

Gordon Research Conferences

Alexander M. Cruickshank

The Gordon Research Conferences for 1970 will be held in New Hampshire from 15 June to 4 September, and in Washington from 15 June to 7 August.

Purpose. The conferences were established to stimulate research in universities, research foundations, and industrial laboratories. This purpose is achieved by an informal type of meeting consisting of scheduled speakers and discussion groups. Sufficient time is available to stimulate informal discussion among the members of each conference. Meetings are held in the morning and in the evening, Monday through Friday, with the exception of Friday evening. The afternoons are available for recreation, reading, or participation in discussion groups, as the individual desires. This type of meeting is a valuable means of disseminating information and ideas to an extent that could not be achieved through the usual channels of publication and presentation at scientific meetings. In addition, scientists in related fields become acquainted, and valuable associations are formed that often result in collaboration and cooperative efforts among laboratories.

It is hoped that each conference will extend the frontiers of science by fostering a free and informal exchange of ideas among persons actively interested in the subject under discussion. The purpose of the program is to bring experts up to date on the latest developments, to analyze the significance of these developments, and to provoke suggestions concerning the underlying theories and profitable methods of approach for scientific research. The review of known information is not desired.

In order to protect individual rights and to promote discussion it is an established requirement of each conference that no information presented is to be used without specific authorization of the individual making the contribution,

whether in formal presentation or in discussion. Scientific publications are not prepared as emanating from the conferences.

Registration and Reservations. Attendance at the conferences is by application. Individuals interested in attending the conferences are requested to send their applications to the director at least 2 months prior to the date of the conference.

Applications must be submitted in duplicate on the standard application form which may be obtained from the office of the director. This procedure is important because certain specific information is required in order that a fair and equitable decision on the application may be made. Attendance at each conference is limited to approximately 100 conferees.

The director will submit the applications of those requesting permission to attend a conference to the committee for that conference. This committee will review the applications and select the members in an effort to distribute the attendance as widely as possible among the various institutions and laboratories represented by the applications. A registration card will be mailed to those selected. *Advance registration by mail for each conference is required and is completed on receipt of the card and the deposit of \$30.* This advance deposit is not required from foreign scientists. Checks are to be made payable to the Gordon Research Conferences. The deposit will be credited against the fixed fee for the conference. A registration card not accompanied by the deposit will not be accepted.

Special Fund. A special fund is provided from the registration fee and is made available to the chairman of the conference for the purpose of increasing the participation of research scientists who could not otherwise attend and participate because of financial limitations. Its use is not limited to scientists who have been invited by the chairman as a

speaker or discussion leader. The money is to be used as an assistance fund only and may be used to contribute toward conferees' travel expenses, registration fee and/or subsistence expenses at the conference, or both. Total travel and subsistence expenses usually will not be provided.

The Board of Trustees of the Conferences has established a fixed fee for resident conferees at each conference. This fee was established to encourage attendance for the entire conference and to increase the Special Fund that is available to each conference chairman for the purpose of assisting conferees who attend a conference at total or partial personal expense with their travel or subsistence expenses, or with both. It is to the advantage of all participants to attend a conference for the entire week. *The fixed fee will be charged regardless of the time a conferee attends the conference—that is, for the periods of from 1 to 4½ days. An additional charge per night per person will be made for a room with a private bath or for a single room, if no double rooms or roommates are available.* These rooms will be assigned in the order that applications are received. An additional charge will also be made for rooms occupied more than five conference nights (Sunday through Thursday).

The fixed fee will cover registration, room (except single room or room with bath), meals, and gratuities for resident conferees. It will not provide for golf, telephone, taxi, laundry, conference photograph, or any other personal expenses.

Conferees are expected to live at the conference location because one of the objectives of the conferences is to provide a place where scientists can get together informally for discussion of scientific research. When special circumstances warrant a request to live elsewhere permission must be obtained from the director. If the request is approved these nonresident conferees will be charged a registration fee of \$65, instead of the resident fee of \$50.

Conferees living at the conference location who will pay all or part of the fixed fee as a personal expense may request a reduction of \$25 in the registration fee. *Application for this special fee must be requested at the Conference office during the conference.*

Accommodations are available for wives who wish to accompany their husbands and for children at least 12 years of age. All such requests should be

The author, director of the Gordon Research Conferences, is professor of chemistry at the University of Rhode Island, Kingston.

made at the time the attendance application is submitted because these accommodations, limited in number, will be assigned in the order that specific requests are received. Pets are prohibited at the conference site.

Fees:

New Hampshire and Washington	
Fixed Fee	\$130
(Registration, resident conferee)	50
Subsistence, including gratuities)	80
Registration (nonresident)	65
Resident guest charges	80
(Subsistence, including gratuities for five conference days)	
Deposit (conferees only)	30

Cancellation. The deposit will be forfeited if an approved application for attendance at a conference is canceled. *This deposit is not transferable to another conferee or conference.*

Program. The complete program for the 1970 Gordon Research Conferences is published in this issue of *Science*. Reprints are available on request.

Membership. Requests for membership in the Conferences, or for additional information, should be addressed to: Alexander M. Cruickshank, Director, Gordon Research Conferences, Pastore Chemical Laboratory, University of Rhode Island, Kingston, Rhode Island 02881. Telephone 401-783-4011.

Mail for the office of the Director from 15 June to 4 September 1970 should be addressed to: Alexander M. Cruickshank, Director, Gordon Research Conferences, Colby Junior College, New London, New Hampshire 03257. Telephone 603-526-2870.

The program to be presented is as follows:

Colby Junior College

Nuclear Chemistry

Arthur M. Poskanzer, chairman; T. T. Sugihara, vice chairman.

15-19 June. Central theme will be nuclear reactions. High energy reactions, knock-on cascade calculations; preequilibrium evaporation, evaporation calculations; reaction theory; heavy ion reactions. Fission experiments, light particles from fission; fission theory; intermediate states. Astrophysics and nucleosynthesis. Subjects of broad interest: nuclear reactions in lunar material; nuclear chemistry in environmental research. (Speakers to be announced.)

Catalysis

Allen N. Webb, chairman; Sol W. Weller, vice chairman.

22 June. H. F. Harnsberger, "Catalytic applications of the electron microprobe"; Robert P. Merrill, "Investigations of catalytic surfaces with molecular beams and low-energy electron diffractions"; Willard F. Libby, "d-Electron catalysis."

23 June. James Anderson, "Local environment of transition metal ions on oxide supports"; Kenzi Tamaru, "Dynamic treatment of chemisorbed species under reaction conditions by means of infrared techniques"; R. J. Kokes and A. L. Dent, "Hydrogenation over zinc oxide."

24 June. Dwight M. Smith, "Heterogeneously-catalyzed addition reactions of acetylenes"; John Turkevich, "Double magnetic resonance in surface studies"; Sergio Carra, "Kinetic models and catalyst deactivation in C₄ hydrocarbon dehydroisomerization on chromia-alumina."

25 June. E. L. Pollitzer and H. Skala, "Halogen activated aluminas"; Atsumu Ozaki, Kenichi Aika and Yutaka Morikawa, "Some problems in the mechanism of ammonia synthesis"; P. H. Emmett, "Iron synthetic ammonia catalysts—and reminiscences."

26 June. K. Otto, M. Shelef and J. T. Kummer, "Studies of the catalytic reactions of NO by isotopic labeling"; Adalbert Farkas, "The catalysis of isocyanate reactions."

Polymers

John R. Schaefgen, chairman; Vivian Stannett, vice chairman.

29 June. (John Stille, discussion leader): R. L. Van Deusen, "Synthesis and properties of aromatic imidazimidine type polymers"; G. C. Berry, "Viscometric studies of interactions in a heterocyclic polymer (BBB)"; W. H. Gloor, "BBB: spinning and fiber properties as related to structure." (George Butler, discussion leader): H. K. Hall, "Polymerization and copolymerization of bicyclic nitriles and esters by opening of strained C-C single bonds."

30 June. (Paul Morgan, discussion leader): C. S. Marvel, "Thermally stable polymers based on anthraquinone"; A. S. Hay, "Syntheses and properties of 2,6-diarylphenylene oxides." (Otto Vogl, discussion leader): G. Manecke, "Polymer and oligomer redox systems."

1 July. (Walter Stockmayer, discussion leader): P. J. Flory, "Configuration-dependent properties of polymers"; G. Allen, "Molecular motion in polymers studied by neutron inelastic scattering." (Herbert Morawetz, discussion leader): A. J. Bur, "Configuration and properties of poly(alkyl isocyanates) in solution."

2 July. (Robert Marchessault, discussion leader): E. S. Clark, "A new theory of elastic behavior in crystalline polymers"; A. V. Tobolsky, "Solid 'liquid-crystalline' films of synthetic polypeptides"; H. Mark, M. Goodman, T. G. Fox, I. Skeist, and H. Spurlin, panel discussion: "Trends in polymer chemistry."

3 July. (Vivian Stannett, discussion leader): J. E. Guillet, "Molecular probes in the study of polymer structure and interactions"; I. N. Einhorn, "Fundamentals of polymer flammability and mechanisms of retardation."

Textiles

Robert W. Work, chairman; Richard H. Braunlich, vice chairman.

6 July. R. W. Fasessinger, W. J. Brickman and H. A. Krassig, "A new tool for tailoring textile properties"; S. P. Rowland, "Structural features of chemically modified and cross-linked cotton cellulose."

7 July. B. S. Sprague, D. E. Stuetz and A. DiEdwardo, "Polymer flammability"; B. Miller, "Flammability behavior of multi-component textile systems"; J. H. Ross, S. Schulman and R. M. Stanton, "Nonflammable fibrous materials: PBI—the optimum in thermal protection."

8 July. C. F. Zorowski, "Effects of twist geometry on the dynamic mechanical properties of viscoelastic continuous filament yarns"; G. A. M. Butterworth, M. M. Platt and R. E. Erlandson, "Tire cord failure mechanism."

9 July. J. Dyer, "Application of gel permeation chromatography to studies of the production and use of rayon"; E. S. Olson, J. J. Porter and E. A. Duffy, "Diffusion rates of cationic dyes in acrylic fibers from organic solvent systems"; K. R. Makinson, "Fiber behavior in felting and friction."

10 July. R. H. Peters, V. Shenk, and R. Sheahan, "Some relationships between fiber properties and chemical structure"; D. C. Prevorsek and R. H. Butler, "Structure of semicrystalline fibers from analysis of anelastic effects."

Scientific Information

Problems in Research

Bart E. Holm, chairman; Madeline M. Henderson, vice chairman.

Studies of Cost, Benefits, and Effectiveness of Information in Research

13 July. Richard L. Kenyon, "Effects and effectiveness of scientific information." (Russell J. Rowlett, Jr., chairman): Russell J. Rowlett, Jr., "The real information requirements of scientists"; W. E. Hanford, "Industry."

14 July. (Henry M. Kissman, chairman): Henry M. Kissman, "Cost effectiveness of current awareness services." Speakers from FDA, IBM and the Dow Chemical Company. (John W. Murdock, chairman): John W. Murdock, "Qualitative compression"; H. Dana Moran, "Information compression"; Lee J. Kieffer, "Data compression."

15 July. (Hanna Friedenstein, chairman): Hanna Friedenstein, "Effectiveness of retrospective searching." (Carlos M. Bowman, chairman): Carlos M. Bowman, "Benefits and problems of using automated techniques"; Ralph O'Dette and Michael F. Lynch (subject to be announced).

16 July. (Marshall C. Yovits, chairman): Marshall C. Yovits, "Current mechanization trends for information transfer."

17 July. (F. W. Lancaster, chairman): F. W. Lancaster, "Cost—performance—benefits analysis of information systems: a review."

Elastomers

Kenneth W. Scott, chairman; A. M. Gessler, vice chairman.

20 July. (W. Prins, discussion leader): M. Shen, "Energy effects in statistical and continuum theories of rubber elasticity"; A. V. Tobolsky, "Some new aspects of rubber elasticity"; R. S. Stein and M. Fukuda, "Stress optical studies of polybutadiene networks"; T. Kotani, "Birefringence and physical properties of rubbers."

21 July. (W. G. Knauss, discussion leader): S. S. Sternstein, "Polymer-solvent interactions: (1) constant volume measurements, (2) inhomogeneous swelling in filled systems"; G. Gee, "The thermodynamic significance of hysteresis and stress softening"; A. G. Thomas, "Fracture mechanics applied to failure in rubber."

22 July. (A. M. Gessler, discussion leader): D. Rivin and E. M. Dannenberg, "The effect of surface modified carbon blacks on vulcanization kinetics and vulcanizate properties"; E. Fischer, "Network and reinforcement studies based on terminally brominated liquid polybutadiene"; N. W. Tschoegl, "The effect of pressure on the mechanical behavior and ultimate properties of elastomers."

23 July. K. F. O'Driscoll, "Copolymerization with depropagation"; H. J. Harwood, "Studies on sequence distributions in elastomers"; E. G. Brame, Jr., "Determination of chlorine distribution in chlorosulfonated polyethylenes by high resolution NMR spectroscopy."

24 July. (J. P. Kennedy, discussion leader): P. Teyssie, "Formation and basic properties of equibinary polydienes"; E. A. Ofstead, "Alternating diene copolymers from cycloolefins."

Corrosion

Robert P. Frankenthal, chairman; John V. Cathcart, vice chairman.

27 July. (J. V. Cathcart, discussion leader): D. A. Vermilyea, "Discovering inhibitors through studies of oxide dissolution"; R. M. Hurd and D. Justice, "Corrosion of single crystal ZnO." (B. E. Wilde, discussion leader): H. G. Masterson, "High-temperature aqueous corrosion of mild steel"; R. L. Cowan and R. W. Staehle, "The kinetics of anodic dissolution and the thermodynamics of the nickel electrode in acid solution from 25°C to 300°C."

28 July. (Z. A. Foroulis, discussion leader): R. L. Jones, "Anodic polarization and film formation on mild steel at elevated temperatures"; W. P. Iverson, "Some recent observations concerning the mechanism of anaerobic corrosion of steel by sulfate-reducing bacteria." (S. Barnartt, discussion leader): B. T. Ellison, "Evaluation of the effects of hydrodynamics on the corrosion rate of steel in sulfuric acids"; M. J. Pryor, "The role of reaction product structure in the corrosion of copper alloys."

29 July. (H. H. Uhlig, discussion leader): E. N. Pugh, "Tarnishing and season cracking of alpha-brass"; S. B. Brummer and F. H. Cocks, "Localized metal deformation and effective oxide ductility—their relation to stress corrosion of aluminum alloys." (H. M. Davis, discussion leader): V. Sawicki and H. H. Johnson, "High strength steels and crack growth in hydrogen-oxygen mix-

tures"; A. R. Troiano, R. F. Hehemann and J. Kolts, "Relation between pitting, cracking, and hydrogen in the stress corrosion cracking of austenitic stainless steel."

30 July. (H. Kaesche, discussion leader): B. F. Brown, "Studies on occluded-cell corrosion phenomena"; Z. Szklarska-Smialowska, "Effect of the ratio of aggressive to nonaggressive ions on corrosion pit nucleation and propagation." (H. Leidheiser, discussion leader): J. Krüger, "Third International Symposium on Passivity—where are we now?"

31 July. (M. A. Streicher, discussion leader): T. R. Beck, "On the mechanism of pitting corrosion of titanium"; H. W. Pickering and R. P. Frankenthal, "The pitting corrosion of iron."

Food and Nutrition

Richard H. Barnes, chairman; Robert A. Clayton, vice chairman

3 August. L. Krook, "Periodontal disease"; J. G. Bieri, "Vitamin A deficiency in the germfree state"; H. F. de Luca, "Vitamin D: a new frontier."

