
THE BRITISH SOCIETY OF RHEOLOGY



BSR BULLETIN
incorporating the
11th Newsletter of the European Society of Rheology
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CONTENTS

Officers & Members of BSR Council 2002/03	ii
Editorial	94
BSR News	
New Members of Council	95
2002 Annual Award – Professor Malcolm Mackley	98
Commentary on the 307 th Council Meeting	101
Commentary on Lecture and Annual Award	105
Obituary John 'Jack' Deer	107
BSR Ties and Pins Offer	109
Aims of the Society	109
Rheology Reviews 2003	110
Conference Reports 6 th European Congress on Rheology	111
11th Newsletter of the European Society of Rheology	
News from Groupe Francais de Rheologie	113
Conference Announcements	
1 st Annual European Rheology Conference 2003	117
XIV th International Congress on Rheology	119
ASME meetings	121
Industry News	123
Conference Diary	126
Course Diary	128

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EDITORIAL

First of all, I should apologise for the late arrival of this Bulletin. I recently became a father, so I am now gaining practical experience in various complex rheological fluids.

The BSR now has a new president, Professor Geoff Maitland from Schlumberger Cambridge Research and new secretary Professor Tim Phillips from University of Wales, Aberystwyth. Both Geoff and Tim provide short biographical introductions in this issue.

The 2002 Annual Award was presented to Professor Malcolm Mackley at a joint meeting of the BSR and the WINNFM in December. In this issue we print the citation for the award given by BSR President Geoff Maitland.

This year sees two significant developments in BSR activities – the launch of Rheology Reviews and the launch of the new BSR website. Rheology Reviews will be reviewed in the next issue.

Oliver Harlen

SUBMISSIONS TO THE BULLETIN

We are always looking for articles for inclusion in the Bulletin, preferably on a rheological topic. I am also happy to include conference announcements and any news items of likely to be of interest to BSR members. Electronic copy is much preferred as it saves retyping, most packages supported (Word, TeX, LaTeX, ASCII, RTF) but always provide a contact name, address, eMail, or telephone number in case of problems.

The copy date for the next Bulletin is 15th June, but late copy can sometimes be accommodated. However the facilities of the BSR and ESR web sites may also be appropriate. Please contact the Editor for details.

COVER ILLUSTRATION

We are always on the look out for colour or black & white pictures (preferably of a rheological nature!) for the front cover of the Bulletin and Rheology Abstracts. Please contact Oliver Harlen (Bulletin Editor), Gary Tucker (Abstracts Editor) or Nick Hudson (Publications Manager). Suggestions are always welcome!

BSR NEWS

New Members of Council

Professor Geoff Maitland

BSR President 2002-2004



Research Director - Chemistry and Biology
Schlumberger Cambridge Research
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Geoff Maitland, is a chemist with a background in both academic and industrial rheology research. The common thread running through his interests over the years has been the links between interactions at the molecular/colloidal level and the bulk properties of materials, particularly their flow behaviour. He read chemistry at Oxford where he carried out research for a D Phil on intermolecular forces and gas transport properties with Dr (now Professor Sir) Brian Smith. After a period as an ICI Research Fellow in the Physical Chemistry Department of the School of Chemistry at Bristol University, he moved in 1974 to a lectureship in the Department of Chemical Engineering at Imperial College, London – and became a member of the British Society of Rheology. There he continued his research on intermolecular forces and the thermophysical properties of simple fluids and extended this to the dynamics and rheology of polymer systems. From 1979 to 1981, he spent two years seconded to ICI Ltd, Plastics Division, as a visiting scientist at the Welwyn R&D Centre to develop his growing interest in

polymerisation reactor engineering. Modelling and experimental studies of the effects of diffusive and convective mass transport on the molecular and physical nature of the products in polymerisation processes was a major research interest for the next five years.

In 1986, Geoff moved to the new Schlumberger Cambridge Research centre as their first Senior Research Scientist to set up and head an activity in the rheology of colloidal-polymeric oilfield fluids. Since then his interests have centred on the physical properties of complex fluids and soft solids, their relation to colloidal interactions and structure, rock-fluid interactions and chemical characterisation of multicomponent fluids. From 1988-95 he was head of the Chemistry Department in Cambridge, and then spent three years at the Schlumberger Dowell Product Center in Clamart, Paris as Chemistry Metier Manager. In 1998 he returned to Cambridge and is currently Research Director for Chemistry and Biology.

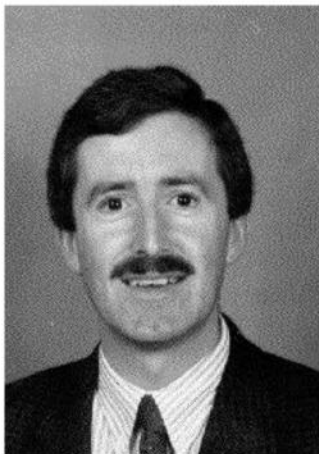
Geoff is a Visiting Professor in the School of Chemistry at Bristol, in Chemical Engineering at Imperial College and in the Materials Research Institute at Sheffield Hallam University. He sits on a number of university, EPSRC and DTI committees and spends much of his time stimulating and engaging in oilfield-related research in chemistry, process engineering, fluids engineering and the biosciences with universities and chemical companies. Of his role as President, he writes:

‘Rheology has been at the centre of my research and product development interests for almost 30 years. It is a great honour to be elected to serve the Society as President and I look forward to working with Council over the next couple of years to maintain and develop the service the Society offers to its members. In particular I hope to focus on three main areas: enhancing our responsiveness to members’ needs and the efficiency of access to information and publications through electronic access; establishing a clear role for the Society’s meetings in this era of increasing frequency of rheology-related conferences across the world; and exploring ways to encourage young researchers in rheology and the continued strength of the subject in the UK. I am always pleased to receive comments and suggestions from members on how the Society is operating and initiatives you would like to see implemented.’

Professor Tim N Phillips

Honorary Secretary 2002 - 2004

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Tim Phillips graduated with a BA in Mathematics from the University of Oxford in 1979. He remained at Oxford for his graduate studies obtaining an MSc in 1980 and a DPhil in numerical analysis in 1983. He spent two years as a Research Fellow at the Institute for Computer Applications in Science and Engineering at NASA Langley Research Center in Virginia before taking up a Lectureship at the University of Wales Aberystwyth. He is currently Professor of Mathematics at Aberystwyth. He has held Visiting Professorships at the University of Delaware and the Ecole Polytechnique Fédérale de Lausanne. His research interests include numerical analysis, spectral methods, computational fluid mechanics and rheology.

