

THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No.151

June 1988

The Newsletter is published monthly except in August. Items and advertisements for inclusion in the Newsletter should be sent to the Editor (Susan Oakes, London Mathematical Society, Burlington House, Piccadilly, London W1V 0NL) to arrive before the first day of the month prior to publication.

FORTHCOMING SOCIETY MEETINGS

Friday 17 June 1988, Burlington House
(J.H. Coates, R.A. Rankin)

Friday 21 October 1988, Burlington House
Friday 18 November 1988, Royal Society

THE INTERNATIONAL CONGRESS OF MATHEMATICIANS 1990 PRELIMINARY ANNOUNCEMENT

The next International Congress of Mathematicians will be held in Kyoto, Japan, at the Kyoto International Conference Hall from August 21 to August 29, 1990, under the auspices of the International Mathematical Union.

The host institution is the Mathematical Society of Japan with the cosponsorship of the Japan Society of Mathematical Education, the History of Science Society of Japan, the Institute of Actuaries of Japan, the Japan Society for Software Science and Technology, the Japan Statistical Society and the Operations Research Society of Japan. The sponsorship of the Science Council of Japan is being requested.

The Committee of ICM-90 has been formed to organize the Congress. The President of the Committee is Kunihiko Kodaira; the Vice Presidents are Kiyosi Ito and Heisuke Hironaka; the Chairman is Hikosaburo Komatsu, and the Executive Secretary is Huzihiro Araki.

For further information, write to the ICM-90 Secretariat, Research Institute for Mathematical Sciences, Kyoto University, Kitashirakawa, Sakyo-ku, Kyoto 606, Japan. The First Announcement containing further details will be distributed in July 1989.

1988 WOLF FOUNDATION PRIZES

The Wolf Foundation has announced the 1988 prize winners which includes mathematics and physics. The prize in mathematics will be shared by Friedrich Hirzebruch, of the Max Planck Institute for Mathematics and the University of Bonn in West Germany and Lars Hormander, of the University of Lund in Sweden. The prize in physics will be shared by Roger Penrose of the University of Ox-

ford and Stephen W. Hawking of the University of Cambridge.

The Wolf Foundation was established in 1976 to promote science and art for the benefit of mankind. The international prize committee annually awards six international prizes in physics, chemistry, medicine, mathematics, agriculture and the arts.

DONALD P. DALZELL

Donald P. Dalzell who was elected a member of the London Mathematical Society on 10th Dec-

ember 1925 died at the age of 89 on 25th March 1988.

GRAHAM L. TINDLE

Graham L. Tindle who was elected a member of the London Mathematical Society on 8th May

1981 died on 24th March 1988.

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HOMOTOPY AT CORTONA PROFESSOR IOAN JAMES'S 60TH BIRTHDAY

The fifth Oxford Topology Symposium will take the form of a conference on Homotopy Theory held at the Palazzone, Cortona, from 23 June to 29 June 1988 by kind permission of the Scuola Normale Superiore of Pisa. This conference will honour the 60th birthday of Professor I.M. James F.R.S., a past Treasurer and President of the Lon-

don Mathematical Society. Attendance is by invitation. The conference is receiving financial support from the London Mathematical Society, and also from Pergamon Press and the Cambridge University Press. Enquiries should be addressed to W.A. Sutherland, New College, Oxford OX1 3BN.

MANCHESTER ASYMPTOTICS CONFERENCE

The Manchester Asymptotics Conference will be held from 20th to 21st June 1988 at Hulme Hall, University of Manchester. The aim of the conference is to bring together mathematicians and physical scientists who work on problems involving asymptotic techniques, in order to stimulate the cross disciplinary transfer of knowledge and expertise between researchers in different fields.

The following scientists have agreed to contrib-

ute talks: W.G.C. Boyd (Bristol); F. Ursell (Manchester); J.M. Arnold (Glasgow); J.N.L. Connor (Manchester); D.S.F. Crothers (Belfast); R.B. Paris (Dundee) and C.H. Chapman (Cambridge).

For further information contact Dr J.N.L. Connor, Department of Chemistry, University of Manchester, Manchester M13 9PL. Telephone 061-275 4693 or 4686 or electronic mail YMUJMC@UK.AC.UMIST (Janet).

LONDON MATHEMATICAL SOCIETY

J.H.Coates (Cambridge)
ARITHMETIC OF ELLIPTIC CURVES

R.A. Rankin (Glasgow)
(1987 Senior Whitehead Prize winner)
THE ADJOINT HECKE OPERATOR

FRIDAY 17 JUNE 1988 at 3.30 p.m.

