FORTHCOMING SOCIETY MEETINGS

Friday-Saturday 17-18 October 1997 - Scientific Societies Lecture Theatre, London
Numerical Analysis
Friday 21 November 1997 - Scientific Societies Lecture Theatre, London
F.P. Kelly (Naylor Prize), M.R. Jerrum
Friday-Saturday 20-21 February 1998 - University of Southampton
Hyperbolic Geometry

LMS COUNCIL DIARY

The Council meeting on Friday 20 June began with some good news in the President's report. The item goes back a few meetings when the previous General Secretary brought to Council's attention that some time ago money was given to New College, Oxford to support a Hardy Junior Research Fellowship. New College has agreed that this post should be filled in 1998 and has asked the LMS to be represented on the selection committee.

In a different vein Council was asked to provide significant financial support to two conferences ICIAM 99 and ICMP 2000; these initials stand for 'International Congress of Industrial and Applied Mathematics' and 'International Congress of Mathematical Physics' respectively. Council agreed to some level of support and has made grants of £25,000 to ICIAM 99 which is to take place in Edinburgh and £10,000 to ICMP 2000 if it happens in Britain.

Council also agreed to continue to support the Isaac Newton Institute in Cambridge. There has been a considerable debate within the mathematical community in Britain about the running of the institute. After delicate discussions it was agreed to make a grant of £15,000 for each of the next two years, to be spent on supporting UK participants. The Institute has now set a minimum target figure for all programmes of 20% participation by UK researchers from outside Cambridge.

A letter from David Blunkett, the Minister for Education and Employment, was received which explained that he could not meet us but was concerned about the teaching of mathematics, although a view was expressed that by 'mathematics' he meant 'numeracy'. He did say that our detailed comments on the teaching of mathematics were valuable. It was agreed that we should write to him asking for interaction with the people actually deciding policy.

The Treasurer reported on the continuing healthy financial position. The allocations to various subcommittees were approved and it is hoped that the Society can continue to spend money, at least at the present level, supporting mathematics. Perhaps we should remember that the Society is a charity with these aims. One of the main sources of income is publications and prices for the various journals were agreed. The future of

journals and the effects of electronic publishing make Council a little wary of assuming that the income will stay constant, let alone grow over the next few years.

Alan Camina

BULLETIN AND JOURNAL ONLINE

The LMS Bulletin and Journal are now available online. From the start of the 1997 volumes, the full text of every article can be downloaded in pdf format from CUP. To make use of this service, go to

http://www.journals.cup.org

and follow the registration instructions. For the next few weeks the service will be freely available to anyone. Subsequently, access will be restricted to sites where there is an institutional subscription to the periodical.

E.C. Lance
Publications Secretary

COLLINGWOOD MEMORIAL PRIZE

This prize was established by the London Mathematical Society in memory of Sir Edward Collingwood, and is awarded annually to a student of the University of Durham obtaining First Class Honours in mathematics and entering a course of postgraduate study. The 1997 prize is awarded to Miss A.J. Carrick, St Mary's College, who is intending to do research at the University of Durham.

HARDY COMMEMORATION

To commemorate the fiftieth anniversary of the death of G.H. Hardy a programme of lectures on his life and work has been arranged for Saturday 6th December, at Oxford. For the list of speakers and other details please send a stamped addressed envelope to Professor I.M. James, Hardy Commemoration, 24-29 St Giles, Oxford OX1 3LB, before the end of October.

LONDON MATHEMATICAL SOCIETY

TWO-DAY MEETING

Friday 17th & Saturday 18th October 1997

Mathematical Aspects of Numerical Analysis of Partial Differential Equations

Friday

14.15   C.M. Elliott (Sussex) *Numerical Analysis of a Mean Field Model of Superconducting Vortices*

15.30   T. Hou (Cal. Tech.) *Stabilizing Effect of Surface Tension and Formation of Pinching Singularities in Fluid Free Surfaces*

16.30   Tea

17.00   P.L. Lions (Paris) *Partial Differential Equations, Monte-Carlo Simulations and Applications to Finance*

19.00   Dinner (venue/cost to be arranged)

Saturday

9.15   E. Suli (Oxford) *A Posteriori Error Analysis of Adaptive Finite Element Methods for Hyperbolic Problems*

10.15   Coffee

10.45   B. Cockburn (Minnesota) *A Posteriori Error Estimates for Nonlinear Parabolic Equations*

12.00   R.C. Rannacher (Heidelberg) *A Paradigm for Error Control and Mesh-Size Selection in Solving Partial Differential Equations with Applications*

The meeting will be held at the Scientific Societies Lecture Theatre, New Burlington Place, London W1

All interested are very welcome

MEETING OF THE SOCIETY

A meeting was held on Friday 20 June 1997 at the Linnean Society's Rooms, Burlington House, Professor J.M. Ball, FRS, President, in the Chair. There were present about 35 members and visitors.

Nine people were elected to *Ordinary Membership:* B.H. Bowditch, V.V. Goryunov, M.P. Joy, C. Knudsen, A.V. Mikhailov, B.P. Rynne, M. Sayed, V.M. Turner, K.A.J. White; two people were elected to *Associate Membership:* R.M. Green, A.G. Livotto; and three people were elected to *Reciprocity Membership:* L. Foschini (UMI), V.G. Miller (AMS), C.A. Semple (NZMS).

The President, on Council's behalf, proposed that Professor P.D. Lax be elected to Honorary Membership of the Society and read the citation. He also announced, on Council's behalf, the award of the 1997 Pólya Prize to Dr J.M. Hammersley, FRS, of the 1997 Senior Whitehead Prize to Professor J.H. Coates, FRS, of the 1997 Junior Berwick Prize to Dr H.D. Macpherson, and of 1997 Junior Whitehead Prizes to Dr B.H. Bowditch, Dr A. Grigor'yan and Dr D. Joyce, and read short versions of the citations.