2002 Annual Award of the BSR Professor Malcolm Mackley

The 2002 annual award of the British Society of Rheology was presented to Professor Malcolm Mackley of the Department of Chemical Engineering, University of Cambridge.

Malcolm Mackley's research career in rheology has covered more than 30 years. Following bachelor's and master's degrees in Physics and Physics of Materials, he worked for 6 years with Felix Frank and Andrew Keller at Bristol University studying the science of crystallisation of fibrous polymers. These are strongly influenced by the flow conditions (especially elongational flow) under which they form and the liquid crystalline properties of these polymers confer highly advantageous improvements on their mechanical properties. This work

engendered his lifelong interest in rheology, fluid mechanics and polymer science. From Bristol he moved to the Chemical Engineering Department in Cambridge and his scientific knowledge and understanding have enabled him to go on to invent scientific equipment, reactors and processes. Some of the highlights of his work are as follows:



Malcolm Mackley receiving the
2002 Annual award certificate

He has developed innovative experimental techniques for the study of extensional flow with particular relevance to polymer systems which have been adopted around the world and further developed by Gerry Fuller (Stanford) for example.

He made the first optical observations of the defects in liquid crystal polymers which are known as disclinations and collaborated with Alan Windle (Cambridge) to develop a model description. In the course of this work on liquid crystal polymers the Cambridge Shear system was developed and is now manufactured commercially by Linkam Scientific who have sold over 60 units worldwide.

He invented processes for the manufacture of high modulus polyethylene based upon minimising the degree of chain entanglement (related to liquid crystallinity again!). The preliminary model for this behaviour has been taken up and refined by Gladden (Cambridge) and Gao (Hong Kong).

Over 25 years he has studied the way molten polymers flow, building up complementary expertise in experimental and numerical methods and establishing constitutive



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equations. He was the first to successfully match experimental flow birefringence data to numerical simulation and has collaborated with Sam Edwards (Cambridge) and several Chinese workers (Beijing), as well as being part of an important European consortium project studying polymer processing.

He pioneered the subject of oscillatory flow mixing as a process operation in which the reactants pass back and forth through an oscillating baffle, and again developed a fluid mechanics model for the process. Commercial applications include chemical reactors, coagulation and flocculation, and the technology has been used by major chemical, petrochemical and water companies. Oscillatory flow mixing groups have been established by his former co-workers, Roberts (Manchester) and Ni (Heriot-Watt).

He invented the cold chocolate extrusion process, which has been adopted by Nestle as an alternative to the (rheologically less interesting) hot flow of molten chocolate. This has involved investigation and modelling of flow instabilities such as necklace formation and stick-spurt phenomena – and an appearance on Tomorrow's World. He is the co-inventor of the Multi-Pass Rheometer as a means of studying rheology under process conditions and which has been applied to polymers, inks, paints and other complex fluids. Several commercial instruments have been purchased worldwide. It is highly appropriate that he is now Professor of Process Innovation in Cambridge.

With over 120 publications and contributions to journals, conferences and books, his output matches the breadth of his scientific interests. His published papers include work on

- polymers, emulsions, inks, chocolate, equine blood and shish kebabs;
- shear flow, elongational flow, numerical modelling, optical microscopy and heat transfer;
- capillaries, ducts, slits and baffles;
- experimental apparatus.

He holds several patents and has received prizes for his work from the Royal Society of Chemistry, the Institute of Physics and the Institution of Chemical Engineers. His work has been recognised worldwide and he is in demand as a guest lecturer.

I have known Malcolm personally for 30 years through our common interests in rheology and polymer science. His approach is characterised

by dedication to his students, enthusiasm for his work and ideas, great flair for invention of devices and processes, and single-minded determination and persistence to press home, on colleagues and the world, the ideas and concepts he believes in.

So it is with great pleasure on behalf of the British Society of Rheology that I present our Annual Award for 2002 to Malcolm Mackley, Professor of Process Innovation at the University of Cambridge, in recognition of his work on the rheology and processing of polymeric liquids.

Geoffrey Maitland
President
December 2002

Commentary on 307th BSR Council Meeting Aberystwyth, 10th December 2002

Was I really the only person there who had not written a commentary for the Bulletin in living memory? I must not complain - I recall how out of touch I felt after finishing a previous period of service on Council and how I urged Council to communicate with the members of the BSR.

Let me take this chance to mention reciprocity and urge members to communicate with Council (with the appropriate officer or any member of Council) - there are a number of items below which are the starting points for discussion and where input from members would be valued.

The main item of business this time (other than the traditional formalities of an official meeting and the reports of the hard-working officers) was a presentation on developments with the BSR website, but I'll leave this to the end. There were four of our six officers present - Oliver Harlen and Geoff Brownsey had been unable to escape from other commitments to make the journey to Aberystwyth - and five of the six ordinary members of Council.

Most of us has spent a very comfortable night at the Conrah (the hotel where an excellent dinner had been held following the scientific meeting and EGM).

A few hangovers were identified - not from the dinner but from the previous Council meeting. The Society is represented on a BSI committee on testing of plastics (rheological properties) and the person asked to step into my shoes had been unable to accept that doubtful honour so we need to search again for someone willing (not necessarily a Council member). We were also reminded that we had failed to decide on honorary memberships at that meeting and this should be considered soon. Matters concerning Rheology Abstracts (taking advantage of modern technology) and membership invoices were also ongoing.

The first officer's report was also Geoff Maitland's first personal contribution to Council since his election as President. He set out his view of the priorities that Council should adopt - the first of which was communicating with the members of the BSR. (I should have seized on that to suggest that he wrote this commentary but thought of it too late and missed that chance.) We shall aim to present the BSR to present and potential members as a professional organisation, make clear the benefits that membership offers, and seek to ensure that we respond promptly to members' enquiries.

A second area for our attention is the organisation of scientific meetings and our relationship with other organisations (such as the European Society of Rheology and a number of scientific and engineering societies and institutes in the UK). There is a discussion that needs to be held on this.

