Gordon Research Conferences: Program for 1965

W. George Parks

The Gordon Research Conferences for 1965 will be held from 14 June to 3 September at five educational institutions in New Hampshire: Colby Junior College, New London; New Hampton School, New Hampton; Kimball Union Academy, Meriden; Tilton School, Tilton; and Proctor Academy, Andover.

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 between different 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 making progress. 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. *All applications must be submitted in duplicate on the standard application form which may be obtained by writing to 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 a deposit of $15. (Checks are to be made payable to the Gordon Research Conferences.) The deposit of $15 will be credited against the fixed fee for the conference if the individual attends the conference for which he has applied. A registration card not accompanied by the $15 deposit will not be accepted. This advance deposit is not required of scientists from foreign countries.

The Board of Trustees of the conferences has established a fixed fee of $115 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. This fixed fee will be charged regardless of the time a conferee attends the conference—that is, for periods of from 1 to 4½ days. It is divided as follows: registration fee $50, room and meals $65 (including gratuities) for 5 days. An additional charge of $1 per night per person will be made for a room with private bath or for a single room, if no double rooms 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 5 conference nights.

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. It is to the advantage of all participants to attend a conference for the entire week. 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 $60, instead of the resident fee of $50.

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

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 fixed fee. *Application for this special fee ($90) must be made 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

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

be 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. The charge for room and meals for a guest is $65 for 5 days, including gratuities. An additional charge of $1 per night per person will be made for a room with private bath or for a single room. An additional charge will also be made for rooms occupied more than 5 conference nights. Pets are not permitted in the dormitories.

Special fund. A special fund is provided by the Board of Trustees from the registration fee and is made available to the chairman of each 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 speakers or discussion leaders. The money is to be used as an assistance fund only and may be used to contribute toward travel expenses, registration fee, and/or subsistence expenses at the conference location. Total travel and subsistence expenses usually will not be provided.

Cancellations. The cancellation of an approved application for attendance at a conference will cause forfeiture of the $15 deposit.

Attendance. Requests for attendance at the conferences, or for additional information, should be addressed to W. George Parks, Director, Gordon Research Conferences, University of Rhode Island, Kingston, Rhode Island. From 14 June to 3 September 1965 mail for the office of the Director should be addressed to Colby Junior College, New London, New Hampshire.

The program to be presented is as follows.

Colby Junior College

Hydrocarbon Chemistry

Thomas J. Hardwick and Lester Friedman are chairman and vice chairman, respectively.

14 June. P. Gardner, "Thermochemical and base catalyzed isomerization"; R. Srinivasan, "Photochemical isomerization."

15 June. J. Grosmangin, "Radiation-induced oxidation of hydrocarbons"; K. Gollnick, "Photosensitized oxidation of hydrocarbons"; R. Cvetanovic, "Reaction of oxygen atoms with hydrocarbons."

16 June. J. Calvert, "Stability of free radicals in the gas phase"; P. Skell, "Stereochemistry of free radicals." Invited papers. (L. Friedman, *chairman.*)

17 June. H. M. Frey, "Reactions of methylene"; I. Dvoretzky, "Reactivity of methylene towards hydrocarbon substrates"; G. B. Kistiakowsky, "Shock tube experiments on hydrocarbon oxidation."

18 June. R. A. Benkeser, "Metallation of organic compounds."

Nuclear Chemistry

Richard M. Diamond and John M. Alexander are chairman and vice chairman, respectively.

21 June. Structure in spherical nuclei: R. Sorensen, "Quadrupole + pairing force model"; P. Stelson, "Coulomb excitation and inelastic scattering measurements on medium weight nuclei"; J. Ball, "Effective interactions and the shell model—a guide to interpreting nuclear levels"; F. Stephens, "Collective excitations in a transition region."

22 June. Structure in deformed nuclei: M. Baranger, "Nuclear deformation"; R. Sheline, "Information from (d,p) reactions on rare-earth nuclei"; J. Rasmussen, "Shell-model calculations of alpha decay in odd-mass spheroidal nuclei"; B. Elbek, "Single particle and vibrational states in deformed nuclei."

23 June. Structure in deformed nuclei (continued): Speaker and subject to be announced. R. Graetzer, "Vibrational states in the rare earths." *Astrophysics session*: P. Morrison, "X-ray stars"; J. Bahcall, "Neutron stars."

24 June. New developments and techniques: H. Motz, "Neutron-capture gamma-ray spectroscopy"; R. Graham, "Doppler shift measurements of subnanosecond half-lives"; V. Telegdi, "Mu-mesonic x-ray studies."

25 June. Summation: B. Mottelson, "The present status of nuclear models."

Catalysis

John B. Peri and Hans A. Benesi are chairman and vice chairman, respectively.

28 June. J. H. Sinfelt, "Catalytic hydrogenation and hydrogenolysis over supported metals"; G. V. Smith, "Metal catalyzed hydrogenation and exchange of unsaturated compounds"; C. Kemball, "The relevance of studies on exchange reactions with deuterium as a guide to the rate-determining steps and mechanisms of catalytic processes."

29 June. T. W. Martin, "Mass spectral studies of chemical catalysis on palladium"; S. Khoobiar, "Particle to particle migration of hydrogen atoms on platinum-alumina catalysts"; H. W. Kohn, "Role of adsorbed oxygen in desorption of H atoms from a platinum catalyst"; V. B. Kazansky, "ESR studies of free radicals adsorbed on catalysts."

30 June. L. L. Van Reijen, "Magnetic studies of the surface complexes of chromium ions in dehydrogenation and polymerization catalysts"; A. Clark, "Polymerization of ethylene on supported chromium oxide catalysts"; B. Imelik, "The nature of the active sites and the catalytic activity of silica gels."

1 July. J. Rabo, "Strong electrostatic phenomena on zeolite surfaces"; J. O'M. Bockris, "Electrocatalysis."

2 July. M. L. Volpe, "Studies on catalysis by oxide single crystals"; J. Kwiatek, "Catalytic hydrogenation by pentacyanocobaltate (II)."

Polymers

Stanley Bywater and Herbert N. Friedlander are chairman and vice chairman, respectively.

5 July. H. Mark, "Forty years of polymer chemistry"; J. E. Mark, "The characteristic ratio $\langle r^2 \rangle_0 / nl^2$ and its temperature coefficient for polymer chains. Theory and experiment"; F. E. Karasz, "Thermodynamic properties of tactic and atactic polymers."

6 July. G. Berry, "Thermodynamic, conformational and hydrodynamic properties of linear and branched polystyrenes in solution"; P. J. Flory, "Thermodynamics of polymer solutions"; H. Benoit, "Solution properties of copolymers."

7 July. B. L. Funt, "Electrically controlled polymerization"; M. Szwarc, "The role of ions and ion-pairs in ionic polymerization"; A. W. Langer, "Some new development in organolithium catalysis"; G. V. Schulz, "Reaction mechanisms and molecular weight distributions in anionic polymerization."

8 July. H. E. DeLaMare and W. A. Hewett, "Polymerization with transition-metal complexes in polar media"; F. A. Bovey, "The application of NMR studies to polymerization mechanisms"; C. E. H. Bamford, "New free radical sources and their application to structural and mechanistic problems in polymerization."

9 July. M. Farina, "Asymmetric synthesis of polymers"; H. Scott, "Cationic polymerization of N-vinyl carbazole."

Textiles

B. S. Sprague and L. Rebenfeld are chairman and vice chairman, respectively.

12 July. Dusan Prevorsek, "Theory of fiber strength"; J. P. Knudsen and W. E. Fitzgerald, "The influence of gel-network mechanics on the tensile properties of wet spun fibers."

13 July. R. D. Andrews, "Cold drawing of solid polymers"; D. Madoc-Jones, "Some observations on the relationship of fine structure to fiber properties in nylon 6,6"; H. Brody, "Diffusion and location of dye molecules in polyamides."

14 July. Masao Horio, "Conjugate fibers"; L. P. Berriman, "Properties of cotton fibers with variations in the number of growth rings."

15 July. D. L. Sheard, "Surface chemical modification as a means of improving polyethylene terephthalate fibers"; J. Trowbridge, R. T. Hunter and H. L. Marder, "Factors affecting the performance of hydrophobic textile fibers in laundering."

16 July. S. M. Ibrahim, "Basic mechanics of stretch fabrics from core-spun spandex yarns."

Elastomers

J. Reid Shelton and A. N. Gent are chairman and vice chairman, respectively.

19 July. W. L. Cox and C. R. Parks, "Effect of curing systems on flex properties"; M. L. Studebaker, "Effect of curing systems on selected physical properties"; (M. L. Studebaker, *discussion leader*); C. D. Trivette, Jr., and A. Y. Coran, "Vulcanization. Some recent studies."

20 July. M. L. Studebaker and J. R. Beatty, "Studies of the hardening of SBR on aging"; E. M. Bevilacqua, "Aging of sulfur vulcanizates"; (E. M. Bevilacqua, *discussion leader*); J. C. Halpin, "The rupture process in gum and reinforced elastomers." (Alan N. Gent, *discussion leader*.)

21 July. J. Morand, "Photolysis of rubber"; L. H. Lee, C. L. Stacy, and R. G. Engel, "Mechanisms of oxidative degradation of rubbers catalyzed by metallic ions"; J. I. Cunneen, "The chemistry of the oxidative aging of natural rubber." (Charles E. Boozer, *discussion leader*.)

22 July. J. R. Dunn, "The stability of ethylene-propylene elastomer networks"; W. A. Bishop, "Oxidation stability of ethylene-propylene terpolymer"; C. W. Lentz and K. E. Polmanteer, "A study of structure and reinforcement of silicone elastomers using silica fillers."

23 July. J. Kruse, "Carbon-black analysis—a microscopic method based on comparison." There will be a demonstration of stereoscopic photomicrographs of carbon-black dispersions by Julius Kruse.

Medicinal Chemistry

Peter Krimmel and Martin M. Winbury are chairman and vice chairman, respectively.

26 July. *Memory*: Francis O. Schmitt, "Chemical correlates of memory"; David Krech, "Experience, brain chemistry and learning—multiple interactions." *Molecular biology*: Leon Goodman, "The synthesis and biological activity of some fraudulent nucleosides"; Kenneth Paigen, "Factors effecting the expression of DNA."