Professor D.G. Quillen gave a lecture on 'Module theory over nonunital rings' and Professor J.P. May gave the 1997 Hardy Lecture on 'Stable algebraic topology and stable topological algebra'.

VISIT OF PROFESSOR L. PAIVARINTA

Professor Lassi Paivarinta from the Department of Mathematics, University of Oulu, Finland, will visit the UK in October 1997 supported by an LMS Scheme 2 grant. His interests lie in the application of analysis to the inverse problems of mathematical physics, in particular to the impedance tomography inverse boundary value problems. He will give lectures on Friday 24 October at the Department of Mathematical Sciences, Loughborough University, on Monday 27 October at the Workshop on Inverse Problems at the Department of Applied Mathematical Studies, University of Leeds, and on Wednesday 29 October at the Department of Mathematics, Manchester University. The title of his lecture is "Inverse Problems for Systems". All members of the Society are very welcome to attend these lectures. For further information contact Dr Y.V. Kurylev (y.v.kurylev@lboro.ac.uk) or Dr P.A. Martin (pam@ma.man.ac.uk).

VISIT OF PROFESSOR C. DENINGER

Professor Christopher Deninger (Muenster) will be visiting the UK in November supported by an LMS Scheme 2 grant. He will give seminars in Cambridge on Tuesday 4 November, Nottingham on Friday 7 November and at UEA on Monday 10 November. At UEA he will also give some informal seminars for postgraduates. His basic topic will be the interaction between K-theory, arithmetic and dynamical systems. For further information, contact J. Nekovar (Cambridge), I. Fesenko (Nottingham) or G. Everest (UEA).

REVIEW OF MATHEMATICS SYLLABUSES

The NEMAS Forum (representing Mathematics Departments in the North of England) has recently discussed progress with the M.Math degree, which has now reached the third or fourth year in many departments. The LMS report of 1992 on 'The Future of Honours Degree Courses in Mathematics and Statistics' envisaged that common standards would be 'maintained as far as possible' in the first two years. The Forum is conducting a survey and comparison of first and second year syllabuses in Honours Mathematics courses for members of the group, and it is hoped that an informal report will be produced by about next May. The Chairman of the NEMAS Forum is Professor Joan Walsh (jwalsh@ma.man.ac.uk), Mathematics Department, University of Manchester.

LONDON MATHEMATICAL SOCIETY

NOTICE OF GENERAL MEETING

There will be a General Meeting of the Society on Friday 17 October 1997 at 5.00 pm in the Scientific Societies Lecture Theatre, London W1, to consider a proposal by the Council of the Society to delete the existing By-Laws I,9, II,1, and II,3 and to substitute those printed below.

The present I,9 asserts that a postal vote must be received 36 hours before an Annual General Meeting in order to be valid. The proposed I,9 would reduce this to 3 hours. (The time chosen attempts to balance adopting the shortest possible period with the various constraints imposed by the need to receive and count votes at the Annual General Meeting.)

In addition, the Council has, in the light of Statute 11, increased the annual subscription of Ordinary Members for 1997-98 by £1 and increased the annual subscription of Corporation and Institutional Members for 1997-98 to £504 from the 1996-97 level of £489; Council has also increased the prices per volume of the *Bulletin*, the *Journal* and the *Proceedings* to individual members for 1997-98 by 75 pence. The new By-Laws II,1 and II,3 would record the new rates.

Text of the proposed By-Law I,9

Members who are unable to attend the Annual General Meeting shall be allowed to vote in the election of the Council and Officers by sending their voting envelopes, duly sealed; and validated, to "The Scrutineers, London Mathematical Society" to reach the Registered Office of the Society at least three hours before the time appointed for the Meeting. Such votes will then be given by the Scrutineers acting as proxy for such Members.

Text of the proposed By-Law II,1

The annual subscription to the Society of Ordinary Members for the 1997-98 session shall be £18.00. The annual subscription to the Society of Associate Members for the 1997-98 session shall be £5.00. The prices of the Society's periodicals to Ordinary, Associate and Reciprocity Members for the 1997-98 session shall be: *Proceedings* £17.50 per volume, *Journal* £17.50 per volume, *Bulletin* £17.50 per volume.

Text of the proposed By-Law II,3

The annual subscription to the Society of Corporation and Institutional Members for the 1997-98 session shall be £504, inclusive of one volume of the *Bulletin* and two volumes of the *Journal* and of the *Proceedings*, except that those Corporation and Institutional Members who have more than one Representative shall pay an additional subscription of £18.00 for each Representative in excess of one.

J S Pym
Council and General Secretary

COMPUTATIONAL FLUID DYNAMICS

A conference on 'Numerical Methods for Fluid Dynamics' will be held from 31 March - 3 April 1988 at the University of Oxford. This is the sixth international conference on Computational Fluid Dynamics organised by the Institute for Computational Fluid Dynamics, a joint research organisation of the Universities of Oxford and Reading. The aim of the conference, as in previous years, is to bring together mathematicians and engineers and other scientists in the field of computational fluid dynamics to review recent advances in mathematical and computational techniques for modelling fluid flows.

The subject area is very large with many active researchers in industry, government laboratories and universities working on a wide variety of methods and applications. The conference will cover all areas of CFD but it is hoped to emphasise three main areas: adjoint problems, design and adaptivity; algorithms for environmental flows; DNS/LES turbulence modelling. In addition to invited lectures the programme will include contributed talks of twenty minutes and poster sessions. These will be selected mainly on the basis of their likely contribution to the above themes.

