# Gordon Research Conferences

Alexander M. Cruickshank

The Gordon Research Conferences for the summer of 1981 will be held in New Hampshire and California.

*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. 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. Sufficient time is available to stimulate informal discussion among members of each conference. In addition, scientists in related fields become acquainted and valuable associations are formed that often result in collaboration and cooperative efforts among laboratories. Meetings are held in the morning and 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.

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

In order to protect individual rights and to promote discussion it is an established requirement of each conference that no information presented is to be used without specific authorization of the individual making the contribution, whether in formal presentation or in discussion. Scientific publications are not prepared as emanating from the conferences. The recording of lectures by tapes and so forth and the photography of slides are prohibited.

*Registration and Reservations:* Individuals interested in attending the Conferences are requested to send their applications to the office of the Director. It is important that you submit your application promptly in order that it may be given early consideration by the review committee. This is particularly necessary for those conferences which are customarily oversubscribed and for which it is often necessary to establish a waiting list.

Applications must be submitted in duplicate on the standard application form which may be obtained from the office of the Director. This procedure is important because certain specific information is required in order that a fair and equitable decision may be made on the application. 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 chairperson for that conference. This chairperson will review the applications and select applicants so as 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 is required for each conference and is completed on receipt of the registration card and the full fixed fee which is required in *Advance of all participants and guests*. The advance payment is also required from scientists arriving in the United States from foreign countries and should be made payable through a U.S. bank in U.S. dollars. Checks are to be made payable to the Gordon Research Conferences.

*Card must be returned 3 weeks prior to the conference with the advance payment or the approved application may be cancelled.* A registration card not accompanied by the advance payment will not be accepted.

As you know, most conferences are over-subscribed, therefore, I am sure that you can appreciate our problems with scientists who are qualified to attend but who have been placed on a waiting list. *Please return your card immediately with the advance payment to assure your attendance and accommodations.*

*Special Fund:* A special fund is provided from the registration fee and is made available to the chairperson 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 chairperson as a speaker or discussion leader. The money is to be used as an assistance fund only and may be used to contribute toward conferees' travel expenses, registration fee, and/or subsistence expenses at the conference, or both. Total travel and subsistence expenses usually will not be provided.

The Board of Trustees of the Conferences has established a fixed fee for all resident participants (speakers, discussion leaders, and conferees) at each conference. This fee was established to encourage attendance for the entire conference and to provide the Special Fund which is available to each conference chairperson. The fixed fee will be charged regardless of the time a participant (speakers, discussion leaders, and conferees) attends a conference—that is, for the periods of from 1 to $4\frac{1}{2}$ days.

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

*Cancellation:*

A. Conferees: All but $40 of the fixed fee will be refunded if an approved application is canceled not later than 2 weeks prior to the conference.

B. Guests: Accommodations (room and meals) are available for guests. (Children must be 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, will be assigned in the order that specific requests are received. The charge for room and meals for guests for five conference nights is indicated in the fixed conference fee schedule. Full refund will be made if cancellation is received 2 weeks prior to the conference; otherwise, $40 will be forfeited. Guests are not permitted to attend the conference lectures or discussion groups.

The author, director of the Gordon Research Conferences, is professor of chemistry, Pastore Chemical Laboratory, University of Rhode Island, Kingston, Rhode Island 02881.

Pets are prohibited at the Conference sites.

*Program:* The complete program for the 1981 Gordon Research Conferences will be published in *Science*, 13 March 1981. Reprints are available on request.

Requests for applications to the Conferences, or for additional information should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Pastore Chemical Laboratory, University of Rhode Island, Kingston, Rhode Island 02281. Telephone 401-783-4011 or 401-783-3372.

Mail for the office of the Director from 8 June to 21 August 1981 should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Colby-Sawyer College, New London, New Hampshire 03257. Telephone: 603-526-2870.

**Fixed Conference Fees—1981**

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|---|---|
| *New Hampshire* | |
| Conferee (double occupancy) | $220 |
| Nonresident conferee (meals, no room) | $180 |
| Guest (room, meals) | $160 |
| *California* | |
| Conferee (double occupancy) | $280 |
| Conferee (single occupancy) | $350 |
| Guest (double occupancy) | $220 |
| Guest (single occupancy) | $290 |

## Adhesion, Science of

*New Hampton School*

Michael L. Hair, chairperson; L. T. Drzal, vice chairperson.

*17 August.* (F. Fowkes, chairperson): R. Thomas, "ESCA, FRESCA and polymer layers"; J. Barlow, "Interfaces and polymer blends"; H. Schrieber, "Surface modification of materials by microwave plasma polymerization processes"; H. Yasuda, "Plasma polymer primer coatings for water-resistant adhesion of polymers to metal surfaces."

*18 August.* (J. Kenney, J. Kelber, chairpersons): A. Roberts, "Adhesion of rubber to ice"; S. Senturia, "The charge-flow transistor: Device for cure monitoring and moisture sensing." Afternoon session—Posters. A. Gent, "Fracture mechanics for model composites"; L. DeMejo, "Wetting and peel behavior of amorphous polymers."

*19 August.* (H. Schonhorn, L. Drzal, chairpersons): E. Goddard, "Polymer-surfactant interactions"; R. Doremus, "Hydration and surface layers on glass surfaces"; E. Plueddemann, "Bonding through silane-modified interpenetrating polymer networks (IPNs)." (L. Drzal, chairperson): Short presentations.

*20 August.* (G. Hardy, R. Draughn, chairpersons): P. Julien, "Electrostatic charge on composite particles"; B. Vincent, "Particle-particle adhesion: Steric versus electrostatic forces"; F. Grinnell, "Cell adhesion to surfaces: The fibronectin connection."

*21 August.* (G. Kratchevsky, chairperson): G. van Campen, "Adhesion to skin"; D. Cheever, "Analysis and use of contact angle measurements in the adhesion of paints and plastics."

The poster session will be held on Tuesday afternoon. Applicants to this conference are asked to signify their intent to present a poster and preference will be given to participants. On Wednesday evening, some time will be set aside for group discussion of selected posters or short presentations. Further information may be obtained from L. Drzal (513-255-2952) or M. L. Hair (416-828-6200).

## Analytical Chemistry

*New Hampton School*

Frederick Brech, chairperson; Gary M. Heiftje, vice chairperson.

*10 August.* (John Travis, discussion leader): Mary J. Wirth, "Spectroscopic measurements of molecular dynamics using picosecond lasers." (Merle Evenson, discussion leader): George G. Guilbault, "Ultra trace determinations in biological materials." (Gary M. Heiftje, discussion leader): Jon C. Vanloon, "Elemental speciation—a new era in analytical atomic spectrometry."

*11 August.* (Lockhart B. Rogers, discussion leader): J. Jack Kirkland, "Recent developments in sedimentation field-flow fractionation." (James W. Robinson, discussion leader): John C. Wright, "Improved selectivity for fluorescence analysis using laser techniques." (Merle Evenson, discussion leader): Michael W. Hunkapillar, "Protein sequencing at picomolar levels."

*12 August.* (F. Donald Bloss, discussion leader): Robert Muggli, "Modern microscopy." (Csaba Horvath, discussion leader): Barry L. Karger, "New developments in reverse phase chromatography"; Georges Guiochon, "Bi-dimensional column chromatography."

*13 August.* (Edwart Chait, discussion leader): Velmer A. Fassel, "Analytical spectroscopies of the 1980's: ICP-MS, APAN, and even LESS." (Tomas Hirschfield, discussion leader): Ray Rogers, "Analytical studies on the Shroud of Turin." Gordon Research Conferences Golden Jubilee Year: Neil Gordon, Jr., "My dad—a few family reminiscences"; George M. Morrison, "50 years of analytical chemistry."

*14 August.* (James W. Robinson, discussion leader): Fred Fricke, "Innovative analytical chemistry for the management of toxic and nutrient materials"; Gary M. Heiftje, "1982, GRC analytical chemistry session."

## Analytical Pyrolysis

*Holderness School*

Henk L. C. Meuzelaar, chairperson; Fred Shafizadeh, vice chairperson.

*13 July.* Humification and diagenesis (A. L. Burlingame, discussion leader): J. M. Bracewell, "Recent Py-MS and Py-GC/MS studies of humification in podzolic soils"; Jan W. de Leeuw, "Diagenesis and origin of sedimentary organic matter as revealed by analytical pyrolysis." Characterization of coals and shales (A. G. Douglass, discussion leader): N. E. Vanderborgh, "Pyrolysis of coals and shales"; S. Larter, "Applications of analytical pyrolysis to fossil fuel exploration and exploitation."

*14 July.* Biomass and geopolymer conversion mechanisms (G. R. Hill, discussion leader): F. Shafizadeh, "Formation and reactivity of cellulosic chars"; J. H. Futrell, "Kinetics of primary thermal fragmentation reactions in kerogens." Biomedical studies (H. R. Schulten, discussion leader): T. H. Risby, "Linear programmed thermal degradation mass spectrometry of biopolymers"; J. Haverkamp, "Curie-point pyrolysis—mass spectrometry studies on biopolymers and cell fractions."

*15 July.* Structure of synthetic polymers (I. N. Einhorn, discussion leader): S. Tsuge, "Structural characterization of various polyamides by pyrolysis—glass capillary gas chromotography"; S. Liebman, "Micro-structural characterization of polymers." Industrial applications (C. J. Wolf, discussion leader): E. J. Levy, "Analytical pyrolysis in the industrial environment. Instrumentation and methodology"; R. P. Lattimer, "The formation of smoke, char, and volatile pyrolyzates from poly (vinyl chloride) and the functional role of smoke retarded additives."

*16 July.* Computerized data processing (A. M. Harper, discussion leader): C. S. Gutteridge, "Handling pyrolysis data by discriminant analysis"; W. Windig, "The application of factor analysis and discriminant analysis of pyrolysis–mass

spectra of yeasts." Special conference lecture (C. E. R. Jones, discussion leader): D. O. Hummel, "History of pyrolytic processes."

*17 July*. New techniques (F. Vastola, discussion leader): M. P. Sinha, "Analysis of aerosol particles by mass spectrometry"; H. L. C. Meuzelaar, "Development of a modular Curie-point MS system."

**Animal Cells and Viruses**

*Tilton School*

Thomas Kelly, chairperson; George Khoury and Barbara Hamkalo, co-vice chairpersons.

*22 June*. Synthesis and processing of messenger RNA (P. Sharp, chairperson.) Regulation of gene expression (D. Nathans, chairperson).

*23 June*. Biosynthesis, structure, and function of viral envelopes (A. Helenius, chairperson). Replication of viral genomes (K. Berns, chairperson).

*24 June*. Tissue culture models for differentiation (E. Scolnick, chairperson). Interactions between viral and cellular genomes (M. Bishop, chairperson).

*25 June*. Viral oncogenesis (D. Baltimore, chairperson). Pathogenic mechanisms and host defenses (P. Choppin, chairperson).

*26 June*. Gene transfer into eukaryotes (J. Sambrook, chairperson). There will be poster sessions to which all conference participants are invited to contribute.

**Athersclerosis**

*Kimball Union Academy*

DeWitt S. Goodman and Donald M. Small, co-chairpersons.

*22 June*. Integrated studies of atherosclerosis in nonhuman primates. Clinical aspects, pathology, lipoproteins, cellular metabolism, and physical chemistry (D. M. Small, chairperson): Thomas Clarkson, Lawrence Rudel, Richard St. Clair, Donald M. Small, speakers. Lipids and lipoproteins of the atherosclerotic arterial wall (Henry McGill, chairperson): Saul Katz, "Changes in composition and physical state of lipids of the arterial wall during progression and regression of atherosclerosis"; Henry Hoff, "Studies on the lipoproteins of the arterial wall."

*23 June*. Cholesterol, cell growth, and HMG-CoA reductase (DeWitt S. Goodman, chairperson): David Gibson, "HMG-CoA reductase and its regulation"; Andrew Kandutsch, Alfred Alberts, discussants; Marvin Siperstein, "Mevalonate and cell growth"; John Glomset, John Watson, discussants. Arterial wall cells and mitogens I (Yechezkiel Stein, chairperson): Michael Gimbrone, "Endothelial cells"; Steven Schwartz, "Growth control and the endothelium"; Russell Ross, Kevin Glenn, "Monocyte-macrophage derived growth factor."

*24 June*. Arterial wall cells and mitogens II (Linda Slakey, chairperson): Colin Schwartz, Monocyte-macrophage in atherogenesis"; Olga Stein, "Interactions between macrophages and smooth muscle cells in culture"; Ake Wasteson, Carl Henrick Heldin, "Platelet-derived growth factor (PDGF)"; Harry Antonaides, Russell Ross, Thomas Deuel, discussants. Lipoprotein and lipoprotein receptors (Daniel Steinberg, chairperson): Larry Witte, "PDGF and the LDL receptor"; Joseph Goldstein, "Hepatic and extrahepatic lipoprotein receptors"; Robert Mahley, discussant.

*25 June*. Apo-E and apo-E lipoproteins (Richard Havel, chairperson): Richard Deckelbaum, Conrad Blum, "Studies of lipoprotein metabolism and apo-E in *a*-betalipoproteinemia"; Lawrence Chan, "Studies on the synthesis of apoliproprotein E"; Karl Weisgraber, "Structure and function of apoliproprotein EE"; Jan Breslow, discussant. Risk factors and intervention in human atherosclerosis (chairperson to be announced): William Castelli, "Risk factors in human atherosclerosis"; Michael Oliver, "Current status of intervention in atherosclerosis."

*26 June*. Lipoprotein receptors and sterol transport into bile (John Dietschy, chairperson): James Shepherd, "The induction of LDL receptors in the liver by the use of bile acid binding resins"; Stevent Turley, "The relation of HDL and LDL receptors, hepatic cholesterol synthesis and biliary secretion"; Julian Marsh, Charles Sparks, "Is intestinal apo-B a ligand for hepatic uptake of chylomicron remnants?"

**Atomic Physics**

*Brewster Academy*

Stephen R. Lundeen, chairperson; Hugh Kelly, vice chairperson.

*6 July*. Charles Rhodes, "Eximer lasers and their applications to spectroscopy"; Sven Hartman, "Relaxation measurements via tri-level photon echos"; Linn Mollenauer, "Color center lasers: Their basic physics and applications in atomic physics"; Kurt Gottfried, "Atomic spectroscopy in a new guise: The spectra of massive quark–anti-quark systems."

*7 July*. Walter Johnson, "Correlation effects in highly charged atoms"; Berned Crasemann, "Threshold excitation of atomic inner shells"; Larry Spruch, "Pedagogical notes on some ramifications of Thomas-Fermi theory: Atoms, stars, and matter"; Oscar Vilches, "Atoms near surfaces."

*8 July*. Carl Lineberger, "Photodetachment threshold processes"; Aaron Temkin, "Two-electron photodetachment and electron-atom ionization threshold law"; James Samson, "Fluorescent studies of doubly excited states of helium"; Dave Wineland, "Experiments with trapped ions and electrons."

*9 July*. Elisabeth Giacobino, "Precision optical spectroscopy in $He_3$"; Steve Lundeen, "Experimental studies of high angular momentum Rydberg states of helium"; Joseph Eberly, "Computer movies: An evolving tool in physics research."

*10 July*. Lewis Cocke, "Collisions involving highly charged low-energy projectiles studied using a secondary ion recoil source"; Michel Barat, "Similarities in ion-molecule and ion atom collision mechanisms at kilovolt energies"; A. Niehaus, "Coherence effects in electron emission by atoms."

**Bacterial Cell Surfaces**

*New Hampton School*

Maxime Schwartz and Moselio Schaechter, co-chairpersons.

*29 June*. Structure of envelope proteins (J. Rosenbusch, session chairperson); Functions of outer membrane proteins (V. Braun, session chairperson).

*30 June*. Entry of macromolecules into bacterial cells (E. B. Goldberg, session chairperson); Synthesis and regulation of envelope proteins (M. Inouye, session chairperson).

*1 July*. Membrane biogenesis and protein secretion I (M. J. Osborn, session chairperson); Membrane biogenesis and proteins secretion II (M. Schwartz, session chairperson).

*2 July*. Ektobiology I (L. Leive, session chairperson); Ektobiology II (S. Razin, session chairperson).

An application blank for attendance at the Gordon Research Conferences may be found on page 1229. A summary of the program is on pages 1208 and 1209.

*3 July*. Murine synthesis, antibiotics, and binding proteins (D. Mirelman, session chairperson).

**Biological Regulatory Mechanisms**

*Holderness School*

Jon Beckwith and Ray Gesteland, chairpersons.

*22 June*. New frontiers in bacterial regulatory mechanisms (Jon Beckwith, chairperson). Global control mechanisms (Susan Gottesman, chairperson).

*23 June*. Regulatory signals and the control of transcription (Jan Pero, chairperson). Regulation of gene expression in eukaryotic systems (Kenneth Paigen, chairperson).

*24 June*. Genetic rearrangements in gene control (Andrew Wright, chairperson). Control at the translation level (Ray Gesreland, chairperson).

*25 June*. Regulation of and by hormones and growth factors (Keith Yamamoto, chairperson). Membrane and organelle biogenesis (Harvey Lodish, chairperson).

*26 June*. Chromatin (John Sedat, chairperson).

All speakers to be announced.

**Biomaterials, Science and Technology of**

*Tilton School*

J. Lemons, chairperson; W. Zingg, vice chairperson.

*27 July*. Bonding and adhesion to calcium hydroxyapatite (S. Bayne, chairperson): D. Smith, "Chemical"; D. Retief, "Mechanical"; E. Lautenschlager, "Bone cement." Short papers on current research (W. Zingg, chairperson).

