

NEWSLETTER

APRIL 1981

6

from the Department for Scientific and Technical Communication

Now available also on Prestel: * 531051 \cong and on Videtel: * 5213 \cong **Must bankers
rethink their role?**

The symposium held by the Commission on 'The role of the banker in industrial innovation' in Luxembourg on 30 September and 1 October 1980 was attended by some 120 participants.

As Lord Caldecote, chairman of Finance for Industry Ltd, said in his talk 'Innovation in industry is bound to be one of the keys to future economic success and prosperity among the developed countries. This is especially so in Europe where we rely so heavily on exporting manufactured goods to other countries. Successful industrial innovation must, therefore, be of concern to the banking community, if only because on this depends the prosperity of many of its customers.'

In his view 'while governments may legitimately be called in by industries seeking aid for investment in innovation, in order to meet shortterm exigences, the financial institutions should be asking themselves what is it that they should be doing in order to make such government intervention unnecessary. It is a question of the financial institutions themselves altering their traditional practices and patterns of behaviour in order to meet the present and future needs of industry and of Europe as a whole.' In particular, he believes 'that there is a greater need than ever for financial institutions to provide equity finance, in addition to loan finance and credit facilities... For most bankers the problem is how to adapt their methods of assessment of risks and creditworthiness so as to understand better the high risks they are being called upon to undertake... The solution to this problem seems to me to lie in a combination of greater expertise and specialization, both in particular industries and in the type of financing provided, and a will to collaborate between those with different expertise.'

If you wish detailed information about the Commission's activities

In the scientific and technical field and the reports, articles, conference proceedings, manuals, directories, atlases, glossaries, etc. associated with them, consult:

— Euroabstracts Section I (activities covered by EEC and Euratom Treaties)

and/or

— Euroabstracts Section II (coal and steel).

For a **free copy** write to CEC — DG XIII/A2, BP 1907, Luxembourg.

The information is also available on-line via Euronet-Diane in the **EABS data base**. Write to ECHO Service, Ms A. ILJON, B.P. 1907, Luxembourg, for details or call Luxembourg 4301 2923.

If you wish to keep up to date with the **highlights of these activities**, consult the Commission's Videotex journals:

— Euronews (on Prestel, UK)

— Euronieuws (on Videtel, The Netherlands)

where you will find news items on:

— latest Council of Ministers decisions on research,

— latest calls for tenders for research under contract,

— forthcoming conferences, symposia, etc.

— recent publications,

— a special feature: 'The invention of the month', etc.

Soon available also on Bildschirmtext (Federal Republic of Germany) and Teletel (France).

Lord Caldecote concluded: 'We have to recognise that what is already true for industry must also in time become a reality for financial institutions: Europe is our base, the world is our market place. When Europe emerges from the present recession we must be sure that its financial base is in the best possible condition to enable its industry to make progress in an era when Europe will be striving to maintain a reasonable standard of living while at the same time contributing to improving those standards in the third world and so reducing the dangerous North-South gap'.

In his closing address, Mr Bombassei Frascani de Vettor, Vice-President of the European Investment Bank, pointed out that the traditional method of assessing the soundness of an enterprise asking for a loan, involving a close examination of its financial situation, certainly remains valid, because it brings out the qualities of both management and staff. Unfortunately it has the serious drawback of giving a reflection of the past only, whereas when innovation is at stake, it is the future that counts. Much more elaborate methods, requiring expertise in a variety of fields not associated traditionally with banking, must be applied to assess this future.

The proceedings of this symposium will be published in German, English, French and Italian. Their publication will be announced in this Newsletter.

Ispra Courses

Ispra courses are designed to contribute

- to the dissemination of the knowledge available in the Joint Research Centre (JRC) as a result of its research activities,
- to the continuing education of the scientific and technical staff in Europe.
- to the development of exchanges and ties between European scientific workers in subjects connected with the JRC programme.