The Treasurer did not cause us any panic - there is currently a significant expenditure on web site development which, in effect, is disposing of the modest surplus that the ICR in 2000 produced for the BSR. This should be a good investment both in terms of the public face of the BSR and in providing modern aids to the officers in their task of keeping the records in order.

We were given the opportunity to blush quietly over our personal failures to keep up to date with subscription payments. Yes - I proudly report that I did cancel my standing order as requested a couple of years ago - but, shamefully, I have to confess that I did nothing in its place - and I now publicly resolve to amend my ways, with a little help from the new system! Members should all have had communications about this earlier (December 2002/ January 2003).

The new Secretary had nothing to report but the absence of the Membership Secretary and Bulletin Editor did not allow us to pass rapidly on. The web site development includes moving the membership records to the same site, which will allow Council colleagues to assist Geoff Brownsey in the arduous task of keeping track of members. Oliver Harlen had sent in his requests for the Bulletin (text of the Annual Award citation, pen portraits of new members of Council, clarification of the content and use of ESR pages in the Bulletin) and we were told that Volume 45, Number 2 should reach members before Christmas. Rheology Abstracts Volume 45, Number 3 was at the printers and Volume 45, Number 4 would reach the Publications manager by the end of January. The reliance on a very few abstractors (6 at the last count) was noted and one or two ideas for improving Abstracts were aired, such as an expanded index with each issue, containing more detail of the categories into which abstracts are divided.

The Publications Manager (Nick Hudson) and the Webmaster (undersigned) had nothing to report that was not already covered. The emergence of these two posts is a clear sign of the way the Society has evolved to make use of modern technology. As with the Officers, these posts are honorary and the Society relies on the “spare” time of all members of Council to operate effectively. The employment of a web development officer (through paying for a postgraduate supervised by Mike Webster) is important in underpinning these voluntary activities and we were all impressed by the presentation Jon Harvey gave us on the development of a new web site for the BSR.

Jon highlighted issues of security (of the site and of members' data), automation of tasks (to enable officers to work more efficiently), database interaction (to keep information as up-to-date as possible as painlessly as possible) and e-mail (to improve communication both within Council and between Council and members of the BSR).

Members should all have received at least one communication from the BSR about this and we hope you have visited the new site and taken the opportunity to verify and, if necessary, correct the information you can see there (which is password protected). It is not appropriate to go into too much detail here of Jon Harvey's presentation to Council since many things have changed in the months since and we are grateful to all who have commented or reported problems. If we don't get feedback, we don't know what is impossible to understand unless you have been instructed by Jon, as several of us have. The site may be reached easily

from the current BSR site at <http://www.bsr.org.uk/> or directly at <http://innfm.swan.ac.uk/bsr/>.

Council's discussion of all these issues had been so absorbing that it was now time for your reporter to set off on the trip back to Newcastle. Unfortunately this was not deemed to be sufficient reason for bequeathing the task of writing for the Bulletin to someone else.

A hasty discussion of dates preceded my departure:

1. Next Council - Afternoon of 16th April at Miskin Manor (at the end of the Rheometry Conference there).
2. Summer Council - 23rd July in London (11am start).

Future scientific meetings include Rheometry at Miskin Manor mentioned above; the first Annual European Rheology Conference in Portugal this September, the ICR in Korea in August 2004 and, in March, the ESR executive will be considering (will have considered by the time you read this) future Annual European Rheology Conferences (for 2005 and 2006 at least).

Matters on the agenda that were to be discussed after I left included a progress report on "Annual Rheology Reviews", the concept of a "Chartered Rheologist", travel grants (application by one student) and more on the membership list and collection of membership fees. Internet banking is under consideration, I believe.

Chris Petrie

Commentary on Joint Meeting of BSR and UWNNFM

Aberystwyth, December 9th 2002

You get a small report on this as an extra to the Council Commentary. I was asked to make the report after the meeting, probably because someone saw me making a note or two. What was not noticed was that this was only on one of the lectures - not because it was the only interesting one, but because it contained information I wished to pass on to a colleague. So now you know how chance plays a major part in the reports you are offered.

The meeting was held in the very comfortable cinema of the Arts Centre on the UWA campus. It consisted of three lectures and the presentation of the Annual Award to Malcolm Mackley. The occasion was well attended but why did only 15 manage to find their way to the BSR EGM which followed? Obviously, busy people were tempted to give time they could scarcely afford to hear the distinguished speakers and there is no doubt that we were treated to three excellent professional presentations. The EGM did very well on proxy votes but a proxy audience for the lectures (if it hopes for any real information from me) is ill served.

The first part of the programme was essentially a BSR affair. Geoff Maitland gave a presidential address on rheology in the oil production industry. If you had heard it you would be clearer now about the significance of drilling mud and fracturing fluids, but I can't recall why there were worms in his title ("From Mud to Worms ... The Rheology of Hydrocarbon Recovery"). After the lecture, Geoff fulfilled another presidential duty and presented the 2002 Annual Award to Malcolm Mackley (and the citation given is printed in this issue). Malcolm's lecture on "Gas Assisted Micro Capillary Polymer Extrusion" described a project aimed at postponing (to higher flow rates) the onset of sharkskin instability in the extrusion of molten polymer by injecting gas at the capillary wall (to reduce the shear stress at the wall below a critical value).

After a coffee break we went back to the cinema to be entertained by David Boger's delivery of the University of Wales INNFM Annual Lecture which was entitled "Environmental Rheology". We were treated to insights into rather horrible chemistry (red mud with pH 13 - not what one wants to leak or leach out into the environment), accounting practices which, from an environmental point of view, are equally horrible and the rheological knight in shining armour devising feasible

ways of dealing with mining waste. Slump tests, yield stresses (if they don't exist they are still a darned good engineering tool) and the behaviour of concentrated suspensions all receive scientific attention in this area of work. There is a nice optimisation problem in determining the minimum cost per tonne of dry solids transported as a function of concentration of the suspension that is pumped - but then in real life one may be faced with a huge mine as in Chile at an altitude of 3,200m in an environment where water is extremely scarce. David illustrated the challenging multidisciplinary nature of the work - for example in the need to cross the divide between civil and chemical engineering and in the involvement of a variety of underpinning scientific disciplines. The BSR may be pleased to hear that the work of a recent President, Dick Buscall, is the origin of the theoretical understanding of relevant aspects of suspension rheology.

