European Mathematical Society

NEWSLETTER No. 1

1st September 1991

A Letter from the President

Dear Reader,

The European Mathematical Society is now within sight of its first birthday, and already has recruited several hundred individual members, as well as over thirty institutional members, the latter including virtually all of the national mathematical societies of Europe.

With the launch of our Newsletter, we have at last the means to establish regular communication with our members. I hope very much that our editorial teams in Prague and Southampton will receive strong support.

With your help, we can build up the society to become a powerful and effective voice in promoting the interests of Mathematics and mathematicians in Europe and beyond.

F. Hirzebruch
President

Contents

We would like to thank Mrs. Beryl Betts and the staff in the Faculty of Mathematical Studies, University of Southampton, for typing this newsletter.

Printed by Boyatt Wood Press, Southampton, UK.

Editorial

Welcome to the first newsletter of the European Mathematical Society. We hope that this newsletter will offer opportunities to spread news of mathematical events throughout Europe as well as helping to build a coherent European Mathematical Community.

This newsletter should be by the members and for the members of the Society. We invite you to submit articles of general mathematical interest but particularly on topics to be discussed at the round tables during the European Congress of Mathematics in Paris, 1992 (see page 6). We shall print articles in any of the major European Languages. We hope to carry articles about our member Societies; in this issue we print the first of these from Czechoslovakia. We shall carry advertisements both from commercial publishers and for academic posts. (Contact the editors about rates). Also, we would like to see a lively correspondence column.

Through the member Societies, we hope to have a network of 'foreign correspondents' appointed. They should be able to report on significant mathematical events throughout Europe. By these means we hope to see the newsletter and the Society grow and prosper; but they can only do so with your help.

Please submit articles to the Editors at either Southampton or Prague; the deadline for the next issue is the last day of October.

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THE EMS: Origins and Aims

E.C. Lance (Secretary)

The European Mathematical Society is a new body, but it has had a long gestation. It originated in an initiative of Professor Sir Michael Atiyah, who at the 1978 International Congress in Helsinki convened a meeting of European mathematical societies to form the European Mathematical Council. There was a widespread feeling, however, that such a body should not just be a consortium of existing societies but should seek a broad individual membership. A constitution was hammered out over a period of years, and was formally adopted at the inaugural meeting of the EMS at Madralin near Warsaw in October 1990. Under this constitution, the membership of the EMS is both corporate and individual. The corporate members provide a stable framework and a modest financial base for the Society, and the individual members will (we hope) provide the ideas, enthusiasm and participation to make its activities a success.

What should these activities be? In the first place, there is a need for more efficient communication among mathematicians at the European level. This Newsletter should play an important role in spreading news about mathematical activities. Please let the Editors know of any newsworthy items for inclusion in the Newsletter.

Another important activity for the Society will be the promotion and coordination of conferences and summer schools. Plans for the first European Congress of Mathematics, in Paris next year, are now well advanced. This promises to be an exciting and unusual event, with a "non-classical" programme of round tables on various aspects of Mathematics and Society alongside a more traditional programme of mathematical lectures.

The EMS came into being at a time when political barriers in Europe were crumbling, but when financial problems are more pressing than ever, especially in the Eastern European countries. It is a priority of the EMS to press for improved funding for mathematical research, and in particular to seek ways to facilitate participation by Eastern European mathematicians in international events.

The work of the EMS will mainly be done through committees set up by the Executive Committee of the Society to cover various specialised areas. So far, there are six of these committees: Applications of Mathematics; European Community Liaison; Education; Publications; Summer Schools; Women and Mathematics. If you can make a contribution in any of these areas, please contact the Chairman of the appropriate Committee (their names and addresses

are on pages 18 and 19. If there are other areas in which you would like the EMS to act, please make suggestions to any member of the Executive Committee (and be prepared to be asked to do some of the work yourself! – the Society has no resources other than the dedication of its individual members).

The governing body of the Society is its Council, which will normally meet once every two years. The next meeting of the Council will be held in conjunction with the Paris Congress in July 1992. Delegates to the Council consist of some nominated by corporate members of the Society and some elected by the individual members. Details of how to nominate delegates for election will be given in a future issue of this Newsletter.

Through the generosity of the University of Helsinki, the Society has a small secretariat. This office will deal with all matters connected with membership of the Society. If you have any queries about membership, please contact Ms T. Mäkeläinen, Department of Mathematics, University of Helsinki, Hallituskatu 15, SF–00100 Helsinki, Finland.

