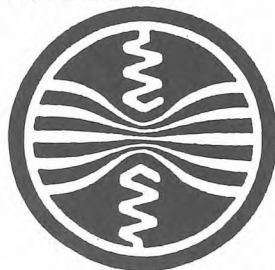


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THE BRITISH SOCIETY OF RHEOLOGY

BULLETIN



1989, Vol. 32 No. 3

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THE BRITISH SOCIETY OF RHEOLOGY
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1989/90

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EDITORIAL

We enter the society's fiftieth year, the climax of which will be the Golden Jubilee meeting at Edinburgh. This will also be the third European Rheology Conference and the organisers confidently expect a very large international audience. Chris Petrie, who is at the forefront of the organising team, urges you to attend this very important occasion and he will be providing further information as the event approaches.

This year sees some notable changes in the officers and members of the BSR council. After many years as a member and officer, Ralph Oliver steps down (temporarily, I'm sure). We will miss his experience and humour at council meetings. Tony Evans and Steve Aldhouse also complete their terms as officers. I'm sure the members would wish to congratulate these three for the excellent work they have done for the society.

This issue contains the first of what will become a regular feature of the Bulletin - 'Commentary'. Each quarter a different member of the council will give members an insight into the inner workings of the society's council meetings. Carole Moules starts us off with the September meeting.

The librarian of the Hugh Owen library at Aberystwyth has asked me to inform members that they may borrow items from the Scott Blair collection (see index in previous Bulletin) through their own local libraries using the normal inter-library loan service.

Congratulations are in order for Howard Barnes, my predecessor as editor of the Bulletin. He has been chosen as 'researcher of the year' by his company, Unilever Research and also has co-authored a new book on rheology with two past presidents of the society, John Hutton and Ken Walters. Well done Howard.



Peter Townsend

Peter Townsend

PRESIDENT'S REPORT

I am happy to report that during the last year the Society has made significant advances in several fronts, our Conferences have been well attended, of a uniformly high quality and a number of new initiatives have been taken up.

Following the award of the Scott Blair Scholarship, Pergamon Press offered a Biorheology Scholarship to be presented annually to a member of the Society. The first recipient, Mr. A. Nanthiananthan from the Pharmacy Department at London University received the award at the Warwick meeting.

There has been a significant rise in membership as you will see from the Membership Secretary's report. This has been due to the recruitment drive through the Bulletin and the members brought in as a result of a new venture, the course in rheology put on by the Society at Birmingham University. The effort to bring in new members will continue, possibly with a more international flavour this year. Further development in rheology education are also being pursued and there is a possibility of the European School of Rheology being set up as an annual event funded by the EEC.

It is one of this President's preoccupations that you should be kept informed about what your Council is up to. Starting with the Council Meeting just held at Warwick, one of the Council members will write a commentary on the meeting and this will be published in the Bulletin. The view will be a personal one and should serve to make everyone feel more involved in the work of the BSR.

Possibly the most memorable event of the past year has been the Legacy of £10000 left to the Society by the widow of the late Dr. Scott Blair. The conditions attached are somewhat restricting in that the money is to be used to enhance the facilities at the Library of the University College of Wales, Aberystwyth, associated with the collected works of her late husband. Your Council has several proposals in hand as how best to use the legacy and suggestions from the membership would also be warmly welcomed.

The Council has taken a decision to award two Gold Medals to mark the Society's Golden Jubilee Meeting and the Third Meeting of European Rheologists in Edinburgh, to be held 3 to 7 September 1990. These will go to Sir Sam Edwards and Professor H-W Gieseckus. The

awards and the Gold Medal Addresses will both be made at the Edinburgh Meeting.

Another very pleasing event during the year has been the proposal from one of our very prominent members to donate a Presidential Chain to the Society. The name of the donor will be announced in due course but it is sufficient to say at this stage that the Council was delighted to be able to accept this most generous offer. The presentation will also be made in Edinburgh.

As a final remark on the subject of the Golden Jubilee Meeting. We are actively seeking sponsorship from industrial concerns for the event. If your firm would wish to be associated with this prestigious conference, and benefit from the attendant publicity, please contact Carol Moules, or Peter Anderson (addresses at the front of the Bulletin).

Finally can I close by saying that it has been a very special pleasure to make the Annual Award to Dr. John Benbow. A former President, his qualifications will be described elsewhere, however no-one could have been more deserving.

Jim Ferguson



Dr. John Benbow receives his Annual Award Certificate from the President, Dr. Ferguson, at Warwick Castle.

REPORT OF THE HONORARY SECRETARY

The Society has held two successful meetings over the past year. "Conundra Rheologica", at the Royal Holloway and Bedford New College in Egham in September 1988 was organised by Peter Anderson and Carole Moules, and was very well attended. A one-day meeting, "Rheology in the Laboratory", was held at the University of Birmingham in Spring this year. This meeting, which was structured as an introduction to rheology for technicians, was organised by Ralph Oliver and Carole Moules, and resulted in 38 applications for Membership.

Regarding future meetings, the Annual Meeting next September will be the Golden Jubilee meeting, which will be held in Edinburgh. Chris Petrie is leading the organisation team, and around 500 delegates are expected. This meeting is also going to be the Third Meeting of European Rheologists.

Doug Hourston is organising a one-day meeting in London in December 1989 on "Rheology of Latices", and Phil Banfill is arranging a conference at Liverpool in March 1990 on the "Rheology of Fresh Concrete".

Additionally, this Society is participating in November in the inaugural meeting of the Portuguese Society of Rheology, which will take place in Lisbon. A healthy contingent of both speakers and delegates from the Society will be attending.

As you can see, the Society has a very active and varied programme of meetings. Having observed at first hand the enormous amount of paperwork and effort needed to ensure the smooth running of this present conference at Warwick, many thanks must go to the organisers of these functions for their tireless efforts.