The hard core of the meeting adjourned to the BSR EGM across the campus and then gathered for an excellent dinner to round off the occasion.

Chris Petrie
School of Mechanical & Systems Engineering,
University of Newcastle upon Tyne

OBITUARY

JOHN 'JACK' DEER

John James 'Jack' Deer of 2, Chessington Close, West Ewell KT19 9EQ died on the 21st January 2003. Mr Deer was responsible for the design of many research instruments at the School of Pharmacy where he was Chief Technician for many years. He is acknowledged for his expertise in rheology and has published many papers in the Pharmaceutical Journal and other publications. He retired in 1978 and died just before his 90th birthday.

Jack had joined the staff at the School of Pharmacy about 1950, and had used his previous wide engineering experience in the planning, installation and equipping the laboratories in Brunswick Square. He rapidly established a reputation for applying his wide knowledge and ingenuity to the design of research instruments and many were greatly helped by his input in the design of their equipment. In due course Jack developed a special interest in controlled stress rheometry and with input from Professor Shotton and Dr. Brian Warburton, he designed the first controlled stress rheometer of modern times. He wrote many papers on this topic and had the respect of many of the leading rheologists in the world, many of whom he knew personally.

After his retirement in 1978, Jack became involved in the further development of controlled stress rheometry and the popularisation of this technique, which has since become the standard for most industrial rheology work on non-Newtonian fluids.

Appreciation by Derek Bell

I first encountered Jack about 30 years ago when I was a young service engineer and he was Chief Technician at the London School of Pharmacy. After that we met off and on at various scientific meetings especially after he had retired from "the Square" and was trying to get the controlled stress rheometer established as a commercially successful product. At these meetings we had various technical discussions usually based on his enthusiasm for the controlled stress technique.

By now I had the clear impression that Jack knew what he knew, and said what he thought more or less regardless but I didn't know him that well personally at this stage.

I got to know him much better when I started with Carrimed as the first employee. Jack was involved as a consultant and he was a regular visitor to the offices of Carrimed. I can remember many afternoon discussions in my office with Jack, especially when he had an idea. Lots of ideas were kicked around in these discussions, some brilliant, some rather impractical - they were all the same to Jack! Many technical developments came from these discussions. Most of them have become the industry standard ways of doing things. I can remember thinking at the time "I hope my mind is as creative as his when I'm his age". He was better able than many people half his age to come up with novel and radical ideas.

At these meetings I learned more about him as a person, but mostly from what he was doing, he wasn't one to talk about himself. Typically he was on his way to, or coming back from some errand to help someone, an example of his kindness, especially in terms of helping the young and was always talking about the schemes he came up with to get a youngster started in some big project. He was a real character in these days of increasing blandness. He helped to start a revolution in the world of rheology that has transformed practical rheometry for many. He went out of this way to help others when most his age would have been in pipe and slippers.

Jack was a keen cyclist and was physically and mentally active right through his 90th year, until he had the minor accident which precipitated his demise. He will be remembered by all who knew him for his ingenuity, unbounded energy and willingness to help everyone. Our sympathy goes to his wife, Rosalie who has always given him so much support.

Derek Bell
February 2003

BSR Ties and Pins Clearance Sale Offers

The Society has a small remaining stock of ties and pins for sale at never to be repeated prices. These will become collectors' items as we are not planning to commission any more in the foreseeable future. The ties are the traditional narrow pattern in polyester with an embroidered BSR logo about 20mm diameter and the pins, originally produced for the Golden Jubilee conference in 1990 for female delegates as a scarf or lapel pin, are in gold on silver and have the BSR logo on the front head about 10mm diameter. Ties are available in blue with red logo, grey with red logo and blue with gold logo (only the last few of the latter are still available, having been produced for the Golden Jubilee Conference in 1990).

Ties are £5 and pins are £10, including postage, strictly payment with order. (Cheques payable to British Society of Rheology).

To place your order, please contact Professor Phil Banfill, School of the Built Environment, Heriot-Watt University, Edinburgh, EH14 4AS.

AIMS OF THE SOCIETY

The way liquids flow and solids deform affects all aspects of life.

Extraction and processing of crude oil, moulding of plastics, use of toothpaste, spreading of margarine, painting and the lubrication of joints in the human body are all examples of processes depending upon rheological behaviour. Rheology is defined as the science of the deformation and flow of matter.

If your work is concerned with rheology in any way, then you have much to gain by joining the British Society of Rheology - publications, conferences and access to fellow members who, while working in a different discipline or industry, may be facing similar problems to yours.

The Society is non-profit making and is registered as a charity.



'RHEOLOGY REVIEWS 2003'

**Published by the British Society
of Rheology.**

Edited by David M Binding
and Ken Walters

Normal Price £ 25
BSR members £ 20

The field of rheology is extremely broad and continues to grow rapidly. With applications in almost every walk of life, important work is published in a very large number of journals and other media. Although modern computer-based technology enables the *location* of *relevant* studies satisfying certain criteria, it cannot determine the *importance*, or indeed, the *significance* of the studies. For this, it is necessary to tap the knowledge and experience of the world's most prominent specialists in rheology. This publication aims to achieve this.

This first issue contains reviews of the following areas: the rheology of filled viscoelastic systems (Howard A Barnes); non-equilibrium thermodynamics (Anthony N Beris); the rheology of mobile interfaces (Gerald G Fuller); compressive rheology (Ross G de Kretser, David V Boger and Peter J Scales); finite element methods for integral viscoelastic fluids (Roland Keunings) and the modelling of entangled polymers (Tom C B McLeish). The authors are all internationally renowned specialists in their particular area. They include scientists with both academic and industrial backgrounds. Over 560 references are brought together in 6 coherent, concise treatises of the current state of knowledge in their respective branches of rheology.

