RHEOLOGY BULLETIN

Publication of The Society of Rheology, Inc.

Volume 41, No. 2 December, 1972

43rd ANNUAL MEETING

JANUARY 29-31, 1973
CINCINNATI, OHIO

This meeting, postponed from October 1972 on account of the 4th International Congress, will take place under the auspices of the University of Cincinnati, on January 29 through 31. Accommodations have been reserved at Stouffer's Cincinnati Inn, 150 West 5th Street. R. P. Chartoff and A. Strauss of the Department of Chemical and Nuclear Engineering are co-chairmen of the local arrangements and will act as hosts. L. Marker, of General Tire and Rubber, One General St., Akron, Ohio 44305, is the Program Chairman.

Abstracts and registration forms will be sent separately. The program arrived too late to be set in type and mailed before the Christmas rush; therefore, it is attached in the form of duplicated typed copy.

There will be specal low room rates for members of the Society. For more information concerning the meeting, contact Richard Chartoff, Dept. of Chemical Engineering, University of Cincinnati, Cincinnati, Ohio 45221. Telephone 513-475-2761.

On Monday evening there will be a discussion on "What is the Best Way to Apply Basic Rheology to Practical Problems?" Chaired by Nobuyuki Nakajima.

Bingham Medal

The Bingham medal will be awarded to Richard Stein of the University of Massachusetts in Amherst. The award will be presented at the banquet.

Slips, Literal and Otherwise

We hear from Program Chairman Marker that in the separate mailing of the program deadline an occasional blank sheet found its way into some of the envelopes. No need to lose any sleep over the matter now—unless you missed the deadline.

OFFICERS

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RHEOLOGY BULLETIN
Raymond R. Myers, Editor
Department of Chemistry
Kent State University
Kent, Ohio 44242

NEW SOCIETY FOUNDED

The Society of Rheology of Japan was founded in Fukui, Japan on October 17, 1972 during the 20th Annual Rheology Symposium, where four SOR members were speakers and present at the founding: R. B. Bird, D. C. Bogue, E. B. Christiansen and J. L. White. Your editor wishes them well.

MONTREAL MEETING

OCTOBER 28-31, 1973

Louis J. Zapas, National Bureau of Standards, Washington is program chairman for the 44th Annual Meeting. The meeting will be held at Montreal's Sheraton-Mt. Royal Hotel on Peel Street. Henry Schreiber of Canadian Industries Limited, McMasterville, Quebec, Canada is chairman of the host committee. R. H. Axebrad, Macromolecular Science Division of the C. I. C. is the official host. Stan Mason of McGill University is the honorary host.

MEMBERSHIP

Anyone knowing a person or organization wishing to become asustaining member of the Society, please contact the Membership Chairman.

The Membership Committee is being enlarged. Anyone wishing to join the Membership Committee should contact Glenn E. Fulmer (Chairman), W. R. Grace & Co., Clarksville, Maryland 21029.

AMERICAN INSTITUTE OF PHYSICS INCORPORATED
FOR SOCIETY OF RHEOLOGY

Statement of Receipts and Disbursements — Six Months Ended June 30, 1972

Balance in Account - January 1, 1972		$17,175.56
RECEIPTS (January 1 - June 30, 1972)		
Dues Collections:		
1971 Dues	($ 10.00)	
1972 Dues	2,659.49	2,649.49
Miscellaneous Income: Fall Meeting		1,267.00
Transactions of the Society of Rheology *Schedule A*		2,024.74
Total Receipts		$23,116.79
DISBURSEMENTS (January 1 - June 30, 1972)		
Charge for Dues Billing and Collection	$ 255.63	
Charge for Preparation and Maintenance of Member Record File	422.87	
Financial Handling Charge - 1972 (Six Months)	107.18	
Member Society Dues - 1972 (Six Months)	395.00	
Editorial Expenses:		
Salaries, Telephone and Postage	798.99	
Directory and Bulletin Mailing	142.44	
S of R Transactions - Mailing Expense	265.76	
Spring Bulletin	262.44	
Other Miscellaneous	278.31	2,928.62
Balance on Account - June 30, 1972		$20,188.17

TRANSACTIONS OF THE SOCIETY OF RHEOLOGY — SCHEDULE A

Statement of Income and Expense — Six Months Ended June 30, 1972

INCOME		
Publication Charges		$2,115.00
Reprint Sales		482.18
Total Income		$2,597.18
EXPENSES		
Publishing Expense	$	
Printing Reprints (Wiley)	556.16	
Order Handling	16.28	
Total Expense		572.44
Net Income or (Expense)		$2,024.74

E. A. Collins, Treasurer

Application for Membership in the SOCIETY OF RHEOLOGY

I hereby desire to apply for membership in the SOCIETY OF RHEOLOGY dating from

January 19.....