4 August. (A. I. Morgan, Jr., discussion leader): D. Farkas, "Fluidized bed processing"; J. C. King, "Dehydration"; Aström, "Food freezing." (R. A. Clayton, discussion leader): C. D. Callihan, "Microbial proteins from waste cellulose"; J. Spinelli, "Characteristics and potential uses of isolated fish proteins."

5 August. Nutrition and central nervous system development (M. Winick, discussion leader): J. Brasel, "Nutrition and nucleic acid synthesis"; G. McKann, "Nutrition and myelin synthesis"; P. Hahn, "Nutrition and carbohydrate metabolism." (L. J. Teply, discussion leader): C. Adamec, "Problems related to nutrition education."

6 August. Impact of federal regulations on the development and nutritional values of foods (H. P. Sarett, discussion leader): E. E. Rice, "Meat and vegetable protein products"; H. W. Howard, "Dairy products." (R. H. Barnes, discussion leader): D. L. Call, "Economic and social factors influencing nutrition."

7 August. Nutrition and development of gastrointestinal function (L. Lutwak, discussion leader): N. Kretchmer, "Development of gastrointestinal enzyme systems"; R. Crane, "Development and organization of intestinal sugar transport mechanisms."

Medicinal Chemistry

Merle H. Pindell, chairman; Irwin J. Pachter, vice chairman.

10 August. A. Brossi, "Nitroimidazoles—chemistry, biology and clinical results"; K. L. Rinehart, Jr., "Antibiotics from mutated streptomyces"; H. L. Crespi, "Effect of non-radioactive heavy isotopes on microbiological systems"; C. P. Schaffner, "Polyene macrolides—biochemistry and pharmacology."

11 August. R. S. Lees, "Treatment of hyperlipoproteinemia"; S. M. Grundy, "Effect of drugs on sterol balance in humans"; R. O. Brady, "Lipid storage diseases"; J. H. Kinoshita, "Role of aldose reductase in the development of sugar cataracts"; D. M. Dvornik, "Inhibitors of aldose reductase."

12 August. D. A. Willoughby, "Future areas for research on inflammation"; M. W. Whitehouse, "In vivo—in vitro studies with nonsteroidal anti-inflammatory drugs"; E. M. Glenn and N. C. Sekhar, "Physiologic and immunologic investigations with non-steroidal anti-inflammatory drugs"; T. Y. Shen, "Some recent studies on anti-inflammatory agents."

13 August. J. S. G. Cox, "Cromolyn sodium in asthma—chemical, biological and clinical aspects"; J. F. Mustard, "Effect of inhibition of platelet function on thrombosis"; R. K. Razdan, "Studies on marijuana constituents and synthetic analogs"; A. T. Shulgin, "The hallucinogens and medical research."

14 August. A. P. Fletcher, "Clinical assessment of thrombolytic agents"; J. M. Schor, "Synthetic thrombolytic agents."

Hormone Action

Oscar Hechter, chairman; Jay Teppe, vice chairman.

17 August. W. Stoeckenius, "Concepts of membrane structure"; J. P. Changeux, "Membrane structure in relation to selective reception and readout of chemical signals." Non-steroid hormone receptors (M. Rodbell, discussion leader).

18 August. Steroid hormone receptors (I. S. Edelman, discussion leader). "Coupling events" in nongeneomic effects of hormone (H. Segal, discussion leader).

19 August. "Coupling events" in hormone effects dependent upon RNA and protein synthesis (B. O'Malley, discussion leader). Correlation of hormone

action at tissue, cellular and subcellular levels: P. Gaillard, "I. Parathormone and calcitonin on bone."

20 August. Correlation of hormone action at tissue, cellular and subcellular levels: L. Birnbaumer, "II. Lipolytic hormones and adipose tissue"; R. Walter, "III. Neurohypophyseal hormones and toad bladder"; Carroll Williams, "Hormones, metamorphosis and genes."

21 August. Differential tissue responses to a single steroid hormone: L. Miller, "I. Cortisol action in liver"; M. Makman, "II. Cortisol action in lymphoid tissue."

Cancer

Robert A. Good, chairman; Robert Love, vice chairman.

24 August. George Klein, "The Burkitt lymphoma system and transplantation immunity"; M. Benish-Melnick, "Antigens associated with EB virus infected cells"; Arnold Reif, "Remarks on Theta antigen—its nature and distribution"; William D. Hardy, Jr., "Immunologic studies of the feline leukemia virus"; Richard T. Smith, "Cellular and humoral aspects of experimental tumor immunity."

25 August. K. Theodore Brunner, "Cell-mediated factors in tumor immunity"; Peter Dent, "Immunological depression and development of malignancy"; Osias Stutman, "Immunosuppression and chemical carcinogenesis"; Phil Gold, "Carcinoembryonic antigens—recent progress and usefulness in diagnosis"; Edward Klein, "Relationship of immune reactions to cutaneous neoplasms."

26 August. J. Sambrook, "Genetic alterations in transformed cells"; Joseph Melnick, "Oncogenic virus transformation and immunity"; Toni Mariani, "Heterogenization of normal tissues"; Benjamin Papermaster, "Twin studies in resistance to malignancy"; Charles F. McKhann, "Tumor immunity, immunosuppression and immunotherapy."

27 August. Donald Morton, "Malignant tumors, tumor immunity, and tumor antigens"; Ingegerg Hellstrom, "In vitro assay of tumor specific antigens and enhancing antibodies"; John David, "Cell mediated immune responses and tumor immunity"; Karl-Eric Hellstrom, "Tumor specific transplantation immunity and malignancy."

28 August. Robert A. Good, Summary of conference—"Essential rela-

tionship between immunity, the lymphoid system and malignancy."

Separation and Purification

Robert E. Sparks, chairman; Earl C. Makin, vice chairman.

31 August–4 September. R. M. Barrer, "Recent work in adsorption and ion exchange"; Robert B. Bean, "Advanced waste water treatment separation"; Friedrich G. Helfferich, "Coherence: a new concept for dynamic multivariable systems"; Kurt A. Krauss and James S. Johnson, "Hyperfiltration"; Charles Skarstrom, "Heatless fractionation of gases over adsorbents"; Norman H. Sweed, "Parametric pumping separations"; James W. Ahlberg and Bruce G. Smith, "Quantitative thin-layer chromatography of pharmaceuticals, and correlation with column chromatography"; E. L. Anderson, "Directional freezing of some organic compounds in a centrifugal field"; Robert B. Long, "Separation of unsaturates by copper complex"; Peter R. Rony, "Chemical separations: can the field be unified"; William N. Musser, "Packing techniques and inlet design in scale-up of chromatographic column"; Donald B. Broughton, "Commercial adsorption separations"; Douglas L. Ford and John A. Brodie, "UCAL melt crystallization"; Wolfgang Schirmer, "Chromatographic separation and adsorption of paraffins."

New Hampton School

Nucleic Acids

Peter Geiduschek, co-chairman; David Hogness, co-chairman; Lawrence Grossman, co-vice chairman; W. Szybalski, co-vice chairman.

15 June. Replication and repair of DNA in bacteria (C. C. Richardson, chairman). Recombination and integration of viral genomes (A. Campbell, chairman).

16 June. Structure replication and genetic organization of the eukaryotic chromosome I and II (C. A. Thomas and D. S. Hogness, chairmen).

17 June. Transcription I: bacterial and animal RNA polymerases and their factors (M. J. Chamberlin, chairman). Transcription II: repressors and the genetics of control (J. Beckwith, chairman).

18 June. Ribosome structure and formation (M. Nomura, chairman). Pro-

tein synthesis (R. Haselkorn, chairman).

19 June. Cell fusion and approaches to somatic cell genetics (W. Bodmer, chairman).

Proteins

Robert L. Hill, co-chairman; Gordon Tomkins, co-chairman; Gerald Fasman, co-vice chairman; Karl Piez, co-vice chairman.

Structure and Function of Proteins

22 June. Structure and variability of antibodies (G. Edelman, chairman): L. Hood, M. Cohn, M. Scharff. Ribosome structure (A. Tissières, chairman): C. Kurland, M. Nomura, I. Wool.

23 June. Protein polynucleotide interactions: W. Gilbert, B. Alberts, H. Boyer, S. Bourgeois, R. Burgess. Chromosomal proteins (J. Bonner, chairman): R. D. Cole, N. Salzman, R. C. Huang.

24 June. Three-dimensional protein structure (A. Rich, chairman): A. Cotton, A. Liljas, M. Rossmann, L. Banaszak. Molecular control of enzyme action (J. Monod, chairman): R. Lehman, P. Reichard, A. Levitsky, H. Buc.

25 June. Receptors: E. Jensen, L. Garren, R. Kelley, P. Cuatrecasas. History of protein chemistry: J. Edsall.

26 June. Membranes: G. Guidotti, S. Roseman, A. Kobata, W. Hubbell.

Chemistry of Heterocyclic Compounds

Jacob Szmuszkowicz, chairman; David M. Lemal, vice chairman.

29 June–3 July. Jack E. Baldwin, "Ylid rearrangements"; Virgil Boekelheide, "Syntheses in the C₂₀-calabash curare series"; C. S. Giam, "Nucleophilic heteroaromatic substitution reactions"; Rudolf Gomper, "New synthesis of purines and related compounds"; Robert Jacquier, "Tautomerism and protonation of pyrazolines and aminopyrazolines"; Francis Johnson, "The synthesis of some naturally occurring lactones"; Robert C. Kerber, "Azimines, valence isomers of triaziridines"; Leo A. Paquette, "Heteroaromatic anions: structural requirements, properties and reactions"; Charles W. Rees, "Reactive intermediates in nitrogen heterocyclic chemistry"; Hans Reimlinger, "1,5-dipolar cyclizations"; Edward C. Taylor, "Oxime cyclizations—a new general

pteridine synthesis"; Nicholas J. Turro, "Cycloaddition reactions of carbonyl compounds possessing high energy content"; Henri Ulrich, "Recent advances in the polar cycloadditions of isocyanates"; Zdenek Valenta, "Total synthesis of ormosia alkaloids"; Eugene van Tamelen, "Biogenetic type synthesis of ajmaline."

Statistics in Chemistry and Chemical Engineering

John W. Gorman, chairman; Alonzo Church, Jr., vice chairman.

6 July. (M. B. Carroll, session chairman): Cuthbert Daniel, "Estimating error from multifactor data with no repeated observations." (R. A. Freund, session chairman): A. E. Hoerl and B. F. Winkel, "Ridge regression—theory and simulation."

7 July. (H. Smith, session chairman): S. M. Free, "Deliberately unbalanced incomplete block designs." (B. H. Margolin, session chairman): S. R. Webb, "Experience using and interpreting non-orthogonal designs."

8 July. (P. W. Tidwell, session chairman): G. E. P. Box, "Practical aspects of Bayesian Analysis." (S. Addelman, session chairman): M. B. Wilk, "Statistical analysis and modeling of the high energy proton data from the Telstar 1 satellite."

9 July. (A. H. Bobis, session chairman): P. V. Youle, "The systems approach to industrial optimisation." (E. G. Bianco, session chairman): B. L. Joiner, "Some useful programs for statistical computing."

10 July. (D. A. Gardiner, session chairman): B. S. Pasternack, "Detection limits for radionuclides in the analysis of multi-component gamma ray pulse-height spectra."

Radiation Chemistry

Peter J. Dyne, chairman; T. Ffrancon Williams, vice chairman.

13 July. (J. L. Magee, discussion leader): L. G. Christophorou, "Resonance electron capture processes in gases." (J. H. Futrell, discussion leader): D. A. Armstrong, "Reactions of free radicals and electrons in irradiated gases."

14 July. (J. W. Boag, discussion leader): J. W. Hunt, "Pulse radiolysis in the sub-nanosecond region." (G. V.

Buxton, discussion leader): A. O. Allen, "Current problems in the radiolysis of liquid water."

15 July. (E. L. Powers, discussion leader): G. Adams, "Radiation chemical techniques in radiobiology." (H. Schulte-Frohlinde, discussion leader): B. Brocklehurst, "Trapping and recombination of ions in irradiated organic glasses."

16 July. (R. Livingston, discussion leader): R. Fessenden, "ESR studies of transient radicals in aqueous solution"; B. Smaller, "ESR studies of transient species." (T. F. Williams, discussion leader): Contributed papers.

17 July. (M. Tomilson, discussion leader): S. P. McGlyn, "Electronic states and electronic processes in inorganic solids."

Organic Reactions and Processes

Cheves Walling, chairman; David Breslow, vice chairman.

20 July. K. U. Ingold, "Autoxidation—recent results and unsolved problems"; C. C. Hobbs, "Intermediate sequences in liquid phase paraffin oxidation"; D. P. Scheirer, "Biallyl from propylene."

21 July. A. G. Davies, "Bimolecular homolytic organometallic reactions"; D. D. Tanner, "On the mechanism of bromination of bromoalkanes"; K. Heusler, "Oxy radicals in organic synthesis."

22 July. R. Breslow, "Specific oxidation remote from functional groups"; E. I. Heiba, "Synthesis by selective oxidation of free radicals by metal salts"; J. K. Kochi, "Some mechanistic aspects of redox reactions."

23 July. J. Tsuji, "New synthetic reactions catalyzed by metal carbonyls"; S. D. Ross, "Anodic oxidation of amides and arenes"; D. Seyferth, "Heavy metal organometallics in organic synthesis."

24 July. Short papers by conference members.

Chemistry of Natural Products

Hans Muxfeldt, chairman; David R. Dalton, vice chairman.

27–31 July. The following persons have been invited to speak: M. Cava, J. Marshall, I. A. Scott, G. Buechi, B. Trost, D. Johnston, Z. Hajos, M. Semmelhack, G. Ourisson, T. Geismann, R. Ireland, and H. Wehrli.

Inorganic Chemistry

Irving Sheft, chairman; Ralph Bertolacini, vice chairman.

3-7 August. Phenomena in non-aqueous solvents (H. H. Hyman, chairman): T. R. Tuttle, "The optical spectra and composition of very dilute solutions of alkali metals in liquid ammonia"; C. C. Addison, "The liquid alkali metals as solvents"; Adam Heller, "The emission of light by ions in nonaqueous solvents"; R. J. Gillespie, "Recent developments in the chemistry of superacid systems"; Viktor Gutmann, "Ionization by coordination." Actinide and trans-actinide chemistry (Norman Edelstein, chairman): David Brown, "Halogen chemistry of the actinides"; Peter Laubereau, "The synthesis and properties of cyclopentadienyl and related complexes of actinide ions"; Larned Asprey, "Unusual oxidation states of the actinides"; Paul Fields, "Proposed production and properties of the superheavy elements." Some recent trends in inorganic macromolecules (Seymour Yolles, chairman): W. C. Drinkard, "Inorganic polymers of polyhedral boranes and metallic oxides"; Peter Block, "Recent developments in poly metallophosphonates"; E. R. Lippincott, "Polywater." Discussion. Thursday evening speaker: J. A. Wood, "The Moon: insights on origin and evolution provided by the Apollo samples."

Electron Donor-Acceptor Interactions

Milton Tamres, chairman; Willis B. Person, co-vice chairman; Peter R. Hammond, co-vice chairman.

10 August. R. S. Mulliken, "Theoretical problems in electron donor-acceptor interactions"; M. Hanna, "Relative importance of electrostatic repulsion and charge transfer effects in donor-acceptor ground states"; S. P. McGlynn, "Spin-orbit coupling in charge transfer complexes."

11 August. A. Weller, "Exciplexes: properties and classification of excited state complexes"; S. Nagakura, "Organic reactions through electron donors and acceptors"; R. Strong, "CT complex intermediates in atom recombination processes."

12 August. A. Szent-Györgyi, "Biological relations of charge-transfer"; B. Pullman, "Quantum-mechanical aspects of EDA interactions in biological sys-

Applications

Scientists are invited to submit applications for attendance at the Gordon Research Conferences. Application blanks may be obtained by returning the postcard on page 1412A to Alexander M. Cruickshank, Director, Gordon Research Conferences, University of Rhode Island, Kingston, R.I. 02881.

tems"; A. Pullman, "Charge-transfer in hydrogen bonding."