To order your copy contact

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CONFERENCE REPORTS

The Sixth European Conference on Rheology

Erlangen, Germany, September 1-6 2002

The conference began with the opening award ceremony in which Professor Ken Walters was awarded the Weissenberg Award for outstanding long-term achievements in rheology. Following the presentation Professor Walters gave a personal history of rheology illustrated through a number of examples. He concluded by highlighting current problems and challenges in the field and by proposing some future directions for rheological research. The first plenary lecture was given by Nadia El Kissi and was entitled "Enhancing processability of polymer melts during extrusion". This provided an excellent and widely enjoyed first lecture that was also related to my own area of interest, polymer melt dynamics. This was followed by a second plenary from Norbert Willenbacher of BASF. His presentation concerned the hydrodynamics, microstructure and colloidal interactions in concentrated suspensions.

In the afternoon the parallel sessions began and, while there were many interesting titles across the five sessions, I concentrated on the modelling session. This proved to be an especially lively forum with presentations by Yuichi Masubuchi, Alexei Likhtman, Martin Kroger, Manfred Wagner and Francesco Greco, amongst others, demonstrating why this field is particularly relevant and active across Europe.

Throughout the next few days of the conference I was able to locate a range of interesting talks. In areas directly relevant to my own work there were presentations in the polymer melts, rheometry and extensional rheology sessions as well as in modelling. Additionally, thanks to the well-presented and accessible style of the presentations, I was able to benefit from the chance to broaden my knowledge of areas to which I am less familiar such as in the solids, suspensions and surfactant sessions, amongst others. After lunch on Thursday there were two further plenary lectures. Ole Hassager discussed Lagrangian simulations of viscoelastic flows, including some spectacular simulations and experimental visualisations of surface instabilities in filament stretching flows. In the second plenary, entitled "Rheology for Processing", Gerrit Peters gave a

wide-ranging discussion of the applications of molecular theory being made at the Dutch Polymer Institute in Eindhoven.

Given the host institute's strong reputation for innovation in the field of extensional rheology it was natural that this area would produce some excellent presentations. The session was begun by Professor Kiyohito Koyama's keynote lecture in which he demonstrated how the strain hardening properties of miscible and immiscible polymer blends can be controlled through the blend composition. Professor Koyama concluded with a surprising application of this work to the problem of producing bread from rice! I also enjoyed Claus Gabriel's lucid presentation concerning the strain hardening properties of polyolefin melts and its relation to molecular structure.

Finally, I would like to take this opportunity to thank the conference organisers for an enjoyable and stimulating conference. This was well exemplified by the conference meal where we all enjoyed the excellent Bavarian food, wine and hospitality.

Richard Graham,
Polymer IRC,
University of Leeds.

News from Other European Societies

GRUPE FRANÇAIS DE RHEOLOGIE (GFR)

<http://www.univ-lemans.fr/sciences/wgfr>



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Rheology Book

The book "Understanding Rheology – From blood circulation to cement hardening" obtained a "Special Mention" of the ROBERVAL awards. This collective publication (in French) of the French Group of Rheology, published by EDP Sciences (www.edpsciences.org) in January 2002, thanks to the strong involvement of the editors (Philippe Coussot and Jean-Louis Grossiord), has received in December a "special mention" of the ROBERVAL awards. The ROBERVAL awards aim at pointing out books which allow a widespread diffusion of technological knowledge and favours a University level teaching in French, so that new concepts that are underlying technical, economical and cultural developments can become accessible to a large audience. The committee award gathers members from French and foreign universities, from industry, as well as scientific journalists. This book was selected among over 90 in his category (Education – University level).

Below is the book abstract, the French version of which can be found at <http://prixroberval.utc.fr/>

"For historical reasons, rheology is little or poorly taught in France, in spite of important applications especially in the industrial field. This book makes the judicious choice to present a large variety of these industrial applications and to link them to the microscopic structure of the fluids. After an introduction which gives the main concepts and technical terms of rheology, the book is entirely dedicated to applications with a strong basis of physics but very few mathematical equations. The first application is of course polymers. Next chapters give a view of other fields where rheology has a key role and illustrate the multidisciplinary approach of rheology. So, biological fluids (especially blood), food dressings and emulsions, magma flow and snow avalanches, paints and cements as well as cosmetics (creams and nails varnish) are described. The text is well illustrated ..., a book dedicated to a broad public which can be read like a novel".

37th Meeting of the French Group of Rheology , Saint Etienne (France), October 9-11, 2002

The 37th meeting of the French Group of Rheology (GFR) was held in Saint Etienne (France) from October 9th to October 11th, 2002. More than 110 scientists, from laboratories, universities and industry have attended the meeting. Following the tradition of the French group, the meeting was organised with the participation of another group from Europe. This year, the German group (Deutsche Rheologische Gesellschaft) was represented by its president Manfred Wagner. The topics of the meeting was Rheology, Morphology, Structure. Four main lectures were presented namely by Manfred Wagner from the University of Berlin (Germany), Jan Vermant from Leuven (Belgium), Thomas Schweizer from ETH Zürich (Switzerland) and Jean-François Palierne from ENS Lyon (France), the latter being the winner of the annual award of the French group. Thirty lectures and more than twenty posters were presented during the conference. Five companies (Anton Paar, Bohlin, Rheometric Scientific, TA Instruments, ThermoRheo) were exhibiting stands dealing with rheological techniques. Poster owners and companies were given a short time to present their work or material during the sessions.

The GFR award was given during the conference banquet to Dr. Jean-François PALIERNE, in recognition of his contributions in various fields: liquid crystals, rheology of emulsions and polymer blends, rheology and thermodynamics of temporary polymer networks. Without any doubt, his paper published in 1990 in *Rheologica Acta*, is known from every one working in the field of immiscible polymers and has led to the so-called Palierne's model. The thesis award has been shared between Dr. Guillaume OVARLEZ (Université Paris VI) for his work on the "statics and rheology of a confined granular medium" and Dr. Laurent ROBERT (CEMEF, Nice) for his work on the "oscillating instability of linear polyethylenes".

AGM of the GFR

After the annual general meeting of the GFR, Dr. Philippe COUSSOT has been elected new president of the GFR for the year 2002-2003. More information on the new board of the GFR and on our activities can be obtained from our internet site.

<http://www.univ-lemans.fr/sciences/wgfr>.

