Gordon Research Conferences: Program for 1964

W. George Parks

The Gordon Research Conferences for 1964 will be held from 15 June to 4 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 lectures 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 be used without the 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, for 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 be made at the time the attendance application is submitted because these accommodations, limited in number,

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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 to be 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, 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 15 June to 4 September mail for the office of the Director should be addressed to Colby Junior College, New London, New Hampshire.

The program to be presented follows.

Colby Junior College

Hydrocarbon Chemistry

Glen A. Russell and Thomas J. Hardwick are *chairman* and *vice chairman*, respectively.

15 June. Frank R. Mayo, "The oxidation of cyclopentene in liquid and gaseous systems"; R. J. Sampson, "Paraffin-oxygen reactions at 500°–650°C"; K. U. Ingold, "The kinetics and mechanism of some elementary reactions in liquid phase autoxidations."

16 June. T. G. Traylor, "Mechanisms of interactions of peroxy radicals and anions"; Harry S. Blanchard, "Mechanism of metal ion catalyzed autoxidation"; John H. Knox, "The role of homogeneous and heterogeneous processes in the gas phase oxidation of hydrocarbons."

17 June. Thomas J. Katz, "Chemistry of aromatic hydrocarbon ions"; J. E. Hofmann, "Ionization rates of weak hydrocarbon acids by isotopic proton exchange with dimethyl sulfoxide"; Gerhard L. Closs, "Syntheses and properties of some unusually strained hydrocarbons."

18 June. Paul R. Story, "Carbonium ion reactions of highly strained polycyclic molecules"; Lester Friedman, "Synthesis and reactions of 'hot' carbonium ions"; H. H. Freedman, "Some recent developments in tetraphenylcyclobutadiene chemistry."

19 June. Earl S. Huyser, "Halogenation of hydrocarbons by the use of polyhalomethanes"; Richard W. Fessenden, "Electron spin resonance studies of hydrocarbon radicals."

Nuclear Chemistry

T. Darrah Thomas and R. M. Diamond are *chairman* and *vice chairman*, respectively.

22–26 June. (Speakers to be announced.) *High energy nuclear chemistry*: "Reactions involving mesons either as incident or emitted particles"; "The question of fragmentation"; "Fission at high energies"; "Attempts to understand high energy reactions"; "Nuclear structure information from high energy reactions." *Fission*: "Fission into three fragments"; "Angular correlations in fission, including both correlations between mass distributions and angular distributions and correlations between fission fragments and third particles"; "Charge distribution in fission"; "New developments in the theory of fission."

Catalysis

Paul H. Emmett and John B. Peri, are *chairman* and *vice chairman*, respectively.

29 June. W. K. Hall, "Acid catalysis"; A. E. Hirschler, "The nature and strength of active acid sites on silica-alumina cracking catalysts"; M. L. Hair, "The infrared investigation of surface activity."

30 June. J. Turkevich, "Catalytic and magnetic resonance studies of molecular sieves"; W. F. Pansing, "Catalytic cracking of paraffins and cumene over acid catalysts"; D. W. McKee, "Hydrocarbon exchange of deuterium over metals and metal alloys."

1 July. F. C. Tompkins, "Kinetics of surface recombination of hydrogen atoms on a non-uniform metallic surface"; H. Wise, "Interaction of atoms with solid surfaces"; L. H. Germer, "Electron diffraction on catalyst surfaces."

2 July. J. L. Garnett, "A charge transfer theory for catalytic exchange reactions"; H. E. Farnsworth, "Low energy electron diffraction by gases on catalytic surfaces"; C. W. Tucker, "Low energy electron diffraction of gases adsorbed on platinum."

3 July. R. B. Lindsey, "Homogeneous catalysis with platinum-tin chloride complexes"; R. J. Cvetanović, "Some application of a 'flash-desorption' technique and of gas-solid chromatography to catalyst studies."

Polymers

F. P. Price and S. Bywater, are *chairman* and *vice chairman*, respectively.

6 July. H. Mark, "Recent advances in polymer research"; J. Lal, "Stereoregular polymerization of vinyl alkyl ethers with metal sulfates"; J. Stille, "Aromatic polymers"; S. Kantor, "Aromatic polyesters."

7 July. F. Dainton, "Interactions between polymer radicals and metallic compounds"; J. Moore, "Permeation chromatography"; J. Furukawa, "Stereoregular and asymmetric polymerization of aldehydes and cyclic ethers"; W. Cooper, "The influence of electron donors on stereoregular diene polymerization."

8 July. A. Keller, "Configurations of polymer crystals from solution and melt and their relevance to the crystallization process"; H. D. Keith, "Crystallization of polymers from the melt"; S. Bluestone, "Monte Carlo calculations of linear polymer dimensions at finite concentrations"; P. Verdier, "Monte Carlo studies of polymer chain dynamics."

9 July. C. Huggins, "Charge transport in organic solids"; M. Labes, "Electrical properties of organic solids including charge-transport complexes and conducting polymers"; W. Gilbert, "Mechanism of protein synthesis."

10 July. A. Kovacs, "Dilatometric and optical investigations of transitions in block copolymers"; G. Ham, "Predictions and correlations of monomer reactivity in copolymerization and terpolymerization—a new approach."

Textiles

D. Donald Gagliardi and B. S. Sprague are *chairman* and *vice chairman*, respectively.

13 July. H. D. Weigmann, "Chemomechanics of keratin fibers"; E. Menefee, "Thermally induced structural changes in wool."

14 July. H. F. Mark, "New materials, new concepts for progress in textile application of polymers"; A. A. Armstrong, "Irradiation induced grafting of monomers to textile fibers."

15 July. W. J. Hamburger, "The effect of environmental changes on micro strains in textiles"; A. J. Rosenthal. "TE$^{\frac{1}{2}}$, an index for relating fiber tenacity and elongation."

16 July. C. H. Giles, "The light fading of dyed fibers"; H. R. Billica, "Kinetics of soil detergency from synthetic fiber substrates."

17 July. H. Peper, "Surface chemical characteristics in soiling and soil removal."

Elastomers

M. L. Studebaker and J. Reid Shelton are *chairman* and *vice chairman*, respectively.

20 July. S. L. Aggarwal, Leon Marker, W. L. Kollar, and R. Geroch, "Melting and crystallization of stereoregular polymers: characterization of stereo-sequence length and effect of stereo-sequence length on crystallization kinetics of propylene oxide polymers"; M. C. Morris, "Finite chain extensibility and surface energy as factors in the elastic behavior of rubber"; Thor L. Smith, "Characterization of ultimate tensile properties."

21 July. A. N. Gent, "Crystallization in oriented polymer networks"; A. G. Thomas, "The strength of rubbers"; B. C. Barton, "Some interesting aspects of flex cracking."

22 July. J. R. Beatty, "Fatigue of rubber"; R. H. Snyder, "Groove cracking in modern tires and factors which influence it"; R. H. Rosenwald and H. E. Wieditz, "Cracking in rubber vulcanizates." (J. R. Shelton, *discussion leader*.)

23 July. R. E. Davis, "Basic mechanistic postulates for correlation of reaction of mechanisms of sulfur compounds"; C. G. Moore, "The chemistry of vulcanization of natural rubber"; D. J. Buckley and R. L. Zapp, "Polymer compatibility as measured by phase separations."

24 July. M. Bruzzone, G. Corradini, A. DeChirico, E. Pauluzzi, G. Giuliani, "Thermal cross-linking of *cis*-polybutadiene at high temperatures"; M. J. Brock, L. J. Gaeta, D. L. Jividen, "Thermal decomposition of polymers."

Corrosion

Henry Leidheiser, Jr., and Walter W. Smeltzer are *chairman* and *vice chairman*, respectively.

27 July. Helmut J. Liebl, "Use of the sputtering ion source mass spectrometer in studies of the chemical composition of surfaces"; David A. Vermilyea, "Electrochemical phenomena in and on very thin Ta_2O_5 films." (Ralph R. Nash, *discussion leader*.) F. W. Young, Jr., "The effect of defect structure on the dissolution of copper crystals"; Leslie H. Jenkins, "On electrochemical properties and defect structure." (Robert P. Frankenthal, *discussion leader*.)

28 July. A. U. MacRae, "Low voltage electron diffraction studies of chromium and nickel"; P. B. Sewell, "Electron diffraction studies of thin oxide films on metals." (Kenneth R. Lawless, *discussion leader*.) J. V. Petrocelli and V. Hospadaruk, "Electrochemistry of metals in the passive state"; Robert F. Steigerwald and M. A. Streicher, "The interpretation of potentiostatic polarization curves: the roles of alloy structure and solution composition." (N. D. Greene, *discussion leader*.)