27 July. *Smooth muscle stimulating substances*: Sune Bergström and Bengt Samuelsson, "The prostaglandins—chemistry, biochemistry and physiology"; K. Frank Austen, "Mechanism of anaphylactic histamine and SRS release"; H. O. J. Collier, "Blockade by drugs of endogenous substances in guinea pig lung." *Inborn metabolic errors*: Bert N. La Du, "Biochemical aspects of metabolic disorders"; Barton Childs, "Potential therapeutic techniques for inborn errors of metabolism."

28 July. *Hormone action*: Gordon M. Tomkins, "Studies on mechanisms of action of steroid hormones"; Philip Feigelson, "Studies on the biochemical basis of glucocorticoid action"; Theodore W. Rall, "The role of adenosine 3′, 5′-phosphate in certain hormone-tissue interactions"; William E. Dulin, "Mechanism of action of antidiabetic agents and factors which modify their activity"; Oscar M. Hechter, "Cybernetic aspects of hormone action."

29 July. *β-Adrenergic blocking substances*: Neil C. Moran, "Pharmacological analysis of adrenergic receptors by the use of blocking drugs"; Douglas A. Chamberlain, "Cardiovascular effects of β-sympathetic blockade in man"; A. F. Crowther, "The effect of changes of chemical structure on β-adrenergic blocking activity"; Cyril Ponnamperuma, "Chemical evolution and the origin of life."

30 July. *Hypersensitivity and autoimmune disease*: Bernard B. Levine, "Immunochemical mechanisms of human penicillin allergy"; Morris Ziff, "The immune response in the connective tissue diseases."

Ion Exchange

O. D. Bonner and Friedrich Helfferich are chairman and vice chairman, respectively.

2–6 August. *General session* (G. E. Boyd, *chairman*): George Eisenman, "Ionic specificity"; Jacob A. Marinsky, "Polyelectrolyte approach to the interpretation of ion exchange phenomena"; J. R. Millar, "The effect of structure on the properties of ion exchange resins"; Jehuda Feitelson, "Interactions between organic ions and highly swollen ion exchange resins." *Liquid ion exchangers* (Richard M. Diamond, *chairman*): Norman Li, "Extraction and NMR studies on dinonylnaphthalene-sulfonates"; D. Peppard, "Alkyl phosphoric acid systems"; G. Scibona, "Extraction of nitric acid and metal nitrates by amines"; W. Müller, "Amine halide extraction studies"; Charles Coleman, "Amine sulfate extraction mechanism and amine extraction metal separations." *Discussion on amine extraction. Kinetics* (K. S. Spiegler, *chairman*): F. G. Helfferich, J. S. Dranoff, "Kinetics of ion exchange accompanied by chemical reaction"; R. H. Doremus, "Ion exchange in glasses"; Hamish Small, "Chelating resins—synthesis and kinetics." *Panel discussion on ion exchange kinetics. Inorganic exchanges* (Henry C. Thomas, *chairman*): Abraham Clearfield, "Structure of inorganic exchangers"; Howard Sherry, "Ion exchange properties of synthetic Faujasite"; Henri Laudelot, "Interpretation of thermodynamic measurements on mineral exchangers." *Ion exchange membranes* (Blanton C. Duncan,

chairman): Karl Sollner, "Liquid ion exchange membranes"; Russell B. Hodgdon, "Poly-α, β, β-trifluorostyrenesulfonic acid ion exchange membranes"; Blanton C. Duncan, "Linearity as a function of displacement from equilibrium."

Corrosion

Walter W. Smeltzer and M. J. Pryor are chairman and vice chairman, respectively.

Correlations of Reactant Transport with Properties of the Corrosion Product and Metal Substrates.

9 August. K. L. Moazed, "Oxide nucleation studies with field electron emission microscope"; Kenneth R. Lawless, "Recent studies on the early stages of the low pressure oxidation of copper and nickel." (J. Bruce Wagner, Jr., *discussion leader.*) J. V. Cathcart, "Influence of paths of easy diffusion in oxide films on oxidation kinetics"; M. A. Heine, P. R. Sperry, and M. J. Pryor, "Dielectric properties of thermal oxide films on aluminum and its alloys." (Earl A. Gulbransen, *discussion leader.*)

10 August. A. T. Fromhold, Jr., "Redistribution of electric charge in the metal-oxide system during growth for several emission and transport mechanisms"; M. J. Dignam, "The growth of oxide films under the influence of high electrostatic fields." (H. H. Uhlig, *discussion leader.*) Vincent Nivoko and H. H. Uhlig," Logarithmic oxidation kinetics of zinc"; D. P. Seraphim, "Electron and ion transport through silicon dioxide films on silicon." (Ernest L. Koehler, *discussion leader.*)

11 August. Richard E. Pawel, "Oxygen solution in tantalum and niobium during oxidation at low temperatures"; D. L. Douglass and J. Van Landuyt, "The oxidation of titanium and zirconium: an electron microscopy study of oxides formed in the thin film range." (B. Cox, *discussion leader.*) Per Kofstad, "Low-pressure, high-temperature oxidation of niobium and tantalum"; J. Paul Pemsler, "High temperature oxidation kinetics of zirconium and hafnium." (M. J. Pryor, *discussion leader.*)

12 August. W. E. Boggs and A. J. Pignocco, "Oxidation of high purity iron: kinetics and structures"; Earl A. Gulbransen, "Structural aspects of localized corrosion processes on iron in oxygen and water vapor." (Joseph V. Laukonis, *discussion leader.*) M. Kahlweit, "Internal oxidation of alloys"; D. Caplan, "Effect of cold work on the oxidation of iron and iron-chromium alloys." (Joan B. Berkowitz-Mattuck, *discussion leader.*)

13 August. C. T. Fujii, "The reaction of iron-chromium alloys with carbon dioxide at high temperatures"; A. U. Seybolt, "Oxidation-nitrification of chromium base alloys." (Walter W. Smeltzer, *discussion leader.*)

Food and Nutrition

E. E. Howe and M. W. Taylor are chairman and vice chairman, respectively.

16 August. Recent advances in vitamin research (R. S. Goodhart, *chairman*): D. B. Coursin, "Vitamin B_6 and the central nervous system"; S. P. Mistry, "Glucose phosphorylation in biotin deficiency." *Trace elements in nutrition* (H. P. Sarett, *chairman*): Walter Mertz, "Chromium in glucose utilization"; D. S. Bernstein, "Effect of fluoride on calcium metabolism in bone disease."

17 August. Food additives and food safety (B. L. Oser, *chairman*): D. V. Frost, "Feed additive residues and consumers; special reference to As and Se"; Frederick Coulston, Arthur Stein, and David Serrone, "Modern evaluation of intentional and inadvertent food additives." *Biological aspects of control of obesity* (T. B. Van Itallie, *chairman*): G. R. Jansen, "Factors influencing lipogenesis"; Philip Teitelbaum, "Hypothalamic factors in the regulation of appetite."

18 August. Effect of maternal nutrition on performance of offspring (M. W. Taylor, *chairman*): B. F. Chow, "Studies in experimental animals"; Franz Rosa, "Evidence in the human on congenital malnutrition." *Factors affecting food acceptability* (R. E. Morse, *chairman*): Richard Hall, "Food flavoring"; Alina Szczesmiak, "Texture in foods"; Harold Corey, "Food viscosity problems."

19 August. The role of lipids in thrombogenesis (W. A. Thomas, *chairman*): A. N. Howard, "Triglycerides and the experimental production of thrombosis and atherosclerosis"; J. F. Mustard, "The effect of diet on platelets, coagulation and thrombosis." *Problems in demography* (E. E. Howe, *chairman*): W. H. Draper, Jr., "The world's exploding population—can we feed them?"

20 August. World food problems (W. H. Sebrell, *chairman*): Raymond Ewell, "Increasing the world's food output"; E. T. Mertz, "Improvement of the nutritional value of cereals by genetic means"; A. R. Brillaud, "Fermentation of petroleum as a potential food source."

Separation and Purification

Kotaro Murai and John R. Anderson are chairman and vice chairman, respectively.

23 August. L. B. Rogers, "Studies in selective adsorption"; Karl Kammermeyer and S. T. Hwang, "Temperature effects in surface flow"; James O. Osburn, "Transfer of matter in biological systems-analog computer simulation."

24 August. L. C. Craig, "Differential dialysis"; H. Gregor, "Electrodialysis and reverse osmosis membranes and their processes"; E. F. Leonard and L. W. Bluemle, Jr., "Medical requirements and engineering approaches to hemodialysis."

25 August. J. E. Powers, "Purification by repeated normal freezing with reflux"; R. Sparks, "Adsorption in conjunction with the artificial kidney"; F. Middleton, "Advanced treatment of waste water for re-use."

26 August. J. Porath, "Gel filtration and related procedures"; C. J. O. R. Morris, "Zone electrophoresis in gels."

27 August. Arthur Rose, "Preparative gas chromatography of labile, low-volatility materials."

Cancer

Paul Kotin and Thomas J. King are chairman and vice chairman, respectively.

30 August. Epidemiology and demography of cancer (clinical and laboratory considerations) (Robert Miller, *chairman*). Robert Miller, keynote address. William Haddon, Jr.; William Haenszel; Milton Terris; Brian McMahon; Neil Wald.

31 August. Technical approaches and interpretation of data (Harry Eagle, *chairman*). R. J. C. Harris, keynote address. Norman Anderson; Richmond Prehn; Leonard Hayflick; John Fahey; P. Emmelot.

1 September. Chemical carcinogenesis (bioassay and mechanism) (Charles Heidelberger, *chairman*). Harry Gelboin, keynote address. Emmanuel Far-

ber; John Weisburger; Charles Heidelberger; Hans L. Falk; Michael Sporn; Harris Busch.

2 September. Viral carcinogenesis (bioassay-mechanism–immunologic considerations) (Hilary Koprowski, *chairman*). Howard Green, keynote address. Wallace Rowe; Howard Temin; Maurice Greene; Vittorio Defendi; Joseph Melnick; Kenneth Endicott.

3 September. Summarization—overview (Paul Kotin, *chairman*). Michael B. Shimkin; Arthur Upton.

New Hampton School

Molecular Beam Methods and Collision Processes

John B. Fenn is chairman. Robert M. Fristrom and John E. Scott are vice chairmen.