*28 July*. Biodegradation phenomenon —materials (R. Buchanan, chairperson): R. Buchanan, "In vitro"; N. Greene, "In vivo versus in vitro." Biodegradation phenomenon—in vivo response (J. Black, chairperson): K. Merritt, "Biological responses"; D. Williams, "Interfaces."

*29 July*. Materials, interface, and animal models for cardiovascular (S. Barenberg, chairperson): H. Allcock, "Biocompatible polyphosphazenes"; J. Falender, W. Boley, "Silicone polyblends"; D. Coleman, "Blood-material interface"; W. Dodds, "Animal models." Small diameter vascular replacements (R. Daniel, chairperson): A. Callow, "Platlet-graft interactions"; W. Burkel, "Self seeding"; R. White, "Porosity compliance."

*30 July*. Interfaces (P. Bajpai, chairperson): B. Ratner, "ESCA studies"; C. Robertson, "TIRF-protein absorption." General audience presentation (J. Lemons, chairperson): R. Daniel, "Microsurgery."

*31 July*. New research methods (J. Anderson, chairperson): D. Gibbons, "Recent approaches to cellular and humoral interactions"; M. Spector, "E.M. characterization of cells."

**Bones and Teeth, Biochemistry and Physiology of**

*Kimball Union Academy*

H. Clarke Anderson, chairperson; Louis V. Avioli, vice chairperson.

*13 July*. Calcium-binding protein and calmodulin: H. C. Anderson, welcome and introduction. Overview of CaBP and calmodulin research (Robert Wasserman, chairman); Eric Windhager, "Na-Ca interaction in transporting epithelia"; Frank L. Siegel, "Recent development in elucidation of calmodulin structure and function"; Geoffrey W. G. Sharp, "Involvement of calcium in insulin secretion"; submitted posters: Louis Avioli, chairperson.

*14 July*. Cell-mediated calcification and matrix vesicles: Overview (S. Y. Ali, chairperson): Hubert A. Sissons, "Calcification and ossification"; Russell Cecil, "Freeze-fracture studies of mineralization in cartilage and bone"; James Craig-Gray, "Ultracryomicrotomy and EM-probe analysis of mineralization in growth plate cartilage"; (discussants: Carol V. Gay and William Landis). H. K. Vaahanen, "Role of matrix vesicle phosphatase in mineralization"; (discussant: H. H. T. Hsu). Role of lipids in calcification: Synoposis and overview, (James Irving, chairperson): Barbara Boyan-Salyers, "Calcifying proteolipid in bones and calcifying oral bacteria"; (discussant: Roy Wuthier). Adele Boskey, "Ca-phospholipid-$PO_4$ complexes: Relation to mineralization front and atherosclerotic calcification."

*15 July*. Proteoglycans in calcification: Synopsis and overview (Klaus Keuttner, chairperson): Lawrence Rosenberg, "Role of proteoglycans in endochondral ossification"; (discussant: Robin Poole). David Howell, "Lysozyme-proteoglycan interactions"; Dick Heinegard, "Role of proteoglycans in cartilage calcification." Post-fetal bone cell differentiation: Synopsis and overview (Marshaw R. Urist, chairperson): A. J. Friedenstein, "Osteoprogenitor cells"; (discussants: M. Owen and Hirokatsu Hanamura). Mark Connover, "Characterization of diffusible dentin morphogenetic protein"; (discussant: James Triffit).

*16 July*. Membrane receptors for PTH and calcitonin: Synopsis and overview (Claude Arnaud, chairperson): Ribert Nissenson, "Renal and skeletal receptors for parathyroid hormone: Discriminator and transducer properties"; Michael Rosenblatt, "Structure-activity relations for parathyroid hormone: A functional map of the hormone molecule"; David Goltzman, "Calcitonin receptors: Localization and biochemical characteristics." Maureen Owen, Introduction of honorary chairperson. Remarks (Janet Vaughn, honorary chairperson): Ernst Beerstecher, "Dentistry in the Old West."

*17 July*. Cartilage destruction in rheumatoid arthritis: Introduction (David Howell, chairperson): Steven Krane, "Cellular and humoral factors which modulate collagenase and $PGE_2$ production by rheumatoid synovial cells"; (discussant: Graham Russell). Edward Harris, "Inhibitors of mammalian collagenase found in human fibro- and articular cartilage"; (discussant: Mary McGuire).

A poster session will be held Monday evening, 13 July. Posters will be selected from abstracts which may be sent to Dr. Louis Avoili, Jewish Hospital of St. Louis, 216 South Kingshighway, St. Louis, Missouri 63124.

**Calcium Phosphates**

*Plymouth State College*

George Nancollas and John A. Gray, co-chairpersons.

*22 June*. (J. C. Heughebaert, chairperson): A. S. Posner, "Precursors in the precipitation of biological and synthetic hydroxyapatites"; G. Nancollas, "Calcium phosphate crystallization—some epitaxial considerations." (J. Jurinak, chairperson): G. Montel "The crystal growth of apatites and the effects of high pressure and temperatures on the crystal chemistry of phosphates"; R. Jahnke, "Current phosphorite formation and solubility of carbonate fluorapatite."

*23 June*. (W. I. Higuchi, chairperson): J. D. B. Featherstone, "The acid reactivity of carbonated-apatites with metal and/or fluoride substitutions"; J. Christoffersen, "A nucleation mechanism explaining the rate of dissolution of calcium hydroxyapatite and the effects of some inhibitors." (E. C. Moreno, chairperson): J. Arends, "The dissolution of carbonate-containing hydroxyapatite single crystals"; P. Somasundaran, "Surface

charge characteristics of apatite and the role in interfacial processes."

*24 June*. (M. D. Francis, chairperson): A. Miller, "Location of hydroxyapatite in mineralized and mineralizing collagen"; M. D. Grynpas, W. D. Landis, "Biological mineralization explored by diffraction spectroscopic and electron optical methods." (J. A. Gray, chairperson): Poster presentations: F. C. M. Driessens, "Some physical properties of Na- and $CO_3$-containing apatites"; E. D. Eanes, "X-ray absorption studies on calcium in crystalline and amphorous calcium phosphates"; E. Arvin, "Calcium phosphate precipitation in biofilms attached to solid surfaces"; H. Furedi-Milhofer, "Precipitation in systems supersaturated with calcium phosphates and calcium oxalates"; J. Fox, "Dissolution kinetics of hydroxyapatite"; N. Blumenthal, "Effect of cartilage proteoglycans of hydroxyapatite precipitation." Submissions for additional poster presentations are invited. Please submit to J. A. Gray, International Association for Dental Research, 734 15th Street, N.W., Washington, D.C. 20005.

*25 June*. ( E. S. Etz, chairperson): J. P. Yesnowski, "New NMR techniques in the study of phosphate chemistry"; R. A. Young, "Multi-method study of differences among differently prepared 'hydroxyapatites.' " (W. E. Brown, chairperson): J. R. Lehr, "Optical crystallography: Application to phosphates."

*26 June*. (R. Z. LeGeros, chairperson): Speaker to be announced, "The fluoresence properties of apatites"; H. Newesely, "Recent progress in calcium phosphates for implantology."

## Cancer

*Colby-Sawyer College*

Leila Diamond, chairperson; Paul Black, vice chairperson.

### Regulatory Mechanisms in Carcinogenesis

*17 August*. New models of malignancy: Robert Schimke, "Gene amplification"; William Hayward, "Promoter insertion"; Robert Wineberg, "Cloning of transforming genes"; Narendra Yadav, "Grown gall plasmid"; Leo Sachs, "Constitutive gene expression"; William Haseltine, "Human indicator sequence for DNA damage."

*18 August*. Cell differentiation: Nicole Le Douarin, "Erythropoietic stem cells"; Charlotte Friend, "Murine erythroleukemia"; Audrey Evans, "Spontaneous regression of human neuroblastoma." Immune mechanisms: Richmond Prehn, "Immune surveillance"; Margaret Kripke, "UV-induced suppressor cells"; Hilary Koprowski, "Monoclonal antibodies for diagnosis and therapy."

*19 August*. Membrane signals: Robert Gallo, "T cell growth factor"; Richard Anderson, "Receptor recycling"; Peter Blumberg, "Phorbol ester receptors." DNA repair and cellular recovery mechanisms: Philip Hanawalt, "Excision repair"; Robert Painter, "Radiosensitivity in *Ataxia telangiectasia*"; William Summers, "Herpesvirus recombination and repair."

*20 August*. Cocarcinogenic interactions: Henry Pitot, "Hepatocarcinogenesis"; Wolf Szmuness, "Hepatitis B virus"; Daniel Medina, "Mammary gland carcinogenesis."

*21 August*. Cocarcinogenic interactions: Herbert Rosenkranz, "Nitroarenes"; John Totter, "Oxygen metabolism"; William Jarrett, "Bovine papillomatosis."

## Carbohydrates, Chemistry of

*Tilton School*

Paul A. Sandford, chairperson; Walter A. Szarek, vice chairperson.

*29 June*. (R. H. Marchessault, moderator): G. A. Jeffrey, "The use of diffraction methods and molecular mechanics for determining the conformation of carbohydrates"; H. Chanzy, "Crystallization of polysaccharides." (W. W. Zajac, Jr., moderator): G. Descotes, "Photochemical reactions at the anomeric center of carbohydrates"; J. Freschet, "Polymers as aids in organic synthesis."

*30 June*. (S. Hanessian, moderator): T. Makaiyama, "New synthetic reactions in carbohydrate chemistry"; K. B. Sharpless, "Metal-catalyzed selective oxygenation and amination of olefins." (R. W. Jeanloz, moderator): N. Sharon, "Carbohydrate protein interactions of biomedical importance"; H. Schachter, "Oligosaccharide comformation and control of glycoprotein synthesis."

*1 July*. (T. Nagabushan, moderator): J. D. Baldeschwieler, "Targeting of phospholipid vesicules in vivo using synthetic glycolipid determinants"; W. A. Szarek, "Positron-emitting radiopharmaceuticals as probes for metabolism." (G. O. Aspinall, moderator): W. J. Whelan, "The biogenesis of glycogen"; H. E. Conrad, "New approaches for the structural analysis of sulfated glycoaminoglycans."

*2 July*. (H. J. Jennings, moderator): L. D. Hall, "Applications of NMR to carbohydrate chemistry." (J. R. Vercellotti, moderator): Gary D. McGinnis, "Recent advances in chromatography of carbohydrates." (M. Mandels, moderator): G. Tsao, "Recent advances in production of alcohol from cellulosic materials"; W. M. Doane, "Polysaccharides as raw materials for chemicals."

*3 July*. (D. Horton, moderator): A. H. Haines, "In; out-isomerism in macrobicylic polyethers"; G. Lukacs, "Natural product synthesis from carbohydrates." (B. Lindberg, moderator): L. Keene, "Structure and conformation of capsular antigens"; B. Casu, "Polysaccharide characterization by enzyme and NMR methods."

Poster sessions will be held throughout the week. All attendees are encouraged to participate. Maximum space available for individual posters is 4 by 8 feet. Poster presentation materials will be available at the conference if necessary.

## Catalysis

*Colby-Sawyer College*

Jule A. Rabo, chairperson; Albert Vannice, vice chairperson.

*22 June*. Hermann K. Beyer, "Substitution of framework aluminum by silicon in Y zeolites and catalytic properties of the obtained high silica zeolite"; Peter A. Jacobs, Jens Weitkamp, "Shape-selective hydroconversion of paraffins over high-silica pentasil-type zeolites"; Warren W. Kaeding, "Para selective alkylation and disproportionation reactions over shape selective zeolite catalysts"; John Dewing, "Nu-1 and Fu-1. Two new, high silica zeolites."

*23 June*. Michel Boudart, "Hydrogenation of cyclohexene on clean and poisoned metal surfaces"; L. Louis Hegedus, "Catalyst poisoning—theory and experiment"; F. M. Dautzenberg, "Catalyst deactivation by poisoning and pore plugging during hydroprocessing of petroleum residues."

*24 June*. Gabor A. Somorjai, "The structure and reactivity of organic and metal monolayers on platinum. The building of new metal catalysts"; J. W. E. Coenen, "Dynamics of the methanation of carbon monoxide on nickel catalysts"; Vladimir Ponec, "The selectivity of alloys in hydrocarbon reactions."

*25 June*. Herman Pines, "The use of organic probes as a tool to determine the nature of catalytic sites"; Claude Naccache, "Support and/or additive effects on group VIII metal catalysts"; Yoshiharu Izumi, "The characteristics of nick-

el catalysts modified with tartaric acid and NaBr."

*26 June*. Kamil Klier, "Structure and selectivity of metal-oxide catalysts for alcohol syntheses, hydrodealkylation, and aromatic ring hydrogenation"; Alexis T. Bell, "Applications of transient response techniques to the study of Fischer-Tropsch synthesis and nitric oxide reduction"; J. P. Fraissard, "NMR study of xenon adsorbed on Y zeolites. Application to the determination of some zeolite properties."

**Catecholamines**

*Proctor Academy*

Roland Ciaranello, chairperson.

*10–14 August*. Growth and development of adrenergic neurons (Ira Black, session chairperson): Story Landis, Mary Johnson, Ake Seiger, Joseph Coyle, Hans Thoenen, Paul Patterson, Ira Black, speakers. Adrenergic receptors (David C. U'Prichard, session chairperson): β receptors: P. B. Molinoff, "Coupling mechanisms for rat lung and glioma β-receptors"; T. K. Harden, "Desensitization of human astrocytoma β-receptors"; M. E. Maguire, "Magnesium transport: A primary β-adrenologic response not mediated by cAMP"; A. Delean, "The ternary couplex model of β-receptor function: Applications to desensitization"; speaker and subject to be announced. $\alpha_2$-receptors: L. E. Limbird, "Solubilization of platelet $\alpha_2$-receptors"; B. B. Hoffman, "Discrimination of $\alpha_1$-,$\alpha_2$-receptors in different tissues"; D. C. U'Prichard, "$\alpha_2$-receptor coupling and regulation in brain and neuroblastoma cells"; J. N. Fain, "Role of phosphatidy-linositol turnover in the elevation of $Ca^{2+}$ mediated by $\alpha_1$- and other receptors." DA-receptors: I. Creese, "Pituitary DA receptors—characterization of two affinity states"; J. Kebabian, "Coupling of pituitary D2-receptors to adenylate cyclase"; M. Titelar, "Discrimination of multiple sites and states of brain DA receptors." Neurotransmitter interactions in the central nervous system (Stanley J. Watson, session chairperson): Mark Molliver, John Sladek, Tomas Hokfelt, speakers. Catecholemine enzyme regulation (John Stolk, session chairperson): John Stolk, "Serum DBH regulation, a model system for assessing inheritance and indirect change"; Richard Winshilboum, subject to be announced; Roland D. Ciaranello, subject to be announced; Tong Joh, "Molecular biology regulation of TH and PNMT"; Xandra O. Breakefield, "Regulation of monoamine oxidase"; Joaquim Raese, "Phosphorylation of TH and instability of dopaminergic transmission." Clinical research in catecholamines (Philip A. Berger, session chairperson): Donald J. Cohen, Robert M. Post, Joseph J. Schildkraut, Daniel van Kammen, Richard J. Wyatt, Herbert Meltzer, speakers.

**Cell Adhesion, Recognition and Movement**

*Proctor Academy*

Ira Pastan, chairperson; Jean Paul Revel, vice chairperson.

*29 June*. Lectins: Are they cell adhesion molecules? (S. Barondes, session leader): S. Barondes, "Approaches to identification of cell adhesion molecules"; R. Lerner, "Genetic studies on the function of a slime mold lectin"; F. Dazzo, "Role of trifoliin and adhesion of *Rhizobium tirfolli* to clover root hairs." Cell junctions (J. P. Revel, session leader): B. Yancey, "Gap junctions as dynamic structures"; M. Steinberg, "Analysis of desmosomes using monoclonal antibodies"; E. Griepp, "Factors affecting tight junction formation."

*30 June*. Localization of intracellular macromolecules (M. Willingham, session leader): M. Osborne, "Immunofluorescence localization of cytoskeletal proteins"; J. Feramisco, "Microinjection of antibodies and labeled proteins into living cells"; M. Willingham, "Electron microscopic immunocytochemical localization of intracellular proteins"; J. Wehland, "Electron microscopic cytochemical localization of microinjected antibodies and proteins." Intracellular transport of proteins (I. Pastan, session leader): H. Lodish, "Viral proteins"; W. Sly, "Lysosmal enzymes"; A. Helenius, "Viral entry"; I. Pastan, "Hormone entry."

*1 July*. Fibronectin and other adhesive proteins (K. Yamada, session leader): F. Grinnell, "Fibronectin in wound healing"; H. Kleinman, "Cell adhesion proteins"; K. Yamada, "Structure and function of fibronectin"; J. Thiery, "Molecular mechanism of neural crest cell migration and homing." Mutants with abnormal cell shape and motility (Michael Gottesman, session leader): H. Epstein, "Myosin mutants"; P. Stanley, "Lectin resistant mutants"; M. Gottesman, "Tubulin mutants."