A feature of the meeting will be the second award of "The Bill Morton Prize" for a paper on CFD by a young research worker. The Prize paper, which should be suitable for a 30 minute talk and which will be presented by the author at a special session of the Conference, will be chosen from eligible contributed papers submitted for the Conference. The prize will be presented at the Conference dinner. The author should be under the age of 31 on 3 April 1998. Each candidate should include a statement of his/her age on that date and should indicate that he/she would be available to present his/her paper at the Conference.

Two page abstracts for contributed papers should be submitted by 5 December 1997, stating a preference for oral or poster presentation. Notification of acceptance will be given by 30 January 1998. Papers accepted for oral presentation will be required at the meeting for publication in the proceedings, immediately after the Conference. Abstracts and enquiries regarding the conference should be addressed to: Mrs B. Byrne, Oxford University Computing Laboratory, Wolfson Building, Parks Road, Oxford OX1 3QD; tel.: 01865-273883; fax: 01865-273839; e-mail: bette@comlab.ox.ac.uk.
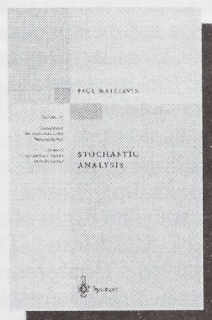
EDINBURGH MATHEMATICAL SOCIETY 1997-98 MEETINGS

Meetings to be held by the Edinburgh Mathematical Society are: 17 October (Edinburgh - Annual General Meeting and Presidential Address) Professor P.F. Smith; 14 November (Glasgow) J. Roe; 12 December (Heriot-Watt) W.T. Gowers; 16 January (Edinburgh) E.J. Hinch; 13 February (Edinburgh) M. Mendes France; 13 March (Dundee) A. Iserles; 8 May (Aberdeen) M.R. Bridson; 5 June (St Andrews) T.O. Hawkes. Further information is available from the Honorary Secretary, Dr P. Heywood, Department of Mathematics and Statistics, University of Edinburgh, Mayfield Road, Edinburgh EH9 3JZ (philip@maths. ed.ac.uk).

NORTH BRITISH FUNCTIONAL ANALYSIS SEMINAR

A meeting of the North British Functional Analysis Seminar will be held at the University of Manchester from 2.30 pm on Friday 24th October until noon on Saturday 25th October 1997. The speakers will include Professor Pierre Julg (Strasbourg). Please note that a meeting on Operator K-theory will be held on Friday morning, before Julg's talk. For further information please contact Dr G. Blower, Lancaster University (g.blower@lancaster.ac.uk).

ICIAM 99 IN EDINBURGH

The Fourth International Congress on Industrial and Applied Mathematics (ICIAM) will be held in Edinburgh from 5th to 9th July 1999. More than 2000 delegates are expected to attend. Previous ICIAM Congresses were held in Paris 1987, Washington 1991 and Hamburg 1995 and this event is now firmly established as the premier international conference in applied mathematics. The last mathematical congress of comparable importance and size to be held in the UK was the International Congress of Mathematicians held in 1958. This, too, was held in Edinburgh. The success of that congress bodes well for ICIAM 99.

The congress will focus worldwide attention on the importance of mathematical and computational methods in the solution of real world problems. The main features of the programme will be:

- 25 general lectures by leading international experts on current developments of industrial, computational and applied mathematics. Mathematical methods for the qualitative and quantitative analysis of models will be presented and important practical applications will be discussed extensively. Particular themes will include: Mathematical Modelling in Industry; Mathematics of Medicine; Financial Mathematics, Insurance, Investment and Banking; Geophysical and Oil Sciences; Large Scale Computation; Environmental and Climate Science; Cryptography, Coding and Computer Security.
- 300 mini-symposia and organised discussion sessions to provide integrated presentations and discussion by international panels on the latest mathematical and computational techniques. Research on industrial, commercial and environmental applications will be discussed as well as other issues including applied mathematics education, public perception of mathematics, and the organisation of applied mathematics societies.
- Special all-day sessions in conjunction with learned societies and other organisations discussing new research in the mathematical and computational sciences and outlining novel applications.
- End of conference session with a panel presenting overviews and perspectives, drawing conclusions from lectures and mini-symposia, and looking forward to the challenges and problems of the next century.

The Joint Patrons of the Congress are H.R.H. The Prince Philip, Duke of Edinburgh, K.G., K.T. and The Right Hon. The Lord Mackay of Clashfern. The Committee for International Conferences on Industrial and Applied Mathematics (CICIAM) is an international association of societies involved in applied mathematics and its applications. The main activity of CICIAM is to hold a four-yearly international congress. The present chair of CICIAM is Professor R. Mennicken (Regensburg University). A company, ICIAM 99 Ltd, has been formed and is responsible for all legal and financial aspects of the congress. The Chairman of the company is Sir Michael Atiyah.

The scientific programme and, in particular, the selection of invited speakers lies in the hands of an international Scientific Programme Committee chaired by Professor J.C.R. Hunt, Honorary Professor at the University of Cambridge and, until recently, Chief Executive of the Meteorological Office. The committee has 30 members from 16 different countries. Chairman of the Programme Management Committee is Professor Jack Carr (Heriot Watt University).

A UK Action Group co-ordinates the involvement and support of the UK scientific community. Organisations involved include the British Computer Society, Royal Statistical Society, Institute of Mathematics and its Applications, International Centre for Mathematical Sciences, London Mathematical Society, Operational Research Society, Royal Society, Royal Society of Edin-

burgh, Engineering and Physical Sciences Research Council.