Sadly, Mrs. Scott Blair, the widow of our Founder, passed away earlier this year. She left a bequest of £10,000 to the Society, to be used for the maintenance and improvement of the Scott Blair collection, i.e. those papers donated by Dr. G.W. Scott Blair to the Society, and kept in the Library at the University College of Wales in Aberystwyth. The money had been deposited in a high-yield deposit account whilst decisions were made upon the best way of applying the funds. Suggestions which have been made so far by Council Members

include funding travelling scholarships, buying new or duplicate books to compensate for wear and tear, binding loose papers properly, subscribing to Journals which the library would not otherwise take, recording the collection on microfiche, and providing improvements to facilities. Any other suggestions from Members would be very welcome.

One of our members has kindly offered to donate a Presidential Chain of Office to the Society. It was hoped that the Chain would be available by the Golden Jubilee meeting, and that the names of all past and future Presidents would be engraved on suitable links in the Chain.

Finally, sales of ties have been quite slow over the last year, although this has improved at this present meeting. If anyone would like a Society tie, they are available from me at a price of £5.50 including postage and packing.

Roy Carter



Dr. J. Ferguson, President of the Society (Centre) with Mr. A. Nithiananthan, the First Pergamon Scott Blair Biorheology Scholar, and Mr. R.A. Speers, the First BSR Scott Blair Scholar, pictured before the conference banquet at Warwick Castle.

Report of the Editor of 'Rheology Abstracts'

Regrettably, this year's issue number 1 was bedevilled with problems during typing and printing. Issue number 2/3 is now with the printers. The number of abstracts so far included is 320, which is down on previous years. This is, I believe, no reflection on the assiduous efforts of our contributors, but reflects a dispersion of rheological effort into a wider range of areas. This is a tendency to be applauded, but means that a wider range of specialist journals may need to be scanned. I would ask members to assist my successor by drawing his attention to, or better, sending in contributions from, such journals.

Rheology Abstracts continues to boost the Society's funds and to be of use to members, although not always in a conventional manner. One member received an issue containing only blank pages - it must have made a splendid notebook! For the material which did appear in print, I am indebted to -

Mr. P.C. Anderson
 Dr. P.F.G. Banfill
 Dr. K.M. Beazley
 Dr. J.J. Benbow
 Dr. G.J. Brownsey
 Dr.R. Buscall
 Dr. C.E. Chaffey
 Dr. R.A. Dawe
 Dr. G.M. Downs

Dr. D.M. Heyes
 Dr. K.G. Hutchinson
 Dr. T.C.B. McLeish
 Dr. D.R. Oliver
 Dr. S.M. Richardson
 Prof. J.F. Steffe
 Mr. T.A. Strivens
 Dr. J. Vincent
 Prof. I.M. Ward

S.T.E. Aldhouse.

MEMBERSHIP NEWS

The following applications for Membership of the British Society of Rheology were approved at the Council Meeting on the 7th of July, 1989

Stephen John Riley fesa
Polymer Laboratories Ltd.,
Epinal Way,
Loughborough. LE11 OQE

Nancy van Uffel fesa
Plastics and Chemicals Lab.,
Bazellaan 1,
1140 Brussels.

Gertrud Bohlin, fesa
Bohlin Reologi,
Science Park Ideon,
S-223 Lund.

Martin Rides, fetsa
National Physical Lab.,
Queens Road,
Teddington,
Middx.

William A. Gerrard, fea
Beechams Prod. Research,
St. Georges Ave.,
Weybridge,
KT13 ODE

Raoul Smith, fetsa
Carrimed Ltd.,
Vincent Lane,
Dorking.

Tahir Naseem Qazi, feta
University of Birmingham,
Birmingham,
B31 2TT

Krystyna Fielden,
The Wellcome Foundation,
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Dartford,
Kent.

Adrian Merrington, fetsa
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Dartford,
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Andrew Richard Buckley,
Stable Micro Systems Ltd.,
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Haslemere,
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Simon James Shilton,
Fibre and Textile Res. Unit,
Dept. of Pure and Applied Chemistry,
Thomas Graham Building,
University of Strathclyde,
Glasgow G1 1XL

John Mark Bilney, fetsa
Sturge Lifford,
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Neil Christopher Thomson,
Sturge Lifford,
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B30 3JW

feta

Miss Ping Gao,
Department Chemical Engineering,
University of Cambridge.

fetsa

Michael Geoffrey Sayer,
Shell Research Ltd.,
Sittingbourne,
Kent
ME9 8AG

peta

BRITISH SOCIETY OF RHEOLOGYREVENUE ACCOUNT for the year ended 30th JUNE 1989

	<u>1989</u>	<u>1988</u>
<u>Expenditure</u>		
Council Expenses	2782	1944
Bulletin Production Costs	3624	2845
Expenditure by Officers;-		
Secretary	255	55
Treasurer	13	13
Membership Secretary & Circulation	<u>1160</u>	<u>952</u>
Professional Fees	1428	1020
Insurance	167	163
Awards	80	64
Miscellaneous	310	320
Depreciation:-	17	20
Word Processor	155	154
Memorial Lectures	-	991
Student Grants	600	-
Purchase of Ties	-	778
	<u>9163</u>	<u>8299</u>
<u>Excess of Income over Expenditure</u>	<u>3408</u>	<u>1303</u>
	<u>£12571</u>	<u>£9602</u>
<u>Income</u>		
Annual Subscriptions and Entrance Fees	2368	2101
Publisher - Rheology Abstracts	3327	3707
Advertising	1790	1125
Bulletin Subscriptions	200	220
Sale of Ties	92	114
Bank Deposit Interest	2597	1906
Conferences - Net surplus per account below	2197	429
	<u>£12571</u>	<u>£9602</u>
<u>Conferences Account</u>		
Surplus or (Deficit) after expenses		
Bath	-	145
Canterbury	-	435
Brunel	-	345
Egham	1938	(496)
Warwick	(90)	-
Birmingham	349	
	<u>£2197</u>	<u>£ 428</u>