**The meeting is at the Geological Society,
Burlington House,
Piccadilly,
London W1**

All interested are very welcome
Tea will be served at 4.30 p.m.

**UNIVERSITY OF EAST ANGLIA
NORWICH**

LECTURESHIP IN PURE MATHEMATICS

Applications are invited for the post of lecturer in Pure Mathematics in the School of Mathematics, tenable from 1 September 1988 or as soon as possible thereafter. The initial salary will be at an appropriate point on the lecturer A scale, £9,260 to £14,500 p.a. plus USS benefits.

Applications (three copies), which should include a full curriculum vitae, including the exact date of birth, together with the names and addresses of three persons to whom reference may be made, should be lodged with the Establishment Officer, University of East Anglia, Norwich, NR4 7TJ (telephone 0603-56161 ext. 2123) from whom further particulars may be obtained, not later than 15 June 1988. No forms of application are issued.

**UNIVERSITY OF LEEDS
DEPARTMENT OF PURE MATHEMATICS
LECTURER (NEW BLOOD)**

Applications are invited for the above post, available from 1 October, 1988. Candidates should have research interests in Functional Analysis, and some preference will be given to those with interests in Banach Algebras or Complex Analysis. The appointment will be on the scale for Grade A (£9,260-£14,500) or Grade B (£15,105-£19,310) according to qualifications and experience. The closing date for applications is 30 June, 1988.

The upper age limit for "New Blood" posts is 35, although marginal exceptions may be made. Persons already holding a permanent appointment at a United Kingdom university are not eligible.

Application forms and further particulars may be obtained from, and applications sent to, The Registrar, University of Leeds, Leeds LS2 9JT, quoting reference number 51/21. Informal enquiries may be made to Professor H.G. Dales, telephone 0532-335243.

LONDON MATHEMATICAL SOCIETY

Popular Lectures

Professor D.G. Kendall
**HOW SHOULD A MATHEMATICIAN THINK ABOUT
SHAPE?**

Professor M.V. Berry
CHAOLGY

Friday 1 July 1988
Great Hall, Sherfield Building,
Imperial College, Exhibition Road, London SW7
at 7.30 pm

Monday 11 July 1988
Eleanor Rathbone Theatre,
University of Liverpool, Liverpool
at 2.30 pm and 7.30 pm

ALL INTERESTED ARE WELCOME

The lectures are intended to be suitable for a general audience and no specific mathematical knowledge will be assumed. Although the talks are not primarily intended for professional mathematicians, everyone is welcome and some members may wish to apply for tickets for friends and relatives.

Admission to the lectures will be by ticket only. Applications for the lectures on Friday 1 July at Imperial College, London should be sent to Miss Susan Oakes, London Mathematical Society, Burlington House, Piccadilly, London W1V 0NL. Applications for the lectures on Monday 11 July at Liverpool University should be sent to Dr I.R. Porteous, Dept of Pure Mathematics, Liverpool University, PO Box 147, Liverpool L69 3BX (indicate which time). A stamped-addressed envelope would be appreciated. There is no charge for admission.

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LONDON MATHEMATICAL SOCIETY

LMS SPITALFIELDS LECTURES

The 4th Spitalfields Lectures will be given on Wednesday 22nd June, 1988 at the Nonlinear Systems Laboratory, University of Warwick. These are colloquium style lectures, intended to be accessible to a general mathematical audience, delivered by members of the 1987/88 Warwick Symposium.

The programme is:

1030	Coffee
1100	A. Katok (Cal. Tech.) (<i>Title to be announced</i>).
1200	Lunch
1400	M. Misiurewicz (Warsaw) <i>Order and chaos in one dimension</i> .
1500	S. Newhouse (N. Carolina) <i>Entropy and Volume</i> .
1600	Tea
1700	J. Franks (Northwestern) (<i>Title to be announced</i>).

All the lectures will be held in Lecture Theatre ELT1 of the Mathematics Institute, University of Warwick. A buffet lunch is available at a cost of £6.00. Bookings and payment must be made by 15th June to Ms Elaine Shiels, Mathematics Research Centre, University of Warwick, Coventry CV4 7AL. Cheques should be made payable to University of Warwick.

Further enquiries may be made to Ms Elaine Shiels, Mathematics Research Centre, University of Warwick, Coventry CV4 7AL, telephone 0203-523053.

LECTURESHIP IN MATHEMATICS

The Council of Victoria University of Wellington invites applications for a lectureship in Mathematics available from 1 October 1988.

