LONDON MATHEMATICAL SOCIETY

PROFESSOR D. SULLIVAN (I.H.E.S.)
IRRATIONAL CYCLES FOR FOLIATIONS AND COMPLEX MANIFOLDS

Dr. J. H. CONWAY (Cambridge)
THE SPHERE PACKING PROBLEM

FRIDAY, 19 March, 1976, at 3.30 p.m.

Room N221,
Chemistry Building,
Chelsea College,
Manresa Road, London, S.W.3

Tea will be served at 4.30 p.m. in the Senior Common Room.

From South Kensington underground, proceed along Brompton Road, turning L. into Sumner Place, R. into Fulham Road, L. into Doverhouse Street, turning immediately R. along South Parade and immediately L. into Manresa Road.

(Alternatively proceed by underground to Sloane Square and then take an 11, 19 or 22 bus.)

LMS NEWSLETTER

WHITEHEAD LECTURE

At the May meeting of the Society, at 3.30 p.m. on Friday 21 May 1976, which will be held at the Mathematics Institute, University of Warwick, Professor C. T. C. Wall, F.R.S., will deliver the 1976 Whitehead Lecture. Further details about the meeting will be announced later. Members are reminded that there will be no meeting in April.

J. L. BRITTON

BRITISH MATHEMATICAL COLLOQUIUM

The L.M.S. Council has been conducting negotiations with the Council of the Edinburgh Mathematical Society and the Committee of the British Mathematical Colloquium to see whether any formal links should be established between them. As a result of these discussions a joint LMS/EMS proposal will be put to the B.M.C. at Aberystwyth in April. This proposal will be considered by the B.M.C. committee and then appear on the agenda of the A.G.M. The main suggestions are:

(1) The L.M.S. and E.M.S. would act as joint sponsors of the B.M.C., providing suitable financial guarantees, but not being involved in the normal running of the Colloquia.

(2) The L.M.S. and E.M.S. would each nominate two members of the B.M.C. committee and would be associated with the auditing of the Colloquium accounts.

M. F. ATIYAH

SYMPOSIUM ON SOLITONS

The I.M.A. and the L.M.S. will hold a joint symposium on Non-Linear Waves and Solitons, at the University of Newcastle upon Tyne, 6–9 September 1976.

Recent developments in the theory of non-linear waves have led to the study of systems of solitary waves which have many of the properties of particle interactions in atomic physics. Such waves are referred to as *Solitons*. Partial Differential Equations which give rise to multi-soliton solutions occur in many branches of Applied Mathematics and Physics.

The interplay between numerical experimentation and analytic solution has led to the resolution of many conjectures about the behaviour of solitons but several still remain.

The purpose of the Symposium is to discuss aspects of this theory from the differing points of view of Applied Mathematics, Pure Mathematics and Physics. Speakers will include:—Professor M. F. Atiyah (Oxford University), Professor R. K. Bullough (UMIST), Professor P. D. Lax (Courant Institute, N.Y.), Professor A. C. Newell (Clarkson College, N.Y.).

It is proposed to arrange major review lectures and include up-to-date contributions from workers in the field. Participants are invited to submit contributions in the form of short abstracts (300 words) to: Miss C. Richards, The Institute for Mathematics and Its Applications, Maitland House, Warrior Square, Southend on Sea, Essex, SS1 2JY by 1 April 1976.

N. C. FREEMAN

THE FOUR COLOUR PROBLEM

Beniamino Segre will give two lectures on the Four Colour Problem at the University of Sussex at 2.15 p.m. on Monday 22nd March and Tuesday 23rd March, 1976. Visitors will be welcomed: for further information please get in touch with Prof. D. B. Scott, Mathematics Division, University of Sussex, Brighton, Sussex BN1 9QH.

REPORT ON THE NOTTINGHAM CONFERENCE

A conference on "Adapting university mathematics to current and future needs" was held at the Shell Centre, Nottingham from 14–17 December 1975.