13 August. H. Drickamer, "Electron transfer and high pressure chemistry in the solid state"; W. Liptay, "Solvent dependence of charge-transfer spectra"; O. Hassel, "Charge-transfer and its consequence in crystal chemistry."

14 August. R. Drago, "Spectroscopic enthalpy correlations"; R. Foster, "Association constants for EDA systems in solution." Discussion leaders include L. J. Andrews, S. D. Christian, E. Clementi, P. R. Hammond, J. J. Kaufman, J. Lascombe, H. W. Offen, W. B. Person, C. N. Rao, S. Shifrin, R. W. Taft, M. Tamres.

Chemistry and Physics of Cellular Materials

John K. Backus, chairman; Edwin M. Maxey, vice chairman.

17 August. A. K. Thoeni, G. K. Baker and C. H. Smith, "Preparation and properties of carbon foam"; D. J. Rush, T. J. Byerley, H. W. Christie and D. E. Jackson, "A novel class of isocyanate-based foams"; E. A. Meinecke and D. M. Schwaber, "Prediction of energy absorption in foams."

18 August. J. A. Rinde and K. Hoge, "Time-temperature dependence of the mechanical properties of polystyrene bead foam"; K. Hoge, "The behavior of foams under dynamic loading, I"; R. H. Valentine and R. J. Wasley, "The behavior of foams under dynamic loading, II"; M. Zaslavsky, "Biaxial experimentation on rigid urethane foam."

19 August. R. J. Ferrari and S. I. Cohen, "Ideal performance characteristics of cushioning materials"; G. A. Campbell, "A simulation of the integral skin foaming process"; E. W. Bennett,

B. Kanner and M. L. Wheeler, "A new structural class of urethane foam surfactants: silicone-polyether graft copolymers."

20 August. J. J. Pitts, P. H. Scott and D. G. Powell, "Inorganic flame retardants in urethane foam"; C. Hilado, "Physical aspects of flammability evaluation of polymers"; S. Ross, "Fundamentals of foam stabilization."

21 August. L. M. Alberino, A. McLaughlin and J. S. Rose, "Friability and cell structure in foamed materials"; K. C. Frisch and K. Ashida, "Modified isocyanurate foams."

Science of Adhesion

Justin C. Bolger, chairman; David H. Kaelble, vice chairman.

24 August. Adhesive joint strengths (John L. Gardon, chairman): Armand F. Lewis, "Phenomenological interpretation of epoxy adhesive joint strengths"; W. E. Walles, "Surface sulfonation of plastics"; R. A. V. Raff, "Adhesion of polymers to metals; surfaces modified by induction heating."

25 August. New experimental techniques (Frederick M. Fowkes, chairman): Tennyson Smith, "Mercury film balance studies of molecular orientation at mercury organic interfaces"; Franco Jona, "Study of clean solid surfaces by low energy electron diffraction (LEED)"; A. W. Neumann, "Characterization of solid surfaces and their phase transitions by measurements of contact angles and their temperature dependence"; Willard D. Bascom, "Wetting of low energy surfaces by non-aqueous solutions."

26 August. Fiber-reinforced polymeric composites (Lawrence A. Nielsen, chairman): Victor J. Mimeault, "Carbon fiber composites"; A. T. DiBenedetto, "Pulsed NMR for studying interfaces"; Irvin Wolock, "Measurement of energy of crack propagation in filament-wound fiber glass-epoxy composites."

27 August. Intermolecular and interfacial forces (David H. Kaelble, chairman): Charles M. Hansen, "The universality of the solubility parameter"; J. R. Dann, "Forces involved in the adhesion process"; M. S. Sahli, "Thermodynamics of adhesion of polymer dispersions to films."

28 August. New adhesive systems (Max L. Williams, chairman): Harvey Alter, "A polyurethane dental adhesives

system: adhesive and adherent"; D. R. Fitchmun, "Electroplating on crystalline polypropylene; peel adhesion versus surface morphology."

Environmental Sciences: Water

James J. Morgan, chairman; James Lodge, vice chairman.

Chemical and Biological Dynamics in Natural Water Systems: Concepts of Aquatic Ecosystem Management

31 August. Criteria for desirable aquatic ecosystems; chemical approach to homeostasis in natural water systems; systems ecology (Hugh D. Putnam and Daniel J. Nelson, session chairmen): Eugene P. Odum, Werner Stumm, and Bernard C. Patten, discussion leaders.

1 September. Factors affecting nutrient uptake and algal growth in natural waters; rates of uptake of dissolved organics and bacterial growth; nutrient availability and bioassay (Joseph Shapiro and Thomas Maloney, session chairmen): O. Holm-Hansen, Holger W. Jannasch, and George P. Fitzgerald, discussion leaders.

2 September. Interactions between overlying waters and sediments; processes in sediments; dynamics of nutrient cycling in natural waters (Richard J. Benoit and Kenneth M. Mackenthun, session chairmen): James R. Kramer, D. E. Armstrong, and Patrick L. Brezonik, discussion leaders.

3 September. Mathematical models of aquatic systems; the eutrophication process; enhancement of aquatic systems (Perry L. McCarty and James M. Symons, session chairmen): Donald J. O'Connor, R. A. Vollenweider, and John E. Ridley, discussion leaders.

4 September. Presentations originating from the conference: the Friday morning session will be reserved for a number of individual presentations of discussions originating during the conference. Individuals wishing to make a presentation on Friday morning should inform the conference chairman by Thursday morning (James J. Morgan, session chairman).

Kimball Union Academy

Lipid Metabolism

Howard A. Eder, chairman; John Law, vice chairman.

15 June. (Howard A. Eder, discus-

sion leader): A. M. Gotto, Jr., "Studies on the structure of the plasma lipoproteins"; B. Shore, "The protein moieties of human serum lipoproteins." (Robert S. Levy, discussion leader): A. M. Scanu, "The reassembly of human serum high density lipoproteins"; R. B. Leslie, "Application of physical methods in the study of plasma lipoprotein structure."

16 June. (DeWitt Goodman, discussion leader): R. M. C. Dawson, "The interaction of soluble proteins with lipid interfaces"; L. Warren, "Composition and metabolism of surface membranes of animal cells." (D. Steinberg, discussion leader): M. Rapoport, "Specificity of glycosphingolipids in immunochemical reactions in intact membranes"; N. R. Harvie, "Studies of human serum L_p lipoprotein."

17 June. (E. H. Ahrens, Jr., discussion leader): G. Popjack, "The precursors of squalene"; R. Clayton, "Lanosterol: its formation and metabolism; some recent findings." (N. B. Myant, discussion leader): E. Mosbach, "The regulation of bile acid synthesis in the rat"; S. Grundy, "Studies on the inter-hepatic circulation of cholesterol and bile acids in man."

18 June. (John Law, discussion leader): G. H. DeHaas, "Structure and properties of porcine phospholipase A"; D. B. Zilversmit, "Dynamic state of phospholipids in cell membranes." (A. J. Vergoesen, discussion leader): B. Samuelsson, "Metabolism of prostaglandins."

19 June. (R. M. Havel, discussion leader): H. Windmueller, "Metabolic studies with the isolated viable rat intestine"; V. Brown, "Studies on the protein components of the VLDL."

Cell Structure and Metabolism

Saul Roseman, co-chairman; Isidore S. Edelman, co-chairman.

Membrane Transport:

Biochemical and Structural Aspects

22 June. The structure of cell membranes studied by electron microscopic, x-ray and electron spin resonance techniques: W. Stoeckenius, D. Caspar, and W. Hubbell. Membrane dynamics analyzed by calorimetric, fluorescence and optical techniques: J. M. Stein, Richard Keynes, and J. Lenard.

23 June. Biogenesis of cellular membranes in animal and bacterial cells: George Palade. Cell recognition and

membrane; membrane interactions: A. A. Moscona, C. W. Orr, and M. Jacobson.

24 June. Membrane transport in organelles: L. Hokin, W. Hasselbach, and E. Wright. Membrane transport in bacteria: W. Kundig, T. H. Wilson, and I. H. Pastan.

25 June. Transport proteins in bacteria: E. Engesberg, L. A. Heppel, and E. P. Kennedy. Review of membrane transport in bacteria: C. F. Fox.

26 June. Role of adenine nucleotides in the regulation of sodium transport in animal cells: P. Post, P. DeWeer, and R. Kirsten.

Enzymes, Coenzymes, and Metabolic Pathways

Robert H. Abeles, co-chairman; Alton Meister, co-chairman; Daniel Lane, co-vice chairman; A. Mildvan, co-vice chairman.

29 June. Biological functions of subunits: Roy Vagelos, "Functional subunits of acetyl coenzyme A carboxylase"; Kurt Ebner, " α -Lactalbumin and the lactose synthetase reaction"; Andrew A. Travers, "Control of transcription by regulatory subunits of RNA polymerase." Subunit interactions: R. H. Haschemeyer, "Subunit structure of proteins"; W. Bowers (subject to be announced).

30 June. Use of NMR in protein structure and enzyme mechanism: William D. Phillips, "NMR studies of the ferredoxins"; Oleg Jardetzky, "High resolution nuclear magnetic resonance studies on selectively deuterated proteins"; Robert Shulman, "The structures of heme proteins." Oxygenases: Gordon A. Hamilton, "Studies on some model reactions for oxygenases"; John Daly, "Areneoxides in the oxidative metabolism of aromatic substances"; Osamu Hayaishi (subject to be announced).

1 July. Transfer enzymes: Michael A. Raftery, "Mechanisms of glycosyl transfer by lysozyme and related enzymes"; George R. Stark, "Studies on the mechanism of action of *E. coli* aspartate transcarbamylase"; Irwin B. Wilson, "Alkaline phosphatase—the expected and unexpected." Some chemical problems of interest to enzymology: Ernest Grunwald, "Fast proton-transfer rates: measurement by NMR, reaction mechanism and solvent participation"; Peter R. Rony, "Tautomeric catalysis: a model of enzymatic polyfunctional catalysis?"

2 July. Elimination and isomeriza-

tion: Paul D. Boyer, "Comparative isotope exchange rates as probes of enzymatic hydration mechanisms"; Kenneth Hanson, "Enzymic ammonia elimination reactions"; I. A. Rose, "Stereochemistry of some enzyme mechanisms." Metabolic defects: Samuel Bessman (subject to be announced); (speaker and subject to be announced).

3 July. Metabolic defects: (speakers and subjects to be announced).

Chemistry, Physiology, and Structure of Bones and Teeth

Stephen M. Krane, chairman; Paul Goldhaber, vice chairman.

6 July. Submitted papers (abstracts should be sent to Dean Paul Goldhaber, Harvard School of Dental Medicine, 188 Longwood Avenue, Boston, Massachusetts 02115). M. J. Glimcher, "Chemistry and ultrastructure of dental enamel."

7 July. Matrices of mineralized tissues (A. Veis, chairman): E. J. Miller, "Cartilage"; D. Volpin, "Dentin"; A. Veis, "Bone"; H. Fleisch, "Pyrophosphate and diphosphonates in calcium metabolism."

8 July. Calcium and cellular metabolism (H. Rasmussen, chairman): A. Borle, "Cellular calcium exchange"; D. Parkinson, "Calcium-activated ATPase"; R. Weed, "Calcium and membrane properties"; H. Rasmussen, "Calcium and intermediary metabolism"; H. F. DeLuca, "Chemistry and metabolism of vitamin D."

9 July. Mucopolysaccharides (J. E. Silbert, chairman): L. Rodén, "Structure and metabolism of the linkage region"; J. E. Silbert, "Biosynthesis of the polysaccharide chain"; E. Neufeld, "Tissue culture studies of mucopolysaccharidoses"; D. D. Federman, "Some genetic aspects of skeletal growth in man."

10 July. Regulation of parathyroid hormone and calcitonin secretion (L. G. Raisz, chairman): L. Sherwood, "Synthesis and secretion of bovine parathyroid hormone in vitro"; L. G. Raisz, "Synthesis and secretion of rat parathyroid hormone and calcitonin in organ culture"; A. D. Care, "Control of calcitonin secretion in vivo I"; L. Deftos, "Control of calcitonin secretion in vivo II."

Structural Macromolecules

Jerome Gross, co-chairman; Sidney Udenfriend, co-chairman

I. Collagen

The purpose of this first meeting will be to provide a fairly exhaustive and critical evaluation of present knowledge of collagen structure and chemistry, biosynthesis, degradation and turnover, immunology, pathology, and pharmacology, presented in the form of nine periods each beginning with a single major presentation which will raise important unsolved questions, areas of controversy, and related pertinent information, to be followed by lengthy open discussions.

13 July. Primary collagen structure: amino acid sequence, special features, subunits (speaker and discussion leader, K. A. Piez). Chemistry of crosslinking (speaker and discussion leader, K. Franzblau).

14 July. Secondary and tertiary structure, and collagen-like polymers (speaker and discussion leader, E. Blout). Fibrillar organization and basement membranes (speaker and discussion leader, R. Ross).

15 July. Biosynthesis of collagen chains and hydroxylation mechanisms (speaker and discussion leader, S. Udenfriend). Biosynthesis and formation of crosslinks, maturation, and aging (speaker and discussion leader, G. R. Martin).

16 July. Biological degradation of collagen (speaker and discussion leader, J. Gross). Turnover of collagen (speaker and discussion leader, D. J. Prockop).

17 July. Pathology, immunology, and pharmacology of collagen (speaker and discussion leader, S. M. Krane).

Chemistry at Interfaces

E. D. Goddard, chairman; F. M. Fowkes, vice chairman.

20 July. Adhesion phenomena (R. J. Good, chairman): M. van den Tempel, "Adhesion of particles to solid surfaces"; F. M. Fowkes, "Intermolecular forces at interfaces"; A. W. Neumann, "Effect of temperature and of phase transitions on contact angles."

21 July. New techniques for studying solid surfaces (G. L. Gaines, Jr., chairman): J. H. Block, "Surface reactions by field ion mass spectroscopy"; E. W. Plummer, "Electron spectroscopy"; R. E. Ogilvie, "Surface structure by scanning electron microscopy."

22 July. Biological systems (F. R. Eirich, chairman): D. Chapman, "Structure of cell membranes"; E. Katchalski, "Interaction of synthetic- and biopoly-

mers with cell membranes"; A. G. Walton, "Nucleation and crystal growth of biopolymers."

23 July. Adsorption ions and dipoles (J. Lyklema, chairman): A. L. Smith, "Adsorption of dipoles and chi potential"; I. Weil, "Adsorption of ions on micelles"; W. Stumm, "Affinity of hydrous oxides for ions."

24 July. Short topics and discussion.

Toxicology and Safety Evaluations

J. Wesley Clayton, Jr., chairman; Edward D. Palmes, vice chairman.

27 July. (R. A. Scala, discussion leader): H. H. Cornish, "Serum isozymes and organ damage"; J. L. Radomski, "The metabolism of 1- and 2-naphthylamine as related to carcinogenesis." (S. L. Friess, discussion leader): J. M. Barnes, "Toxic substances and the nervous system."

28 July. (S. Epstein, discussion leader): C. Jacobson, "Test systems for the reproductive evaluation of mutagens"; D. J. Kilian, "The role of cytogenics in evaluating the toxicity of chemical compounds." (H. V. Malling, discussion leader): C. Valenti, "Effects of psychotropic drugs on mammalian chromosomes in vitro and in vivo observations."

29 July. (C. H. Hine, discussion leader): R. E. Hodges, "The role of human studies in evaluating potentially hazardous agents"; L. H. Schmidt, "What nonhuman primates have taught us relative to the action of chemicals on living systems." (Sidney Leskovitz, discussion leader): B. Pernis, "Immunological problems in toxicology."