14 June. J. B. Fenn, "High intensity beams"; G. H. Miller, "Detectors, signals and noise."

15 June. J. B. French, "High energy beams"; R. B. Bernstein, "Elastic and inelastic scattering."

16 June. D. R. Herschbach, "Reactive scattering experiments"; J. Ross, "Reactive scattering theory."

17 June. M. J. Boudart, "Molecule-surface interactions"; J. E. Scott, Jr., "New developments."

18 June. R. F. Stebbings, "Charged beam scattering."

Nucleic Acids

H. G. Khorana and Paul Berg are chairman and vice chairman, respectively.

21–25 June. "Chemical and enzymatic synthesis of polynucleotides" (F. Cramer and H. G. Khorana, *chairmen*); "Macromolecular chemistry of nucleic acids (strandedness, tertiary structure, circularity, molecular weights, etc.)" (R. L. Sinsheimer, *chairman*); "Conformational reactions of nucleic acids" (R. L. Baldwin, *chairman*); "Chemical and enzymatic approaches to sequential analysis" (H. Fraenkel-Conrat, *chairman*); "Transfer-RNA: primary structure" (P. Zamecnik, *chairman*); "Transfer-RNA: secondary structure, recognition sites" (P. Berg, *chairman*); "Polypeptide synthesis. Trinucleotide recognition, Codon sequences" (M. Nirenberg, *chairman*); "Peptide bond formation" (F. Lipmann, *chairman*).

Proteins

William F. Harrington is chairman.

28 June. Physical methods for the study of protein structure (H. K. Schachman, *chairman*): H. K. Schachman; V. Luzatti; G. Schwarz. (J. A. Schellman, *chairman*): E. Blout; G. Weber; M. Cohn.

29 June. Allosteric properties of proteins (E. B. Anfinsen, *chairman*): J. Wyman; J. Gerhart. *Proteins in immunology* (M. Sela, *chairman*): M. Crumpton; M. Sela; A. Nisonoff; E. Franklin.

30 June. Stereochemistry of polypeptide chains (H. Scheraga, *chairman*): P. Flory; S. Lifson. *Structure of fibrous proteins* (G. N. Ramachandran, *chairman*): K. Piez; A. Partridge; B. Fraser.

1 July. Mechanism of enzyme action (D. Koshland, *chairman*): H. Neurath; F. Richards. *Open session* (J. Edsall, *chairman*).

2 July. Problems and prospects in protein structure in the solid state and in solution (chairman to be announced): J. C. Kendrew; W. Kauzmann.

Coal Science

Henry R. Linden is chairman.

5 July. Mineral matter in coal: Roy F. Abernethy, "Composition of ash of United States coals"; James L. Elder, "Composition of the ash in northern great plains lignites"; Vernon E. Swanson, "Humates in modern coastal sediments of northwest Florida, present and potential carriers of metals"; Maria-Therese Mackowsky, "Behavior of the mineral substances in coal at high temperature"; J. D. Watt, "Behavior of mineral matter in coal in present and future combustion systems."

6 July. Mineral matter in coal (continued): Eric Skipsey, "Mineralogical studies of British coals"; Harold J. Gluskoter, "Electronic low-temperature ashing of coal"; William F. Berry, "Occurrence of pyrite in coal"; Irving A. Breger, "Uranium and coal"; L. C. F. Blackman, "The relation between chemical composition and viscosity of coal-ash slags from British coals." (William T. Reid, *discussion leader.*)

7 July. Pyrolysis and hydrogenation reactions of coal: R. T. Eddinger, "Rapid pyrolysis of a sub-bituminous coal"; Eric Skipsey, "The rapid carbonisation of coal at medium and high temperatures"; E. Gorin, "The mechanism of thermal hydrogen donor cracking of coal and coal extracts"; George R. Hill, "Experimental energies and entropies of activation for bituminous coal dissolution—their significance in reaction mechanism and rate prediction."

8 July. Pyrolysis and hydrogenation reactions of coal (continued): K. Hedden, "On the kinetics of carbon and charcoal hydrogenation"; C. Y. Wen, "The kinetics of the reactions of steam hydrogen mixtures with char at high temperatures and pressures"; R. W. Hiteshue, "Coal hydrogenation and reactions in a plasma jet"; T. J. Birch, "The hydrogasification of brown coal." (Fred Moseley, *discussion leader.*)

9 July. Melvin P. Silverman, "Coal microbiology, past, present and future." *Discussion of coal research trends and planning for next conference.*

Statistics in Chemistry and Chemical Engineering

Ralph A. Bradley and Spencer M. Free, Jr., are chairman and vice chairman, respectively.

12 July. (W. L. Nicholson, *chairman*): Colin L. Mallows, "Some approaches to regression problems." (Lyle D. Calvin, *chairman*): M. J. R. Healy, "What is the use of statistics?"

13 July. (Otto Dykstra, *chairman*): Carl F. Kossack, "Multivariate statistical classification techniques and the electronic computer." (Ernest G. Bianco, *chairman*): Mavis B. Carroll, "Statistical analyses of gas chromatographic data."

14 July. (Darrell Bock, *chairman*): Rolf E. Bargmann, "Exploratory statistical techniques in multivariate analysis." (Allyn W. Kimball, *chairman*): Marvin A. Kastenbaum, "Contingency tables."

15 July. (Shanti S. Gupta, *chairman*): Donald W. Marquardt, "Statistics of non-linear models applied in engineering." (Sidney W. Hess, *chairman*): Duane A. Meeter, "Transformations of parameters in non-linear least squares."

16 July. (Philip H. Scott, *chairman*): Raymond H. Myers, "Methods for estimating the composition of a three component liquid mixture."

Scientific Information Problems in Research

Hugh C. Wolfe and Francois Kertesz are chairman and vice chairman, respectively.

Role of the scientific societies.

19 July. Keynote address, Philip H. Abelson. *Scientific society meetings*: Belver C. Griffith, "Information exchange in psychology"; Erik Rudberg, "Scientific meetings in Sweden."

20 July. Scientific society meetings (continued): Robert A. Harte, "The 1964 Biochemical Congress"; Frank Fremont-Smith, "Conferences for interdisciplinary communication." *Abstracting services*: Phyllis Parkins, "Biological abstracts"; Stella Keenan, "Studies of abstracting in physics."

21 July. Information centers: William T. Knox, "Evolving information systems"; Norman E. Cottrell, "The American Society for Metals Information Center"; Charles W. Shilling, "Development of an information center for aquatic biology." *Documentation research*: Frank Y. Speight, "Information services of the Engineers Joint Council."

22 July. Documentation research (continued): Kenneth H. Zabriskie, Jr., "Documentation activities of the American Chemical Society"; Malcolm Rigby, "Documentation activities of the American Meteorological Society"; Daniel I. Cooper, "Pop science."

23 July. Review and forecast (J. M. Mullen, *chairman*): B. W. Adkinson and G. S. Simpson, Jr.

Organic Reactions and Processes

Thomas R. Steadman and Daniel Swern are chairman and vice chairman, respectively.

26–30 July. Everett Clippinger, "Reactivity as a function of aliphatic chain length"; Alex Oswald, "Free radical reactions: the problem of selectivity"; Emanuel Vogel, "Structure and reactivity of 1,6-methanocyclodecapentaene and related compounds"; C. C. Price, "Thia and phosphorabenzenes"; Francesco Minisci, "The reactions of nitrogenous free radicals with organic chemicals"; Alfred Hassner, "Stereochemistry of additions to olefins leading to introduction of nitrogen functions"; Abraham Schneider, "Formation of perhydrophenalenes and polyalkyladamantanes by the isomerization of perhydroaromatics"; R. A. Benkeser, "The selective reduction of aromatic compounds to dihydro or tetrahydroproducts"; John Happel, "Pyrolysis of methane for production of acetylene and hydrogen"; Janos Kollonitsch, "Selective free radical chlorination of protonated bases"; G. J. M. van der Kerk, "Some aspects of fourth main group organometallic chemistry"; R. E. Rinehart, "Olefin reactions catalyzed by soluble noble metal salts"; P. P. Nicholas and A. T. Blomquist, "Highly fluorinated cyclic and linear dienes"; George E. Ham, "Some ring opening reactions of activated aziridines."

Radiation Chemistry

Robert H. Schuler and Leon M. Dorfman are chairman and vice chairman, respectively.

2 August. (P. Kebarle, *chairman*): S. Wexler, "Interaction of charged particles and molecules." (G. G. Meisels, *chairman*): A. Henglein, "Ion-molecule reactions."

3 August. (G. E. Adams, *chairman*): M. S. Matheson, "Intermediates in radiation chemistry." (H. A. Schwarz, *chairman*): H. C. Sutton, "Radiation chemistry of aqueous systems."

4 August. (M. Kasha, *chairman*): G. S. Hammond, "Organic photochemistry." (R. F. Firestone, *chairman*): R. A. Back, "Radiation chemistry of gaseous systems."

5 August. (R. A. Holroyd, *chairman*): R. L. Wolfgang, "Reaction of hydrogen atoms in organic systems." (J. F. Riley, *chairman*): T. Gäumann, "Radiation chemistry of hydrocarbons."

6 August. (R. R. Hentz, *chairman*): A. O. Allen, "Radiation chemistry of heterogeneous systems."

Analytical Chemistry

Willard P. Tyler and David M. Hercules are chairman and vice chairman, respectively.

9 August. William M. Ritchey, "Applications of NMR to polymer structure determination"; Garry A. Rechnitz, "Cation sensitive electrodes, theory and practice."

10 August. Bernhard Wunderlich, "Applications of differential thermal analysis to polymers"; Allan P. Gray, "General applications of differential scanning calorimetry"; Paul D. Garn, "Applications of differential thermal analysis to non-polymeric systems."

11 August. Hans Malissa, "Modernization of microanalytical methods"; William J. Potts, "Use of group frequency shifts in interpreting infrared spectra"; Duncan Erley, "Applications of infrared spectroscopy to bio-medical analytical problems."

12 August. Arthur J. Ahearn, "Advances in spark source mass spectroscopy." Open session.

13 August. Anthony J. Glazko, "Analytical problems in drug metabolism studies."

Steroids and Other Natural Products

Ernest Wenkert is chairman.

16–20 August. The following persons have been invited to speak: A. D. Cross, E. Farkas, M. Fétizon, R. Goutarel, K. Heusler, P. Kropp, R. Mechoulam, H. Muxfeldt, T. Norin, G. Snatzke, J. R. Sutherland, K. Wiesner, and W. Wildman.