Further information on the Congress can be found on the World Wide Web under the address http://www.maths.ed.ac.uk/conferences /iciam99/ where the current information is constantly brought up to date and you can preregister for the meeting following easy instructions. If you do not have access to the World Wide Web, further information can be obtained by writing/telephoning/faxing/e-mailing: ICIAM 99 Congress Secretariat, c/o Meeting Makers, 50 George Street, Glasgow G1 1QE; tel: +44 (0)141 553 1930; fax: +44 (0)141 552 0511; e-mail: geninfo.iciam@meetingmakers.co.uk .

DIOPHANTINE GEOMETRY AND DIFFERENTIAL EQUATIONS

A meeting in celebration of Professor Sir Peter Swinnerton-Dyer's 70th birthday will be held from Monday 22nd to Tuesday 23rd September 1997 at the Isaac Newton Institute, Cambridge. The programme is as follows:

Monday

2.00   Colin Sparrow (Cambridge): Ordinary differential equations; explosions and bifurcations

3.30   Noel Lloyd (Aberystwyth): Hilbert's 16th problem, 97 years on

5:00   Miles Reid (Warwick): The cubic surface through the ages

Tuesday

10:30   Richard Taylor (Harvard): Weight one forms, congruences and Galois representations

11:45   Jean-Louis Colliot-Thelene (Orsay): Local-to-global principles for varieties over a number field

2:00   Jan Nekovar (Cambridge): Euler systems and the conjecture of Birch and Swinnerton-Dyer

3:15   Don Zagier (Max Planck Inst): Diophantine equations and differential equations

A dinner in honour of Sir Peter will be held on Monday evening. The meeting is supported by the LMS, and there are some funds available to support travel and accommodation for UK research students and young mathematicians wishing to attend. To register or apply for funding, please contact Tracey Hibbitt (e-mail: t.hibbitt@newton.cam.ac.uk; tel: 01223-335984). Further information is available on: http://www.newton.cam.ac.uk/psd.html.

LANCELOT HOGBEN SYMPOSIUM

A meeting in memory of Lancelot Hogben FRS, 1895-1975, will be held in the School of Education of the University of Birmingham from 2 pm to 6 pm on 5 November 1997.

Hogben's career and interests covered a vast range. At various times, he held Chairs in Zoology, Social Biology and Natural History and became the first Professor of Medical Statistics at the University of Birmingham in 1947. He is best known for his popular books "Science for the Citizen" and "Mathematics for the Million", but wrote widely on many issues.

Speakers at the symposium will include: Professor Cedric Smith (Mathematics and Genetics), Professor Wilfrid Butt (Endocrinology), Professor Ailwyn Smith (Epidemiology), Professor Lewis Wolpert (Developmental Biology), Professor John Edwards (Human Genetics), Professor Peter Ricketts (Linguistics). There will be a subscription dinner (£25 per head) after the symposium. Those wishing to attend should contact Professor Sarah Bundey, Clinical Genetics Unit, University of Birmingham, Birmingham B15 2TG (sbundey@hgmp.mrc.ac.uk).

1997 SIR EDMUND WHITTAKER MEMORIAL PRIZE

The Edinburgh Mathematical Society has awarded the 1997 Sir Edmund Whittaker Memorial Prize to Dr Alan Rendall, of the Max Planck Institut fur Gravitationsphysik, Albert Einstein Institut Potsdam. Dr Rendall is a graduate of the University of Aberdeen.

BOOK REVIEW

Selected Japanese Senior High School Textbooks, Kunihiko Kodaira (Editor), George Fowler (Translation Editor), American Mathematical Society and the University of Chicago School Mathematics Project, 1996.

In the early 1980s, Isaak Wirszup of the University of Chicago drew attention to the enormous differences in mathematical expectations exhibited in school texts from the USA and the USSR. Not only was more mathematics taught in the schools of the USSR, but a far greater percentage of the age cohort was expected to study advanced mathematics (see Wirszup, 1981). Wirszup's work had two obvious consequences, the establishment of the University of Chicago School Mathematics Project (a curriculum development project) and the launching of a series of translations of foreign textbooks, published jointly by the American Mathematical Society and the UCSMP, intended "to give US educators and researchers a first-hand look at the contents of mathematics instruction in educationally advanced countries". Texts from the former USSR, Hungary, Bulgaria and Japan have previously appeared.

I was particularly pleased to be asked to review the present texts since some interesting innovations have recently taken place in Japan. There, children begin a six-year primary school course at age 6 and then attend Junior High School for 3 years (compulsory). After this, at age 15, about 95% progress to Senior High School in which mathematics is offered in a core plus options format. All students must take Mathematics I (4 hours per week in Grade 10 - English Year 11). Mathematics I and II (3 hours per week in Grade 11) are seen as the common core for all those bound for higher education. Mathematics III (3 hours per week in Grade 12) is core mathematics for would-be scientists and mathematicians. Mathematics A, B and C (each 2 hours per week for one year) are intended to provide deeper mathematical understanding and to emphasise mathe-

matical thought alongside the mathematical literacy provided in the core units (see below). This distinction between "literacy" for all and "thought" for the specialists is an interesting one and owes much to Hiroshi Fujita (see Fujita, 1985), who chaired the committee established to formulate the current Japanese mathematics curricula. English readers will note with envy the planning which went into this: after some years' discussion, the new syllabuses were published in 1990 and became effective for Senior High Schools in 1994, thus allowing ample time for new textbooks to be prepared. Briefly, for example, (but see also Howson, 1991, and Howson and Wilson, 1986, pp 56-57), descriptive statistics is seen as part of "literacy", axiomatic probability theory as part of "thought", and elementary probability bestrides the two. I was eager, then, to see how theory had been translated into textbook practice and (unwisely as it turned out) skipped the Preface and hurried to Chapter 1.

