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THE BRITISH SOCIETY OF RHEOLOGY

BULLETIN



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THE BRITISH SOCIETY OF RHEOLOGY
OFFICERS AND MEMBERS OF COUNCIL
1989/90

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EDITORIAL

At the last meeting of Council concern was expressed over the future of Rheology Abstracts. The number of journals abstracted over the past few years has fallen. This, combined with the ever tightening library budgets, has led to a fall in circulation figures to a point where the viability of the journal may be in question. To improve the situation, the editor, Geoff Brownsey, is urgently seeking abstracters - see further information later in this Bulletin. The future of this very useful journal is very much in the hands of members.

In an effort to promote collaboration with our American cousins, the BSR and the Society of Rheology have agreed to encourage members of one society to join the other. A brief article describing some of the work of the Society of Rheology is given later, together with an application form for membership.

The Golden Jubilee meeting is almost with us. Papers are flooding in and a very full programme is promised. If you haven't registered yet and you want to save money, get in touch with Chris Petrie now.

Finally, may I wish all members a happy new year and indeed, a happy new decade.

Peter Townsend

Peter Townsend





Howard Barnes with guests Ken Walters, Jim Ferguson, John Hutton, Neville Waters, Dick Buscall, Roger Platt and Derek Bell at the presentation of the 'Researcher of the Year' award to Howard by his company, Unilever Research.

"Rheology of Food, Pharmaceutical and Biological Materials"
University of Warwick, 12 - 15 September 1989

In all, 29 papers were presented at this annual conference, all of which were of a very high standard. Many of the papers presented were mainly based on theoretical principles, although a fair few demonstrated the practicality of rheology for substances ranging from blood to cake batters and fish. The Proceedings of the Conference are to be published by Elsevier Applied Science in early 1990, but I summarise the papers below.

The proceedings opened with "Structure and mechanical properties of model composite foods", by Dr M Green. The paper illustrated composites of solid particles with stronger interaction between the particle and the matrix. This was followed by "Injection moulding of confectionery materials", presented by Dr A Collyer, who demonstrated the structural build up with time using Haake Rotovisco ball and cup viscometer. In "Expansion, colour and textural properties of extrusion-cooked fish/corn grit mixtures", Mr A Shah showed significant differences on textural properties of extrudates containing 100% corn grit and those containing 11% freeze dried cod.

"Influence of a filler on the rheological properties of food materials" was given by Dr H Luyten. This paper aimed at demonstrating the rheological and fracture behaviour of composite materials such as cheese. In "The rheology of food melts and its application to extrusion processing", Dr R Parker illustrated some compositional affects of the rheology of food melts using a capillary rheometer. Dr D C-H Cheng's paper on "Viscosity measurement of an orange juice" described the development of a test procedure for studying the effect of processing in the preparation of fruit juice concentrates on the property of reconstituted juice.

The seventh paper was presented by Mr A Speers, who won the Society's first Scott Blair Scholarship in 1988. His work was entitled "Flow behaviour of commercial brewing yeast suspensions", and illustrated the rheological properties of brewing yeast suspensions as a function of time, shear rate, temperature and concentration. "Blood viscosity characteristics and red cell aggregation" was presented by Dr M Rampling. The paper indicated red cell aggregation induced by plasma proteins, leading to prominent shear thinning. "Developments in biopolymer gel rheology", by Dr J Mitchell, reviewed some of the more important developments confined to gels formed by polysaccharides and proteins in the presence of water.

Professor R Lapasin presented "Rheological behaviour of scleroglucan aqueous systems in the solution and gel domains". The paper characterised the rheological behaviour both of the concentrated solutions and gels composed of scleroglucans. Mr B Johnson, in "The use of the TA-XT2 texture analyser to quantify the staling effect of various bakery products", illustrated some of the characteristics such as crispness, toughness and rubberiness which could be measured and quantified with the TA-XT2 texture analyser. Dr H Kerr, in the "Ups and downs of baking bread", indicated that the surface shear rheological properties of the gas cell wall

components in bread dough are important. This paper reviewed the results obtained with aqueous extracts of wheat flour using a surface shear oscillatory technique.

"The rheological character of gluten", presented by Dr G Brownsey, showed the ease with which rheological tests could be used to probe structural features of protein-lipid-carbohydrate complex in gluten. Dr P Zoon, in "Inter-relation between the dynamic moduli and the relaxation modulus of rennet-induced skim milk gels", illustrated the time-dependent properties of these materials as determined by two methods, viz by stress relaxation measurements and by determination of dynamic moduli as a function of frequency. "Influence of the film contact angle of emulsion droplets on the dispersibility of the sediments" was given by Dr F van Voorst-Vader, who indicated that for easy re-dispersion, strong interaction of the droplets correlated with the occurrence of large contact angles.

Dr W Jones' presentation on the "Rheology of milk concentrates produced by ultrafiltration and the search for a model fluid" showed that the milk concentrate was found to be shear thinning and displayed no measurable first normal stress difference. Miss I Pateras, in "Preliminary investigations into the replacement of sugar in cake batters", indicated that sugar is paramount in controlling batter viscosity. Mr A Steventon, in "The rheology of yogurt and related substances", attempted to relate the basic dynamic rheological parameters with practical processing conditions.

"The surface shear rheology of aqueous solutions of gum acacia senegal in the presence of various second components" was presented by Dr B Warburton. The paper described the effect of the addition of electrolytes, sugars, urea and glycerol on the film forming properties of aqueous solutions of gum acacia senegal. "New aspects of die design for paste extrusion" by Dr J Benbow explained the practicality of die design and its use. "Dynamic mechanical spectroscopy of food and biological materials using the polymer laboratories DMTA" was given by Dr R Marsh. The paper illustrates examples of the use of DMTA to study both model and real biological systems.