*2 July*. Calmodulin and calcium regulation (T. Vanaman, session leader): T. Vanaman, "Calmodulin and regulation of protozoan ciliary motility systems"; D. M. Watterson, "Calmodulin and calmodulin-regulated enzymes in transformed and normal chicken embryo fibroblasts"; C. Klee, "Myosin light chain kinase in smooth muscle and non-muscle tissues"; M. Cormier, "Calmodulin in spermatozoa and in the fertilization process." Phosphorylation of regulatory proteins (E. Korn, session leader): E. Korn, "Differential regulation of amoeba myosin isoenzymes by heavy chain phosphorylation"; B. Sefton, "Phosphotyrosine and cell transformation"; W. L. Kerrick, "Regulation of contraction in skinned muscle fibers by calcium and myosin light chain phosphorylation."

*3 July*. Organization of genes for structural and contractile proteins (B. de Crombrugghe, session leader): D. Yaffe, "Myosin genes"; D. Cleveland, "Tubulin genes"; B. de Crombrugghe, "Collagen genes"; P. Anderson, "Genetic analysis of myosin in *Caenorhabditis elegans*."

**Central Nervous System: Normal and Abnormal Development**

*Tilton School*

Antonia Vernadakis, chairperson; Paola Timiras, vice chairperson.

*15 June*. Drugs and the developing brain (Ezio Giacobini, Antonia Vernadakis, discussion leaders): Norman Weiner, "Development of neurotransmission mechanisms in the central nervous system"; Dixon Woodbury, "Drugs as a tool for studying development of the blood-brain barrier"; Michael Corner, subject to be announced; Joseph Coyle, "Drug induced lesions of the immature neocortex: Effects on synaptic neurochemistry"; Donald H. Ford, "Prenatal exposure to methadone and brain development"; Mont Juchau, "Biotransformation and bioactivation of foreign organic chemicals in the developing brain"; Abel Lajtha, "The effect of nicotine and smoking on the developing brain"; Rudolfo Paoletti, "Prostaglandins-leukotrienes and the developing central nervous system"; Igor Sytinsky, "Neurochemical basis of the clinical use of the gamma-aminobutyric acid preparations in pediatry." Nutrition and the developing brain (Robert Balazs, discussion leader): Robert Balazs, "The effect of nutrition on brain development"; Linda Crnic, "Interaction of nutrition and environmental variables: Behavioral and biochemical effects"; Loy Lytle, "Nutrition and drug effects on fetal brain transmitters"; Paul Segall, "The central nervous system in delayed development and aging."

*16 June*. Environmental factors, metals, and other toxicants and high altitude

(Dominick Purpura, Paola Timiras, discussion leaders): Ellen Silbergeld, "Manganese and lead as developmental neurotoxins in the young and aged brain"; Stephen Bondy, "Modification of neuronal circuitry by toxic agents: Detection by receptor binding studies"; Marian Diamond, "The cerebral cortex: Environmental influence on its morphology"; Barry Hoffer, "Chronic lead exposure. Examples of distribution, histological, and electrophysiological consequences in the nervous system"; Richard Van Sluyters, "The role of visual experience in the development of cat striate cortex." Influence of hormones (Robert Balazs, Junzo Kato, discussion leaders): Paola Tirmiras, "Hormones as pacemakers of growth, development and aging"; Spyros Alivisatos, "Influences of steroid hormones upon biological membranes. Specific sites for their binding and their action on integral proteins"; Bruce McEwen, subject to be announced; Paul Sze, "The influence of glucocorticoids on monouniergic neurons during development"; Anna Taylor, "Early and persistent neuroendocrine and behavioral effects of neonatal exposure to corticosteroids and ACTH"; Andrea Vaccari, "Presynaptic and postsynaptic influences of sexual hormones on the development of neurotransmission"; Theony Valcana, "Thyroid hormone receptors"; Richard Whalen, "The dissociation of estrogen and progesterone regulation of behavior by perinatal hormone manipulations."

*17 June*. Neural growth factors; neurotrophism (Silvio Varon, Gennady Buznikov, discussion leaders): Silvio Varon, "Trophic factors directed to nerve cells"; Gennady Buznikov, "The possible role of 'prenervous' neurotransmitters in cellular interactions of early embryogenesis"; Daniel Drachman, "Trophic interaction between motor nerves and skeletal muscles"; Jean Lauder, "Humoral influences on brain development"; Thomas Lentz, "Partial purification of a nerve trophic factor from brain extracts"; Lars Olson, "Nerve growth factors in the rat iris"; Mark Toneby, "Neurogenesis and neurohumoral regulation of early embryogenesis"; Antonia Vernadakis, "Role of glial cells and glial factors on neuronal growth." Neural culture: A developmental model (Stanley Crain, discussion leader): Stanley Crain, "Preferential innervation of CNS target tissues in organized cultures"; Leif Hertz, "Biochemical characteristics of mouse astrocytes developing in primary cultures and their modification by some hormones and drugs"; Robert Lasher, "Morphological and immunological studies of synaptogenesis in dispersed cell cultures of neonatal rat cerebellum"; Philip Nelson, "Modulation of neuronal maturation by electrical activity and neuroactive compounds"; Kedar Prasad, "Control mechanisms of differentiation of neuroblastoma cell in culture"; Elliott Richelson, "Synaptogenesis in dispersed cell cultures of neonatal rat cerebellum"; Nicholas Seeds, "Reaggregates–cell surface interactions in development."

*18 June*. Cell communication; neurotropism; synaptogenesis (Daniel W. Nebert, discussion leader): Daniel W. Nebert, "Genetic differences in drug metabolism: Plausible mechanism for variability in dysmorphogenesis"; David Bentley, "The initial establishment of neural connections in the grasshopper embryo"; Herman Blumenthal, "Age-related neuron binding immunoglobulins"; Richard Dietrich, "The use of genetics in neuropharmocology"; Melitta Schachner, "Developmentally regulated cell surface antigens in the nervous system." Cell communication; neurotropism; synaptogenesis (Guido Filogamo, Aron Moscona, discussion leaders): Marcus Jacobson, "Compartmentalization in the developing central nervous system"; Annica Dahlstrom, "Influence of central monoamine neurons on intraaxonal transport in motor nerves"; Carlo Di Benedetta, "Role of macromolecules of synaptic region during development"; Fulvia Gremo, "Role played by cells surface macromolecules in early synaptogenesis"; Enrico Mugnaini, "Changes in the repartation of neuronal surfaces: A synaptic maturation in a ganglion"; Sidney Ochs, "Axoplasmic transport and neuronal function"; Maruizio Raiteri, "Developmental aspects of neurotransmitter release mechanisms in central nerve endings"; William Shoemaker, "Physiologic interactions between cardiovascular and respiratory functions: Neural and neurohumeral mechanisms"; Gabriella Augusti-Tocco, "Modifications of neuron surface related to the establishment of functional contacts."

*19 June*. Neuropathological processes; regeneration (Amico Bignami, Michael Norenberg, discussion leaders): Abraham Shahar, subject to be announced. Murray Bornstein, "The application of combined immunological and tissue culture techniques in studies on myelinogenesis"; Doris Dahl, "Neurofilament proteins in regenerating nerve"; Raymond Lund, "Transplantation of the mammalian nervous system"; Dominick Purpura, "Neurite formation in mature cortical neurons in the gangliosidoses"; Marcus Singer, "Blueprint hypothesis of regeneration and neogenesis of neurons central pathways."

## Applications

Scientists are invited to submit applications for attendance at the Gordon Research Conferences. An application blank is on page 1229 and may be submitted to Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, University of Rhode Island, Kingston, Rhode Island 02881.

### Ceramics, Solid State Studies in Science of Ceramic Processing

*Proctor Academy*

Lutgard C. De Jonghe, chairperson; D. Hasselman, vice chairperson.

*13 July*. H. K. Bowen, "Presintering science"; G. Onoda, "Powder behavior"; R. Gordon, "Active powders"; J. Halloran, "Powder characteristics and sintering of $Al_2O_3$."

*14 July*. P. Reynen, "Microstructure-forming relationships"; O. Hunter, "Fabrication effects on sintering of yttria"; D. L. Johnson, "Sintering: Models and experiments"; G. Kuczynski, "Pore development and evolution."

*15 July*. R. N. Coble, "Reactive sintering"; H. Exner, "Multiparticle and chemical effects in sintering"; J. B. Holt, "Transport in and on covalent solids"; R. Loehman, "Liquid phase sintering in $Si_3N_4$."

*16 July*. R. Charles, "Processing for piezo-electric ceramics"; R. Brook, "Ultrafast firing"; Tung-Shen Yen, "Ceramics in China: Art and science."

*17 July*. P. Morgan, "Formation of multiphase ceramics for nuclear waste storage"; B. Yoldas, "Ceramics by sol-gel process."

Submissions for a poster display throughout the conference are invited.

### Chemical Oceanography

*Plymouth State College*

Peter G. Brewer, chairperson; Frank J. Millero, vice chairperson.

*3 August*. Fluxes across the air-sea interface (R. F. Weiss, session chairperson): S. C. Wofsy, "Exchange of trace gases between hydrosphere and atmosphere"; W. J. Jenkins, "Gas and water vapor exchange at the ocean surface

using tritium and helium-3"; speakers and subjects to be announced.

*4 August.* Fluxes in the oceanic water column (D. W. Spencer, session chairperson): Y. Nozaki, "Radionuclide fluxes"; J. Bishop, "Deep pumping experiments"; J. Martin, "Upper ocean fluxes"; J. Farrington, R. Gagosian, "Organic chemical fluxes"; M. Bacon, "Radioisotopic fluxes."

*5 August.* Fluxes across the sediment water interface (J. W. Murray, session chairperson): F. Sayles, "Pore water fluxes"; S. Emerson, "Organic matter diagenesis and carbonate chemistry"; P. Santschi, subject to be announced; C. Martens, "Fluxes from coastal sediments"; R. Aller, "Biological mixing of sediments."

*6 August.* River fluxes to the ocean (E. R. Sholkovitz, session chairperson): A. W. Morris, "Chemical reactions in the very low salinity regime of estuaries"; K. K. Turekian, "The geochemistry of estuarine waters and sediments"; speaker and subject to be announced. Physical chemistry of sea water (F. J. Millero, session chairperson): J. Weare, "Use of Pitzer equations to estimate activity coefficients in natural waters"; M. Whitfield, "Use of ion pairing models to estimate activity coefficients in natural waters."

*7 August.* Remote sensing of the oceans (N. R. Andersen, session chairperson): F. Hoge, "Use of airborne lasers in chemical oceanography"; E. Traganza, "Use of infrared imagery in investigating nutrient fronts in the ocean."

## Chemical Senses: Taste and Olfaction

*Proctor Academy*

Thomas Getchell, chairperson; Steven Price, vice chairperson.

*20 July.* Neurogenesis and plasticity in the chemosensory systems (Albert Farbman, chairperson); Neurotransmitters in chemosensory pathways (Frank Margolis, chairperson).

*21 July.* Metabolic conditions affecting gustatory and olfactory input (Ralph Norgren, chairperson); Role of flavor and fragrance in human nutrition (Morley Kare, chairperson).

*22 July.* Molecular biophysics of chemoreception (John DeSimone, chairperson); Molecular receptor mechanisms and transduction (Gregory Mooser, chairperson).

*23 July.* Peripheral and central processing of gustatory information (Thomas Scott, chairperson); David Ottoson, subject to be announced.

*24 July.* Human psychophysics: Where is it taking us? (Linda Bartoshuk, chairperson).

## Chemotherapy of Experimental and Clinical Cancer

*Plymouth State College*

Emil Frei, chairperson.

*27 July.* Brain tumors: "Biological and tissue culture studies"; "Biochemical pharmacologic studies"; "Treatment, clinical and experimental." Variability in response of human cells to DNA-damaging agents: "Variability of DNA damage to human cells by chemicals"; "Variability of tumor cells to chemical damage"; "Genetic factors affecting sensitivity of human cells to drugs."

*28 July.* Cell differentiation and chemotherapy: "Cell differentiation, cytidine analogs, and DNA methylation"; "Induction of differentiation in colon tumors"; "Overview." Platinum compounds as antitumor agents: "Mechanism of action"; "Synthesis-structure activity studies"; "Preclinical biological and clinical studies of *cis*-platin and analogs."

*29 July.* Clinical pharmacology: "The pharmacology of regional chemotherapy"; "Antimetabolite modulation"; "Autologous marrow." Control of cell division: "Effect of growth factors on cell division"; "Biochemistry, biology, and chemotherapeutic perturbations of the replication trigger"; "Lipids, mevalonic acid, and cell division."

*30 July.* Cytoskeleton and cell membrane—therapeutic targets: "Calmodulin-calcium flux and the cell membrane"; "Cytoskeleton, cell membrane, and chemotherapy"; "Overview." Biological response modifers: "Monoclonal antibodies and tumor antigens—therapeutic implications"; "Interferons—experimental and clinical studies."

*31 July.* Long-term effects of chemotherapy (exclusive of carcinogenic effects): "Anthracycline cardiac toxicity"; "Endocrine and immunomyelo chronic toxicity"; "Other long-term effects." Chairpersons and speakers to be announced.

## Chronobiology

*Proctor Academy*

D. K. Hayes, chairperson; C. Ehret, vice chairperson.

*15–16 June.* Cellular aspects of chronobiology; Biochemical genetics; Biochemistry of photoreception; Macromolecular synthesis; Energy metabolism: S. Brody, L. Edmunds, J. Feldman, J. Jacklet, R. Konopka, P. Leong, M. Menaker, H. Nakashima, J. Paietta, J. Perlman, R. Satter, W. Taylor, T. Vanden Driessche.

*17 June.* Data acquisition and handling: J. de Prins.

*17–19 June.* Hormonal and neurobehavioral chronobiology; Photoperiodism; Neurotransmitters; Ultradian rhythms; Hormonal and neurohormonal rhythms during development and aging: S. Beck, A. Cahill, L. Gilbert, F. Halberg, N. Horsman, M. Menaker, T. Page, R. Reiter, L. E. Scheving, J. Takahashi, H. Underwood, R. Writer.

An application blank for attendance at the Gordon Research Conferences may be found on page 1229. A summary of the program is on pages 1208 and 1209.

## Coatings and Films, Physics and Chemistry of

*Plymouth State College*

H. S. Bender, chairperson; P. Pappas, vice chairperson.

*15 June.* J. Lichtenbelt, "New methods to assess pigment dispersion and flocculation"; W. D. Ross, "Light scattering by tianium dioxide pigment in coatings"; W. Funke, "Barrier mechanism of corrosion protective coatings."

*16 June.* H. P. Hopfenberg, A. R. Berens, "The exploitation of sorption and transport measurements for the characterization of aging in glassy polymers"; N. N. Li, "Encapsulation and separations by liquid surfactant films"; W. T. Short, "Solvent, polymer, and pigment interactions in urethane-melamine coatings"; J. E. Glass, "Interplay of macromolecular conformation, extensional viscosity, and roll application speeds in ribbing phenomena."

*17 June.* P. E. Pierce, "Surface tension forces and coatings defects"; G. C. Bell, Jr., J. Hochberg, "Mechanics of electrostatic atomization, transport, and deposition of coatings"; M. E. R. Shanahan, A. Carre, J. Schultz, "Adhesion of coatings in a liquid environment"; W. M. Prest, Jr., "Molecular orientation in solvent cast films and polymer-polymer blends."

*18 June.* A. Rudin, "Study of the curing of solid phenolic resins by high resolution C.N.M.R."; W. J. Blank, "Amino resins for high solids coatings";

J. M. Radovich, "Ultrafiltration and electrophoresis for the recovery of electrocoating paints."

*19 June*. F. L. Floyd, "Effect of liquid particle size on liquid and solid-state properties of latex paints"; B. Felder, "Mechanistic studies on sterically hindered amines as protective agents in the photochemically induced oxidation of hydrocarbons."

**Corrosion**

*Colby-Sawyer College*

Graham C. Wood, chairperson; E. Neville Pugh, vice chairperson.

*20 July*. Solid solution scale and porous layer development on metals and alloys: (E. N. Pugh, discussion leader): D. P. Whittle, "Quantitative understanding of growth of solid solution scales on alloys"; H. W. Pickering, "Surface instability and porous layer development in high temperature systems." Examination of films and scales by in situ methods: (K. N. Strafford, discussion leader): T. E. Mitchell and L. Hobbs, "Microstructural and in situ HVEM studies of the oxidation of iron and nickel"; R. A. Rapp, "In situ observation of metal scaling."

*21 July*. Mechanical aspects of oxidizing specimens: (M. Van de Voorde, discussion leader): M. I. Manning, "Macro- and micro-approaches to the deformation and breakdown of high temperature oxidation scales"; C. E. Lowell, "A unified model of spalling for adherent scales." Intergranular and internal penetration: (N. Birks, discussion leader): F. H. Stott, "The intergranular and internal oxidation of nickel-base alloys." Surface analysis in oxidation studies: D. F. Mitchell, "Application of multiple surface analytical techniques to the oxidation of an iron-chromium alloy."

*22 July*. Corrosion in mixed oxidant atmospheres: (F. Gesmundo, discussion leader): J. Blakely, "Surface phases produced by adsorption and their effect on reaction"; W. L. Worrell, "Formation and growth stages of scales on nickel in $SO_2$ atmospheres." Thin film development: (M. J. Graham, discussion leader): F. P. Fehlner, "The role of vitreous oxides in oxidation and the oxidation of glassy metals"; B. Pieraggi, "A geometrical approach to structure of the metal-oxide interface."

