services; food and drink; health and life sciences; IT and electronics; leisure and education; manufacturing, production and business services; materials; retail and distribution; transport. The panels are to be made up of business, technology and scientific expertise and there should be scope for members of the EPG to have an input to relevant panel members.

"Technology Foresight" looks at predicting developments over the next 10-20 years and the results of the exercise will be distributed to universities and industry. "Forward Look" is an annual publication that considers the Governments present use of funds and its strategy in the near term for science and technology. The Offices of Science and Technology should co-ordinate cross department science and technology issues.

The IoP has input comments to the Offices and Science and Technology that considers areas of application and the climate for exploitation and growth. Matters that concern the EPG are included, but an important document "The UK Environmental Foresight Project" has already been released (1 December, 1993 by HMSO Books and the Centre for Exploitation of Science and Technology) and provides invaluable information on road transport and the environment. Drawing on experience gained by the US Environmental Protection Agency the project identifies hazardous air pollution such as 1,3-butadiene, benzene and PM10 (particulate matter with a mean aerodynamic diameter of less than 10 µm) that are inadequately monitored by the DoE. The project also examines health problems caused by noise pollution. However, it is obvious from work completed in the USA and elsewhwere that it is not possible to control emissions sufficiently. Careful town planning with an integrated transport system that places homes, shops and the workplace near public transport hubs provide a better solution.

The spread of topics covered by the foresight panels and the potential for several panels studying different aspects of a particular problem are useful. Using air pollution as a hypothetical example the health and life sciences panel may decide that improved pollution monitoring sensors, that record short term peaks over a large area, are a market priority. The use of improved sensors would enable an improved investigation of the prevalence of pollution related illness and the success or failure of various treatments. A particular emphasis may be needed on prevention (e.g. by reducing exposure to pollutants) rather than treatment as this is often more cost effective. At the same time the agriculture, natural resources and environment panel may wish to consider the possibilities for changes in farming practice that encourage pest and disease resistant crop strains that will reduce the amount of pesticides, herbicides, nitrogen, etc., entering the environment. Transport, retail and distribution, and the manufacturing and business process panels may also consider changes that could be beneficial to the economy and the environment. New energy efficient machinery could add to the quality of life by reducing the production of pollution. Such measures should also include the development of high speed traffic tolling systems and the production of a high speed mass transport system.

In conclusion, technology foresight and Forward Look are welcome attempts by the Government to involve industry, business, science, technology and engineering in achieving the maximum economic benefit from science and technology. To achieve a significant improvement a radical change in the way the UK financial system treats high technology companies must be a priority. However, it is also an exercise in improving communication between Government, business and the science and technology base.

Colin McCarthy,
IoP Industry Committee and EPG member

Any feedback or requests for further information should be directed to Colin at the following address:

C S J McCarthy
2 Beverley Close, Penbridge, South Staffordshire
UK GER: The Globe
As per usual we include information about The Globe, the newsletter of the UK GER Office. The August issue contains a summary of the various session topics included in the British Association Meeting in Loughborough during the early part of September. The next issue (number 21) is due out now and leads with the general theme Modelling Global Environmental Change. Number 22 is perhaps of more interest to EPG members in that it deals with Global Observing Systems and is due out this November. Copies of The Globe can be obtained from the UK GER Office at the address below.

Members may be aware that the GER Office has produced a database of over 900 environmental projects in the UK and a new version is to be released in the near future. It was originally intended as a GER resource but it is now used for briefings, background information and for “focussed interrogations”. It will soon be available via the Global Environment Network for Information Exchange (GENIE) Project. Apparently the paper version of the database has proved unpopular so future versions will be supplied on diskettes. Reports of specific searches will also be provided upon written request. All such requests should be made to Stephen Morgan at the UK GER Office.

UK Global Environmental Research (GER) Office, Polaris House, North Star Avenue, Swindon SN2 1EU Tel: (0783) 411721/411779/411768

The British Association for the Advancement of Science
The British Association for the Advancement of Science (BAAS) has just had its annual meeting in Loughborough. The BAAS meeting will be in Newcastle at which the Association will also host the European Community Contest for Young Scientists.

The BAAS has recently published its Annual Report for 1993/94 and it describes the activities it has been involved in during that time. For those unfamiliar with the aims and objectives of the BA (or their “mission and aims” as they put it), copies of their Corporate Plan, entitled Challenge and Change and released in 1992, are available on request from the Executive Secretary at the address given below.