Expertise in combinatorics or algebra is particularly sought, but applications in all areas of pure mathematics will be treated on merit. The appointee will be expected to engage in research, and teach at all levels.

Enquiries concerning academic aspects of this position may be made to Professor R. Goldblatt, Chairperson, Department of Mathematics, telephone (04) 721.000 extension 8320, e-mail Internet: rob @ rs1.vuw.ac.nz.

The salary scale for Lecturers is \$NZ32,000-\$NZ38,500 per annum.

Conditions of appointment and method of application are available from the Administrative Assistant (Appointments), Victoria University of Wellington, P.O. Box 600, Wellington, New Zealand, with whom applications close on 31 July 1988.

MANY-SORTED LOGIC AND ITS APPLICATIONS IN COMPUTER SCIENCE

The interdisciplinary Centre for Theoretical Computer Science will be holding a meeting at the University of Leeds from 12th to 14th September 1988, to provide a forum for computer scientists and mathematicians to discuss problems in many-sorted logic and its applications in computer science. The meeting will be jointly sponsored by the British Logic Colloquium, the London Mathematical Society and the Science and Engineering Research Council under the newly formed Logic for Information Technology Initiative.

Many-sorted logic is logic for reasoning about more than one type of object. Much of mathematics and computer science is inherently many-sorted; vectors and scalars, elements and functions, data and programs, data and time. Furthermore many higher order logics, infinitary logics and modal temporal logics can be translated into many-sorted logic. Thus it provides a unified

framework for these logics. Invited speakers will lecture on areas such as many-sorted logic and its connections with higher order and infinitary logic, equational many-sorted logic, many-sorted logics for program specification and verification, specification of abstract data types, logic programming and automated theorem proving.

At present the following have agreed to speak at the meeting; H. Andreka (Budapest), J.A. Bergstra (Amsterdam), A.G. Cohn (Warwick), I. Guessarian (Paris), M. Manzano (Barcelona), K. Meinke (Leeds), I. Németi (Budapest), J.V. Tucker (Leeds), E.G. Wagner (IBM Yorktown Heights).

To receive further information concerning the programme and accommodation please contact K. Meinke, Department of Computer Studies, University of Leeds, Leeds, LS2 9JT. (Telephone 0532 431751, JANET karl @ uk. ac. leeds. dcs).

EUROPEAN MATHEMATICAL NEWSLETTER

The European Mathematical Newsletter gives an extensive list of meetings and conferences. The Mathematisches Forschungsinstitut Oberwolfach who produce and distribute the Newsletter are requesting members to send them information about meetings or conferences for inclusion in the Newsletter. Announcements to be published in the next

issue should be sent not later than 15th September 1988 to: Mathematisches Forschungsinstitut Oberwolfach, Geschäftsstelle, Alberstr.24, D-7800 Freiburg, West Germany. If you or your department wish to receive the Newsletter write to Kerstin Weigel at the above address.

PROFESSOR R.L. GOODSTEIN

With reference to Professor Goodstein's obituary in the March 1988 issue of the Society's Bulletin, members may be interested to note that his former pupil H.P. Williams is currently Professor of Operational Research (and Dean of the Faculty of Math-

ematical Studies) at Southampton University. He was formerly Professor of Management Science at Edinburgh University.

D.A. Brannan

We wish to purchase runs and odd Nos of: Sphinx, Revue Mensuelle des Questions Recreatives, Bruxelles, 1931-39, Journal of Recreational Mathematics, 1968-. Recreational Mathematics Magazine, 1961-64, Sphinx-Oedipe, Nancy, 1906-1932. Mathematical Pie, 1950 -. All books published in the series "Librairie du Sphinx" Bruxelles, Rouse-Ball, W.W. "Mathematical Recreations and Essays" all editions from the first (1891) to 11th (1939). Also mathematical books of all kinds from very elementary to advanced texts. Also biographies of mathematicians and physicists.

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ON THE FUNDING OF MATHEMATICS

Report by the President

(presented to the British Mathematical Colloquium, Exeter, April 1988)

Mathematics in British universities is funded primarily by the UGC (University Grants Committee) and the SERC (Science and Engineering Research Council). Compared with other subjects, however, it is poorly treated by the UGC, as can be seen from tables 1 and 2.

Table 1. UGC Staff unit of resource.