The 1981 programme includes the following courses and seminars:

Nuclear Science and Engineering

Multiphase processes in LMFBR safety analysis
Operator behaviour in abnormal conditions
Mathematical and statistical methods in nuclear safeguards

Information and systems science

The craft of systems analysis
Programming for software sharing

Mechanical science

Advanced seminar on fracture mechanics

Energy systems and technology

Design and technology of solar heating and cooling systems for buildings
Thermal energy storage
Managing national energy systems
Performances of solar energy converters
Part A: Thermal collectors
Part B: Photovoltaic cells

Resources

Remote sensing for land use inventories

Chemical sciences and methods

Analytical techniques for heavy metals in blood
Mass spectrometry of large molecules

Health physics / Fisica Sanitaria

Fondamenti di Radioprotezione
Radioprotezione fisica nelle applicazioni medico-sanitarie

The courses will be held in English.

Further information of each course may be obtained from the Ispra Courses

Secretariat, Centro comune di ricerca, I-21020 ISPRRA (Va) Italy.

In certain cases the lecture notes of the courses will be published. So far the following titles have been published:

1. Biological aspects of freshwater pollution

The problem of pollution of fresh water is well known to be crucial but in spite of intensive studies on the subject, several fundamental aspects of the problem are still unclear. An advanced course was therefore organized by the Joint Research Centre of the Commission of the European Communities to illustrate and discuss the fundamentals of the effects of pollution on freshwater organisms, populations and communities and to supply an up-to-date picture of research. Ten renowned experts in their specific fields have contributed papers to this volume on a selection of the most important topics within the general area of freshwater pollution.

EUR 6392 EN

ISBN 0-08-023442-9

pp. ix + 214

Price: £ 13

Order from: Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, UK.

2. Advances in elasto-plastic fracture mechanics

Advanced seminars on fracture mechanics at Ispra were inaugurated under the auspices of European cooperation. They were suggested by a group of European experts, meeting informally in Winterthur in October 1974, as a way of enhancing European cooperation in the field of fracture mechanics. These experts welcomed the idea of organizing them in the Ispra Establishment of the Joint Research Centre of the Commission of the European Communities. In fact, the European character and the facilities of this establishment as well as the already existing 'Ispra Courses', one of the aims of which is to contribute to the exchanges and ties between European scientific workers in subjects related to European Community research programmes, offered an excellent framework.

Subsequently, the aforementioned group of experts formed the nucleus of the European Group on Fracture (EGF) founded in 1977 with Prof. Kerkhof as chairman. The EGF confirmed the biannual organization of advanced seminars on fracture mechanics (ASFM) in Ispra, alternating with European colloquia on fracture to be held at other places, as being of its main activities.

For the 2nd ASFM, held on 2-6 April 1979, the EGF nominated an advisory group with the following members:

Dr M.J.G. Broekhoven, Delft University of Technology, Holland (EGF Secretary),

Prof. J. Carlsson, The Royal Institute of Technology, Stockholm, Sweden,

Prof. D. François, Université de Technologie de Compiègne, France,

Dr E. Sommer, Institut für Festkörpermechanik, Freiburg, FRG,

Prof. C.E. Turner, Imperial College, London, United Kingdom,

Dr H.C. Van Elst, Metaalinstituut TNO, Apeldoorn, Holland.

In the early discussions of the advisory group, in the beginning of 1978, it became evident that EPFM was a favoured theme for the 2nd ASFM. It was decided to exclude the treatment of plasticity effects in fatigue crack growth and creep phenomena to allow an in-depth treatment of EPFM under monotonic loading, considering only time-independent material properties. A basic knowledge of fracture mechanics was defined as the starting point. The lectures covered all aspects of EPFM from the fundamental microscopic and macroscopic concepts to the most recent theoretical formulations and numerical methods, with in between such methods which have achieved, or are close to achieving, the status of standards.

The seminar was divided into three sections. The first, initiation of crack extension, contained two introductory lectures on the macroscopic aspects of crack extension and on the microscopic aspects of crack extension, a lecture on the one parameter characterization viewpoint, and two lectures on experimental aspects: the experimental techniques for the determination of the initiation of failure, and the status of COD, J and J_{1c} testing methodology.