30 July. (W. B. Ennis, discussion leader): D. O. King, "Rational management of the environment"; K. C. Barrons, "Benefits of agricultural chemicals." (J. P. Frawley, discussion leader): L. Cole, "The chemical threat to our environment."

31 July. (E. D. Palmes, discussion leader): T. Foin, "Technology, population and the environment."

Solid State Studies in Ceramics

Stanley B. Austerman, chairman; Arthur H. Heuer, vice chairman.

Non-Stoichiometric Ceramics

3 August. (J. S. Anderson, chairman): R. F. Brebick, "Recent advances in chemical and statistical thermodynamics"; P. C. Clapp, "Theory of ex-

tended defects." (T. S. Lundy, chairman): R. Gordon, "Galvanic cell studies of the Wustite system"; J. B. Wagner, "Transport in non-stoichiometric crystals."

4 August. (R. S. Roth, chairman): B. G. Hyde, "Crystallographic shear in the Ti + O system"; B. E. F. Fender, "Defect cluster complexes; diffuse neutron scattering." (S. B. Austerman, chairman): J. D. Venable, "Vanadium carbide substructures; electron diffraction"; W. Williams, "Heat capacity and transport properties through the order-disorder transition of VC₈₃."

5 August. (A. H. Heuer, chairman): R. W. Vest, "Nickel oxide—interactions between native defects and impurities"; M. A. Seitz, "Dielectric properties of selected oxides." (A. Diness, chairman): P. Arne Magheli, "Formation and transformation of some transition metal oxide phases"; A. Wold, "Crystallographic, magnetic and electrical properties of some ternary transition metal chalcogenides."

6 August. (A. D. Miller, chairman): A. Bowman and E. Storms, "High temperature structure and thermodynamic behavior of M₂C carbides"; E. Rudy, "Constitution and thermodynamic behavior of ternary metal-carbon alloys."

7 August. (S. C. Carniglia, chairman): G. G. Libowitz, "Rare earth hydrides"; L. Eyring, "Pseudo-phase behavior in rare earth oxides."

Chemistry and Physics of Solids

Albert M. Clogston, co-chairman; Theodore H. Geballe, co-chairman.

Transition Metal Compounds

10, 11 August. Transition metal compounds that are metals: new and unusual compounds; band structure, theory and experiment; transport properties, polarons; superconductivity; spin resonance.

12, 13 August. Transition metal compounds that can be either metals or insulators: metal-insulator transition in transition metal oxides; band filling experiment; theories of metal-insulator transitions; Hubbard hamiltonian.

13, 14 August. Transition metal compounds that are insulators; exchange, magnetism and spin waves; one and two dimensional spin systems; optical resonance and light scattering; properties of particularly unusual or important compounds. A partial list of speakers who will be participating: A. D. Yoffe,

B. T. Matthias, H. F. Jarrett, L. F. Mattheiss, W. M. Walsh, N. F. Mott, V. Jaccarino, R. Loudon, R. Elliott, D. B. McWhan, and T. M. Rice.

Infrared Spectroscopy

Jon T. Hougen, chairman.

17 August. C. B. Moore, "Laser studies of vibrational energy transfer in gases"; J. C. Polanyi, "Vibrational and rotational excitation in the products of some simple chemical reactions."

18 August. M. M. Rochkind, "Low-temperature matrix isolation in analytic chemistry"; S. H. Walmsley, "Vibrations in solids."

19 August. J. Overend, "Vibrational anharmonicity in polyatomic molecules"; A. J. Sievers, "Far infrared spectroscopy of solids."

20 August. M. Delhaye, "Techniques and applications of ultra fast Raman spectroscopy"; G. Pimentel, "Infrared spectroscopic studies of the atmosphere and surface of Mars: Mariner 1969."

21 August. E. R. Lippincott, "Polywater."

Chemistry and Physics of Paper

Howard S. Gardner, chairman; Harry L. Spiegelberg, vice chairman.

24 August. (L. A. Cox, discussion leader): K. V. Sarkanen, "Degradation of polysaccharides in alkaline pulping processes"; Knut Kringstad, "Chromophoric structures in wood and very high yield pulping"; Necmi Sanyer, "Ionic factors in high yield pulping."

25 August. (J. K. Craver, discussion leader): J. W. Swanson, "Absorption of polyelectrolytes by pulp fibers"; Edward Stradins, "Accessibility and ion exchange capacity of cellulose with cationic polymers"; L. W. Zabel, "Charge response of powders to ion bombardment"; Alf de Ruvo and S. Martin-Löf, "Mechanical spectroscopy on single fibers."

26 August. (Bengt Leopold, discussion leader): D. H. Page, "The mechanism of beating"; J. E. Stone, "The gel structure of papermaking fibers"; R. E. Durst, "Hydrodynamics of pulp, air and water suspensions."

27 August. (K. W. Britt, discussion leader): Ben Radvan, "Some limitations of the fourdrinier machine"; Nils Hartler, "Special properties of fibers/paper from high yield pulp"; R. W. Davidson, "Dry strength of

paper"; A. R. Jones, "Evaluation of pulp from southern pine."

28 August. (H. L. Spiegelberg, discussion leader): R. W. Perkins, "Model for mechanical properties of paper sheets"; W. H. Burgess, "Effect of basic weight on tensile strength."

Lasers in Medicine and Biology

William T. Ham, Jr., co-chairman; Walter J. Geeraets, co-chairman; Donald E. Rounds, vice chairman.

31 August. Current advances in laser technology (Frederick Brech, chairman). Physiological optics (Myron L. Wolbarsht, chairman).

1 September. Lasers in photochemistry and photobiology (Kendric C. Smith, chairman). Lasers in cellular research (Michael W. Berns, chairman).

2 September. Acute and long term biological effects from low level electromagnetic radiation (Thomas P. Davis, chairman). Clinical applications of lasers (Stanley Stellar, chairman).

3 September. Current legislative and protective status of lasers (Henry J. L. Rechen, chairman). Informal discussion groups.

4 September. Additional topics on lasers in medicine and biology (A. M. Clarke, chairman).

Tilton School

Structural Aspects of Water and Aqueous Solutions

Robert L. Kay, chairman.

15 June. (W. Kauzmann, session chairman): J. A. Pople, "Theory of interactions of small numbers of water molecules"; F. H. Stillinger "Statistical mechanical theory of water"; J. A. Barker, "Monte Carlo calculations, intermolecular potentials, and the structure and dielectric constant of water"; A. Rahman, "Motion of molecules in water."

16 June. (H. Friedman, session chairman): P. Egelstaff, "Molecular structures and motions in liquid water, as studied by radiation techniques"; A. H. Narton, "Water: x-ray scattering and radial distributions." (H. S. Frank, session chairman): T. Litovitz, "Molecular motions in water and their implications for a structural model."

17 June. (R. Kay, session chairman): H. L. Friedman, "Structural effects in thermodynamic excess func-

tions of aqueous 1-1 electrolytes compared with the properties of Hamiltonian models"; R. L. Kay, "Structural effects in transport properties in aqueous electrolytes." (J. A. Glasel, session chairman); H. G. Hertz, "Structure and molecular motion around hydrated ions."

18 June. (H. S. Frank, session chairman): F. Franks, "The influence of nonelectrolytes on the intermolecular nature of water-hydrogen bonding and apolar hydration effects"; E. Grunwald, "The proton transfer reaction of the hydrogen and hydroxide ions"; G. E. Walrafen, "Stimulated and spontaneous Raman scattering from water and aqueous solutions."

19 June. (F. Franks, session chairman): H. J. C. Berendsen, "The dynamics of water molecules in the presence of biopolymers"; R. Lumry, "Entropy/enthalpy compensation in aqueous solutions of biopolymers."

Theoretical Chemistry

Albert Moscovitz, chairman; Darwin W. Smith, vice chairman.

22 June. J. Lindberg, "Spin properties and electronic correlation in molecules"; William P. Reinhardt, "The use of many-body Green's functions in electronic structure determinations: a critical appraisal"; Alec Dalgarno, "Radiative bound-free and free-free transitions"; Kent R. Wilson, "Photofragment spectroscopy of dissociative excited states."

23 June. Roy G. Gordon, "Piece-wise analytic wave functions"; Robert Yaris, "The theory of random matrices with application to ^{13}C NMR"; M. A. El-Sayed, "Multiple resonance techniques in the study of triplet state spectroscopy"; Karl Freed, "A theory of radiationless processes in polyatomic molecules."

24 June. D. P. Santry, "Approximate molecular orbital calculations for molecules containing second row elements"; Roald Hoffman, "The electronic structure of some transition states and intermediates"; R. F. W. Bader, "Calculation of potential surfaces for chemical reactions and their interpretation in terms of changes in the electronic charge and spin density distributions"; A. C. Wahl, "Some recent progress on the *Ab Initio* calculation of simple chemical reaction surfaces and chemical bond strengths."

25 June. (Speaker and subject to be announced); M. Krauss, "Some *Ab*

Initio calculations"; E. R. Lippincott, "Polywater"; E. Clementi, "Preliminary studies of hydrogen bonding."

26 June. C. A. Mead, "Bound states in molecules analogous to Cooper pair states"; M. R. Philpott, "Vibronic coupling in polymers and molecular crystals."

Animal Cells and Viruses

James E. Darnell, chairman; David Baltimore, vice chairman.

29 June–3 July. Cell genetics; cell rates, genetics: Richard Davidson, Howard Green, Bob Krooth, Matthew Scharff. Chromosome structure, DNA replications, mitosis: Ernest DePraw, Joe Gall, P. M. B. Walter, Carl Schildkraut, Thoru Pederson. Ribosomes and tRNA: Oscar Miller, Bob Perry, Jon Warner, Ed McConkey, M. Bernfield. mRNA nuclear RNA: Jim Darnell, Martin Nemer, Klau Scherrer, John Bishop, Giuseppe Attardi, Joe Sambrook. Protein synthesis and control: David Baltimore, Howard Dintzis, Stuart Heywood, John Hunt, Kivie Moldave, David Sabatini, Gordon Tomkins. Mitochondria: Igor Dawid, Jonas Galper, Sheldon Penman, G. Attardi. Membranes: Max Burger, Guido Guidotti, Bernard Roizman, Boyce Burge, Stan Nathenson.

Chemistry and Physics of Space

A. G. W. Cameron, chairman; G. W. Wetherill, vice chairman.

6 July. G. G. Goles, "Igneous processes on the moon"; (speaker to be announced), "Internal composition of the moon"; G. J. Wasserburg, "Rb-Sr dating of the lunar surface"; L. T. Silver, "U-Pb dating of the lunar surface."

7 July. D. Gault, "Cratering"; R. L. Fleischer, "Processes on the lunar surface"; D. Heymann, "The Ar^{40} problem in lunar dust"; J. H. Reynolds, "Lunar xenology."

8 July. (Speaker to be announced), "Lunar seismology"; C. P. Sonett, "Lunar magnetic processes"; P. van de Kamp, "Planetary companions of nearby stars"; J. W. Truran, "Chemical evolution of the galaxy."

9 July. (Speaker and subject to be announced); J. R. Jokipii, "Modulation of the cosmic ray intensity by the sun"; R. O. Pepin, "The neon problem."

10 July. (Speaker to be announced), "Solar wind processes"; (speaker to be announced), "Surface of Mars."

Radical Ions

Glen A. Russell, chairman; M. Thomas Jones, vice chairman.

13 July. R. Kreilick, "NMR studies of phenoxy, verdazyl and nitronyl nitroxide mono and biradicals"; A. Rassat, "Nitroxide mono and biradicals"; U. Schöllkopf, "Mechanism of Wittig Meisenheimer and Stevens rearrangements"; R. F. Nelson, "Anodic oxidation pathways of aromatic amines in non-aqueous media."

14 July. (J. Q. Adams, discussion leader): S. F. Nelsen, "Radical cations of hydrazine derivatives"; F. Minisci, "Polar effects in hydrogen abstraction and aromatic amination by amino radical cations"; R. S. Neale, "Reactions of nitrogen cation and related radicals. Rearrangements and additions to unsaturated hydrocarbons"; T. Kuwana, "Optical methods in the study of short-lived intermediates generated electrochemically."

15 July. H. J. Shine, "Cation-radical chemistry"; L. L. Miller, "Rearrangements triggered by electron transfer"; K. M. Dessau, "ESR spectra and the chemical behavior of aromatic radical cations generated by Co(III) "; S. K. Malhotra, "Autoxidation of enamines and Schiff bases of α,β -unsaturated ketones"; R. Zahradnik, "Electronic spectra of open-shell systems."

16 July. J. F. Garst, "Electron transfer to alkyl halides"; G. D. Sargent, "The application of aromatic radical anions as reagents for the generation and investigation of dicoordinate carbon"; W. D. Closson, "Anion radicals of sulfonate esters"; W. C. Danen, "Decomposition and reactions of halogenated aromatic radical anions"; R. G. Lawler, "NMR signal enhancement during free radical reactions."

17 July. H. B. Mark, "Attempts to explain quantitatively radical ion decay reactions: effects of solvent, oxygen reactions, proton donors"; J. J. Eisch, "Radical-anion intermediates in organometallic chemistry"; D. J. Williams, "Diarylalkane and paracyclophane anion radicals."

Biological Regulatory Mechanisms

Ellis Englesberg, chairman.

20 July. Mark Ptashne, "Control problems in λ and certain aspects of the repressor"; Harvey Eisen, "Regulation in λ "; Ekkehard K. F. Bautz, "The

sigma factor and the regulation of phage T4."

21 July. Jeffrey Miller, "Controlling elements in the *lac* operon." W. Reznikoff, discussant. Walter Gilbert, "The *lac*-repressor." Arthur D. Riggs, discussant. David Sheppard, "The L-arabinose operon." Nancy Lee and Don Kessler, discussants.

22 July. (Geoffrey Zubay, discussion leader): Jon Beckwith, "Catabolite repression, transient repression, 3'/5' cAMP, and the 3'/5' cAMP dependent protein." Howard Rickenberg, Boris Magasanik, Ira Pastan, Leonard Katz, discussants. Edward Umbarger, "Regulation in isoleucine-valine biosynthesis"; Michael Brenner, "The histidine operon."

23 July. Henry Vogel, "Evidence for translational repression in the arginine system in *E. coli*." W. K. Maas, discussant. Raymond Masteller, "Is trp-RNA the correpressor of the trp operon?"

Ellis Golub and Jerry Feldman, "Control of derepression of tyrosinase in *Neurospora*"; Robert L. Metzenberg, "Positive control by the *cys-3* locus in regulation of cysteine biosynthesis in *Neurospora*"; Donald Hawthorne, "Regulation of galactose metabolism in yeast."

24 July. Gordon Tomkins, "Regulation of specific gene expression in mammalian cell cultures"; Richard Palmiter, "Steroid hormone effect as related to ovalbumin."

Nuclear Structure Physics

Benjamin F. Bayman, chairman; Francis G. Perey, vice chairman.

27-31 July. The general theme of the Nuclear Structure Conference will be models of bound states of atomic nuclei. Attention will be focused on the adequacy of the models in describing the

observed degrees of freedom of nuclei, and on our understanding of the models from a more fundamental description of the nucleus as a many-particle system.

Physics and Physical Chemistry of Biopolymers

Gary Felsenfeld, co-chairman; Rufus Lumry, co-chairman.