	1983/4		1984/5		1985/6	
	£	%	£	%	£	%
Mathematics	1600	-18	1700	-16	1860	-15
Computer science	1440	-26	1570	-23	1770	-19
Physics	2380	+22	2640	+30	2890	+33
Arts	1700	-13	1750	-14	1880	-14
University average	1950		2030		2180	

By 'staff' unit of resource in Table 1 we mean the total sum actually spent by universities on academic salaries divided by the total full time equivalent student load (with graduates weighted the same as undergraduates). The percentage difference from the average is also shown. The figures only refer to salaries of academic staff and do *not* include costs of non-academic salaries, technicians, laboratories, equipment, consumables, etc.

The figures are calculated from the UGC University Statistics, volume 3, Finance, for the last three years that have been published to date. The year 1983/4 is included because those were the latest figures that were available when the UGC did its last major resource allocation exercise in 1985/6, and on which, for political reasons, the distribution of funding between the different cost centres for the subsequent four years was based. Consequently the UGC funding of mathematics has been frozen at 5% below that of arts until 1989/90. Computer science appears to be treated the worst in Table 1, but in 1986/7 the UGC increased their unit of resource and informed the universities, and so the universities have responded by treating computer science more generously since then, as can be seen from Table 2. Meanwhile the most striking figure in Table 1 is the difference between mathematics and physics. Experimentalists argue that laboratory work requires extra academic staff, but it is doubtful whether such argument can justify as much as a 50% margin of physics over mathematics purely for academic staff (not counting technicians, etc.). Indeed the converse can be argued, that the teaching of mathematics is *more* labour intensive than the teaching of physics, because mathematics requires more one-to-one contact if students are to understand it properly in depth. Furthermore, since computing has now become such an integral part of both mathematics teaching and mathematics research, it will be necessary to fund mathematics in future as an experimental subject.

The most dramatic manifestation of the unit of resource is the staff-student ratio, as shown in Table 2.

Table 2. Staff-Student Ratios.

	UGC Statistics	CHUDOMS Questionnaire 1987	
	1985/6	1986/7	Plans 1989/90
Mathematics	11.7	12.0	12.9
Computer science	12.6	10.8	11.5
Physics	8.1	8.6	10.4
Arts	11.1	10.4	11.5
University average	10.4	10.4	11.5

The first column is calculated from the same published UGC Statistics as Table 1. The other two columns are derived from the answers to the Questionnaire last summer of CHUDOMS (Committee of Heads of University Departments of Mathematics). The general trend of government cuts is shown by the planned average increase of 1.1 by 1989/90. There is, however, no justification that the mathematics staff-student ratio should be planned by universities to be 1.4 worse than the university average, and 1.4 worse than arts. When pressed the universities respond by saying that they are merely following the UGC lead, and when the UGC is pressed it responds by saying that it is merely following the universities' lead. If mathematics is to be funded fairly then ***all mathematicians must participate in a sustained campaign at all levels to obtain an increase in the UGC mathematics unit of resource sufficient to improve the mathematics staff-student ratio to the university average.*** Such improvement is possible, because it has been achieved by computer science as can be seen from Table 2.

The importance of an improved staff-student ratio is threefold: it allows proper teaching, proper time for research, and most important of all proper recruitment of young postdoctorals for university posts. Table 3 shows the loss of posts calculated as a simple consequence of the deteriorating staff-student ratio shown in Table 2, assuming that the total number of students is kept fixed.

Table 3. Mathematics Posts in Universities.

	UGC Statistics	Calculation from SS Ratios	
	1985/6	1986/7	1989/90
Number of posts	1604	1564	1455
LOSS of posts		40	109

Indeed the CHUDOMS Questionnaire confirms that during the coming three years 1987/8-1989/90 there will be on the one hand an estimated 144 retirements, and on the other hand an estimated total of 49 posts advertised (including both replacements and new posts), leading to a net loss of 95 posts. This loss will be a direct consequence of individual universities planning to increase their mathematics staff-student ratios because of the perceived poor UGC unit of resource for mathematics. The depth of the impending crisis is focused in Table 4.

Table 4. Short term crisis.

Steady State	Mathematics Posts in universities Years in post Therefore replenishment per year	~1600 ~35 ~45
Short term crisis during next three years 1987/88-1989/90	Loss of posts per year	~32
	Posts available per year	~16

Nor, because of the age-bulge, can we expect the situation to right itself after the next three years. Table 5 shows the age distribution of university mathematics staff in 1980/1, which is of course now out of date due to early retirements (and indeed it would be useful if this information were updated). But it is still probably true that about 60% of staff at present lie in the age band 42-56, and would normally be retiring between 1999 and 2013.

Table 5. Age distribution of mathematics staff in 1980/1.