Inorganic Chemistry

Rolf B. Johannesen and Edwin M. Larsen are chairman and vice chairman, respectively.

23 August. Recent developments in synthetic inorganic chemistry (William L. Jolly, *chairman*): Cedric L. Chernick, "Techniques for handling fluorine and reactive fluorides"; Earl L. Muetterties, "Hydride syntheses in molten salts"; Grant W. Urry, "Some monoboron free-radical complexes and related compounds"; Robert E. Sievers, "Gas chromatographic separation of metal complexes"; B. P. Block, "Inorganic polymers."

24–25 August. Nuclear resonance spectroscopy (Paul C. Lauterbur, *chairman*): Robert R. Holmes, "Chemical applications of nuclear quadrupole resonance"; George E. Peterson, "Experimental aspects of nuclear quadrupole resonance spectroscopy"; P. J. Bray, "Nmr studies of crystalline and glassy solids"; Charles D. Cornwell, "Nmr studies of gaseous fluorides: relaxation effects and chemical shifts"; J. C. Hindman, "Nmr studies of rare gas compounds"; Paul C. Lauterbur, "Lead—207 Nmr spectra: coordination in solids and solutions"; Leland C. Allen, "Isotropic Nmr shifts in ionic complexes of cobalt and nickel."

25–26 August. Unusual oxidation

states (Robert E. McCarley, *chairman*): George W. Watt, "Recent studies on lower oxidation state species"; John D. Corbett, "Subhalides in metal-metal halide systems"; Evan H. Appelman, "Solution chemistry of xenon and perhaps radon"; Thomas K. Keenan, "Fluoride stabilization of unusual oxidation states of selected actinide elements." *Chemistry and astronomy*: G. P. Kuiper, "Planetary atmospheres."

27 August. Unusual oxidation states (continued): S. J. Lippard, "Structure and chemistry of rhenium (III) compounds"; Robert E. McCarley, "Lower halides and halide complexes of the group V and VI transition elements."

This program is supported in part by a grant from the Directorate of Chemical Sciences, Air Force Office of Scientific Research.

Chemistry of Adhesion

Floyd H. Bair and Robert R. Stromberg are chairman and vice chairman, respectively.

30 August. Wartan A. Jemian, "A behavioral theory of adhesion to crystalline materials." (Robert E. Parkinson, *discussion leader.*) Louis H. Sharpe, "Adhesion, the glass transition and adhesive joints." (John D. Sullivan, *discussion leader.*)

31 August. F. A. Khoury, "Morphology of crystalline polymers." (Ryong-Joon Roe, *discussion leader.*) Harold H. Levine, "Heteromatic polymers: effect of molecular structure upon concepts of fundamental polymer chemistry and thermally stable adhesives." (August H. Frazier, *discussion leader.*

1 September. Samuel W. Bradstreet, "Gross and interfacial stress transfer mechanisms in composites." (Herbert C. Corten, *discussion leader.*) William D. Bascom, "Some fundamental aspects of ice adhesion." (Hans H. G. Jellinek, *discussion leader.*)

2 September. Ralph W. Phillips, "Adhesion in dentistry"; Fred Leonard, "Adhesives in medical applications." (Robert C. Craig, *discussion leader.*) G. L. Krieger, "Characterization of surfaces using an indium probe"; D. F. A. Kutscha, "Mechanics of adhesive joints." (Marco Petronio, *discussion leader.*)

3 September. Sam Brelant, "The nature of the glass-resin interface in filament-wound structures." (Robert Wong, *discussion leader.*)

Kimball Union Academy

Lipid Metabolism

Daniel Steinberg and Fred H. Mattson are chairman and vice chairman, respectively.

14–18 June. F. Lynen, "Regulation of fatty acid biosynthesis"; R. Vagelos, "Studies on the mechanism and control of fatty acid biosynthesis." (H. Anker, *discussion leader.*) K. Bloch, "Regulation of unsaturated fatty acid synthesis in *E. coli*"; M. Siperstein, "Regulation of cholesterol biosynthesis." (I. D. Frantz and C. B. Taylor, *discussion leaders.*) E. G. Ball, "Some factors affecting triglyceride lipolysis in adipose tissue"; L. A. Carlson, "Regulation of free fatty acid turnover in vivo"; P. Randle, "Interactions between fatty acid and carbohydrate utilization"; S. Bergström, "The nature of the prostaglandins and their physiological effects"; H. Schneiderman, "The action of insect growth hormones"; J. H. Law, "Chemical control of insect behavior."

Biochemical Pathology

Emmanuel Farber is chairman.

21–23 June. Reactions of cell nucleus to injury—chemical and physical agents (Earl P. Benditt, P. O'Brien Montgomery, and Jan W. Steiner, *chairmen*): Wilhelm Bernhard, Shinya Inoue', Robert Love, P. O'Brien Montgomery, Hans Ris, R. C. Reynolds, Charles Smith, Hewson Swift, Sheldon Wolff, Claud S. Rupert.

24–25 June. Biochemical morphology of the developing lung—relation to neonatal distress (Jerome Kleinerman, *chairman*): Mary Ellen Avery, James Felts, Marshall Klaus, Thomas Leeson, S. Sorokin.

Cell Structure and Metabolism

James Bonner and David J. L. Luck are cochairmen.

Formation of Cellular Subsystems

28 June. Self assembling protein structures (Henry Kuffler, *chairman*): Alan Hodge, Aaron Klug. *Origin of lipid membranes* (Roscoe Brady, *chairman*): Morris Kates, Guy Thompson, Jr., A. D. Brown.

29 June. Mitochondrial biogenesis (A. Lehninger, *chairman*): David Luck, P. P. Slonimski. *Chloroplast biogenesis* (Laurence Bogorad, *chairman*): Dieter von Wettstein, Ruth Sager.

30 June. RNA and protein synthesis in mitochondrial and plastid systems (T. S. Work, *chairman*): John Kirk, George Brawerman, D. B. Roodyn. *Biogenesis of bacterial ribosomes* (Richard Roberts, *chairman*): Alexander Spirin, M. Nomura, Roy Britten.

1 July. Biogenesis of the ribosomes of higher organisms (James Bonner, *chairman*): Max Birnstiel, John Hopkins, D. D. Brown. *Cytoplasmic particles of paramecium* (David Luck, *chairman*): Ian Gibson.

2 July. The possibility of other cellular self-replicating subsystems (Daniel Mazia, *chairman*): Joseph Gall, Eugene Hoffman, John Randall.

Coenzymes and Metabolic Pathways

Bernard R. Baker and Gertrude B. Elion are chairman and vice chairman, respectively.

5 July. (Arnold D. Welch, *chairman*): Frank Maley, "Regulation of pyrimidine deoxyribotide metabolism"; Peter Reichard, "Enzymatic reduction of ribonucleotides." (B. R. Baker, *chairman*): Charles A. Nichol, "Nucleosidic antibiotics and analogs"; Howard J. Schaeffer, "Mode of binding of inhibitors to adenosine deaminase."

6 July. (J. Bertino, *chairman*): Gene M. Brown, "Enzymatic synthesis of folic acid and related compounds"; Walter S. McNutt, "The metabolism of pteridines." (F. M. Huennekens, *chairman*): Donald B. McCormick, "Interconversions and functions of analogs of riboflavin, FMN and FAD"; Vincent Massey, "Flavoprotein catalysis and transport."

7 July. (D. Perlman, *chairman*): Robert H. Abeles, "Studies on the mechanism of action of B_{12} coenzymes"; Frank M. Huennekens, "Mode of action of vitamin B_{12} coenzymes." (C. A. Nichol, *chairman*): Dorris J. Hutchison, "Mechanisms of resistance to folate antagonists"; Joseph R. Bertino, "Dihydrofolic reductase and methotrexate oxidase."

8 July. (G. B. Elion, *chairman*): Morris E. Friedkin, "The activities of various pteroyl and homopteroyl derivatives with thymidylate synthetase and dihydrofolic reductase"; Bernard R. Baker, "Inhibition of some folic cofactor enzymes." (T. C. Bruice, *chairman*): Paolo Fasella, "The bind-

ing of B_6 to apo-enzyme and to substrates: mechanistic implications"; W. Terry Jenkins, "Participation of protons in pyridoxal protein catalysis."

9 July. (H. J. Schaeffer, *chairman*): E. M. Kosower, "Pyridinyl radicals and NAD-NADH mechanisms"; Thomas C. Bruice, "Recent developments in mechanism of coenzyme action."

Chemistry, Physiology, and Structure of Bones and Teeth

Isadore Zipkin and Robert P. Heaney are chairman and vice chairman, respectively.

12 July. Short communications selected from submitted abstracts (to be sent to Robert P. Heaney, *vice chairman*, before 15 May). *Some nutritional factors affecting bones and teeth* (Robert Van Reen, *chairman*): Ronald L. Hartles, "Differing reactions of bones and teeth to nutritional deficiency of calcium, phosphorus and vitamin D"; Eugene Eisenberg, Bernard L. Pimstone, and Sol Silverman, "Hypophosphatasia in man and rat."

13 July. Protein-polysaccharides complexes of cartilage, bones, and teeth (Maxwell Schubert, *chairman*): D. D. Dziewiatkowski, "Degradation of chondromucoprotein by an enzyme from cartilage"; Albert Hirschman and D. D. Dziewiatkowski, "Immunochemical and fluorescent antibody studies of the mucoproteins of epiphyseal cartilage"; G. M. Herring, "Studies on the mucopolysaccharides and glycoproteins of cortical bone"; James A. Yaeger, "Effect of inorganic ions on the polysaccharide-protein complexes of rat incisor dentin." *Biology of cartilage* (Martin B. Mathews, *chairman*): Marijke E. Holtrop, "A cytological analysis of endochondral ossification"; Philip Person and Delbert E. Philpott, "On the origin, evolution, and biological significance of cartilage tissues"; Martin B. Mathews, "Molecular evolution of connective tissue. A comparative study of acid mucopolysaccharide-protein complexes."