*23 July*. Scale development and transport in $\alpha$-$Al_2O_3$ and $Cr_2O_3$: (F. Pettit, discussion leader): J. L. Smialek, "Morphology and transport in $\alpha$-$Al_2O_3$ scales". Short presentations and general discussion on $\alpha$-$Al_2O_3$ and $Cr_2O_3$ scales. W. W. Smeltzer, "Growth of $Al_2O_3$ protective films from internal oxide precipitates in Ni-Al and Fe-Al alloys"; J. S. Sheasby, "$^{18}O$ tracer studies of transport in $Al_2O_3$ scales"; G. Yurek, "Mechanisms of the oxidation of pure chromium at very low oxygen pressures"; P. Kofstad, "Growth and properties of scales formed on pure chromium at different oxygen pressures"; D. Lees, "A study of the oxidation mechanism of chromium at 950°C in oxygen." Debate: Oxidation research is up a blind alley; G. C. Wood, chairperson; P. Hancock, proposer; D. L. Douglass, seconder; J. Stringer, opposer; B. Cox, seconder.

*24 July*. Novel alloys and their oxidation resistance: (J. G. Smeggil, discussion leader): G. R. Wallwork, "A comparison of the oxidation of Fe-Mn-Al and Fe-Cr-Al alloys"; G. H. Meier, "The formation of $Al_2O_3$ on refractory-metal containing rapid solidification rate alloys and surface modified M-Cr-Al alloys." Diffusion in oxides and sulphides: (E. M. Fryt, discussion leader): R. A. McKee, "Generalized representation of self-diffusion in high defect concentration materials." Poster papers: Facilities will be provided for papers in various fields, including more practically oriented subjects not so amenable to in-depth discussion.

**Cyclic Nucleotide**

*Kimball Union Academy*

Ferid Murad, chairperson; Martha Vaughan, vice chairperson.

*8 June*. Adenylate cyclase (A. G. Gilman, chairperson): P. Sternweiss, D. Storm, A. Levitsky, speakers. Guanylate cyclase, (G. Schultz, chairperson): J. Lewicki, H. Brandwein, T. Deguchi, speakers.

*9 June*. Mechanisms of refractoriness and desensitization (J. Perkins, chairperson): G. Brooker, K. Catt, speakers. Phosphodiesterases (J. Hardman, chairperson): J. Wang, R. Kincaid, J. Beavo, speakers.

*10 June*. Kinases and phosphatases (E. Krebs, chairperson): P. Cohen, Y. Nishizuka, H. C. Li, speakers. Compartmentation (T. Rall, chairperson): A. Steiner, R. Curnow, speakers.

*11 June*. Cyclic nucleotide turnover and transport (J. Dumont, chairperson): R. Butcher, N. Goldberg, L. Brunton, speakers. (F. Murad, chairperson): speakers to be announced.

*12 June*. Some effects and functions of cyclic nucleotides (D. Russell, chairperson): D. Garbers, M. Bitensky, speakers.

Poster sessions—Tuesday, Wednesday and Thursday 3 to 6 p.m. Coordinated by Martha Vaughan.

**Developmental Biology**

*Proctor Academy*

Fotis Kafatos, chairperson; David Hogness, vice chairperson.

*27 July*. Oogenesis (J. G. Gall, chairperson): J. Gall, U. Scheer, R. Laskey, L. D. Smith, speakers. Cytoplasmic localization and early development (E. H. Davidson, chairperson): I. Dawid, E. H. Davidson, L. Kedes, J. Gerhart, speakers.

*28 July*. Genetic analysis of pattern formation and control of cell lineages (E. Wieschaus, W. Wood, co-chairpersons): G. Struhl, E. Wieschaus, R. Horvitz, W. Wood, speakers. Complex developmental loci (W. Gehring, chairperson): W. Bender, P. Spierer, G. Rubin, W. Gelbart, S. Artavanis-Tsakonas, W. Gehring, R. Saint, speakers.

*29 July*. Arrangement, structure and expression in model gene systems (D. S. Hogness, F. C. Kafatos, co-chairpersons): T. Maniatis, A. Spradling, F. Kafatos, J. Rine, K. Yamomoto, G. Ringold, P. Cherbas, D. Hogness, M. Weiss, L. Hood, speakers.

*30 July*. Chromatin fine structure of specific genes and its functional significance (H. Weintraub, chairperson): K. Nasmythe, M. Kirschner, P. Schedl, H. Weintraub, speakers. Post-transcriptional regulatory processes (J. Darnell, chairperson): J. Abelson, H. Raskas, J. Nevins, J. Darnell, J. Rosen, P. Wellauer, speakers.

*31 July*. Molecular morphogenesis and cellular communication at the membrane level (B. Huang, N. B. Gilula, co-chairpersons): H. Epstein, J. C. Regier, B. Huang, N. B. Gilula, speakers.

**Drug Metabolism**

*Holderness School*

Patrick Murphy, chairperson; Mary Vore, vice chairperson.

*20 July*. The nature and significance of the metabolism of sulfur containing xenobiotics (Bruce Migdalof, chairperson): Robert A. Neal, "Toxicological implications of the metabolism of thionsulfur compounds"; Marion Anders, "Enzymatic sulfoxide reduction: Role of the thioredoxin system"; Bruce Midgalof, "The metabolism and disposition of

Captroprial, a novel sulfhydryl-containing antihypertensive agent." Drug disposition in the elderly (Zafer Israeli, chairperson): H. Gwynne Giles, "Pharmacokinetic and pharmacodynamic alterations of drugs in the elderly"; David Greenblatt, "Predicting age-related changes in drug metabolism capacity"; Dennis Drayer, "Excretion of drugs in the elderly."

*21 July*. Metabolism of nitrogen containing compound (Robert Hanzlik, chairperson): A. K. Cho, "P-450–mediated oxidation of aliphatic nitrogen"; Dan Ziegler, "Role of the flavin-containing monooxygenase in the oxidative metabolism of nitrogen compounds"; Patrick Hanna, "Structure-activity and mechanistic aspects of the suicide inactivation of acylhydroxamic acid *N,O*-acyltransferase." Novel drug delivery systems (David Yesair, chairperson): David Yesair, "Lymphasomes —oral delivery of estradiol via the lymphatics"; Ken Widder, "Tumor remission in tumor bearing rats by selective targeting of magnetic-albumin microspheres containing doxorubin"; James Robbins, "Carbohydrates targeting of drugs and liposome containing drugs"; Frank Davis, "Therapeutic applications of polyethylene glycol-bound enzymes."

*22 July*. Insecticide metabolism (Ernest Hodgson, chairperson): Ernest Hodgson, "Role of the hepatic FAD-dependent mono-oxygenase in insecticide metabolism"; C. F. Wilkinson, "Insecticide synergists: Inhibitor mechanisms"; Bruce Hammock, "Epoxides and epoxide hydrolase in insecticide metabolism." Toxicological manifestations of altered drug metabolism (Joe LeBeau, chairperson): John Ramsey, "Nonlinear pharmacokinetics relative to toxicity in use of toxicological data"; Jim Rose, "The implication of dose-dependent pharmacokinetics/metabolism on toxicological and pharmacological response."

*23 July*. Vitamin metabolism (Hector DeLuca, chairperson): Frank Huennekens, "Metabolic interrelationship of folic acid and vitamin $B_{12}$"; Anita Roberts, "Metabolism of vitamin A"; Sam Tove, "Metabolism of vitamin E"; Hector DeLuca, "Vitamin D metabolism."

*24 July*. Activity of conjugated drugs (Mary Vore, chairperson): William Slikker, "Cholestatic activity of glucuronide conjugates of estrogens"; Fred Kadlubar, "Carcinogenic activity of glucuronide conjugates"; Gerald Mulder, "Role of sulfation in the generation of reactive intermediates from aromatic amines."

## Dynamics of Gas-Surface Interactions

*Plymouth State College*

M. J. Cardillo, chairperson; John T. Yates, Jr., vice chairperson.

*10–14 August*. T. J. Chuang, "Infrared laser stimulated gas-surface interactions"; T. Engel, "Structural studies with He diffraction from surfaces"; G. Ertl, "Electronic and rotational energy transfer in gas-surface scattering"; W. Goddard, "Ab initio studies of reaction intermediates on surfaces"; R. Gomer, "Surface diffusion of adsorbates on metal surfaces"; D. A. King, "Relationship between kinetic processes and surface structure"; R. Laughlin, "Surface structural analysis using atom diffraction: Recent accomplishments and future directions"; D. Menzel, "Desorption kinetics"; R. Merrill, "Surface reaction kinetics in the frequency domain"; H. Metiu, "Phonon, photon, and electron-holepair induced desorption"; J. C. Polanyi, "Dynamics of rotational excitation in gas-surface encounters"; B. Sexton, "Vibrational spectroscopy of surface reactions on metals by EELS"; Speaker to be announced, "Chemical interactions of low energy ions at surfaces"; J. P. Toennies, "High resolution TOF determinations surface phonon dispersion using He scattering"; U. Valbusa, "Scattering of H, D, and Ne from graphite and LiF." Poster session Tuesday morning.

## Elastin

*Kimball Union Academy*

Joel Rosenbloom, chairperson; Robert Rucker, vice chairperson.

*10 August*. Physical and chemical structure of elastin and tropoelastin (D. Urry, discussion leader): L. Sandberg, "Primary structures of tropoelastin"; D. Urry, "The polypentapetide of elastin: A non-random biological elastin." Crosslinking and lysyl oxidase (H. Kagan, discussion leader): H. Kagan, "Substrate specificity and properties of sysyl oxidase"; E. D. Harris, "Occurrence and regulation of lysyl oxidase"; F. Lamy, "Photolysis and ozonolysis of elastin crosslinks."

*11 August*. Biosynthesis of elastin (R. Mechan, discussion leader): R. Rucker, "Features of elastin biosynthesis and degradation"; F. Keeley, "Modulation of synthesis of elastin by endogenous and exogenous factors"; R. Mecham, "Elastin gene expression; regulation during development." Molecular biology of elastin (J. Davidson, discussion leader): S. Shibahara, "Elastin cDNA probes"; J. Foster, "Differential regulation of elastin genes"; W. Burnett, "Cloning of chick elastin cDNA."

*12 August*. Interaction of elastin with cells and other macromolecules (J. Foster, discussion leader): T. Cleary, "Microfibrillar component of elastic fibers"; G. Quintarelli, "Elastin fibrogenesis"; R. Senior, "Chemotactic properties of elastin peptides." Application of immunologic techniques to elastin (J. Rosenbloom, discussion leader): B. Starcher, "Immunologic quantitation of desmosines"; U. Kucich, "Detection of elastin degradation products in body fluids."

*13 August*. Degradation of elastin: Elastase and elastase inhibitors (A. Janoff, discussion leader): J. Travis, "Neutrophil elastase: Biochemical properties and interaction with α1Pi"; Z. Werb, "Murine macrophage elastase-biochemical properties and interactions with endogenous inhibitors"; A. Janoff, "Elastase, elastase-inhibitors and oxidants: Potential interactions in emphysema of cigarette smokers." Involvement of elastin in lung disease (G. Turino, discussion leader): Speakers and subjects to be announced.

*14 August*. Involvement of elastin in vascular diseases (C. Franzblau, discussion leader): L. Robert, "Immunology of elastin and the pathogenesis of arterial disease"; speakers and subjects to be announced.

## Elastomers

*Colby-Sawyer College*

Peter Juliano, chairperson; Emmanuel Kontos, vice chairperson.

*13 July*. (J. McGrath, discussion leader): J. Kennedy, "New elastomers and networks by carbocationic techniques." (D. Schulz, discussion leader): J. Witte, G. Marwede, "Polymerization of conjugated dienes with catalysts based on *f*-transition metals." (F. Loveless, discussion leader): J. Oziomek, "Synthesis and properties of copolymers of butadiene and isobutylene." (J. Lal, discussion leader): G. Rehage, "Synthesis and properties of liquid crystalline elastomers."

*14 July*. (N. Langley, discussion leader): J. Herz, "Thermoplasic elastomers: Synthesis and properties of multiblock copolymers containing polymethylsiloxane blocks." (K. Meyers, discussion leader): W. Graessley, "Recent advances in relating elastic properties and structure in polymer networks." (R. Stein, discussion leader): C. Han, H. Yu, C. Picot, "Small angle neutron scat-

tering on elastomer networks." (A. Jones, discussion leader): E. Samulski, B. Deloche, "Probing orientation phenomena in strained elastomers with deuterium NMR."

*15 July*. (R. Bauer, discussion leader): E. Papirer, "An experimental approach of the role of the interface in reinforced viscoelastic material." R. Thomas, discussion leader): C. Batich, "XPS (ESCA) studies of polymer surface chemistry and surface segregation." (D. Pearson, discussion leader): K. Osaki, "Rheology of entangled polymeric systems—experimental tests of the tube model theory of Doi and Edwards." (J. Dealy, discussion leader): J. Wortberg, G. Targiel, "Rheology of rubber compounds and machine design."

*16 July*. (A. Yee, discussion leader): T. Gierke, G. Adams, S. Wu, "Energy absorption of toughened nylons." (A. Medalia, discussion leader): J. Janzen, "Modern concepts of carbon black morphology." (J. O'Malley, discussion leader): B. Schmitt, "Molecular dispersion and thermodynamics of polymer blends and block copolymers by neutron scattering." (E. Kontos, discussion leader): S. Horne, "The creative process in elastomer research."

*17 July*. (D. Goldwasser, discussion leader): G. Wilkes, "Structure-property behavior of segmented polyurethanes—present concepts and newer developments." (M. Liedtke, discussion leader): R. Gerkin, F. Critchfield, "Characterization methods for the RIM urethane process."

## Elementary Particle Interactions

*Proctor Academy*

Rudi Thun, chairperson; Robert Cahn, vice chairperson.

*17 August*. Accelerators and detectors for the 1990's (R. Schwitters, session chairperson); Particle physics beyond $Z^0$ and $W\pm$ (E. Eichten, session chairperson).

*18 August*. Grand unification and proton decay (H. Georgi, session chairperson); Neutrino masses and oscillations (H. Williams, session chairperson).

*19 August*. Beauty (B. Gittelman, session chairperson); Charm (N. Reay, session chairperson).

*20 August*. Jets, gluons, and hadron structure (V. Luth, session chairperson); Quark confinement? (A. Litke, session chairperson).

*21 August*. Open for new results or other topics (R. Cahn, session chairperson).

## Energy Coupling Mechanisms

*Holderness School*

Youssef Hatefi, chairperson; Peter L. Pedersen, vice chairperson.

*17 August*. Structure of energy transducing membranes (R. A. Capaldi, C. R. Hackenbrock, chairpersons): C. R. Hackenbrock, "Introduction to part A"; C. R. Hackenbrock, "Lateral diffusion in mitochondrial electron transfer"; R. Cherry, "Rotational diffusion of proteins in the inner mitochondrial membrane"; E. Margoliash, "Cytochrome *c* mobility." General discussion (A. Azzi, discussion leader). R. A. Capaldi, "Introduction to part B"; R. Bisson, "Labeling of electron transfer complexes with arylazidophospholipids"; M. E. Dockter, "Subunit and heme localizations in yeast cytochrome *c*–cytochrome *c* oxidase complexes"; T. Osnishi, "Determination of spatial organization of respiratory chain redox components." General discussion (R. A. Capaldi, discussion leader). Electron transfer systems (H. Weiss, Y. Hatefi, chairpersons): H. Weiss, "Introduction"; B. Chance, "Reaction mechanisms of Fe-S-Cu in cytochrome oxidase"; D. C. Wharton, "Status of copper in cytochrome oxidase." General discussion. C. I. Ragan, "Iron-sulfur proteins of mitochondrial NADH: Ubiquinone oxidoreductase"; H. Weiss, "Three-dimensional structure of mitochondrial ubiquinol: Cytochrome *c* oxidoreductase"; A. R. Crofts, "Ubiquinol–cytochrome $c_2$ oxidoreductases of *Rhodopseudomonas spheroides* and *Rps. capsulata*." General discussion. A. H. Stouthamer, "Proton translocation in aerobic and anaerobic electron transport in *Paracoccus denitrificans*," B. A. Haddock, "Molecular biology of electron transport in *Escherchia coli*."

*18 August*. $F_1$-ATPases (H. S. Penefsky, P. Vignais, chairpersons): H. S. Penefsky, "Introduction"; M. L. Amzel, "Single crystal x-ray diffraction studies on $F_1$-ATPase"; M. Satre, "Small angle neutron scattering of *Escherichia coli* $BF_1$-ATPase." General discussion. R. L. Cross, "Adenine nucleotide binding sites of $F_1$: Cooperative interactions and essential residues"; W. S. Allison, "Identity of functional amino acid residues at the catalytic site of $F_1$-ATPase." General discussion. A. Senior, "Role of the $\alpha$ subunit in $F_1$-ATPase." C. Grubmeyer, "Role of two hydrolytic sites on $F_1$-ATPase." General discussion, P. Vignais, "The natural ATPase inhibitor and its interaction with the mitochondrial ATPase: Topological and functional aspects"; H. Strotmann, "Nucleotide binding and regulation of chloroplast ATPase." Proton-ATPase—structure, function and regulation (P. L. Pedersen, W. Sebald, chairpersons): P. L. Pedersen, "Introduction"; Y. M. Galante, "$H^+$-ATPase of bovine heart: Structure, function and regulation"; W. Sebald, "Structure-function relationships in the ATP synthetase $H^+$-channel"; J. A. Downie, "Cloning and expression of the genes of the ATPase complexes from *Escherichia coli*"; Y. Kagawa, "$H^+$ATPases of thermophilic bacterium and *Escherichia coli*: Structure and function"; S. M. Shuster, "The capacity of the $F_1$ moiety of liver $H^+$-ATPase to catalyze partial reactions of ATP synthesis"; P. L. Pedersen, "Regulation of $H^+$-ATPases"; F. Freund, "Protons and defect protons transfer mechanisms along weakly coupled OH transport chains"; E. C. Slater, "Summary."