Age in 1980/81	% staff in 1980/1	Age now 1987/8	Retirement date at age 67
<30	6.8	<37	>2018
30-34	15.8	37-41	2014-2018
35-39	25.3	42-46	2009-2013
40-44	20.3	47-51	2004-2008
45-49	13.0	52-56	1999-2003
50-54	8.9	57-61	1994-1998
55-59	6.1	62-66	1989-1993
60-64	3.3	≥67	1988
≥65	0.5		
	100.0		

The conclusion from Table 5 is that the shortage of jobs is likely to continue until the turn of the century, after which the rate of replenishment will increase, and may have to double during the decade 2004-2013.

Any catastrophic drop in the number of appointments, such as we are facing in the next three years, followed by a sharp increase again in the future, is obviously harmful to the system. And the plight of mathematics is far worse than that of the other sciences, because the cushioning effect of the Research Councils is much less, as we explain below. Unless action is taken soon to improve the situation, many more of our best young post-doctorals will be forced to leave the subject or join the brain-drain. The country can ill afford to lose such talent and investment, especially in view of demographic trends and the age-bulge anomaly; it will not only harm mathematical research, but the relentless knock-on effect in the first decade of the next century will cause

crippling shortages of mathematicians for school teaching, statistics, engineering, core science, computing, operational research, accountancy, commerce and industry, even to the extent of undermining the very industrial base of the country.

The simplest solution would be for the UGC to increase the mathematics unit of resource (preferably by means of a relatively small amount of extra funding from the DES) sufficient to improve the mathematics staff-student ratio to the university average. It would then be up to the universities to use this increased resource for the appointment of young postdoctorals (rather than retarding early retirements). At the meeting of HUDOMS on 22nd January, however, the chairman of the UGC, Sir Peter Swinnerton-Dyer, confirmed that it would be difficult for the UGC to act without help from outside. Such help could be specific extra funding from the DES. But equally valuable would be support from the scientific community and the Research Councils on the one hand, and commerce and industry on the other, because both those communities are well aware that they cannot flourish without a strong and healthy mathematical base.

UGC Research Assessment.

Turning to the UGC's differential allocation of funds between different departments, members of the LMS will be interested to learn that the UGC is planning the next allocation exercise in 1989. It has invited comments from the learned societies, including the LMS, and so if members wish to comment on the procedure now is the time. Members can write either directly to the UGC or to anyone on the Council of the LMS, which will be responding to the UGC in due course.

In the 1986/7 UGC allocation to mathematics approximately 2% of the funds were given to universities as 40% overheads to the Research Council grants earned by their mathematics departments. Of the other 98%, 80% was allocated purely on the basis of student numbers, and 20% depended on both student numbers and research assessment.

For the research assessments each department was given a score between 0 and 4 for each of pure mathematics, applied mathematics and statistics (see LMS Newsletter, October 1986), and the scores were then weighted by staff numbers. The approximate implication of the scores on the percentage unit of resource and the staff-student ratio is indicated in Table 6.

Table 6. UGC 1985/6 Research Assessment in Mathematics.

Score	% Unit of Resource	1986/7 Staff-Student ratio
4	120	10.2
3	111	11.0
2	102	12.0
1	93	13.2
0	83	14.7

Of course the universities are not bound by these figures, because the allocations to the different cost centres are hidden within each University's single cheque, and so each department has to extract resources from its own university as best it can. In fact the standard deviation in the unit of resource spent by different universities on mathematics in 1985/6 was 22%, whereas the standard deviation in the UGC allocations in 1986/7 was only 8%, so the UGC was much closer to the norm than the universities themselves. Indeed it is interesting to note that the standard deviation of 8% is only half the size of the 15% by which the whole subject is being underfunded, as indicated in Tables 1 and 2.

The research assessments, however, have been used not only by the UGC for calculating funding to the universities, but also more seriously by the universities themselves in their attitudes towards their own mathematics departments when allocating resources. Here it can be seen in retrospect that the UGC Mathematics Subcommittee may have committed a serious error by scoring fewer departments above 2 than below 2, because a score of 2 has been misinterpreted as 'average', as illustrated by Table 7.

Table 7. UGC 1985/6 Research Assessments in Mathematics

Score	Misinterpretation	Number of departments		
		Pure	Applied	Statistics
>2	Above average	13	11	8
2	Average	19	17	18
<2	Below average	21	25	27

The implicit danger in grading at all is that the harm done to some smaller departments (in library cuts for instance) may be far greater than the benefits obtained by larger departments. Admittedly concentration of expensive equipment may be necessary in some of the experimental sciences, and if certain science departments are going to be starred as outstanding then it may be judicious to star an equivalent number of arts and mathematics departments in order to prevent unfair treatment between subjects by universities in general. However, I believe that the protection of research mathematicians in small departments should be one of the main priorities of the UGC Mathematics Subcommittee in its 1989 exercise.