29 July. K. G. Weil, "Studies on stationary and on transition states of passive iron under potentiostatic conditions"; Jerome Kruger, "Ellipsometric-potentiostatic studies of iron passivity." (M. J. Pryor, *discussion leader*.) Ernest L. Koehler, "Potentiostatic studies of aluminum corrosion mechanisms"; Norman Hackerman, "Studies of adsorption using differential capacity measurements." (Walter W. Smeltzer, *discussion leader*.)

30 July. Peter R. Swann, "Electron microscopy study of stress corrosion cracking"; D. A. Vaughan, "Microscopic and x-ray diffraction studies on stress-corrosion cracking mechanisms." (Morris Cohen, *discussion leader*.) N. A. Nielsen, "Motion picture photography of stress corrosion cracking"; T. P. Hoar, "Electrochemical aspects of stress corrosion cracking." (J. E. Draley, *discussion leader*.)

31 July. M. B. Ives, "Micro-autoradiographic determination of the adsorption of iron during dissolution of lithium fluoride in inhibited solutions"; Raymond K. Hart, "Electron optical investigation of corrosion films." (Henry Leidheiser, Jr., *discussion leader*.)

Medicinal Chemistry

Murray Finkelstein and Peter Krimmel are *chairman* and *vice chairman*, respectively.

3 August. Cell regulators: Albert Szent-Györgyi, "Studies in growth"; George Hitchings, "Chemical suppression of the immune response." *Diuresis*: John E. Baer, "Comparative pharmacology of ethacrynic acid"; Elwood L. Foltz, "Mechanism and clinical application of ethacrynic acid in man."

4 August. Macromolecules: John R. Platt, "Properties of large molecules that go beyond the properties of their chemical sub-groups"; Alexander Rich, "Synthesis of proteins on polyribosomes"; Ephraim Katchalski, "Polyamino acids and their use in biological studies"; Bruce Merrifield, "Solid-phase peptide synthesis"; Thomas M. S. Chang, "Semipermeable aqueous microcapsules."

5 August. Drug metabolism: Julius Axelrod, "The biochemical factors in the activation and inactivation of drugs"; James R. Gillette, "Mechanisms of the drug oxygenases and reductases in liver microsomes and of the factors which alter their activity"; Robert E. McMahon, "Structure activity studies on substrates and inhibitors of liver microsomal dealkylase activity"; Milton T. Bush, "The *in vivo* metabolism of barbiturates"; R. T. Williams, "Drug metabolism in man as compared with laboratory animals."

6 August. Phospholipids and atherosclerosis: J. F. Mustard, "Development of the atherosclerotic plaque"; Donald J. Hanahan, "Biochemistry of simple and complex lipids: some biological implications"; L. L. M. van Deenen, "The synthesis of phospholipids and some biological applications"; C. M. Pomerat, "Cinematography in pharmacological research."

7 August. Mitochondria and drug action: D. F. Parsons, "Correlation of structure and function of mitochondria"; Berton C. Pressman, "Inhibition of mitochondrial metabolism as a mechanism of drug action."

Food and Nutrition

Robert S. Harris and I. J. Hutchings are *chairman* and *vice chairman*, respectively.

10 August. Deteriorative reactions in low moisture foods (Marcus Karel, *chairman*): John Kuprianoff, "Changes in water holding ability of proteins in dehydrated foods"; Albert S. Henick, "Chemical reactions affecting stability of dehydrated foods"; M. Karel, "Role of water in the autoxidation of unsaturated fatty acids in model systems." *Phosphorus and caries; calciphylaxis and nutrition* (S. N. Gershoff, chairman): A. E. Nizel, "Phosphorus and dental caries"; Hans Selye, "Calciphylaxis, nutrition and the aging of tissues."

11 August. Cholesterol metabolism (L. W. Beck, *chairman*): C. R. Treadwell, "Absorption and transport of dietary cholesterol"; W. E. Connor, "Dietary cholesterol, serum cholesterol and atherosclerosis"; N. Spritz, E. H. Ahrens, Jr., and S. Grundy, "Studies on the hypocholesterolemic action of unsaturated fats." *Tocopherols and fatty acids* (L. J. Machlin, *chairman*): D. C. Herting, "Interrelationships between tocopherols and unsaturated fatty acids"; U. Gloor, "Biochemical activities of isomeric tocopherols and related compounds."

12 August. New approaches to the study of protein metabolism (D. M. Watkin, *chairman*): G. Arroyave, "Biochemical approaches to the evalution of protein nutritional status"; C. F. Consolazio, "Nitrogen excretion in sweat"; G. Costa, "Production of elemental nitrogen by certain mammals." *Environmental factors affecting nutrition* (C. F. Consolazio, *chairman*): T. R. A. Davis, "Influences of environmental factors on metabolism"; D. M. Hegsted, "Problems in space nutrition."

13 August. Deleterious compounds natural to foods (O. Mickelsen, *chairman*): F. M. Strong, "Toxic amino acids and amino nitriles"; J. C. Somogyi, "Antivitamins"; J. J. Rackis, "Proteolytic enzyme inhibitors from soybeans." *Taste* (R. S. Harris, *chairman*): C. Pfaffmann, "Sensory and motivating properties of taste."

14 August. Enzyme and allergen systems in plants (G. W. Irving, *chairman*): M. Lieberman, "Genesis of ethylene in plants"; E. F. Jansen, "Biochemical fates of ethylene in plants"; J. R. Spies, "Oil seed allergens."

Separation and Purification

K. C. D. Hickman is *chairman*.

17 August. Everett Howe, "Water separation processes"; Stellan Hjerten, "Rotating column electrophoresis and molecular sieving."

18 August. George Mangan, "Reverse osmosis: introduction"; Ulrich Merten, "Equations of flow"; A. S. Michaels, "Non-cellulose acetate membranes"; Bertram Keilin, "Pilot plant with cellulose acetate membranes."

19 August. G. H. Dale, "Pulsed extraction column"; Nick Pelick, "Lipid separations with TLC"; Orville Privett, "Lipid separations; stills and motion pictures."

20 August. Alexander Kolin, "Electromagnetic and electrokinetic fractionation methods"; Peter Watt, "Separations: inventor's paradise."

21 August. Frederick Baumann, "Monitoring with gas chromatography."

Cancer

Milan J. Kopac and Paul Kotin are *chairman* and *vice chairman*, respectively.

24–25 August. Chromosomes, chromosomal aberrations, gene action, and differentiation: Oscar L. Miller, Jr., "Lampbrush chromosomes"; George T. Rudkin, "Puffs and Balbiani rings in polytene chromosomes"; Heinrich Kroeger, "Gene locus activation"; Barbara McClintock, "Genetic mechanisms responsible for chromosomal aberrations"; T. C. Hsu, "Chromosomal aberrations induced by chemical agents"; George Yerganian, "Production of new karyotypes by chromosomal aberrations"; Susumu Ohno, "Aberrations in nucleolar chromosomes"; Theodore S. Hauschka, "Significance of chromosomal aberrations."

26 August. Nuclear environments and differentiation (Thomas J. King, *chairman*): Marie Di Berardino, "Chromosomal aberrations in transplanted nuclei"; John A. Moore, "Effects of interspecific cytoplasms on transplanted nuclei"; James F. Wilson, "Nuclear transplantation in neurospora"; Lester Goldstein, "Transfer of genetic information based on nuclear transplantation studies"; Heinrich Kroeger, "Explantation of salivary gland nuclei of drosophila and chironomus."

27 August. Action of foreign nucleic acids on cells: Kenneth E. Wolf, "Lymphocystis virus and lymphocystis cells"; T. C. Hsu, "Chromosomal aberrations induced by viruses"; Philip O'B. Montgomery, "Application of electronics to the study of cells."

28 August. Plant cell growth and tumors (Gladys M. Mateyko, *chairman*): Jyotirmay Mitra, "Behavior of the nucleus in plant cell cultures"; Tom Stonier, "Plant cell tumor induction and development."

Nuclear Structure Physics

Bernard L. Cohen and Norman Austern are *co-chairmen*.

Nuclear reaction mechanisms: direct reactions

31 August. Experimental data on simple direct reactions: R. Sherr, "Proton-induced reactions"; L. L. Lee, Jr., "Deuteron stripping"; L. Cranberg, "Neutron-induced reactions"; N. S. Wall, "Inelastic scattering of complex particles." *Standard theories and their approximations*: N. Austern, "Outline of standard theories"; M. H. Mittleman, "Recoil and antisymmetrization."

1 September. Optical model and its parameters: G. E. Brown, "Introductory sketch of optical model"; R. Bassel, "Status of optical-model parameters"; F. G. Perey, "Status of nonlocal potentials." *Numerical applications of distorted wave-born approximation*: G. R. Satchler, "Review of DWBA calculations"; A. Agode, "Finite-range calculations"; (speaker to be announced), "Coupled-channels calculations."