Miss C Raines presented the "Extrusion of microcrystalline cellulose formulations", which indicated that the curves for formulations based on "powdered" grades of microcrystalline cellulose powder showed pseudoplastic flow. "The influence of moisture content and particle size of barium sulphate on the extrusion properties of mixtures with microcrystalline cellulose" was presented by Dr A Anderson. His study showed that all the samples indicated non-Newtonian flow properties, as illustrated by the shear/die wall shear stress graphs. Dr H Kerr's second paper, on the "Surface shear rheological properties of dialuronic acid solutions - metal ion effect" explained some biorheological features of sinuvial fluid in the knee joint.

The twenty-fifth paper by Mr D de Bruijne on "The rheological properties of bread dough and their relation to baking properties" illustrated the rheological and ultimate properties of bread dough as determined by subjecting samples to uniaxial extension. This paper was presented together with a visual aid in the

form of a video cassette. Dr E Koutsakos, in the "Effects of rheological changes on power consumption and Laser Doppler measurement of liquid velocity distributions induced by a Rushton turbine in a stirred vessel", reported on Newtonian fluids and found that the distribution of the non-dimensional ratios of V_{mean}/V tip and V'/V tip for non Newtonian fluids does not necessarily remain constant at different impeller speeds. "Application of the Strathclyde Rheometer to a variety of curing systems", given by Dr D Hayward, described the theory underlying a new rheometer and gave as examples of the instrument's application, experimental data for cure of a simple resin, a powder coating, a filled epoxy resin and a paint system.

The penultimate paper, on the "Use of a potential energy model to describe the stress relaxation process", was presented by Miss G Atkin. The paper described a new model that has been developed to describe the relaxation process which is based on the storage of potential energy in the system under consideration and its subsequent decay. The final paper was by Mr H Schimanski on the "Results obtained using controlled stress oscillation on some difficult pastes". The paper discussed the problems encountered in obtaining valid measurements for a number of materials classified as difficult.

The Conference was attended by 77 delegates, a respectable figure considering that there was a major conference on pharmaceuticals being held concurrently. There were 8 stands exhibiting a wide selection of viscometers and rheometers ranging from simple quality control viscometers to a rheometer capable of measuring complex phenomena.

The University of Warwick proved to be an ideal location for the conference. The accommodation for delegates was of a high standard and the bar facilities were excellent with spacious lounges.

Socially, the conference was a great success. To occupy the only free evening, a traditional Jazz Band played in the bar at the request of the Society, but this proved so popular even the local students joined in the fun. The conference dinner took place at Warwick Castle in the form of a Medieval Banquet. This was a real experience of a life-time for some of the delegates who had arrived from other parts of the world. Those who attended will surely not forget the hilarious, if rather risqué, jester and the many choruses of "Drink hail!". In particular, at least one Civil Servant, who shall remain nameless, showed us that he has aspirations to become a thespian following his performance as Richard III.

On a more serious note, Mr Nithiananthan, a student from the School of Pharmacy, University of London was presented with the 1989 Pergamon Press Scholarship to assist him with further studies. Additionally, the Society's Annual Award was presented to Dr John Benbow for his many years of service to the Society and to rheology.

Finally, a vote of thanks should be given to Roy Carter and his staff from Carter Baker Enterprises for handling the lion's share of the organisation for this most enjoyable and worthwhile conference.

Ajay J Shah

Minutes of the 49th Annual General Meeting

Held on Wednesday 13th September 1989
in the Physics Lecture Theatre at the University of Warwick

The Meeting started at 6.20pm. 39 Members were present.

1. Apologies for Absence

Apologies had been received from Dr P Banfill and Dr D Hourston.

2. Minutes of the 48th AGM

Mr Carter said that the Minutes had been published in Volume 31 (3) of the Bulletin, and, at the request of the President, read the Minutes to the Meeting. The Minutes were accepted and were duly signed by the President.

3. Matters Arising from the Minutes

Dr H Kerr asked if there was any progress on the proposal to press for an exhibit on rheology at the Science Museum. Mr Carter replied that there had been no response to his appeal for suggestions for a dynamic exhibit, and that the matter was in abeyance.

4. President's Report

The President's report was published in Volume 32 (3) of the Bulletin. There were no questions.

5. Treasurer's Report

The Treasurer, Dr Evans, tabled the Audited Accounts for 1988-89. These were printed in Volume 32 (3) of the Bulletin. Expenditure had increased marginally over the year, but this was more than offset by a considerable increase in income. The Society closed the year with assets of £31,679. A new item, the Scott Blair legacy of £10,000, was in addition to this. Dr Evans said that he had completed four years as Treasurer, and thus was retiring under the Rules. Dr Baker proposed that the accounts were accepted, and this was seconded by Mr Schimanski. The accounts were accepted unanimously. Dr Ferguson proposed that Alfred Simmons & Co be reappointed as auditors at a fee no more than 10% of the past year's fee. The motion was seconded by Dr Buscall, and was carried nem con.

6. Membership Secretary's Report

Mr Schimanski distributed copies of his report. At the end of July 1989, Membership stood at 759. No Members had been submitted for deletion under Rule 4 (d). Many Members who had lapsed in the payment of subscriptions had changed address. 38 applications for Membership had been received at the

"Rheology in the Laboratory" symposium at Birmingham. 19 applications had been received at the present Meeting. Mr Schimanski said that about half of the UK Members were now paying their fees by Standing Order, and that it would be very useful if more Members could pay by this method.

A Membership list was being prepared, and should be ready in early 1990.

The President commented that it was nice to see that Membership was keeping above the 700 mark.

7. Abstracts Editor's Report

Mr Aldhouse's report was printed in Volume 32 (3) of the Bulletin.

8. Bulletin Editor's Report

Prof Townsend said that the cost of printing the Bulletins for the year was more expensive than in previous years, and pointed out that the Bulletins contained many more pages than in previous years. The higher cost of publishing was more than offset by the increase in advertising revenue during the year. He had published a wealth of conference advertising, papers, conference reports, an index to the Scott Blair collection, advertisements for ties, and, sadly, some notable obituaries.

