

# RHEOLOGY BULLETIN

Publication of The Society of Rheology, Inc.

---

Volume 37, No. 4

---



---

November, 1968

---

## 39th ANNUAL MEETING THE SOCIETY OF RHEOLOGY, INC.

WILLIAMSBURG LODGE  
COLONIAL WILLIAMSBURG, VIRGINIA

JANUARY 13-15, 1969

### *Program Committee*

J. G. Brodnyan (Chairman), Research Laboratories,  
Rohm and Haas Company, Spring House, Pennsylvania  
19477.

M. L. Dannis, Goodrich Research Laboratories,  
Brecksville, Ohio 44141.

C. L. Sieglaff, Diamond Alkali Research Center,  
P. O. Box 348, Painesville, Ohio 44077.

J. R. Knox (Local Arrangements Chairman), Avisun  
Corporation, Post Road, Marcus Hook, Pennsylvania  
19061.

This is the 1968 Annual Meeting of the Society of  
Rheology, Inc., despite the fact that the date has been  
delayed until 1969 because of the International Con-  
gress in Japan.

### *Accommodations*

Preregistration is urged, and directions for reaching  
Williamsburg Lodge will be sent by the Local Arrange-  
ments Chairman to those who send him the preregistra-  
tion form which is inserted in this Bulletin. Those who  
do not preregister can get these directions by written  
request to the Local Arrangements Chairman. The regis-  
tration desk at Williamsburg Lodge will be open on  
Sunday from 2:00 to 6:00 P.M.; on Monday from 8:00  
A.M. to noon, and on Tuesday from 10:00 A.M. to  
noon.

Accommodations will be available at Williamsburg  
Lodge and also at the Williamsburg Inn, across the street  
from the Lodge.

A form for hotel reservations is included with this  
Bulletin.

### *Travel to Williamsburg*

#### BY AIR:

Dulles airport, Washington, D.C., is 150 miles north  
of Williamsburg, which is about two and one-half hours  
by car. Newport News, Virginia is served by the  
following air lines: Allegheny, National, Piedmont, and  
United. Newport News is only 15 miles from Williams-  
burg by airport limousine.

#### BY SURFACE:

The main line of the Chesapeake and Ohio R.R.  
goes westward from Williamsburg. Those desiring north  
or south connections will change at Richmond, Virginia.  
There is Greyhound bus service from Washington, D.C.  
to Williamsburg.

### *Facilities*

Speakers will be provided with a blackboard and 2  
inch by 2 inch and 3-1/4 inch by 4-1/4 inch slide  
projectors. If other facilities are required for the pre-  
sentation, the Local Arrangements Chairman should be  
contacted as soon as possible.

## THE BINGHAM MEDAL, 1968

Dr. Jerald L. Ericksen, Professor, Department of  
Mechanics, The Johns Hopkins University, has been se-  
lected as the recipient of the Bingham Medal for 1968.  
Professor Ericksen is a mathematician whose work and  
personality are both widely known and appreciated by  
rheologists. Though known and recognized for his theo-  
retical work, he has a grasp of the significant experi-  
mental developments in rheology which is matched by  
few experimentalists. His theoretical work in continuum  
mechanics is remarkable for its originality and has open-  
ed up large areas of the subject which have subsequently  
been extensively cultivated. Of particular note is the  
idea of specifying all deformations possible for materials  
of a certain class of constitutive equations. This idea is  
basic to the rational measurement of material properties.  
In a further development he showed that rectilinear  
flow through non-circular tubes was possible only for

## RHEOLOGY BULLETIN

Raymond R. Myers, Editor  
Department of Chemistry  
Kent State University  
Kent, Ohio, 44240

very special fluids, and thus that nonrectilinear flow can usually be expected for non-Newtonian fluids. Professor Ericksen is also responsible for opening up the study of propagation of waves in nonlinear materials by studying surfaces of discontinuity of mechanical parameters. More recently he has been developing a rational approach to the mechanical theory of liquid crystals through his concept of anisotropic fluids.