This, on "Numbers and Expressions", began with some work on real numbers, absolute values, inequalities, and what I suspect was a fair amount of revision before moving on to square roots and surds. I began to have doubts when I met a section on simplifying double radicals by, for example spotting that $6 - 2\sqrt{8}$ could be rewritten as $(2 - \sqrt{2})^2$: recall that this is a text for GCSE year for all students, not just the brightest. This seemed on a par with learning the meaning and spelling of syzygy as part of ordinary literacy (whilst realising that both tasks could add spice for the brighter pupil). My doubts increased as I read on and eventually I was forced to go back to the Preface. There I discovered that the Japanese system described was one no longer followed and that the books translated were those published in 1983 to meet the demands of the previous curriculum.

Far from giving readers a "first hand" look at what is happening in Japan, the translations are, then, misleading. Even more out of date are the indications

regarding the state of health of Japanese school mathematics. For example, we are told that in 1990 about 25% of students opted to take mathematics in what would be our second sixth-form year. We are not told that by 1994 the percentage had dropped to 12 (Itaka *et al,* 1994). Japan, then, has great problems.

The books sent for review are not to my mind particularly distinguished pedagogically - Durell did a better job - but are not without mathematical merit. There is little attempt to motivate students, to explain why they are studying a topic or to demonstrate its applicability. Everything would seem to depend on the student being "instrumentally" motivated, *i.e.* viewing mathematics as an instrument which will provide him or her with entry to what (s)he really wants to do. Now university entrance is no longer so dependent upon a student's obtaining good mathematics marks, that type of motivation is being undermined at the Senior High School level. Japanese mathematicians and educators are fully aware of the problem and it would be of great interest to all educators to learn how they are attempting to deal with it and to what extent these efforts have proved successful.

Certainly, Japanese students excelled at 13 + in the recent Third International Mathematics and Science Study (Beaton, *et al,* 1996). But already by 13 +, 52% of Japanese students felt that they were not doing well at mathematics. On the other hand, 93% of English students felt they were. There must be a sensible mean between discouraging high-attaining students because of possibly over high expectations and leaving low-attaining ones well-satisfied with their performance! Most countries face great problems now so far as mathematics teaching is concerned: the step from mathematics for an élite to mathematics for all has not proved an easy one to take. One can only welcome the initiative of the AMS and UCSMP in trying to help us to see how others are attempting to solve their problems. However, these particular translations were well past their "best by" date when published. I can only suggest that the publishers withdraw them from sale and proceed quickly with preparing a translation of their successors, or, alternatively, that further sales are deferred until an accompanying booklet can be prepared setting out the changes that have been made to the Japanese syllabuses and textbooks together with a rationale for these.

References
Beaton, A.E. *et al,* 1996, *Mathematics Achievement in the Middle School Years,* IEA-TIMSS, Boston, USA
Fujita, H., 1985, The present state and a proposed reform of mathematical education at senior secondary level in Japan, *J. Sc. Educ. Japan,* 9(2), 39-52
Howson, A.G., 1991, *National Curricula in Mathematics,* Stanley Thorne for the Mathematical Association
Howson A.G. and Wilson, B.J., 1986, *School Mathematics in the 1990s,* Cambridge University Press
Itaka, S. *et al,* 1994, Mathematics Education at Risk, Mathematical Society of Japan *et al,* duplicated translation
Wirszup, I., 1981, The Soviet Challenge, *Education Leadership,* 38(5)

Appendix: The Japanese Senior High School Mathematics Syllabuses
Below we give brief synopses (extracted from Howson, 1991) of the syllabuses for the various mathematics units. It will be noted that, because of the breadth of the Senior High School curriculum, Japanese students devote less time to the study of mathematics than do their English counterparts. As indicated above, I have not had the opportunity to study the post-1994 Senior High School texts. However, those for the Junior High School include significantly more contextualised examples and exercises than their predecessors and seek to provide greater motivation through the use, where possible, of generic applications to introduce new topics.

It should be pointed out that Japan will soon abandon Saturday morning schooling. This will mean a cut in the time

allocation for mathematics teaching and the committees already working on the new curriculum, to be announced in 2000 and to become operative in the Senior High Schools in 2004, are having to determine which content will have to be postponed to later years and which will have to be excluded altogether.

The outline teaching content of the syllabuses is:

Mathematics I : 1. Quadratic functions: quadratic function and its graph, quadratic equations and inequalities. 2. Geometric figures and mensuration; trigonometric ratios, sine and cosine theorems. 3. Treatment of numbers of objects; sequences of natural numbers, permutations and combinations. 4. Probability; basic laws of probability, independent trials, expectation.

Mathematics II : 1. Functions; exponential function, logarithmic function, trigonometric functions and the addition theorems. 2. Geometric figures and equations; coordinates of a point, equations of a straight line and of a circle. 3. Functions and change; differential coefficient and derivatives, applications, idea of integration.

Mathematics III : 1. Functions and limits; rational and irrational functions, composite functions and inverse function, limits of sequences and of functions. 2. Differential calculus; differentiation of sums, products and quotients of functions and of composite functions, applications. 3. Integral calculus; indefinite and definite integrals, integration by substitution, simple integration by parts, applications to area, volume, distance.

Mathematics A : 1. Numbers and algebraic expressions; number systems, polynomials, identities and inequalities. 2. Plane geometry; properties of plane figures, basic theorems, loci, geometric transformations in the plane. 3. Number sequences; series and its sum, recurrence relations, mathematical induction, binomial theorem. 4. Computation and the computer; operation of computer, flow charts and programs, computation using a computer.