Future Events

The next GFR annual conference (38th annual GFR meeting) will be held in Brest 15-17 October 2003. The topic is "Rheology and physical-chemistry of formulated materials". The aim of the conference is to show the complementarity between the rheological approach and the physical and chemical characterisations in designing formulated materials. The objective is obviously to encourage and to develop exchanges and collaborations between academic scientists and centres of industrial studies (polymers, chemistry, biomedical, food science, paintings, chemical engineering...) about these problems. Indeed, the topics chosen for this meeting are of interest for the rheologist who wants to better understand the links between the physical and chemical interactions and the macroscopic behaviours but also for those who are in charge of formulating a compound in order to obtain a given property.

We want this meeting to foster exchanges between academic and industrials communities around the following types of materials :

- Polymer solutions and gels
- Emulsions and foams
- Paste and suspensions

11TH NEWSLETTER OF THE EUROPEAN SOCIETY OF RHEOLOGY

- Polymer blends, filled polymers and nanocomposites
- Filled elastomers

Systems can be considered from various angles: theory (analytical as well as numerical), experiments (including additional techniques to rheometry)

More information can be found on the conference website at the following address : <http://www.univ-brest.fr/qfr20003/> ,and additional inquiries can be obtained through qfr2003@univ-brest.fr .

Jean-François Tassin
International Delegate.

CONFERENCE ANNOUNCEMENTS



1st Annual European Rheology Conference, AERC 2003

The Portuguese Society of Rheology and the Department of Polymer Engineering of the University of Minho are pleased to announce the organisation of the first Annual European Rheology Conference 2003, AERC 2003, to take place in Guimarães, Portugal, in the period September 11-13, 2003.

AIMS AND SCOPE

The aim of AERC 2003 is to contribute to the advancement of Rheology in Europe, by bringing together researchers from both within and outside Europe, in a meeting of broad scientific scope but focussed on the presentation of novel, recent high-quality scientific results. Special attention will be given to fostering fruitful discussions between participants and promoting the participation of young researchers.

CONFERENCE FORMAT

The AERC 2003 will have a 3-day duration and will be split into topical Symposia, focussed either on mainstream or upcoming areas of Rheology. Each Symposium will have two Chairpersons, who will be renowned experts in the field, and will be in charge of organising its scientific programme (selection of mode of presentation, organisation of sessions, etc.).

The conference will have Plenary, Oral (in parallel sessions) and Poster contributions, paper submission and registration being done electronically over the WWW at

<http://www/rheology-esr.org/AERC/2003/aerc2003.htm>

The deadline for abstract submission will be kept very close to the conference (see below for details). Also, in order to promote the presentation of high-quality results, special issues of both *Rheologica Acta* and *Journal of Non-Newtonian Fluid Mechanics*, containing contributions selected from each Symposium by the respective Chairpersons, will be edited after the conference.

LOCATION

Guimarães is an attractive city in the north of Portugal, located about 50 Km from the Francisco Sá Carneiro International Airport in Oporto and directly linked to it by motorway (A3 and A7). It is located in the verdant region of Vale do Ave, in the heart of the province of Minho, 40 Km away from the beautiful National Park of Gerês and 50 km away from the Atlantic Ocean and its beaches. In the twelfth century, when the nation was founded, Guimarães was the first capital of Portugal, and today it still maintains the Historic Centre, which has been duly rehabilitated and represents the principal cultural and tourist attraction of the city, having been awarded the status of World Heritage of Humankind by UNESCO on December 13, 2001.

In mid-September the weather conditions in the region are usually mild, with sunny weather and average daytime temperatures between 20 °C to 30 °C.

IMPORTANT DATES

Abstract submission for Oral presentations:	May 15th, 2003
Notification of acceptance (oral):	June 15th, 2003
Abstract submission for Poster presentations:	June 30th, 2003
Notification of acceptance (poster):	July 15 th , 2003

CONTACTS

For more information, please contact:

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<http://www.rheology-esr.org/AERC/2003/aerc2003.htm>



The XIVth International Congress on Rheology

August 22 ~ 27, 2004,

COEX Convention Center, Seoul, Korea

Call for Papers

Authors are invited to submit abstracts (each not exceeding 300 words) for either oral presentations or poster presentations. Abstracts should be submitted to the Congress Secretariat no later than September 30, 2003. On-line Abstract Submission via Congress Website (www.icr2004.or.kr) is highly recommended.

Authors will be notified of the acceptance of their papers/posters by January 31, 2004, and then requested to submit the manuscripts no later than March 31, 2004 for the publication of the proceedings in CD ROM. The manuscript will be included in the proceedings only if accompanied by the early registration of the paper/poster presenter.

The topics and the organisers of the Mini-Symposia are below and the presentations will be grouped according to the subject categories by the Scientific Committee.

Mini-Symposia	Organisers
Computational rheology	Prof. A N Beris, Prof. N Phan-Thien
Flow instability	Prof. S G Hatzikiriakos, Prof. E G Shaqfeh
Foams, emulsions & surfactants	Dr. A M Kraynik, Prof. L G Leal
Foods & biomaterials	Prof. H A Barnes
Materials processing	Prof. D G Baird, Prof. J A Covas, Prof. J M Piau
Microstructural modelling	Prof. R G Larson
Nanorheology & microfluidics	Prof. G G Fuller, Dr. Sangtae Kim
Non-Newtonian fluid mechanics	Prof. O Hassager, Prof. G H McKinley
Polymer melt	Prof. P Moldenaers, Prof. M H Wagner,

11TH NEWSLETTER OF THE EUROPEAN SOCIETY OF RHEOLOGY

Prof. H Watanabe

Polymer solutions Prof. S J Muller, Prof. T Sridhar

Rheometry & experimental methods Prof. M R Mackley, Prof. R K Prud'homme

Solids & composites Prof. G B McKenna, Prof. H H Winter

Suspensions & colloids Prof. D V Boger, Prof. H Usui

General papers Prof. J C Hyun

Important Dates

Deadline for Abstract Submission September 30, 2003

Notification of Acceptance January 31, 2004

Deadline for Manuscript Submission March 31, 2004

Deadline for Early Registration April 30, 2004

Social Program

The Organizing Committee is to prepare interesting and enjoyable social programs for all the participants of the ICR2004 to give special memories and cultural experiences during their stay in Korea. A half-day excursion to Kyungbok Royal Palace including the adjacent National Museum is an example. Various pre- and post-conference tour programs are also recommended to the participants for their further enjoyment in Korea.

