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RHEOLOGY BULLETIN

Publication of the Society of Rheology

Volume 21, No. 1

Spring 1952

BETWEEN THE MEETINGS

Rheology is gathering momentum. This was the general consensus of opinion last Fall at Chicago after the very successful annual meeting on the occasion of the 20th Anniversary of the American Institute of Physics. It was considered highly desirable that Rheology should develop as the central science for the host of workers in Academical Research and Industry who, knowingly or unknowingly, base their activities on Rheology.

The story of Colloid Chemistry may here be recalled. When it was a young discipline, it was considered an oddity; when Colloid Chemistry developed rapidly, it was taken as a matter of course, and after it had pervaded every conceivable field, every scientist considered his particular facet as his own domain. Yet, it is now recognized that the failure to develop schools of general Colloid Chemistry seriously hampers individual progress and that it has made proper, systematic, training all but impossible. It is well to aim at a unified Science, but unification must come from competence which can only be had by consolidated knowledge of the peculiarities of individual fields.

The American Rheological Society and the corresponding societies overseas endeavour to prevent Rheology from sharing the fate of Colloid Chemistry, its mother science. The problems encountered in geology, the rubber industry, cheese manufacture, and lubrication, to mention an arbitrary few, may appear entirely different; yet there is a central body of knowledge, and common method of approach which enhance the solution of the most diverse questions. Rheology is young and in most instances we have just scratched the surface. It is all the more important to keep looking for basic themes of which the observed forms of deformation of matter are the variations.

Our Annual Meetings are striving to become one of the instruments toward this goal. By personal contact, these meetings provide the best opportunity to bring the existing problems to the attention of the more theoretical men, and vice versa, help to spread academic advances to the practical worker. There has been a tendency in the past to solicit papers mostly from workers in established lines of Rheology. It is inevitable that they should form the hard core of the program. However, the past Chicago Meeting has shown that there are plenty of applied and borderline topics of general interest. It is hoped that the presence of such papers will become a permanent feature of future meetings, and an urgent appeal is directed to members and non-members to assist this development by preparing and submitting papers from their field of experience.

APPEAL OF THE PROGRAM COMMITTEE

The Program Committee met on February 26, to plan the program for the 1952 Meeting which will be held on October 30 and 31, at the Franklin Institute in Philadelphia, Pa. The committee felt that a broader participation by the membership, particularly in the presentation of papers, would be most desirable. Will any members who expect to have a contribution for our next meeting, please notify the Chairman:

J. H. Elliott
Hercules Experiment Station
Wilmington, Delaware

before May 15. This year it is planned to have papers refereed, for presentation and subsequent publication in the Rheology Number of the Journal of Colloid Science, prior to the meeting. Contributors, therefore, should aim at submitting three copies of their manuscripts before September 1, 1952. The early refereeing will enable the Committee to assign discussion leaders, who will start the discussion after each paper or group of papers, and thereby ensure one of the main purposes of the meeting.

Depending on the response to this appeal, and on the time available, it is further planned to hold a discussion, without formal papers, on fundamental rheological concepts. Finally, a number of prominent workers may be asked to give brief review papers on fields in rapid development, such as the use and application of dynamic methods, thermodynamics and flow phenomena, non-linear relationships in rheology, etc.

AN INTERNATIONAL UNION OF RHEOLOGY

Members will remember that discussions pertaining to the foundation of an International Union of Rheology have been going on between the rheological societies of various countries for a considerable while. Leading in the wish to create a new union is the British Society of Rheology, a very active group of about the same size as the American Society, which holds meetings several times a year and issues bulletins which have so far provided 2233 abstracts and references of papers of rheological interest. The British feel these abstracts to be one of the most valuable activities of their Society, but they are handicapped by the mounting costs and think that also on principle international cooperation in these abstracts would be desirable.

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RHEOLOGY BULLETIN

F. R. EIRICH, EDITOR

The Polytechnic Institute

Brooklyn 2, N. Y.