14 July. Lipids in bones and teeth (James T. Irving, *chairman*): R. E. Wuthier, "Lipids at the calcification front"; Thomas R. Dirksen, "Constituent lipids of enamel, dentin, and bone"; Richard L. Cruess and Irwin Clark, "Effect of vitamins A and D and parathyroids on the lipids of rat bone"; S. K. Das and R. S. Harris, "Lipids and fatty acids in the teeth of several species." *Calcifying systems of teeth* (Wallace D. Armstrong, *chairman*): J. E. Eastoe, "Observations on the organic phases of bone and tooth tissue"; Finn Brudevold, "Mechanism of deposition of fluoride in human enamel."

15 July. Non-collagenous mineralizing systems (Albert E. Sobel, *chairman*): Benjamin Volcani, "Silicification and shell formation in the diatoms"; E. J. Miller, "The chemistry of elastin and its maturation through crosslinking"; Irwin D. Mandel, "Factors in the formation of oral calculi"; William H. Boyce, "Crystal formation in normal, pathologic and artificial urinary systems." *Dental evidence in criminology and identification of human remains* (Isadore Zipkin, *chairman*): David B. Scott.

16 July. Newer methodology in calcified tissue research (Clayton Rich, *chairman*): Ronald H. Wensel, Wade Volwiler, and Clayton Rich, "Measurement of calcium absorption and secretion by intubation and perfusion of normal intact human small intestine"; Robert P. Heaney, "Quantitative estimation of local bone formation rates in human bones in vivo"; William A. Peck and Stanley J. Birge, "Metabolic studies on isolated bone cells"; Harold M. Fullmer, "Histochemical studies of enzyme activities of bones and teeth."

Physical Metallurgy

Daniel N. Beshers and William W. Mullins are chairman and vice chairman, respectively.

Interactions of imperfections.

19–23 July. L. A. Girifalco, "The theory of point defects in stress fields"; A. Sosin, "The interaction of dislocations with point defects introduced by radiation damage"; H. A. Wriedt, "Effect of lattice defects on the solution of N in α-Fe"; C. L. Bauer, "Stress-induced pipe diffusion of substitutional impurities"; R. W. Balluffi, "Dislocation sources and sinks for vacancies"; R. H. Chambers, "Suppression of dislocation relaxations by point-defect-dislocation interactions"; R. Bullough, "Theory of strain aging"; C. S. Hartley, "Strain aging in Ta"; G. S. Baker, "Interaction of interstitial impurities with dislocations in Ta and W"; G. Alefeld, "Thermal activation of dislocations with emphasis on materials with high peierls stresses"; T. Jossang, "Energies of dislocation configurations"; I. L. Dillamore, "Stacking fault energy in aluminum."

Chemistry at Interfaces

Egon Matijevic and H. Van Olphen are chairman and vice chairman, respectively.

26 July. Chemisorption (H. Van Olphen, *chairman*): Gert Ehrlich, "Chemisorption and surface diffusion on single crystal planes: an atomic view"; F. C. Tompkins, "The nature of the chemisorbed bond at metal surfaces."

27 July. Physics of solid surfaces (F. M. Fowkes, *chairman*): J. J. Lander, "Contributions to surface chemistry by low energy electron diffraction"; J. T. Hobson, "Van Der Waals interactions of gases with surfaces at very low coverage"; W. M. H. Sachtler, "Field emission studies of chemisorption complexes on different crystal faces of tungsten and related experiments."

28 July. Solid/liquid interface and flotation (J. Leja, *chairman*): D. W. Fuerstenau, "Surfactant adsorption in flotation systems"; M. E. Wadsworth, "Infrared studies of fatty acid flotation of hematite, fluorite and barite"; R. H. Ottewill, "Adsorption at the solid-liquid interfaces and its relationship to the stability of dispersions."

29 July. Physical-chemical properties of colloid systems (chairman to be announced): M. Kerker, "Light scattering by colloid systems"; D. A. I. Goring, "Some recent studies of the electroviscous effects"; S. Claesson, "Measurements of rate processes in colloidal systems from changes in hydrodynamic properties and light scattering."

30 July. Surface properties of solutions (B. A. Pethica, *chairman*): J. Lucassen, "Damping of capillary waves on surfactants solutions"; E. H. Lucassen-Reynders, "Surface equation of state for solutions of electrolytes."

Solid State Studies in Ceramics

Ivan B. Cutler and Ralph Carter are chairman and vice chairman, respectively.

2 August. (Ralph Carter, *chairman*): A. U. MacRae, "Low energy electron diffraction studies of surfaces"; R. S. McDonald, "Chemistry of surface functional groups of oxides

as observed by infrared spectroscopy." (Cyrus Klingsberg, *chairman*): J. C. Courvoisier, "Information on semiconductor surfaces from ESR and epitaxial experiments"; "Gas desorption from metallic surfaces by low energy electron bombardment"; B. E. Deal, "Characteristics of oxidized semiconductor surfaces."

3 August. (Ted Planje, *chairman*): Peter Mark, "Chemisorption on insulator surfaces; principally CdS"; Milton E. Wadsworth, "Geometric factors in kinetic systems." (Hayne Palmour III, *chairman*): R. D. Gretz, "Heterogeneous nucleation from vapor on substrates"; "Growth from vapor on nonmetallic substrates."

4 August. (David R. Wilder, *chairman*): Ralph Condit, "Oxygen grain boundary diffusion in ceramics"; Paul G. Shewmon, "Implications of surface diffusion data for sintering." (George C. Kuczynski, *chairman*): P. J. Anderson, "Studies on the interaction of water with the oxide surface"; D. Lynn Johnson, "Grain boundary diffusion in the sintering of oxides."

5 August. (J. E. Burke, *chairman*): *Four to six reports of current research to be arranged for at the conference.* (J. J. Gangler, *chairman*): James B. Edson, "The surfaces of the moon and planets."

6 August. (F. A. Hummel, *chairman*): J. J. Westbrook, "Indentation hardness studies of surfaces and grain boundaries"; S. Wiederhorn, "Determination of the fracture surface energy of glass by the double-cantilever cleavage technique."

Toxicology and Safety Evaluations

V. K. Rowe and Fred H. Snyder are chairman and vice chairman, respectively.

9 August. (Fred H. Snyder, *chairman*): Albert M. Kligman, "What's new in the toxicological evaluations of topical agents for primary irritation, sensitizatoin, and photosensitization?"; Donald L. Opdyke, "Practical problems in the evaluation of the safety of cosmetics." (J. C. Calandra, *chairman*): Enrico C. Vigliani, "Mechanism of cytotoxic action of quartz on macrophages and its prevention by synthetic polymers."

10 August. (Harold C. Hodge, *chairman*): H. N. MacFarland, "Methodology of inhalation studies"; A. A. Thomas, "Continuous inhalation exposures in toxicity and safety evaluations." (David W. Fassett, *chairman*): R. D. Stewart, "The use of human subjects to monitor and to measure the effects of exposure to chemicals"; F. Coulston, "What's new in the use of human subjects in toxicity and safety evaluations?"

11 August. (N. Rakieten, *chairman*): Y. Alarie, "Techniques in assessing airway reaction to inhaled materials"; R. E. Gosselin, "Physiological and pharmacological responses of ciliated epithelium." (John A. Zapp, *chairman*): Fred H. Dale, "Evaluation of the safety of chemicals to fish and wildlife."

12 August. (B. L. Oser, *chairman*): O. G. Fitzhugh, "Reproduction studies: methodology and use in safety evaluations"; Charles S. Delahunt, "Teratogenic studies: methodology and use in safety evaluations." (D. D. Irish, *chairman*): John L. Harvey, "The impact of toxicology and safety evaluations upon international trade."

13 August. (Mitchell Zavon, *chairman*): Wayland J. Hayes, Jr., "Safety evaluation of candidate chemosterilants."

Chemistry and Physics of Solids

Melvin Lax and Bernard Mozer are chairman and vice chairman, respectively.

Physical properties of disordered systems

16 August. N. F. Mott, "Behavior of a Fermi electron gas in a disordered lattice"; H. Fritsche, "Impurity interaction effects in semiconductors"; B. Halperin, "Impurity band tails in the high density limit."

17 August. V. Jaccarino, "Magnetic localized states: experimental aspects"; H. Suhl, "Magnetic localized states: theory"; M. Klein, "Statistical properties of dilute magnetic alloys in noble metals."

18 August. H. Cusack, "Present status of liquid metals: experiment"; A. D. Pearson, "Transport and fluorescence anomolies in the glassy state"; T. J. Rowland, "Magnetic resonance in metallic solid solution."

19 August. J. Rayne, "Experimental evidence concerning the band structure of disordered alloys"; J. Friedel, "Electronic properties of alloys"; J. Langer, "Vibrational properties of disordered lattices."

20 August. I. M. Lifshitz, "On the structure of the energy spectrum of disordered systems"; (speaker and subject to be announced).

Nuclear Structure Physics

Steven A. Moszkowski is chairman.

23 August. Nuclear matter, three-body problem: W. Wong, "Theory of nuclear matter"; A. B. Migdal, "Quasiparticles and nuclear structure"; R. Amado, "Three-body problem"; L. Schiff, "Structure of H^3 and He^3."

24 August. Nuclear spectroscopy. M. Baranger, "Deformations in a simple pairing plus quadrupole model"; C. Levinson, "Hartree Fock calculations"; R. Lawson, "Effective interactions in the nuclear shell model"; A. E. Litherland, "New methods in experimental spectroscopy."

25 August. Excited States: J. P. Schiffer, "Systematics of single particle states in medium nuclei"; (speaker to be announced), "Systematics of excited states in light nuclei"; G. Brown, "Deformations in light nuclei"; G. T. Garvey, "Isobaric analogue states in nuclei."

26 August. New machines: A. Bromley, "Nuclear structure work with intermediate energy electrostatic accelerators"; B. Harvey, "Experiments with intermediate energy cyclotrons." *Pairing*: L. Kisslinger, "Pairing effects in nuclei."

27 August. Nuclear structure and high energy physics: D. Wilkinson, "Elementary particles in nuclear structure studies."

Chemistry of Molten Salts

M. A. Bredig and Milton Blander are chairman and vice chairman, respectively.

Fused salts

30–31 August. Equilibrium properties (M. Blander, *chairman*): L. Topol, "Theoretical calculations of the topology of phase diagrams of reciprocal systems." Contributions by K. Grjotheim and by another speaker from abroad. (D. Cubicciotti, *chairman*): J. D. Corbett, "Phase diagrams of metal-metal halide systems"; A. Muan, "Phase equilibria in oxide systems"; D. Cubicciotti, "Liquid-vapor equilibria"; *Physical properties and structure of molten oxide melts* (J. D. Mackenzie, *chairman*): E. F. Riebling, "Structure of ternary oxide melts from density measurements"; S. N. Flengas, "Oxygen potential in silicate melts."