Slow stable crack growth and instability were the subject of the second section. It started with a lecture on slow stable crack growth and unstable fracture in the LEFM regime followed by a lecture on the corresponding experimental characterization of toughness under plane stress conditions by the R-curve method. The new theories on the application of J_r curves to slow stable crack growth and unstable tearing in the plastic regime were then dealt with. The last three lectures of the second section concerned the numerical treatment of crack growth problems, the EPRI ductile fracture program and the micromechanisms of slow stable crack growth.

The last two days of the 5-day seminar were devoted to the third section: the use of EPFM in design. One should recognize that advanced EPFM methods are mainly in a development phase where the theories and numerical methods for treating laboratory specimen geometrics are under discussion, whereas designers are continuously coping with complex structural design problems for which they have to make decisions. They have therefore introduced practical rules which allow the determination of an approximate and more or less conservative answer with a reasonable effort. After a lecture summarizing such methods, this section contained presentations of design curves based on COD and J, and of the CEBG

two-criteria approach. However simplified, these methods have incorporate the effect of the practically very significant residual and thermal stresses which were treated in the next lecture. Finally, the numerical aspects of EPFM including 3-D problems were considered in the last lecture. Recognizing the ever increasing importance of probabilistic methods for assessing the integrity of structures, a lecture on probabilistic fracture mechanics was included in the seminar. Owing to lack of space in section 3, it was included in section 1; however, in the book it finds its most logical place at the end.

A round table on EPFM in design concluded the seminar. It was brilliantly chaired by Dr Nichols and had as panelists B.J.L. Darlaston, M.G. Dawes, U. Marston, G. Rousselier and C.E. Turner. Other lectures and the participants contributed to the discussions and asked questions from the floor. Since the discussions at this seminar were not taped, a full account of the round table has not been prepared for the book. The questions asked of the panel included the following. Is it necessary to use elasto-plastic fracture mechanics at the design stage, or does LEFM suffice? Do all EPFM methods give similar results? How does one deal with local regions and how does one deal with the evaluation of defects found in service? The panelists replied to this in technical detail and to other provocative questions which culminated in 'is fracture mechanics necessary at all?'. In reply to this the panelists had no difficulties in proving that it was indispensable! From the floor came a question on 'False science' by which was meant some of the design approaches. The answer was that these methods are not necessarily claimed to be scientifically rigorous; they are pragmatic, semi-empirical approaches which allow the treatment of everyday problems.

This book contains the lectures virtually as they were given at the seminar; in some cases minor modifications have been introduced by the authors. In order to benefit fully from the offset procedure and shorten the publication time, camera-ready manuscripts prepared by the authors were used without any retyping. I hope that the reader will accept the few minor variations in typing standards between the different lectures.

EUR 6564 EN
pp. x + 428
Price: £ 22.50

ISBN 0-85334-889-8

Order from: Applied Science Publishers Ltd., Ripplside Commercial Estate, Barking, Essex, UK.

3. Advanced structural dynamics

This book is based in the lecture notes prepared for the advanced course on structural dynamics held at the Joint Research Centre of the Commission of the European Communities, Ispra Establishment, in October 1978.

Although the subject of structural dynamics has a long history, the last two decades have seen a remarkable development of numerical methods for dynamic analysis of engineering structures. The intention in organising the Ispra Course was to provide a review of modern numerical procedures for structural dynamics and to illustrate use by application to significant practical problems.

The first part of the book covers techniques for dynamic response in the frequency domain as well as methods for transient response by time integration. The variational methods of structural dynamics are presented and their finite element implementation discussed in detail. The use of modal methods for calculating a transient response is described with a particular emphasis on the problem of reducing a multi-degree of freedom system to a smaller set of degrees of freedom. A review is then made of implicit, explicit and combined explicit operators for transient response by time integration. This is followed by a presentation of finite element formulations adapted to implicit and explicit time integrators.

The second part of the book is devoted to a detailed presentation of practical applications. These cover a wide range of situations, including dynamic fracture mechanics, anti-missile design, pipe whip accidents and transient fluid structure interaction. The latter topic is given particular attention in view of its growing importance in nuclear reactor safety studies. Applications are described based on finite difference, finite element and boundary integral methods.

The present book will prove to be useful to researchers and engineers engaged in the development and use of numerical methods for dynamic analysis of structures.