Conformation of Macromolecules in Solution

3 August. Thermodynamics (J. Sturtevant, session chairman); conformational dynamics (P. von Hippel, session chairman).

4 August. Nucleic acid conformation (J. Hearst, session chairman); X-ray diffraction (D. R. Davies, session chairman).

5 August. Comparative studies of

Program Summary, Gordon Research Conferences for 1970

	Colby Junior College New London, N.H.	New Hampton School New Hampton, N.H.	Kimball Union Academy Meriden, N.H.
15-19 June	Nuclear Chemistry	Nucleic Acids	Lipid Metabolism
22-26 June	Catalysis	Proteins	Cell Structure and Metabolism
29 June-3 July	Polymers	Chemistry of Heterocyclic Compounds	Enzymes, Coenzymes and Metabolic Pathways
6-10 July	Textiles	Statistics in Chemistry and Chemical Engineering	Chemistry, Physiology and Structure of Bones and Teeth
13-17 July	Scientific Information Problems in Research	Radiation Chemistry	Structural Macromolecules
20-24 July	Elastomers	Organic Reactions and Processes	Chemistry at Interfaces
27-31 July	Corrosion	Chemistry of Natural Products	Toxicology and Safety Evaluations
3-7 Aug.	Food and Nutrition	Inorganic Chemistry	Solid State Studies in Ceramics
10-14 Aug.	Medicinal Chemistry	Electron Donor-Acceptor Interactions	Chemistry and Physics of Solids
17-21 Aug.	Hormone Action	Chemistry and Physics of Cellular Materials	Infrared Spectroscopy
24-28 Aug.	Cancer	Science of Adhesion	Chemistry and Physics of Paper
31 Aug.-4 Sept.	Separation and Purification	Environmental Sciences: Water	Lasers in Medicine and Biology

* Week not available

heme proteins (Q. Gibson, session chairman).

6 August. Water as solvent (session chairman to be announced).

7 August. Nucleic acid conformation (R. L. Baldwin, session chairman).

Friction, Lubrication, and Wear

Frederick F. Ling, chairman; Bruce W. Kelley, vice chairman.

10 August. (R. L. Johnson, discussion leader): R. L. Johnson, "Friction, lubrication and wear of metal prosthetic materials"; H. Amstutz, "Bioengineering aspect of joint lubrication"; V. C. Mow, "Ultrasonic methods of measuring behavior of biological materials—theoretical considerations"; L. F. Mockros, "Some mechanics of human articulate cartilage."

11 August. (P. M. Ku, discussion leader): J. F. Archard and R. W. Snidle, "Point contacts and non-Newtonian be-

havior of lubricants"; H. Christensen, "Microelastohydrodynamics"; R. S. Fein, "Boundary lubrication—magic?"; A. Cameron and W. Grew, "Thermodynamics of scuffing."

12 August. (B. Jakobsson, discussion leader): D. Dowson, "Elasto-plasto-hydrodynamic lubrication"; M. H. Birnboim, "Viscoelastic properties of fluids"; C. H. T. Pan, "Short-time viscometry"; J. A. Tichy and W. O. Winer, "The influence of lubricant viscoelasticity: analytical and experimental study of squeeze films."

13 August. (E. A. Saibel, discussion leader): E. A. Saibel, "Tire friction on wet pavement"; I. Kragelskii, "Tire wear"; Georg von Bekesy, "Violin."

14 August. (R. Courtel, discussion leader): R. G. Bayer, "Some observations on friction and wear of sliding systems of cast ceramics"; D. H. Buckley, "Low energy electron diffraction studies and lubrication."

Thin Films

Thomas E. Hutchinson, chairman; Robert B. Marcus, vice chairman.

Thin Film Switching Devices

17 August. (Esther Krikorian, discussion leader): David Brust, "Energy bands and electronic structure in disordered semiconductors"; Hellmut Fritzche, "Conduction in amorphous semiconductors." (R. B. Marcus, discussion leader): David Adler, "Physical studies of memory type semiconductors."

18 August. (Kasturi Chopra, discussion leader): Brian Bagley, "Mechanisms for switching in amorphous semiconductors"; Charles Sie, "Memory elements using ovonic thin films." (Maurice Francombe, discussion leader): Ronald Uttecht, "Bistable resistivity switching properties of the semiconducting glass As-Te-Ge."

19 August. (C. A. Neugebauer, dis-

New Hampshire and Washington

Tilton School Tilton, N.H.	Proctor Academy Andover, N.H.	Holderness School Plymouth, N.H.	Providence Heights College Issaquah, Washington
Structural Aspects of Water and Aqueous Solutions	Hydrocarbon Chemistry	Research at High Pressure	Plasma Physics
Theoretical Chemistry	Science and Tech- nology of Biomaterials	Crystal Growth	Immunochemistry and Immunobiology
Animal Cells and Viruses	Lysosomes	Biochemistry in Agriculture	Chemistry and Physics of Isotopes
Chemistry and Physics of Space	Developmental Biology	*	High-Temperature Chemistry
Radical Ions	Polymer Physics	*	Molecular Pathology
Biological Regulatory Mechanisms	Physical Acoustics	*	Chemistry and Biology of Pyrrole Compounds
Nuclear Structure Physics	Dielectric Phenomena	*	Dynamics of Quantum Solids and Fluids
Physics and Physical Chemistry of Biopolymers	Biomathematics	Heart Muscle	Nonlinear Optic Effects
Friction, Lubrication, and Wear	*	Particle-Solid Interactions	*
Thin Films	*	Metals and Metal Binding in Biology	*
Physical Metallurgy	*	Cyclic AMP	*
Metal-Insulator-Semi- conductor Systems	*	Geochemistry	*

cussion leader): Allan M. Goldman and Louis E. Toth, "Fluctuations in superconducting films"; Myron Strongin, "Properties of ultrathin film superconductors." (Jay Zemel, discussion leader): Robert Laibowitz, "d.c. Josephson tunnel devices."

20 August. (John Hudson, discussion leader): Arthur Yelon, "Basic properties of magnetic thin films"; Floyd B. Humphrey, "Dynamic magnetization configuration during flux reversal." (Siegfried Mader, discussion leader): J. Sosniak, "Magnetic domains in sputtered orthoferrite films."

21 August. (Richard Hoffman, discussion leader): R. P. Ferrier, "Studies of magnetic thin films by high voltage electron microscopy"; J. S. Lally, R. M. Fisher, and L. E. Thomas, "High voltage electron microscopy of thin films."

Physical Metallurgy

John E. Hilliard, chairman; Michael F. Ashby, co-vice chairman; James C. Li, co-vice chairman.

24-28 August. L. Guttman, "Equilibrium critical phenomena"; G. Alefeld, "Hydrogen in metals—diffusion and phase transformations"; J. B. Cohen, "The physical meaning of local order and clustering"; J. W. Cahn and R. B. Heady, "Thermodynamics and nucleation in the vicinity of the critical point"; D. de Fontaine, "Application of Fourier methods in physical metallurgy"; G. S. Cargill, "Metallic glasses"; S. Moss, "Structure and transformation in network glasses"; H. L. Marcus, P. M. Palmberg, and N. C. MacDonald, "Auger electron spectroscopy: microscopic analysis in two-dimensional metallurgy"; E. W. Hart, "Phase transformations in grain boundaries"; R. W. Balluffi, "Study of high-angle grain boundaries by transmission electron microscopy"; J. J. Holmes, "Experimental results on void formation induced by neutron irradiation"; S. D. Harkness and Che-Yu Li, "Model for void formation in fast neutron irradiated metals"; F. C. Frank, "The earth—the largest accessible specimen for the solid-state physicist."

Metal-Insulator-Semiconductor Systems

R. Jaccodine, chairman.

31 August. (C. Mead, discussion leader): C. Mead, "Metal-insulator barrier studies"; D. Williams, "Photoemis-

sion and photoconductivity in insulators"; R. J. Powell and C. N. Berglund, "Internal photoemission and barrier phenomena."

1 September. (B. Deal, discussion leader): V. Rodriguez, "Charge storage effect in $\text{Si}_3\text{N}_4\text{-SiO}_2$ layers"; H. Nigh, " $\text{Al}_2\text{O}_3\text{-SiO}_2$ dual dielectric studies"; J. M. Eldridge, "Charge effects in phosphosilicate glass= SiO_2 ."

2 September. (L. Gregor, discussion leader): D. Kerr, "Basic measurements of surface properties"; A. Goetzberger and E. Nicollan, "Avalanche injection effects on surface properties"; F. Feigl, "ESR studies of defects in dielectrics."

3 September. (J. Zemel, discussion leader): L. Young, "Ion transport in oxides"; G. Schnable and E. Schlegel, "Ion motion over the surface of dielectrics."

4 September. (K. Zaininger, discussion leader): V. A. J. van Lint, "Radiation damage in semiconductors"; K. Zaininger, "Radiation effects in insulator films."

Proctor Academy

Hydrocarbon Chemistry

David M. Lemal, chairman; Henry C. Stevens, vice chairman.

15 June. R. Pettit, "Reactivity of hydrocarbons coordinated to metals"; F. D. Mango, "The removal of orbital symmetry restrictions to organic reactions with transition metals"; G. Wilke, "Stereospecific catalytic synthesis of hydrocarbons."

16 June. H. R. Ward, "The mechanistic implications of nuclear spin sorting in radical-radical reactions"; M. Szwarc, "Chemistry of radical-ions and dianions of some hydrocarbons"; P. S. Wharton, "1,5-Cyclodecadienes"; M. R. Willcott, "Molecular rearrangements: stereochemistry of the bornadiene-trimethyltropilidene conversion."

17 June. S. Masamune, "The chemistry of some cyclic systems"; J. A. Berson, "Stereochemical pathways of thermal and photochemical rearrangements"; W. Roth, "Stereochemistry of the alkylidene-cyclopropane rearrangement."

18 June. D. G. Farnum, "Stable carbonium ions: structure and synthetic uses"; H. H. Freedman, "NMR studies of chirality in trityl cations"; R. Criegee, "The chemistry of the pentamethylhomofulvenes."

19 June. E. Wasserman, "Chemical topology"; H. E. Simmons, "Macrocyclic structures."

Science and Technology of Biomaterials

Harlan C. Amstutz, chairman.

22 June. (H. Amstutz, discussion leader): L. Weiss, "Biophysical aspects of cell interactions with biomaterials"; D. Mears, "Electron probe analysis of tissue and cells from implant areas"; P. Cuatrecasas, "Insoluble enzymes"; J. H. R. Kagi, "Role of metals in enzymes and proteins." (J. Bougas, discussion leader): P. Bullough, "Tissue response to foreign material"; C. Homsy, "Polymer screening methods"; J. Autian, "Compatibility of polymers in animals and tissue culture"; E. Lautenschlager and E. Kaminski, "Relation of anodic potential and tissue compatibility."

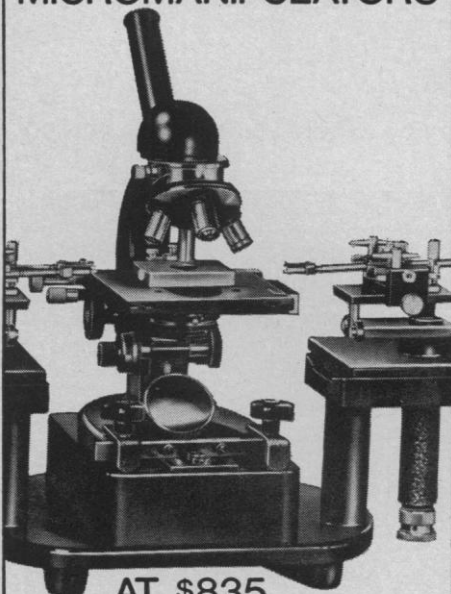
23 June. (C. Homsy, discussion leader): E. A. Balaza and D. Gibbs, "The rheological properties and biological function of hyaluronic acid"; T. Gruen, "Viscosity of synovial fluid and its role in joint lubrication"; C. Homsy, "Pseudosynovial fluids derived from sodium carboxymethylcellulose"; P. Walker, "Some rheological properties of polyethylene oxide solutions"; I. Paul and E. Radin, "In vitro evaluation of pseudo-synovial fluids with the arthrotripsometer"; B. Helal, "Clinical studies in joint lubrication with silicone polymer." (S. Levine, discussion leader): H. Nossel, "Hageman factor surface interactions"; R. Baier, "Protein films on prosthetic materials"; L. Vroman, "Blood-surface interactions and their significance in thrombogenesis"; N. Green, "Metal tissue interactions"; C. Kliment, "Chemistry and properties of hydron and related materials."

24 June. (E. Lautenschlager, discussion leader): S. Musikant, "Theories of composites"; R. Chang, "Struction and environmental effects on composites"; E. Lautenschlager, "Properties of a polymethyl methacrylate based composite"; R. Regester, "Reinforced polymers in salt solutions"; J. Niebauer, "Animal and clinical experience with decron reinforced and stabilized artificial finger joints"; P. Walker, "Mechanical characteristics of normal canine tendons and artificial replacements." (D. J. Lyman, discussion leader): D. J. Lyman, "Effect of biological environment on polymer properties"; F. Leonard, "Biodegradation of polymers"; R. J. Boucek, "Polymer tissue interaction"; J. F. Lontz, "Static and dynamic stress properties of polymers in biological environment."

25 June. (E. Eyring, discussion leader): L. Hench, "Mechanisms of in-

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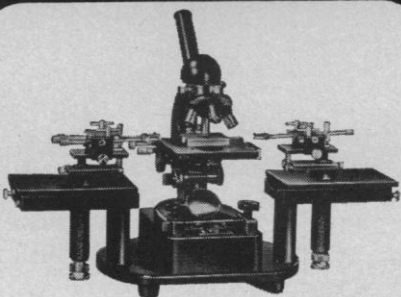


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terfacial bonding between ceramics and bone"; S. Hulbert, "Physical and mechanical testing of composite porous materials"; E. Eyring, "Attempts at knee replacement with ceramic composites"; C. Homsy, "Dynamic interfaces in prosthetic stabilization"; J. Galante, "Fiber metal composites as a basis for skeletal attachment"; J. Hirschhorn, "Studies on porous metal implant materials." R. M. Kenedi (subject to be announced).

26 June. (C. Bean, discussion leader): (speakers to be announced), Progress reports.

Lysosomes

James G. Hirsch, co-chairman; Michael Locke, co-chairman.

29 June. B. Trump, "Autophagy in liver and kidney cells"; M. Locke, "Autophagy in insect fat bodies"; E. Holtzmann, "Remodeling in nerve cells"; M. Farquhar, "Secretion and autophagy in pituitary cells"; R. Rifkind, "Erythrocyte maturation."

30 June. R. Kessel, "Oogenesis"; D. Phillips, "Spermiogenesis"; E. F. Hartree, "Lysosomes in sperm"; A. C. Allison, "Fertilization"; E. Parr, "Hatching and early mammalian egg development"; F. Beck, "Teratogenesis"; J. Ericsson, "Involution of the mammary gland."

1 July. H. Holtzer, "Quantal mitoses during development"; J. Saunders, "Cell death in remodeling during chick development"; R. Ross, "Wound healing"; G. Vaes, "Remodeling in bone"; J. Dingle, "Remodeling in cartilage."

2 July. R. Weber, "Remodeling during amphibian development"; J. Woessner, "Collagen remodeling in the developing chick"; J. Gross, "Biochemical mechanisms for collagen remodeling"; C. Williams, "Remodeling in insect development."

3 July. E. Haye, "Origin of blastemas"; S. Simpson, "Blastemas in lizards."

Developmental Biology

Donald D. Brown, chairman.

6 July. (E. H. Davidson, session chairman): "Differential gene action and informational RNA in embryos"; (I. B. Dawid, session chairman): "Role of cytoplasmic DNAs in development."

7 July. (H. Berendes, session chairman): "Chromosome puffing"; (J. G. Gall, session chairman): "Amplification of genes."

8 July. (A. Garen, session chairman): "Transdetermination"; (R. Briggs, session chairman): "Nucleocytoplasmic interactions in embryos."

9 July. (M. Nemer, session chairman): "Translational control in eggs and embryos"; (W. J. Rutter, session chairman): "Differentiation of specialized cell types."

10 July. (P. A. Marks, session chairman): "Developmental studies of hemoglobin."

Polymer Physics

Robert S. Marvin, chairman; Anton Peterlin, vice chairman.