The award will be presented at the Rheology Meeting on January 13-15, 1969, at Williamsburg, Virginia.

### Other Activities

There will be a cocktail party on Tuesday evening, January 14, from 6:15 P.M. to 7:15 P.M., and a banquet at 7:30 P.M. the same evening. The Bingham Medal will be awarded at the banquet.

### A Note from the Editor's Secretary

Occidentals become inscrutable after visiting the mysterious Orient!—but, perhaps before the next issue of this Bulletin the mystery and opulence will have gone and the enchanted Congressmen will have given us some *scientific* idea of what went on in Kyoto. Until then, sayonara.

## PROGRAM

### 39th ANNUAL MEETING THE SOCIETY OF RHEOLOGY, INC.

January 13-15, 1969

(Asterisks indicate invited paper)

MONDAY, JANUARY 13

#### SESSION A—Monday Morning

Chairman: J. G. Brodnyan, Rohm and Hass Co., Spring House, Pa.

##### A-1

9:00 a.m.\* I. M. Krieger, Case Western Reserve University, Cleveland, Ohio, "Monodisperse Colloidal Suspensions of Spherical Particles."

10:00 a.m. Coffee break

##### A-2

10:15 a.m. B. D. Coleman, Mellon Institute, Carnegie-Mellon University, Pittsburgh, Pa., "Shear Waves as a Possible Cause of Melt Fracture"

##### A-3

10:45 a.m. R. A. Mendelson, W. A. Bowles, F. L. Finger, Monsanto Company, Texas City, Texas, "The Effect of Molecular Structure on Polyethylene Melt Rheological Behavior"

##### A-4

11:15 a.m. R. A. Stratton, Mobil Chemical Company, Edison, New Jersey, "Non-Newtonian Flow in Polymer Systems with No Entanglement Coupling"

#### SESSION B—Monday Afternoon

Chairman: M. L. Dannis, B. F. Goodrich Company, Brecksville, Ohio

##### B-1

2:00 p.m. W. N. Findley and K. Onaran, Brown University, Providence, Rhode Island, "Product Form of Kernel Functions for Nonlinear Viscoelasticity of PVC Under Constant Rate Stressing"

##### B-2

2:30 p.m. J. S. Y. Lai and W. N. Findley, Brown University, Providence, Rhode Island, "Prediction of Uniaxial Stress Relaxation From Creep of Non-Linear Viscoelastic Material"

##### B-3

3:00 p.m. R. A. Dickie and T. L. Smith, Stanford Research Institute, Menlo Park, California, "Stress-Strain Characteristics of an SBR Vulcanizate in Simple Tension, Constrained Biaxial Tension and Equal Biaxial Tension"

3:30 p.m. Coffee break

##### B-4

3:45 p.m. K. L. Cheng, Lord Corp., Erie, Pa., "A Strain Energy Function for Rubber-like Materials"

##### B-5

4:15 p.m. K. C. Valanis, Iowa State University, Ames, Iowa, "Elastic Materials with Particle Interactions of Finite Range"

##### B-6

4:45 p.m. H. K. Mueller, California Institute of Technology, Pasadena, California, "Some Mechanical Properties and the Surface Energies of a Swollen and Unswollen Polyurethane Elastomer"

PREREGISTRATION FOR 39th ANNUAL MEETING  
OF THE  
SOCIETY OF RHEOLOGY, INC.

NAME .....

ADDRESS: .....

.....