EUR 6693 EN
pp. XVIII + 471
Price: £ 37.50

ISBN 0-85334-859-6

Order from: Applied Science Publishers Ltd., Rippleside Commercial Estate, Barking, Essex, UK.

4. Creep of engineering materials and structures

The seminar on which this book is based was organised by the Training and Education Service and the Materials Science Division of the Joint Research Centre (JRC), Ispra Establishment. It is part of a group of activities (seminars, courses...) designed to encourage scientific and technical exchanges at the European level in various specific sectors of great topicality and importance. Bearing in mind these directives, which correspond to one of the roles of the JRC, I should like briefly to describe the themes of the seminar itself.

The industrial revolution of the last century, which has contributed greatly to the progress of mankind, has also posed the problem of making machines operated by heat (e.g. steam turbines) work at the highest temperatures possible to obtain the greatest thermodynamic efficiency and therefore the greatest yield. From this arose the problem of the heat resistance of materials and structures (in other words the problem of 'creep') which did not exist in preceding centuries. Many years have passed and creep has been studied in its various aspects (physical models, engineering models, design, etc.) with considerable results, but the argument of topicality always remains, as the operating temperature of machines and structures continues to increase and designers always require more in the way of stresses, resistance to the environment, performance, etc. It is therefore undoubtedly useful to review the creep situation in its various aspects from time to time and this is the aim of this book.

EUR 6674 EN
pp. XII + 420
Price: £ 33.50

ISBN 0-85334-878-2

Order from: Applied Science Publishers Ltd., Rippleside Commercial Estate, Barking, Essex, UK

5. Remote sensing application in agriculture and hydrology

Within the framework of Ispra Courses, an advanced seminar on remote sensing applications in agriculture and hydrology was held in November/December 1977 at the Joint Research Centre of the European Communities, Ispra, Italy. The Seminar was intended for:

- officials responsible for planning and management in public administration (agriculture, forestry, environment, land engineering and equipment, etc.) wishing to acquire the technical knowledge necessary for their work;
- data handling and information specialists desirous of improving their understanding of the applications of their studies;
- specialists in agronomy, forestry, botany and hydrology wishing to complement their knowledge in this new and rapidly evolving field;
- specialists in development of sensors and data acquisition systems;
- students in the earth sciences and agronomy seeking to begin or continue a specialization in the application of earth-remote observation techniques to their specific fields.

Of the twenty-six lecturers asked to contribute to this seminar, twenty-three are well-known specialists in European universities and institutes, and three are scientists from the USA; their presentations, accordingly, reflect research and developments internationally. Many of the contributors directed themselves to the difficulties inherent in trying to extrapolate from the wealth of proven remote-sensing techniques as applied in America those appropriate to the quite different structural and ecological conditions existing in Europe.

Of the many seminars and symposia in the field of remote sensing, the Ispra seminar is one of the very few to date which has limited itself strictly to agricultural and hydrological applications; the success of its formula is proven by the many requests we have received from people who could not attend the 1977 seminar for copies of the lectures. In response to this flood of requests, and with the support of the Directorate-General of the Scientific and Technical Information of the European Communities at Luxembourg and the organization of the Ispra Courses, we asked the authors to re-write and update their contributions for presentation here. All of them enthusiastically accepted this supplementary task, some even rewriting their contribution completely in order to reflect the rapid progress in this field. We would like to thank all of them for their cooperation.

Our thanks go also to the Directorate-General of the Scientific and Technical Information offices, the Division Ispra courses and the publisher for their help in the production of this volume. We believe that it reflects the scope and the coverage of the seminar and

trust that it will constitute a useful tool for all those involved in remote sensing of agriculture and hydrology.

EUR 6611 EN ISBN 90-6191-081-1
pp. IX + 502
Price: HFL 142

Order from: A.A. Balkema Publishers, PO Box 1675, 3000 BR Rotterdam, The Netherlands.

6. Application of remote sensing to agricultural production forecasting

This work contains eighteen complete lectures of a course held at the Joint Research Centre of the Commission of the European Communities in the framework of the Ispra Courses in Ispra, Italy.