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Discussions have been going on between the British Executive Committee and Dutch and French colleagues. Basically, the European workers are all in favor of an international union but wish to found it only if the American Rheological Society would join in the venture. In this country the question has been raised whether the time has come to be sure of the necessity or desirability of such a union. The issues surrounding this question are as yet far from being settled, and a report on the situation will be given at the forthcoming Fall Meeting. Voices have been raised that the purposes of the union could be fulfilled by more intimate contact between the Societies of the various countries and by working through ASTM and its international ramifications. The problems besetting an international rheological abstracting service are also numerous and complex and will have to be further investigated.

There has been rather keen disappointment in Europe over the apparent reluctance of the American colleagues, but it may be stated that there is no principal objection against the formation of a union on the part of most rheologists in this country. In the meantime, our Executive Committee proposed that the secretaries or editors of the various Societies should mutually become members of the other societies in order to enhance the exchange of information and ideas concerning the proposed union. So far, Dr. Harrison, secretary of the British Society, has accepted. The reply of our secretary is quoted below:

Dear Dr. Harrison:

Thank you for your letter of February 4, in which you accept appointment as Foreign Secretary of the Society of Rheology for 1952. I sincerely hope that you will be able to continue your activities also during 1953.

I will be very glad to present to the membership the proposal concerning distribution of your Bulletin in this country at a reduced subscription rate. I would like to have full details in time for the Fall Issue of our Bulletin and subsequent presentation to the Executive Committee in November.

Sincerely yours,

G. J. Dienes

Members who are interested in learning more about British activities are advised that it is proposed to make the British Bulletin available over here. Requests may be sent to this Editor.

MINUTES
BUSINESS MEETING
OF THE SOCIETY OF RHEOLOGY

October 24, 1951

Hotel Sherman, Chicago

The Meeting was called to order at 4:40 P.M. by President Traxler.

It was moved and carried that the Minutes of the 1951 Business Meeting be accepted as printed in the Rheological Bulletin.

The Secretary-Treasurer submitted his interim report. The financial condition of the Society was reported as of September 25, 1951, and the tentative budget for 1952 submitted (complete reports on file with the Secretary-Treasurer's records).

Financial Statement,

Interim, January 1 — September 25, 1951

General Funds

Cash on hand, January 1, 1951	\$1215.46
Income for 1951 (to Sept. 25)	1648.59
Total	2864.05
Disbursements (to Sept. 25)	1162.02
Balance, cash, Sept. 25, 1951	\$1702.03
Special Appropriation for	
Rheology Issue*	\$200.00
Estimated net expense for	
remainder of 1951	196.00
	\$396.00
Estimated balance, January 1, 1952	\$1306.03
Estimated operating surplus	
for 1951	\$ 90.59

* Appropriated to cover the expense of publishing the unusually large number of excellent papers given at the 20th anniversary meeting of AIP.

Special Funds

<i>Bingham Fund</i>	
Total in fund, Sept. 25, 1951	\$784.38
<i>Rheological Memoirs Fund</i>	
Total in Fund, Sept. 25, 1951	\$68.21

The Society operated well within its income and budget. Full financial report will be made at the end of the year.

Tentative Budget for 1952

Estimated cash at end of 1951	\$1300.00
Estimated income	1600.00
Total cash resources	\$2900.00

Estimated Expenses

AIP Assessment and	
Service charge	\$290.00
Academic Press	800.00
Meeting expenses	50.00
Printing	210.00
Mailing — Secretary's expenses	80.00
Rheology Bulletin	160.00
Total Expenses	\$1590.00
Estimated Surplus	\$ 10.00

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It was moved and carried that the Secretary-Treasurer's interim report and budget be accepted and filed.

Important items considered at the Executive Committee Meeting were reviewed at the business meeting (full details are given in the Minutes of the Executive Committee Meeting). A brief summary is given here.

Plans for the 1952 meeting were discussed, with particular emphasis on the pros and cons of holding the 1952 meeting at the Franklin Institute. The members present voted to recommend to the Executive Committee that the invitation of the Franklin Institute be accepted for the 1952 meeting.