The changing pattern of sixth-form education in mathematics, with its implication for the state of preparation of entrants into university mathematics degree courses, prompted the Education Committee of L.M.S. Council, under its Chairman, Professor H. B. Griffiths, to initiate this working Conference. The intention was that university departments of mathematics would review their undergraduate programmes, especially in the first and second years, on the basis of information presented and discussions held during the Conference, with any such review taking account of the facts that increasing numbers of candidates offer only one A-level in mathematics, that the number of candidates for mathematics degrees is declining, that the attitudes towards the specialised study of mathematics suffer from a variety of uncertainties, that new forms of the 18+ examination are under consideration, and that the supply of qualified mathematics teachers is dangerously low. The Conference was designed to be fully participatory, to involve representatives from all the branches of mathematics, and to cost as little as possible. A small number of teachers and experts in school education were invited to keep discussions linked to reality. The Conference was fortunate to receive co-sponsorship from the Royal Society—IMA Committee on Mathematical Education, and generous financial assistance from the BP and Shell Companies (the former channelled through the Schools and Industry Committee of the Mathematical Association).

There were in all 142 participants, including an average of two members from each University department, with a good spread in age, seniority, experience and range of interests. Because of the limited time available, and the complexity of the questions to be considered, it was decided that the Conference would concern itself on this occasion solely with a single subject degree course.

The programme was based on eight subject panels (Methods and techniques, Non-Physical applied mathematics, Physical applied mathematics, Statistics, Computing, Algebra, Analysis, Geometry and topology) which met in the morning and afternoon of 15 and 16 December, and to which participants were assigned from the outset—each panel having a Chairman and Recorder and about 15 members representing a mix of specialisms—and on plenary sessions during the evenings of 14, 15, 16 December and the morning of the last day. Each panel worked, within certain assigned constraints, towards a constructive statement on the desired place and weight of its subject in the general curriculum; and in the end each panel had the opportunity to comment, constructively or otherwise, on the statements of the other panels. The panels did not produce, and it had never been intended that they should produce, an attempt at a universal syllabus; what the panels achieved (with a high degree of success) was to get participants involved in argument with representatives from universities and subjects other than their own about the composition of a professionally acceptable mathematical education for the changing undergraduate population of the future—and what the organisers hope is that this discussion will now be carried over into individual departments.

The principal function of the plenary sessions was to provide background information.

On Sunday evening, Professor Atiyah opened the Conference, and then two short lectures were given. The first was by Professor Griffiths, entitled "What is the reality for universities?"; this looked at contemporary monetary constraints on mathematics departments, how these were related to the need to produce enthusiastic school teachers and how such considerations had led to the structure of the Conference. The second was by Dr. R. R. McLone (Southampton), who described the statistics that he had gathered on the potential numbers of qualified applicants for university places. A very lively discussion followed, which included a suggestion that it would be better for universities to put their energies into persuading schools to keep up standards, than to discuss the planned business of the Conference. This suggestion was criticised on the grounds that university mathematicians had, individually, been "telling" schools for years, without themselves having a generally agreed idea of what really was wanted. For reasons such as that, and our general lack of expertise in school matters, the overwhelming feeling of the meeting was to continue with the business as planned.

At the second Plenary session, four speakers described new teaching methods they were trying out: Mr. I. Riley (Exeter) on first-year projects in statistics; Mr. Keating (Imperial College) on a reading course in linear algebra; Dr. R. D'Inverno (Southampton) on a self-paced course for engineers; and Dr. D. O. Tall (Warwick) on problems of using duplicated lecture notes. The second and third talks involved variations on the " Keller Plan ", and Dr. D'Inverno especially gave details of academic assessment, and of costing.

On the third evening, talks were given by Mr. D. Quadling and Dr. T. Fletcher, H.M.I. The first dealt with the planning background and time-scale, both for the proposed new 16+ examination, and the N/F levels. Mr. Quadling is Chairman of the Mathematics Steering Committee, which has been set up by the Schools Council with other subject-committees, and he described various types of mathematics syllabus that his Committee is commissioning from different quarters. Dr. Fletcher spoke of the shortage of qualified teachers of mathematics (with 1,200 mathematics graduates needed in England and Wales) and of the contemporary changes in school-structure, emphasising the variety of schools and the dangers of generalising about them; he pointed out the difficulties under which many of them had been working, owing to changing demands. Here he was underscoring similar remarks made throughout the Conference by the specially invited small number of schoolteachers, whose statements of experience were very valuable. He pointed, too, to the need for mathematics departments to consider courses that would be suitable for future school teachers; and he was at pains to stress that there was no reason to suppose that the position of mathematics in our schools would improve for some time to come.