The short term forecasting of annual or periodical crop production is becoming an essential requirement for both agronomists and food economists working towards a more efficient management of crops and food supplies.

The book provides an insight into the fundamentals of crop production, into the crop-yield weather modelling to be developed at regional levels and into remote sensing methods which are applied to estimate the input parameters.

EUR 6672 EN ISBN 90-6191-098-7
pp. VI + 266
Price: HFL 120

Order from: A.A. Balkema, PO Box 1675, Rotterdam, The Netherlands.

7. Energy storage and transportation

To match the need of the users to the availability, and characteristics of the primary energies we normally use energy carriers, chiefly: electricity and fuels. In some cases the primary energy can be also the energy carrier, as in the typical case of natural gas used as a fuel, in other cases a conversion is necessary; this is usually the situation for primary energies with discontinuous availability or whose production site is far from the site of use.

We can say that in parallel with the large increase in total energy consumption all over the world, as a function of time, we have a shift from the direct use of primary energies to other energies which are more and more difficult to convert into energy carriers, to provide a secondary energy, i.e. the form of energy as needed by users.

In these conditions, we can state that the technologies for energy storage and transportation provide the means to match the production of energy with the consumer's needs (in time and place). These technologies allow the use in large quantities of primary energies which could not otherwise be used. The performance and the efficiency of most of the 'new energies' can be improved only by including storage in the energy system.

EUR 6979 EN ISBN 90-277-1166-6
pp. X + 497
Price: HFL 75

Order from: D. Reidel Publishing Company, PO Box 17, 3300 AA Dordrecht, The Netherlands.

8. Solar thermal power generation

The articles of this volume of **Electric Power Systems Research** are lectures which have been given within the frame of the ISPRA Courses, held at the Joint Research Centre of the European Communities, Ispra, Italy. They are organised in order to disseminate scientific knowledge in areas within the research programme of the Joint Research Centre and to exchange views with scientists of other organisations on an international basis.

After the flat-plate solar collectors for warm water production and house heating, solar power plants for electricity and process heat production are on the verge of entering the industrial stage. Experimental, demonstration and commercial power plants are now being built in the kilowatt to megawatt range by several industries. The time is ripe, therefore, to exchange experimental results and scientific and technical points of view on the matter.

Direct conversion by means of photovoltaic cells and thermomechanical conversion are the main candidates for solar power/electricity generation. In order to keep the solar collector field of the latter (mirror field) size reasonably small, high efficiency conversion processes must be applied. i.e. use of high or very high working temperatures, which in turn requires concentration of the solar radiation.

Most solar power plants today are steam cycle systems. In order to improve on the potential and cost benefits, different technology/cycles should be investigated. At this moment, gas and hybrid gas/steam cycles seem to be very promising. Open cycle gas turbine plants need no refrigeration, which is an extra benefit in remote and sunny areas where the provision of cooling water may be a problem.

Solar thermal power generation is feasible today; no major scientific breakthroughs are required, but rather the development and cost reduction of more or less available components, as well as optimisation of the systems linking together those components: receiver, heliostat, prime mover, storage, heat cycle.

EUR 6670 EN ISSN 0378-7796
pp. 305
Price: SFr 150

Order from: Elsevier Sequoia SA, avenue de la Gare 50, Lausanne, Suisse.

SELECTED RECENT PUBLICATIONS

1. La conservazione dell' avifauna in Europa, di S. Cramp

L'Europa è un continente relativamente piccolo, ove per secoli l'uomo ha vissuto e prosperato. L'esplosione demografica degli ultimi cento anni ed il relativo incremento delle attività umane hanno avuto un effetto diretto ed indiretto particolarmente profondo sull'ambiente e sulle creature viventi allo stato selvatico.

In tempi recenti l'opinione pubblica è diventata sempre più sensibile al problema dell'ambiente naturale. Taluni hanno iniziato a chiedersi se il pre-

zzo pagato per la crescita economica non sia eccessivamente elevato; molti altri pretendono invece che nella programmazione economica vengano rispettati i valori ambientali.