2 September. Polarization and gamma ray angular correlation of reaction products: R. C. Johnson, "(d,P) polarization"; A. E. Litherland, "Angular correlation experiments." *More complicated reactions, theory and experiment*: W. Daehnick, "(P,α) and (d, Li^6) reactions"; R. Drisko, "(P,α) and (d, Li^6) theory"; D. A. Bromley, "Experiments with heavy ions"; K. R.

Greider, "Theory for heavy-ion reactions"; J. S. Blair, "Unusual cases of inelastic excitation."

3 September. Intermediate structure; new developments: R. Lemmer, "'Doorway' states in compound nucleus formation." *Reactions at high energy*: (speaker to be announced), "New information available from high energy experiments"; D. F. Jackson, "Use of WKB wave functions in reaction calculations."

4 September. Applications of dispersion methods to direct nuclear reactions: H. Schnitzer, "Dispersion methods in direct nuclear reactions"; I. S. Shapiro (subject to be announced).

New Hampton School

Environmental Sciences: Microchemical Contaminants in Water

Robert A. Baker and Allen D. Brandt are *chairman* and *vice chairman*, respectively.

15 June. Conference introduction (Robert A. Baker, *chairman*). "Drinking water standards—substance or speculation?" (Leon Weinberger, *chairman*; R. D. Hoak, *discussion leader*). "Toxicological-physiological effects of microchemical pollutants" (G. Rohlich, *chairman*; John A. Zapp, *discussion leader*).

16 June. "Electrokinetic factors in coagulation, flocculation" (James Morgan, *chairman*; R. F. Christman, *discussion leader*). "Identification and persistence of microchemical pollutants by CCE procedure" (A. D. Brandt, *chairman*; D. L. Ryckman and A. Rosen, *discussion leaders*).

17 June. "Deepwell injection and underground pollution effects" (S. K. Love, *chairman*; William R. Samples, *discussion leader*). "Radioactivity—identification, persistence and effects" Frank L. Parker, *chairman*; Conrad Straub, *discussion leader*).

18 June. "Dispersion of micropollutants in lakes and large water bodies" (T. J. Powers, *chairman*; D. W. Pritchard, *discussion leader*). "Effects of microchemical contaminants on aquatic life" (C. Weiss, *chairman*; John Cairns, *discussion leader*).

19 June. "Pesticides and insecticides: recovery, identification and evaluation of effects" (J. Clark, *chairman*; Paul E. Porter, *discussion leader*). Summary, Richard Bogan.

Nucleic Acids

Seymour Benzer and H. G. Khorana are *chairman* and *vice chairman*, respectively.

22–26 June. "Natural history of nucleic acids" (Julius Marmur, *chairman*); "Genetic mechanisms" (Gunther Stent, *chairman*); "The translation apparatus" W. Gilbert, *chairman*); "Ribosomes and polyribosomes" (Robert Langridge, *chairman*); "Regulation mechanisms" (Alan Garen, *chairman*); "The genetic code, I" (F. H. C. Crick, *chairman*); "The genetic code, II" (Marianne Grunberg-Manago, *chairman*); "Mutagenesis in relation to nucleic acid structure" (Max Delbrück, *chairman*); "Nucleic acids in differentiation" (Fred H. Wilt, *chairman*).

Theoretical Chemistry

Martin Karplus and W. T. Simpson are *chairman* and *vice chairman*, respectively.

29 June. (H. M. McConnell, *chairman*): G. W. Robinson, "Excitation transfer and stimulated emission in molecular crystals"; S. A. Rice, "Excited states in molecular solids"; S. P. McGlynn, "Charge transfer in collective molecular systems." (J. O. Hirschfelder, *chairman*): H. P. Kelly, "Applications of many body perturbation theory to atomic physics"; A. Dalgarno, "Correlation effects in atomic systems."

30 June. (R. G. Parr, *chairman*): R. Hoffmann, "σ-Orbitals in extended Hückel theory"; R. G. Shulman, "Covalency effects in transition metal complexes"; J. Moskowitz, "Molecular calculations with Gaussian basis sets." (F. A. Matsen, *chairman*): D. Fox, "Error bounds for energies and expectation values"; H. Conroy, "Accurate solutions to the molecular Schrödinger equation."

1 July. (W. T. Simpson, *chairman*): I. Tinoco, "Absorption and rotation of light by polynucleotides"; O. Sinanoglu, "Van der Waals dispersion forces in liquids and the solvent denaturation of DNA"; R. Bersohn, "Double quantum scattering by molecules." (J. A. Pople, *chairman*): R. McWeeny, "Theoretical analysis of the electron distribution in atoms and molecules"; A. D. Buckingham, "Measurement and interpretation of molecular multipole moments."

2 July. (H. Shull, *chairman*): C. C. J. Roothaan, "Energies and other properties of molecules from Hartree-Fock wave functions"; E. Clementi, "Stability computations for atoms and molecules." (E. F. Greene, *chairman*): Richard B. Bernstein, "Rotational excitation and beam scattering of diatomic molecules": Dudley R. Herschbach, "Molecular mechanics of chemical reactions."

3 July. (H. Hameka, *chairman*): H. C. Longuet-Higgins, "The application of group theory to non-rigid molecules"; R. Harris, "The correlation function approach to radiative and radiationless processes."

Metals and Metal Binding in Biology

Maynard Chenoweth and Rufus Lumry are *chairman* and *vice chairman*, respectively.

6 July. Metal binding to amino acids and other protein fragments (Mildred Cohn, *chairman*): C. C. McDonald, "Amino acids"; F. R. N. Gurd, "Proteins"; H. C. Freeman, "X-ray crystallography of metal-peptide complexes"; G. Eichorn and M. Cohn, "Metal binding to nucleic acids and nucleotides."

7 July. Porphyrin chemistry and structure (Alsoph H. Corwin, *chairman*): W. S. Caughey, "Properties of metalloporphyrins"; J. L. Hoard, "Stereochemistry of metalloporphyrins"; J. R. Platt, "Ultraviolet and visible spectra of porphyrins"; Harold H. Strain "Magnesium compounds in photosynthesis."

8 July. (George C. Cotzias, *chairman*): W. F. Bethard, "Manganese: activation analysis"; L. Hurley, "Consequences of transition metal deficiencies on the development of the mammalian embryo"; G. Cotzias, "Manganese in excess"; F. Vasington, "Divalent metal transport in mitochondria"; M. Wolfsburg, "Mechanisms of interdisciplinary exchange" (roundtable discussion).

9 July. (Arthur Martell, *chairman*): (speaker to be announced), "New developments in coordinating ligands for metal ions"; George C. Rose, "Time-lapse cinemicrography of cells in tissue culture."

10 July. (C. Paul Bianchi, *chairman*): S. Winegrad and R. Podolsky, "Role of calcium in excitation—contraction coupling."

Statistics in Chemistry and Chemical Engineering

Harry Smith, Jr., and Ralph A. Bradley are *chairman* and *vice chairman*, respectively.

13 July. R. L. Anderson, "Nonbalanced experimental designs for estimating variance components"; P. M. Reilly, "Experimental designs for autocorrelated information."

14 July. C. R. Rao, "Multivariate analysis"; G. Wernimont, "Use of principal component variates to compare spectrophotometric absorbance curves."

15 July. Ronald Howard, "Markovian models for probabilistic systems"; L. J. Savage, "The idea of personal probability as a guide in a statistical practice."

16 July. R. Pinkham, "Reliability: theory and practice"; R. W. Hamming, "Present and future impact of computers on experimentation."

17 July. John C. Orcutt, "Some practical aspects of chemical process optimization."

Scientific Information Problems in Research: Critical Tables

Bruno J. Zwolinski and Merrill B. Wallenstein are *chairman* and *vice chairman*, respectively.

20 July. Importance of critical tables in research (Charles W. Beckett, *chairman*): Frederick D. Rossini and Edward L. Brady, "Importance of critical data in research—general aspects." *Importance of critical tables in research* (continued) (Daniel R. Stull, *chairman*): H. A. Skinner, "Importance of critical data in research—specific areas (physical sciences)"; (speaker to be announced), "Importance of critical data in research—specific areas (engineering sciences)."

21 July. Critical evaluation and generation of standard reference data—techniques and operational procedures (Lawrence N. Canjar, *chairman*): Joseph Hilsenrath, "Critical evaluation and generation of standard reference data (physicochemical data)"; Donald D. Wagman, "Critical evaluation and generation of standard reference data (thermochemical data)." *Critical evaluation and generation of standard reference data—techniques and operational procedures* (continued) (Merrill B. Wallenstein, *chairman*): Ransom B. Parlin and Harold S. Johnston, "Critical evaluation and generation of standard reference data (chemical kinetic data)."