Congress Secretariat

The Korean Society of Rheology

Rm. 806, New Bldg., The Korea Science & Technology Center

635-4 Yeoksam-dong, Kangnam-ku, Seoul 135-703, Korea

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E-mail: icr2004@icr2004.or.kr

Website: <http://www.icr2004.or.kr>



THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Rheology and Fluid Mechanics of Nonlinear Materials

November 16-21, 2003, Washington DC

The Fluid Mechanics Technical Committee of the Fluids Engineering Division of the ASME and the Materials Processing Technical Committee of the Materials Division are sponsoring a Symposium on the Rheology and Fluid Mechanics of Nonlinear Materials for the 2003 ASME International Mechanical Engineering Congress and Exposition in Washington, D.C.

The purpose of this Symposium is to provide a platform for the reporting of the latest results concerning issues related to various aspects of the rheological and flow properties of nonlinear materials, and in particular advanced materials for the 21st century. Fundamental issues such as flow instabilities, inverse problems in rheology and constitutive formulations appropriate for electrorheological fluids, thin films, suspensions, slurries, emulsions, oil field fluids, paper making fluids such as black liquor, laminar and turbulent flows of polymeric and other non-Newtonian liquids, are included as well as various transport processes, bubble motions, sprays, extrusion phenomena, fibre spinning, film blowing, industrial coatings, etc. Areas of interest are not limited to these issues. Theoretical, numerical and experimental contributions are solicited.

ORGANISERS

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THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Advances in Materials Processing Science

November 16-21, 2003, Washington DC

The Fluid Mechanics Technical Committee of the Fluids Engineering Division of the ASME and the Materials Processing Technical Committee of the Materials Division are jointly sponsoring a Symposium on the "Advances in Materials Processing Science" for the 2003 ASME International Mechanical Engineering Congress and Exposition. The purpose of this symposium is to bring together researchers from academia, industry, and government to promote further development in this broad field. Topics of interest include but are not limited to:

- Process Modeling
- Material Rheology during Processing
- Novel Processing Methodologies
- Thermal and Chemical Issues
- Mechanics During Processing
- Process Automation and Control
- Process Optimization
- Sensing During Processing

Accepted papers will be published in CD-ROM format available at the meeting, and the print version of the Symposium Proceedings will be published after the meeting by ASME. Papers will be considered for publication in an ASME Journal affiliated with the Symposium if so requested after the regular review process.

ORGANISERS

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Professor Sayavur I. Bakhtiyarov
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INDUSTRY NEWS

TA INSTRUMENTS PURCHASE RHEOMETRIC SCIENTIFIC

TA Instruments has recently completed the asset purchase of the Rheology Division of Rheometric Scientific, one of the world's most recognised suppliers of rheometers. The purchase was announced October 14, 2002 and has recently been approved by the SEC and Rheometric Scientific shareholders.

Customers will continue to benefit from TA Instruments investment in new products. Rheometric Scientific customers will especially benefit from TA Instruments reputation for customer support and service with access to the largest worldwide network of professional sales, service and applications specialists. In the coming months, more information will be forthcoming about the consolidation process. Visit the TA Instruments website often for the latest information. <http://www.tainst.com>

BOHLIN INSTRUMENTS INTRODUCE NEW DIGITAL CAPILLARY RHEOMETERS

Bohlin Instruments has introduced the RH7-D and RH10-D to its range of capillary rheometers. Since its launch, the Rosand RH7 has set new standards in research level capillary rheometry. Today, the Rosand RH7 is used in several hundred research laboratories around the world for a range of applications including polymers, foods, coatings and ceramics.

Bohlin Instruments has continuously developed the original RH7 design, since the acquisition of the Rosand capillary product line, along with its operating software to produce a new generation of floor standing capillary units with market leading performance characteristics and capabilities.

The RH7-D and RH10-D retain much of the robust 'H' frame design principle, which lies at the heart of the instruments' ability to operate under high loading conditions - up to 100 kN of load and 1200 mm/min

of speed is available on the RH10-D model. A new digital drive system, gives the RH7-D and the RH10-D unsurpassed performance in terms of speed control, accuracy, and dynamic operating range. This new hardware is supported by the latest generation of 32 bit WindowsTM based software, FlowmasterTM, with many new experimental possibilities.

For more information about these and other products in the Bohlin Instruments rheometer range, please contact sales@bohlin.co.uk or call +44 1285 644407.

NEWLY- DESIGNED RHEOLOGY NEWSLETTER FROM PAAR SCIENTIFIC

Paar Scientific published the first of its newly designed rheology newsletters. This publication is written for anyone with an interest in rheology or viscosity measurement and is intended to keep such persons up to date with practical information. The subjects covered in this issue are.

- Thixotropy, Friend or Foe ?
- Book Review
- Rheology Workshop
- Free Application Notes
- AMVn Viscometer -supreme accuracy
- for low viscosity materials
- Paar Scientific News
- Literature Request

The Newsletter can be downloaded it from the Paar-Scientific website at <http://www.paar-scientific.com/pages/news.htm>.

PAAR SCIENTIFIC EXPAND INTO LARGER PREMISES

For just over twenty years, Paar Scientific have been based in Raynes Park, South London. In that time we have seen several expansions to our premises to accommodate our growing company. As a result of our

continued expansion in the UK rheometry/viscometry market the time has come to move on.

As from 2nd January 2003 Paar Scientific will move to new larger premises on a specialised business park in Hertford, purpose built for the needs of both our customers and ourselves in the future. This will enable us to fulfil our ambitious plans as Anton Paar and Physica continue to develop new, exciting instruments and techniques as well as developing our existing range.

As part of the worldwide Anton Paar family of companies, we are taking full advantage of modern communications technology with direct links to our factory in Graz, Austria, giving you the best support possible. A fully equipped laboratory will offer customer solutions and sample analysis. Our range of Anton Paar and Physica instrumentation will also be available for demonstrations and training courses.