F. D. Dexter reviewed the activities of the Membership Committee and suggested that membership lists be distributed to all members. It was moved and carried that the Society be authorized to distribute membership lists to its members.

J. M. Elliott reviewed publication policies and discussed the need for the extra \$200 appropriation required to take care of publication of the papers given at the meeting.

A. A. Bondi reported briefly on the activities of the West Coast Section.

Dr. Traxler called upon Dr. W. F. Fair to give the report of the Ballot Committee (W. F. Fair, Chairman, E. Thelen, G. Cathers)

193 Ballots were cast of which 190 were valid. The slate proposed by the Nominating Committee was declared elected (complete teller's report on file). Because of Dr. Fischer's untimely death shortly after the ballots were sent out the First Vice-Presidency became vacant. In accordance with the by-laws, W. H. Markwood became First Vice-President and F. D. Dexter was appointed by the Executive Committee to the Second Vice-Presidency. The officers elected for 1952-53 are:

R. S. Spencer — President
W. H. Markwood — First Vice-President
F. D. Dexter — Second Vice-President
F. R. Eirich — Editor
G. J. Dienes — Secretary-Treasurer

Dr. Traxler turned the chair over to Dr. Spencer.

Dr. Spencer announced the appointment of A. A. Bondi as Assistant Secretary to represent the West Coast Section to the Society.

The meeting adjourned at 5:18 P.M.

After the Business Meeting there was a brief session of the new Executive Committee. The actions of the previous Executive Committee were approved. It was decided to hold the 1952 Annual Meeting in Philadelphia. The date was tentatively set as October 30-31, 1952.

Submitted by Secretary-Treasurer
G. J. Dienes December 7, 1952

APPOINTMENTS

Apart from the officers of the Society elected as above, the following appointments were made by the President, Dr. R. S. Spencer:

Additional Member of Executive Committee:

R. N. Traxler

Committees:

Bingham Medal Award:

J. H. Dillon, Chairman
T. Alfrey, Jr.
R. Buchdahl
C. Mack
N. W. Taylor

Program Committee:

J. H. Elliott, Chairman
H. H. Hull
R. S. Marvin
E. Thelen

Membership:

F. D. Dexter, Chairman

Publicity:

W. H. Markwood, Jr.

Arrangements for Meeting, Philadelphia, 1952:

E. Thelen

Representatives:

Asst. Secretary for the Pacific Coast:

A. Bondi

AAAS Representative:

R. S. Spencer

Proxies to represent The Society of Rheology at The Annual Meeting of The Institute of Physics:

F. R. Eirich
H. F. Wakefield

National Association of Corrosion Engineers — Inter-Society Committee on Corrosion:

W. F. Fair, Jr.

ASA Committee Z59: ROBERT S. SPENCER, President
R. B. Dow The Society of Rheology

MEMBERSHIP ACTIVITIES

During the last fiscal year there was a moderately large turnover in membership. Due largely to the cooperative efforts of the Membership Committee we were joined by a number of new members resulting in an overall gain in member strength. Thus the steady growth enjoyed by the Society during the post war years remains uninterrupted. Continued efforts, not only by the Membership Committee, but on the part of all members, will insure this expansion during the coming years.

Following are the Committee Members whose invaluable assistance contributed much to last years successful operation:

C. G. Albert	W. R. Mark
Robert S. Balk	Robert S. Marvin
J. Betram Bates	John J. Mullan
W. G. Bechtel	J. M. Purdy
Alden B. Bestul	R. F. Reed
R. Braddicks	James V. Robinson
Carl M. Conrad	Robert A. Stephens
Frank C. Croxton	R. R. Sullivan
Harold J. Dawe	Edmund Thelen
A. R. Decker	J. H. Westbrook
S. S. Gutkin	F. J. Williams
C. E. Hammett	F. D. Dexter
Stewart J. Lloyd	(Chairman)
W. M. MacAlpine	

**THE RHEOLOGISTS MEETING
IN BERLIN, 1951
THE FOUNDING OF
A GERMAN RHEOLOGICAL SOCIETY**

A meeting of German rheologists took place from October 3-6, 1951 at the Office Berlin-Dahlem for Materials Testing. It was the first of its kind and, apart from the technical session, was convened for the purpose of founding a German rheological society. The Chairman of the Meeting, Dr. H. Umstaetter, stated that, after a lion's share in the early development of rheology, German science has fallen far behind in the development of this important borderline where practically all disciplines of science, engineering, and biology meet. By unanimous approval a society was founded and preliminary rules and by-laws adopted. No appointments of officers have as yet been made.