BRITISH SOCIETY OF RHEOLOGYBALANCE SHEET as at 30th June 1989

<u>ASSETS</u>	1989	1988
<u>Fixed Assets</u>		
Word Processor at cost	618	618
Less: Depreciation to date	<u>309</u> 309	<u>154</u> 464
<u>Current Assets</u>		
Cash at bank		
Special Deposit Account	24127	23066
Deposit Accounts	1817	1078
Current Accounts	<u>2212</u> 28156	<u>3006</u> 27150
Sundry Debtors and Prepaid Expenses	<u>3987</u>	<u>945</u>
	32452	28559
<u>LIABILITIES</u>		
<u>Current Liabilities</u>		
Sundry Creditors	<u>773</u>	<u>288</u>
	£31679	£28271
<u>Scott Blair Legacy Fund Assets</u>		
Bank Special Deposit Account	<u>10013</u>	-
	<u>£41692</u>	<u>£28271</u>
<u>General Fund</u>		
At 1st July 1988	28271	26968
Add: Excess of Income over Expenditure in year	<u>3408</u>	<u>1303</u>
	£31679	£28271
<u>Scott Blair Legacy Fund</u>		
Legacy received	10000	
Bank deposit interest	<u>13</u>	
	<u>10013</u>	-
	<u>£ 41692</u>	<u>£28271</u>

... *Anthony Evans* ... Hon. Treasurer

We have examined the books of account of the British Society of Rheology and report that to the best of our knowledge the above Balance Sheet and Revenue Account are in agreement therewith.

Chancery House
3 Hatchlands Road
REDHILL, RH1 6AA

ALFRED SIMMONS & COMPANY
Chartered Accountants

COMMENTARY

The final council meeting of our year is held at the Autumn Conference and previously one day before the AGM. This year it is to be one hour before the AGM (more on that later).

This particular meeting on Wednesday 18th September marks a significant change from previous occasions. The decision of council (inner secrets) and the ways in which they are implemented (undercover) are to be leaked by a 'MOULLES' to the Editor of the Bulletin.

During the reign of our present president, Dr Ferguson, and no doubt beyond, regular commentaries of council meetings will continue via a variety of amateur journalists to keep the rank and file aware of the amount and range of work which is carried out by Council members on your behalf. By the next AGM no doubt 'would be' officers and ordinary members of Council will need to canvas for your votes. When will a woman become President? Our numbers are increasing at the conferences, one even asked for a token for women members similar to ties for men!

All this preamble is to fill my commentary because the meeting prior to the AGM is restricted by time and hence not filled with stimulating deeds. Once we let members out from the lecture theatre at the end of the days proceedings the number who will return for the AGM decreases exponentially with an increase in time. Critical Q(quorum) is reached at around 65 mins and an air of trepidation fills the Council chamber (lecture theatre) as the audience leaves. Your secretary who has had to organise this last council meeting after the days proceedings and prior to the AGM, through a 'wise' decision made at the 3rd meeting of our year, visibly blanches.

The last of the audience leaves the lecture theatre at 17.13, the President commands the secretary to 'come and sit here' indicating the desk at the front of the room behind which he is standing.

The secretary moves to lean upon the side of the desk and 5 other members of the council sit haphazardly in the pews. What a change from the normal hotel room neatly laid out with table, chairs pencils, squash, water and sweets.

After hearing apologies from two council members at 17.14 there is a temporary halt as a conference organiser comes in with money from a potential new member to the BSR. A further minute is wasted when the money is dropped on the floor and your membership secretary hastily scrambles to recover it for our funds. Schimanski's a Scotsman!

Rumours of a broken axle and a man without a bed filter through the group. Jim and Roy (we use Christian names in private) remain standing - perhaps this is the way to speed up the meeting.

While I ponder this point I missed the decision about a May '90 meeting about on-line viscometry. If you are interested keep a gap in your diary.

Apparently we have no nominations for Council from the membership - apart from a hiccup last year this is normal. Thank goodness we on Council do this for you. No voting at the AGM means that an extra 5 mins can be spent at the bar.

I realise Jim is sitting, but not for long, at 17.24 he is back on his feet in time to accept the apologies of Peter T and Richard who rush in red and flustered having been sent to the wrong room by a college receptionist. It was a TV room. What time is Neighbours on?

A scoop for this column, Jim decrees I can announce next years Gold Medal Award winners. Yes, plural.

To mark our Golden Jubilee and Third European Conference next September we are very pleased to inform you that Sir Sam Edwards and Professor Geisekus, both highly regarded rheologists, have been awarded and have accepted the highest honour the BSR can confer.

Jim says he has arranged for John Benbow to be presented with the Annual Award at the AGM rather than in the cellars at Warwick Castle, the venue of the conference dinner. Is this to keep the numbers up?

General nods of approval for Alex Speers' lecture following his first year as the BSR recipient of the Scott Blair Scholarship.

Suddenly I see our President is sitting but no he bounces up again at 17.44 to announce the officers reports. First comes our treasurer, Jim will surely sit now and savour his soliloquy. Yes I do know it's thoughts spoken by a person while alone!

17.47 It's all over, we have a further increase in our funds and we have moved on to the next report. Did the clock stop?

More increases in membership boosted by the attendees at the Conference are approved.

More increases in advertising thus more income to offset the extra contents of the bulletin, which last time included a catalogue of the BSR's Scott Blair Collection, are applauded.

It's 18.01 and Tony is calling for the door to be opened. Why are the rest talking about the venue for the December meeting? I agree with Tony, open the doors quickly, the hum of voices surrounding the exhibits outside has dropped. Has someone turned off the computers, are there no games to keep our quorum?