SERC Funding.

In contrast to the cavalier treatment that mathematics has been receiving from the UGC, it has recently benefited from a steady increase in research grants from SERC, as illustrated by Table 8. The figures have been converted to 1987 prices to allow for inflation, and so represent the real increase.

Table 8. SERC Mathematics Research Grants.

	£ Millions at 1987 prices	
	Demand	Grants awarded
1979/80	2.6	1.3
1980/1	3.0	1.1
1981/2	3.8	1.5
1982/3	6.7	1.6
1983/4	4.1	1.9
1984/5	5.8	2.4
1985/6	8.5	3.0
1986/7	7.2	2.6
1987/8		2.7

The grants awarded during the last three years include the extra funding earmarked for the Nonlinear Systems initiative, of the order of £0.7 μ per year, and during the last two years include approximately the same amount earmarked for the Complex Stochastic Systems initiative.

The lesson to be learnt from Table 8 is that awards are roughly proportional to demand. The price of each successful applicant is the disappointment of some other applicant. This is a fact of life that must be appreciated in the competition for funds with the other sciences in SERC, otherwise if demand dries up then so will the grants awarded. Writing grant applications is time consuming, and failure can be disappointing especially if the application has been graded α , but is essential to persist.

It is interesting to note that the SERC Mathematics and Biology Committees are twice as stringent as physics and chemistry in grading applications as α -quality, when this is considered as a percentage of the academic community that they serve, as illustrated by Table 9.

Table 9. SERC Science Board 1984/5.

	Academic community	Number of grant applications	As % of community		
			Applications	Graded α	Awarded
Biology	2200	630	29	13	9
Chemistry	1600	653	41	23	14
Mathematics	1700	265	16	12	10
Physics	1100	288	26	20	15

Therefore mathematicians with unfunded α -graded applications should not feel discouraged, because they are in fact being rated by their peers higher than many of physicists and chemists who are being funded are rated in *their* communities, and so these mathematicians should definitely try again. On the other hand biologist and chemists complain that only a third of their applications are being funded, whereas two-thirds of mathematics and physics applications are being funded; the reason for the high proportion in the case of mathematics is that the awards include the large number of small grants for overseas Visiting Fellows.

At present about 60% of the funds awarded to mathematics through research grants are in fact being spent on postdoctoral research assistants. Indeed, applying for and obtaining funds for a research assistant is one of the most effective ways that an individual can contribute towards the most serious problem facing the community, namely the maintenance of good young postdoctorals within the academic system until the age-bulge begins to recede. In spite of this, however, and in spite of the increased support for mathematics in recent years, the actual numbers of SERC research assistants in mathematics is very small compared with those in other subjects. For example in 1983 there were approximately 6000 research staff being supported on SERC grants, of whom approximately 3000 were postdoctoral research assistants, and of the latter only 1½% were in mathematics. Of course the main reason for this is that the experimental sciences depend much more upon research assistants to do the actual experiments. But the point I want to make here is that this large reservoir of posts provided by the Research Councils in physics, chemistry, biology and engineering, cushions those subjects against the current shortage of university posts, and will enable them the more easily to keep their best young postdoctorals within the academic system until the turn of the century, when posts will begin to open up. By contrast mathematics is much more vulnerable: the coupling of the poor UGC unit of resource with the smallness of the Research Council cushion spells disaster for the mathematical community, and the loss of several generations of our best talent.

There is a glimmer of hope on the horizon, however, because SERC is aware of the problems and is already moving towards greater flexibility. It is sympathetic to the plight of mathematics, and is considering a variety of options that might help. For example

one suggestion made by the LMS last year to the ABRC (Advisory Board to the Research Councils) was the creation by SERC of a substantial number of 5-year Intermitable Fellowships earmarked for mathematics. Here the word 'intermitable' means that the Fellow could hold the Fellowship for 10 or more years, and would be allowed to draw salary for 5 of those years. This would allow a Fellow to intermit, for example, by taking temporary jobs in major centres overseas, or teaching in a developing country, or having children, with the guarantee in each case of being able to return to mathematics within the UK. Besides being relatively inexpensive, the great advantage of such Fellowships is that the Fellows would then be available when the country will be urgently needing them at the beginning of the next century in order to fill university posts as the age-bulge begins to recede. Such Fellowships may not necessarily be suitable for the experimental sciences because of the difficulties associated with moving between laboratories. Mathematicians on the other hand can carry their research with them, and so SERC should design such Fellowships specifically for the mathematical community.