The occasion of arranging the meeting was the addition of a rheological group to the German testing institution, in recognition of the ever increasing importance of a fundamental study of flow properties. The meeting was attended by 160 participants from Germany and abroad, many of international prominence. The following summary of lectures and titles may be taken as representative of the present state of rheology in Germany.

A. Bartel, Passau: "The Limits of Service Pressures on Lubricated Metal Surfaces."

G. Becker, Berlin: "The Penetration of Preservatives into wood and wood meal."

K. H. Bussmann, Berlin: "Creep and Relaxation of Transmission Belts."

K. Edelmann, Fibre Institute, Teltow: "Structural Viscosity of polyamino acid and polyacrylonitrile solutions."

A. G. Epprecht, Zurich: "End Point Determination of Precipitations by a Rotatory Viscosimeter."

H. H. Emschermann, Berlin: "A luminographic Method for Measuring Flow Times."

H. Fromm, Mainz: "Correction for Fluid Relaxation in Capillary Viscosimeters."

L. Grunberg, Glasgow: "Viscosity and Molecular Structure", with special reference to paraffins.

E. Heidebrock, Dresden: "Testing for Suitability as Lubricant."

M. Joly, Paris: "Concentration Effects on the Orientation of Suspended Rigid Particles."

E. Jung, Berlin: "Relaxation of Steel in Reinforced Concrete."

H. Lorenz, Berlin: "Hydrostatic Anomalies in Thixotropic Liquids."

W. Neudert, Berlin: "The Mechanism of Deformation of Droplets on Solid Surfaces."

M. Pfender, Berlin: "Testing of Lubricants in Compression at Low Velocities."

G. Seitz, Berlin: "Relaxation of Steel After High Pressure Pulses."

L. Ubbelohde, Dusseldorf: "The Static Strength of Films of Lubricants."

K. Ueberreiter and H. Orthmann, Berlin: "The Viscosity of Selenium in the Glass State."

H. Umstaetter, Berlin: "The Value of Viscosity as a Material Constant; its Relation to Relaxation."

R. Wille and C. Schreck, Berlin: "The Mechanics of Continua and the Weissenberg Effect."

**ACTIVITIES OF THE WEST COAST SECTION
OF THE
AMERICAN SOCIETY OF RHEOLOGY;
3rd ANNUAL MEETING**

Our West Coast Section has been increasingly active under the leadership of Dr. A. Bondi. His achievements have been recognized at the recent Annual Meeting of the Executive Committee by his nomination as Assistant Secretary of the section. A brief report on the 3rd Annual Meeting, which was held on November 16, 1951 on the Berkeley Campus, in cooperation with the Division of Mechanical Engineering of the University of California, is given below.

The following papers were presented.

R. J. Moore and Henry Eyring discussed the structure of the liquid state and the viscosity of hydrocarbons. The molecules of solid normal paraffins were suggested to be not only aligned parallel but to experience hindered rotation up to temperatures above the melting point. Discontinuities in the curves of physical parameters vs. temperature occurred where geometrical considerations would indicate the onset of free rotation. Assuming rotations as the prevalent movement, the observed data permit the conclusion that flow occurs by a mechanism similar to that found in metals, which involves movement of dislocations.

T. Baron talked on the viscosity of high polymer melts measured over a wide range of shearing stresses and temperatures. The data are well represented by Eyring's hyperbolic sine law. Equations could be derived for the flow of non-Newtonian liquids in capillaries.

H. P. Lundgren interpreted the effects of chemical agents on stress relaxation in wool fibers and proposed a rheometric method for the determination of the distribution of hydrogen bonds.