Jim adjourns the meeting - the doors are opened.

Council meeting resumes

19.20 Jim and Roy are still standing, the AGM is over, it was well attended and we are all relaxed. There is a new face on Council - Geoff Brownsey and a familiar one missing, Ralph Oliver taking a well earned rest.

At last we have an important decision to make, 'who is to be President Elect?'

Vote taken, white smoke appears, Xmas pudding in London and away to dinner.

GOLDEN JUBILEE MEETING

As members may have realised, next year marks the fiftieth anniversary of the founding of the British Rheologists' Club. Ten years later, amid much anxious discussion, we (or rather our predecessors) changed the name to the British Society of Rheology. At that time the President was Dr. G. W. Scott Blair, the Secretary Dr. E.W. J. Mardles, the Editor (of the Bulletin which at the time incorporated Rheology Abstracts), Dr. V. G. W. Harrison and the Treasurer Dr. J. G. Oldroyd. Older members of the Society will know all these names, and no rheologist should be ignorant of the contributions to the science and to this society of some of them.

Enough of the past (for now) - the present is occupied for some of us in planning and organizing for a major scientific celebration which we hope will attract many more of the members of the society than are able to attend the regular meeting of the society. Details are given elsewhere in this Bulletin; the message of this note is simple:

Come to the Golden Jubilee Conference in Edinburgh.

Put the dates, Sunday 2nd September to Friday 7th September 1990 in your diary now and fill in and send off the registration form as soon as you can. If you can offer a paper, offer it soon; if not, come and hear what others have been doing in the name of rheology and don't let them get away with any nonsense. If you have any ideas about the way we might celebrate, do let us know - write or talk to any of the organizers or any Council member.

The meeting is also the Third European Rheology Conference and we expect a substantial number of rheologists from all over the world to participate. Already papers have been offered from Australia, Canada, Czechoslovakia, France, Germany, Italy, Japan, Poland, U.S.A., and U.S.S.R., (to name just the first ten countries that come to mind). The Council of this Society has invited presidents

or their representatives from every other national society of rheology and most have already accepted the invitations. The organizers hope that we can at least equal the successes of the First and Second European Conferences (in Graz in 1982 and Prague in 1986) - to do that we need a really good attendance of British rheologists, young and old.

As well as being a scientific occasion of the first rank, the meeting in Edinburgh next September will be an occasion for nostalgia and for thinking about the next fifty years. If you can remember the days of the British Rheologists' Club then come and tell us what it was really like, and see whether the atmosphere of the club can be recreated - do you, for example, know the words of the Rheogoniometer Song? (I don't, though I heard it once, long ago). If you are not interested in the past, see what you can contribute to the present and try to influence the future, rheologically speaking, at least.

Final test - can you remember the dates without looking back? If you can, there's no reason why you shouldn't send off the registration form straight away. If you can't then clearly your brain needs the stimulation that only the Golden Jubilee can provide. If you can't stand the style of this exhortation, don't let that put you off. In fact register even sooner than you might otherwise have done; if every member has registered by December then I won't need to write another such article, will I?

Chris Petrie.

INTERNATIONAL CONFERENCE ON EXTENSIONAL FLOW

COMBLOUX, FRANCE, MARCH 20-23rd, 1989

At the successful meeting at Chamonix in January 1988, it was apparent that the extensional data obtained from the many different instruments being used were significantly different. The organising committee suggested that a cooperative project be established for measurements to take place on a single fluid, a proposal that was warmly welcomed by those at the meeting. Tam Sridhar was approached to prepare such a fluid, to which he readily agreed. A preliminary survey was sent out to determine the capabilities and requirements of the different instruments so that a suitable fluid could be prepared. At the same time the programme was widened so that a full characterisation of the fluid could take place. The number of participants in the Round Robin also increased (word having spread rapidly along the grapevine).

The test fluid selected was a Boger fluid, prepared at Monash University (hence it was titled M1). This fluid was despatched to participants last summer. The project was brought to its conclusion at the special workshop held at Combloux, near Megeve, in the French Alps, during March. A special issue of JNNFM will shortly be published containing the papers presented at this meeting, which was in three parts.

In the first session, the properties of M1 in extension were discussed. Tam Sridhar gave details of M1, then described his fibre spinning equipment using a vacuum take-up. His results showed that in each experiment there was a constant strain rate, and the apparent extensional viscosity increased along the spin line. He also extrapolated back into the upper capillary to determine, and allow for, start up stresses. Ralph Oliver then described his technique for a spinning experiment performed horizontally. Though strain rates varied along his spin line, he was able to correlate all data by utilising the Treloar measure of strain. Dave Binding and Mike Jones presented data from both a converging flow

apparatus and a Carri-Med elongational viscometer. Using average values of stress and strain rate from each experiment, they correlated their data and obtained power law expressions. Jim Ferguson gave details of experiments performed on a Carri-Med elongational viscometer. The apparent elongational viscosity, calculated from the full equations of motion, increased with strain up to a maximum, before falling slightly. The level of this maximum depended upon the speed of the take-up drum, showing that the elastic response of the fluid was the dominant feature. Using average values of stress and strain rate, he was able to correlate his data with those given by Binding and Jones. He also showed results from pendant drop experiments, which illustrated quite dramatically the effects of the elasticity of the fluid, with the drop accelerating, decelerating almost to a stop, then accelerating again, as it pulled the filament from the upper capillary. Mervyn Jones then gave his results from his pendant drop experiments. He initially smoothed his data through these variations in the velocity curve, but when they were taken into account, his elongational viscosity curve was the same shape as Ferguson's. Joe Matta introduced a technique of stretching a liquid filament by essentially replacing the pendant drop with a known mass. Since these masses were much larger than the drops used in the last two papers, the experiment was concluded in much shorter times, and the variation in velocity curve was not apparent.