31 August–1 September. Kinetic properties (B. R. Sundheim, *chairman*): B. R. Sundheim, "Thermoelectric measurements." Other reports by speakers from abroad. (R. W. Laity,

chairman): G. J. Hills, "Temperature and pressure coefficients of translational processes in molten salts"; J. O'M. Bockris and M. K. Nagarajan, "Transport phenomena in molten salts at constant volume"; C. A. Angell, "The free volume in configuration and transport"; R. W. Laity, "Ionic transport in binary salt mixtures."

1–2 September. Spectroscopy (G. P. Smith, *chairman*): J. R. Morrey, "Electronic spectra of actinide complexes in fused and crystalline salts"; C. R. Boston and N. J. Bjerrum, "Spectra resulting from the combination of Bi° and Bi^{3+} in molten solvents containing $AlCl_3$." (N. H. Nachtrieb, *chairman*): S. Hafner, "Nuclear magnetic resonance in molten salts"; D. Gruen, "Coordination and conformation equilibria in fused salts"; B. R. Sundheim, "Photochemical processes in molten salts."

2 September. General (M. A. Bredig, *chairman*): D. Inman, "Complex ions and electrode processes in molten salts"; G. Sternheim, "Covering layer electrodes." Other discussions.

3 September. Applications (S. Senderoff, *chairman*): B. Agruss, "Regenerative liquid metal-fused salt fuel cell systems"; W. R. Grimes, "Molten fluorides as nuclear reactor materials"; S. Senderoff, "Electrodeposition of refractory metals from molten fluorides."

Tilton School

Biochemistry and Agriculture

Richard D. O'Brien and Paul D. Strickler are chairman and vice chairman, respectively.

Design of inhibitors and biocides.

14 June. (E. Y. Spencer, *chairman*): J. L. Webb, "The forces of interaction between enzymes and inhibitors"; E. E. Smissman, "Steric factors in receptor site binding"; R. G. Caldwell, "A quantum biochemical approach to structure-activity relationships"; C. Hansch, "Rho-Sigma-Pi analysis of toxicity."

15 June. (chairman to be announced): R. M. Krupka, "Function and relative position of groups at the active center of acetylcholinesterase"; A. R. Main, "The significance of the reversible binding to enzymes of irreversible inhibitors"; Virgil Freed, "Some implications of infrared absorption to biological activity in herbicides"; D. Moreland, "Inhibition of the photochemical activity of isolated chloroplasts by phytotoxic chemicals."

16 June. (E. G. Jaworski, *chairman*): D. J. Hennessy, "Structure-lethality relationships in the diarylalkanes"; J. Kuc', "Biosynthesis of antimicrobial compounds and triggering mechanisms associated with disease resistance in plants"; A. C. Leopold, "Three translocation systems in plants"; M. J. Canny, "Mass flow in plants."

17 June. (J. P. English, *chairman*): B. R. Baker, "Active site-directed irreversible inhibitors"; Roy Kisliuk, "New aspects in the design of folic acid antagonists"; J. H. Quastel, "Chemical control of cell metabolism and function."

18 June. (E. E. Smissman, *chairman*): David Kupfer, "Interferences with corticoid metabolism"; E. S. Huyser, "Free radical mechanisms in biochemical reactions."

Magnetic Resonance

R. E. Norberg and G. K. Fraenkel are chairman and vice chairman, respectively.

21 June. (H. S. Gutowsky, *chairman*): J. G. Powles, "Nuclear relaxation and spin-rotation interaction in diamagnetic liquids"; R. E. Richards, "Dynamic nuclear polarization in solutions"; I. Oppenheim, "Theoretical interpretation of NMR in gases." (E. L. Hahn, *chairman*): J. Jeener, "NMR in solids: pairs of RF pulses and strong irradiation"; J. Butterworth, "Nuclear relaxation in metals and alloys"; J. Winter, "NMR and spin temperature in alkali metals."

22 June. (A. D. McLachlan, *chairman*): A. Carrington, "Hyperfine interactions in aromatic radicals"; T. R. Tuttle, "Properties of metal ammonia and amine solutions"; E. de Boer, "Rates of molecular processes." (C. A. Hutchison, *chairman*): A. H. Maki, "ENDOR of free radicals in liquids"; R. L. Mieher, "ENDOR of hole centers in alkali halides."

23 June. (D. F. Holcomb, *chairman*): S. Alexander, "Spin lattice relaxation by slow motional processes in pure quadrupole resonance"; H. Meyer, "Nuclear relaxation in solid He^3"; J. Combrisson, "Anisotropy of nuclear relaxation by paramagnetic impurities." (G. E. Pake, *chairman*): M. Cohn, "NMR studies of metal-activated enzyme systems"; R. G. Shulman, "Magnetic resonance of metal-ion complexes of nucleic acids."

24 June. (D. I. Bolef, *chairman*): M. H. L. Pryce, "Propagation of ultrasonics in ferromagnetic crystals at frequencies near magnetic resonance"; E. H. Jacobsen, "Ultrasonic dispersion in paramagnetic materials." (G. K. Fraenkel, *chairman*): H. Weaver, "NMR spectroscopy in superconducting magnetic fields"; M. Borghini, "Recent developments in polarized targets."

25 June. (J. E. Wertz, *chairman*): M. Gueron, "Magnetic resonance in semiconductors"; D. Jerome, "Double resonance in phosphorous-doped silicon."

Chemistry and Physics of Space

Richard Davies and Lawrence H. Aller are chairman and vice chairman, respectively.

28 June–2 July. Session chairmen: L. Goldberg, J. Arnold, R. Lyttleton. *Ranger photographs*: H. C. Urey; Ewen Whittaker. *Planetary atmospheres*: Guido Munch, "Recent observations of the planets"; John Strong, "Infrared balloon astronomy"; P. Thaddeus, "Venus radio data"; A. G. W. Cameron, "Planetary atmospheres origins"; Roland Carpenter, "Radar planetary astronomy." *Comets*: F. Whipple, "Theory"; Freeman Miller, "Observations." *"Origin of life in the solar system*: Stanley Miller. *Meteorites*: John Wood; E. Anders. *Interior structure of the earth and planets*: G. F. J. MacDonald. *Mariner IV magnetic field data*: E. Smith. Additional sessions on meteorites and solar particles and the interplanetary medium. The recent National Academy of Sciences' recommendation for an extensive planetary program in the 1970's and the current flight of Mariner IV toward Mars have suggested that this year's conference place more emphasis on discussion of the planets than was done in previous years.

Organic Photochemistry

O. L. Chapman and R. Srinivasan are chairman and vice chairman, respectively.

5 July. G. S. Hammond, (subject to be announced); S. G. Cohen, "The effects of mercaptans on photochemical and radiation induced reactions."

6 July. P. E. Eaton, "The reactivity of photoexcited α, β-unsaturated ketones"; E. J. Corey, "Photoaddition reactions"; D. Bryce-Smith, "Photochemistry of aromatic compounds and quinones."

Program Summary, Gordon Research Conferences for 1965—New Hampshire

Qualified scientists are invited to submit applications for attendance at the Gordon Research Conferences. Application blanks may be obtained by returning the postcard on page 1281 to W. George Parks, Department of Chemistry, University of Rhode Island, Kingston, R.I.

Date	Colby Junior College	New Hampton School	Kimball Union Academy	Tilton School	Proctor Academy
14–18 June	Hydrocarbon chemistry	Molecular beam methods and collision processes	Lipid metabolism	Biochemistry and agriculture	
21–25 June	Nuclear chemistry	Nucleic acids	Biochemical pathology	Magnetic resonance	Dielectric phenomena
28 June–2 July	Catalysis	Proteins	Cell structure and metabolism	Chemistry and physics of space	Environmental sciences: air pollution
5–9 July	Polymers	Coal science	Coenzymes and metabolic pathways	Organic photochemistry	*
12–16 July	Textiles	Statistics in chemistry and chemical engineering	Chemistry, physiology, and structure of bones and teeth	Fluorine chemistry	Chemistry and metallurgy of semiconductors
19–23 July	Elastomers	Scientific information problems in research	Physical metallurgy	Organic coatings	Biomathematics
26–30 July	Medicinal chemistry	Organic reactions and processes	Chemistry at interfaces	Microbiological deterioration	*
2–6 Aug.	Ion exchange	Radiation chemistry	Solid state studies in ceramics	Chemistry and physics of liquids	*
9–13 Aug.	Corrosion	Analytical chemistry	Toxicology and safety evaluations	Photonuclear reactions	*
16–20 Aug.	Food and nutrition	Steroids and other natural products	Chemistry and physics of solids	Low temperature geochemistry	*
23–27 Aug.	Separation and purification	Inorganic chemistry	Nuclear structure physics	Chemistry of heterocyclic compounds	Lasers in medicine and biology
30 Aug.–3 Sept.	Cancer	Chemistry of adhesion	Chemistry of molten salts	Glass	Energy coupling mechanisms

* Week not available.

7 July. A. M. Trozzolo, W. A. Gibbons, and R. A. Murray, "Spectroscopy of aryl methylenes"; R. M. Hochstrasser, "Spectra and properties of the excited states of some organic molecules."

8 July. P. J. Kropp, "Photochemistry of dienones." Short contributions by participants. E. Havinga, "Aromatic photosubstitution reactions."

9 July. P. Ausloos, "Photoelimination of olefins from aldehydes and ketones"; J. G. Calvert, "Photochemistry of some simple organic molecules." Short contributions by participants.

Fluorine Chemistry

Murray Hauptschein and Joseph D. Park are chairman and vice chairman, respectively.

12 July. (Michael Szwarc, *chairman*): Philip S. Skell, "Developments in carbene chemistry"; Ronald A. Mitsch, "CF_2 chemistry." (William T. Miller, *chairman*): Walter Mahler, "Fluorocarbon fluorophosphoranes"; Colin R. Patrick, "Theoretical aspects of fluorocarbon chemistry."