E.C. Zeeman

MIS NEWSLETTER

The RS/IMA Mathematical Instruction Subcommittee (MIS) has been publishing a series of Newsletters to provide a channel of information to everyone interested in UK participation and contributions at ICME - 6. The next MIS newsletter will be the last one before ICME - 6. It will contain last minute details about the Congress and how to

get there. For further MIS information or to join the UK mailing list please contact: Jill A. Nelson, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG (telephone 01-839 5561, ext. 266). Back issues of the newsletters and copies of the Second Announcement of ICME - 6 are also available.

GUEST RESEARCH FELLOWSHIPS

In May 1979 the Royal Society established a scheme for Guest Research Fellows to assist outstanding leaders in research in the UK wishing to invite, as guests from overseas, scientists uniquely able to bring an expertise, unavailable in the UK, to complement that of the host's group.

The first awards were offered in 1980 and, to date, more than 140 have been made to recipients in departments of science, including mathematics. The grant awarded normally includes a mainten-

ance allowance, decided in accordance with the guest's seniority, but no stipend; the cost of international travel; and provision for some other expenses, such as travel in the UK and special research expenses.

The next closing date will be 31 October for which forms are currently available from Mr L. Mole, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG.

FOR SALE

Four complete sections from William Laybourn's 'Arithmetical Recreations' (1695): Numerical, Geometrical, Mechanical and Statistical Recreations (pp.1-56, 1-68 plus 2 folding plates, 1-31 and 1-24) together with Richard Sault's 'A New Treatise of Algebra' (pp.1-48, pp.49-52 supplied as photocopies). £48.00 o.n.o. Apply to Peter Gill, 21 Selwyn House, Selwyn Road, Eastbourne, East Sussex BN21 2LF. Telephone 0323 646853.

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COLLECTED WORKS OF NIELS HENRIK ABEL (Oeuvres complete de Niels Henrik Abel)

The Norwegian Mathematical Society now offers for sale a limited number of copies of the original 1881 edition (in French) of Abel's Collected Works. These copies have been stored for over 100 years in the State Archives in Oslo and are of considerable historical and mathematical interest.

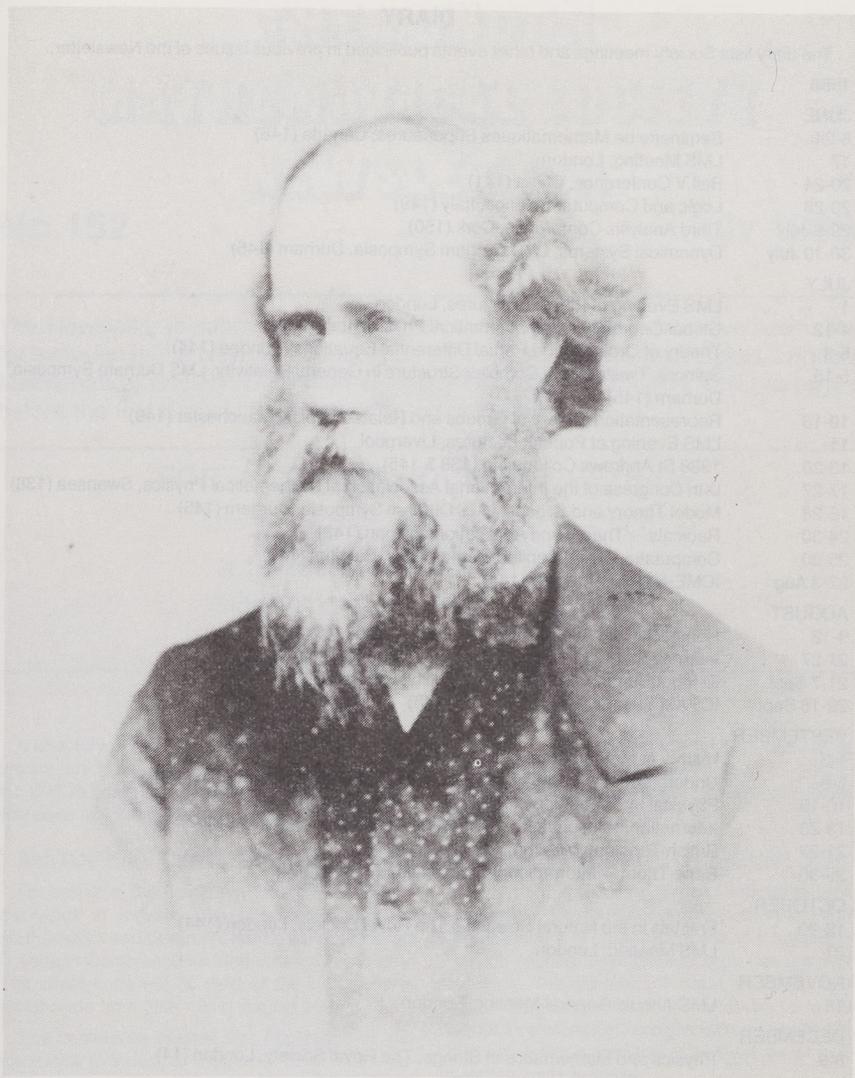
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Sylow and Lie end the preface with these words: "Abel a eu de grands successeurs; mais pour qui veut continuer dans la voie frayée par lui, il sera toujours profitable de remonter à la source même: les immortelles Oeuvres d'Abel".