*19 August*. Cation transport (E. Carafoli, D. H. MacLennan, chairpersons): D. H. MacLennan, "Introduction"; E. Carafoli, "Calcium ATPase of plasma membrane"; D. G. Nicholls, "Mechanism of calcium uptake and release by mitochondria"; A. E. Shamoo, "Isolation of electrophoretic calcium carrier from mitochondria"; E. Racker, "Phosphorylation of β subunit of $NA^+/K^+$ ATPase"; J. P. Reeves, "$Na^+/Ca^{2+}$ exchange in cardiac sarcolemma"; D. H. MacLennan, "Calcium ATPase of sarcoplasmic reticulum"; L. Herbette, "X-ray neutron diffraction analysis of sarcoplasmic reticulum ATPase"; S. Fleischer, "Motional characteristics of lipid in reconstituted sarcoplasmic reticulum." General discussion. Energy-linked nicotinamide nucleotide transhydrogenase (R. R. Fisher, chairperson): R. R. Fisher, "Introduction"; J. Rydstrom, "Molecular and catalytic properties of purified and reconstituted nicotinamide nucleotide transhydrogenase from beef heart"; R. R. Fisher, "Reconstitution of portion translocating mitochondrial transhydrogenase"; Y. Hatefi, "On the mechanism of energy transduction by the mitochondrial nicotinamide nucleotide transhydrogenase"; R. Houghton, "On the functional groups of the *Escherichia coli* NAD/NADP transhydrogenase." General discussion. Biogenesis of energy transducing membranes (H. R. Mahler, A. Tzagoloff, chairpersons): A. Tzagoloff, "Introduction"; P. Perlman, "Genetic and biochemical studies of mitochondrial mutants of bakers' yeast with complex phenotypes"; L. A. Grivel, "Split genes on yeast mitochondrial DNA"; D. S.

Beattie, "Regulation of complex III assembly"; S. Werner, "Identification and processing of mitochondrially synthesized precursor proteins in *Neurospora crassa*"; J. Walker, "Genes coding for ATPase subunits"; G. Attardi, "Organization and expression of information in human mitochondrial DNA." General discussion.

*20 August*. Energy transduction: Mechanisms and molecules (P. D. Boyer, M. Wikstrom, chairpersons): How is ATP made? P. D. Boyer, "Overview"; Panel discussion (H. A. Lardy, discussion leader): P. D. Boyer, L. Ernster, S. J. Ferguson, G. G. Hammes, A. T. Jagendorf, E. Moudrianakis, panel. Proton translocation by cytochrome complexes: M. Wikstrom, "Overview"; Panel discussion (M. Wikstrom, discussion leader): A. Alexandre, R. P. Casey, P. L. Dutton, A. A. Konstantinov, S. Papa, panel. Biogenesis of energy transducing membranes (part B) (H. R. Mahler, A. Tzagoloff, chairpersons): H. R. Mahler, "Introduction"; R. A. Butow, "Cellular interactions of the yeast mitochondrial genome"; T. L. Mason, "Dual genetic control of mitochondrial ribosome formation in yeast"; W. Neupert, "Synthesis and intracellular transfer of mitochondrial membrane proteins"; H. Riezman, "Import of proteins into mitochondria." General discussion. Energy transduction: Mechanisms and molecules (M. Avron, A. L. Lehninger, chairpersons): Stoichiometric, kinetic and thermodynamic constraints on oxidative phosphorylation: A. L. Lehninger, "Overview"; Panel discussion (A. L. Lehninger, discussion leader): J. Lemasters, H. Rottenberg, J. Stucki, D. Walz, panel. Roles of proton gradients, potential and localized energy domains: M. Avron, "The temporal interaction of membrane potentials and proton concentration gradients during photophosphorylation"; R. E. McCarty, "The role of transmembrane proton concentration gradients in photophosphorylation"; Panel discussion (M. Avron, discussion leader): A. B. Hope, W. Junge, R. E. McCarty, B. A. Melandri, D. Ort, panel.

*21 August*. Transport of anions and neutral molecules ( H. R. Kaback, M. Klingenberg, chairpersons): H. R. Kaback, "Introduction"; P. Mitchell, "Mechanistic principles of ligand conduction in porterology"; H. R. Kaback, "Energetics and mechanisms of active transport in isolated bacterial membrane vesicles"; P. C. Hinkle, "Glucose transport from human erythrocytes"; M. Klingenberg, "Probing the mechanism of transport through reagents and ligands of the ADP/ATP carrier"; T. A. Krulwich, "Transport processes in alkalophilic bacteria"; U. Hopfer, "Chloride transport across the brush border of small intestine." General discussion.

Poster Sessions: *17 August*: Structure and organization of energy transducing membranes (S. Ferguson-Miller, discussion leader). *18 August*: Proton ATPases (B. Beechey, discussion leader). *19 August*: Transport and biogenesis (D. S. Beattie, discussion leader). *20 August*: Mechanisms and control of energy transduction (B. L. Trumpower, discussion leader).

## Environmental Sciences: Air

*New Hampton School*

Jack G. Calvert, chairperson; Kenneth L. Demerjian, vice chairperson.

*15 June*. The important transient species in tropospheric chemistry (Hiromi Niki, session chairperson): Dieter Ehhalt, "New direct evidence for the important transient species in tropospheric chemistry"; Charles Wang, "Direct monitoring of the OH-radical in the polluted lower troposphere." (Larry Anderson, session chairperson): Douglas Davis, "Recent tropospheric OH-radical measurements from aircraft"; Malcomb Campbell, "Recent results of the chemical methods of OH-radical monitoring in the lower troposphere."

*16 June*. Recent observations of reactive molecules in the troposphere (Robert Huie, session chairperson): James N. Pitts, "Long pathlength spectroscopic observations of some molecular species important in the chemistry of the polluted troposphere"; Gregory Kok, "Recent chemical studies of some molecular species important in the chemistry of the polluted troposphere." (Ralph Cicerone, session chairperson): Stuart Penkett, "Recent mass spectrometer–gas chromatographic studies of some trace molecular species and their potential roles in tropospheric chemistry"; Paul Crutzen, "Recent studies of some trace molecular species and their tropospheric chemistry."

*17 June*. The mechanism and chemistry of sulfur dioxide oxidation in the lower troposphere (Jack Durham, session chairperson): L. Robbin Martin, "Recent laboratory studies of the $SO_2$, $NO_x$, aerosol chemistry"; Michael Hoffmann,"Recent studies of the mechanism of sulfur dioxide oxidation." Recent developments and outstanding questions in the meteorology of long-range transport (Lester Machta, session chairperson): Jerry Mahlman, "The role of global circulation modeling in understanding tropospheric chemistry"; Richard Anthes, "Recent developments in mesoscale meteorological modeling."

*18 June*. Recent experimental and theoretical studies of dry deposition of gases and particles (Bruce B. Hicks, session chairperson): Michael H. Unsworth, "Recent studies on dry deposition of gases"; Marvin Wesely, "Recent studies on dry deposition of particles." Recent experimental and theoretical studies of the precipitation scavenging of gases and particles (Jeremy M. Hales, session chairperson): Len A. Barrie, "Precipitation scavenging of gases"; Hans R. Pruppacher, "Precipitation scavenging of particles."

*19 June*. Theoretical models for simulating the physical and chemical dynamics of the atmosphere (John Seinfield, session chairperson): Jack Fishman, "Modeling geochemical cycles in the global troposphere"; Robert Lamb, "Regional modeling (1000 kilometers) of the polluted atmosphere."

## Enzymes, Coenzymes and Metabolic Pathways

*Kimball Union Academy*

George L. Kenyon and Joseph J. Villafranca, co-chairpersons; E. T. Kaiser and William Orme-Johnson, vice co-chairpersons.

*6 July*. (E. T. Kaiser, chairperson): J. R. Knowles, "Isotopically chiral phosphoryl groups: Chemistry and enzymology"; J. A. Gerlt, "Chemical and enzymatic hydrolyses of [$^{17}$O,$^{18}$O] chiral phosphodiesters"; G. Lowe, "The stereochemical courses of some phosphoryl and nucleotidyl transferases using chiral [$^{16}$O,$^{17}$O,$^{18}$O] phosphates." (A. S. Mildvan, chairperson): S. J. Benkovic, "On the mechanism of biological phosphodiester formation"; I. R. Lehman, "Structure and mechanism of recA protein of *Escherichia coli*"; P. R. Schimmel, "Specific recognition of RNA and DNA sequences in relation to biological function of aminoacyl–transfer RNA synthetases."

*7 July*. (P. F. Cook, chairperson): W. P. Jencks, "Transmogrification of isotope effects"; W. W. Cleland, "Effect of coupled atomic motions on primary and secondary isotope effects"; J. P. Klinman, "Catalytic and regulatory mechanisms of dopamine-β-hydroxylase"; D. V. Santi, "Isotope effects in reactions of pyrimidine nucleosides and nucleotides." (J. Chlebowski, chairperson): R. J. Fletterick, "The catalytic role of pyridoxal phosphate in phosphorylase"; J. F. Kirsch, "A proposed mechanism for

the aspartate aminotransferase reaction"; G. Petsko, "The mechanistic pathway of ribonuclease A at atomic resolution."

*8 July*. (S. G. Sligar, chairperson): T. C. Bruice "Flavin and iron porphyrin activation of oxygen"; G. T. Groves, "High-valent metalloporphyrin complexes related to peroxidase and cytochrome P-450"; I. C. Gunsalus, "The P-$450_{cam}$: substrate-redox center." (J. Stubbe, chairperson): L. P. Hager, "Chemical characterization of oxidized enzyme intermediates in peroxidase reactions"; C. T. Walsh, "Mechanistic studies of redox enzymes"; E. H. Cordes, "Enzymology of angiotension converting enzyme: MK421."

*9 July*. (G. H. Reed, chairperson): R. H. Holm, "Structure and function of metal clusters related to biological redox sites"; J. E. Coleman, "Structural and magnetic resonance studies on alkaline phosphatase"; G. D. Markham, "Structure and mechanism of *S*-adenosylmethionine synthetase from *Escherichia coli*"; I. A. Rose, "Ubiquitin activation and its role in protein degradation." (M. Wimmer, chairperson): A. Meister, "Mechanism of action of the enzymes of the γ-glutamyl cycle"; G. A. Hamilton, "New and possibly physiological substrates for D-amino acid oxidase and L-hydroxy acid oxidase."

*10 July*. (D. Dunaway-Mariano, chairperson): J. Retey, "Steric course and mechanism of some enzymic reactions as studied by high-resolution NMR spectroscopy"; F. C. Wedler, "Catalytic cooperativity among subunits of glutamine synthetase"; D. Gorenstein, "Stereoelectronic effects in phosphoryl transfer reactions."

## Epithelial Differentiation and Keratinization

*Tilton School*

Joseph McGuire, chairperson; William Epstein, vice chairperson.

*10 August*. (Lloyd King, discussion leader): Lloyd King, "EGF modulated protein kinase"; Per Peterson, "Epidermal retinoid receptors and their alteration in disease"; I. A. King, "Alteration of cell surface carbohydrate by retinoids"; Cynthia Marcello, "Modulation of epithelial differentiation by retinoids and cyclic nucleotides."

*11 August*. (Stuart Yuspa, discussion leader): P. M. Blumberg, "Phorbol ester receptors"; Robert Rice, "P-450 induction in keratinocytes by benzpyrine and dioxin"; Alan Poland, "Keratinization and TCDD receptors"; James Rheinwald, "Aberrations in the differentiation of keratinocytes expressed in culture by human squamous cell carcinoma"; Stuart Yuspa, "Fundamental alternations in epidermal differentiation associated with carcinogenesis"; Elaine Fuchs, "The expression of keratin genes in human epidermis: complementary DNA clones"; E. F. Woods, "Amino acid sequence of keratins"; Peter Gibbs, "Epithelia keratin messenger RNA."

*12 August*. (Peter Steinert, discussion leader): David Parry, "Keratin filament biochemistry"; Peter Steinert, "Intermediate filament structures"; Mary Gilmartin, "Phosphorylation of epithelial keratins"; Henry Sun, "Expression of keratin antigens during differentiation"; D. Skerrow, "The significance of relative abundance of keratins in scaling disorders." (Gerald Lazarus, discussion leader): Gerald Lazarus, "Proteases in differentiation and disease"; Robert Lavkar, "Heterogeneity of epidermal basal cells"; G. J. Gorbsky, "Epidermal desmosomes: identification of intercellular and cytoplasmic components."

*13 August*. (A. Telzer, discussion leader): Beverly Dale, "Stratum croneum basic protein"; Kimie Fukiyama, "Location of synthesis of nonfibrous protein in epidermis"; A. Telzer, "Immunochemical localization of low molecular weight keratin in lingual epithelium"; Fiona Watt, "Envelope formation in differentiating keratinocytes"; Joseph Kubilis, "Envelope precursor protein"; Hideoki Ogawa, "The nature of keratin polpetides in ichthyosis"; Peter Elias, "Cell surface carbohydrate and glycosidases in epidermis. Theories of adhesion."; I. Anton-Lamprecht, "Ultrastructure in ichthyosis"; Ronald Marks, "Characterization physical properties of stratum corneum in scaling disorders."

*14 August*. (Kurt Stenn, discussion leader): Kurt Stenn, "Epibolin"; Victor Terranova, "Role of laminin cell in attachment"; John Stanley, "Epidermal migration and the formation of basement membrane"; Takae Hirone, "Formation of basal lamina in tissue culture"; Philippe Sengel, "Role of the dermis in the differentiation of embryonic epidermis in amniotes."

## Extrachromosomal Elements

*Tilton School*

Nicholas W. Gillham, chairperson; Richard Novick, vice chairperson.

*6 July*. Bacterial plasmids: Segregation and incompatibility (Kurt Nordstrom, chairperson): K. N. Timmis, Stanley N. Cohen, speakers. Elimination of organelle DNA molecules in crosses (Ruth Sager, chairperson): R. A. E. Tilney-Bassett, John E. Boynton, Melvin Simpson, G. M. W. Adams, speakers.

*7 July*. Organelle DNA: The segregating unit (C. W. Birky, Jr., chaiperson): Annette Coleman, Karen Van Winkle Swift, Harvard Lyman, speakers. Replication of plasmids (Donald Helinski, chairperson): Richard P. Novick, John Scott, Kenichi Matsubara, Jun-Ichi Tomizawa, speakers.

*8 July*. Replication of organelle DNA molecules (David Clayton, chairperson): Donald Cummings, David Wolstenholme, Alan Lambowitz, Walton Fangman, speakers. Transmission of bacterial plasmids (Neil S. Willets, chairperson): Mary Dell Chilton, Donald Clewell, Walter Guild, speakers.

*9 July*. Variable genetic segments I (Nancy Kleckner, chairperson): James Shapiro, Ahmed Bukhari, Ellen Murphy, William Resnikoff, David Sherratt, speakers. Variable genetic segments II (Nina Fedoroff, chairperson): Forrest Chumley, James Hicks, C. S. Levings, III, speakers.

*10 July*. Variable genetic segments III (Piotr Slonimski, chairperson): Alexander Tzagoloff, Philip Perlman, Ronald Butow, Bernard Dujon, speakers.

An application blank for attendance at the Gordon Research Conferences may be found on page 1229. A summary of the program is on pages 1208 and 1209.

## Fertilization and Activation of Development

*Holderness School*

Bennett M. Shapiro, chairperson; Frank J. Longo, vice chairperson.

*3 August*. Specific components of gamete and embryo surfaces monoclonal antibody studies: (E. M. Eddy, chairperson): D. Myles, K. Bechtol, R. Kemler; Cytoskeletal rearrangements in fertilization and early development: (V. Vacquier, chairperson): L. Tilney, J. Spudich, J. Bryan.

*4 August*. Small molecules as effectors of activation. I. Gametes (F. Longo, chairperson): H. Kanatani, J. Maller, "Oocyte maturation"; D. Garbers, R. Christen, "Sperm activation." Small molecules as effectors of activation. II. Zygote activation: (D. Epel, chairperson): M. Gould-Somero, R. Nuccitelli, R. Steinhardt.

*5 August*. Molecular aspects of deter-

mination and differentiation (M. Johnson, chairperson): B. Hough-Evans, M. Sherman, P. Hoppe, J. Van Blerkom. Teratocarcinoma as a mimic of early mammalian development: (M. Edidin, chairperson): C. Graham, D. Solter, G. Martin.

*6 August.* Genetic controls in early development (C. Epstein, chairperson): L. Silver, R. Elinson, P. Burgoyne. Roundtable discussion: Is the sperm more than just a trigger for development? Panelists and participants will discuss the evidence for and against the idea that the sperm contributes more than its genome in shaping early development (J. Gerhardt, chairperson): A. Monroy, F. Jacob, M. Kirschner, M. Johnson, P. Hoppe, B. Shapiro and participants.

*7 August.* Segregation of cytoplasmic components after fertilization (W. Wood, chairperson): L. Jaffe, J. Ruderman, H. Weintraub.

In addition to the program as presented above, participants are encouraged to submit posters on the topics shown. These posters will be hung throughout the meeting; in addition, the chairpersons will integrate the material from the relevant posters into the appropriate session. In this way, discussion should be expanded substantially beyond the formal program. Applications should include a title and brief abstract or outline of anticipated poster presentations.