Five related sessions will be devoted to a comparison of molecular theories, models, and concepts used to describe the viscoelastic behavior of amorphous polymers, and evaluation of their adequacy in predicting the behavior of such systems.

13 July. Dilute solutions (J. D. Ferry and W. H. Stockmayer, discussion leaders).

14 July. Concentrated solutions and undiluted polymers (W. W. Graessley and A. S. Lodge, discussion leaders).

15 July. Summary. Consideration of need for and possibilities of new theories and concepts (R. B. Bird, discussion leader). W. L. Peticolas, "Inelastic laser light scattering from polymers."

16 July. Growth and characterization of solution grown polymer crystals (F. A. Khoury, discussion leader). Open session.

17 July. Liquid crystals (J. L. Erickson, discussion leader).

Physical Acoustics

John de Klerk, chairman.

20 July. (A. R. Hutson, session chairman): E. Conwell, "Acousto-electric effect for bulk and surface waves"; Y. V. Gulayev, "Acousto-electric phenomena due to interaction of surface waves with electrons in semiconductors and layered media." (E. Stern, session chairman): K. A. Ingebrigtsen, "Experiments with acoustic surface waves in composite structures of semiconducting films on LiNbO₃ surfaces"; G. S. Kino, "Parametric effects in acoustic media."

21 July. (W. P. Mason, session chairman): E. G. Spencer, "Crystalline materials for physical acoustics"; J. de Klerk, "Piezoelectric films." (R. T. Smith, session chairman): M. J. P. Musgrave, "Elasticity of piezoelectric

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materials"; E. Sittig, "Creeping waves around isotropic cylinders."

22 July. (E. Sittig, session chairman): G. W. Farnell, "Surface waves in layered media"; P. G. Klemens, "Surface wave scattering mechanisms"; H. F. Tiersten, "Guidance of surface waves." (W. Spencer, session chairman): P. Lloyd, "Analysis of piezoelectric resonator structures in the neighborhood of their thickness cut-off frequencies."

23 July. (B. Auld, session chairman): H. Whitehouse, "Surface wave filters—a time domain approach"; R. H. Tancrill, "Surface wave filters—a frequency domain approach."

24 July. (M. Gottlieb, session chairman): D. A. Pinnow, "Acousto-optic materials, methods and applications"; R. W. Weinert, "Probing of bulk and surface waves by Bragg scattering."

Dielectric Phenomena

Charles P. Smyth, honorary chairman; Graham Williams, chairman; David W. McCall, vice chairman.

27 July. R. Zwanzig, "Theory of dielectric relaxation in polar liquids"; J. E. Anderson, "Model calculations of cooperative motions in chain molecules"; W. P. Slichter, "N. M. R. relaxations in polymers"; G. W. Chantry, "Dielectric behavior of polymers at submillimeter wavelengths."

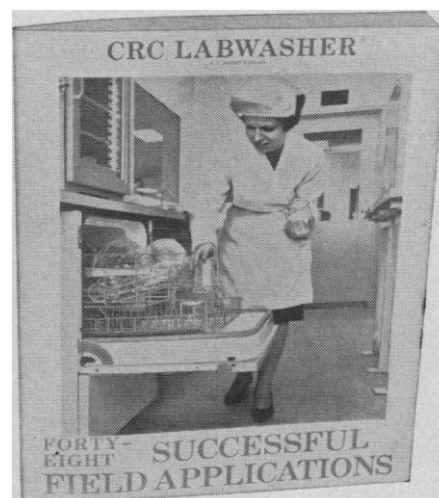
28 July. C. Brot, "Total dipolar absorption of simple molecules in the microwave–far infrared region"; M. M. Davies, "Absorptions in non-polar liquids"; A. A. Maryott, "Dielectric and N. M. R. correlation times of symmetric top gases and mixtures"; G. Birnbaum, "A new line shape for resonant and non-resonant absorption, and its application to dielectric phenomena."

29 July. H. P. Schwan, "Dielectric relaxation and mechanism in Biology—A Survey"; E. H. Grant, "Dielectric dispersion in aqueous solutions of globular proteins, with particular reference to myoglobin, haemoglobin and serum albumen"; C. T. O'Konski, "Electrical properties of macromolecules"; S. Takashima, "Dielectric properties of ordered solutions of biopolymers."

30 July. W. Dannhauser, "Liquid structure and dielectric polarization of alcohols"; E. Whalley, "The dielectric properties of ice"; L. Onsager, "Protonic semiconductors."

31 July. W. Reddish, "The significance of developments in instrumentation in dielectrics research"; H. K. Welsh, "Dielectric absorption and defects in long chain solids."

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SCIENCE, VOL. 167

Biomathematics

H. David Block, chairman; Simon A. Levin, co-chairman; David Cardus, vice chairman.

3-7 August. (Julia T. Apter, discussion leader): W. H. Bossert, "Models of evolution of polygenic characters"; Hans Bremermann, "Optimization algorithms for many variables. Applications to problems in dynamical systems and pattern recognition"; Jacob Bronowski, "The evolution of complexity"; Dan Cohen (subject to be announced); Jack Cowan, "Some aspects of the modeling of single-unit and large-scale neural activity by differential equations"; Lloyd Demetrius, "Multiplicative processes"; Steve Farris, "A biological interpretation of the Steiner problem with rectilinear distance"; Heinz von Foerster, "Epistemological problems of 'intelligence,' natural or artificial"; Stephen Grossberg, "Operant conditioning: hierarchies of cellular filters and feedback"; Bela Julesz, "Effects of Fourier domain operations on stereopsis"; H. D. Landahl, "On coupling between oscillators which model biological systems"; Jerome Lettvin (subject to be announced); Christopher Longuet-Higgins, "Associative memory models"; Robert MacArthur, "What competition minimizes"; John Maynard-Smith, "Problems in evolution theory"; Theodosios Pavlidis, "Interacting biochemical oscillators"; Robert Rosen, "On the interpretation of dynamical models of biological processes"; Frank Rosenblatt, "Mathematical models of memory mechanisms"; Sol Rubinow, "Problems in cell population kinetics"; Lee Segel, "Collective motions of chemotactic cells"; Norman Shapiro, "Simplicity in biological models"; Lawrence Slobodkin, discussion leader; Arthur Winfree, "The behavior of fungi and fruit flies: geometrical approaches to temporal organization"; Lewis Wolpert (subject to be announced).

Holderness School

Research at High Pressure

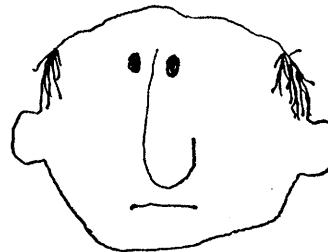
George E. Duvall, chairman; Robert W. Keyes, vice chairman.

15 June. Electronics and optics (R. W. Keyes, chairman): J. Schirber, "Effects of compression on the Fermi surface"; George Bloom, "Brillouin scattering in shock compressed materials"; R. Graham and C. Julian, "Effects of elastic shock compression on conductivity of Ge." Equations of state

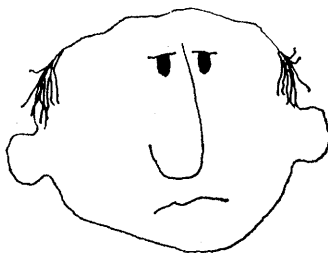
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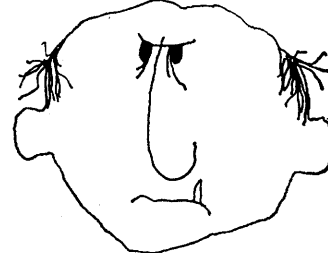
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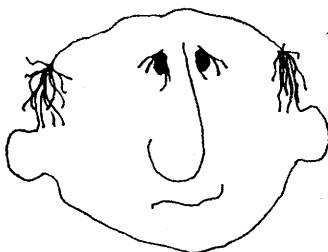
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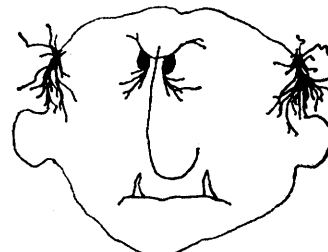
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THAT TAKE
TOO LONG TO GIVE
YOU A READING!



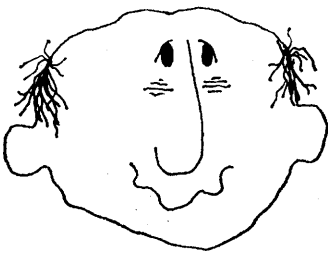
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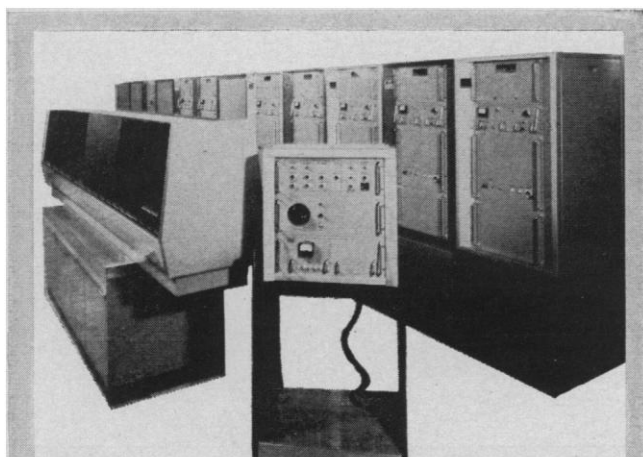
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(E. Teller, chairman): M. Ross, "Theories of melting"; E. B. Royce and R. Grover, "Equation of state data from shock compression"; C. W. F. T. Pistorius, "Regularities in solid-solid phase transitions"; M. Nicol, "Raman spectroscopy of high pressure phases of solids."

16 June. Superconductivity (P. Seiden, chairman): J. Olsen, "General review"; J. W. Garland, "Microscopic theory"; J. P. Franck, "Phonon spectra and energy gap from tunneling"; R. J. Higgins, "Fermi surface topology from superconducting pressure measurements." Calculations of mechanical properties from first principles (Neil Ashcroft, chairman): D. Liberman, "Self-consistent field calculations of equations of state for solids"; W. Rudge, "First principles calculations of the mechanical properties of solids under pressure"; E. Kmetko, "Calculations of effects of pressure on band structure and Fermi surfaces. Correlation with compressibility."

17 June. Magnetic properties (C. Tomizuka, chairman): Daniel Bloch, "Pressure effects on magnetism of rare earth elements"; T. M. Rice, "Pressure effects on antiferromagnetism of chromium"; Akira Sawaoka, "Magnetic anisotropy"; L. C. Bartels, "Effects of pressure on properties of itinerant ferromagnets." Dielectric properties (G. Samara, chairman): W. Daniels, "Dielectric properties of rare gas solids"; Don Schuele, "Pressure dependence of dielectric properties of alkaline earth fluorides"; E. Whalley, "Dielectric properties of various forms of ice"; G. Samara, "Pressure dependence of dielectric properties of ferroelectric crystals."

18 June. Mechanical properties (George C. Kennedy, chairman): H. L. D. Pugh, "Mechanical properties under hydrostatic pressure"; R. W. Rhode, "Mechanical response of solids to shock wave compression"; S. Mitra, "Pressure dependence of optically active phonons in crystals." Metal-semiconductor transitions (T. M. Rice, chairman): D. B. McWhan, "Mott transition in doped V₂O₃"; D. Jerome, "Metal-semiconductor transitions in Yb metals"; W. Paul, "Pressure-induced transitions in VO₂."

19 June. Experimental techniques and recent results (W. Paul, chairman).

Crystal Growth

W. G. Pfann, co-chairman; Robert L. Parker, co-chairman.

22 June. R. F. Sekerka, "Phenomeno-

logical theory of growth from the melt"; S. Coriell, "Morphological stability of ice crystals in aqueous solutions"; D. Uhlmann, "Crystallization and melting in glass-forming systems"; H. Gatos, "Crystal growth from the melt with emphasis on aspects of the growth interface."

23 June. (K. A. Jackson, discussion leader): A. A. Chernov, "Theory of crystal growth from solutions and in the presence of impurities"; J. Verhoeven, "Controlled solidification and melting experiments in concentrated alloys"; W. A. Tiller, "Crystallization interfaces—their energetics, kinetics and topography."

24 June. L. G. Van Uitert, "Growth of crystals for magnetic and optical applications"; H. Reiss, "Mobilities of nuclei and islands of outgrowth during formation of hetero-epitaxial films from the vapor"; R. S. Wagner and R. J. H. Voorhoeve, "Nucleation and growth of cadmium from the vapor."

25 June. J. J. Tietjen, "Vapor phase growth of 3–5 compounds"; B. W. Batterman, "Assessment of crystal perfection"; R. E. Hanneman, "Diamonds, meteorites and the moon."

26 June. D. T. J. Hurle, "Convection in the liquid, and its effects on solute segregation"; W. R. Wilcox, "Macroscopic segregation phenomena."

Biochemistry in Agriculture

Edward F. Rogers, chairman; Arthur W. Galston, vice chairman.

29 June. G. M. Woodwell, "Toxic substances and ecological cycles"; P. C. Kearney, "Biodegradation of pesticides"; D. G. Crosby, "Photodecomposition of pesticides"; L. D. Owens, "Rhizobitoxin, a naturally occurring model for the design of herbicides."

30 June. C. A. West, "Regulation of kaurene biosynthesis"; R. H. Hageman, "Nitrate reductase assays as a means of selecting higher-yielding, high-protein cultivars"; A. R. Cooke, "Uses of Ethrel for inducing ethylene responses in plants"; N. J. Leonard, "Cytokinins."

1 July. F. Matsumura, "Studies on the membrane ATPases in relation to the action mechanism of DDT"; C. F. Wilkinson, "The mode of action of insecticide synergists"; G. Kaugars, "Newer types of insecticidal structures"; C. P. DiSanzo, "Principles governing the control of plant-parasitic nematodes with contact nematocides."

2 July. N. E. Tolbert, "Plant microbodies (peroxisomes and glyoxysomes)"; I. Zelitch, "The relation of photorespira-

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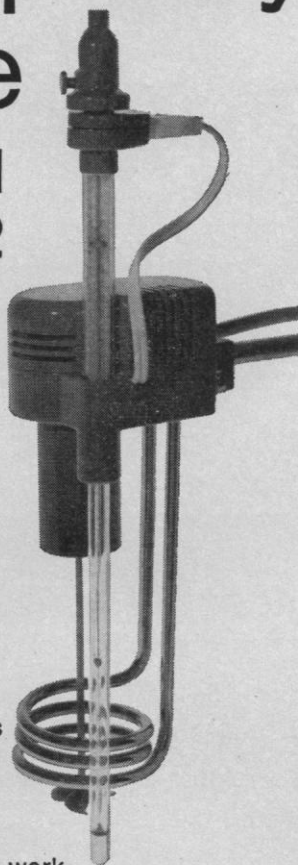
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tion to net photosynthesis"; O. E. Nelson, "Opaque-2 maize."

3 July. D. C. Torgeson, "New developments in fungicides"; K. Maramorosch, "Mycoplasma as causative agents in plant diseases."

Heart Muscle

John R. Blinks, chairman.

3 August. (A. F. Huxley, chairman): Models of muscular contraction. (B. R. Jewell, chairman): Mechanics of cardiac and skeletal muscle.

4 August. (H. Reuter, chairman): Activating currents in cardiac and skeletal muscle. (G. A. Langer, chairman): Ion fluxes across membranes.

5 August. (D. Noble, chairman): Passive electrical properties of heart muscle. (G. Moe, chairman): Mechanism of arrhythmias.

6 August. (D. R. Wilkie, chairman): Energetics of contraction in cardiac and skeletal muscle. (H. Morgan, chairman): Metabolic control in cardiac and skeletal muscle.