G. E. Dorn and C. D. Starr studied the effect of alpha solid solution alloys of aluminum on the behavior of the grain boundary in polycrystalline specimens. Only the magnesium alloys changed the rate of relaxation of the rigidity modulus.

B. W. Hotten and D. H. Birdsall talked on the fine structure and flow properties of lithium soap-oil dispersions. The texture and consistency of the resulting greases could be correlated with the surface area of the soap crystals.

L. W. Neubauer presented a paper on the effects of viscosity changes on the amount of sediment transported in open channels. A large influence of thermal convection was found when the viscosity of the water was varied with temperature. Addition of sugar increased the movement of sand. The amount transported begins above a critical value, and is a function of the shear stress at the wall.

A supplement referring to other meetings will be attached to this issue.

SUPPLEMENT

to

RHEOLOGY BULLETIN

Volume 21, No. 1

Spring, 1952

REPORT ON TWO PAST MEETINGS OF INTEREST.

ABBREVIATED LIST OF FUTURE MEETINGS THROUGH 1952.

THE SECOND MIDWESTERN CONFERENCE ON FLUID MECHANICS.

This conference was held on the campus of the Ohio State University in Columbus on March 17-19. It followed upon the Midwestern Conference on Fluid Dynamics at the University of Illinois, May 12, 1950. The proceedings of the latter have been published by J.W. Edwards, Ann Arbor, at the price of \$10, and contain a most valuable array of essays on theoretical problems, with main chapters on aerodynamics, mathematical theory of fluid dynamics, chemical engineering, hydraulics and mechanical engineering, preceded by two invited addresses on turbulence and on aerophysics.

This year's conference presented sections on turbulence, particle dynamics, convective phenomena, hydraulics, gas dynamics and supersonics, aerodynamics and potential flow,

laminar viscous motion, combustion, flow measurements and heat transfer, and transition to turbulent flow. The proceedings presumably will appear again in one volume.

MEETING OF THE HIGH POLYMER DIVISION, AMERICAN PHYSICAL SOCIETY, March 20-22, 1952, Columbus, Ohio.

A program of many attractions for rheologists was presented at this meeting. In view of the large number of papers, only a selection of titles shall be given to inform members who had no opportunity of seeing the program.

A New Approximate Conversion Method for Relating Stress Relaxation and Dynamic Modulus
R.S. Marvin, National Bureau of Standards

Correlation of Dynamic and Static Measurements on Rubber-Like Materials II
R.D. Andrews, The Dow Chemical Company

Viscoelastic Properties of Polymers by Phase Angle Measurements
R.D. Spangler, du Pont Company

Investigations on Plastics in a Large Range of Mechanical Frequencies
W. Philippoff, The Franklin Institute

Method for Determining Dynamic Mechanical Properties of Gels and Solids at Audiofrequencies; Comparison of Mechanical and Electrical Properties
E.R. Fitzgerald and J.D. Ferry, University of Wisconsin

Dynamic Mechanical and Electrical Properties of the System of Polyvinyl Chloride - Dimethyl Thianthrene
J.D. Ferry and E.R. Fitzgerald, University of Wisconsin

The Relaxation Distribution Function in Polyisobutylene and Polyisobutylene-Decalin Solutions
L.D. Grandine, Jr., E.R. Fitzgerald, I. Jordan and J.D. Ferry, University of Wisconsin