I believe that the scope for this new Society is enormous, but its achievements will depend entirely on the active participation and enthusiasm of its members. Ask not what the Society can do for you but what you can do for your Society!

MEMBERSHIP

For full information about how to apply for membership of the **EMS** contact either the Secretary of the corporate member society to which you belong (see page 20 for a list of these Societies), or Ms T. Mäkeläinen, at the address given in the above article.

EUROPEAN CONGRESS OF MATHEMATICS

CONGRÈS EUROPÉEN DE MATHÉMATIQUES

ECM/CEM

Paris July 6 – 10, 1992

This, the first European Congress of Mathematics, will be held under the auspices of the European Mathematical Society.

Its purpose is threefold: to present various new aspects of pure and applied mathematics to a wide audience; to be a forum for discussion of the relationship between mathematics and society in Europe; to enhance cooperation among mathematicians from all European countries.

The congress will feature fifty invited lectures, including nine plenary lectures by the following speakers:

V.I. Arnold	**L. Babai**	**C. De Concini**
S. Donaldson	**B. Engquist**	**P.–L. Lions**
W. Müller	**A.–S. Sznitman**	**M. Vergne**

Round tables will be held on the following subjects:

Mathematics and the general public	Collaboration with developing countries
Women and mathematics	European scientific policy
European mathematics: myth or historical fact?	Mathematics and computer science
Role of mathematics in educational policies	Mathematics and economics
Mathematics in secondary school	Mathematics, biology and medicine
Student exchange programmes	Mathematics and chemistry
Mathematical libraries in Europe	Mathematics and industry

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L. Lovasz	Y. Manin	J. Moser
C. Procesi	J. Tits	

Preregistration:	**as soon as possible**
Dates of the Congress:	**July 6–10, 1992**
Location	**Paris** The sessions will take place at the Sorbonne and Paris universities.
Accommodation	hotel rooms and student dormitories (limited number of opportunities)
Satellite conferences:	they will be held in Universities close to Paris before and after the Congress and will be advertised in the second and third announcements.
Prizes	10 prizes will be awarded to young European researchers.
Financial help:	it will be offered, when necessary to a limited number of participants (please fill in the "special needs" line in the preregistration form).

For further information and preregistration forms please contact the Congress Office:

Congrès Européen de Mathématiques,
Collège de France
3 rue d'Ulm
Paris (5é)
FRANCE

e.mail EUCM@FRMAP711.Bitnet.

The European Mathematical Society has over 30 corporate members. In issues of the EMS newsletter we hope to print a brief history of each one. Here is the first, from Czechoslovakia.

UNION OF CZECH MATHEMATICIANS AND PHYSICISTS

Jiří Rákosník and Ivan Netuka

The Union of Czech Mathematicians and Physicists is one of the oldest existing learned societies in Czechoslovakia. It was founded in 1862 and since then the main purpose of its activities has been the improvement of teaching of mathematics and physics in all types and levels of schools and promotion of the development of mathematics as fields of science.

The Union brought together, among its members, many teachers of secondary schools and institutions of higher learning as well as university professors and researchers. Already in 1872 the Union began to publish a journal for mathematics and physics and a year later it began to publish textbooks and scientific monographs. After the creation of an independent Czechoslovakia in 1918 the Union became practically the only qualified publisher of textbooks, monographs and journals in mathematics, physics and related fields.

In the early fifties, when the Czechoslovak Academy of Sciences was founded, the Union became a learned society attached to the Academy and its property was transferred there.

Nowadays, the Union represents the largest learned society in the country with 4000 members, approximately half of them being secondary school teachers. The Union today has a two-fold structure: in a number of cities where institutions of higher learning and/or institutes of the Czechoslovak Academy of Sciences are located, it has its branches organizing their independent regional activities; besides, the Union has four sections: Mathematical Research Section, Physical Research Section, Mathematical Pedagogical Section and Physical Pedagogical Section, all having specialized groups that work on the national scale.

In the field of science, the Union either independently or jointly with institutions of higher learning or research institutes organizes national as well as international conferences, symposia, seminars and schools. In the field of education, the Union systematically analyses the existing state of teaching mathematics and physics in all types and levels of schools, and submits suggestions for their improvement and modernization. Mathematics and

Physics Olympiads are important means of attracting the younger generation, a task in which the Union has been engaged for many years.