Prof Townsend asked Members to send any articles and conference details for the Diary well in advance of the Meetings.

Dr Ferguson proposed that expenditure be made available to publish a new Membership list. This was seconded by Dr Oliver, and carried nem con. Prof Townsend said that he would publish an appeal to Members to send in corrections to addresses etc.

9. Honorary Secretary's Report

Mr Carter presented his report, which was printed in Volume 32 (3) of the Bulletin.

10. Election of Officers and Council for 1989-90

There being no other nominations from the floor, the Officers and Council for 1989-90 were elected as follows:

Honorary Secretary:
Honorary Treasurer:
Abstracts Editor:
Membership Secretary:

Mr R E Carter
Mr P C Anderson
Dr G J Brownsey
Mr H Schimanski

Ordinary Members of Council:

Mr S T E Aldhouse
Dr A Evans

Dr P F G Banfill
Dr D J Hourston

Dr R Buscall
Mrs C A Moules

Dr Ferguson thanked Dr Ralph Oliver, the retiring "Father of the Council", for his contribution to the Society over many years. He thanked all Members of the Council for their sterling work over the past year. The Society was very much indebted to the two Officers, Dr Evans and Mr Aldhouse, who were retiring to the back benches after serving for four years as Treasurer and Abstracts Editor respectively. Dr Ferguson noted that this had been Dr Evans' second term as Treasurer.

11. Presentation of Awards

Dr Ferguson read the Citation for Dr John Benbow's Annual Award, and presented him with a framed certificate and a cheque. Dr Benbow made a speech accepting the Award.

Dr Ferguson then said that the first Scott Blair Award had been made to Mr Alex Speers, and was pleased to announce that the Award would continue into its second and final year. Mr Speers thanked the Society for its support.

Dr Ferguson said that Mr Nithiananthan had been called away, and that the Pergamon Scott Blair Biorheology Scholarship would be awarded to him at the Conference Dinner.

12. Any Other Business

Dr Helen Kerr asked if any Society items other than ties were available, for ladies, Mrs Moules said that she was organising the supply of brooches for the Golden Jubilee meeting in 1990.

Dr Ferguson said that he had invited Prof Morken to give a plenary lecture at the Golden Jubilee meeting. He appealed for sponsors to provide funds to develop the Society.

Date and Place of Next Meeting

The 50th AGM will be held during the Golden Jubilee Conference in Edinburgh, September 3rd - 7th, 1990.

There being no other business, the meeting closed at 7.09 pm.

R E Carter
Honorary Secretary

COMMENTARY

The 259th BSR Council meeting was held at the SCI Headquarters, Belgrave Square on Wednesday 13th December following the one-day symposium on Polymer Latex Rheology. The President, Dr. Ferguson was in the chair and Mrs. Moules kindly agreed to take the minutes in the absence of the Honorary Secretary who apparently was suffering from an allergy to estate agents. The meeting started at 5.40pm.

The Council was informed that a group of biorheologists had commissioned a plaque in honour of Scott Blair, his death had however prevented its presentation. The plaque was now being offered to the Society and Council agreed that it should form part of the Scott Blair Collection at Aberystwyth. This item was followed by a discussion of the use to which the income from the Scott Blair legacy should be put. It was suggested and agreed that part of this should be used to add to the book collection with the intention of building up and maintaining a complete and up-to-date collection of rheological works. Donations of books past or current from members would also be very welcome.

The Treasurer reported that the Society's finances were in a healthy state. Your commentator however noticed from the accounts that the sale of the remaining Society Ties had slowed down with only three sales in the year. This stagnation in the tie market no doubt reflects concern over current interest rates.

In the discussion relating to future meetings it was noted that Dr. Petrie had already received a substantial number of offers of papers for the Golden Jubilee Conference. Appreciative comments were also made about the programme put together for the meeting on concrete rheology to be held in Liverpool later this year.

Recent exchanges between the new Abstracts Editor and Pergamon Press prompted a lengthy discussion on the future of the Abstracts. It was agreed amongst other things that the methods used to prepare copy should be up-dated. The possibility of obtaining a text-reading computer that would allow the direct production of copy will be explored with Pergamon. The number of journals abstracted has declined over the years and because of this new abstractors are still required. The Editor would be very pleased to hear from potential abstractors, especially from those with special access to journals, for example from those on editorial boards, and from those with access to uncommon and foreign-language journals. The President reported that an application had been made to the EEC COMET scheme asking for support for an annual European School of Rheology. Their preliminary reaction had been favourable.

The Council was pleased to hear that Dr. Cheng had agreed to become the next President of the Society.

The business of the meeting, which as usual had been conducted in an efficient but friendly

manner, was concluded at about 7.30pm, at which point the Council repaired to a local hostelry for dinner. In view of the date paper hats were worn, in the case of the past treasurer this gesture to the season was apparently unprecedented.

The next meeting of Council will be held at Aberystwyth on 14th March 1990 at which time the Council will take the opportunity to view the Scott Blair Collection.

Golden Jubilee Conference Exhibition

A comprehensive exhibition of rheological instruments and literature is to be held in Edinburgh from 3-7th September 1990.

To book a stand or for further information contact:

*Mrs Carole Moules,
Rheo-Tech International Ltd.
120/2 Woodgrange Road,
Forest Gate,
London,
E7 0EW.*

Tel. 01-519-5578.

Fax 01-555-1907.

A NOTE FROM THE ABSTRACTS EDITOR

Rheology Abstracts, to remain both comprehensive and informative, must improve the journal coverage that it has at present. We only cover a small proportion of journals that have a rheological input.