Member	\$ 6.00
Non-member	\$10.00
Registration plus membership	\$16.00

Mail to:

J. R. Knox  
Avisun Corporation  
Post Road  
Marcus Hook, Pennsylvania 19061

SPECIAL TOPIC DISCUSSION—Monday Evening

8:00 p.m. Topic: "*The Rheology of Dispersions*"  
Discussion Leader: S. G. Mason, McGill University,  
Montreal, Canada

TUESDAY, JANUARY 14

SESSION C—Tuesday Morning

Chairman: C. L. Sieglaff, Diamond Alkali Company,  
Painesville, Ohio

C-1

9:00 a.m. E. Menefee, Western Regional Research  
Laboratory, Albany, California "*Improvements in  
Viscoelastic Theory for Polydisperse Entangled  
Macromolecules*"

C-2

9:30 a.m. J. Rotne and S. Prager, University of Min-  
nesota, Minneapolis, Minnesota, "*Variational Treat-  
ment of Hydrodynamic Interaction in Polymers*"

10:00 a.m. Coffee break

C-3

10:15 a.m. F. Bueche and G. Tokcan, University of  
Dayton, Dayton, Ohio, "*Range of Validity of the  
DTO Model*"

C-4

10:45 a.m. P. J. Carreau, The University of Wisconsin,  
Madison, Wisconsin, "*Rheological Equations From  
Molecular Network Theories*"

C-5

11:15 a.m. N. Sarkar, The Dow Chemical Company,  
Midland, Michigan, "*Viscosity of Polymer Solu-  
tions as a Function of Shear Rate*"

C-6

11:45 a.m. J. L. Sutterby, The Dow Chemical Com-  
pany, "*Zero Shear Rate Viscosity by Falling Sphere  
Viscometry. I. Wall, Inertial, and End Corrections  
to Stokes Law for Newtonian Fluids*"

SPECIAL TOPICS DISCUSSION—Tuesday Afternoon

2:00 p.m. Topic: "*The Influence of Entanglement on  
Flow*" Discussion Leader: E. A. Collins, B. F. Good-  
rich Company, Avon Lake, Ohio.

4:00 p.m. Coffee break

4:30 p.m. Society of Rheology Business Meeting

WEDNESDAY, JANUARY 15

SESSION D—Wednesday Morning

Chairman: J. R. Knox, Avisun Corporation, Marcus  
Hook, Pa.

D-1

9:00 a.m.\* R. F. Scott, California Institute of Technol-  
ogy, Pasadena, California, "*The Application of Rhe-  
ology to Soil Mechanics*"

10:00 a.m. Coffee break

D-2

10:15 a.m. R. L. Schiffman, University of Illinois, Chi-  
cago, Illinois, "*Secondary Consolidation of Clays—  
A Viscoelastic Analysis*"

D-3

10:45 a.m. J. L. Ericksen, The Johns Hopkins Univer-  
sity, Baltimore, Maryland, "*Some Ordinary Differ-  
ential Equations Pertaining to Liquid Crystals*"

D-4

11:15 a.m. B. Bernstein and R. L. Fosdick, Illinois In-  
stitute of Technology, Chicago, Illinois, "*Some Rhe-  
ological Relations for Small Oscillations Superposed  
on Large Steady Shear of Non-Newtonian Fluids*"

D-5

11:45 a.m. H. Leeming and W. G. Knauss, Lockheed  
Propulsion Company, Redlands, California, "*Con-  
stitutive Behavior of Polymers Under Transient  
Thermal Conditions*"

SESSION E—Wednesday Afternoon

Chairman: R. A. Stratton, Mobil Chemical Co., Edison,  
New Jersey

E-1

2:00 p.m. A. Siflinger and A. Silberberg, Weizmann  
Institute of Science, Rehovot, Israel, "*The Mechanical  
Stability of Viscoelastic Jets*"

E-2

2:30 p.m. R. I. Tanner, Brown University, Providence,  
Rhode Island, "*The Use of Iterative Numerical  
Methods for the Solution of Integral Equations Aris-  
ing in Rheology*"

E-3

3:00 p.m. A. C. Pipkin and R. I. Tanner, Brown Uni-  
versity, Providence, Rhode Island, "*Intrinsic Errors  
in Pressure-Hole Measurements*"

E-4

3:30 p.m. R. C. Penwell and R. S. Porter, University of  
Massachusetts, Amherst, Massachusetts, "*Rheology  
of Polystyrene Near the Glass Transition*"