22 July. Critical evaluation and generation of standard reference data—techniques and operational procedures (continued) (Lewis M. Branscomb, *chairman*): Joseph Kestin, "Critical evaluation and generation of standard reference data (atomic and molecular physics)"; (speaker to be announced), "Critical evaluation and generation of standard reference data (nuclear physics)."

23 July. Needs and coordination in special areas (Paul C. Cross, *chairman*): Abraham Savitzky, "Needs and coordination in special areas (spectral data)"; *Needs and coordination in special areas* (continued) (A. V. Astin, *chairman*): (subject to be announced).

24 July. Needs and coordination in special areas (continued) (Guy Waddington, *chairman*): Robert H. Wentorf, "Needs and coordination in special areas (high pressure and temperature data)"; (speaker to be announced), "Needs and coordination in special areas (biochemical data)."

Radiation Chemistry

Malcolm Dole and R. H. Schuler are *chairman* and *vice chairman*, respectively.

27 July. R. L. Platzman, "Highly excited states of atoms and molecules." (J. L. Magee, *discussion leader.*) J. A. Simpson, "Low-energy electron impact studies." (Aron Kupperman, *discussion leader.*)

28 July. L. Kevan and W. F. Libby, "Ion-molecule reactions in solid hydrocarbons." (C. D. Wagner, *discussion leader.*) Z. Hernan, "The mass spectrometric investigation of ionizing reactions between excited metastable atoms and polyatomic molecules." (J. H. Futrell, *discussion leader.*)

29 July. Walter Gordy, "Electron spin resonance spectra and free radicals." (R. W. Fessenden, *discussion leader.*) E. R. Johnson, "Radiation chemistry of solid alkali and alkaline earth perchlorates." (G. E. Boyd, *discussion leader.*) Contributed papers. (Leon Dorfman, *discussion leader.*)

30 July. A. Chapiro, "Radiation polymerization of solid monomers." (T. F. Williams, *discussion leader.*) A. Charlesby, "Radiation mechanisms and radiation protection in polymers." (W. W. Graessley, *discussion leader.*)

31 July. P. J. Dyne, "Summary of conference and discussion of unsolved problems in radiation chemistry." (F. W. Lampe, *discussion leader.*)

Steroids and Other Natural Products

Ernest Wenkert is *chairman.*

3–7 August. The following persons have been invited to speak: S. Bernstein, O. L. Chapman, G. W. Kirby, Y. Mazur, G. Ourisson, K. Overton, J. Polonsky, K. Rinehart, E. E. van Tamelen, and R. B. Woodward.

Inorganic Chemistry

Peter R. Girardot and Rolf B. Johannesen are *chairman* and *vice chairman*, respectively.

10–11 August. Bonding and structural considerations—group VI (Russell S. Drago, *chairman*): Harry B. Gray, "Sulfur as a donor in square planar transition metal complexes"; Richard H. Holm, "Four and six-coordinate transition metal complexes containing sulfur as a donor"; Emil T. Kaiser, "ESR studies of sulfur-containing anion radicals"; Russell S. Drago, "Inferences concerning sulfur π-bonding from donor strengths and proton NMR studies"; John K. Ruff, "Studies of sulfur oxyfluorides"; Lawrence Dahl, "Structure investigations of sulfur and selenium-containing metal carbonyls"; John L. Margrave, "High temperature and thermodynamic studies of selenium and tellurium compounds."

11–12 August. The transition state and reactive intermediates in inorganic chemistry (Arthur W. Adamson, *chairman*): Gordon M. Harris, "The transition state and/or reactive intermediates in ligand reactions of some diacido chelate cobalt (III) and chromium (III) complexes"; George H. Nancollas, "The formation of transition metal ion complexes and ion pairs with anions in solution"; Hans L. Schläfer, "The role of the doublet state in the photochemistry of chromium (III) complexes"; Gerald B. Porter, "Emission spectra of transition metal complexes"; Carl W. Moeller, "Photolysis reactions and reactive intermediates in inorganic chemistry"; A. A. Vlcek, "Intermediates in electrode reactions of

transition metal complexes"; G. A. Crosby, "Electronic spectroscopy of complexes."

13 August. Edward D. Goldberg, "The oceans as a chemical system."

13–14 August. Structure of inorganic and metal-organic compounds elucidated by Mössbauer spectroscopy (Rolfe H. Herber, *chairman*): David A. Shirley, "The origin of the isomer shift"; (speaker and subject to be announced); G. J. Perlow, "Quadruple splitting in xeon compounds"; Norman Greenwood, "Mössbauer spectroscopy of inorganic compounds." (This program is supported in part by a grant from the Directorate of Chemical Sciences, Air Force Office of Scientific Research.)

Analytical Chemistry

Theodore Kuwana and Willard P. Tyler are *chairman* and *vice chairman*, respectively.

17 August. Joseph Jordan, "Thermochemical titrations"; Roger G. Bates, "*p*H measurements in amphiprotic solvents"; John E. Leonard, "Problems in potentiometric measurements: *p*H, *p*Na and *p*M."

18 August. David M. Hercules, "Principles and applications of spectrofluorometry"; Ricardo Pastor, "Laser principles and materials"; Frederick Brech, "Laser excited emission spectroscopy: current and potential capabilities."

19 August. C. A. Parker, "Photoluminescence and the triplet state"; Raymond Castaing and Georges Slodzian, "Modern methods of microanalysis."

20 August. Donald T. Sawyer and Charles N. Reilley, "Nuclear magnetic resonance studies of metal chelates." (Open discussion.)

21 August. Buell O. Ayres, "Recent advances in gas chromatography and their practical significance."

Chemistry of Heterocyclic Compounds

William I. Taylor is *chairman.*

24–28 August. The following persons have been invited to speak: P. Beak, E. E. Campaigne, K. M. Davies, G. deStevens, R. L. Hinman, S. Hünig, A. R. Katritsky, E. M. Kosower, M. E. Kuehne, R. Olofson, L. A. Paquette, P. A. S. Smith, L. M. Sternbach, and H. H. Wasserman.

Adhesion

James R. Huntsberger and Floyd H. Bair are *chairman* and *vice chairman*, respectively.

31 August. R. R. Stromberg, "Adsorption of polymers"; C. A. J. Hoeve, "Molecular theories of polymer adsorption." (F. R. Eirich, *discussion leader.*) D. H. Kaelble, "A molecular free volume theory of adhesion and cohesion of polymers." (R. S. Stein, *discussion leader.*)

1 September. H. Corten, "Mechanism of adhesive failure." (G. Irwin, *discussion leader.*) R. L. Patrick, "Role of water in adhesive failure." (W. D. Bascom, *discussion leader.*)

2 September. R. E. Johnson, Jr., "Concepts of wettability and applications to adhesion." (Fred Fowkes, *discussion leader.*) R. J. Good, "Intermolecular forces, interfacial energy and adhesion." (J. L. Gardon, *discussion leader.*)

3 September. D. V. Keller, Jr., "Adhesion between solid metals." (Q. Van Winkel, *discussion leader.*) D. M. Mattox, "The interface and adhesion in metallic systems." (Harvey Alter, *discussion leader.*)

4 September. R. F. Wegman, "Response of epoxy adhesives when stressed to failure in milliseconds"; Elise McAbee, "Effect of rate of load application on tensile behavior of glass reinforced resin systems." (John Tordella, *discussion leader.*)

Kimball Union Academy

Lipid Metabolism

David Kritchevsky and Daniel Steinberg are *chairman* and *vice chairman*, respectively.

15 June. A. D. Bangham, "Physical structure and behavior of lipids and lipid enzymes"; J. A. Clements, "The role of surface active lipids in pulmonary function"; F. A. Vandenheuvel, "Structure of myelin"; A. N. Davison, "Some aspects of brain lipid metabolism."

16 June. N. S. Radin, "The 2-hydroxy fatty acids of brain"; A. Fulco and J. F. Mead, "The metabolism of long chain α-hydroxy acids"; J. A. Olson, "The metabolism of β-carotene and retinol"; F. Chevallier, "Turnover of cholesterol in the rat."

17 June. J. D. Wilson, "Cholesterol metabolism in the isotopic steady state in the rat"; E. H. Ahrens, Jr., "Sterol balances in man"; D. S. Goodman, "Recent studies on the metabolism of cholesterol esters"; L. I. Gidez, P. S. Roheim, S. Switzer, H. A. Eder, "Origin and role of plasma cholesterol esters"; J. A. Glomset, "Recent studies of the plasma cholesterol esterification reaction of sperry."

18 June. J. M. Johnston, "Recent developments in intestinal absorption of fats"; R. J. Havel, "Transport and metabolism of triglycerides in blood plasma"; K. Folkers, "New aspects of research on coenzyme Q." (General discussion.)