*** ***

American Institute of Chemical Engineers. Journal
 American Society of Lubrication Engineers. Transactions
 American Society for Testing & Materials Bulletin
 AOSTRA Journal of Research
 APPITA. Journal of the Australian & New Zealand Pulp and
 Paper Industry Technical Association

Acta Mechanica
 Acta Metallurgica
 Acta Polymerica (East Germany)
 Advances in Applied Mechanics
 Advances in Cement Research
 Advances in Polymer Science
 Allgemeine Papier -Rundschau
 American Ink Maker
 Annales de Chimie
 Annals -New York Academy of Sciences
 Annual Review of Fluid Mechanics
 Applied Clay Science
 Archives of Mechanics
 Archives of Ophthalmology
 Archive for Rational Mechanics and Analysis
 Aufbereitungstechnik
 Biopolymers
 Biorheology
 British Medical Journal
 British Journal of Haematology
 British Plastics and Rubber
 Bulletin -American Ceramic Society
 Bulletin -Chemical Society of Japan
 Comptes Rendus -Academie des Sciences Paris
 (Generale, Serie 1,2,3)
 Cahiers -Groupe Francais de Rheologie
 Canadian Journal of Chemical Engineering
 Canadian Journal of Chemistry
 Canadian Journal of Physics
 Cement & Concrete Research
 Ceramic Engineering & Science Proceedings
 Ceramic Forum International
 Chemical Engineering and Technology
 Chemical Engineering and Processing
 Chemical Engineering Communications
 Chemical Engineering Science
 Chemical & Pharmaceutical Bulletin -Tokyo
 Chemical Physics Letters
 Chemical Reviews
 Chemistry & Technology of Fuels and Oils
 Clinical & Laboratory Haematology
 Clinical Hemorheology
 Colloid & Polymer Science
 Colloid Journal
 Colloids & Surfaces

Computer Physics Reports
 Computers and Fluids
 Concrete Works International
 Contemporary Physics
 Cryogenics -London
 Dairy Industries International
 Doklady -Academy of Sciences of the USSR
 Drug Development and Industrial Pharmacy
 Engineering -London
 Engineering & Technology
 Engineering & Applications of Fracture Mechanics
 Engineering and Science
 Engineering Fracture Mechanics
 European Polymer Journal
 FLEXO
 Faraday Symposia -Chemical Society
 Glass Technology
 Glastechnische Berichte
 Gold Bulletin -International Gold Corporation Ltd.
 Helvetica Chimica Acta
 Hyomen
 Industrial & Engineering Chemistry Fundamentals
 International Chemical Engineering -New York
 International Journal of Biological Macromolecules
 International Journal of Engineering Science
 International Journal of Heat and Mass Transfer
 International Journal of Heat and Fluid Flow
 International Journal of Mechanical Sciences
 International Journal of Mineral Processing
 International Journal of Multiphase Flow
 International Journal of Pharmaceutics
 International Journal of Pharmaceutical Technology
 & Product Manufacture
 International Journal of Polymeric Materials
 Interceram
 Journal -American Ceramic Society
 Journal -American Chemical Society
 Journal -American Oil Chemists Society
 Journal -Chemical Society Faraday Transactions (1,2)
 Journal -Institution of Engineers. India
 Journal -Oil and Colour Chemists Association
 Journal -Physical Society of Japan
 Journal -Society of Dyers and Colourists
 Journal -Society of Rheology Japan
 Journal -Textile Institute
 Journal of Applied Mechanics and Technical Physics
 Journal of Applied Physics
 Journal of Applied Polymer Science
 Journal of Cellular Plastics
 Journal of Chemical and Engineering Data
 Journal of Chemical Physics
 Journal of Colloid and Interface Science
 Journal of Composite Materials
 Journal of Composites Technology and Research
 Journal of Computational Fluids
 Journal of Dairy Research
 Journal of Dental Research
 Journal of Dentistry -Bristol

Journal of Dispersion Science and Technology
 Journal of Electrical & Electronics Engineering.
 Australia
 Journal of Engineering Mathematics
 Journal of Experimental Biology
 Journal of Fluid Mechanics
 Journal of Food Science -Chicago
 Journal of Macromolecular Science B Physics
 Journal of Materials Science
 Journal of the Mechanics and Physics of Solids
 Journal of Non-Crystalline Solids
 Journal of Non-Newtonian Fluid Mechanics
 Journal of Non-Equilibrium Thermodynamics
 Journal of Parenteral Technology
 Journal of Petroleum Technology
 Journal of Pharmacy and Pharmacology
 Journal of Pharmaceutical Sciences
 Journal of Physics London (C) Solid State Physics
 Journal of Physical Chemistry
 Journal of Physics London (D) Applied Physics
 Journal of Physics London (E) Scientific Instruments
 Journal of Physics London (F) Metal Physics
 Journal de Physique
 Journal de Physique Letters
 Journal of Polymer Engineering
 Journal of Polymer Science. Polymer Physics Edition
 Journal of Polymer Science. Polymer Symposia
 Journal of Pulp & Paper Science
 Journal of Research -National Bureau of Standards
 Journal of Rheology -New York
 Journal of the Science of Food and Agriculture
 Journal of Scientific & Industrial Research
 Journal of Soil Science -London
 Journal of Statistical Physics
 Journal of Texture Studies
 Kagaku Kogaku Ronbunstu
 Kautschuk und Gummi Kunststoffe
 Keramische Zeitschrift
 Kovove Materialy
 Kunststoffe German Plastics
 Laboratory Practice
 Langmuir
 Lubrication Engineering -Illinois
 Macromolecules
 Magazine of Concrete Research
 Makromolekulare Chemie
 Materials Science & Engineering -Lausanne
 Materials and Structures
 Measurement and Control -London
 Mechanika Teoretyczna I Stosowana
 Modern Plastics
 Molecular Physics
 NLGI Spokesman
 Nature -London
 Oil & Gas Journal
 Particle Characterisation
 Petroleum Engineer
 Philosophical Magazine (A,B)