Name .....
(Include Title, e.g., Mr., Dr., Prof., Miss, etc.) Please print.

Mail Address .....

Mail Address .....

Professional Connection .....

Position .....

Chief Interest .....

Highest Academic Degree .....

Date .....

Enclose Remittance of $10 for Regular Annual Dues or $100 for Sustaining Annual Dues and Mail to:

SOCIETY OF RHEOLOGY
American Institute of Physics
335 East 45 Street
New York, New York 10017

Program for Cincinnati Meeting

January 29, 30, 31, 1973

Stouffer's Cincinnati Inn

Monday Morning
January 29, 1973

Symposium on New Generation Instrumentation in Rheology

I. Krieger Chairman

A-1 9:00 a.m. - 10:00 a.m.
Invited Lecture
M. Birnboim, Rensselaer Polytechnic Institute, Troy, N. Y.
"Progress in Computerized Instrumentation for the Rheologist"

A-2 10:00 a.m. - 10:30 a.m.
Invited lecture
L. J. Garfield and R. E. Mack
Eastman Kodak Company, Rochester, New York
"On-Line Computation of Oscillatory Data from the Rheogoniometer"

10:30 - 10:45 Coffee

A-3 10:45 a.m. - 11:15 a.m.
C. J. Drislane and W. M. Woreham
Instron Corporation, Canton, Massachusetts
"A New Rotational Rheometer"

A-4 11:15 a.m. - 11:45 a.m.
T. F. Niu and I. M. Krieger
Case Western Reserve University, Cleveland, Ohio
"A Computer-Coupled Rotational Rheometer"

A-5 11:45 a.m. - 12:15 p.m.
J. E. Soussou
Massachusetts Institute of Technology, Cambridge, Mass.
"Dynamic Properties of Polymers Subject to Random Loading"

12:15 p.m. Lunch

A-6 2:00 p.m. - 2:30 p.m.
Invited Lecture
R. S. Stein
University of Massachusetts
"Optical Studies of Solid Polymers"

A-7 2:30 p.m. - 3:00 p.m.
Invited Lecture
John Schrag
University of Wisconsin
"Computerized Measurements of Viscoelastic Properties of Dilute Polymer Solutions"

3:00 p.m. - 3:15 p.m. Coffee

A-8 3:15 p.m. - 3:45 p.m.
R. W. Flumerfelt and J. Hsu
University of Huston
"Extensional Flow Measurements Using a Drop Extension Technique"

A-9 3:45 p.m. - 5:15 p.m.
Panel Discussion on New Instrumentation
M. Birnboim, J. L. Schrag, I. M. Krieger, E. A. Collins, C. W. Macosko, R. S. Brodkey, C. J. Drislane

Monday Morning

B-1 10:45 a.m. - 11:15 a.m.
Thomas C. Warren, John L Schrag, and John D. Ferry
University of Wisconsin, Madison, Wisconsin
"Infinite-Dilution Viscoelastic Properties of Polydimethyl Siloxane and Poly-γ-Benzyl-1- Glutamate"

B-2 11:15 a.m. - 11:45 a.m.
C. D. Han and K. U. Kim
Polytechnic Institute of Brooklyn, Brooklyn, N. Y.
"On the Determination of Rheological Properties of Viscoelastic Fluids in Simple Shear Flow"

B-3 11:45 a.m. - 12:15 p.m.
Enrique R. Bazua and Michael C. Williams
University of California, Berkeley, California
"A Molecular Formulation of the Internal Viscosity in Polymer Dynamics, and Stress Symmetry"

12:15 p.m. Lunch

Monday Afternoon

B-4 3:15 p.m. - 3:45 p.m.
R. R. Huilgol
Illinois Institute of Tech., Chicago, Illinois
"Uniqueness and Non-Uniqueness in the Plane Creeping Flows of Second Order Fluids"

B-5 3:45 p.m. - 4:15 p.m.
Ronaldo Coutinho Fernandes and Affonso Silva Telles
Universidade Federal Do Dio De Janeiro
"Normal Stresses in Flows Through Porous Media"

B-6 4:15 p.m. - 4:45 p.m.
D. L. Hunston and R. Y. Ting
Naval Research Laboratory, Washington D. C.
"Analysis of the Viscoelastic Response of Drag Reducing Polymer Solutions Based on a Modified Oldroyd Model"