With excellent road/rail links and with Stansted Airport within 20 minutes drive, we have chosen the ideal location. We will of course be informing all customers of our new details, but for your information, please note that starting January 2nd 2003, Paar Scientific will be at:

Unit 13,
Harforde Court
John Tate Road
Hertford
Herts
Tel: 01992 514730

CONFERENCES

You are also advised to visit the BSR home pages where an extensive list of conferences is maintained by Chris Petrie: <http://www.bsr.org.uk>:

2003	
4-7 June Lausanne Switzerland	XIIIth International Workshop on Numerical Methods for non-Newtonian Flows Robert Owens, LMF-IE-FSTI, Ecole Polytechnique Fédérale de Lausanne, CH 1015 Lausanne, Switzerland. T: +41 21 693 3589 F: +41 21 693 5307. Info: lmfwww.epfl.ch/IWNMNF2003 E: wkshop2003@epfl.ch
16-17 June Bristol UK	Complex Fluids Dr Karen L. Henderson, University of the West of England, Frenchay Campus, Bristol, BS16 1QY Info: www.cems.uwe.ac.uk/~klhender/complexfluids/ E: Karen.Henderson@uwe.ac.uk
22-26 June Sofia Bulgaria	12th European Conference on Clinical Hemorheology E: antonova@imbm.bas.bg Info: www.12ECCH.primasoft.bg
6-10 July Honolulu USA	FLOWS IN MANUFACTURING PROCESSES Advances in Materials Processing Science Info: www.engr.twsu.edu/DrSiginer/asmehawaii.htm T: 1 316 978-3400, F: 1 316 978 3853 E: siginer@engr.twsu.edu
7-10 July Melbourne Australia	PPS-19 POLYMER PROCESSING SOCIETY Info: www.pps19.nww.com.au E: pps19@rmit.edu.au
11-13 Sep Guimaraes Portugal	AERC 2003 Annual European Rheology Conference Info: www.rheology-esr.org/AERC2003 E: jmaia@dep.uminho.pt
14-17 Sep Athens Greece	PPS-2003 POLYMER PROCESSING SOCIETY Nereus Congress and Conferences, 2, Afentouli Str., 185 36, Piraeus, Greece T:+30 210 45 24 842, F: +30 210 41 82 308. E-mail: pps2003@nereusgroup.gr Info: www.nereusgroup.gr/pps2003
7-10 Oct Lake Placid USA	4th International Conference on Mechanics of Time Dependent Materials E: sem@fs.uni-lj.si Info: www.uni-lj.si/~cem/mtdm03
T: Telephone; F: Facsimile; E: Email; Info: WWW URL	

2003

Oct 12-16 **75th Annual Meeting of The Society of Rheology**
Pittsburgh
USA Info: www.rheology.org/sor/annual_meeting/2003Oct/

3-8 Nov **3rd International Symposium on Slow Dynamics in**
Sendai **Complex Systems**
Japan Info: <http://www.ifs.tohoku.ac.jp/slow-dynamics/>

3-5 Nov **Multiphase Flow 2003**
Santa Fe Info: [www.wessex.ac.uk/conferences/2003/multiphase2003/index.h](http://www.wessex.ac.uk/conferences/2003/multiphase2003/index.html)
USA tml
E: enquiries@wessex.ac.uk T: 0238 029 3223 F: 0238 029 2853

4-6 Nov **Moving Boundaries 2003**
Santa Fe Info: [www.wessex.ac.uk/conferences/2003/movingboundaries200](http://www.wessex.ac.uk/conferences/2003/movingboundaries2003/index.html)
USA [3/index.html](http://www.wessex.ac.uk/conferences/2003/movingboundaries2003/index.html)
E: enquiries@wessex.ac.uk T: 0238 029 3223 F: 0238 029 2853

5-7 Nov **Materials 2003**
Santa Fe Info: [www.wessex.ac.uk/conferences/2003/materials2003/index.ht](http://www.wessex.ac.uk/conferences/2003/materials2003/index.html)
USA ml
E: enquiries@wessex.ac.uk T: 0238 029 3223 F: 0238 029 2853

16-21 Nov **ASME Advances in Materials Process Science**
Washington Prof Dennis A. Siginer ,Wichita State University
DC USA 1845 Fairmount ,Wichita, KS 67260 T: +1 316 978-3400
F: +1 316 978-3853 E: dennis.siginer@wichita.edu
Info: www.asmeconferences.org/congress03

16-21 Nov **ASME Rheology and Fluid Mechanics of Nonlinear**
Washington **Materials** Prof Dennis A. Siginer ,Wichita State University
DC USA 1845 Fairmount ,Wichita, KS 67260 T: +1 316 978-3400
F: +1 316 978-3853 E: dennis.siginer@wichita.edu
Info: www.asmeconferences.org/congress03

2004

22-27 Aug **XIV INTERNATIONAL CONGRESS ON RHEOLOGY**
Seoul Congress Secretariat, The Korean Society of Rheology,
Korea Rm.806, New Bldg., The Korea Science and Technology
Center 635-4 Yeoksam-dong, Kangnam-ku, Seoul 135-703,
Korea Info: www.icr2004.or.kr; E: icr2004@icr2004.or.kr

T: Telephone; F: Facsimile; E: Email; Info: WWW URL

COURSES

2003	
7-8 May Warwickshire UK	RHEOLOGY WORKSHOP Steve Goodyer, Paar Scientific Ltd, 13, Harforde Court, John Tate Road, Hertford, SG13 7Q T: +44 (0)1992 514730; F: +44 (0)1992 514739 E: goodyer.s@anton-paar.co.uk
3-6 Jun Glasgow UK	Theoretical, Experimental and Industrial Aspects of Rheology. Dr NE Hudson, Dept P&A Chemistry, University of Strathclyde, 295 Cathedral St, Glasgow, UK. T: +44 (0) 141 5482162; F: +44 (0) 141 5484822 E: n.e.hudson@strath.ac.uk
15-19 Sep Leuven Belgium	9th EUROPEAN SCHOOL OF RHEOLOGY Peter Van Puyvelde E: peter.vanpuyvelde@cit.kuleuven.ac.be Info: www.cit.kuleuven.ac.be/cit/ltrk/course.html
10-14 Nov Glasgow UK	PROCESS RHEOLOGY Dr NE Hudson, Dept P&A Chemistry, University of Strathclyde, 295 Cathedral St, Glasgow, UK T: +44 (0) 141 5482162; F: +44 (0) 141 5484822. E: n.e.hudson@strath.ac.uk
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