Philosophical Transactions -Royal Society (A,B)
 Physics & Chemistry of Glasses
 Physics & Chemistry of Liquids
 Physics of Fluids
 Physics Letters (General, A,B)
 Physical Review (A,B,C,D)
 Physical Review Letters
 Physica (A,B,C,D)
 Plastics & Rubber Processing Applications
 Polymer Engineering & Science
 Polymer -London
 Polymer Communications -Guildford
 Powder Technology
 Proceedings -Cambridge Philosophical Society
 Proceedings -Royal Society of London (A,B)
 Progress in Colloid & Polymer Science
 Przegląd Papierniczy
 Reports on Progress in Polymer Physics in Japan
 Research -London
 Reviews of Modern Physics
 Revue Roumaine des Sciences Techniques Serie Mecanique
 Appliquee
 Review of Scientific Instruments
 Revue de Chimie Minerale
 Rheologica Acta
 Rubber Chemistry & Technology
 SPE Drilling Engineering
 SPE Formation Evaluation
 SPE Production Engineering
 SPE Reservoir Engineering
 Science -New York
 Scientia Sinica Series A. -European Edition
 Scripta Metallurgica
 Silicates Industriels
 Sklar a Keramik
 TAPPI
 Takenaka Technical Research Report
 Textile Research Journal
 Transactions -Institution of Mining and Metallurgy.
 Section C
 Wear
 Wochenblatt fur Papierfabrikation
 Zeitschrift fur Metallkunde
 Zeitschrift fur Physikalische Chemie -Frankfurt
 Zeitschrift fur Physikalische Chemie -Leipzig
 Zellstoff und Papier
 Zement Kalk Gips

* This is a list of the journals which Rheology
 Abstracts has abstracted in the past. It would be most
 helpful if members could let me know:-
 - if there are any journals which we should include
 in the list
 - if you are willing to abstract any of these
 journals

Editor: Rheology Abstracts

Geoff Brownsey

MEMBERSHIP NEWS

The following applications for Membership of the British Society of Rheology were approved at the Council Meeting on the 13th September, 1989

Mr N J Collins
 Rubberoid Building Products Ltd
 Brimsdown
 Enfield
 Middlesex

fesa

Mr T Dobbie
 Rosand Precision Ltd
 11 Little Ridge
 Welwyn Garden City
 Herts

Mr J Haunton
 Dept. of Materials Science
 Brunel University
 Uxbridge
 Middlesex

fetsa

Mr M J Holloway
 Dept. of Materials Technology
 Brunel University
 Uxbridge
 Middlesex

Mr M Proto
 Stevens AWS Ltd
 Roding House
 Oakwood Hill Industrial Estate
 Loughton
 Essex

fea

Dr K L Rabone
 Unilever Research
 Port Sunlight Laboratory
 Quarry Road East
 Bebington
 Merseyside

fetsa

Mr S Robertson
 Stevens AWS Ltd
 Roding House
 Oakwood Hill Industrial Estate
 Loughton
 Essex

fetsa

Dr W A Worraker
 UKAEA Harwell Laboratory
 BLDG 392.4
 Didcot
 Oxon

ftsa

Membership Classification Scheme

The symbols which follow membership entries indicate the interests of the members according to the following classification:

- f* member's main interest is rheology
- p* rheology is a secondary interest
- e* approach is experimental
- t* approach is theoretical
- s* area of work is pure science
- a* area of work is technology
- A* metals
- B* composites
- C* solid polymers
- D* molten or dissolved polymers
- E* natural fibres
- F* liquid—liquid systems
- G* liquid—solid systems
- H* particulate solids
- I* glasses, ceramics
- J* oils, greases
- K* building and road materials
- L* foodstuffs
- M* biological materials
- N* theoretical models
- O* other systems

THE GOLDEN JUBILEE

Plans for the meeting in Edinburgh are developing steadily.

The dates are **Sunday 2nd - Friday 7th September** this year (1990); you hadn't forgotten, surely?

First good news:

The deadline for early registration at a reduced fee is being extended. It was 15th February but this Bulletin may not reach you until then or slightly after. The organisers have therefore decided to take a risk for your benefit and accept registrations at the reduced fee (see registration form and details in the last Bulletin - volume 32, number 3, pages 114-116) until one week after the receipt of this Bulletin.

HURRY - THIS IS POSITIVELY THE LAST CHANCE TO SAVE MONEY

Make sure a cheque for the deposit reaches me at Newcastle University within the week.

Second good news:

Honorary members should each have received a letter from the organisers encouraging them to attend, asking for their views and offering a reduced rate to those who are no longer working. We cannot extend the offer generally because the Society has finite resources, but hope that the intention of some honorary members to attend will encourage other long-established members to make a special effort to join the celebration.

The programme:

We have offers of papers from 23 countries, and that number could increase since there are some countries with rheology societies which have not yet offered any papers. We hope to welcome a representative of every rheology society to the meeting, whether we get a paper from every country or not. To date (20th December) there are over 160 papers, and we shall not be surprised if this goes up to nearer 200 even though the deadline is already well past. Clearly we shall have to break with Society tradition and hold parallel sessions (probably three in parallel) but there will be some plenary sessions when delegates will not have to make any decision about where to go.

Gold medal addresses by Professor Sir Sam Edwards and Professor Hanswalter Giesekus are at present scheduled for Thursday 6th September, one in the late morning and one in the afternoon. The topics of these are not yet decided. Sir Sam Edwards has given the rheology of foams and soft solids as his provisional topic while Professor Giesekus plans to offer a

personal view of the development of constitutive equations for viscoelastic fluids. A third plenary lecture is to be delivered by Professor Alex Malkin on some inverse problems in rheology (such as - "Can you deduce the molecular weight distribution of a polymer from its relaxation spectrum?" - my words, not the speaker's).

Materials whose rheology is discussed include solutions, suspensions, slurries, pastes, paints, gels, foods, polymers and many more and approaches range from very practical engineering to theoretical and academic. Numerical simulation, rheo-optics, extensional flow, liquid crystals, rheometry and non-linear effects are topics which each attract the attention of several speakers. A number of keynote speakers are being invited to address topics from this list.