- Ultrasonic Investigation of Plasticized Polymethyl
Methacrylate
R.G. Cheatham and A.G.H. Dietz, Mass. Institute of
Technology.
- Acoustic Properties of Rubber as a Function of Chemical
Composition
W.S. Cramer and I. Silver, Naval Ordnance Laboratory
- Studies of Rapid Crystallization in Polymers
W.H. Cobbs, Jr. and R.L. Burton, du Pont Company
- Polymer Research as a Branch of Solid State Physics
E. Guth, University of Notre Dame
- Structure of Solid Solutions
R. Smoluchowski, Carnegie Institute of Technology
- Structure of Solids by Neutron Diffraction
C.G. Shull, Oak Ridge National Laboratory
- Structure and Mechanical Properties of Glasses
W.A. Weyl, Pennsylvania State College
- The Viscosity of Concentrated Macromolecular Solutions
R. Simha, New York University
- Self Diffusion and Bulk Viscosity of High Polymers
F. Bueche, Cornell University
- The Effect of Diluents on the Second Order Transition and
Flow Properties of Polystyrene
T.G. Fox, Rohm and Haas Company
- The Effect of Crosslinking on the Second Order Transition
Temperature of Polymethyl Methacrylate
S. Loshaek, Rohm and Haas Company
- Strain-Temperature Studies of Transitions in Rubbers
R.J. Derenthal, F.P. Baldwin and R.L. Anthony, University
of Notre Dame
- Dielectric Breakdown of Polymers under Prolonged Stress
C.G. Brodhun, du Pont Company
- Structure and Properties of Polyamides
R. Brill, Polytechnic Institute of Brooklyn

Relations between Viscosity and Flow Birefringence of
Polyelectrolytes
P.M. Kamath, B. Rosen and F.R. Eirich, Polytechnic
Institute of Brooklyn

Configuration Distribution of a Chain Molecule with
Correlations
C.M. Tchen, National Bureau of Standards

CALENDAR OF MEETINGS OF POSSIBLE INTEREST TO RHEOLOGISTS
FOR THE BALANCE OF 1952

- April 7-9 Amer. Soc. Lubrication Engrs., seventh annual
meeting and lubrication show, Cleveland, Ohio
- April 9-11 Soc. of Plastics Industry, reinforced plastics
division, 7th annual technical session, Edgewater
Beach Hotel, Chicago, Ill.
- April 16-17 Fiber Society, spring meeting, Clemson House,
Clemson, S.C.
- April 16-18 National Petroleum Assoc., semi-annual meeting,
Hotel Cleveland, Ohio
- April 27 -
May 1 Amer. Ceramic Soc., 54th annual meeting, William
Penn Hotel, Pittsburgh, Pa.
- April 28-30 Natl. Acad. Sciences, Annual Meeting, Washington,
D.C.
- April 28-30 Amer. Oil Chemists' Soc., Shamrock Hotel,
Houston, Texas
- April 30-
May 2 Amer. Chem. Soc., Rubber Division, spring meeting,
Netherlands Plaza Hotel, Cincinnati, Ohio
- May 1-3 Amer. Phys. Soc., Washington, D.C.
- May 5-7 Amer. Geophysical Union, thirty-third annual
meeting, National Academy of Sciences, National
Research Council, Washington, D.C.
- May 5-7 American Mining Congress, annual spring meeting,
Netherlands Plaza Hotel, Cincinnati, Ohio

- May 6-9 Scientific Apparatus Makers Assoc., annual meeting, Edgewater Beach Hotel, Chicago, Ill.
- May 8-10 Acoustical Soc. of Amer., New York, N.Y.
- May 14-16 Soc. Exptl. Stress Analysis, spring meeting, Hotel Lincoln, Indianapolis, Ind.
- May 21-22 American Iron & Steel Institute, annual meeting, Waldorf-Astoria Hotel, New York, N.Y.
- June 1-4 Amer. Leather Chemists Assoc., annual convention, New Ocean House, Swampscott, Mass.
- June 9-21 International Organization for Standardization, triennial meeting, Columbia University, New York, N.Y.
- June 10-13 Lithographers National Assoc., annual convention, Greenbrier, White Sulphur Springs, W. Va.
- June 16-18 Amer. Chem. Soc., Division of Colloid Chemistry, 26th National Colloid Symposium, University of Southern California, Los Angeles, Calif.
- June 16-18 National Association of Printing Ink Makers, annual convention, The Homestead, Hot Springs, Va.
- June 16-20 Amer. Crystallographic Assoc., Camp Tamiment, Poconos, Penna.
- June 16-
August 25 Gordon Research Conferences:
- | | | |
|-----------|-----------------|-------------------------------|
| June 16 | Petroleum | Organic Coatings |
| June 30 | | Elastomers |
| July 7 | Polymers | |
| July 14 | Textiles | Chemistry & Physics of metals |
| July 21 | | Pprous Media |
| July 28 | Instrumentation | |
| August 25 | | Coal |
- June 19-21 Amer. Soc. Mech. Engrs., applied mechanics division conference, Pennsylvania State College, State College, Pa.
- June 23-25 Forest Products Research Soc., 6th annual national meeting, Milwaukee, Wis.
- June 23-27 A.S.T.M., annual meeting and biennial apparatus and photographic exhibits, Hotels Statler and New Yorker, New York, N.Y.