**Few-Body Problems in Chemistry and Physics**

*Brewster Academy*

Roger G. Newton, chairperson; Herschel Rabitz, vice chairperson.

*10 August.* E. F. Redish, W. Reinhardt, "General introduction and overview"; F. S. Levin, V. Vanzani, "New results on N-body collision theory."

*11 August.* M. Kawai, "Progress in a coupled-channel calculations"; E. Alt, "3-body systems with Coulomb forces"; W. Glockle, "3-body systems with 3-body forces"; G. L. Payne, "3-body wave functions."

*12 August.* W. McCurdy, "Use of dilation analyticity"; B. Simon, "Recent mathematical results on atomic systems"; M. Macfarlane, "Coulomb excitation"; T. George, "Collisions in intense radiation fields."

*13 August.* A. Kuppermann, "Three-dimensional quantum-mechanical reactive scattering"; L. Thomas, "Solving coupled scattering equations"; A. Temkin, "Electron-molecule scattering"; B. Schneider, "Calculation of electron-molecule scattering by R-matrix and integral-equation methods."

*14 August.* A. Askar, "Application of action-angle variables"; L. Eno, "Sensitivity analysis."

**Fiber Science**

*Colby-Sawyer College*

Norman R. S. Hollies, chairperson; Ralph McGregor, vice chairperson.

*6 July.* (Charles R. Williams, session leader): M. G. Northolt, "Structure and mechanical properties of armid fibers"; M. Feughelman, "Mechanical analysis of the composite fiber protein, Alpha Keratin" S. Batra, M. Konopasek, "Analysis and synthesis of textile structures and processes."

*7 July.* (Dennis C. Shultz, session leader): D. C. Prevorsek, Y. D. Kwon, R. H. Butler, "Optimization of spinning and drawing processes in terms of the material state variables"; J. O. Casey, S. S. Chen, "Melt spinning of PET: Mathematical models and experimental observations"; J. J. Thwaites, "Shrinkage of nylon and polyester fibers during rapid heating."

*8 July.* (Norman J. Abbott, session leader): B. Kirkwood, C. R. Williams, F. Figucia, W. Kova, "Response of textile systems to dynamic transverse impact"; R. E. Fornes, J. D. Memory, R. D. Gilbert, "Effects of ionizing radiation on graphite reenforced composites"; F. Scardino, F. Ko, "Manipulation of high modulus yarns for optimum performance."

*9 July.* (Fred Fortress, session leader): J. Skelton, "Bending and shear behavior of fabrics in the laundry process"; G. P. Morton, "User evaluation of sheet performance in the home"; R. W. Work, "Supercontraction: A cross-disciplinary study of certain spider fibers."

*10 July.* (Steven M. Spivak, session leader): B. Miller, L. Penn, "The role of fiber surface energy in adhesion"; P. S. Hough, J. Seaborne, "Fiber pores and internal surface: Importance and measurement."

**Fluids in Permeable Media: Physics and Chemistry**

*Tilton School*

R. L. Reed and R. S. Schechter, cochairpersons; F. I. Stalkup, vice chairperson.

*3 August.* Miscible displacement (F. I. Stalkup, session chairperson): F. M. Orr, "Equilibrium phase compositions of $CO_2$–crude oil mixtures: Measurement by a continuous multiple-contact experiment"; D. L. Triffin, W. F. Yellig, R. L. Henry, "Effects of high water saturation on multiple-contact miscible gas displacements"; L. E. Baker, W. F. Yellig, "Phase equilibria and the mechanisms of displacement in enriched gas drives." (F. I. Stalkup, session chairperson): D. F. Brost, L. A. Davis, "Determination of oil saturation distributions in field cores by microwave attenuation"; K. Khilar, H. S. Fogler, "On the water sensitivity of sandstones"; A. C. Todd, G. Stewart, "Injectivity changes arising from dissolution in sandstone $CO_2$ floods."

*4 August.* Microemulsion structure and wettability (H. T. Davis, session chairperson): Chun Huh, "Hydropile-lipophile balance in the formulation of microemulsions"; Surajit Mukherjee, Clarence A. Miller, "Microemulsion drop size–theory and experiment"; E. Ruckenstein, "Origin of middle phase microemulsion."; Y. Talmon, "Recent advances in direct visualization of microstructured liquids"; G. F. Teletzke, L. E. Scriven, H. T. Davis, "Patterns of wetting behavior in multi-component systems"; A. C. Hall, S. H. Collins, J. C. Melrose, "Stability of aqueous wetting films in Athabasca Tar Sands."

*5 August.* Surfactant phase behavior (Joseph J. Taber, session chairperson): W. H. Wade, R. S. Schechter, A. Graciaa, "The interrelation of surfactant structure, phase behavior, solubilization and interfacial tension"; R. C. Nelson, "The effect of live crude on phase behavior and performance of a chemical flood"; D. B. Siano, J. Bock, "Polymer-microemulsion interaction"; M. Bourrel, "Influence of oil and surfactant structure on solubilization into microemulsions"; S. J. Salter, "Birth and death of the three-phase region"; M. K. Tham, P. B. Lorenz, "The EACN concept: Is it universally correct?"; I. Chatzis, "Mechanisms of oil entrapment and mobilizations illustrated by micromodels."

*6 August.* Chemical flooding processes (L. W. Holm, session chairperson): R. L. Reed, C. W. Carpenter, "Shear-stabilized emulsion flooding"; C. J. Radki, "Emulsion flow in porous media"; C. T. Presley, "Sulfonate retention and residual oil saturation"; G. Hirasaki, "Interpretation of precipitation and redissolution of surfactant in the presence of mixed electrolytes"; P. Somasunderan, M. Celik, K. Viswanathan, "Co-adsorption of sulfonates and oils on minera solids"; J. C. Noronha, D. O. Shah

"Necessary conditions for achieving ultra-low interfacial tension in the oil/brine/surfactant alchol systems."

*7 August*. Polymers (J. P. Batycky, session chairperson): M. Tirrell, "Macromolecules in narrow channels: Effects of velocity gradient variation concentration and walls"; J. L. Duda, "Influence of bulk rheology on the flow of polymer solutions in pourous media"; E. Glass, "Water soluble polymers: Their adsorption on clays and thermal stability."

**Food and Nutrition**

*Colby-Sawyer College*

Irving I. Rusoff, chairperson; James R. Kirk, vice chairperson.

*27 July*. Dietary components and brain function (Steven Zeisel, session chairperson): Loy D. Lytle, "Dietary tryptophan and brain function"; Alan F. Sved, "Dietary tyrosine and brain function"; Steven Zeisel, "Dietary choline and brain function." Dietary fiber methodology (Robin Saunders, session chairperson): Ivan Furda, "Analytical methods used to measure dietary fiber"; Olof Theander, "Results and recommendations of an international study of comparing dietary fiber analytical procedures."

*28 July*. Dietary fiber and nutrient availability (Doris Calloway, session chairperson): David Jenkins, "Fiber and energy availability"; Judith Marlette, "Availability of dietary minerals." Importance of dietary protein on mineral requirements compared to dietary fiber (Harold Sanstead, session chairperson): Henry Sinclair, "Chemistry of browning and its significance for nutrient availability"; Phyllis Johnson, "Effects of browning on trace element availability"; Harold H. Sandstead, "Relative importance of dietary protein and fiber on mineral requirements of Americans."

*29 July*. Measurement of consumption patterns and nutritional studies (Robert O. Nesheim, session chairperson): R. Guarth Hansen, USDA requirements and concerns"; John Vanderveen, "FDA requirements and concerns"; Michael J. Lane, "Limitations of current methods for assessing nutritional status"; Potential approaches for meeting future needs (Robert O. Nesheim, session chairperson): Robert O. Nesheim, "Report of the food and nutrition board committee on food consumption patterns"; George Beaton, "Factors in the measurement of food consumption and nutritional status."

*30 July*. Factors affecting food selection (Gail G. Harrison, session chairperson): Katherin Kolasa, "Food nutrition and nutrition education"; Barry Popkin, "Economic approaches"; Gail G. Harrison, "Anthropological approaches." Children's food habits: What are we measuring? (Frances R. R. Davidson, session chairperson).

*31 July*. Nutrition and dental health (Juan Navia, session chairperson): Harold Slavkin, "Nutritional aspects in developmental craniofacial biology"; Michael Alfano, "Nutritional factors in maintenance and function of oral mucous membranes"; Juan Navia, "Nutritional and dietary considerations in prevention of oral disease."

**Free Radical Reactions**

*Holderness School*

Gerhard L. Closs, chairperson; Marvin Poutsma, vice chairperson.

*15 June*. (C. Walling, discussion leader): E. Davidson, "Energetics of biradicals"; P. Dervan, "Photochemistry of 1,1-diazenes." (R. Kreilick, discussion leader): A. Trifunac, "Time resolved magnetic resonance studies of paramagnetic transients"; Y. N. Molin, "Optical detection of ESR spectra of short lived ion radical pairs."

*16 June*. (D. Tanner, discussion leader): D. Schulte-Frohlinde, "Ethylene radical cations in aqueous solutions"; J. C. Martin, "Multicenter electron rich sigma bonding in radical chemistry." (F. Greene, discussion leader): G. Schuster, "Pulsed laser analysis of reactive radical dynamics"; J. Scaiano, "Laser flash photolysis study of reactions of alkoxyl and alkoxyl derived radicals."

*17 June*. (M. Poutsma, discussion leader): B. Giese, "Alkyl radical additions to alkenes"; J. Franz, "The role of hydroaromatic structure in radical initiation pathways. Hydrogen atom and alkyl radical induced fragmentation of coal structure." (M. McBride, discussion leader): P. Krusic, "ESR studies of iron carbonyl radicals"; R. Sagdeev, "Novel aspects of CIDNP."

*18 June*. (B. Griffin, discussion leader): N. Porter, "Mechanism and products in polyunsaturated fatty acids and membrane oxidation"; E. Mehelik, "Stereochemical aspects of lipid oxidation." (G. L. Closs, discussion leader): Poster session and short contributions.

*19 June*. (J. Wilt, discussion leader): B. David, "Liquid phase pyrolysis of hexadecane"; E. Janzen, "ESR detection of free radicals by spin trapping in micellar and microsomal systems."

**Fuel Science**

*Plymouth College*

C. Tom Ratcliffe, chairperson; Duayne Whitehurst, vice chairperson.

*6 July*. Mechanism of syngas conversion (Heinze Heinemann, chairperson): Jule Rabo, "Initiation of $CO/H_2$ reactions"; Alex Bell, "Propagation of $CO/H_2$ reactions"; Vladimir Ponec, "Some aspects of the mechanism of Fischer-Tropsch synthesis"; Ralph Dalla Betta, "Selectivity in $CO/H_2$ reactions."

*7 July*. Organic and structural chemistry of coal (Marty Gorbaty, chairperson): Ron Liotta, "Chemical crosslinks in coal via isotopic labeled organic chemical reactions"; Laszlo Heredy, "Bituminous coal model structures"; Randy Winans, "Coal macerals, chemical characterization by selective degradation techniques"; J. Kovac, T. Green, John Larsen, "Structural model of coal based on solvent swelling and specific solvent interactions."

*8 July*. Organic and free radical chemistry of coal (F. Dee Stevenson, chairperson): Ralph Livingston, "ESR study of free radicals during pyrolysis of model coal compounds"; Herb Retkofsky, Richard Sprecher, "In situ rapid pyrolysis with ESR"; Marvin Poutsma, "Thermlysis studies on model coal structures."

*9* and *10 July*. Surface science of coal and carbon (Karl Vorres, chairperson): Harry Marsh, "Limitations and implications of surface area measurements"; Phil Walker, "Active sites in carbon—what are they and how do we find them"; Terry Baker, "Dynamic study of carbon surfaces via controlled atmosphere electron microscopy."

*10 July*. Discussion of selected poster session topics (Duayne Whitehurst, chairperson).

**Genetic Toxicology Bioassays, Scientific Basis and Application of**

*Colby-Sawyer College*

Andrew Sivak, chairperson; Ceinwen A. Schreiner, vice chairperson.

*29 June*. (David F. Krahn, chairperson): David F. Krahn, "Gene loci"; Bruce Ames, "Mutagenicity testing in *Salmonella*—new directions"; Graham Walker, "What does pKm 101 really do?"; Eckhard Vogel, "*Drosophila*—an underutilized resource"; Thomas C. Caskey, "CHO—studies on the HGPRT locus"; June Carver, "Multiple locus studies with CHO." (Dale Matheson, chairperson): Dale Matheson, "Gene

loci"; Donald Clive, "L5178Y revisited—new views on an old assay"; Kenneth Palmer, "L5178Y—studies on the $TK^{+/-}$ locus"; Anthony Corrano, "Induced SCE and their relationship to other genetic events"; William G. Thilly, "New development in human cell mutation systems."

*30 June*. (Steve Haworth, chairperson): Steve Haworth, "Metabolic activation systems"; John R. Dent, "In vivo relevance of microsomal activation systems"; Robert J. Langenbach, "Cellular activation systems"; Herbert S. Rosenkranz, "Bacterial metabolism of chemicals—cautions and uses"; Curtis C. Harris, "Human organ culture systems as tools for metabolic activation." (Harvey Scribner, chairperson): Harvey Scribner, "Experimental data correlations"; George R. Mohn, "DNA binding and mutagenic response in pro- and eukaryotes"; Frederick J. J. de Serres, "Results and problems on an international multilaboratory study"; Verne A. Ray, "Selected compounds"; Angela E. Auletta, "The EPA gene-tox program—a search for correlations."

*1 July*: (Errol Zeiger, chairperson): Errol Zeiger, "Chemical and biological interactions"; James L. Epler, "Bioassay of complex samples"; Judith Harris, "Preparation of complex samples for bioassay"; Frederick T. Hatch, "Mutagens in cooked food"; Sandra R. Wolman, "Genetic responses of cells from humans with genetic deficits"; (Joseph D. Irr, chairperson): Joseph D. Irr, "Statistics and mathematical models"; Ronald Snee, "Statistical methods for analysis of biological data"; Young Jack Lee, "An appropriate use of mathematics in biology—conceptual designs of experiments."

*2 July*. (Robert W. Naismith, chairperson): Robert W. Naismith, "In vivo assay systems"; Henry E. Holden, "In vivo cytogenetics"; Daniel A. Casciano, "Mouse enzyme profiles as an in vivo tool for mutagenesis studies"; Gary Sega, "DNA binding and UDS studies in sperm cells"; Liane Brauch Russell, "Specific locus assay—variations on a theme." (Michael G. Farrow, chairperson): Michael G. Farrow, "Risk assessment"; C. C. Lu, "An overview of genetic risk assessment"; Alfred Wechsler, "Overview of the components of risk assessment"; William R. Lee, "A new model for molecular dosimetry of geneotoxic events."

*3 July*. (Charles Johnson, chairperson): Charles Johnson, "Regulatory, commercial and scientific needs"; Michael D. Waters, "Genotoxic tests to serve the complex regulatory needs of EPA"; Judith MacGregor, "Genotoxic bioassays in the commercial setting"; Ronald W. Hart, "Genotoxic tests —where to now?"

An application blank for attendance at the Gordon Research Conferences may be found on page 1229. A summary of the program is on pages 1208 and 1209.

## Glass

*Plymouth State College*

Peter C. Schultz, chairperson; Cornelius Moynihan, vice chairperson.

*3 August*. Fluoride glasses: Marcel Poulain, "Fluoride and polyhalide glasses"; Martin Drexhage, "Optical properties of multicomponent fluoride glasses"; Toyotaka Manabe, "Fabrication technique and transmission characteristics of the fluoride glass fiber." Oxynitride glasses: Ronald E. Loehman, "Oxynitride glasses"; Raja Wusirika, "Effect of nitrogen on physical properties of $MgO\text{-}Al_2O_3\text{-}SiO_2$ glasses."

*4 August*. Novel glasses: Kurt Nassau, "Rapid quench glasses"; Roger Bartholomew, "Techniques for incorporation of water into silicate glasses." Glasses from gels: Bulent Yoldas, "Glasses from chemical polymerization"; Ramon Puyane, "Potential applications of sol-gel processes"; C. Jeffrey Brinker, "Compositional processing effects on the gel-to-glass conversion."

*5 August*. Larry Hench, "Surface behavior of gel glasses"; Sumio Sakka, "Mechanism of formation of glass fibers and films through sol-gel conversion of alkoxides"; Robert Shoup, "Composition, quality and purity of densified silicate gel glasses." Strength of glass: Steven Freiman, "Crack propagation and stress corrosion of glass"; Minoru Tomozawa, "Role of surface energy in mechanical strength of glass."

*6 August*. Herbert Richter, "Environmental effects on stress corrosion"; Jack Mecholsky, "Fracture toughness of glasses and glass-ceramics"; Hans Claasen, "Dissolution kinetics of glass in geologic media"; Julian Goldsmith, "Global tectonics, volcanoes and the depths of the earth, natural glass production, and the plagues of Egypt."

Open poster session—8 to 10 p.m.

*7 August*. Paul France, "Fatigue behavior of glass fibers used for optical communications (includes compound glasses)"; John Helfenstine, "Fatigue behavior of doped fused silica optical waveguides."

Informal technical poster sessions open to all conferees on any recent glass topic.

## Glycoproteins and Glycolipids

*Kimball Union Academy*

Donald M. Marcus and Pamela Stanley, co-chairpersons; Harry Schachter, vice chairperson.