B-7 4:45 p.m. - 5:15 p.m.
Charles Goldstein and W. R. Schowalter
Princeton University, Priceton, N. J.
"Fluid Nonlinearity and Unsteady Flows: The Oscillating Sphere and the Orthogonal Rheometer"

Tuesday
January 30, 1973

Symposium on the Rheology of the Solid State

C-1 9:00 a.m. - 10:00 a.m.
Invited Lecture
Pedro Macedo
Catholic University of America, Washington, D. C.
Viscoelasticity of Inorganic Glasses"

C-2 10:00 a.m. - 10:30 a.m.
J. S. Y. Lai and W. N. Findley
Brown University, Providence, R. I.
"Creep of Polyurethane Under Varying Temperature for Nonlinear Uniaxial Stress"

10:30 a.m. - 10:45 a.m. Coffee

C-3 10:45 a.m. - 11:15 a.m.
Tsu-Jiunn Peng
Jet Propulsion Laboratory, Calif. Institute of Tech.
"Thermoelasticity of Mechanically Incompressible but Thermally Expansible Materials"

C-4 11:15 a.m. - 11:45 a.m.
L. R. Schmidt and J. F. Carley
University of Colarado, Boulder, Colorado
"Biaxial Stretching of Heat-Softened Plastic Sheets"

C-5 11:45 a.m. - 12:15 p.m.
R. J. Ferris - Aerojet Solid Propulsion Co., Sacramento
L. R. Herrmann - Univ. of California, Davis, Calif.
"Limitations of Current Linear Viscoelastic Models and Their Representations"

12:15 p.m. Lunch

C-6 2:00 p.m. - 3:00 p.m.
Invited Lecture
Robert Penn
National Bureau of Standards, Washington D. C.
"Non-Linear Viscoelasticity of Aluminum"

C-7 3:00 p.m. - 3:30 p.m.
R. E. Cohen and N. W. Tschoegl
California Institute of Tech., Pasadena, Calif.
"Dynamic Mechanical Properties of Block Copolymer Blends. A Study of the Effects of Terminal Chains in Elastomeric Materials."

3:30 p.m. - 3:45 Coffee

C-8 3:45 p.m. - 4:15 p.m.
D. G. Fesko and N. w. Tschoegl
California Institute of Tech., Pasadena, Calif.
"Time-Temperature Superposition in Two-Phase Viscoelastic Materials"

C-9 4:15 p.m. - 4:45 p.m.
Peter P. Gillis and James M. Kelly
University of California, Berkeley, California
"Continuum Descriptions of Dislocations Under Stress Reversals"

C-10 4:45 p.m. - 5:15 p.m.
R. J. Farris and H. P. Briar
Aerojet Solid Propulsion Co., Sacramento, Calif.
"A Direct Method For Superior Viscoelastic Characterization"

Tuesday Morning

D-1 10:15 a.m. - 10:45 a.m.
L. Hoogenboom
Mechanical Technology Incorporated, Lathan, N. Y.
"Rotational Viscometer with Viscous Drive"

D-2 10:45 a.m. - 11:15 a.m.
Richard C. Penwell and William W. Grassley
Northwestern University, Evanston, Illionis
"Measurements of Transient Stress in a Modified Weissenberg Rheogoniometer"

D-3 11:15 a.m. - 11:45 a.m.
K. Higashitani
University of Wisconsin, Madison, Wisconsin
"Experimental Measurements of Hole Pressure Errors in Shear Flow Generated by a Pressure Gradient"

D-4 11:45 a.m. - 12:15 p.m.
Herbert J. Sutherland, Jace. W. Nunziato, Richard Lingle
Sandia Laboratories, Albuquerque, New Mexico
"An Acoustical Determination of Stress Relaxation Functions for Polymers with Applications to Shock Wave Studies"

Wednesday
January 31, 1973

E-1 9:00 a.m. - 9:30 a.m.
Richard C. Penwell, Andre Kovacs, and William W. Graessley
Northwest Univ., Evanston, Illinois and Centre De Recherches Sur Les Macromolecules, Strasbourg, France
"Temperature Dependence of the Viscosity-Shear Rate Behavior and Stress Relaxation in Linear and Star Polystyrene Melts"

E-2 9:30 a.m. - 10:00 a.m.
J. K. Okeson and A. H. Emery
Purdue University, Lafayette, Indiana
"Transient Development of Viscosity Profiles During Shear Flow of a Viscoelastic Fluid"

E-3 10:00 a.m. - 10:30 a.m.
M. G. Hansen, K. Higashitani, and A. S. Lodge
University of Wisconsin, Madison, Wisconsin
"Transient Shear Stress and Primary Normal Stress Data Following the Start of Shear Flow"