Already from the very beginning the Union developed contacts with mathematicians and physicists abroad. In 1920, it became a member of the newly founded International Mathematical Union. Nowadays, besides the EMS the Union is a collective member of the European Physical Society, the Bernoulli Society, the International Association for Statistical Computations, the European Consortium for Mathematics in Industry, and a reciprocal member of the American Mathematical Society.

* * * * * * * * * * * *

Some Forthcoming Conferences

9–11 October 1991 **Schweizerische Mathematische Gesellschaft Société Mathématique Suisse**

Speakers include D. Kotschick (Basel), A. Lubotsky (Jerusalem), P. Hess (Zürich), K. Osterwalder (ETHZ), H. Kunz (EPFL), P. de la Harpe (Genève),E. Zehnder (ETHZ), O. Besson (Neuchâtel), C. Riedtmann (Bern).

Details from François Sigrist, Institut de Mathématiques, Université de Neuchâtel, Chantemerle 20, 2007 Neuchâtel.

24–28 March 1992 **Annual meeting of Gesellschaft für Angewandte Mathematik und Mechanik (GAMM)**

University of Leipzig

Details from Professor R. Klötzler, Universität Leipzig, Sektion Mathematik, Augustusplatz 10, D–0–7010 Leipzig, Germany.

11–18 July 1992 **St. Andrews Colloquium**

Speakers include A.M. Davie (Edinburgh), R.L. Graham (Bell Laboratories) V.F.R. Jones (Berkeley)

Details from St. Andrews Colloquium 1992, Mathematics Institute, North Haugh, St. Andrews, KY16 9SS, Scotland.

17–23 August 1992 **Septième Congrès International sur l'enseignement des Mathématiques.**

For details see page 13

For details of conferences organized by the Institute of Mathematics and its Applications (IMA), write to Pamela Irving, IMA, 16 Nelson Street, Southend–on–Sea, Essex SS1 1EF, UK.

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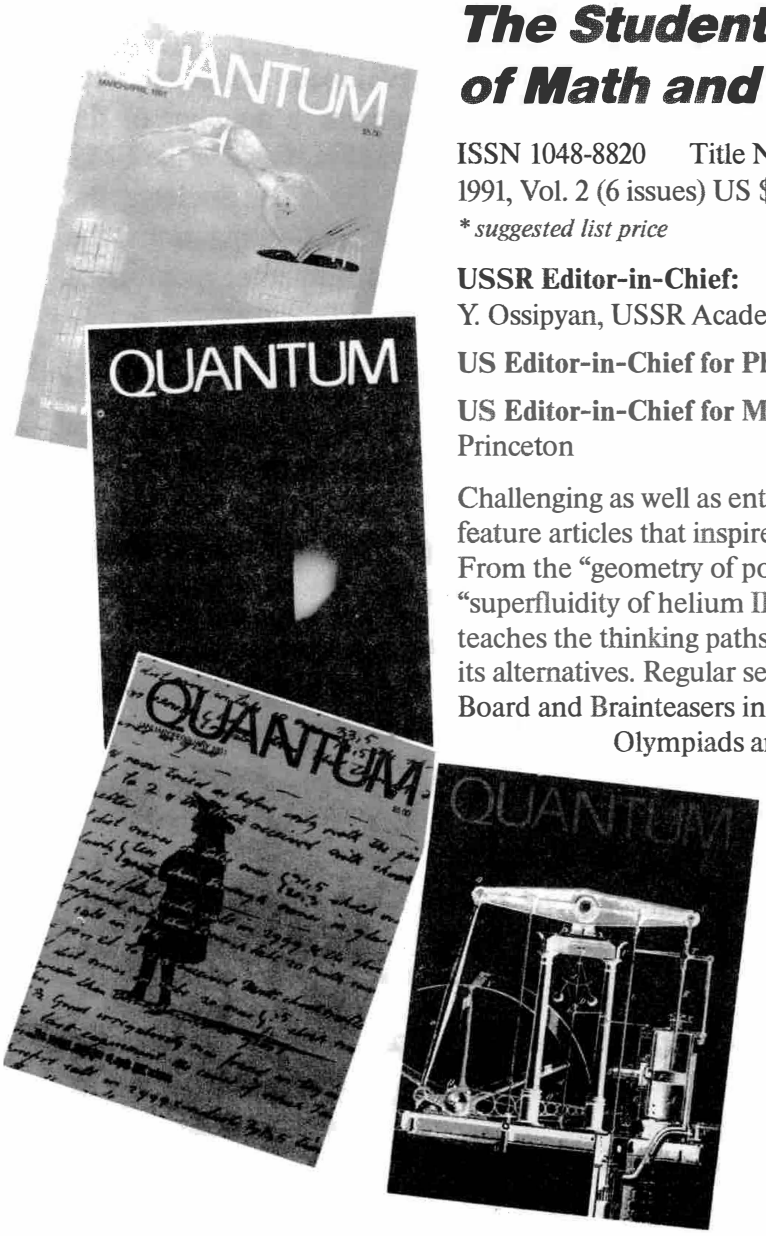