*3 August*. Carbohydrate structures: New developments (Charles Sweeley, chairperson): Akira Kobata, J. Vliegenthart, Jeremy Carver, speakers. (Rosalind Kornfeld, chairperson): Samuel Turco, speaker.

*4 August*. Biosynthesis, processing and metabolism of complex carbohydrates (Robert Spiro, chairperson): Phillips Robbins, Anthony Adamany, speakers. (Pamela Stanley, chairperson): Harry Schachter, Winifred Watkins, speakers.

*5 August*. Carbohydrate receptors (Gilbert Ashwell, chairperson): Stuart Kornfeld, Robert Hill, Philip Stahl, speakers. Biological properties of proteoglycans (Brian Toole, chairperson): Lloyd Culp, Magnus Hook, speakers.

*6 August*. Carbohydrate-protein interactions (Donald Marcus, chairperson): Irwin Goldstein, Kathryn Stein, Werner Green, speakers. Role of carbohydrates in cellular interactions (Harry Schachter, chairperson): Sen-itiroh Hakomori, Paul Atkinson, Paul Wassarman, speakers.

*7 August*. Role of carbohydrates in cellular interactions (Richard Hynes, chairperson): Wayne Springer, Jukka Finne, speakers.

## Heterocyclic Compounds, Chemistry of

*New Hampton School*

Kevin T. Potts, chairperson; H. B. Renfroe, vice chairperson.

*6–10 July*. R. K. Boeckman, "Stereochemical control in the intramolecular Diels-Alder reaction"; J. B. Bremner, "Studies in the synthesis of fused, medium-sized heterocycles"; M. R. Detty, "New tellurium heterocycles"; T. L. Gilchrist, "Nitroso and azo-olefins in heterocyclic synthesis"; K. N. Houk, "The interplay between theory and experiment in the study of 1,3-dipolar cycloadditions"; P. Jacobi, "Intramolecular cycloaddition routes to natural products"; G. Jones, "New reactions from bridgehead nitrogen heterocycles"; S. Karady, "1,2,5-Thiadiazole-1-oxides.

Synthesis, stereochemistry and ring interconversions"; A. R. Katritzky, "Heterocycles as leaving groups: New vistas in the chemistry of the amino group"; Thomas Kauffmann, "New directions in heterocyclic chemistry"; A. P. Kozikowski, "Studies in the total synthesis of the ansamycin related antibiotics—the rubradirins"; D. Lemal, "Rearrangements of fluorinated heterocycles"; Y. Lin, "New syntheses of 5- and 6-membered heterocycles"; D. McKinnon, "New reactions involving isothiazoles"; G. R. Newkome, "New avenues to ligand design"; A. Padwa, "Intramolecular dipolar cycloaddition reactions"; K. H. Pilgrim, "Ring closure reactions with acylated and carbamoylated hydrazines and hydrazones"; E. Schaumann, "Cycloaddition routes to thiolactams"; E. C. Taylor, "Novel heterocyclic transformations"; D. Wadsworth, "Cyclopropenones as synthons for novel heterocyclic systems"; C. Wentrup, "Novel reactive compounds via F.V.P."

### Immunochemistry and Immunobiology

*Holderness College*

Martin Weigert and Philippa Marrack, co-chairpersons.

*8 June*. Ontogeny and differentiation of lymphocytes (Max Cooper, chairperson). Regulation of rearrangement of antibody genes (Robert Perry, chairperson).

*9 June*. Genetic control of antibody expression (Leroy Hood, chairperson). Organization of variable region gene segments (Susumo Tonegawa, chairperson).

*10 June*. Structure and diversity of variable regions (Donald Capra, chairperson). T cell receptors (Philippa Marrack, chairperson).

*11 June*. Function of cloned T cell lines (Gary Fathman, chairperson). Lymphocyte activating molecules (Richard Dutton, chairperson).

*12 June*. Long term B lymphocyte lines and tumors as models for B cell activation (William Paul, chairperson).

### Inorganic Chemistry

*New Hampton School*

D. F. Shriver, chairperson; G. Stucky, vice chairperson.

*3 August*. Relationships between organometallic chemistry and surface chemistry: G. Whitesides, "Solution and surface organoplatinum chemistry"; B. Gates, "Metal complexes and metal clusters anchored to oxide surfacets"; A. Brenner, "Synthesis, nature and catalytic implications of supported carbonyl complexes"; J. Gland, "Reactions and adsorption of small molecules on single crystal surfaces"; N. Sheppard, "Structural analogies between metal cluster ligands and surface adsorbed species as investigated by vibrational spectroscopy."

*4 August*. Advances in main group chemistry: J. Dye, "Preparation and optical, magnetic, conductance properties of alkalides and electrides"; K. O. Christe, "Perfluoroammonium chemistry"; E. Flannigan, "Zeolites, their synthesis and structural chemistry."

*5 August*. Relationships between solid state chemistry and surface chemistry: R. Voorhoeve, "Catalytic oxidation over defect solids"; J. Longo, "Metallic pyrochores as catalysts for electro-organic oxidations"; A. Sleight, "Characterization of solid state and surface species for molybdate oxidation catalysts"; E. Derouane, "Structure reactivity relationships for SAM-5 type catalysts"; A. Lunsford, "Synthesis, characterization and catalytic properties of metal complexes in zeolites."

*6 August*. Advances in bioinorganic chemistry: B. Spielvogel, "Pharmacologically active boron analogues of $\alpha$-amino acids"; E. Solomon, "Chemical and spectroscopic studies of active sites in copper proteins"; K. Raymond, "Coordination environments in biochemical iron transport."

*7 August*. Metal cluster substrate interactions: H. D. Kaesz, "Transformations of carbonyl groups into $C_2$ substrates on polynuclear metal cluster complexes."

### Inorganic Geochemistry

*Colby-Sawyer College*

Marco T. Einaudi and Hiroshi Ohmoto, Co-chairpersons; Hydrothermal Systems Related to Ore Deposits.

*17 August*. Magmatic hydrothermal systems I (C. Wayne Burnham, session chairperson): Jeffrey Abbott, "Geological, petrological and geochemical contrasts between porphyry Cu and porphyry Mo deposits"; Victor J. Wall, "Peraluminus granite-genesis and associated ore deposits." Magmatic hydrothermal systems II (Donald M. Burt, session chairperson): Rainer J. Newberry, Marco T. Einaudi, "Contrasts in the environments of W-, Cu-, and Zn-bearing skarn deposits"; Simon M. F. Sheppard, "Hercynian magmatism and mineralization."

*18 August*. Modeling of hydrothermal systems I (Heinrich D. Holland, session chairperson): Julian Hemley, James A. Whitney, "Solubilities of Fe and Cu minerals in high temperature aqueous solutions"; David A. Crerar, Nicholas J. Susak, "Solubility and spectroscopic studies of transitional metal complex ions pertinent to ore genesis"; Harold C. Helgeson, "Reaction rates, mass transfer and thermodynamic consequences of nonhydrostatic stress, fluid, immiscibility and adiabatic expansion in hydrothermal systems." Modeling of hydrothermal systems II (Larry M. Cathles, session chairperson): S. Edward Drummond, "Boiling and mixing of hydrothermal fluids: Chemical effects on mineral precipitation"; George H. Brimhall, Jr., Mark Ghiorso, "Sulfur metasomatism and the origin of the advanced argillic assemblage."

*19 August*. Submarine geothermal systems—modern (Paul B. Barton, session chairperson): John Edmond, "Chemistry of 350°C solutions in the hydrothermal field at 21°N on the East Pacific Rise"; Rachel Hayman, "Geochemistry and mineralogy of hot spring deposits at 21°N on the East Pacific Rise"; Majorie M. Styrt, "Mineralogy and geochemistry of the hydrothermal deposits at 21°N on the East Pacific Rise." Submarine geothermal systems—ancient (Steven D. Scott, session chairperson): Edwart T. C. Spooner, "Origin of the Cyprus deposits"; Hiroshi Ohmoto, "Origin of the Kuroko deposits."

*20 August*. Kinetics of sulfur reactions (Robert M. Garrels, session chairperson): Antonia C. Lasaga, Hiroshi Ohmoto, "Sulfide/sulfate reactions in high temperature, hydrothermal systems"; Martin B. Goldhaber, "Reactions involving pyrite at low temperatures." Hydrothermal systems associated with sedimentary basins I (Lewis B. Gustafson, session chairperson): Murray Hitzman, "Geology and geochemistry of the Ruby Creek Cu-Co deposit."

*21 August*. Hydrothermal systems associated with sedimentary basins II (Hubert L. Barnes, session chairperson): Dimitri A. Sverjensky, "Solutions and reactions that formed Mississippi Valley tides deposits"; Yousif K. Kharaka, "Geochemistry of oil field water from the northern Gulf of Mexico and implications for the origin of lead-zinc deposits." Overview (Marco T. Einaudi, Hiroshi Ohmoto, session chairperson).

There will be poster sessions on three afternoons, probably on Monday, Tuesday, and Thursday. The presentations at these poster sessions will be made primarily by graduate students and recent Ph.D.'s.

# Program Summary, Gordon Research Conferences

| | Colby-Sawyer College (N) New London, N.H. | Colby-Sawyer College (S) New London, N.H. | New Hampton School Hew Hampton, N.H. | Kimball Union Academy Meriden, N.H. | Tilton School Tilton, N.H. |
|---|---|---|---|---|---|
| 8–12 June | Mammary Gland Biology | | Nucleic Acids | Cyclic Nucleotides | Structural Polymers, Chemical Characterization of* |
| 15–19 June | Nuclear Chemistry | | Environmental Sciences: Air | Lipid Metabolism | Central Nervous System* |
| 22–26 June | Catalysis | | Proteins | Atherosclerosis | Animal Cells and Viruses |
| 29 June–3 July | Polymers | Genetic Toxicology Bioassays, Scientific Basis and Application of* | Bacterial Cell Surfaces | Polyamines | Carbohydrates, Chemistry of |
| 6–10 July | Fiber Science | Liquid Crystals | Heterocyclic Compounds, Chemistry of | Enzymes, Coenzymes and Metabolic Pathways | Extrachromosomal Elements |
| 13–17 July | Elastomers | Thin Films and Solid Surfaces | Organic Reactions and Processes | Bones and Teeth, Chemistry, Physiology, and Structure of | Polymer Colloids |
| 20–24 July | Corrosion | Periodontal Diseases* | Natural Products | Photosynthesis, Physicochemical Aspects of | Metal Hydrides* |
| 27–31 July | Food and Nutrition | Thermodynamic Analysis* | Statistics in Chemistry and Chemical Engineering | Toxicology and Safety Evaluations | Biomaterials, Science and Technology of |
| 3–7 August | Medicinal Chemistry | Parasitism, Immunological and Molecular Aspects of* | Inorganic Chemistry | Glycoproteins and Glycolipids | Fluids in Permeable Media |
| 10–14 August | Separation and Purification | Remote Sensing of Earth's Surface from Space | Analytical Chemistry | Elastin | Epithelial Differentiation and Keratinization |
| 17–21 August | Cancer | Inorganic Geochemistry | Adhesion, Science of | Ion Exchange | Transport Phenomena in Lipid Bilayer |

*New conferences in 1981.

# 1981 Schedule—New Hampshire and California

| Proctor Academy Andover, N.H. | Holderness School Plymouth, N.H. | Brewster Academy Wolfeboro, N.H. | Plymouth State College (N) Plymouth, N.H. | Plymouth State College (S) Plymouth, N.H. | Holiday Inn Ventura, Calif. |
|---|---|---|---|---|---|
| Plant Molecular Biology | Immunochemistry and Immunobiology | Physical Organic Chemistry | Laser Diagnostics in Combustion, Chemistry and Physics of* | Vibrational Intensities* | |
| Chronobiology | Free Radical Reactions | Magnetic Resonance | Red Cells | Coatings and Films | |
| Plant Cell and Tissue Culture | Biological Regulatory Mechanisms | Space Plasma Physics | Calcium Phosphates | Molecular Pharmacology | Marine Natural Products<br><br>Physics of Steady-State Plasma Confinement: Advanced Methods |
| Cell Contact, Recognition and Movement | Muscle | Molecular Energy Transfer | Purines, Pyrimidines and Related Compounds | Quantum Solids and Fluids | |
| Physical Metallurgy | Solids, Chemistry and Physics of | Atomic Physics | Fuel Science | Structural Macromolecules; Collagen | |
| Ceramics, Solid-State Studies in | Analytical Pyrolysis | Micellar and Macromolecular Catalysis | Quantitative Structure Activity Relationships | Line and Point Defects | |
| Chemical Senses; Taste and Smell | Drug Metabolism | Neural Plasticity | Molecular Pathology | Phagocytes* | |
| Developmental Biology | Molecular Collisions, Dynamics of | Microbiological Degradation | Ion-Containing Polymers | Chemotherapy of Experimental and Clinical Cancer | |
| Organic Photochemistry | Fertilization and Activation of Development | Nonlinear Optics | Glass | Chemical Oceanography | |
| Catecholamines | Liquids, Chemistry and Physics of | Few Body Problems | Dynamics of Gas-Surface Interactions | Nuclear Structure Physics | |
| Elementary Particle Interactions | Energy Coupling Mechanisms | Molten Salts | | | |

**Ion Containing Polymers**

*Plymouth State College*

S. L. Cooper, chairperson.

*27 July*. Synthesis I (N. M. Bikales, chairperson): J. C. Salamone, "Synthesis and properties of polymers containing ionic monomer pairs"; L. L. Guilbault, "Industrially significant synthetic polyelectrolytes." Solution properties: (L. G. Donaruma, chairperson): C. L. McCormick, "Water soluble random and graft copolymers as models for fundamental studies of enhanced oil recovery processes"; C. E. Williams, "Structure of polyelectrolyte solutions"; P. K. Agarwal, "Rheological behavior of concentrated ionomer solutions."

*28 July*. Solid state (W. J. MacKnight, chairperson): A. Eisenberg, "Structure-property relations in styrene ionomers"; B. Rodmacq, "Mössbauer study of microphase separation in solid ionomers." Perfluorinated ionomer membranes: (M. Pineri, chairperson): T. D. Gierke, "Morphology of 'Nafion' perfluorinated membranes"; K. A. Mauritz, "Hydration structure in perfluorosulfonate membranes."

*29 July*. Suspensions (S. L. Cooper, chairperson): P. Pincus, "Colloidal crystals." Poster session: contributors. Materials: (R. D. Lundberg, chairperson): D. Dieterich, "Synthesis and specific interaction effects on polyurethane ionomers"; B. Gunesin, "Synthesis, characterization and properties of metal coordinated polymers."

*30 July*. Synthesis II (Y. Okamoto, chairperson): J. E. McGrath, "Synthesis and characterization of sulfonated homopolymers, random and block copolymers of polysulfone and related poly (aryl ethers)"; Ph. Tessie, "Halato telechelic polymers: Synthesis and properties of new model ionic materials." Round-table discussion: All participants, "The future for ion containing polymers."

*31 July*. Applications (J. S. Tan, chairperson): J. W. Vanderhoff, "Ion containing emulsion polymers"; P. Blais. "Health care applications of polyelectrolyte and ion interactive polymers."

**Ion Exchange**

*Kimball Union Academy*

Gilbert E. Janauer, chairperson; Howard Sherry, vice chairperson.

*17 August*. Polymers and functions (Mart Baldwin, session chairperson): J. M. Farrall, "Special functions on polystyrene matrices"; D. C. Sherrington, "Preparation and application of polymer-bound phase transfer catalysts"; D. C. Nicholas, "Use of polymers in template syntheses." Show and tell poster party (G. E. Janauer, H. S. Sherry, moderators).

*18 August*. Advances in ion exchange theory (Friederich G. Helfferich, session chairperson): J. A. Marinsky, "Equilibria with weak acid cation exchangers"; K. Bunzl, "Kinetics of film diffusion-controlled contact ion exchange processors"; E. E. Graham, "The use of Stefan Maxwell equations in describing ion exchange kinetics." Separations (John Mikes, session chairperson): R. P. W. Scott, "Basic theory of high-resolution liquid chromatography; microbore columns"; R. Wood, "New supports for biochemical separations."

*19 August*. Ion exchange chromatography (Harold F. Walton, session chairperson): J. S. Fritz, "High resolution, rapid chromatography of inorganic ions"; F. F. Cantwell, "Double-layer ionic adsorption and exchange on porous polymers"; R. Rosset, "High capacity ion exchanges based on silica transition–metal-modified silica gels"; M. Doury-Berthod, C. Poitrenaud, "Ligand-exchange chromatography of amino acids"; P. E. Hare, "Resolution of optical isomers through metal complexes in the mobile phase."

*20 August*. What's new in applications? (John R. Millar, session chairperson): J. Sherman, "Progress in artificial kidneys. An ion exchange/enzyme/sorbent system developed for hemodialysis"; G. Guter, "Field research on ion exchange. Nitrate removal from drinking water"; L. Liberts, "Nitrogen-phosphorus fertilizer recovery from wastewater treatment"; J. D. Nolan, "Softening of saturated brines using chelating ion exchange resins." Special lecture: I. Abrams, "The history of ion exchange in the United States."

*21 August*. Ion exchange in pollution abatement (Calvin Calmon, session chairperson): F. X. McGarvey, "Ion exchange in nuclear waste technology"; J. Barrett, "Removal of organics"; I. Spinner, "Ion exchange methodology for toxic, metal ions."

**Laser Diagnostics in Combustion, Chemistry and Physics of**

*Plymouth State College*

John W. Daily, chairperson; David Crosley, vice chairperson.