("Abel has had great successors, but for those who want to continue on the road which he has paved, it will always be profitable to go back to the sources: the immortal works of Abel").

To order Abel's Collected Works, send a cheque or an international money order for the amount of NKR 1000,- (Norwegian Crowns) which includes postage and handling to:

The Norwegian Mathematical Society,
P.O. Box 1053, Blindern,
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Henry John Stephen Smith (1826-1883) graduated with a double first from Oxford just after the University's all-consuming religious controversies had died down, and succeeded Baden Powell as Savilian Professor in 1860. A highly conscientious administrator, and a liberal by temperament, he seems to have charmed those who knew him. His mathematical work was preeminently in the theory of numbers and its connections with elliptic functions, which he understood profoundly. His six Reports on it are still worth reading. In 1868 he solved the problem of the representation of a number as a sum of five squares. Unaware of this, the Paris Academy of Sciences offered the topic in a prize competition in 1882; he was awarded the prize posthumously. He was the Society's sixth President, from 1874-1876.

DIARY

The diary lists Society meetings and other events publicised in previous issues of the Newsletter.

1988

JUNE

- 6-24 Seminaire de Mathematiques Superieures, Canada (146)
17 LMS Meeting, London
20-24 Bail V Conference, China (141)
20-28 Logic and Computer Science, Italy (149)
29-2 July Third Analysis Conference, Cork (150)
30-10 July Dynamical Systems, LMS Durham Symposia, Durham (145)

JULY

- 1 LMS Evening of Popular Lectures, London
4-12 Global Geometry and Mathematical Physics, Italy (149)
5-8 Theory of Ordinary and Partial Differential Equations, Dundee (144)
5-15 Spinors, Twistors and Complex Structure in General Relativity, LMS Durham Symposia, Durham (145)
10-16 Representation Theory of Groups and Related Topics, Manchester (149)
11 LMS Evening of Popular Lectures, Liverpool
13-20 1988 St Andrews Colloquium (138 & 145)
17-27 IXth Congress of the International Association of Mathematical Physics, Swansea (138)
18-28 Model Theory and Groups, LMS Durham Symposia, Durham (145)
24-30 Radicals – Theory and Applications, Japan (143)
25-30 Computational and Applied Mathematics, Belgium (142)
27-3 Aug ICME-6 1988, Hungary (144)

AUGUST

- 9-12 Henstock Real Analysis Symposium, Ireland (148)
21-27 International Conference on General Algebra, Austria (145)
21-7 Sept St Flour Summer School in Probability, France (150)
22-16 Sept ICPAM Summer School, France (148)

SEPTEMBER

- 1-3 History of Mathematics, Leicester (150)
5-8 Undergraduate Mathematics Teaching Conference, Nottingham (150)
16-19 Physical Interpretation of Relativity Theory, London (143)
19-23 International Colloquium on Differential Geometry, Spain (146)
21-22 British Topology Meeting, Manchester (149)
25-30 René Thom – International Symposium, France (147)

OCTOBER

- 19-20 Fractals in the Natural Sciences, The Royal Society, London (144)
21 LMS Meeting, London

NOVEMBER

- 18 LMS Annual General Meeting, London

DECEMBER

- 8-9 Physics and Mathematics of Strings, The Royal Society, London (14)

1989

JUNE

- 14-16 Nonlinear Control Systems Design, Italy (150)

JULY

- 3-7 British Combinatorial Conference, East Anglia (146)

AUGUST

- 13-19 Differential Equations and Applications, Bulgaria (148)

For further information, refer to the figure in brackets, which is a cross reference to the LMS Newsletter Number.