Mathematics B : 1. Vectors; vectors in the plane, addition of vectors, inner product, vectors in space, coordinates in space. 2. Complex numbers and the complex plane; solutions of equations, Argand diagram, De Moivre's theorem. 3. Probability distributions; calculation of probability, random variables and probability distributions, binomial distribution. 4. Algorithms and the computer; function of computer, programs for various algorithms.

Mathematics C : 1. Matrices and linear computation; matrices and their operations, inverse matrix, system of linear equations, solution by elimination. 2. Curves; equations, ellipse and hyperbola, parametric representation, polar coordinates. 3. Numerical computation; approximate solution of equations (Newton, bisection), numerical integration, approximate computation of area. 4. Statistics; arrangement of data, representative values and measures of dispersion, correlation, populations and samples, normal distribution, idea of statistical inference.
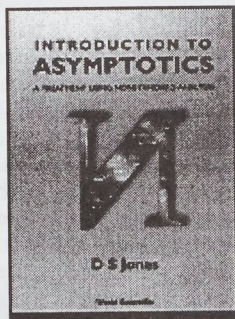
A.G. Howson

1997 HANDBOOK AND LIST OF MEMBERS

The *1997 Handbook and List of Members* should accompany this Newsletter. My thanks to all members who returned their forms. As far as possible each individual member's entry contains precisely the information supplied by the member. Some alterations have, however, been necessary to achieve the consistent format agreed by Council, and others have been forced by space limitations. If any member finds an error in their entry which is not attributable to these causes, or if there are any subsequent changes to the particulars (such as extra degrees gained, or change of address) please inform the office, as soon as possible, either in writing, or by e-mail: (lms@lms.ac.uk).

Susan Oakes
Administrator

13

WORKSHOP ON PROBABILITY: THEORY AND APPLICATIONS

This meeting will take place from 20th to 24th April 1998 at Nottingham Trent University and is partially funded by EPSRC. The aim of the workshop is to encourage interaction between pure and applied probabilists on topics of mutual interest. One day will be devoted to each of the following areas:

- Probability in Finance
- Probability in Information Science
- Probability in Biology
- Probability in Physics
- Probabilistic Methods and Modelling

The following have accepted invitations to give plenary talks: D. Aldous (Berkeley), A. Barbour (Zurich), J. Chayes (Microsoft), M. Davis (Mitsubishi), A. Dorlas (Swansea), T. Gowers (Cambridge), L. Hughston (Merrill Lynch), C. Pfister (Lausanne), S. Tavare (USC) and J. Ziv (Haifa). Other speakers will include B. Derrida (Paris), P. Donnelly (Oxford) and J. Rosenthal (Toronto). As hotel accommodation in Nottingham is limited, prospective participants are advised to register their intention to attend by contacting the workshop administrator Ms Samantha Casterton as soon as possible (e-mail: cos3castesj@ntu.ac.uk; tel: 0115 9418418 ext 2862; fax: 0115 9486536). Participants wishing to give short talks should send an e-mail giving the title and a short abstract to pconf@maths.ntu.ac.uk. All non-EPSRC funded participants will be required to pay a workshop fee of £100 (this does not include accommodation and subsistence). Nottingham Trent University will make available 20 workshop fellowships of up to £300 each to cover travel and subsistence for young research-active participants under the age of 30. To apply for one of these, send a short (one page) cv and an estimate of your travel expenses by e-mail (pconf@maths.ntu.ac.uk).

The Scientific Committee consists of: David Applebaum (NTU) - main organiser, Frank Ball (Nottingham), Alison Etheridge (QMW), Charles Goldie (Sussex), John Lewis (Dublin), Gareth Roberts (Cambridge) and David Williams (Bath). Further information is available on the web page (http://euler.ntu.ac.uk/pconf/html/).

ECMI 98

The European Consortium for Mathematics in Industry (ECMI) will organise its 10th conference in Göteborg, Sweden, 22-27 June 1998. The aim is to provide a forum for the presentation of work on the applications of mathematics in industrial problems, where researchers from both academia and industry will meet and discuss current problems of interest. Advanced and postgraduate students are particularly encouraged to attend. The main topics are mathematical modelling of vehicles (dynamics and logistics), materials, finance, telecommunications and scientific computing. Invited speakers include Schweizer (Berlin), Traub (Columbia NY), Mazullo (Milano), Langer (Linz), Hougaard (Kopenhagen), Fasano (Firenze), Engquist (Stockholm), Laporte (Montreal), Widman (Djursholm).

There will be minisymposia on topics like combustion, airline scheduling, wood, molecular modelling, reservoir simulation and cryptography. The conference is hosted by Chalmers University and Göteborg University. Those who are interested in contributing a paper or organising a minisymposium should submit an abstract to the address below before 30 January 1998. Registration fees are (in SEK): ECMI members 1300 (1500 after 24 April 1998); non-members 1500 (1800 after 24 April 1998); students 250 (350 after 24 April 1998). All further information can be obtained from the following address: School of Mathematical and Computing Sciences, Chalmers University of Technology and Göteborg University, S-412 96 Göteborg, Sweden; e-mail: ecmi98@math.chalmers.se; www: http://www.math.chalmers.se./ECMI98; fax: + 46 31 16 19 73.

Conference: Bayesian Methods in Neural Computing, 15-19 December 1997
Organisers: C M Bishop (Aston) and M Niranjan (Cambridge)

Bayesian methods are being widely applied to neural networks and other machine learning techniques, and are currently the focus of much research interest. Recent benchmark comparisons of generalization performance suggest that a Bayesian approach may provide the best overall framework for practical applications.

This conference will bring together researchers from the neural networks, machine learning and statistics communities, and will explore a variety of themes including Markov chain Monte Carlo methods, analytical approximation schemes, Gaussian processes, sequential algorithms, benchmarking, model complexity, independent component analysis, and probabilistic graphical models.