Timetable:

Authors who have offered papers should have heard from us in January or early February. A letter and copy of the registration form will have been sent from Newcastle and instructions for the preparation of three-page extended abstracts will be sent out by Elsevier. We must have abstracts back (to Dr Ralph Oliver, Department of Chemical Engineering, University of Birmingham) in camera-ready form by mid-April so that Elsevier can produce the book in time for the conference.

Participants who register should not expect to hear until much nearer the time of the conference, when maps and useful information will be sent out. Seven fully-paid registrations have already been received and for the second time the I have organised a conference the first registration fee came from a participant from ICI. Other companies have been donating money to help us make the conference a memorable one, and we shall record our gratitude publicly in a later issue of this Bulletin.

Anyone interested in participating in the exhibition (of rheological instruments and publications) should contact Mrs Carole Moules (address inside the front cover of this Bulletin) as soon as possible.

Last words:

- last for this issue anyway - We hope the non-rheological programme will be as attractive to everyone as the rheological programme is (to the fanatics). We have booked Stirling Castle for the reception on the Monday evening, which is magnificently situated and promises to make that a memorable event.

See you all in Edinburgh?

Chris Petrie.

Footnote:

Does more need to be said about our plenary lecturers? **Professor Sir Sam Edwards F.R.S.** is Cavendish Professor and Head of the Department of Physics in the University of Cambridge. He has talked to the Society before (in 1977, in Edinburgh, on the theory of rubber elasticity) and gave the Treloar Memorial Lecture more recently. **Professor Dr. rer. nat. Hanswalter Giesekus** recently retired from his chair at the University of Dortmund and from the post of Executive Editor of *Rheologica Acta*, and he too has addressed the Society on a number of occasions, showing memorable films as well as deep insight. **Professor Dr. Sc. Alex Malkin**, of the Research Institute of Plastics in Moscow, has not (as far as I know) addressed the Society before. He was a colleague of the late Professor George Vinogradov whose visits to Society conferences many of us do remember, and he himself gave one of the plenary lectures at the second European Conference in Prague in 1986.

***A systematic treatment of the linear theory underlying
the behavior of viscoelastic materials!***

N. W. Tschoegl, Pasadena, CA, USA

The Phenomenological Theory of Linear Viscoelastic Behavior

An Introduction

1989. XXV, 760 pp. 227 figs,
25 tabs. Hardcover DM 148,-
ISBN 3-540-19173-9

This book provides a full exposition of the theory of linear viscoelastic behavior and is intended for scientists, practicing engineers, teachers, and students. The theory applies to polymeric materials and to metals and ceramics. Differential calculus and the rudiments of complex variable theory are the only mathematical tools required. The presentation uses the Laplace transformation. The transformation calculus is summarised in an Appendix. The book's 11 chapters contain sets of problems whose fully worked solutions are included.



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DEFORMATION, YIELD AND FRACTURE OF POLYMERS

8-11 April 1991, Churchill College, Cambridge, UK

The Churchill conferences, held triennially since 1970, have established this event as the leading conference on its subject worldwide. The last meeting in 1988 was attended by a capacity audience of over 250 delegates and included 34 presented papers and 60 poster papers of a truly international character.

The next meeting in April 1991 will review developments and identify trends in the scientific understanding of the deformation, yield and fracture of polymeric materials.

Contributions:

Both presented (lecture) papers and poster papers are invited on novel work within the theme of the Conference. The Organisation committee has compiled the following list of topic areas relevant to the conference and for which offers of papers are invited, although the list is not intended to be exhaustive:

- Deformation of amorphous polymers
- Deformation of crystalline polymers
- Liquid crystalline polymers
- Computer modelling
- Toughening mechanisms
- Crazing and fracture
- Fatigue and Impact
- Lifetime prediction
- Mechanisms of polymeric interfaces
- New measuring techniques
- Elastomerics

Timetable:

Abstracts of 2-300 words should be sent, with the attached form, to the PRI Conference Department (address below) by 1 September 1990. Authors of accepted papers will be advised by 21 October 1990 and extended abstracts (about 2,500 words) will be required by 1 January 1991.

All accepted papers, lecture and poster presentations, will be printed in the book of conference papers, and four pages of the text will be allocated to each author. Special manuscript paper will be provided for this purpose. This will not prejudice subsequent full publication of the work.

Presentations and all written material will be in English and at least one author from each paper will be expected to attend the conference to present the work.

The Conference is organised by the Plastics and Rubber Institute in association with The British Society of Rheology, the Institute of Physics and the Macro group.

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 Prof A F Yee - University of Michigan, USA

CONFERENCE DIARY

Date	Place	Details
3/90	Liverpool, U.K.	'Rheology of fresh cement and concrete' contact: Dr P.F.G.Banfill, School of Architecture and Building Engineering, University of Liverpool, P.O.Box 147, Liverpool L69 3BX, U.K.
17-20/5/90	Nice France	Sixth Annual Meeting of the Polymer Processing Society contact: Michel Vincent - CEMEF, Ecole des Mines de Paris, Rue Claude Daunesse - Sophia Antipolis, 06560 Valbonne, France.
5/90	Montpellier France	'Unilateral contact and dry friction' contact: Prof J.J.Moreau, Laboratoire de Mécanique Générale des Milieux Continus, USTL, 34060 Montpellier Cedex, France.
2-4/7/90	Vienna, Austria.	'The effect of phase transformation in solids on constitutive laws' contact: Prof F.G.Rammerstorfer, Institute of Light Weight Structures, Technical University, Gußhausstraße 27-29/317, 1040 Vienna, Austria
23-25/7/90	Brno Czechoslovakia	'International Symposium on Polymer Analysis and Characterization' contact: Dr Josef Janca, Inst. Analytical Chem., Czech. Acad. Sci., Leninova 82, 61142 Brno, Czechoslovakia.
24-26/7/90	Cambridge U.K.	'Polymer Blends' contact: Dr D.J.Hourston, Dept. of Chemistry, University of Lancaster, Bailrigg, Lancaster, Lancashire LA1 4YA, U.K.
27-30/8/1990	Hamburg, W Germany.	'The time-dependent behaviour of ice' contact: Professor O. Mahrenholz, Technische Universität Hamburg-Harburg, Eissendorfer Strasse 38, 2100 Hamburg 90, German Federal Republic.