19 June. M. Heimberg, "Effects of hormones, diet and drugs on hepatic triglyceride metabolism"; P. D. Klein, "Uses and consequences of dual tracer experiments in lipid metabolism."

Solid-State Studies in Ceramics

J. B. Wachtman and Ivan B. Cutler are *chairman* and *vice chairman*, respectively.

22 June. R. E. Howard, "Formation, interaction and motion of point defects in ceramics"; R. O. Simmons, "Equilibrium defect structure of pure silver halides"; W. Parrish, "High resolution x-ray power diffractometry"; J. G. Mullen, "A Mössbauer study of the association and precipitation of point imperfections."

23 June. F. Laves, "Investigation of order-disorder relations in crystals by infrared and nuclear magnetic resonance"; J. E. Wertz, "Electron spin resonance and optical spectra of point defects in MgO"; L. E. J. Roberts, "The variation of thermodynamic quantities across homogeneity ranges on non-stoichiometric oxides"; D. H. Bowen, "The distribution of impurities in magnesium oxide."

24 June. A. S. Nowick, "Dielectric and anelastic relaxation of point defects"; Roger Chang, "Internal friction associated with paired point defects"; N. M. Tallan, "Defect structure and electrical properties of some metal oxides"; J. S. Nadeau, "Observations of point defects in crystals by means of the flow stress measurement."

25 June. (Morning session to be arranged.) Edwin Roedder, "Volcanic eruptions and some unexpected properties of solids."

26 June. W. Meinke, "Present status of activation analysis"; Peter Gibbs, "Cation motion in and out of alpha quartz."

Cell Structure and Metabolism

J. H. Taylor and Walther Stoeckenius are *cochairmen.*

The organization of the cell nucleus

29 June. The molecular structure of nucleoproteins (W. Stoeckenius, *chairman*): M. F. Wilkins; V. Luzzati. *Physico-chemical properties of nucleoproteins* (W. J. Kauzmann, *chairman*): E. Frédéricque; A. R. Peacocke.

30 June. Fine structure in the nucleus (M. L. Watson, *chairman*): V. Marinozzi; H. Swift; J. Kaye. *Fine structure of the nucleus* (H. Ris, *chairman*): J. G. Lafontaine; M. J. Moses; W. Beerman, O. Hess, and G. F. Meyer.

1 July. Chromosome structure (J. G. Gall, *chairman*): H. G. Callan; S. Inoué. *Biochemistry of isolated nuclei* (G. E. Palade, *chairman*): L. B. Zbarskii; J. P. Zalta; G. Siebert.

2 July. Basic problems in nuclear metabolism, I (chairman to be announced): S. Spiegelman; P. Geiduschek; E. Reich. *Thoughts about control of chromosomal function* (chairman to be announced): J. Bonner.

3 July. Basic problems in nuclear metabolism, II (J. H. Taylor, *chairman*): V. G. Allfrey; H. Stern.

Coenzymes and Metabolic Pathways

Arnold D. Welch and Bernard R. Baker are *chairman* and *vice chairman*, respectively.

6 July. (A. D. Welch, *chairman*): E. E. Snell, "Some aspects of the metabolism and metabolic role of pyridoxal in bacteria"; T. C. Bruice, "Model studies of transamination reactions"; G. Hammes, "The mechanism of action of aspartic amino transferase." (G. B. Elion, *chairman*): J. L. Strominger, "Structure and biosynthesis of bacterial cell walls"; J. J. Saukkonen, "Studies on the properties of teichoic acids."

7 July. (B. R. Baker, *chairman*): J. J. Burchall, "Differential binding to dihydrofolic reductases as a basis for selective inhibition by antimetabolites"; E. P. Kennedy, "The role of pteridine cofactors in the oxidation of glyceryl ether"; G. W. Kidder, "Pteridines in crithidia." (T. H. Jukes, *chairman*): H. Weissbach, "The role of vitamin B_{12} in the biosynthesis of methionine"; H. L. Elford, "Transfer of the methyl group of methyl-tetrahydrofolic acid to a cobamide."

8 July. (G. W. Kidder, *chairman*): G. B. Elion, "Inhibition of xanthine oxidases from different species"; G. V. R. Born, "Effects of adenine nucleotides and of related substances on the aggregation of blood platelets *in vitro* and *in vivo*"; H. G. Mautner, "Selenocoenzyme A and related compounds; biological and kinetic studies of sulfur and selenium analogs." (E. E. Snell, *chairman*): P. D. Boyer, "Phosphohistidine—chemistry and metabolic relationships"; E. Racker, "Coupling factors in oxidative phosphorylation."

9 July. (H. G. Wood, *chairman*): S. Wakil, "The mechanism of action of enzyme-bound biotin"; J. Knappe, "Studies on the mechanism of CO_2 transfer by biotinenzymes"; H. J. Schaeffer, "Chemical reactivity of models related to a proposed CO_2-biotin-enzyme complex"; H. G. Wood, "General discussion of biotin and CO_2 fixation." (J. L. Strominger, *chairman*): L. E. Hokin, "Role of phosphatides in secretion"; A. S. Weisberger, "Inhibition of induced ribosomal protein synthesis by chloramphenicol."

10 July. (H. P. Broquist, *chairman*): J. P. Changeux, "Reversible structural alterations and allosteric transitions of threonine deaminase"; R. A. Yates, "Biochemical changes at the cellular level associated with learning."

Chemistry, Physiology, Structure of Bones and Teeth

Philip H. Henneman and I. Zipkin are *chairman* and *vice chairman*, respectively.

13 July. Short communications selected from submitted abstracts (to be sent to Isadore Zipkin, *chairman*, before 15 May). *Immunoassay of parathyroid hormone* (A. D. Kenny, *chairman*): A. H. Tashjian, Jr., "Studies of parathyroid hormone by quantitative complement fixation"; J. T. Potts, Jr., G. D. Aurbach, S. A. Berson, R. S. Yalow, "Radioimmunoassay of parathyroid hormone."

14 July. The determination of bone mineral content in vivo (H. Schraer, *chairman*): R. A. Hunt and H. Schraer, "Quantitative radiography of bone mineral: effects of hypoxia, estrogens and calcium administration"; C. J. Maletskos, "Bone calcium determination by neutron activation"; J. R. Cameron, "Measurement of bone mineral using a monochromatic low energy photon beam"; P. D. Saville, "Determination of bone mineral content by iliac crest biopsy." *Resorption of collagen and bone* (P. Goldhaber, *chairman*): J. Gross, "Collagen remodelling"; G. Martin, "Alterations in bone metabolism induced by parathyroid extract."

15 July. Magnesium metabolism (I. MacIntyre, *chairman*): J. A. F. Rook, "Hypomagnesemia in ruminants"; L. G. Welt, "Magnesium deficiency: experimental and clinical"; M. Walser, "The renal handling of divalent cations"; L. V. Avioli, "Studies with Mg^{28}"; M. A. Kumar, "Magnesium, calcium and the parathyroids." *Vitamin D metabolism* (R. H. Wasserman, *chairman*): R. H. Wasserman, "Introduction: on the mode of action of vitamin D"; D. Schachter, "Studies on the metabolism of radioactive vitamin D and its mechanism of action in the small intestine."

16 July. Fluoride and bone (L. Singer, *chairman*): W. D. Armstrong, "The chemistry and physiology of fluoride"; M. J. Purves, "The application of fluoride treatment in demineralizing diseases"; A. Singh, "Endemic fluorosis." *Tetracyclines and bone* (I. Clark, *chairman*); G. Bevelander, "The effect of tetracycline on growth and mineralization"; R. A. Milch, "Binding of tetracycline to demineralized tissues."

17 July. Selected topics (G. C. H. Bauer, *chairman*): M. Pope, "Charge motion in organic solids"; D. McPherson, "Stable calcium isotopes as tracers"; A. V. Montgomery, "Calcium loss during weightlessness"; M. Berman, "Computer analysis of tracer kinetics."

Physical Metallurgy

John W. Cahn and Daniel N. Beshers are *chairman* and *vice chairman*, respectively.

Kinetics

20 July. W. W. Mullins, "The diffusional stability of growth forms and the evolution of morphology"; I. M. Lifshits, "Kinteics of diffusive decomposition of supersaturated solid solutions"; M. Kahlweit, "Ostwald-ripening in solid solutions."

21 July. (M. Hillert, *discussion leader*): J. E. Hilliard, "Current problems in spinodal decomposition"; Rob-

in Nicholson, "Precipitation by spinodal decomposition."

22 July. A. C. Damask, "Effects of radiation on solid state kinetics in nonfissionable alloys"; R. M. Fisher and G. Speich, "Transformation studies using laser pulse heating"; R. J. Borg, "Pulse heating using prompt-burst neutron machines"; A. L. Ruoff, "On strain-enhanced diffusion in metals."