In addition to invited speakers there will be additional contributions selected competitively on the basis of extended abstracts (of up to two pages in length). Potential contributers are requested to send their abstract to M Niranjan at the address above, or e-mail M.Niranjan@newton. cam.ac.uk The deadline for submissions is 29 September 1997 and an acceptance/ rejection decision will be made by 6 October 1997.

Provisional list of Invited Speakers:

S-I. Amari (Tokyo), M. Niranjan (Cambridge), C.M. Bishop (Aston), M. Opper (Aston), M. Feder (Tel Aviv), C. Rasmussen (Toronto), A. Gelman (Columbia), T. Richardson (Washington), P. Green (Bristol), R. Rohwer (Prediction Co), D. Haussler (UCSC), T.D. Saad (Aston), G.E. Hinton (Toronto), T.J. Sejnowski (Salk), S. Luttrell (DRA), J. Shawe-Taylor (Royal Holloway), D.J.C. MacKay (Cambridge), C.K.I. Williams (Aston).

This conference forms part of the six month programme on Neural Networks and Machine, Learning, organised by C.M. Bishop, D. Haussler, G.E. Hinton, M. Niranjan and L.G. Valiant.

Location and Costs: The conference will take place at the Newton Institute and accommodation for participants will be provided at Wolfson Court, adjacent to the Institute. The conference package costs £240 which includes five nights of accommodation from Sunday 14 December to Thursday 18 December inclusive, as well as all meals. There will be a reception on the Sunday evening and a conference dinner later in the week.

Financial support for a limited number of participants will be available, with priority being given to more junior researchers.

Application forms are available via WWW at http://www.newton.cam.ac.uk /programs/nnm_bayes.html Completed forms should be sent to Heather Dawson at the above address, or by e-mail to: h.dawson@newton. cam.ac.uk.

Closing date for the receipt of applications and abstracts: 29 September 1997.

Dynamics of Astrophysical Discs (January - July 1998)
Organisers: J.C.B. Papaloizou (QMW); J.E. Pringle (Cambridge); J.A. Sellwood (Rutgers)

Theme: Many astrophysical systems, over a vast range of length scales, consist of matter organised in differentially rotating, centrifugally supported discs. Such systems include planetary rings, protostellar discs (which provide the environment from which planets may form), close binary star systems, and normal and active galaxies. Understanding the structure and evolution of astrophysical discs is therefore of central importance in astronomy. Discs may be modelled as collections of discrete particles, and this leads to study of collisionless many body problems. Other studies treat the disc as a differentially rotating turbulent fluid, possibly containing a magnetic field. The effects of self-gravitation may also need to be taken into account. The programme will bring together experts from relevant areas in astrophysics and mathematicians

and scientists familiar with appropriate analytic methods and numerical simulation techniques, including the solution of differential or integro-differential equations. The aim is to make progress with the different approaches, and, in particular, to advance our understanding of the connections between them.

Preliminary Programme

12 Jan - 6 Mar: Angular momentum transfer in discs

- MHD, dynamos, global field generation, physics of flux limitation
- Energy loss processes and location of dissipation
- and implications for calculation of spectra
- Transfer through waves, through self-gravity, loss to winds.
- Comparison of components of stress tensor

9 Mar - 8 May: Twists and warps

- Evolution of twists and warps, viscous effects and wave-like transfer,
- effects of finite thickness, adequacy of vertical averaging.
- Driving of warps through radiation and winds
- Effects of self-gravity.

11 May - 3 Jul: External forcing of discs

- Planets and gaps, Circumbinary discs, tidal truncation.
- Binary star formation, induced fragmentation (self- gravity)
- Disk galaxy formation Galaxy interactions and minor mergers
- Disk/bar/halo interactions
- Formation and dynamics of bars Gas response in galaxies - AGN/starburst phenomena

Participants include: S.A. Balbus (Virginia), A Brandenberg, (Newcastle), C.G. Campbell (Newcastle), C. Gammie (Harvard), J. Goodman (Princeton), S. Lubow (STSI), C.A. Norman (Johns Hopkins), G.I. Ogilvie (Cambridge), J.C.B. Papaloizou (QMW), J.E. Pringle (Cambridge), J.A. Sellwood (Rutgers), S. Sridhar (Pune), C. Terquem (Santa Cruz), S. Tremaine (Toronto).

Further information about the programme is available via WWW at http://www.newton. cam.ac.uk/programs/dad.html.

For enquiries about participating in the programme please contact Ann Cartwright, Newton Institute Administrator, 20 Clarkson Rd, Cambridge CB3 0EH, e-mail: a.cartwright@newton.cam.ac.uk.

Arithmetic Geometry (January - July 1998)

Organisers: J-L Colliot-Thélène (Orsay); J Nekovár (Cambridge); C Soulé(IHES)

Theme: The origin of this subject was the study of solutions of Diophantine Equations - that is the the the search for integer or rational solutions of systems of polynomial equations - using geometric methods. Today, Arithmetic Geometry has expanded to cover a wide range of topics central to Number Theory, Algebraic Geometry and other branches of pure mathematics. The programme will highlight several areas of this vast subject, including: arithmetic of algebraic cycles, motivic cohomology, rational points on algebraic varieties, Arakelov theory, and regulators and special values of L-functions.

As a part of the European Commission's Training and Mobility of Researchers programme, two post-doctoral positions are offered for research work related to the programme. See http://www.univ-rennes1. fr/labos/IRMAR/arithgeom.html for details.