- | | | |
|------------|------------------------------|--|
| 3-7/9/90 | Edinburgh,
Scotland, U.K. | 'Third Conference of European Rheologists'
and 'Golden Jubilee Meeting' British Society
of Rheology', contact Dr. C.J.S. Petrie,
Dept. of Engineering Mathematics, University
of Newcastle upon Tyne, Newcastle upon
Tyne, NE1 7 RU, U.K. |
| 3-6/12/90 | St. Etienne,
France. | 'Experimental identification of the mechanical
characteristics of composite materials and
structures', contact: Prof A.Vautrin,
Dept. Mechanical and Materials Eng., Ecole des
Mines de St-Etienne, 42023 St.Etienne Cedex 2,
France. |
| 7-12/1/91 | Tucson
Arizona
USA. | 'Third International Conference on
Constitutive Laws for Engineering Materials:
Theory and Application,
contact: Professor C.S.Desai, Dept. of Civil
Engineering and Engineering Mechanics, Univ.
of Arizona, Tucson, AZ 85721, USA. |
| 15-17/1/91 | Aussois
France | 'Response of shear flows to imposed
unsteadiness'
contact: Dr G.Binder, Institut de Mécanique
de Grenoble, B.P. 53 X, 38041 Grenoble Cedex,
France. |

CASE Studentship in Rheology

The Department of Mathematics of the University of Manchester Institute of Science and Technology is seeking a research student to work on a project involving the construction of constitutive equations for liquids with micro-structure such as biological systems including margarines, ice cream, creams and concentrated emulsions used for the preparation of highly porous membranes.

The student should have a background in engineering, physical science or mathematics. He will be required to spend some of his time working at the Port Sunlight laboratories of the industrial partner, Unilever Research. When living away from Manchester appropriate expenses will be paid. The standard SERC studentship will be supplemented. The usual conditions of eligibility for SERC awards apply. A suitable candidate could be appointed now but students graduating in 1990 are encouraged to write to:

Dr A Kaye
Department of Mathematics
UMIST
PO Box 88
Manchester M60 1QD



MEETINGS

The Annual Meeting of the Society is normally held in mid-October. This meeting attracts about 250 registrants and is organized in such a way as to promote interactions between rheologists interested in different materials and in taking different approaches to solving rheological problems. There are normally no more than three simultaneous sessions, and the program includes plenary lectures, special symposia, informal evening discussions, and instrument exhibits. A banquet is held to honor the recipient of the Bingham Medal, which has been presented annually since 1948 to a North American rheologist who has made an outstanding contribution to the science of rheology. The Annual Meeting for those years during which an International Congress is held (1988, 1992, etc.) is held early in the following year.

PUBLICATIONS

The *Journal of Rheology*, published eight times per year, is the archive publication of the Society and evolved from the *Transactions of the Society of Rheology*, which first appeared as an annual publication in 1957. The *Journal* maintains a high standard of quality and endeavors to carry out its review process with minimum delay. The *Rheology Bulletin* is published twice a year and carries news of Society activities and other items of interest to rheologists. All members receive both the *Journal* and the *Bulletin* at no extra cost. Members also receive in advance the program and abstracts for the Annual Meeting. The Society publishes a membership directory at regular intervals.

AN INVITATION

If you have an interest in rheology, you are invited to apply for membership using the enclosed application form. In order to help us make our membership directory as useful as possible, please supply as much as possible of the information requested on the form. Dues are for a calendar year. You may start your membership on January 1 of either the present year or next year. In the former case, you will receive all the issues of the *Journal* for your first year of membership. If

The Society of Rheology

The Society of Rheology was founded in 1929 to foster the study of the mechanical properties of deformable materials. Through its Annual Meetings and the publication of the *Journal of Rheology*, the Society provides a forum for engineers, chemists, physicists, polymer scientists, food scientists, material scientists, biologists, and applied mathematicians to communicate current research in rheology. The present membership of about 1400 is sufficiently small that the Society is able to respond quickly to their needs. The Society brings together a broad spectrum of individuals from academic, industrial, and governmental organizations whose interests include experimental methods, constitutive equations, material processing, flow of non-Newtonian fluids, mechanical behavior of solids, and rational mechanics. Materials of interest include, among many others, polymers, paints, foods, biological fluids, and petroleum production fluids. The approach ranges from mathematical theory to industrial practice. A primary objective of the Society is to facilitate communication among rheologists interested in a wide variety of materials; between engineers and academics; between theoreticians and experimentalists.

The Society of Rheology is one of five founding members of the American Institute of Physics, which provides administrative services to the Society. By virtue of this affiliation, all members of the Society receive *Physics Today* at no extra charge. The Society is also a member of the International Committee on Rheology, which organizes the International