Full details regarding membership of the BA should be addressed to the Membership Secretary:
British Association for the Advancement of Science, 29 Saville Row, London W1X 1AB Tel: 071 494 3926

Meeting Report

Colonial Observatories and Observations: Meteorology and Geophysics
A joint meeting of the History of Meteorology and Physical Oceanography Specialist Group (Royal Meteorology Society) The Environmental Physics Group (Institute of Physics) The Association of British Climatologists St. Mary's College, University of Durham 8-10 April, 1994

The Astronomer Royal and President of the Institute of Physics, Emeritus Professor Arnold W. Wolfendale, introduced the proceedings with a lively talk on the “Astronomers Royal and overseas connection”, adding as a stimulating digression news of a press release from the Royal Astronomical Society on the 6 April concerning the support given by the meteorological records at Armagh Observatory for a link between air temperatures and solar activity. Historical context for the conference was given by a further astronomical paper by Richard Stephenson on observations in East Asia from the medieval to the Jesuit period.

Other papers were presented by Jim Burton on the development of the meteorological observing network set up by the Royal Engineers and the Army Medical Department in the third quarter of the nineteenth century and, in contrast, by Stan Cornford on the nineteenth century heritage and the subsequent work of WMO, emphasizing the heavy cost of meteorology as a proportion of individual income in some of the smaller states and islands participating in WWW. Thomas Fitzpatrick on the history of meteorology in Malta, by Jane Insley on the trial and tribulations in the nineteenth century of “getting their in the first place” with instruments intact, by John Kington on the impact of the voyage of the British First Fleet from Portsmouth to Port Jackson, 1787-88, on the history of meteorology in Australia, and by Shirley McConnell and Anne Shirley on magnetism and meteorology at Hobart, 1840-54. Focus on the southern hemisphere was continued by David Limbert on the history of Antarctic observatories.

A distinguished and welcome visitor was Professor Stanley Jackson, form Johannesburg, who spoke on the history of meteorology and geophysics in South Africa, while Ron Girdler reviewed the fascinating history of geophysical observations elsewhere in Africa, Joan Kenworthy told of the establishment of the Meteorological Service in East Africa by A. Walter OBE, just in time for the outbreak of the second World War, and Professor B W “Tommy” Thompson spoke on his experiences as a meteorologist on secondment...
Meeting Report

to CIRO in Tanganyika, adding some reminiscences of working life at the Royal Observatory, Hon Kong, the distinguished history of which was evaluated by Lieutenant Commander David Morse.

Visits were made to the Oriental Museum and Botanic Gardens of Durham University. The well-known climatic atlas of Africa produced by Stanley Jackson and "Tommy" Thompson were exhibited, and a most interesting evening discussion followed the viewing of a film strip, belonging to Thompson, showing synoptic charts of the Indian Ocean for 1981 published in Mauritius, which stimulated subsequent research into their background by Stan Cornford. Jim Burton brought "colonial observations" up to date by showing a video recently brought back from Antarctica by his son, a member of the Australian expedition to set up the observatory on the South Polar Plateau. The highlights of the conference undoubtedly arose from the considerable overlap in the interests and experience of the members present which ensured lively and provocative discussion.

The proceedings of the meeting will be published by the Department of Geography in the University of Durham, to follow the proceedings of the previous conference on Observatories and Climatological Research, published in 1994 at £ 7.50.

Joan M Kenworthy
St. Mary’s College,
University of Durham

Environmental Issues in Physics Education

University of Reading
29 – 31 March, 1994

I have been reliably informed that a full report of this, the 1994 Annual Conference of the Education Group of the Institute of Physics, is to be published in Physics World. A shorter report will be included in a future issue of the EPG newsletter. Ed.

An important space filler:

Members will no doubt have read the notice in the September issue of Physics World about next years IoP Congress to be held at the Telford International Centre (27 – 30 March, 1995). There is a list of participating groups and divisions and the EPG is not on it. In fact, the EPG is planning to be there and a program for a one-day meeting will be announced in the next newsletter if it is available. Ed.

Future Events

EPG Meetings:

Urban Air Quality: A Breath of Fresh Air? September, 1995

Preliminary Announcement

As concern for the quality of the air we breath in the urban environment escalates, it has become all to clear that there is a desperate need for a better understanding of the underlying processes governing the formation and transport of airborne pollutants in and around our major conurbations. The pollution episodes occurring in many of our towns and cities this summer have amply demonstrated the potential health and social implications of poor urban air quality. The urban environment is becoming an important issue both scientifically and politically and there is increasing pressure on industry and commerce to comply with UK and EU air quality standards.

It is intended that this meeting will provide a forum for the discussion of recent scientific advances in the monitoring and modelling of urban air quality and how these can help our understanding of its impact on human health. However, it is essential to include the policy and decision makers who develop and implement air quality management strategies that will inevitably affect our everyday lives in the future city environment.