23 July. R. H. Willens, "Metastable phases by rapid quenching from the melt"; J. R. Beeler, "Computer experiments on order-disorder kinetics"; C. S. Smith, "A broad view of transformations."

24 July. K. T. Aust and J. H. Westbrook, "Kinetics of solute hardening at interfaces"; R. Fleischer, "Charged particle tracks in solids." (Short contributions where time permits.) M. Hillert, "Kinetics of grain growth in single phase alloys"; R. M. Fisher, "The kinetics of ordering."

Chemistry at Interfaces

Donald P. Graham and Egon Matijevic are *chairman* and *vice chairman*, respectively.

27 July. Effects of adsorbed films on solids (A. C. Zettlemoyer, *chairman*): Robert J. Good, "Surface energies and embrittlement"; A. R. C. Westwood, "Effects of surface character and environment on mechanical properties of crystalline materials."

28 July. Polarization and structure at interfaces (Tomlinson Fort, Jr., *chairman*): W. A. Zisman, "Changes in surface potentials of metals caused by adsorbed monolayers"; Jerome Kruger, "Ellipsometric studies of metal surface reactions"; D. A. Haydon, "Polarization and structure at some liquid interfaces."

29 July. Biological membranes

Program Summary, Gordon Research Conferences for 1964

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 1167 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
15–19 June	Hydrocarbon chemistry	Environmental sciences: microchemical contaminants in water	Lipid metabolism	Biochemistry and agriculture
22–26 June	Nuclear chemistry	Nucleic acids	Solid state studies in ceramics	Friction, lubrication, and wear
29 June-3 July	Catalysis	Theoretical chemistry	Cell structure and metabolism	Chemistry and physics of space
6–10 July	Polymers	Metals and metal binding in biology	Coenzymes and metabolic pathways	Chemistry of carbohydrates
13–17 July	Textiles	Statistics in chemistry and chemical engineering	Chemistry, physiology and structure of bones and teeth	Chemistry and physics of isotopes
20–24 July	Elastromers	Scientific information problems in research: critical tables	Physical metallurgy	Organic reactions and processes
27–31 July	Corrosion	Radiation chemistry	Chemistry at interfaces	High temperature chemistry
3–7 Aug.	Medicinal chemistry	Steroids and other natural products	Toxicology and safety evaluations	Biopolymer-solvent interactions and the structure of liquids
10–14 Aug.	Food and nutrition	Inorganic chemistry	Dissolution and crystallization of calcium phosphates	Organic photochemistry
17–21 Aug.	Separation and purification	Analytical chemistry	Chemistry and physics of solids	Geochemistry: water
24–28 Aug.	Cancer	Chemistry of heterocyclic compounds	Infrared spectroscopy	Chemistry and metallurgy of semiconductors
31 Aug.–4 Sept.	Nuclear structure physics	Adhesion	Non-linear optics	Ionic movements and interactions in biological, chemical, and physical phenomena

Proctor Academy, Andover

13–17 July Biomathematics
20–24 July Biological regulatory mechanisms

(Martin G. Larrabee, *chairman*): J. D. Robertson, "Structure of lipid membranes"; Richard D. Keynes, "Selective permeability and its rapid change in biological membranes"; Thomas E. Thompson, "Synthetic biomolecular membranes."

30 July. Dynamic processes at liquid-liquid interfaces (Donald R. Lewis, *chairman*): Thomas Baron, "Processes affecting transport at dynamic liquid-liquid interfaces"; Robert Schechter, "Interfacial tension and mass transport under nonequilibrium conditions"; Raymond Defay, "Theoretical and experimental consideration of processes at liquid surfaces."

31 July. Special topics (Egon Matijevic, *chairman*): A. C. Zettlemoyer, "Effects of ambients on semiconductors."

Toxicology and Safety Evaluations

Leonard J. Goldwater and V. K. Rowe are *chairman* and *vice chairman,* respectively.

3 August. (V. K. Rowe, *moderator*): W. H. Teichner, "Psychophysiology of toxicity testing"; M. H. Joffe, "Toxicological evaluation by behavioral methods." (C. J. Krister, *moderator*): I. R. Tabershaw, "Sequelae of phosphate ester insecticide poisoning."

4 August. (E. Eagle, *moderator*): S. L. Friess, "Toxic interactions at cholinergic chemoreceptors"; I. B. Wilson, "Acid transferring inhibitors of acetylcholinesterase." (K. Boucot, *moderator*): L. J. Goldwater, "Human experiments in mercury exposure."

5 August. (R. Henderson, *moderator*): A. W. Phillips, "Effects of host-intestinal flora interaction on monamine oxidases and amines"; B. S. Wostman, "The present and future germfree animal as a tool for critical testing." (F. H. Snyder, *moderator*): K. R. Long, "Application of cell culture for the measurement of insecticide toxicity."

6 August. (F. Coulston, *moderator*): D. E. Hathway, "Biochemical investigations related to the toxicity of dieldrin and telodrin in mammals"; J. J. Heise, "Electron spin resonance as a possible technique for toxicity studies." (L. J. Goldwater, *moderator*): L. Golberg, "New horizons in toxicology."

7 August. (H. P. Drobeck, *moderator*): E. W. McChesney, "Metabolism of some 4-aminoquinoline antimalarials and its implications in toxicology."

Dissolution and Crystallization of Calcium Phosphates

R. S. Manly and Walter E. Brown are *cochairmen.*

10 August. (R. S. Manly, *chairman*): Aaron Posner and E. D. Eanes, "Effect of crystal size and perfection on reactivity of calcium phosphate"; H. Newesely, "The behavior of the poorly crystallized calcium phosphates"; James R. Lehr, "Petrographic microscopy applied to calcium phosphates" (with demonstrations). *Solid phase structure and chemical behavior* (R. S. Manly, *chairman*): Walter E. Brown, "Structural interrelationships among the calcium phosphates"; M. U. Nylen or Jan Erich Glas, "Electron microscopy of apatite materials."

11 August. Solid phase structure and chemical behavior (continued) (W. E. Brown, *chairman*): Z. S. Altschuler, "Biological versus geological apatites"; K. H. Butler, "Infrared spectroscopy of calcium phosphate"; William H. Emerson, "Carbonate in the apatite lattice." *Thermodynamics* (W. E. Brown, *chairman*): T. M. Gregory, "Solubilities in the three-component system, $CA(OH)_2$-H_3PO_4-H_2O"; Mary Thompson, "Membrane electrode potentials of calcium phosphate solutions"; A. M. Pommer and A. Truesdell, "Calcium electrodes."

12 August. Dissolution (R. S. Manly, *chairman*): Michael Buonocore and A. X. Apostolopoulos, "Comparative dissolution rates of enamel dentin and bone"; V. Cotty and J. H. Wood, "Decalcification of dental enamel and inorganic model systems." *Kinetics of dissolution* (W. E. Brown, *chairman*): J. Hatfield, "Factors controlling the reaction of concentrated acids with rock phosphate"; John A. Gray, "Subsurface dissolution of tooth enamel"; W. Higuchi, "Dissolution rates of hydroxyapatite in acidic buffers."

13 August. Crystallization (R. S. Manly, *chairman*): B. H. Amdur, "Calcification in organic precipitates"; F. D. Pickel, "Remineralization of dental enamel"; T. F. McNamara, "Calcification in bacteria-containing systems"; F. Hubbard Horn, "Mechanisms of crystal growth."

14 August. Diffusion (W. E. Brown, *chairman*): O. W. Edwards, "Interferometric measurement of diffusion coefficient in the system CaO-P_2O_5-H_2O"; S. R. Olsen, "Diffusion coefficients of phosphate in soil by transient and steady-state methods."

Chemistry and Physics of Solids

J. J. Hopfield and R. W. Morse are *chairman* and *vice chairman.*

Electron-phonon Interactions

17 August. J. R. Schrieffer, "Elementary excitations in metals"; W. Kohn, "Kohn anomalies"; A. R. Hutson, "Effects of piezoelectric coupling in semiconductors."

18 August. Y. Toyozawa, "Optical line widths"; T. D. Schultz, "The polaron problem"; J. D. Gavenda, "Ultrasonic attenuation in metals."

19 August. M. H. L. Pryce, "The Jahn-Teller effect"; G. W. Robinson, "Radiationless transitions"; L. Kleinman, "Phonon-assisted tunneling in semi- and super-conductors."

20 August. J. H. Van Vleck, "Spin-lattice relaxation in paramagnetic systems"; M. Sparks, "Magnon-phonon interactions"; L. P. Kadanoff, "The effect of lattice coupling on properties of normal metals."