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Polymer Melts and Conc. Solns.	I
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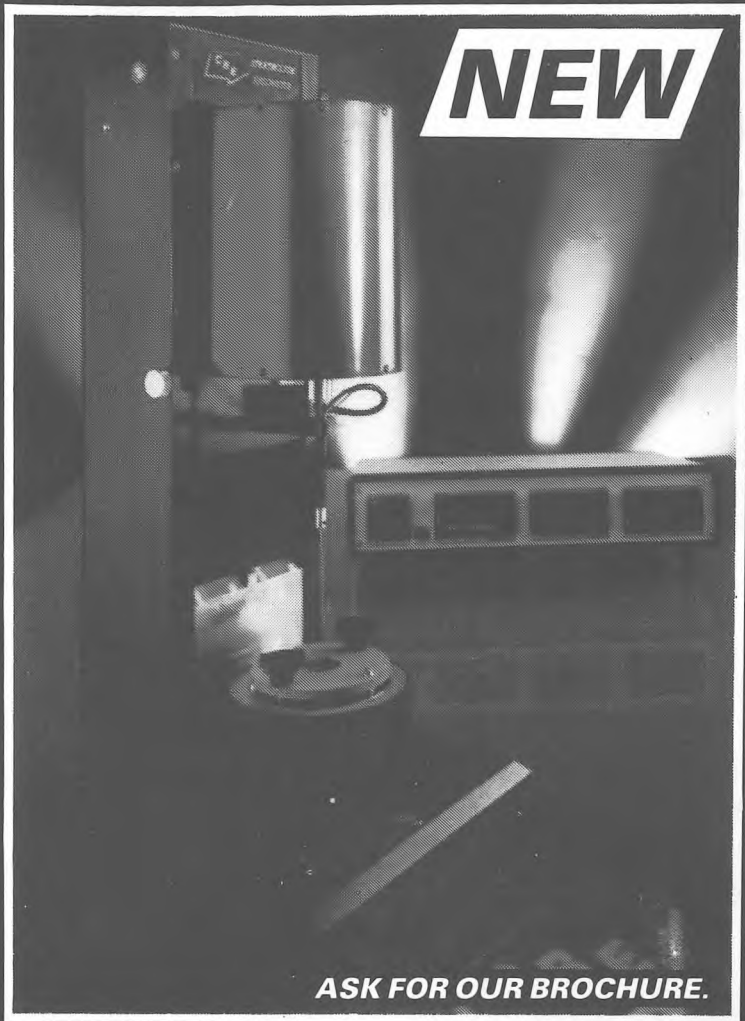
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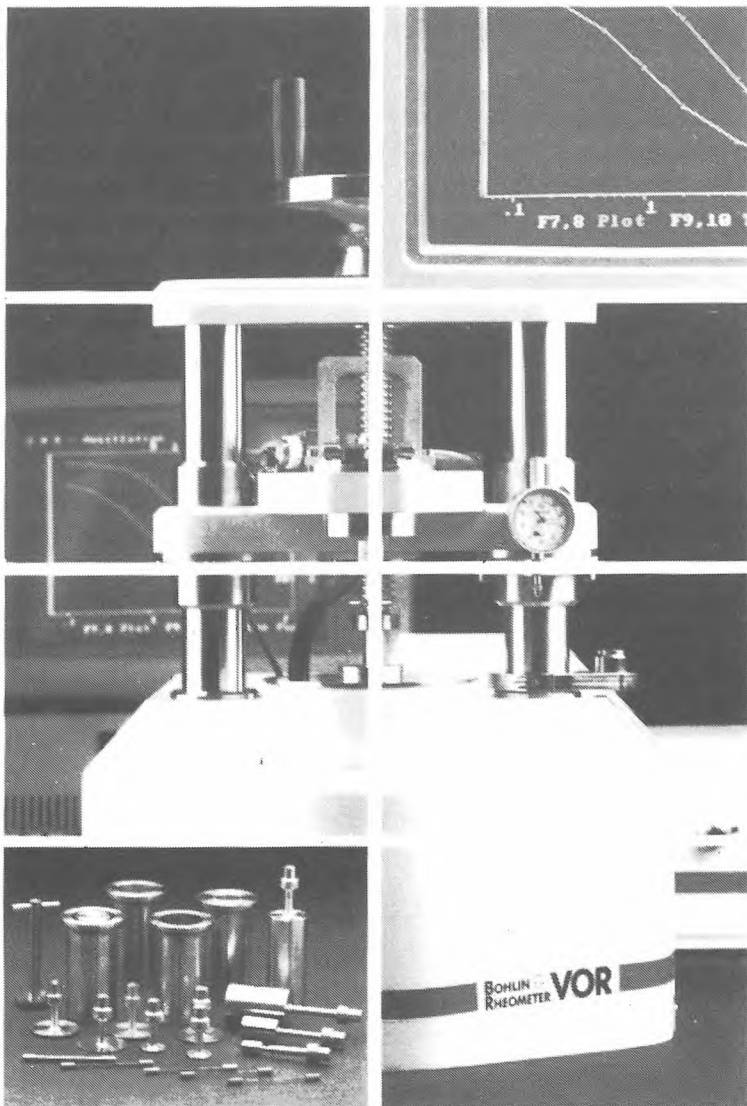
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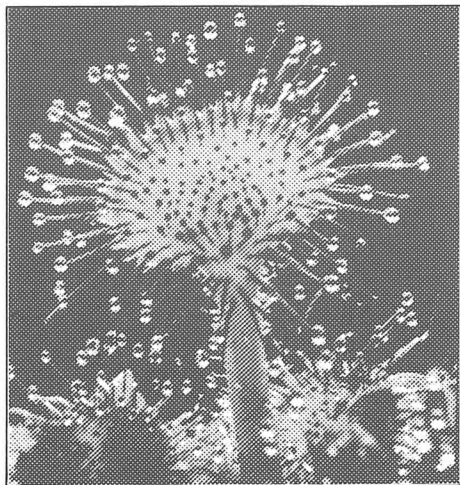
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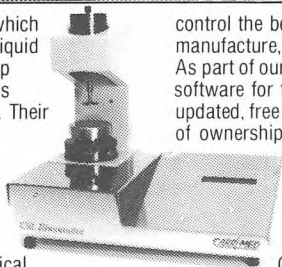
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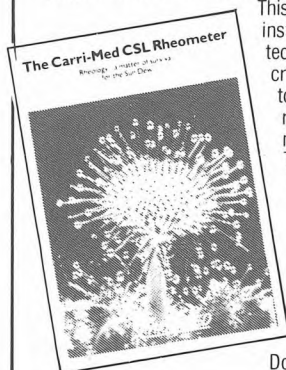
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