- June 25-27 American Physical Soc., division of fluid dynamics, University of Utah, Salt Lake City, Utah
- July 11-13 Amer. Chem. Soc., Division of Physical and Inorganic Chemistry, Summer Symposium, University of Notre Dame, Notre Dame, Ind.
- July 16-18 Inst. Aeronautical Sciences, annual summer meeting, Los Angeles, Calif.
- Sept. 1-5 Combustion, Internatl. Symposium, Mass. Inst. Tech, Cambridge, Mass. (notice in Library)
- Sept. 3-13 World Engineering Conference, ASCE centennial, other engineering societies, Chicago, Ill. (notice in Library)
- Sept. 8-10 American Standards Assoc., National standardization conference, Museum of Science & Industry, Chicago, Ill.
- Sept. 8-12 Amer. Soc. Mech. Engrs., industrial instruments and regulators division, and Instrument Society of America exhibit and joint conference; symposium on high pressure, Cleveland, Ohio
- Sept. 10-12 Natl. Petroleum Assoc., 50th Annual meeting, The Traymore, Atlantic City, N.J.
- Sept. 11-12 Amer. Geophysical Union, Regional meeting, University of Chicago, Chicago, Ill.
- Sept. 22-24 Amer. Soc. Mech. Engrs., petroleum mechanical engineering conference, Hotel President, Kansas City, Mo.
- Oct. 10-11 Amer. Ceramic Soc., Glass Division, Bedford Springs Hotel, Bedford, Pa.
- Oct. 12-18 Printing Ink Industry of America, annual convention, Chase Hotel, St. Louis, Mo.
- Oct. 18-19 American Society for Metals, annual seminar, Benjamin Franklin Hotel, Philadelphia, Pa.
- Oct. 27-29 National Lubricating Grease Institute, annual meeting, Edgewater Beach Hotel, Chicago, Ill.
- Oct. 29-31 Amer. Chem. Soc., Division of Rubber Chemistry, Fall Meeting, Hotel Statler, Buffalo, N.Y.

- Nov. 1. Natl. Paint, Varnish, and Lacquer Assoc.,
Chicago, Ill.
- Nov. 5-9 Scientific Apparatus Makers Assoc., midyear
meeting of Industrial Instrument, Laboratory
Apparatus, Laboratory Equipment, Optical
Aeronautical and Military Instruments Sections,
The Homestead, Hot Springs, Va.
- Nov. 6-7 Society of Automotive Engineers, national fuels
and lubricants meeting, The Mayo, Tulsa, Okla.
- Nov. 6-8 Amer. Assoc. Textile Chemists and Colorists,
national convention, Boston, Mass.
- Nov. 10-13 Amer. Petroleum Inst., annual meeting, Conrad
Hilton Hotel and Palmer House, Chicago, Ill.
- Nov. 17-21 Soil Sci. Soc. Amer., Amer. Soc. Agronomy,
Netherlands Plaza Hotel, Cincinnati, Ohio
- Nov. 19 American Standards Assoc., annual meeting,
Waldorf-Astoria Hotel, New York, N.Y.
- Dec. 26-31 Amer. Assoc. Advancement of Science, annual
meeting, St. Louis, Mo.
- Dec. 27-28 Amer. Chem. Soc., Division of Industrial and
Engineering Chemistry, 18th Annual Chemical
Engineering Symposium, Evanston, Ill.