Programme Outline: Apart from a regular seminar programme throughout the period the following workshops are planned: 23 - 27 February, Arithmetic of Algebraic Cycles and Motivic Cohomology (organised by J-L. Colliot-Thélène and U. Jannsen); 23 - 28 March, EC Summer School Part I: Instructional conference (organised by J-L. Colliot-Thélène, J. Nekovár and C. Soulé); 30 March - 4 April, EC Summer School Part II: Rational Points (Organised by J. Nekovár and H.P.F. Swinnerton-Dyer); 29 June - 3 July, Arakelov Theory, Values of L-functions (organised by J. Nekovár and C. Soulé).

Further information about the programme is available via WWW

at http://www.newton.cam.ac.uk/programs/ amg.html.

For programme-specific enquiries please contact: J. Nekovár, Dept of Pure Mathematics and Mathematical Statistics, 16 Mill Lane, Cambridge CB2 1SB; tel: 01223 337990; e-mail: nekovar@dpmms.cam.ac. uk; fax: 01223 337920.

For more information about the Newton Institute and its programmes, please see our Website at http://www.newton.cam.ac.uk.

SHIFTS IN THE CONTENT OF SINGLE HONOURS MATHEMATICS

Single honours undergraduate mathematics in England and Wales has seen significant change in its intake of students over the last few years, with mass higher education and the broader approach now followed in schools ensuring that students arrive with differing mathematical experiences. It is to be expected that the undergraduate programmes themselves will have been adapted to cope with this new situation. One strategy has been to develop new teaching methods that make mathematics more accessible and a second has been to adapt the content of courses, which is the focus of a study to be published in the October issue (22(3)) of the journal *Studies in Higher Education.*

The study, by Peter Kahn at Liverpool Hope University College and Celia Hoyles at the Institute of Education in London, looks at changes in the content of single honours undergraduate mathematics in England and Wales between 1989 and 1996. It consisted of a questionnaire, which was completed by 29 of the 52 relevant institutions, followed by detailed case studies of several representative degree programmes.

The study found that single honours mathematics degrees have tended to become broader and less focused on catering for the elite. Introductory material has been added to more than half of the degrees and as much as half of a year's worth of higher mathematics had been cut in some cases. Seventy percent of the universities had sought to broaden their degree programme, with many new applications of mathematics now included. Furthermore, changes in examination practice glimpsed in the case studies included an increased use of questions involving computation, greater predictability of questions, new structure with additional questions that appeared shorter and easier, and more guidance on how to answer questions.

Taken together, these changes in mathematics degrees not only make the degrees more accessible but also mean a decrease in emphasis on courses in abstract mathematics that are dominated by proof. It is surprising how similar the picture is to schools, where the curriculum has also become broader with less emphasis placed on proof. The tension between broad education and specialised study is now common to both schools and higher education.

Furthermore, it was apparent that change was greater in programmes where the standard of intake was higher. This association may arise from a convergence of the goals held for their students by the different universities. Programmes with a higher standard of intake may have previously taken a narrower approach to mathematics, catering more for the needs of students intent on further study in mathematics. It may also be the case that departments with a lower standard of intake had already better catered for less well prepared students.

The study concludes by focusing not on standards - comparing the difficulty of abstract courses dominated by proof with courses on applications of mathematics is probably irresolvable - but on this issue of balance between broad and specialised education. Abstract concepts and proof are so important to mathematics that more steps should be taken to promote students' interest in them and competence in dealing with them. This must be done without compromising a broad mathematical education.

<div style="text-align:right">

Peter Kahn
Liverpool Hope University College

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E. BOREL
Honorary Member 1939

DIARY

The diary lists Society meetings and other events publicized in previous issues of the Newsletter. For further information, refer to the figure in brackets, which is a cross reference to the LMS Newsletter number.

SEPTEMBER 1997

1-5 Probabilistic Graphical Models EC Summer School, Newton Institute, Cambridge (251)

1-12 Symplectic Geometry Symposium, University of Warwick (251)

8-10 New Paradigms for Computation on Classical Spaces, University of Birmingham (249)

8-12 Stochastic Modelling of Physical Systems Workshop, Cambridge University (244)

9-11 Theorem Proving Short Course, Cambridge (251)

14-19 Integrable Systems Instructional LMS-EPSRC Conference, Oxford (250)

20-21 Mathematics in the Ancient World Conference, Kellog College, Oxford (249)

22-23 Diophantine Geometry and Differential Equations Meeting, Newton Institute, Cambridge (251)

22-23 Function Theory Meeting, DPMMS, Cambridge (248) (249)

22-26 Austrian Congress of Mathematics, Salzburg (248)

27-3 Oct Algebraic Independence Instructional Conference, CIRM, Luminy, France (249)

29-2 Oct Technology in Mathematics Teaching Conference, University of Koblenz, Germany (251)

OCTOBER 1997

17-18 Two-Day London Mathematical Society Meeting, London - Numerical Analysis

24-29 Number Theory and Arithmetical Geometry Conference, Spain (250)

25 Celebration of William Burnside Meeting, Royal Naval College, London (250)

NOVEMBER 1997

21 London Mathematical Society, Annual General Meeting, London

DECEMBER 1997

13-17 European Women in Mathematics 8th General Meeting, ICTP, Trieste, Italy (244)

FEBRUARY 1998

9-13 Hyperbolic Problems Theory, Numerics, Application Conference, ETH Zurich, Switzerland (246)

20-21 Two-day London Mathematical Society Meeting, University of Southampton - Hyperbolic Geometry

APRIL 1998

6-9 British Mathematical Colloquium, Manchester University

AUGUST 1998

18-28 International Congress of Mathematicians, Berlin, Germany (238) (242)

30-5 Sep Algebraic Number Theory and Diophantine Analysis Conference, Graz, Austria (249)