21 August. S. M. Puri, "Phonon drag"; W. Harrison, "The calculations of electron-phonon interactions."

Infrared Spectroscopy

Ellis R. Lippincott is *chairman.*

24 August. D. Dows, "Interactions in dense media; infrared intensities in crystalline solids"; B. Crawford, "ATR"; D. Reddington, "Rotation in condensed phases."

25 August. J. Pliva, "Anharmonic potential functions"; Y. Morino, "Compliance matrices and mean amplitudes"; H. H. Claussen, "Vibrational spectra of inorganic molecules: noble gas compounds."

26 August. T. Miyazawa, "Normal coordinates and frequency assignments in proteins and polypeptides"; G. Zerbi, "Infrared studies of polymers"; L. Bellamy and W. Potts, "Developments in group frequency analyses."

27 August. R. Terhune, "Stimulated Raman"; W. Weltner, "Frozen hot species"; (speaker to be announced), "Current research in USSR."

28 August. J. T. Hougen, "Effect of electronic coupling on vibrational states"; R. M. Hammaker, "Chemisorbed species."

Nonlinear Optics

C. G. B. Garrett and R. W. Terhune are *chairman* and *vice chairman.*

31 August–4 September. John A. Armstrong, "Harmonic generation in injection lasers"; Arthur Ashkin and Gary D. Boyd, "Use of the gas maser for the observation of non-linear optical effects"; John D. Axe, Jr., "Two-quantum transitions within the $(4f)^n$ configuration"; Jacques Ducuing, "Boundary harmonics and a measurement of optical non-linearities"; Peter A. Franken, "The structure of non-linear optical phenomena"; J. A. Giordmaine, "Optically induced coherent molecular and lattice vibrations"; R. W. Hellwarth, "Non-linear effects associated with stimulated Raman scattering"; A. Javan, (subject to be announced); R. Glen Kepler, "Laser-induced excitons in a molecular crystal"; D. A. Kleinman, "Second harmonic generation in very long crystals: the effects of double refraction, absorption and dispersion"; P. D. Maker, "Experimental studies of the third order non-linear optical polarizability tensor"; R. W. Minck, "Optical frequency electrical discharge phenomena in gases"; Robert C. Miller, "Quantitative studies of optical harmonic generation in crystals"; P. M. Platzman, "Non-linear interaction of light in a vacuum"; Boris Stoicheff, "Characteristics of stimulated Raman radiation"; C. H. Townes, "Stimulated Raman effects"; John Ward, "Optical rectifications—the linear electro-optic effects and higher order processes"; E. J. Woodbury, "Experimental techniques for stimulated Raman emission"; H. J. Zeiger, "Recent developments in stimulated Raman emission."

Tilton School

Biochemistry and Agriculture

Ernest G. Jaworski and R. D. O'Brien are *chairman* and *vice chairman*, respectively.

Regulation in biological systems

15 June. Responses to light (William Hillman, *chairman*): S. Beck, "Photoperiod and the control of insect morphogenesis"; J. A. Naegele, "Responses to light in acarids"; J. A. Bergeron, "Ultrastructure and pigments of the photomotor system of *Euglena*"; W. R. Briggs, "Interactions between photomorphogenic and phototropic systems in higher plants"; and Harold W. Siegelman, "Purification and properties of phytochrome, a chromoprotein photoreceptor of higher plants."

16 June. Responses to temperature (A. Glenn Richards, *chairman*): H. Highkin, "Temperature history and influence on plant genetics"; S. M. Siegel, "Interaction of temperature stress with other environmental factors in plant growth and biological behavior"; P. S. Messenger, "Comparison of the effects of constant versus variable temperature incubations on insect development"; E. H. Colhoun, "Adaptation, acclimation and metabolism in insects."

17 June. Control mechanisms (Arthur Galston, *chairman*): Arthur B. Pardee, "Feedback control and repression in microorganisms"; Samuel G. Wildman, "Cell free synthesis of RNA and protein by plant leaves"; F. Kafatos, "An example of cellular metamorphosis in the developing silk moth"; and Hans Laufer, "Chromosomal puffing."

18 June. Control mechanisms (continued) (Arthur Galston, *chairman*): J. Key, "Influence of auxin on RNA metabolism"; Joseph E. Varner, "Gibberellic-acid-controlled synthesis of α-amylase in barley endosperm"; and Colin S. Pittendrigh, "Circadian rhythms."

19 June. Techniques (Seymour Rothchild, *chairman*): R. Loftfield, "The use of pulse labelling tracer techniques in biological systems"; M. Salpeter, "Autoradiography with the electron microscope."

Friction, Lubrication, and Wear

J. K. Appeldoorn and Douglas Godfrey are *chairman* and *vice chairman*, respectively.

22 June. Richard C. Bowers, "Lubrication of plastics"; and Elmer E. Klaus, "Chemical properties of lubricants and additives in boundary lubrication."

23 June. A. W. J. de Gee, "The friction of gold-silver alloys against steel"; E. J. Duwell, "The interaction of abrasive materials with metal surfaces."

24 June. H. E. Ries, Jr., "The structure of monomolecular films"; L. E. St. Pierre, "Chemical effects in boundary lubrication."

25 June. Tibor E. Tallian, "Incomplete elastohydrodynamic lubrication"; W. D. May, "Friction and wear of wood."

26 June. J. F. Archard, "Elastohydrodynamics."

Chemistry and Physics of Space

James R. Arnold and Richard Davies are *chairman* and *vice chairman*, respectively.

29 June–3 July. (Speakers to be announced), "Planetary and lunar surfaces"; "Planetary atmospheres"; "Early evolution of sun and stars"; "Comets"; "Cosmic dust"; "Meteorites"; "X-ray astronomy."

Chemistry of Carbohydrates

Hewitt G. Fletcher, Jr., and Fred Smith are *chairman* and *vice chairman*, respectively.

6 July. Elucidation of the structure of carbohydrates by enzymes (S. Kirkwood, *discussion leader*): S. Kirkwood, "The specificity of some carbohydrases and their use as structural tools"; A. S. Perlin, "Selective enzymolysis of some polysaccharides"; Dexter French, "The complementarity of enzyme specificity and starch-glycogen structure."

7 July. W. J. Whelan, "Enzymic investigation of the fine structures of glycogen and amylopectin"; G. W. Jourdian, "Studies on sialic acid metabolism"; D. L. MacDonald, "Carbohydrate phosphates."

8 July. Ionic derivatives of the carbohydrates (J. V. Karabinos, *discussion leader*): J. V. Karabinos, "Acidic carbohydrate derivatives"; E. F. Paschall, "Cationic polysaccharides"; Derek Horton, "Amino sugars."

9 July. Analytical aspects of carbohydrate chemistry (J. M. Bobbitt, *discussion leader*): J. M. Bobbitt, "Thin-layer chromatography and carbohydrates"; M. B. Perry, "Gas chromatography and carbohydrates"; S. S. Spicer, "Attempts at *in situ* characterization of mucopolysaccharides in mammalian tissues by histochemical methods"; R. Schaffer, "Application of isotopic methods of analysis."

10 July. S. Siggia, "Functional group analysis"; K. Biemann, "Mass spectrometry."

Chemistry and Physics of Isotopes

Peter E. Yankwich and Robert N. Clayton are *chairman* and *vice chairman*, respectively.

13 July. Organic reaction mechanisms and related topics (A. J. Kresge, *chairman*).

14 July. Isotope effects in biochemistry and biology (Henry L. Crespi, *chairman*).

15 July. Isotope separations (William Spindel, *chairman*). *Isotope effects in geochemistry* (chairman to be announced).

16 July. Theory and calculations (Jacob Bigeleisen, *chairman*).

17 July. Research reports (Peter E. Yankwich, *chairman*).

Organic Reactions and Processes

William E. Truce and T. R. Steadman are *chairman* and *vice chairman*, respectively.

20–24 July. M. M. Baizer, "Electrolytic reductive coupling of activated olefins"; K. C. Brannock, "Eneamine chemistry"; G. M. Coppinger, "Hindered phenols"; H. J. Dauben, Jr., "Hydride-transfer reactions"; H. H. Freedman, "Cyclobutadiene derivatives"; J. L. Harper, "Addition reactions with isocyanic acid"; J. Kochi, "Metal ion oxidations"; C. W. Rees, "Novel ring-forming reactions"; G. A. Russell, "Electron-transfer reactions of carbanions"; M. Schmidt, "Sulfur chemistry"; H. G. Viehe, "Electronegatively-substituted acetylenes"; J. F. Bunnett, "Base-catalyzed isomerizations of polyhalobenzenes"; P. L. Jacobs, "Chemistry of allenes."