Our proposed outline for the meeting will include a wide range of topic areas suggested by these objectives. Four main headings are proposed.

• The assessment of urban air quality – Monitoring of all pollutants in the gaseous and particulate phase; sampling techniques and instrumentation; analytical aspects and emissions inventories.

• Prediction of urban air quality – Dispersion modelling; source apportionment (receptor) modelling; modelling developments (mathematical and statistical) and applications; physical and chemical processes in the boundary layer.

• The Impact on environmental health – Air pollution related illnesses; epidemiological studies; exposure estimates.

• The Management and sustainability of urban air quality – Policy issues; local and Government initiatives; evaluation of pollution control policies; integrated air quality management strategies.

The meeting will be composed of oral and poster presentations and it is hoped that the proceedings will be published either as a special issue of a journal or as a book. A call for abstracts will be announced in the very near future with the second call for papers following early in the new year. This is an important subject which affects us all and so we encourage all those with an interest to help us make this meeting a success.

Geoff Hassall and Ranjeet Sakhi
Environmental Physics Group Committee
Future Events

Electro-technologies for Waste Processing and Purification 23 November, 1994
Venue: The Institute of Electrical Engineers, Savoy Place, London
This is a collaborative effort between the Institute of Electrical Engineers (IEE), the Environmental Physics Group and the Plasma Physics Group of the Institute of Physics. It will assess and identify suitable industrial and commercial electro-technologies for future energy efficient waste processing and purification of solids, liquids and gases.

With the current concern about the release of hazardous and toxic materials into the environment, novel and energy efficient technologies are being sought to deal with pollutants materials resulting from industrial activity. Cost effectiveness is an important factor if such techniques are to be implemented across the full range of potential industrial end-users. In recent years the ever stricter legislation governing the emission of pollutants has forced industry to rethink the way in which it treats its waste and as a result of this there has been a growing interest in the US, Europe and Japan in the use of electrically based technologies such as plasma arcs and torches, as well as high energy electron beams and electrical coronas, as possible tools in the battle against pollution.

The purpose of this meeting is to identify the industrial and commercial electro-technologies that may be suitable for implementation as efficient waste processing and purification techniques. It will investigate how these novel and rapidly developing techniques may be integrated with the current trend for Clean Technology, i.e. the reduction of waste through a fundamental redesign of the industrial process itself.

Further information can be obtained from:
A Stokes
IEE, Savoy Place, London WC2R 0BL

Future Events

EPG Visits:
The Meteorological Office, Bracknell 8 December, 1994
This is a half-day visit to the Met. Office in Bracknell and has proved to be of great interest to our membership with many more members interested in attending than could be accommodated. However, the good news is that a second visit has been arranged for Thursday, 8 December, 1994. The same format will be used as the September visit and booking forms will be circulated in good time.

Further information can be obtained from:
J B Stewart,
Institute of Hydrology, Wallingford, Oxford OX10 8BB

Other Meetings:

British Soil-Water Physics Group Meeting
Scaling problems in soil-water physics 29 September, 1994
Venue: ADAS Soil and Water Research Centre, Trumpington, Cambridge
This meeting will discuss issues of scaling in soil physics, both the use of classical scaling theory and the application of soil physical models at a variety of scales. As with all BSWP meetings, the intention is to bring together workers to share ideas and experiences. The emphasis will be on discussions. Offers of short presentations, describing either theoretical ideas or practical applications, and enquiries to:
Dr A C Armstrong
ADAS Soil and Water Research Centre
Anstey Hall, Maris Lane, Trumpington,
Cambridge CB2 5LJ
Tel: (0223) 840011, Fax: (0223) 841618

Institute of Chemical Engineers North Western Branch
Best Available Techniques for the Use and Reuse of Water
Wednesday, 19 October, 1994
Venue: UMIST Conference Centre
This meeting is organised by the Water: Preparation, Use and Clean-up subject group of the North Western branch, Institute of Chemical Engineers. It is co-sponsored by the Industrial Water Society and the Society of Chemical Industry Environment and Water Group.

"Minimising the volume of water used in a process is vital from both operating cost and effluent discharge quantity points of view. Designing a process for the optimum water utilisation can also have substantial impact on the capital cost of a project.

This symposium will employ case studies to demonstrate how modern design techniques and novel technical solutions have achieved considerable reductions in water usage for both new project and well established plants, and show how these are widely applicable in the process industry."

Further information can be obtained from: T. Thompson
7 The Serpentine,
Liverpool L19 9DT.
The EPG Committee

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