Gerry Fuller described his elongational rheometer which utilises opposing jets. Apparent elongational viscosity increased with strain rates, resulting in Trouton ratios from 1-100, in rough agreement with the pendant drop techniques but at least an order of magnitude below those of the fibre spinning technique. Birefringence experiments carried out simultaneously showed that the extensional flow field was about twice as wide as the jet orifices. Jeff Odell drew on the vast experience at Bristol of using opposing jets and birefringence measurements. Combined with pressure drop data, apparent extensional viscosities were obtained that were of the same magnitude as Fuller's results. He also showed that above strain rates of about $7s^{-1}$ the flow field became very erratic, so that great care had to be taken in interpreting results above this value. David James gave a considered report on converging channel extensional rheometry. Quite high

strain rates were achieved, though his results were orders of magnitude lower than those obtained by Binding.

The second session concentrated on the simple and complex shear flow properties of M1. R. Hingmann, Ken Walters, Klaas te Nijenhuis, Arthur Lodge, Raj Gupta, David Boger, Phillippe Steiert, K. Jayaraman, Nick Hudson and Tam Sridhar presented steady shear and dynamic data from a wide range of instruments. The results showed considerable agreement between the various laboratories. Flow rates in steady shear covered 6 decades whilst frequencies in oscillatory shear were over 5 decades. Second normal stress data were obtained by Walters and by Lodge. Start up of steady shear was investigated by Hingmann, Lodge, Steiert and Hudson. Substantial stress overshoots were found above a critical shear rate, suggesting a stability problem with the fluid (possibly connected to the unusual behaviour in extension noted above). Dominique Dupuis demonstrated an optical technique for determining the normal stress coefficient. Gupta showed that under squeeze flow conditions, the fluid retains a Newtonian response. Dan Joseph gave data on wave speeds, climbing constants, and delayed die swell. Jayaraman presented data on fluid degradation. Sridhar examined the flow of a sphere through M1, showing dramatic changes in the drag coefficient. Rod Binnington examined the behaviour of M1 in circular entry flows, and showed corner and lip vortices. James gave results on experiments of flow in corrugated tubes.

The final session was on Rheology in general. Mort Denn gave some new ideas on numerical simulation of the spin line. Pierre Attane and Mme de la Lande showed a theoretical analysis of melt flow in an extensional rheometer. Jean-Michel Piau and Pierre Doremus theoretically examined the behaviour in extension of a fluid with a yield stress. Brian Duffy gave some thoughts on extensional flows of anisotropic fluids. Frank Leslie discussed liquid crystals in Poiseuille flow. Andre Muller examined fluid adsorption on the surfaces of viscometers and the effects this would have on results, together with degradation in extension flow fields. Han-Werner Bewersdorff discussed the effects of pre-shear on the extensional properties of fluids. Pierre Leblans looked at shear modification of LDPE and its effect on the elongational viscosity of the melt.

John Hinch gave an impromptu paper, written the night before, based on the pendant drop technique, showing the conditions under which the drop would decelerate, stop, then retract. Finally, Balta Mena demonstrated a new technique for measuring extensional viscosity. Based on Gupta and Sridhar's vacuum tube technique, he surrounded the spin line fluid (suitably coloured) with the same fluid (to remove the effects of gravity and surface tension), though how only the coloured fluid flowed through the bottom capillary remained a mystery to all present!

In between sessions, and in the evenings, there was ample opportunity to explore the surrounding countryside. Following the mild winter, there was very little snow on the lower slopes, but the aficionados managed to find some reasonable runs. As usual, accommodation and food were excellent.

Overall, this was a very successful meeting in that a large number of laboratories are in good agreement about their measuring techniques, particularly in shear flow. Though there is still a wide divergence in extensional flow results, a greater understanding between techniques has been achieved, and some consensus has been agreed.

RHEOLOGY IN THE LABORATORY

School of Chemical Engineering, Birmingham University.

April 6th, 1989.

This one-day meeting was novel in several ways. The programme was targetted at rheologists who were new to the field; non-members were charged a fee which included the 1989 subscription to the British Society of Rheology and the detailed organisation was carried out by Dr Stuart Guy, of Birmingham University.

About thirty people attended, to hear lectures on Flow in tubes (Dr Oliver), Flow curves, rotational viscometers, suspensions and polymer solutions (Dr Barnes), Industrial viscometers, control and analysis (Mrs Moules), Extensional and in-line rheometers (Dr Ferguson) and Extrusion of pastes (Dr Benbow). Although the level was pitched slightly above that of a "course", no full sets of notes were provided and some attendees asked about this: they were referred to the authors. It is a tradition of the B.S.R. (occasionally departed from) not to provide proceedings giving the full text of talks; this makes it easier for the authors to present recent data and avoids the hard graft of paper preparation.

The audience was quiet and attentive in the morning session, but after a pleasant lunch in attractive surroundings became more lively in the afternoon. A "General Discussion" session produced, in particular, one spirited argument about the relative merits of tube viscometers and rotational viscometers for making in-line rheological measurements. The former type had the merit of simplicity, whereas the latter permitted oscillatory as well steady shear tests to be performed.

As a result of this meeting, we now have sixteen additional members for 1989 (now ratified by Council). It will be interesting to see how many retain their affiliation in subsequent years; even if several drop out the exercise will have been worthwhile.

This concept of sharing the organisational work with a University department was also very successful. As more departments employ staff to run short courses and conferences this could happen more often, taking much of the routine load from our B.S.R. organisers in return for some form of profit-sharing arrangement.

The meeting was successful (both academically and financially) and the ideas which were pioneered should be useful on later occasions.