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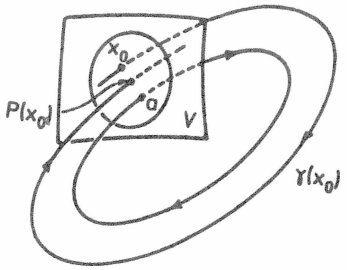
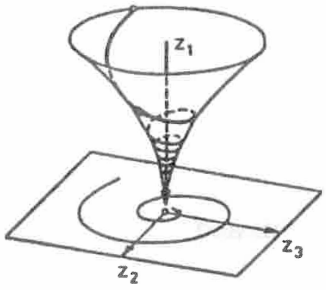
L. Perko, Northern Arizona University, Flagstaff, AZ

Differential Equations and Dynamical Systems

1991. XII, 403 pp. 177 figs. (Texts in Applied Mathematics, Vol. 7) Hardcover DM 78,- ISBN 3-540-97443-1

The main purpose of the book is to introduce students to the qualitative and geometric theory of ordinary differential equations originated by Henri Poincaré at the end of the 19th century. It is also intended as a reference book for mathematicians doing research on dynamical systems.
There are several new features in this book such as the simplified proof of the Hartman-Grobman Theorem and examples illustrating the proof, map in the theory of limit cycles, an efficient method for obtaining the global phase portrait of two-dimensional systems, and the description of the behavior of a one-parameter family of limit cycles. The authors show the global qualitative theory of a nonlinear dynamical system leads to an understanding of the solution set of the nonlinear system that rivals the understanding that we have of linear flows.





Contents: Preface. – Linear Systems. – Nonlinear Systems: Local Theory. – Nonlinear Systems: Global Theory. – Nonlinear Systems: Bifurcation Theory. – Bibliography. – Index.

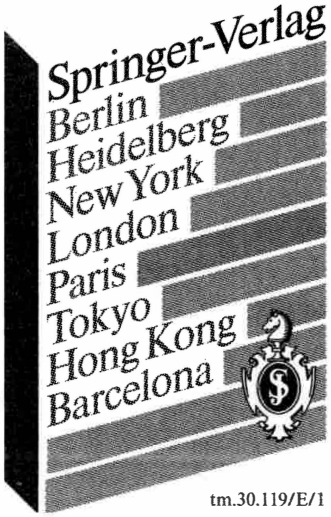
F. Verhulst, State University of Utrecht

Nonlinear Differential Equations and Dynamical Systems

1990. IX, 227 pp. 107 figs. 2 tabs. (Universitext) Softcover DM 38,- ISBN 3-540-50628-4

This text bridges the gap between elementary courses on differential equations and the research literature. Subject material from both the qualitative and the quantitative point of view is presented. Many examples illustrate the theory and the reader should be able to start doing research after studying this book.

Contents: Introduction. – Autonomous equations. – Critical points. – Periodic solutions. – Introduction to the theory of stability. – Linear equations. – Stability by linearisation. – Stability analysis by direct method. – Introduction to pertubation theory. – The Poincaré-Lindstedt method. – The method of averaging. – Relaxation oscillations. – Bifurcation theory. – Chaos. – Hamiltonian systems. – Appendices. – Answers and hints to the exercises. – References. – Index.