Per un numero sempre maggiore di europei la fauna selvatica rappresenta una parte considerevole dell'ambiente, una componente essenziali di quella vita più naturale cui dovrebbero tendere tutte le misure economiche. Gli uccelli, come gli alberi ed i fiori, con i quali la loro vita è inestricabilmente connessa, esercitano su molte persone una particolare attrattiva, e richieste sempre più numerose mirano alla loro effettiva conservazione.

Il presente manuale cerca di esaminare l'evoluzione dell'avifauna in una Europa in sviluppo, specie nel corso dell'ultimo secolo. Gli uccelli sono diminuiti in modo preoccupante e vengono quindi analizzate le principali cause dei mutamenti avvenuti, e, alla luce di ciò, suggerite le azioni che devono essere intraprese (dalla Comunità economica europea, dai governi nazionali, da organizzazioni volontarie o da privati), al fine di salvaguardare questo importante patrimonio naturale europeo.

In un'opera necessariamente contenuta è impossibile esporre dettagliatamente tutte le informazioni scientifiche disponibili in un settore così a lungo studiato; spero quindi che il mio resoconto rifletta accuratamente la situazione generale. È inoltre impossibile esaminare in modo imparziale i vari atteggiamenti dell'uomo nei confronti degli uccelli, specie per quanto concerne l'aspetto emotivo che ingenera la caccia e l'uccellazione. Benché sia sempre stato un fautore della conservazione della natura, mi sono sforzato di analizzare la situazione in modo imparziale. Quanto poi alle misure che dovrebbero essere adottate, benché convinto che si possa raggiungere un ampio accordo tra i vari interessi in gioco, torno a sottolineare che si tratta solo delle mie opinioni personali.

EUR 5606 IT ISBN 88-206-2099-5
pp. x + 97
Price: LIT 5 000

Order from: Edagricole, Casella Postale 2202/2203, 40139 Bologna, Italy. The same book is also available in English, German and Danish and will soon be available in Dutch.

Bird Conservation in Europe

EUR 5606 EN ISBN 0-11-700258-5
pp. v + 58
Price: £ 2.25

Order from: HMSO, Atlantic House, Holborn Viaduct, London EC1P 1BN, UK

Schicksal und Zukunft der Vögel Europas

EUR 5606 DE ISBN 3-921427-76-2
pp. 71
Price: DM 7.90

Order from: Kilda-Verlag, Münsterstrasse 71, 4402 Greven, Germany

Fuglebeskyttelse i Europa

EUR 5606 DA ISBN 87-411-4811-8
pp. 105
Price: DKr. 18.60

Order from: Branner og Korch's Forlag, Fuglebaekvej 4, 2770 Kastrup, Denmark

2. Non-technical obstacles to the use of solar energy

A key question for policy makers throughout the industrialized world is how to accelerate the introduction of non-conventional sources of energy, particularly solar energy. Although most countries have embarked upon research and development in this field, the need exists to assess to what extent non-technical obstacles could slow down the widespread introduction of solar energy for heating.

The 'international symposium on non-technical obstacles to the use of solar energy' was to address itself to this latter topic by pursuing the following aims:

- to identify those non-technical obstacles which can impede the wider use and exploitation of solar energy in industrialized countries;
- to identify and evaluate measures which are being or could be used to minimize or overcome the impacts of the identified obstacles;
- to make recommendations.

How successful was the symposium in meeting its aims? A rapid reading of the contents page will show that the range of obstacles discussed was exhaustive, from industrial aspects to regulatory factors, from utility issues to consumer aspects.

The symposium was organised in such a way that, apart from the opening session, each session started with one keynote speech followed by a shortened presentation of the two session background papers which had been sent to the participants before the symposium as part of a working document.

The greater part of each session was devoted to the discussion of the session topic.

The proceedings contain the full text of the keynote speeches and the background papers as well as a session summary prepared by the vice-chairman of each session.