D R OLIVER

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.
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A COMMENT ON CHENG: THE ART OF COARSE RHEOLOGY¹

P.F.G. Banfill

Dr. Cheng's excellent and humorous review of what rheologists do should be compulsory reading for all research students and others embarking upon rheology research. However, I would like to set the record straight about what Cheng calls the mean field theory approach to the rheology of particulate suspensions². He implies that the model Moore described in 1959³ was the first to describe thixotropic behaviour. In fact it was predated by four years by Tattersall's model for the rheological behaviour of cement paste⁴. This model proposes that the material possesses a structure composed of "links", the number of which governs the rheological behaviour and that breakdown under shear proceeds at a rate proportional to the shear rate and to the number of links present, all of which are features of the Moore model. Since cement paste is not thixotropic and the structural breakdown is irreversible (structural buildup by the hydration reactions is, of course, a chemical process) Tattersall's model needs to consider only the breakdown process, but can be readily extended.

Moore does not refer to Tattersall's work so presumably he was not aware of it, which is an example to support Cheng's comment⁵ that it is best not to know the literature too well in order to be credited as an independent discoverer of a particular model.

The moral of this is that research workers in a subject as diverse as rheology have to be attuned to related work going on with materials different from their own and which is, rightly, published in the specialist journals for those other materials. One way this can be done effectively is through Rheology Abstracts, another is by attending the Society's meetings, with their diverse subject matter.

References

1. Cheng, D.C-H., BSR Bulletin 1989, 32, 1-21.
2. Ref.1, p.9.
3. Moore, F., Trans. Brit. Ceramic Soc. 1959, 58, 470-494.
4. Tattersall, G.H., Brit. J. Appl. Physics 1955, 6, 165-7.
5. Ref 1, p.13.

School of Architecture and
Building Engineering,
University of Liverpool,
P.O. Box 147,
Liverpool, L69 3BX

CONFERENCE DIARY

Date	Place	Details
21-26/10/89	Montreal, Canada.	'First Inter-American Conference on Rheology' and '61st Annual Meeting, Society of Rheology' and 'First Annual Meeting of the Canadian Rheology Group': contact Dr. L.A. Utracki, NRCC/IMRI, 75 boul. de Mortagne, Boucherville, Quebec, Canada, J4B 6Y4.
31/10/89 - 2/11/89	Paderborn, Germany. (B.R.D.)	'Thermal effects in fracture of multiphase materials' Euromech 255: contact Professor Dr. K.P. Hermann, Laboratorium fur Technische Mechanik, Paderborn University, Pohlweg 47-49, 4790 Paderborn, German Federal Republic.
21-23/11/89	Paris France	'24th annual meeting of Groupe Français de Rheologie' contact: Prof. B.Launay, Departement de l'Aliment, ENSIA, 1 avenue des Olympiades, 91305 Massy, France.
23-25/11/89	Estoril Portugal	'Molecular structure and rheology of polymers' Joint meeting of British-Spanish-Portuguese societies, contact: Fátima Maia de Loureiro, CFMC/INIC, Av. Gama Pinto 2, 1699 Lisboa Codex, Portugal.
13/12/89	London U.K.	'The rheology of polymer latices' contact: Dr D.J.Hourston, Dept. of Chemistry, University of Lancaster, Lancaster, Lancs.
14/12/89	Cambridge U.K	'Polymers in motion' contact: Dr M.R.Mackley, Chemical Eng., New Museums Site, Pembroke St., Cambridge, CB2 3RA.
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.

- | | | |
|--------------|------------------------------|--|
| 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 |
| 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
Universitat 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. |
| 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. |

Golden Jubilee Meeting of the British Society of Rheology and Third European Rheology Conference

Edinburgh, 3rd to 7th September, 1990

GENERAL INFORMATION

Accommodation has been reserved in the Pollock Halls of Residence of the University of Edinburgh and technical sessions will take place in the University's Appleton Tower and George Square lecture theatres.

The conference will open on the morning of Monday, 3rd September and will close at lunchtime on Friday, 7th September.

Registration will be possible on the afternoon and evening of Sunday, 2nd September when there will be an informal get-together and possibly a coach tour of the city.

The social programme will include a reception in the evening of Monday, 3rd September, a choice of one of several excursions on the afternoon of Wednesday, 5th September and the conference banquet on Thursday, 6th September.

EDINBURGH FESTIVAL

The 1990 Edinburgh International Festival of Music and Drama takes place during the three weeks prior to the conference and it is possible to arrange accommodation in the Pollock Halls (subject to availability of rooms) for some of that time. Anyone wishing to reserve accommodation for dates before the conference should write, mentioning the BSR Golden Jubilee Conference, to

*Reservations Office, Pollock Halls of Residence, University of Edinburgh,
18, Holyrood Park Road, EDINBURGH, EH16 5AY, Scotland.*

Accommodation cannot be guaranteed, but is likely to be available for the week immediately preceding the conference. If you book by March you will almost certainly avoid disappointment. Payment for this accommodation must be arranged with Pollock Halls and is entirely separate for payment for the conference.

COSTS

The cost of registration will be £160. See below for details of reductions offered for early registration and to students.

For full and student registration the fee covers attendance at technical sessions, transport between the technical sessions and the Pollock Halls (and also a location convenient for some hotels), coffees and teas at the technical sessions, five lunches, a book of extended abstracts, the reception, excursion and banquet.

Accompanying persons do not receive the book, are charged for three lunches only (Monday, Wednesday and Friday) and are not charged for the technical sessions, teas and coffees. but apart from that, the fee covers all the items listed above. Excursions will be offered (probably through an agent) but, apart from the Wednesday afternoon excursion and a coach tour of the city, these are not included in the fee.

OFFERS OF PAPERS

Papers are welcome on any rheological topic.

Anyone wishing to present a paper should send a title and abstract of up to 250 words to Dr Petrie (preferably well before the December deadline). There is no special form for this first abstract; information about preparation of extended abstracts will be sent to those whose papers are accepted.