7 August. (A. Katz, chairman): Contractile proteins.

Particle-Solid Interactions

Sheldon Datz, chairman; Walter L. Brown, vice chairman.

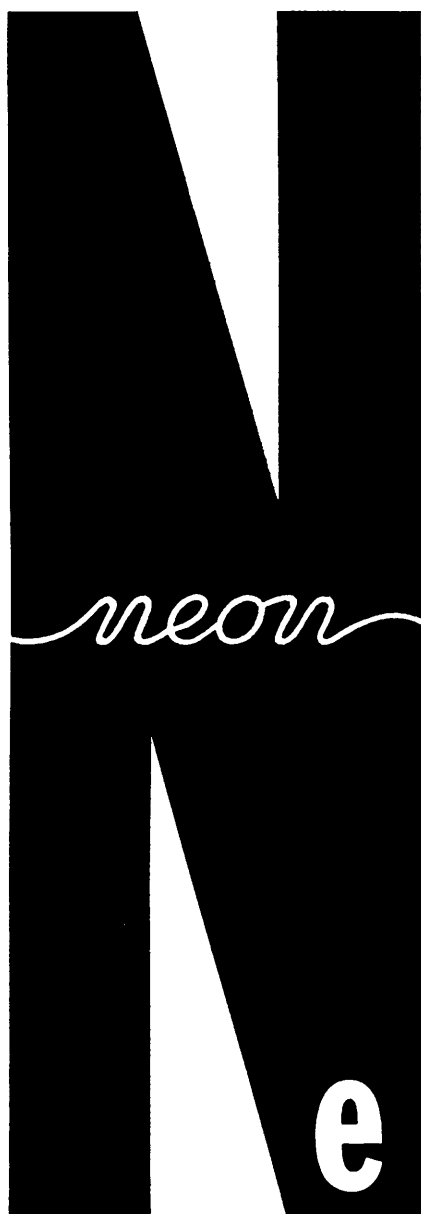
10 August. (Hans Schiøtt, discussion leader): J. M. Poate, "Energy loss phenomena"; R. H. Ritchie, "Plasmons." (Peter Sigmund, discussion leader): Felix T. Smith, "Interatomic potentials and scattering."

11 August. (W. M. Gibson, discussion leader): Mark T. Robinson, "Channeling mechanisms and ion trajectories." (Q. Kessell, discussion leader): Arnold Russek, "Inelastic atomic collisions."

12 August. (E. Merzbacher, discussion leader): J. Kahn and J. Cairns, "Ion-induced x-ray emission." (R. S. Nelson, discussion leader): Hans O. Lutz, "Impact parameter dependence of x-ray emission"; Nicole Colombie, "Kinetic secondary electron ejection."

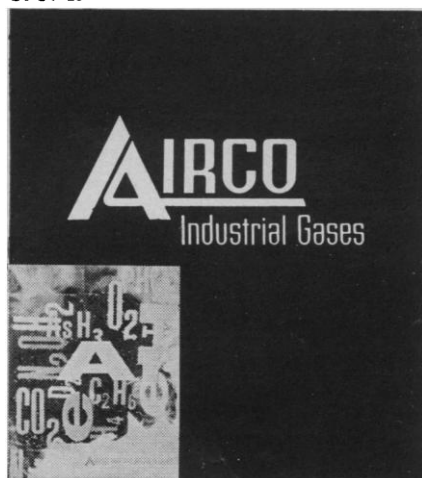
13 August. M. Kaminsky, "States of ions in solids"; C. D. Moak, "Charge-state spectroscopy." (M. W. Thompson, discussion leader): P. K. Rol and W. van der Weg, "Atom surface collisions"; E. Bøgh, "Rutherford scattering in the surface region."

14 August. (James W. Mayer, discussion leader): L. Feldman, "Ion crystallography."



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Metals and Metal Binding in Biology

Paul Saltman, chairman; Richard H. Holm, vice chairman.

17 August. Alkali ions in biological systems (M. Eigen, discussion leader): J. H. Prestgaard, "Cation specificity of nonactin"; B. Pressman, "The valenomycin effect"; G. Eisenman, "Alkali ion transport in lipid bilayers"; H. A. Lardy, "Active ion transport."

18 August. Non-heme iron: I. Gunsalus, "Biochemistry of non-heme iron proteins"; W. Orme-Johnson and M. Poe, "Structure of non-heme iron proteins"; R. Holm, "Iron sulfur chemistry"; P. Saltman, "Biochemistry of iron storage and transport"; H. Gray, "Iron oxide chemistry."

19 August. Oxygen binding and oxidation: J. Ibers, "Structure of metal-oxygen models"; L. Hoard, "Oxygen stereo chemical constraints provided by porphyrin skeletons"; R. Shulman, "NMR of heme proteins"; T. Vangard, "EPR studies of metallo-oxidases"; I. Fridovich, "Oxygen radicals, oxygen toxicity and superoxide desmutase."

20 August. Nitrogen binding and fixation: J. Chatt and E. van Tamelen, "Abiological nitrogen fixation"; L. E. Mortensen, R. Hardy and R. C. Burns, "Biochemistry of nitrogenase: characterization, reactions and mechanisms." All speakers, "Abiological-biological relationships."

21 August. Open for discussion—presentation of related papers.

Cyclic AMP

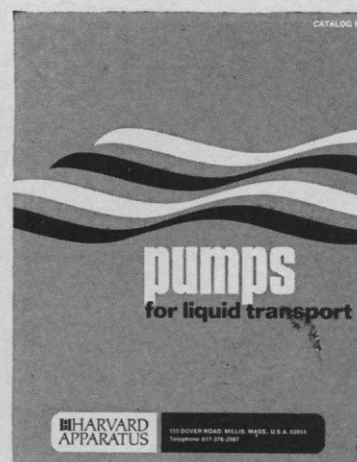
G. Alan Robison, co-chairman; Earl W. Sutherland, co-chairman; Charles G. Smith, vice chairman.

24 August. (E. W. Sutherland, discussion leader): N. D. Goldberg and A. L. Steiner, "Newer methods of assay." (G. I. Drummond, discussion leader): D. A. Walsh and P. Greengard, "Mechanism of action of cyclic AMP."

25 August. (S. P. Colowick, discussion leader): R. L. Perlman and G. Zubay, "Catabolite repression." (H. C. Pitot, discussion leader): W. D. Wicks and T. A. Langan, "Protein synthesis and histone phosphorylation."

26 August. (G. A. Robison, discussion leader): O. M. Rosen and S. L. Pohl, "Receptors and adenyl cyclase." (G. W. Liddle, discussion leader): A. E. Broadus and L. R. Chase, "Clinical endocrinology." (C. R. Park, discussion leader): F. Murad and H. M. Good-

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man, "Factors influencing the formation and action of cyclic AMP."

27 August. (R. W. Butcher, discussion leader): M. Schramm and H. Wells, "The release of large and small molecules." (T. W. Rall, discussion leader): T. M. Konijn and J. W. Dobbs, "Some other effects of cyclic AMP."

28 August. (C. G. Smith, discussion leader): J. G. Hardman and R. Paoletti, "Derivatives and other cyclic nucleotides."

Geochemistry

Wilson L. Orr, co-chairman; Gordon W. Hodgson, co-chairman.

31 August. Geochemistry of porphyrins and biochemical fossils (J. Sugihara, session chairman): A. Treibs, "Work of Hans Fischer, fundament of our knowledge on porphyrins in nature"; E. W. Baker, "Fossil porphyrins and chlorins in deep ocean sediments"; M. Blumer, "Structure and geochemical significance of high molecular weight porphyrins"; A. Corwin, E. Baker, E. Klesper and E. Danielly, "A crystalline petroporphyrin from Wilmington crude oil"; T. C. Hoering, "Optically active steranes in a Miocene petroleum and in an Eocene shale"; W. K. Seifert, E. J. Gallegos and R. M. Teeter, "Identification of steranoid and diterpenoid crude oil carboxylic acids by deuterium labeling"; F. M. Swain, "Carbohydrates in Mesozoic and Cenozoic plant fossils."

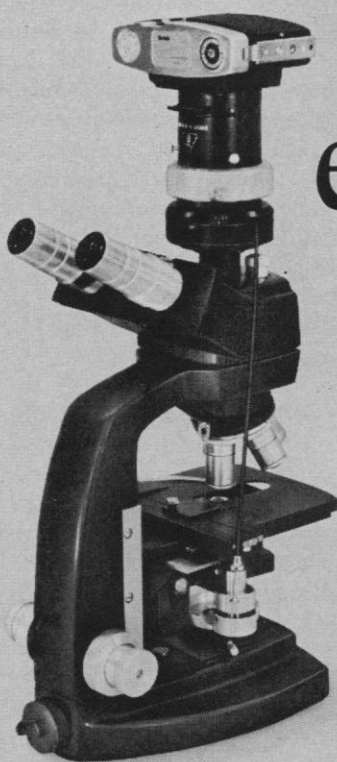
1 September. Chemical fossilization and mineralization (R. M. Mitterer, session chairman): R. M. Mitterer, "Amino acid composition of organic matter in biogenic and non-biogenic carbonates"; P. E. Hare, "Amino acid reactions in deep-sea sediments"; R. A. Berner, "Mineralization as a result of organic matter decomposition"; E. W. Biederman, Jr., "Growth of pyrite in organic rich sedimentary environments." Natural gases (session chairman to be announced): R. Kranz, "Organic matter in the gas and liquid inclusions of uranium bearing minerals and their radioactive disequilibrium"; M. Duel and A. G. Kim, "Gases produced by microbial action during early coalification"; R. D. McIver, "Natural gas."

2 September. Sedimentary organic matter (R. F. Scalani, session chairman): J. M. Hunt, "Organic geochemistry of Black Sea sediment"; J. A. Calder, "Organic geochemistry of marsh environments"; M. A. Rashid, "Humic acids of different sources and clay-organic interactions"; H. W. Scharpen-

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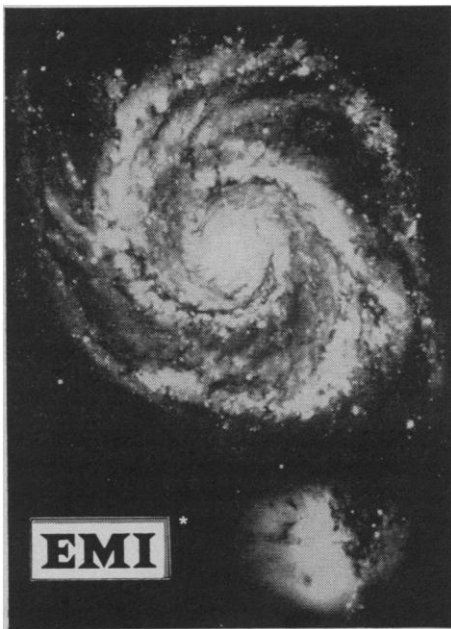
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seel, "The role of various cations and nitrogeneous substances as bridge links in clay-organic interactions." I. Havenaar, "Geochemical data on organic matter in Recent sediments off the southwest African coast." Isotope geochemistry (J. M. Hunt, session chairman): W. D. Redfield, "Distribution of stable carbon isotopes in microbial lipids"; A. Nissenbaum, "Carbon isotopes as tracers of source of organic matter in Recent sediments"; S. R. Silverman, "Carbon isotope geochemistry of petroleum."

3 September. Organic processes in the sub-surface (A. Hood, session chairman): B. P. Tissot, "Effects of temperature and pressure in organic processes in lower Toarcien shales of the Paris basin"; F. T. C. Ting, "Alteration of organic matter and its bearing on the thermal history of sediments"; J. C. Winters and J. A. Williams, "Microbial alteration of crude oil in the reservoir." Geochemistry of petroleum (E. E. Bray, session chairman): J. A. Williams and J. A. Momper, "Effects of crude oil alteration on correlation properties"; E. G. Baker, "Liquid crystal micelles for the migration of hydrocarbons in water."

4 September. Lunar samples in general papers (K. A. Kvenvolden, session chairman): B. Nagy, "Analysis of lunar rock samples"; G. W. Hodgson, "Porphyrins in lunar rock samples"; S. Chang, K. A. Kvenvolden, I. R. Kaplan and C. Ponnampuruma, "Molecular composition and abundances of carbon compounds in lunar samples"; J. D. Brooks and co-workers (subject to be announced); G. Eglington and co-workers (subject to be announced); P. H. Given and D. J. Cassagrande, "Amino acids in the plants and peats of the Florida Everglades."

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Plasma Physics

John Dawson, chairman; A. Trivelpiece, vice chairman.

15 June. Methods and technology for generating high-current relativistic electron beams (B. D. Fried, chairman): J. C. Martin, "Technology of high voltage systems used in the generation of high-current relativistic beams"; S. V. Nablo, "Technology of diodes used in the generation of high-current relativistic beams." High-current relativistic beam diodes (W. B. Lewis, chairman): H. R. Jory, "Numerical studies of equilibrium conditions for high-current rela-

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tivistic diodes"; R. Z. Sagdeev (subject to be announced); L. C. Hebel (subject to be announced).

16 June. High-current relativistic beam transport (W. H. Bennett, chairman): G. Yonas, "High-current relativistic beam transport and ion acceleration results"; D. Hammer, "Propagation of high-current relativistic beams theory"; Ya. B. Fainberg (subject to be announced). Collective effect acceleration schemes (M. Reiser, chairman): J. D. Lawson, "Review and theory of collective effect acceleration mechanisms"; B. Eastlund, "Cerenkov drag acceleration of ions by high-current relativistic beams"; M. Rabinovich (subject to be announced).

17 June. Electron ring accelerators (W. Perkins, chairman): D. Keefe, "Electron ring accelerators"; A. Schluter (subject to be announced); L. I. Rudakov (subject to be announced). ASTRON (G. Budker, chairman): N. C. Christofilos, "Recent progress on ASTRON"; R. J. Briggs, "Negative mass instabilities"; M. Rensink, "Equilibrium and stability."

18 June. Un-neutralized plasmas (R. M. Kulsrud, chairman): R. C. Davidson, "Equilibrium and stability of un-neutralized magnetically confined plasma"; R. Levy, "HIPAC-theory and experiment"; R. Sudan (subject to be announced). Electron cyclotron resonance plasmas (A. Bers, chairman): R. Dandl, "Electron cyclotron resonance plasma experiments"; T. Consoli (subject to be announced); A. Kuckes, "Cyclotron heating theory."

19 June. Review of promising theoretical and experimental problems (S. J. Buchsbaum, chairman): N. Rostoker, "Theory"; A. C. Kolb, "Experiment."

Immunochemistry and Immunobiology

Ray D. Owen, chairman; Herman N. Eisen, vice chairman.

22 June. (R. Owen, chairman): B. A. D. Stocker, "Chemistry and genetics of bacterial polysaccharides"; V. Ginsburg, "Cell surface sugars as determiners of specificity." (J. Preer, chairman): I. Finger, "Biochemical immunogenetics of ciliates."

23 June. (S. Hakomori, chairman): S. J. Singer, "The cell membrane"; V. Defendi, "Modification of cell surface specificities by viruses." (R. Prehn, chairman): K. Hellstrom, "Tumor immunity."