10:30 a.m. - 10:45 a.m. Coffee

E-4 10:45 a.m. - 11:15 a.m.
Jeffery T. Fong
National Bureau of Standards, Washington, D. C.
"On the Applicability of the Bernstein-Kearsley-Zapas' Theory of Incompressible Media to Materials with Finite Compressibility"

E-5 11:15 a.m. - 11:45 a.m.
L. U. Lilleleht and P. J. Leider
University of Virginia, Charlottesville, Va.
"The Behavior of a Viscoelastic Fluid in Stagnation Flow"

E-6 11:45 a.m. - 12:15 p.m.
N. Mitsuishi and Y. Aoyagi
Kyushu University, Fukuoka, Japan
"Non-Newtonian Fluid Flow in an Eccentric Annulus"

12:15 p.m. Lunch

E-7 2:00 p.m. - 2:30 p.m.
C. D. Han
Polytechnic Institute of Brooklyn, Brooklyn, N. Y.
"Stratified Two-Phase Flow of Viscoelastid Polymeric Melts"

E-8 2:30 p.m. - 3:00 p.m.
A. E. Everage, Jr.
Monsanto Textiles Co., Pensacola, Fla.
"Theory of Stratified Bicomponent Flow of Polymer Melts-Part 1: Equilibrium Newtonian Tube Flow"

E-9 3:00 p.m. - 3:30 p.m.
F. Nazem and C. T. Hill
Washington University, St. Louis, Missouri
"Elongational Viscosity of Filled Styrene Acrylonitrile"

3:30 p.m. - 3:45 Coffee

E-10 3:45 p.m. - 4:15 p.m.
R. T. Balmer
University of Wisconsin, Milwaukee, Wisconsin
"Unsteady Fano Extensional Flows"

E-11 4:15 p.m. - 4:45 p.m.
C. D. Han and L. H. Drexler
Polytechnic Institute of Brooklyn, Brooklyn, N. Y.
"A Study of Converging Flows of Viscoelastic Polymeric Melts by Means of the Flow Birefringence Technique"

E-12 4:45 p.m. - 5:15 p.m.
C. D. Denson
General Electric Co., Louisville, Kentucky
"Superposition of Extensional and Shear Viscosity Data for Poly (Isobutylene)"

Wednesday Morning

F-1 9:00 a.m. - 9:30 a.m.
Thomas A. Johnson and R. W. Ditmar
Airforce Materials Laboratory, Dayton, Ohio
University of Dayton Research Institute
"The Reliability of a Plastic Component in Service with Maintenance"

F-2 9:30 a.m. - 10:00 a.m.
W. F. Adler
Bell Aerospace Company, Buffalo, N. Y.
"Rain Erosion of Polyurethane Elastomers"

F-3 10:00 a.m. - 10:30 a.m.
Jerry W. Crowder and James L. White
Univ. of Tennessee, Knoxville, Tenn.,*"Extrusion Characteristic & Rheological Properties of Carbon Black Compounds of Polybutadiene and Butadiene-Styrene Copolymer"*

10:30 a.m. - 10:45 a.m. Coffee

F-4 10:45 a.m. -11:15 a.m.
J. Robert Dees, Larry E. Abbott,
Joseph E. Spruiell, James L. White
University of Tennessee, Knoxville, Tenn.
"Oriented Crystallization During the Melt Spinning of the Polyethylene Fibers"

12:15 p.m. Lunch

Wednesday Afternoon

F-5 2:00 p.m. - 2:30 p.m.
H. H. Bowerman, E. A. Collins, N. Nakajima
B. F. Goodrich Chemical Co. Avon Lake, Ohio
"Tensile Stress-Strain and Stress Relaxation Behavior of Raw Elastomers Using a High Speed Testor"

F-6 2:30 p.m. - 3:00 p.m.
N. Nakajima, E. A. Collins, H. H. Bowerman
B. F. Goodrich Chemical Co., Avon Lake, Ohio
"Master Curve for Tensile Stress Strain Behavior of Amorphous Elastomers at Both Small and Large Deformation"

3:00 p.m. - 3:15 p.m. Coffee

F-7 3:15 p.m. - 3:45 p.m.
J. E. Soussou and J. Tseng
Massachusetts Institute of Tech., Cambridge, Mass.
"A Dynamic Programming Approach to the Time-Temperature Superposition Principle"

F-8 3:45 p.m. - 4:15 p.m.
Tadao Kotaka and James L. White
University of Tennessee, Knoxville, Tenn.
"Rheological Properties of Solutions of Butadiene-Styrene Compolymers of Varying Microstructure"