Papers will be presented in parallel sessions; how many will depend on the number of papers offered. As yet there are no specific topics for particular sessions but contributions to most areas of rheology are expected.

PUBLICATION OF PAPERS

Extended abstracts of all contributed papers will be published by Elsevier in a book to be available at the conference. Authors will need to supply texts of these (three pages on forms to be supplied) promptly.

Plenary lectures and invited keynote papers will be published in full as *Progress and Trends in Rheology III*, to be a supplement to *Rheologica Acta*.

REGISTRATION *See form opposite*

A reduction of £30 is offered to students. Student applications should be accompanied by a letter from supervisor or Head of Department.

A reduction of £20 is offered for early registration provided that this is accompanied by payment of a non-returnable deposit of £40 and prompt payment of the balance.

TIMETABLE

- 1st December 1989 - Offers of papers, with a title and brief summary
- January 1990 - Notification of paper acceptance
- 15th February 1990 - Last date for reduced fee; deposit due
- May 1990 - Extended abstracts required (details to be notified)
- 1st July 1990 - Balance of registration fee due

ACCOMMODATION

The organizers hope that most of the delegates will stay in the Pollock Halls, which offer "good student accommodation". The cost of five nights bed and breakfast and four dinners (Sunday dinner to Friday breakfast, excluding Thursday dinner - lunches and the conference banquet are already included in the registration fee) is £105. For those arriving on Monday 3rd September the cost is £85.

This accommodation is booked by completing the appropriate section of the registration form. Accommodation cannot be guaranteed for late bookings, though of course we shall do our best to meet your requirements.

Those requiring accommodation other than that offered by the University in the Pollock Halls of Residence should write directly to

*The City of Edinburgh, Advance Reservations, Tourist Accommodation Service,
Waverley Market, 3, Princes Street, EDINBURGH, EH2 2QP, Scotland.*

Mention the BSR Golden Jubilee Conference and supply all necessary information for a booking (e.g. whether you prefer a hotel, guest house or private house; how much you are prepared to pay for bed and breakfast; whether you require single, double, twin or family room(s); with or without bath; arrival and departure dates).

TRAVEL

Details of how to reach the Pollock Halls and the George Square and Appleton Tower lecture theatres will be sent to those who register.

Please tell us your planned date and time of arrival.

We hope to meet delegates arriving by air on Sunday, 2nd September; please give us your flight number if you wish to be met at Edinburgh Airport.

PAYMENT

Payment should be made in Sterling (by cheque drawn on a British bank or by direct credit transfer at the expense of the sender). The preferred method of payment from overseas is by Sterling Draft drawn on London.

Cheques should be made payable to the British Society of Rheology and credit transfers to the British Society of Rheology Conference Account, account number 01-01457438, at the National Westminster Bank, 38 St Mary's Place, Newcastle upon Tyne, NE1 7PQ, U.K. - bank sort code 60-15-51.

Please ensure that the name of the conference delegate is quoted in any credit transfer.

.....
All enquiries, registration forms and cheques should be sent to

*Dr C J S Petrie, Department of Engineering Mathematics,
Stephenson Building, University of Newcastle upon Tyne,
Newcastle upon Tyne, NE1 7RU, United Kingdom.*

Telephone: +44 (0)91-222-6000 extension 6230

FAX: +44 (0)91-261-0191 Telex: 53654 UNINEX G

e-mail: Chris.Petrie@Newcastle.AC.UK (on EARN/BITNET)
Chris.Petrie@UK.AC.Newcastle (on JANET)

REGISTRATION FORM

British Society of Rheology
Edinburgh, 3rd - 7th September 1990

Please complete and send, with payment, to

*Dr C J S Petrie, Department of Engineering Mathematics, Stephenson Building,
 University of Newcastle upon Tyne, Newcastle upon Tyne, NE1 7RU, United Kingdom.*

NAME: _____ TITLE: _____

ADDRESS: _____

Name and affiliation, for badge: _____

Please state any dietary or other special requirements.

ACCOMMODATION Please tick one of the alternatives (a), (b), (c) and (d):

- (a) I require university accommodation from 2nd September and enclose £105 ☐
 (b) I require university accommodation from 3rd September and enclose £85 ☐
 (c) I shall book through the Edinburgh Tourist Accommodation Service ☐
 (d) I am making my own arrangements for accommodation ☐

FEES Please tick the appropriate box:

If posted	before 15th February 1990	after 15th February 1990
Full registration	£140 ☐	£160 ☐
Student registration	£110 ☐	£130 ☐
Accompanying persons	£60 ☐	£70 ☐

TOTAL ENCLOSED †: £ _____ BALANCE ‡: £ _____

† This should include payment for any university accommodation.

‡ The balance is due by 1st July 1990 if the deposit (£40) is sent before 15th February 1990, otherwise complete payment is due with this form.

Please state sending bank if payment is being sent by direct credit transfer.

TRAVEL ARRIVAL DATE: _____ TIME: _____

If you wish to be met at Edinburgh Airport please give your flight number: _____



Polymers in Motion

14th December 1989
Cambridge University.

A day-conference on the dynamical aspects of polymeric liquids and solids organised jointly by Institute of Physics and the British Society of Rheology.

Morning Session (Review of subject areas)

Introduction by Prof. Sir Sam Edwards

Dynamics of Isolated Coils	Dr. J. Hinch
Reptation and Polymer Topology	Dr. T. McLeish
Fast Motions in Viscoelastic and Solid Materials	Prof. R. Petherick
Diffusion in Polymer Blends	Dr. R. Jones
Melts in Motion	Dr. M. Mackley
Instabilities	Dr. R. Ball
Liquid Crystal Polymers	Dr. D. Mead

Afternoon Session (Short contributions; Formal and informal discussion)

Short, prepared contributions and discussion will be structured around three headings:

Liquid Crystal Polymers Rubbers and Networks Blends and Polydispersity

Arrangements

Meeting sessions will be held in the Department of Chemical Engineering and Lunch provided at Emmanuel College (included in fee of £20.00). Dinner (£12.00) and bed and breakfast (£19.50) will be available at Emmanuel College if required (please indicate on slip below).