13 July. (Cedric L. Chernick, *chairman*): F. G. A. Stone, "Transition metal fluorocarbon complexes"; C. Tamborski, "Perfluoroaromatics of Group IV elements." (Wallace S. Brey, Jr., *chairman*): George V. D. Tiers, "Application of nuclear magnetic resonance in fluorine chemistry"; Earl L. Muetterties, "Studies of exchange processes in fluorides by nuclear magnetic resonance."

14 July. (chairman to be announced): Jeremiah P. Freeman, "Organic fluorides of nitrogen and sulfur"; Julianne H. Prager, "Organic fluorides of oxygen." (George H. Cady, *chairman*): Richard T. Holzmann, "Inorganic fluorides of nitrogen, oxygen and sulfur"; Alan F. Clifford, "S-F-N chemistry."

15 July. (Paul Tarrant, *chairman*): Carl G. Krespan, "The chemistry of perfluoroketones"; Cyril Woolf, "The chemistry of perhaloketones." (Leo A. Wall, *chairman*): Henry C. Brown, "Perfluoroalkyl - substituted heterocycles"; Norman L. Madison, "Fluorine-containing heteroatomic polymers."

16 July. (Neal O. Brace, *chairman*): N. Lynn Jarvis and William A. Zisman, "Surface chemistry of fluorochemicals."

Organic Coatings

Joseph Gaynor and J. Kenneth Craver are chairman and vice chairman, respectively.

19 July. Leon Jacqué, "Contributions to analytical methods of high polymers"; Theodore S. Hermann, "Frustrated multiple internal reflection infrared spectroscopy of organic coatings."

20 July. J. Kenneth Craver, D. L. Taylor, and E. D. Pierron, "Polymer solvent interactions by ultrasonic impedometry and x-ray diffraction"; Irvin M. Krieger, "Rheology of suspensions of non-interacting particles."

21 July. Percy E. Pierce, "Mechanical properties of coatings"; Turner Alfrey, "Adhesion of coatings to substrates."

22 July. John Ballard, E. Kropa, and W. Kay, "Cyclic phenol-formaldehyde intermediates"; William J. Burlant, "Curing of organic coatings by ionizing radiation"; George L. Brown, "Emulsion polymerization mechanisms."

23 July. Elio Eusebi, "Electrodeposition of organic coatings."

Microbiological Deterioration

Hugh Sisler and John Leonard are chairman and vice chairman, respectively.

26 July. Transport: Howard J. Rogers, "Nature of bacterial envelope"; Howard V. Rickenberg, "Sugar and ion accumulation in bacteria."

27 July. Transport (continued): Adam Kepes, "Transport models." *Protection against microbial action*: J. J. Willard and Robert F. Schwenker, "Resins as barriers to microorganisms; chemical structure of resin-treated cotton."

28 July. Protection against microbial action (continued): Raymond J. Lukens, "Chemistry of fungicides"; M. R. Siegel, "Mechanism of action of imide antibiotics"; Ellis B. Cowling, "Natural resistance of wood to microbial deterioration."

29 July. Microbial or enzymatic degradation of polymeric materials: Kendall W. King, "Enzymatic depolymerization of homopolysaccharides"; W. Yaphe, "Microbial degradation of heteropolysaccharides"; John A. Alford, "Microbial degradation of lipids."

30 July. Summary (Howard J. Rogers, *discussion leader*.)

Chemistry and Physics of Liquids

Robert S. Marvin and Robert M. Mazo are chairman and vice chairman, respectively.

2 August. R. H. Cole, "Current status of dielectric relaxation theories"; Robert Zwanzig, "Relaxation processes in liquids"; S. A. Rice, "Electronic states of liquids—theory and experiment."

3 August. Irwin Oppenheim, "Dialog between theoreticians and experimentalists"; (C. J. Pings, J. Ross, J. S. Rowlinson, and J. Waugh, *discussants*). H. Z. Cummins, "Applications of lasers to light scattering phenomena in liquids."

4 August. C. H. Townes and R. Chiao, "The propagation of hypersonic waves in liquids"; I. Prigogine, "Variational principles in irreversible thermodynamics."

5 August. E. G. D. Cohen, "Theory of transport phenomena in dense gases"; P. C. Martin, "Transport coefficients and correlation functions." (Open session for brief reports on, or discussion of, topics not included above.)

6 August. John Dahler, "Theory of structured continua"; J. L. Ericksen, "Mechanical behavior of liquid crystals."

Photonuclear Reactions

W. D. Whitehead and G. L. Bishop are chairman and vice chairman, respectively.

9 August. (L. Katz, *chairman*): S. Fultz and G. Bosco, "Electro and photonucleon production cross sections." (L. Biedenharn, *chairman*): J. Eisenberg and G. Bishop, "Inelastic electron scattering."

10 August. (H. Koch, *chairman*): S. Hannah and Brian Buck, "Inverse reactions"; W. Greiner and D. Jamnik, "Sum rules and total absorption cross sections."

11 August. (chairman to be announced): V. Gillet and speaker to be announced, "Intermediate resonances, mixed configurations and related topics." (P. Axel, *chairman*): F. Metzger and speaker to be announced, "Elastic photon scattering."

12 August. (chairman to be announced): D. Isabelle and speaker to be announced, "Nuclear correlations and related topics." (chairman to be announced): G. Mando and speaker to be announced, "Fluctuations and statistical properties of nuclei."

13 August. Subject to be announced (H. Lipkin, *discussion leader*).

Low Temperature Geochemistry

H. D. Holland and W. S. Broecker are chairman and vice chairman, respectively.

16 August. G. Arrhenius, "Coordination equilibria in aqueous systems"; I. Barnes, "Reactions of carbonates, oxides and sulfides at low temperature in ground water"; J. J. Hemley, "The influence of variable aqueous silica activity in alkali-alumina-silica-water systems"; L. A. Hardie, "The gypsum-anhydrite equilibrium"; H. D. Holland, "Trace elements incorporation in calcite and aragonite."

17 August. T. Takahashi, "Solubility of $CaCO_3$ in sea water"; K. K. Turekian, "Trace elements in sea water"; E. D. Goldberg, "Rare gases in sea water and the escape of helium from the atmosphere"; E. Degens, "Experimental data on interactions, in terms of polymerization effects, between clay minerals and amino acids"; E. Hare, "Comparative biochemistry of some invertebrate shell structures."

18 August. W. Sackett, "Carbon isotope geothermometry"; M. L. Keith, "Systematic relationships between carbon and oxygen isotopes in coral and algal carbonates"; R. M. Garrels, "Silicates in the water cycle"; R. Siever, "Interstitial water in deep-sea sediments"; K. S. Deffeyes, "On the geologic history of sea water."

19 August. W. S. Broecker, "Uranium series isotopes in carbonates: age dating and diagenesis"; D. J. J. Kinsman, "Carbonates and sulfates in sediments of the Persian Gulf"; R. N. Ginsburg, "Recent oölites and their geologic future"; R. A. Berner, "Diagenesis of carbonates"; E-an Zen, "Theoretical studies of the zeolite-greenschist facies boundary."

20 August. Papers arising from the conference.

Chemistry of Heterocyclic Compounds

Peter A. S. Smith is chairman.

23–27 August. R. A. Abramovitch, "Substitution and orientation in the pyridine series"; J. P. Anselme, "Stereochemistry of the decomposition of

cyclic azo compounds"; R. Gompper, "Synthesis of heterocycles from ketene acetals and related compounds"; Salo Gronowitz, "Aromatic boron heterocyles or halogen-metal interconversion in thiophenes and pyrimidines"; D. M. Lemal, "Aspects of diazene chemistry"; W. C. Linn, "Cyano-substituted epoxides"; F. Ramirez, "The oxaphospholane and oxaphospholene ring systems"; R. K. Robins, "Purines, pyrimidines and related systems"; G. Smolinsky, "Azirines"; E. C. Taylor, "New Syntheses in heterocyclic chemistry"; P. Yates, "Dihydrofuranone chemistry"; Martin J. Weiss, "Indole and pyrroloindole chemistry."

Glass

Martin Goldstein and C. R. Kurkjian are chairman and vice chairman, respectively.

30 August–3 September. J. W. Cahn, "Nucleation and spinodal mechanisms of phase separations"; W. B. Hillig, (subject to be announced); J. J. Hammel, "The stability of a glass phase on, or near, a glass coexistence curve"; R. C. Charles, "Connectivity of phase separated structures in glass"; E. M. Levin, "Structural interpretation of immiscibility in oxide systems: elaboration and experimentation"; J. A. Williams and G. E. Rindone, "Application of small angle x-ray scattering to studies of phase separation in glass"; R. Roy, "Sequence of phases appearing in some simple and complex glasses"; J. Zarzycki, "X-ray diffraction study of phase separation"; F. Oberlies, "Proof of microheterogeneities on ultra-microtome slices of different glasses"; P. W. McMillan, "Microphase separation in simple glasses"; W. Vogel, "Investigation of the unmixing process and the resulting structure of different glasses"; G. H. Beall, "Crystallization of β-quartz solid solutions from glass."

Proctor Academy

Dielectric Phenomena

John D. Hoffman is chairman.

21–25 June. Dielectric relaxation in polar liquids: Worth E. Vaughan, "Survey of dielectric loss in polar liquids in microwave region"; Robert Zwanzig, "Dielectric friction in fluids"; T. Litovitz and G. D. McDuffie, "Dielectric and mechanical relaxation in nonpolymeric liquids"; Robert S. Cole, "The dielectric relaxation spec-

trum of simple polar liquids." *Dielectric relaxation in organic glasses and polymers*: Julian Gibbs, "On the temperature dependence of cooperative relaxation in glass-forming liquids"; W. Stockmayer, "Dielectric dispersion in dilute polymer solutions"; Hyuk Yu and A. Bur, "Dielectric relaxation of rodlike molecules in solution"; E. Passaglia and J. D. Hoffman, "Dielectric and mechanical relaxation in semicrystalline polymers." *The transition from resonant to nonresonant dielectric absorption (gases)*: A. A. Maryott, "Dielectric relaxation in gases: experimental foundation"; G. Birnbaum, "Microwave relaxation in gases"; A. Ben-Reuven, "Theoretical aspects of line shape and microwave relaxation effects." *Rotation of dipoles in molecular crystals*: Mansel Davies, "Aspects of the dielectric study of molecular rotation in the solid state"; M. Broadhurst, "Model for dielectric relaxation in molecular crystals"; J. G. Powles, "Dielectric and NMR studies of rotation of molecules in molecular crystals."