High-Temperature Chemistry

W. A. Chupka and LeRoy Eyring are *chairman* and *vice chairman*, respectively.

27 July. D. A. Ramsay, "The electronic spectra of species of high temperature interest"; R. F. Barrow, (to be announced); W. Klemperer, "Molecular beam electric resonance spectroscopy"; A. Buchler, "Geometry of high temperature molecules by electric deflection and mass spectrometry."

28 July. K. K. Innes, "The electronic spectra of some molecules containing boron, aluminum, or gallium"; D. R. Lide, "Studies of high temperature species by microwave spectroscopy"; P. W. Gilles, "Mass spectrometric studies of boron sulfides"; J. Drowart, "Mass spectrometric studies of evaporation equilibria and of the kinetics of gas-solid reactions."

29 July. J. S. Anderson, "The role of non-stoichiometry in high temperature reactions"; B. Hyde, "Order, stoichiometry and reactivity in metal oxides"; C. E. Birchenall, "Chemical interdiffusion in binary alloys."

30 July. J. N. Smith, "Studies of gas-surface interactions utilizing modulated molecular beam techniques"; J. D. McKinley, "Surface orientation effects in nickel-halogen reaction kinetics"; (speaker and subject to be announced).

31 July. T. M. Sugden, (subject to be announced); T. B. Reed, "Properties, generation and uses of plasmas at thermal equlibrium."

Biopolymer-Solvent Interactions and the Structure of Liquids

Jake Bello is *chairman.*

3–7 August. John R. Cann, "Theory of transport of interacting systems of macromolecules"; John Hearst, "Isopiestic determination of hydration of DNA"; Maurice Huggins, "Theory of polymer-solvent interactions"; Oleg Jardetzsky, "Investigation of biopolymer hydration by nuclear magnetic resonance"; Michael Laskowski, Jr., "Volume of exclusion as a tool in topological studies of globular proteins"; Max Lauffer and Charles Stevens, "Hydration and endothermic polymerization of tobacco mosaic virus protein"; William P. Jencks, "Peptide-salt interactions"; Jerome R. Vinograd, "Buoyant behavior of solvated biological macromolecules"; Phillip Wahl, "Fluorescence depolarization in protein solutions"; Harold A. Scheraga, "Hydrophobic bonding in proteins"; Wilfried Heller, "Absorption isotherms of water and ethanol vapors on proteins"; Kozo Hamaguchi, "Denaturation of lysozyme"; Oktay Sinanoglu, "Solvent denaturation of DNA"; George Brady and Ronald Salobey, "X-ray studies on the conformation of polymers in solution"; Walter Englander and Peter von Hippel, "Hydrogen exchange and polyneucleotides and proteins."

Organic Photochemistry

Anthony M. Trozzolo is *chairman.*

10 August. G. Porter, "Reactivity of excited states of carbonyl compounds"; N. C. Yang, "Photochemical reactions of carbonyl compounds in solution."

11 August. (G. M. Wyman, *discussion leader*): O. L. Chapman, "Photochemical rearrangement of unsaturated ketones"; G. W. Griffin, "Photochemistry of maleic and fumaric acid derivatives and related derivatives"; G. O. Schenck, "Photosensitization and recent advances in photochemical cycloaddition yielding carbocyclic and heterocyclic compounds."

12 August. H. E. Gunning, "Reactions of sulfur atoms and sulfur-containing biradicals"; J. R. McNesby, "Photolysis of hydrocarbons"; E. F. Ullman, "Reversible photochemical valence tautomerizations of epoxy-ketones."

13 August. (L. H. Piette, *discussion leader*): R. Livingston, "Use of kinetic measurements in determining reaction mechanisms and transition probabilities"; E. Wasserman, "Electron spin resonance of triplet molecules"; R. Srinivasan, "Photochemical reactions of olefins catalyzed by π-complexes."

14 August. (J. P. Paris, *discussion leader*): A. H. Weller, "Mechanisms of fluorescence quenching"; S. P. McGlynn, "Charge-transfer in excited states."

Geochemistry: Water

K. O. Emery and John M. Hunt are *chairman* and *vice chairman*, respectively.

17 August. H. S. Frank, "Structure of water"; P. F. Low, "Water near mineral surfaces"; L. G. Sillen, "Chemical activity of water."

18 August. Bostwick H. Ketchum, "Distribution of properties of sea water"; I. K. Barnes, "Hydrologic systems"; H. D. Holland, "Geological history of water."

19 August. E. Steemann Nielsen, "Organic productivity of waters"; N. G. Jerlov, "Dissolved and suspended organic matter"; Sam Epstein, "Stable and unstable isotopes in water."

20 August. M. C. Powers, "Interstitial waters of sediments"; D. E. White, "Evolution of ground waters"; W. G. Zarrella and R. Mousseau, "Oil field brines."

21 August. Panel summary discussion.

Chemistry and Metallurgy of Semiconductors

P. I. Pollak and G. A. Wolff are *chairman* and *vice chairman*, respectively.

24 August. J. Hornstra, D. G. Thomas, S. Amelinckx, "Defects in semiconductors."

25 August. N. Holonyak, Jr., and R. H. Rediker, "Injection luminescence in semiconductors"; J. P. Suchet, "The crystallochemical model."

26 August. O. H. LeBlanc, Jr., R. G. Kepler, M. Silver, "Conduction phenomena in molecular crystals."

27 August. H. C. Gatos, "Semiconductor surfaces"; B. J. Kolomiyets (subject to be announced); A. R. Regel (subject to be announced).

28 August. W. Paul and M. Banus, "Semiconductors at high pressure."

Ionic Movements and Interactions in Biological, Chemical, and Physical Phenomena

George Eisenman is *chairman.*

31 August. (F. Helfferich, *discussion leader*): T. Teorell, "Transport processes in ionic membranes and excitability phenomena"; P. Meares, "The interactions of ionic fluxes across a cation-selective membrane." (A. K. Solomon, *discussion leader*): C. Bean, "Diffusion and potentials in membranes with small pores"; H. Passow, "Interactions between convection and diffusion in tubes."

1 September. (F. Snell, discussion *leader*): R. Schlögl (subject to be announced); R. H. Doremus, "Interdiffusion of ions in glass." (O. Kedem, *discussion leader*): R. M. Barrer, "Cation migration in porous crystals", R. J. Charles, "Filimentary diffusion pads in glass."

2 September. (R. M. Garrels, *discussion leader*): G. Eisenman, "Some atomic interactions underlying ionic specificity"; D. Reichenberg, "Interactions underlying ion-exchange selectivity." (J. Moore, *discussion leader*): K. S. Cole, "Electrodiffusion in cell membranes"; P. Horowicz, "Movement of ions across muscle membranes."

3 September. (J. Tobias, *discussion leader*): J. L. Kavanau, "A theory of biological membrane transformations regulated by cation displacements"; I. Tasaki, "Electrochemical behavior of intracellularly perfused squid axons." (A. M. Monnier, *discussion leader*): D. C. Tosteson, "Structural and functional components of the red cell membrane"; A. Rothstein, "Cation specificity in transport systems of yeast."

4 September. (L. J. Mullins, *discussion leader*): D. Goldman, "Membrane structure, phospholipids, and electrical characteristics"; F. Conti, "The role of membrane structure on electrical potentials and ionic fluxes."

Proctor Academy

Biomathematics

Otto Schmitt is *chairman.*

13–17 July. (Speakers to be announced.) "Strategies for automated analysis of cardiovascular data"; "Generalization of transfer function theory applicable to biomedical studies"; "Models of bioperiodicity"; "Patterns discovering and recognizing systems"; "Phase spaces and generalized vectorial representation for biomedical problems"; "Mathematical models for tissue impedance and its measurement"; "The problem of automated medical diagnosis"; "Theoretical studies of information retrieval systems."

Biological Regulatory Mechanisms

Werner K. Maas and Bernard Horacker are *co-chairmen.*

20 July. B. Ames, P. Slonimski, B. Magasanik, N. Otsuji, "Regulation of enzyme synthesis in microorganisms."

21 July. H. Kornberg and J. Mandelstam, "Control of metabolism in microorganisms"; R. Shimke, H. C. Pitot, "Control of metabolism in cells of higher organisms."

22 July. O. Maaløe and S. Hnilica, "Replication of the genetic material"; G. Stent, F. Neidhardt, R. Lavalle, "Regulation of RNA synthesis in microorganisms."

23 July. A. Campbell and R. Thomas, "Control mechanisms in phage formation"; M. Sussman, "Differentiation in lower forms."

24 July. J. Tata and W. Beerman, "Hormones in growth and development."

Forthcoming Events

The scheduled sessions of the 15th International Astronautical Congress (7–12 September, Warsaw, Poland and their chairmen are:

Problems of Manned Lunar Exploration

Flight Programs (trajectory studies and rendezvous problems for a lunar mission):