Please register me for the Polymers in Motion conference.

Name:

Organisation:

Address:

Conference Fee £20.00 (registered student £10.00)

£ ____ : ____

Dinner on December 13th (£12.00)

£ ____ : ____

Bed and Breakfast 13th/14th (£19.50)

£ ____ : ____

Dinner on December 14th (£12.00)

£ ____ : ____

Bed and Breakfast 14th/15th (£19.50)

£ ____ : ____

TOTAL

£ ____ : ____

Cheques made payable to "The University of Cambridge" and sent to Dr. M.R. Mackley, Dept. of Chemical Engineering, Pembroke St., CAMBRIDGE CB2 3RA.

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THE RHEOLOGY OF POLYMER LATICES

A one-day meeting on this topic will be held in the Society of Chemical Industry's lecture theatre at 14/15 Belgrave Square, London on **Wednesday, 13th December, 1989**. This will be a joint meeting with the Macro Group (UK) Ltd.

For further details please contact:

*Dr. D.J. Hourston,
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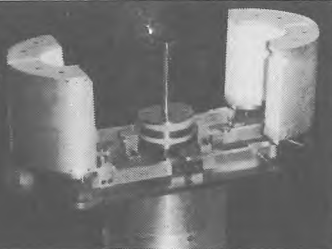
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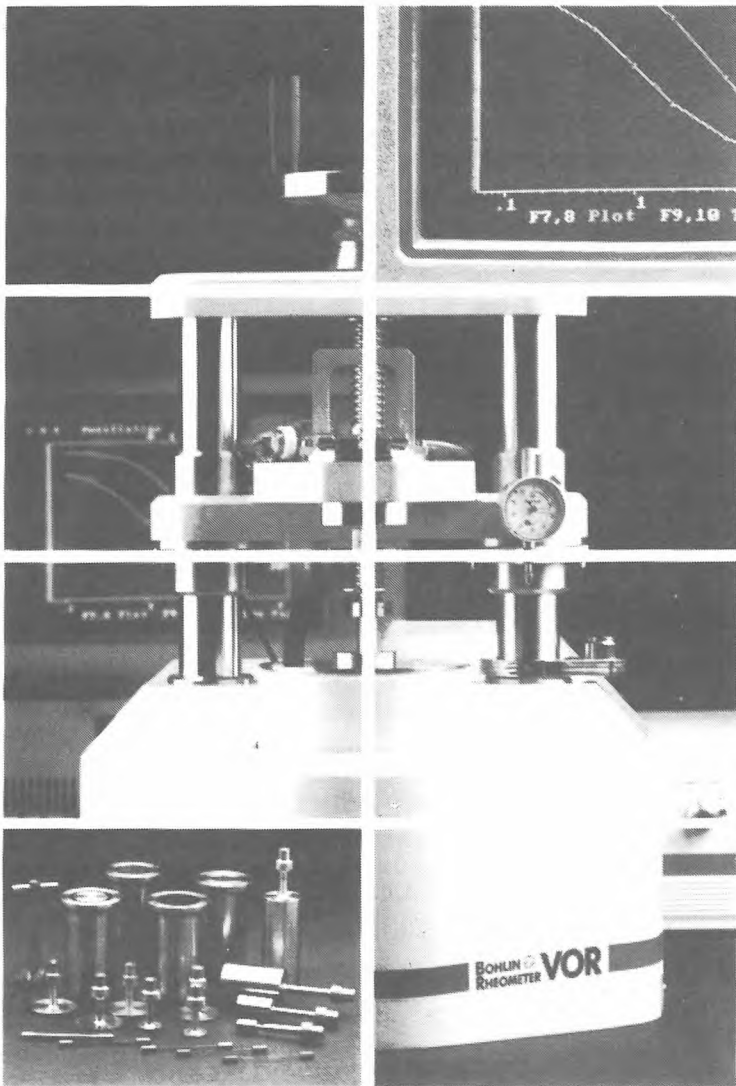
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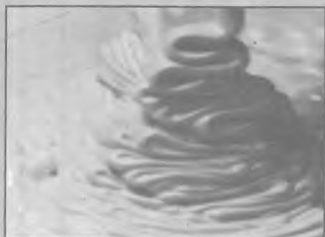
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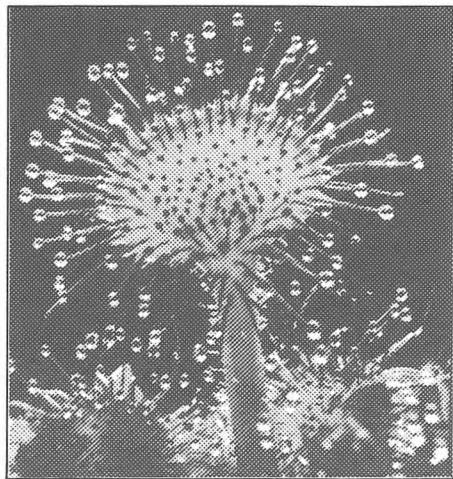
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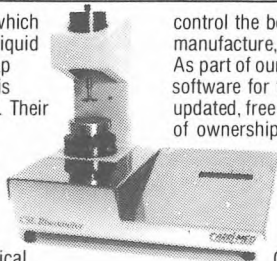
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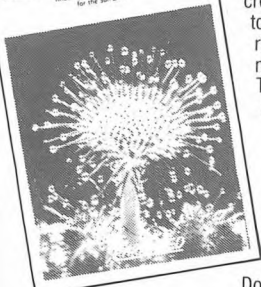
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