The Conference ended on the Wednesday lunchtime, after a final Plenary Session at which two matters were dealt with. First, the Chairman of each Panel gave a brief summary of his Panel's position—its attitude to its own proposals in the light of the strictures of other Panels, and its views on other proposals. Second, Professor Atiyah asked for ideas for future plans. It was decided that the proceedings of the Conference should be typed and circulated to members, but not published in full; that a short report of the Conference be published; and that various other conferences on similar lines be organised. Possible meetings between representatives from higher education with (i) teachers and subject advisors in L.E.A.s, (ii) representatives from industry, were specifically mentioned, as was a conference on the higher education/ job interface. Steps will be taken by the L.M.S. to invite other bodies to organise such conferences on the topics suggested since there is neither wish nor good reason for the L.M.S. alone to be concerned with these problems. Finally, in connexion with the N and F proposals, there was considerable support for designing a " core " syllabus for schools, and this problem will be on the agenda of the next meeting of the Joint Mathematical Council.

Participants generally seemed to have enjoyed the hard work of the Conference, and the proceedings ended with thanks to the organising committee and especially Dr. J. Anderson and the Shell Centre for their local organisation.

Detailed Conference proceedings will be sent to all who participated. A limited number of copies will be available on request from The Secretary, Shell Centre for Mathematical Education, The University, Nottingham NG7 2RD.

H. HALBERSTAM

SUPPORT FOR CONFERENCES

In response to recurring requests for support for conferences, the Council of the London Mathematical Society has decided to make a limited amount of money available for this purpose, for a trial period. In general, it is intended that this money should be used for small conferences, or for small items that cannot be covered by grants from other sources.

Applications for support should include full organisational details of the conference, the proposed budget, and available information about the conference programme.

Enquiries and applications should be addressed to Professor C. T. C. Wall, Department of Pure Mathematics, University of Liverpool. Applications received by the date of the B.M.C. will be considered in April; those received by 1 June will be considered in June; others will be considered in October.

WARWICK FOLIATIONS SYMPOSIUM

During the present academic year there is a Symposium on Foliation Theory at the University of Warwick. This Symposium has been made possible through the support of the Science Research Council. Members of staff and students are welcome to attend either for individual seminars or for longer periods; limited funds are available for members of staff to help pay expenses, but visitors are asked to try to obtain expenses from their own institutions before applying to the Symposium. For information, please write to D. B. A. Epstein, Mathematics Institute, University of Warwick, Coventry CV4 7AL.

CONFERENCE ON FOLIATION THEORY

I am organising a conference on Foliation Theory in Oberwolfach during the period 19–25 September 1976. Limited support is provided by the Institute at Oberwolfach, but fares cannot be provided. If you are interested in attending, please let me know as soon as possible.

D. B. A. Epstein

TRANSFORMATION GROUPS

There will be a conference on Transformation Groups during 4–11 August 1976 at the University of Newcastle upon Tyne. Further details and application forms will be available soon. Anyone interested in attending is asked to contact Dr. Czes Kosniowski at the School of Mathematics, University of Newcastle upon Tyne, Newcastle upon Tyne, NE1 7RU.

MATHEMATICAL COMPETITIONS IN BRITAIN

Mathematical competitions in this country were started by Mr. Watson, then at Manchester Grammar School, for about 200 boys in the neighbourhood, who did a paper, set in America, by the Mathematical Association of America and the Society of Actuaries. News of this spread, and in 1964 it was suggested that the best 60 pupils in the competition should be invited to compete in the British Mathematical Olympiad set, in the first instance, jointly by Professor and Mrs. Hayman. This stimulated much more interest, which further increased after 1966 when we arranged that a team for Great Britain should take part in the International Mathematical Olypmiad which was, until that time, open only to teams from East Europe. The number now taking part has risen to about 12,000 and last year 17 countries, including America, competed in the international competition.

Unlike many countries, we have no training sessions for our international team —we are one of the few countries without government sponsorship—but nevertheless our team has always been in the top six and last year was fifth after U.S.S.R., East Germany, Hungary and America.

The competitions are run by a committee of the Mathematical Association in co-operation with S.M.P., who generously finance the cost of the international competition.

Margaret Hayman

HARDY LECTURER

The Society's Hardy Lecturer for 1977 will be Professor J. Moser (Courant Institute of Mathematical Sciences, New York University). Further details will be announced later.

J. L. Britton