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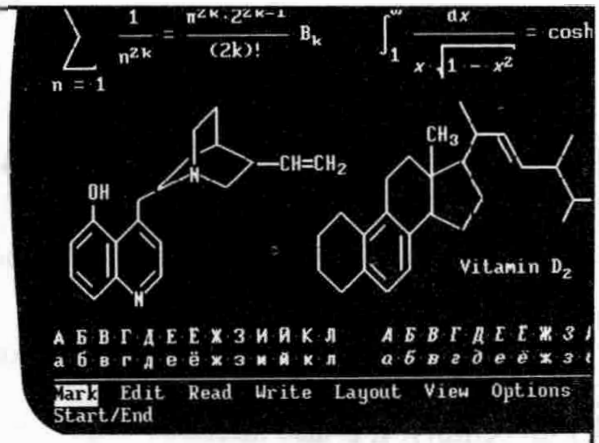

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SEPTIÈME CONGRÈS INTERNATIONAL SUR L'ENSEIGNEMENT DES MATHÉMATIQUES
17-23 août 1992

Le Septième Congrès international sur l'enseignement des mathématiques (ICME-7) aura lieu à l'Université Laval, dans la ville de Québec (Canada), du 17 au 23 août 1992. La deuxième annonce est maintenant disponible à l'adresse suivante :

Congrès ICME-7 Congress
Université Laval
Québec, QC, Canada G1K 7P4

Téléphone: (418) 656-7592
Télécopieur: (418) 656-2000
Adresse électronique: ICME-7@VM1.ULAVAL.CA

Elle contient des informations générales sur ICME-7, entre autres sur l'inscription et l'hébergement, ainsi qu'un formulaire pour soumettre une communication brève.

Le Congrès ICME-7 permettra aux participants de s'informer des développements récents en éducation mathématique au plan international et de prendre connaissance d'innovations et de recherches récentes concernant l'apprentissage et l'enseignement des mathématiques à tous les niveaux. La composante majeure du programme scientifique est un ensemble de 23 Groupes de travail favorisant chacun l'étude active d'un aspect particulier de l'éducation mathématique dans un contexte international d'actualité. Chaque Groupe de travail se réunira pendant quatre séances de 90 minutes.

Au programme figurent également des conférences plénières, des exposés, des groupes thématiques, des groupes d'étude, des présentations nationales, des communications brèves sous forme d'affiches ou de bandes vidéo ou de logiciels, des projets, des ateliers, des films, de même que des expositions de livres, de logiciels et d'autres matériels didactiques. Au début du Congrès, une demi-journée sera spécialement consacrée à un Mini-congrès sur les calculatrices et les ordinateurs. De plus, un certain nombre d'événements socio-culturels sont prévus au programme.

Il est recommandé de s'inscrire tôt. Les personnes qui s'inscriront avant le 15 décembre 1991 bénéficieront d'une réduction substantielle. La date limite pour soumettre une proposition de communication brève est le 31 janvier 1992. Les demandes de réservation de chambre seront acceptées jusqu'au 1er juillet 1992; il est cependant conseillé de faire des réservations beaucoup plus tôt.

La troisième annonce sera disponible en avril 1992 et comprendra le programme détaillé du Congrès. Elle sera envoyée aux personnes dont les inscriptions auront été reçues avant le 15 juin 1992. Les participants s'inscrivant après cette date ne recevront le programme que sur les lieux du Congrès.

The EUROMATH Project

by

Helmut Lenzing, Paderborn
(Chairman of the Euromath Project Committee)

The EUROMATH Project originated mainly through the efforts of M. Atiyah, M. Demazure, C.J. Mulvey, F. Topsøe, J.L. Vicente and J.M.E. Valenca. The project is funded within the SCIENCE program by the European Commission. Phase I of the project started in 1988 with the aim to design a homogeneous computer working environment (Euromath system), based on a single data model and perfectly adapted to the needs of the working mathematician, allowing us in particular to deal with structured editing, data bases, computer algebra and electronic mail in an efficient and uniform way.

The shortage of funds required a fundamental restructuring of the project during 1990/91 which was directed by M. Demazure, Paris. The project is now in its 2nd Phase (to last until the end of 1993), the available funds being 1.2 million Ecus. The Euromath system will be built upon a structured editor designed originally as a prototype by V. Quint at INRIA (Institut National de Recherche en Automatique) by a French software company. A main task (directed by B. v. Sydow, Gotenburg) is therefore to adapt the editor in cooperation with GRIF to the needs of the mathematician.