Environmental Sciences:

Air Pollution

Allen D. Brandt and Frank E. Clarke are chairman and vice chairman, respectively.

Sulfur oxides and related compounds.

28 June. "Sources of sulfur oxides, quantities, forms, etc. (general)" (A. D. Brandt, *chairman*; J. H. Field, *discussion leader*). "Oxidation-reduction reactions; aerosol formation; adsorption on particulates; washout" (A. J. Haagen-Smit, *chairman*; F. E. Gartrell, *discussion leader*).

29 June. "Methods of identification and measurement" (M. D. Thomas, *chairman*; J. P. Lodge, Jr., *discussion leader*). "Physiological effects—experimental" (Leonard Greenburg, *chairman*; Mary Amdur, *discussion leader*).

30 June. "Health effects—epidemiological evaluation" (J. L. Whittenberger, *chairman*; E. J. Cassell, *discussion leader*). "Economic aspects—vegetation, materials and goods" (Ronald Ridker, *chairman*; J. T. Middleton and R. O. McCaldin, *discussion leaders*).

1 July. "Control by decreasing mass emission rate" (T. T. Frankenberg, *chairman*; Harry Perry, *discussion leader*). "Meteorological factors in preventing high sulfur compound concentrations at affected receptors" (G. H. Strom, *chairman*; M. E. Smith, *discussion leader*).

2 July. "Permissible levels in ambient air, and criteria affecting or governing such levels" (V. G. MacKenzie, *chairman*; D. W. Fassett, *discussion leader*). *Summary*: Norton Nelson.

Chemistry and Metallurgy of Semiconductors

G. A. Wolff and R. C. Sangster are chairman and vice chairman, respectively.

12 July. Crystal growth and etching: J. P. Hirth, "Nucleation and growth of crystals"; R. Kern, "Morphology and crystal growth as influenced by crystal structure and matrix"; W. R. Runyan, "Epitaxial growth of semiconductors"; A. Reisman, "The kinetics of vapor phase etching of semiconductors."

13 July. Crystal surfaces: G. Rupprecht, "Semiconductor surface states"; H. E. Farnsworth, "The structure of semiconductor surfaces as determined by low-energy electron diffraction"; R. J. Jaccodine, "Electron microscope studies of semiconductor surfaces"; W. W. Harvey, "Semiconductor surface properties and electrode behavior."

14 July. Semiconductor compounds: R. W. Haisty, "A review of the preparation, properties and applications of semi-insulating III-V compounds"; M. Aven, "Preparation and properties of II-VI compounds"; F. Hulliger, "Crystal chemistry of transition-element compounds TX_2"; E. Parthé, "On the stability of diamond structure materials."

15 July. J. C. Woolley, "Preparation and properties of solid solutions of III-V compounds"; F. A. Trumbore, "Solubilities and electrical behavior of impurities in III-V compounds"; (speaker and subject to be announced).

16 July. R. Roy, "Phase diagrams and materials research"; A. L. McWhorter, "Semiconductor laser."

Biomathematics

L. Stark and G. O. Barnett are chairman and vice chairman, respectively.

19–23 July. Mathematical concepts of central nervous system function (Lawrence Stark, *chairman*): Warren McCulloch and Lewis Sutro. *Nonlinear control system theory* (G. Octo Barnett, *chairman*): Richard Bellman and Otto Smith. *Sensory communication* (Samuel Mason, *chairman*): Gil-

bert McCann and David Lange. *Mathematical biophysics* (Wilfred Rall, *chairman*): Ernst Attinger, Richard FitzHugh, and Arne Troelstra. *Taxonomic approach to pattern recognition* (Earl Gose, *chairman*): Kosei Takahashi and Vincent Giuliano. *Stochastic models in biology* (Anthony Bartholomay, *chairman*): A. T. Bharucha-Reid and John Stephenson. *Potential distribution functions in electrocardiography* (Otto Schmitt, *chairman*): David B. Geselowitz and H. L. Gelernter. *Mathematical biology: past, present, and future* (Herbert Landahl, *chairman*): Nicolas Rashevsky. *Use of computers for training in biomathematics*: Panel, Alan J. Perlis, Samuel Talbot, Bernard Widrow, James Dow, and Donald Perkel.

Lasers in Medicine and Biology

Peter Hornby and Leon Goldman are cochairmen.

23 August. Laser instrumentation: Edward Damon, "A review of calorimetric and photodetection techniques together with their anticipated accuracies"; Ronald J. Rockwell, Jr., "Harmonic generation techniques using ruby lasers"; Fred Johnson, "Second and fourth harmonic generation using neodymium"; Paul Mauer, "Characteristics and system parameters necessary for consistent high energy neodymium performance"; Glenn Hardway, "Techniques for expanding Q-switching lasers into higher megawatt outputs with single spiking."

24 August. Experimental retinal studies: Leo Amar, "Generation of elastic waves in the eye"; Arnold Shapiro and Milton Zaret, "Some quantitative methods for the analysis of ocular damage"; William Ham, "Nonthermal effects in the eye due to high power density lasers." *Clinical retinal studies*: A. E. Jones, G. H. Herbener, and A. J. McCartney, "Morphological effects of liminal ruby laser exposures of the retina"; H. Christian Zweng, "Clinical observations and results of laser retinal photocoagulation."

25 August. Laser-tissue interaction models: Samuel Fine, Edmund Klein, and M. Litwin, "Parameters of the interaction of lasers with biological systems"; Janice Mendelson, "Evaluation of the mechanics of some physical effects of laser radiation on tissue"; J. R. Hayes, "Studies of laser interactions in neurosurgery." *Laser applications*: R. C. Rosan, "Applications in quantitative tissue analysis."

26 August. Laser cancer studies: John Minton, "Factors in the quantitation of tumor destruction by laser energy"; Paul McGuff, "Experimental and clinical studies in laser tumor destruction"; Donald Rounds, "Basic studies on laser irradiation of tissue culture"; Alfred Ketcham, "Factors relating to the clinical application of laser energy for tumor destruction"; James Helsper, "Low energy clinical use of the laser in tumor surgery."

27 August. Ralph Stern and R. F. Sognnaes, "Laser effects on dental structures"; Leon Goldman, "Review of current and future laser studies."

Energy Coupling Mechanisms

Philip Handler is chairman.

30 August. Microanatomy of phosphorylating structures. Mitochondria: D. E. Green, "The repeating units of the mitochondrial outer and inner membranes"; F. L. Crane, "The relation between mitochondrial membrane structure and electron transport"; D. F. Parsons, "Recent advances correlating structure and function in mitochondria." *Chloroplasts*: L. Bogorad, "Structure and function of chloroplasts"; E. Moudrianakis, "Functional correlations to morphological units revealed by high resolution electron microscopy in spinach chloroplasts." *Photosynthesis. Photochemistry*: R. Clayton, "The significance of emitted light accompanying photosynthesis"; G. Seely, "Mechanisms of chlorophyll sensitized photoreductions"; B. Kok, "Early events in photosynthesis"; G. Hind, "The site and mode of action of uncouplers on chloroplast electron transfer."

31 August. Photophosphorylation: H. Baltscheffsky and M. Baltscheffsky, "Multiple coupling sites in plant and bacterial photophosphorylation"; A. Jagendorf, "A high energy state of illuminated chloroplasts"; E. Racker, "A coupling factor for photophosphorylation"; C. Black and A. San Pietro, "Role of spinach ferredoxin in photophosphorylation"; M. Avron, "Photophosphorylation." *Carbohydrate formation*: M. Gibbs, "Energy requirements for photosynthetic biosynthesis of carbohydrate." *Oxidative phosphorylation. Efficiency*: A. L. Smith, "Increased efficiency of phosphorylation in oxidative phosphorylation of mitochondria"; W. Hempfling, "Electron transport and coupled energy conservation by intact bacteria"; R. H. Eisenhardt, "Uncoupling, respiratory control and the ATP-

jump." *Mechanisms*: W. Wainio, "Iodohistidine in the mitochondrion"; P. D. Boyer, "Phosphorylation mechanisms"; D. D. Tyler, "Studies on the possible role of free radicals in the uncoupling action of chemical compounds."

1 September. Coupling factors: G. Webster, "Mode of action of the site-specific ATP synthetases in mitochondrial oxidative phosphorylation"; R. Sanadi, "Coupling enzymes—single or multiple"; R. E. Beyer, "ATP synthetase II: its purification and function at phosphorylation site II during oxidative phosphorylation." *Associated electron transport*: E. C. Slater, "Mechanisms of energy conservation in mitochondrial oxidoreductions"; L. Ernster, "Mechanisms and pathways of energy conservation in submitochondrial electron transport particles"; H. A. Lardy, "Oxidative phosphorylation and the work of mitochondria"; *Ion transport. Mitochondria*: A. L. Lehninger, "Calcium transport in mitochondria"; J. B. Chappell, "Circumstantial evidence for the existence of a H^+-pump in mitochondria"; H. Rasmussen, "A mitochondrial calcium pump"; G. F. Azzone, "Mechanisms of swelling and shrinkage in mitochondria"; W. S. Lynn, "Cation exchanges in mitochondria—a unified concept for ion transport, oxidative phosphorylation, and hydration of mitochondria"; G. P. Brierley, "Membrane permeability and ion transport in heart mitochondria."

2 September. Chloroplasts: L. Packer, "Energy-coupling of water and ion transport in chloroplasts"; R. Dilley, "Ion and water transport processes in chloroplasts related to light-dependent shrinkage"; N. E. Good, "Photophosphorylation and chloroplast conformation." *Other systems*: T. J. McManus, "Cation transport by erythrocyte membranes"; R. L. Post, "A phosphorylated intermediate in the membrane ATPase pump for sodium and potassium ions"; A. Weber, "Calcium transport by the endoplasmic reticulum."

3 September. Metabolic controls: M. Klingenberg, "Energy transfer in mitochondria: the relation between phosphate transfer and phosphate carrier transfer"; F. A. Hommes, "Oscillatory phenomena during anaerobic glycolysis in yeasts"; B. Chance, "Control of glycolysis"; R. Estabrook, "The pattern of glycolytic intermediates during the Pasteur effect"; I. Harary, "Energy sources for beating heart cells in culture"; Th. Bucher, "Mitochondrial-extramitochondrial interreaction in liver cells."