24 June. (J. Stimpfling, chairman):

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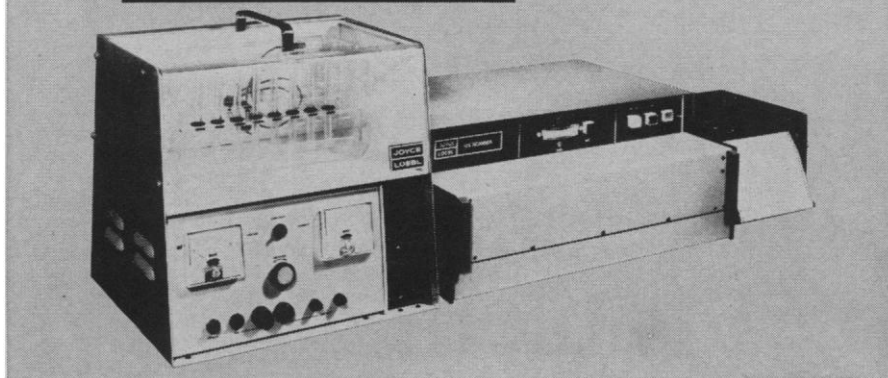
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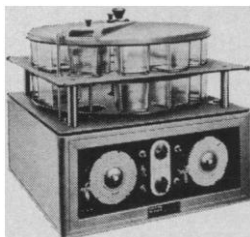
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D. Shreffler, "Immunogenetics of the H-2 region of the mouse"; L. Herzenberg, "The H-2 region and the immune response." (R. Weiser, chairman): A. Nisonoff, "Cytochrome immunochemistry."

25 June. (H. Winn, chairman): D. B. Amos, "Genetics of human histocompatibility antigens"; S. Nathenson, "Chemistry of histocompatibility antigens." (A. Bearn, chairman): B. Blumberg, "The Australia antigen and serum protein polymorphism."

26 June. (H. Eisen, chairman): L. Hood, "Immunoglobulins and the immune response."

Chemistry and Physics of Isotopes

V. J. Shiner, Jr., chairman; F. S. Rowland, vice chairman.

29 June. Isotope abundances in lunar samples, Apollo 11 and 12 (R. N. Clayton, chairman): (speakers to be announced), "Stable isotopes of H, C, N, O, S and Si." Chemical activation studies (D. W. Setser, chairman): H. Heydtmann, "Isotope effects in chemical activation studies"; P. S. T. Lee, "Tritium and C¹⁴ tracer studies of methylene reactions with deuteromethyl halides."

30 June. Organic chemistry (R. L. Schowen, chairman): B. L. Murr, "Deuterium effects on the reactions of carbonium ion pairs." Session for short contributed papers on research in progress (J. G. Jewett, chairman).

1 July. Lunar samples (continued) (R. N. Clayton, chairman): (speakers to be announced), "Radioactive isotopes, noble gases, cosmic radiation and solar wind effects." Hot atom processes (B. S. Rabinovitch, chairman): R. N. Porter, "Recent developments in the theory of hot atom processes"; C. C. Chou, "Isotope effects in hot atom reactions of tritium."

2 July. Organic chemistry (T. W. Koenig, chairman): J. E. Baldwin, "Isotope effects in cycloaddition reactions"; W. H. Saunders, Jr., "Isotope effects in SYN elimination reactions." Models in the calculation of isotope effects (M. Wolfsberg, chairman): J. Bigeleisen, "Introduction"; A. Kuppermann, "The hydrogen atom plus hydrogen molecule exchange reactions—exact calculations, approximate models and isotope effects."

3 July. (M. Wolfsberg, chairman): P. Yankwich, "Modeling the transition state"; M. J. Stern, "Isotope effects as indicators of quantum mechanical tunnelling—predictions from model calculations."

SCIENCE, VOL. 167

High-Temperature Chemistry

Robert J. Thorn, chairman; K. Douglas Carlson, vice chairman.

Order-Disorder and Meanings of High-Temperature Chemistry

6 July. Order-disorder in nonstoichiometric compounds (L. Eyring, session chairman): J. W. Cahn, discussion leader.

7 July. Ordered clusters in liquids (alloys) (G. R. B. Elliott, session chairman): G. Borelius, L. S. Darken, discussion leaders. Correlation of entropic and enthalpic effects. Scaling laws (J. Norman, session chairman): P. Winchell, H. T. Davis, discussion leaders.

8 July. Transport and reactions in solids (J. B. Wagner, Jr., session chairman): R. E. Hanneman, H. Schmalzried, D. A. Stevenson, discussion leaders.

9 July. Gas-solid interactions, vaporization and sublimation (P. G. Wahlbeck, session chairman): F. O. Goodman, J. T. Yates, Jr., discussion leaders. Directions in science and technology in high-temperature chemistry (P. W. Gilles, session chairman): H. Burte, A. V. Grosse, discussion leaders.

10 July. Syntheses (J. L. Margrave, session chairman): P. L. Tims, L. Andrews, discussion leaders.

Molecular Pathology

Henry C. Pitot, chairman; Russell Ross, vice chairman.

The Biochemical Bases of Genetic Disease

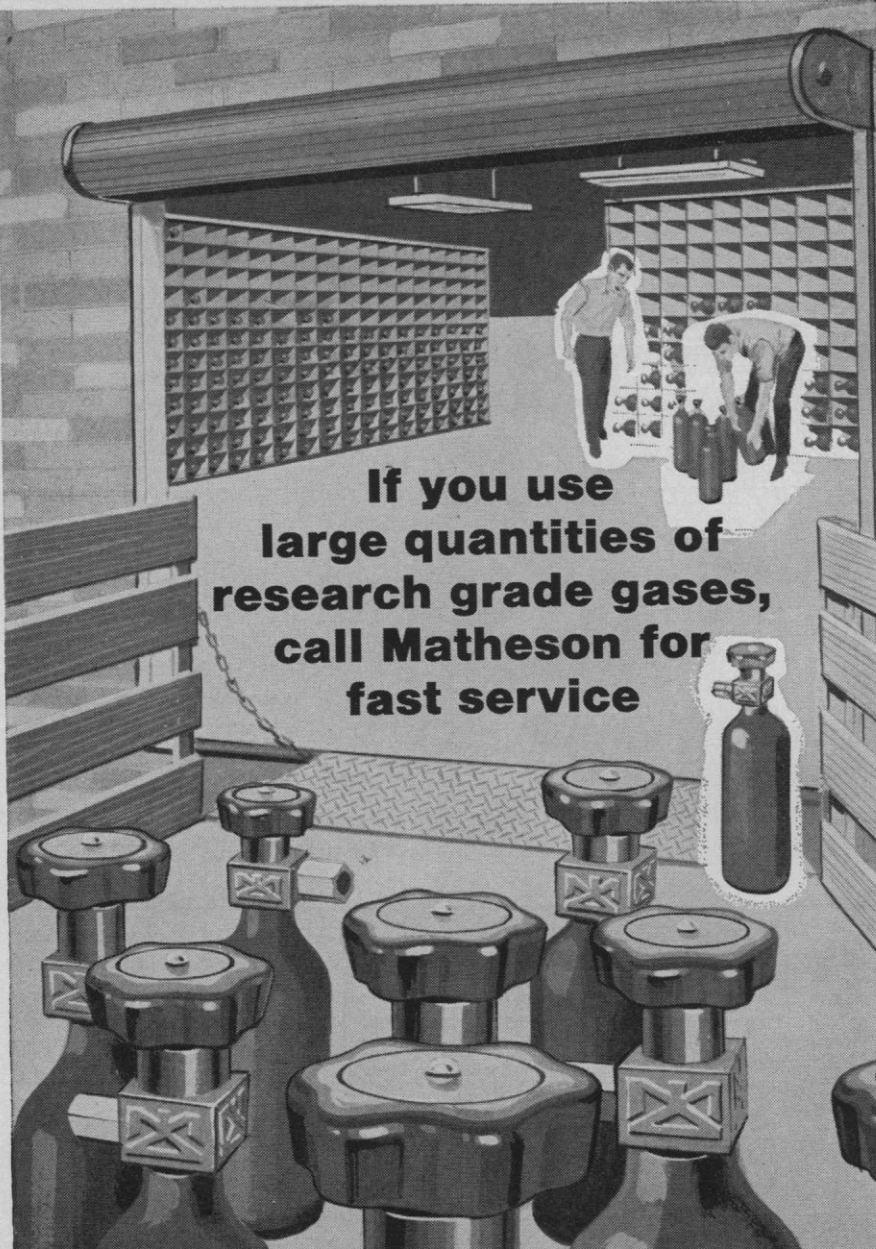
13 July. X-linked disease (Henry C. Pitot, chairman): Robert DeMars; J. Edwin Seegmiller, "X-linked uric-acidurias." Disorders of nucleic acid metabolism (Robert DeMars, chairman): James Regan.

14 July. Ganglioside and phospholipid storage diseases (J. Edwin Seegmiller, chairman): Roscoe Brady, John S. O'Brien. The mucopolysaccharidoses and cystic fibrosis (Roscoe Brady, chairman): Albert Dorfman, B. S. Danes.

15 July. The glycogenoses (James Regan, chairman): D. H. Brown, H. G. Hers. Galactosemia, diabetes and other genetic disorders of carbohydrate metabolism (H. G. Hers, chairman): David Hsia, George Cahill.

16 July. Disorders of amino acid and heme metabolism (David Hsia, chairman): Donald Tschudy, S. Harvey Mudd. (Donald Tschudy, chairman): Harry Waisman, Joseph Dancis.

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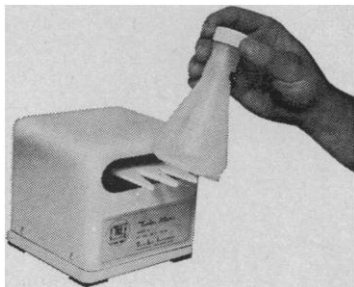
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17 July. The hemoglobinopathies (Harry Waisman, chairman): H. Lehman, Paul Marks.

Chemistry and Biology of Pyrrole Compounds

Lawrence Bogorad, chairman; Lyonel G. Israels, vice chairman.

20 July. Porphyrin and metalloporphyrin chemistry and photochemistry: D. H. Dolphin, J. J. Katz, D. Mauzerall, A. A. Krasnovskii. Biosynthetic and control mechanisms in pyrrole and porphyrin metabolism. δ -Aminolevulinic acid and porphobilinogen: B. Burnham, A. Gajdos, S. Granick, P. Jordan, A. Kappas.

21 July. δ -Aminolevulinic acid and porphobilinogen (continued): G. Kikuchi, J. Lascelles, G. S. Marks, A. Neuberger, S. van Heyningen, H. von Kowsky, D. Tschudy. Uroporphyrinogens: L. Bogorad, B. Frydman, M. Grinstein, E. Y. Levin.

22 July. Protoporphyrin and hemes: Y. Yoneyama, O. T. G. Jones, R. Labbe, A. G. Redeker. Chlorophylls: S. Aronoff, M. Gassman, S. Holt, A. H. Jackson, A. A. Shlyk.

23, 24 July. Bile pigments: I. Arias, N. Berlin, D. Drabkin, L. Israels, R. Lester, H. S. Marver, W. Rudiger, S. Schwartz, H. W. Siegelman, R. Troxler, P. White.

Dynamics of Quantum Solids and Fluids

W. Kohn, co-chairman; P. A. Wolff, co-chairman.

Major Problems in Solid State Physics

27 July. Phenomenology of materials: B. T. Matthias, "Superconductivity and the periodic system"; J. Phillips, "Ionicity of the chemical bond in crystals"; D. Adler, "Electrical and optical properties of transition metal compounds"; (speaker to be announced), "Quantum electronic materials."

28 July. Disordered systems: Nevill Mott, "Impurity conduction in crystals and glasses"; J. Stuke, "Electronic properties of amorphous semiconductors—experiments"; David Turnbull, "Structure and thermal properties of amorphous solids"; Morrell Cohen, "Electronic structure in amorphous semiconductors—theory"; Hans Stocker, "Mechanism of threshold switching in semiconducting glasses—theory and experiment."

29 July. Surfaces: R. Gomer, "Ad-

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sorption and the properties of clean metal surfaces"; R. Schrieffer, "Theory of chemisorption"; P. J. Estrup, "Surface studies by low energy electron diffraction"; C. G. B. Garrett, "Semiconductor surfaces: science and related technology."

30 July. Matter under extreme conditions: Y. R. Shen, "Highly nonlinear optical phenomena"; M. Ruderman, "Superdense matter in astrophysics"; H. Brooks, "Prospects for solid state physics."

31 July. Matter under extreme conditions (continued): G. E. Duvall, "Concepts and applications of shock waves"; B. J. Alder, "Pressure induced transitions."

Nonlinear Optic Effects

C. K. N. Patel, chairman; Y. R. Chen, co-vice chairman; R. W. Hellwarth, co-vice chairman.

3-7 August. Far infrared nonlinear optical effects; stimulated nonlinear effects including stimulated Rayleigh, Brillouin, Raman and Polariton scattering; linear and nonlinear optical effects with picosecond light pulses; propagation of coherent optical radiation through absorbing media. Discussion leaders and speakers: N. Bloembergen, M. Duguay, H. Gibbs, J. A. Giordmaine, T. Greytak, R. W. Hellwarth, B. F. Levine, C. K. N. Patel, P. W. Richards, Y. R. Shen, George Benedek, R. G. Brewer, B. Stoicheff, E. B. Treacy, S. Yatsiv, K. Dransfeld, C. H. R. Flytzanis.

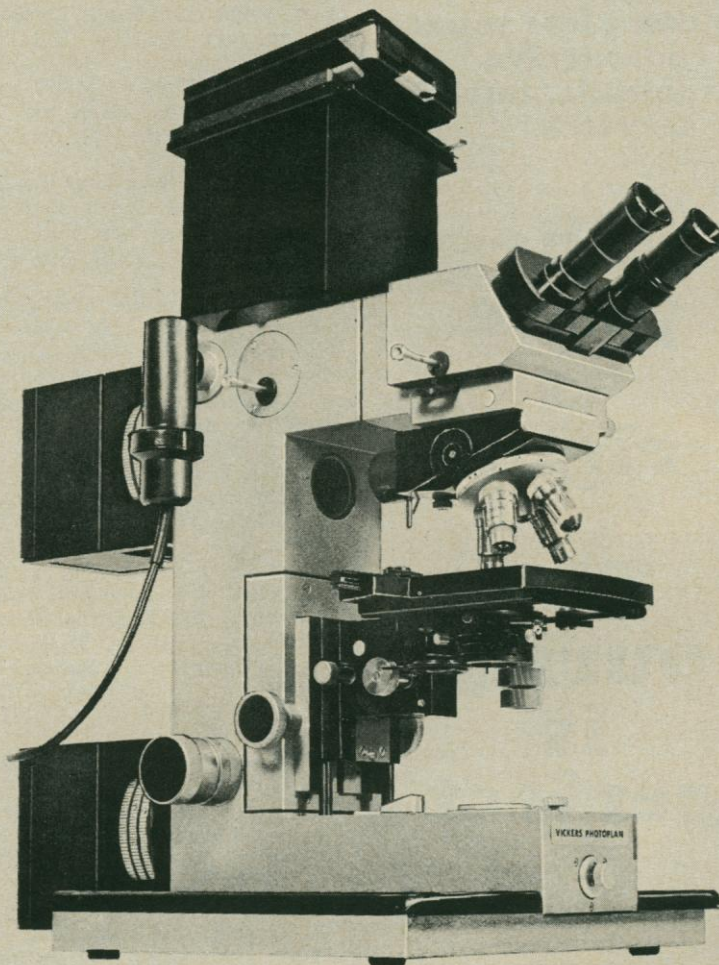
Courses

Paleogeography, Mainz and Karlsruhe, Germany, 3-21 August. The purpose of this NATO Advanced Study Institute is to bring together scientists interested in the problems of paleogeography. Emphasis will be on the integration of the various aspects of geology and geophysics and upon the field excursion program in the Saar-Nahe basin and the Rhine graben. Applications are invited from participants who should have some knowledge of German. Limited funds are available to assist with travel expenses. *Deadline for applications:* 15 April. (Prof. A. E. M. Nairn, Geology Department, Case Western Reserve University, Cleveland, Ohio 44106)

Powder Metallurgy for Engineers, Madison, Wis., 27-31 July. The entire field will be covered with emphasis on the application of metallurgical and scientific principles to the understanding and commercial utilization of the process. (David L. Atwood, University of Wisconsin Engineering Extension, 432 North Lake St., Madison 53706)

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