A further major task will consist in designing (in cooperation with Fachinformationszentrum Karlsruhe (FIZ)) a database module allowing to access (in particular) the "Zentralblatt für Mathematik" database of FIZ and to build personal databases locally. The task is directed by R. Timoney, Dublin. Further modules will be incorporated in the Euromath system in cooperation with INESC, Lisbon, this task being steered by J. Slater (Kent) and A. Chalmers (Sussex). We expect the final version of the Euromath system to be available mid 1993; in an intermediate form the Grif editor, forming the heart of the Euromath system, will be available during 1991.

A Europe-wide project would not be possible without the support of mathematicians from the various countries. With a single exception, each country has formed a so-called National Coordinating Committee, responsible for national Euromath activities. In Denmark these efforts have already lead to the foundation of the Euromath Centre, Copenhagen.

The Euromath project itself is run through EMT, the European Mathematical Trust, located at the University of Canterbury at Kent, with J. Davenport (Bath), J. Slater (Kent) and F. Topsøe (Copenhagen) taking main responsibility for company affairs.

The following headline appeared on the Front page of the British newspaper "The Independent" for an article about the Kingman report. It is very pleasing to see such prominence given to a "Mathematics story" and we invite our readers to send in examples of "Maths in the news" that appear in European newspapers.

THE INDEPENDENT Saturday 20 July 1991

Mathematics faces crisis, report says

Ngaio Crequer examines the details of a report which warns of a 'flight from maths' in schools

THE MOST in-depth study of the teaching and learning of mathematics to have been undertaken for a decade concludes that continued underfunding of the subject in universities will damage the nation's ability to meet its needs.

The study, by the Mathematics Strategy Review Panel of the Science and Engineering Research Council (SERC), was set up in 1989. Its report says that the "flight from mathematics" in schools presents a "bleak picture". It says the Department of Education and Science must ensure that there are enough sufficiently qualified maths teachers, and warns that the "crisis" in schools must be resolved or the national research base will be only one of the casualties.

The universities need a regular supply of good quality PhD students to replace academic staff and maintain a mathematical research base.

But out of one group of 800,000 young people of the same age, only 200 went on to postgraduate maths research. Of those, only 115 completed their doctorates within the normal four-year period.

Yet universities need at least 86 students to emerge with maths PhDs each year, and that takes no account of the demands of other university departments (such as computer science and business schools), polytechnics, government departments, research agencies, industry and commerce.

The report says that the present supply of people with maths PhDs is "dangerously inadequate". And it adds that the situation is much worse than the figures suggest, since demand from abroad for students with maths PhDs – notably the United States – is "high and increasing dramatically".

The Americans were so concerned about their lack of mathematical scientists that the National Science Foundation conducted its own inquiry in 1984 and updated it in 1990. Dr Edward David, its chairman and a former US presidential adviser, served on the SERC committee.

The British report shows that, from 1994, the Americans will be looking to the UK and Germany to plug their vacancies.

A recent international comparison of government funding of academic and related research revealed that for the period 1984-87 funding for maths in real terms had gone up by 8 per cent in West Germany, 24 per cent in the US, but only 1 per cent in the UK. Spending in France had gone down by 1 per cent, and this had led to a 16 per cent increase in funds in 1988-89.

It was not enough for the UK simply to lift the results of research activity from other countries. "Such an attitude is not only unworthy but doomed to failure," the report says. A mathematician had to be an expert to understand the importance of a discovery by another. The report says: "A nation which requires access to the cutting edge of mathematics will maximise its chances by having an active mathematical research community which gives it membership of the global club."

Leading mathematicians would not stay in a country which did not offer them facilities for their work, or the stimulus of original colleagues. Mathematics depends increasingly on a fusion of ideas from many different branches. "A little mathematical thought can often be worth a thousand hours of un-illuminating computing."

It is essential, the report argues, to maintain research in all the important areas. The British maths contingent must be large enough and strong enough to stand a good chance of contributing to progress on the world scene.

The report also looks at how mathematics has changed. The number of undergraduate courses centred on computer use had doubled between 1985 and 1990, but the extra costs had not been covered, it says.

In a recent grants round, the research council's mathematics committee (budget £2m) found that the equipment needed for only three applications would have used up 70 per cent of the council's grants budget. There is "an acute and worsening problem" in funding the highest quality research proposals, with "no scope" left for funding initiatives.

In several important fields of research, the report says, there are too few UK mathematicians. Because maths is an interwoven complex of ideas and techniques, "any decline below the current level of research activity could set in train a dangerous spiral of contraction". That, in turn, could lead to an irretrievable loss of knowledge.

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