EUR 7003 EN ISBN 3-7186-0050-1
pp. 465
Price: HFL 95

Order from: Harwood Academic Publishers, c/o Proost en Brandt N.V., Dept. P.S., 8335, 353 RH Utrecht, The Netherlands

3. Energy from biomass in Europe

Biomass has recently attracted much attention as a future energy source in Europe and other parts of the world. Despite being our oldest conventional energy resource, there is considerable controversy as to the prospects for its wider use. Those who say we should not expand the use of biomass for energy point in particular to the large water needs for energy crops and the competing uses of biomass for food, animal feedstuffs and industry.

The need for a fair assessment of opportunities for a larger use of biomass in Europe was taken up a few years ago by the Commission of the European Communities in the framework of its solar energy research and development programme which was started in 1975. This report is the outcome of a study by experts from all member countries of the Community. The study was intended to be a broad overview to set out a frame for future activities.

Results show that all photosynthetic residues together represent a huge energy reserve, with which the European Community could possibly meet up to 5% of its current energy needs. Energy crops not involving radical changes in farming practice might provide another 5% of future needs.

EUR 6809 EN
pp. xiv + 234
Price: £ 16,50

ISBN 0-85334-934-7

Order from: Applied Science Publishers, Rippleside Commercial Estate, Barking, Essex, UK

SERIES

EUROPEAN APPLIED RESEARCH REPORTS

A Journal of European Science and Technology

Environment and Natural Resources Section

ISSN 0272-4626

Published for the Commission of the European Communities, Directorate-General for Scientific and Technical Information and Information Management Brussels and Luxembourg

This periodical publishes referred papers of original scientific research conducted in collaboration with the Commission of the European Communities. Issues contain reports on all aspects of environmental and natural resources, results of original scientific research, as well as proceedings of important symposia. Articles and issues are of varied length, and issues are not necessarily published at regular intervals. Certain single issues (e.g. those containing a whole symposium proceedings) are individually priced. From time to time, supplementary issues are published for subscribers. Each volume comprises between 400 and 500 pages (including supplements).

PUBLICATION: European Applied Research Reports — Environment and Natural Resources Section is published with an irregular number of issues in each volume, and a volume is comprised of between 400 to 500 pages.

SUBSCRIPTION RATES: HFL 165 (approximately USD 89.50) per volume, including postage and handling.

Subscriptions should be sent to: Subscription Department, Harwood Academic Publishers, P.O. Box 786, Cooper Station, New York, NY 10276, USA

Nouvelles de la maison

Le département «Communication scientifique et technique» désire recevoir des offres pour la mise en place et la gestion d'un journal électronique en France basé sur le système TELETEL. Les informations porteront sur des sujets d'intérêt communautaire tels que:

- Décisions du Conseil de ministres
- Appels d'offres de la Commission pour des contrats de recherche
- Publications
- Conférences, séminaires, symposia, etc.
- Innovation.

Le journal se composera de 50 pages avec une mise à jour périodique de 10 pages par mois.

Un tel service existe déjà au Royaume-Uni (*531051≤% et aux Pays-Bas (*5312≤% et sera bientôt lancé en république fédérale d'Allemagne.

Entrée en vigueur du contrat: 1^{er} septembre 1981.

CONFERENCES, SEMINARS, SYMPOSIA CALENDAR

1. Reduction of dose and optimization in radiation exposure during medical diagnostic procedures. 27-31 April 1981, Neuherberg (Federal Republic of Germany)
2. 4th Symposium on neutron dosimetry. 1-5 June 1981, Neuherberg (Federal Republic of Germany)
3. Symposium on the transfer and exploitation of scientific and technical information. 10-12 June 1981, Luxembourg
4. Symposium on lexicography in the electronic age. 7-9 July 1981, Luxembourg
5. 6th International conference on structural mechanics in reactor technology (SMIRT — 6). 17-21 August 1981, Palais des Congrès, Paris
6. Conference on measurements, testing and control in rolling mills. 2-3 September 1981, Luxembourg
7. Symposium on the scientific basis for the assessment of hazards from chemicals associated with the environment. 7-10 September 1981, Imperial College, London
8. Symposium on coke oven techniques. 23-25 September 1981, Luxembourg
9. 2nd European Symposium on physico-chemical behaviour of atmospheric pollutants. 29 September-1 October 1981, Varese (Italy)
10. Conference on steel in marine structures. 5-8 October 1981, Paris

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