*8 June*. Collisional energy transfer (P. Dagdigian, discussion leader): D. R. Crosley, M. J. Cottereau, speakers. Raman modeling (A. J. Cotlar, discussion leader): D. Stevenson, R. J. Hall, speakers.

*9 June*. Collisional effects on laser induced fluorescence (J. W. Daily, discussion leader): N. M. Laurendeau, M. Steinberg, speakers. Line shapes (K. Sando, discussion leader): R. K. Hanson, R. Gordon, speakers.

*10 June*. Fluorescence concentration measurements (K. Schofield, discussion leader): J. W. Daily, J. H. Bechtel, speakers. Raman concentration measurements (M. Drake, discussion leader): A. C. Echbreth, W. F. Murphy, speakers.

*11 June*. Fluorescence temperature measurements (D. R. Crosley, discussion leader): N. Omenetto, R. J. Cattolica, speakers. Raman temperature measurements (R. Goulard, discussion leader): C. M. Penny, A. B. Harvey, speakers.

*12 June*. New techniques (G. Mallard, discussion leader): L. A. Rahn, "Advanced CARS methods"; J. W. Daily, "Coherent transient spectroscopy"; D. R. Crosley, "Two photon spectroscopy."

**Lipid Metabolism**

*Kimball Union Academy*

Robert M. Bell, chairperson; Julian B. Marsh, vice chairperson.

*15 June*. Coated pits and coated vesicles (Barbara Pearse, chairperson): John Heuser, "Electron microscopy of coated pits/coated vesicles"; Michael Brown, "Mutants of CHO cells defective in LDL metabolism"; Mark S. Bretscher, "Coated pits act as molecular filters"; Ari Helenius, "Coated vesicles, semliki forest virus, and membrane fusion." Coated vesicles/membrane assembly/protein translocation (Michael Brown, chairperson): James Rothman, "Transport of proteins along the endoplasmic reticulum–Golgi system in cell free extracts"; Randy Schekman, "Secretion and organelle assembly in yeast"; Milton Schlesinger, "Fatty acylation: Post-translational modification of membrane proteins."

*16 June*. Synthesis, assembly and translocation of membrane proteins and lipids (Mary J. Osborn, chairperson): Gottfried Schatz, "Synthesis, translocation and assembly of mitochondrial membrane proteins"; William Wichner, "Assembly of membrane proteins"; Richard Pagano, "Intracellular translocation and metabolism of fluorescent phospholipids in cultured cells"; Henk van den Bosch, "Transbilayer movement of lysophosphatidylcholine and phosphatidylcholine." Glycerolipid metabolism (Eugene Kennedy, chairperson): Christian R. H. Raetz, "Animal

cell mutants defective in phosphatidylcholine synthesis"; Fred Snyder, "A novel class of biologically active ether phospholipids"; William Dowhan, "Cloning of genes and characterization of gene products involved in *Escherichia coli* phospholipid metabolism."

*17 June*. Phospholipid structure and protein-lipid interactions (Thomas E. Thompson, chairperson): Helmut Hauser, "Phospholipid structure and motion in bilayer membranes"; Donald M. Engleman, "Bacteriorhodopsin is an inside-out protein"; Joseph Seelig, "Lipid-protein interactions probed with deuterium NMR"; Peter Culles, "Nonlamellar phase lipids in model systems and membranes." Regulation of lipid metabolism (Claudia Kent, chairperson): Dennis Vance, "Regulation of phosphatidylcholine biosynthesis"; T. Y. Chang, "Coordinate regulation of enzymes of cholesterol synthesis."

*18 June*. Adipocyte differentiation/regulation of adipocyte function (Ora Rosen, chairperson): Howard Green, "Adipose conversion of 3T3 cells"; Gerard Ailhaud, "Differentiation of mouse preadipocyte lines"; Peter Spooner, "Regulation of lipoprotein lipase and hormone sensitive lipase in 3T3-L1 cells"; Michael Czech, "Transmembrane signaling in adipocyte membranes by insulin: Insulin receptor interaction." Regulation of triacylglycerol/lipoprotein synthesis (Donald Small, chairperson): Daniel Lane, "Metabolism of hepatic triacylglycerol-rich vesicles and secretion of VLDL nascent chains"; Roger Davis, "Coordination of triacylglycerol synthesis and liproprotein secretion from hepatocytes"; Michael Wells, "Lipid digestion and transport in suckling rats.

*19 June*. Fatty acid metabolism (William Lands, chairperson): John Cronan, "Regulation of fatty acid biosynthesis in *Escherichia coli*: Insights from studies applying recombinant DNA techniques"; Philip Majerus "How arachidonic acid enters and exits from phosphatidylinositol."

The program will also include a limited number of invited posters.

## Liquid Crystals

*Colby-Sawyer College*

Dwight W. Berreman, chairperson; Robert B. Meyer, vice chairperson.

*6 July*. Michael Clark, "Dual frequency addressing in liquid crystal devices"; William Heffner, "Bistable cholesteric twist cells: Operating characteristics"; Noel Clark, "Electro-optic effects in ferro-electric liquid crystals"; Shunsuke Kobayashi, "Critical surface tension and optical properties of substrates and their aligning properties for liquid crystal molecules." Poster session on device-related subjects.

*7 July*. David Johnson, "The nematic–smectic-A–smectic-C multicritical point"; David Nelson, "Smectic and cholesteric order in 2 and 3 dimensions"; Tom Lubensky, "Theory of nematic to smectic phase transitions"; Robert Peklovits, "Smectic C to A transition in 3 dimensions"; Alfred Saupe, "Nematic-nematic transitions and biaxial nematic phases in amphiphilic systems"; Ken Miyano, "Molecular interactions in monolayer films manifested in mechanical properties"; Jerzy Janik, "New aspects of the fast molecular reorientations problem in liquid crystals."

*8 July*. Madeleine Veyssie, "Macromolecular solutes in nematic solvents"; Horst Stesemeyer, "Physical properties of blue phases"; Paul Keyes, "The cholesteric blue phase; theory and experiment"; Saul Meiboom, "Observations on three blue phases." Poster session on academic subjects. H. Finkelmann, "Optical and thermodynamic investigations on linear and crosslinked liquid crystalline polymers"; Andy Griffin, "Chemical structure of thermotropic liquid crystalline polymers."

*9 July*. Georges Durand, "Plastic behavior of smectic phases under shear and compression"; Alan Leadbetter, "Modulations in liquid crystal structures"; John Goodby, "The hexatic and crystal B phases and the accompanying problems of phase classification"; David Litster, "X-ray scattering studies of smectic phases"; Hans Gruler, "Monomolecular films in biophysics."

*10 July*. S. Chandrasekhar, "Defects in discotic phases"; Jean Charvolin, "Structural study of the calamitic-discotic transition in lyotropic nematics"; H. Gasparoux, "New experimental aspects of liquid crystal polymorphism: Disk-like phases and frustrated polar smectic-A systems."

Persons wishing to contribute to one of the poster sessions should send abstracts of 20 lines or less for consideration to Dwight W. Berreman, Room 1D-435, Bell Laboratories, Murray Hill, New Jersey 07974, to arrive by 1 April. Notification of acceptance of abstracts will be mailed by 15 April. A few posters with astounding new information may be accepted later if space permits.

## Liquids, Chemistry and Physics of

*Holderness School*

Robert L. Scott, chairperson; George Stell, vice chairperson.

*10 August*. Melting (chairperson to be announced): J. P. McTague, "Defect structure and melting in two dimensions"; D. R. Nelson, "Bond orientational order, dislocation loops, and three dimensional melting." Liquid crystals (R. Meyer, session chairperson): W. M. Gelbart, "Molecular theory of nematic liquids"; J. T. Litster, "Recent problems in liquid crystal physics."

*11 August*. Interfaces (J. S. Rowlinson, session chairperson): B. Widom, "Theoretical and experimental studies of the interfaces between fluid phases"; M. Moldover, "Phase transitions in the structure of liquid-vapor interfaces"; R. G. Horn, "Measurements of forces between molecularly smooth surfaces in various liquids with a distance resolution of one Angstrom." Poster session.

*12 August*. Polar liquids and electrolyte solutions (G. S. Rushbrooke, session chairperson): G. M. Patey, "Current problems and progress in theory and computer simulation of polar liquids and ionic solutions"; M. Wertheim, "Equilibrium statistics of polarizable polar fluids"; M. Chabanel, "EXAFS of polymeric LiBr and of complex bromides in weakly polar solvents." Quantum fluids (B. J. Alder, session chairperson): D. Chandler, "Exploiting the isomorphism between theory and classical chemical equilibria in solutions"; P. G. Wolynes, "Quantum dynamics in liquids"; M. H. Kalos, "Numerical computation of quantum liquid properties."

*13 August*. Systems far from equilibrium. W. G. Hoover, "Nonequilibrium molecular dynamics"; E. G. D. Cohen, "Light scattering from fluids not in thermoequilibrium"; D. Beysens, "Brillouin scattering in systems under temperature gradients: Status of the experimental situation." Liquids in Joel Hildebrand's hundreth year (R. L. Scott, session chairperson): M. L. McGlashan, B. J. Alder.

*15 August*. Mixtures: F. L. Swinton, "The real world of mixtures"; W. B. Streett, "Phase equilibria in mixtures at high pressures."

## Magnetic Resonance

*Brewster Academy*

Myer Bloom, chairperson; Robert R. Vold, vice chairperson.

*15 June*. Michael Mehring, "Application of high resolution NMR to low dimensional solids"; Bernard G. Silbernagel, "Atomic and molecular motion in reduced dimension"; Hans C. Wolf, "Dimensionality, coherence and interaction of triplet excitons in organic crystals"; Richard E. Norberg, "Spin relax-

ation in a spin 9/2 system $^{85}Kr$ in solid krypton"; Douglas D. Osheroff, "NMR on the ultralow temperature phases of solid and liquid helium three."

*16 June*. Harold T. Stokes, "NMR of platinum catalysts—the PT surface resonance"; Hans W. Spiess, "Deuterium NMR, a powerful tool for studying slow motions and the orientational distribution in solids and solid polymers"; E. Elliott Burnell, "Orientational order in liquid crystalline systems"; Alexander L. Pines, "Selective n-quantum excitation"; John S. Waugh, "Slow molecular motions in the presence of multiple coherent excitations."

*17 June*. Robert G. Griffin, "Two dimensional rotational spin echo NMR in solids"; James Norris, "Echoes, EPR and pulsed microwaves in the study of the primary events in photosynthesis"; Sven Hartmann, "Echoes in the optical regime"; Thomas L. Estle, "Muon spin rotation ($\mu$SR), 'Muonium' in elemental semiconductors and coherence effects in double electron muon resonance (DEMUR)"; Robert Shelby, "High resolution laser spectroscopy of solids."

*18 June*. Kurt Wuthrich, "New high resolution NMR techniques for studies of biological macromolecules"; Jeffrey R. Alger, "Saturation transfer NMR studies of in vivo ATPase kinetics in *Escherichia coli* and yeast"; Eric Oldfield, "NMR of protein crystals and membrane proteins"; Walter N. Hardy, "Magnetic resonance of H-atoms at low temperatures"; Edward M. Purcell, "Beginnings of NMR." Several invited posters will also be presented on Thursday evening.

*19 June*. Hans Glattli, "Resonant conversion and spin-lattice relaxation in $CH_4$"; Hans van Willigen, "ENDOR on paramagnetic systems randomly oriented in rigid matrices"; Jiri Jonas, "Dynamic structure of disordered systems." Several invited posters will also be presented during the conference.

## Mammary Gland Biology

*Colby-Sawyer College*

Russell Hilf, chairperson; H. Allen Tucker, vice chairperson.

*8 June*. Development of the mammary gland (H. Allen Tucker, discussion leader): K. Kratochwil, "Hormonal regulation of embryological development of the mammary gland"; S. Nandi, J. Yang, "Factors affecting mammary development in primary culture"; G. Shyamala, "Regulation of steroid hormone receptors during different functional states of the mammary gland." Transport across mammary epithelium (M. Peaker, discussion leader): M. Neville, "Calcium transport"; C. Baumrucker, "Amino acid transport in bovine mammary tissue."

*9 June*. Biological characteristics of mammary cells at high risk of neoplastic transformation (P. Gullino, discussion leader): H. Bern, F. Talamantes, "Risk of neoplastic transformation in mammary tissue of neonatally hormone-exposed mice"; M. Banerjee, "Onset of high risk cell populations during hormonal modulation in vitro of growth and regression of adult mammary tissue"; P. Gullino, "Acquisition of angiogenic capacity as a step in the progression of mammary cells toward neoplastic transformation." Prevention of mammary tumor development and growth (C. Welsch, discussion leader): R. C. Moon, "Retinoids and mammary gland tumorigenesis: Mechanism of action"; S. Abraham, "Influence of dietary lipids on mammary tumors in rats and mice."

*10 June*. Hormonal regulation of mammary cell metabolism (I. Forsyth, discussion leader): D. E. Bauman, "Hormonal regulation of nutrient partitioning"; B. K. Vonderhaar, "Hormonal regulation of milk protein synthesis in vitro"; K. Hove, "Insulin secretion in cattle." Advances in clinical breast cancer therapy (R. Hilf, discussion leader): B. Fisher, "The treatment of primary breast cancer"; E. R. DeSombre, "Steroid receptors as predictors of response to hormonal therapy of breast cancer patients."

*11 June*. Immunobiological aspects of the mammary gland (J. Butler, discussion leader): M. E. Lamm, "Origin and specificity of lymphocytes and plasma cells in mammary gland"; J. Halsey, "Significance of serum sources of mammary immunoglobulins in mouse mammary secretions"; H. L. Leary, "Transport pathway of bovine IgG, through the mammary secretory cells"; J. P. Krahenbuhl, "Role of the secretory component in transport of IgA across mammary epithelium." Historical perspectives on physiology and control of prolactin secretion: J. Meites, speaker.

*12 June*. Mechanisms and function of oxytocin in the mammary gland (C. D. Grosvenor, discussion leader): R. C. Gorewit, "Physiological stimulation of oxytocin release in cattle"; F. Mena, "Physiological inhibition of oxytocin function"; M. Soloff, "Receptors for oxytocin."

Conferees wishing to participate in daily poster sessions should indicate so on their application.

## Marine Natural Products

*Holiday Inn, Ventura, California*

D. John Faulkner, chairperson; James J. Sims, vice chairperson.

*22 June*. The chemistry of biologically active marine natural products: Francis J. Schmitz, speaker. Biology of sponges: Klaus Rutzler, speaker. Applications of NMR spectroscopy to structural elucidation: Laurence Hall, speaker.

*23 June*. The chemistry of biological active marine natural products: Raymontas Kazlauskas, speaker. Synthesis of marine natural products: Thomas Hoye, speaker.

*24 June*. The chemistry of marine phytoplankton: Raymond Anderson, speaker. Biosynthesis of marine natural products: Kevin Barrow, speaker.

*25 June*. The structure of palytoxin: Richard E. Moore, Yoshimasa Hirata, speakers.

*26 June*. Metabolites of soft corals: John Coll, speaker.

## Medicinal Chemistry

*Colby-Sawyer College*

Josef Fried, chairperson; Denis M. Bailey, vice chairperson.

*3 August*. Chemotherapy of rhinovirus infections (Edward C. Hermann, chairperson): Jack M. Gwaltney, "Epidemiological and clinical aspects of rhinovirus infections"; Bruce D. Korant, "Biochemical basis for rhinovirus chemotherapy"; Donald C. Delong, Charles J. Pagent, "Development and status of a new rhinovirus compound." The etiology and treatment of asthmatic states—the leukotrienes (Lawrence W. Chakrin, chairperson): Barbara A. Jakschik, "Assembly of leukotrienes by enzymes from RBL-1 cells"; Priscilla J. Piper, "Pharmacological actions of the leukotrienes"; Michael K. Bach, "Formation of leukotrienes CND and pharmacological modulations of their synthesis."

*4 August*. Immunopharmacology (William J. Wechter, chairperson): Edward D. Harris, Jr., "Collagenase and the arthritides"; Ken Eakins, "Arachidonic acid lipoxygenase in inflammation and its inhibition as a mechanism for anti-inflammatory drugs"; Gideon Goldstein, "Therapeutic uses of monoclonal antibodies to human T lymphocytes." Immunopharmacology (William J. Wechter, chairperson): R. Neil Pinckard, "The chemistry and biology of AGEPC"; William E. Stewart, II, "Interferon: Structures versus biological function"; Edwin Blalock, "Human leukocytes produce ACTH and endorphins

in the form of leukocyte interferon."

*5 August.* Calcium entry blockers as a new therapeutic concept (Alexander Scriabine, chairperson): H. Meyer, S. Kazda, "Structure activity relations in a series of 1,4-dihydropyridines with cardiovascular activity"; D. J. Triggle, "Comparative chemical pharmacology of calcium entry blockers"; C. van Breemen, "Separate calcium channels for smooth muscle activation"; S. F. Flaim, "The cardiovascular physiology and clinical applications of calcium entry blockers." Special topics—Quo vadis? (Denis M. Bailey, chairperson): Benjamin Weiss, "Structure activity relationships for altering calmodulin activity"; Phil Skolnick, "New directions in drug-receptor interactions"; Nicholas Bodar, "Soft drugs."

*6 August.* Peptides (Johannes Meienhofer, chairperson): Choh Hao Li, "Human β endorphin: Recent biological and chemical studies"; Victor J. Hruby, "Conformational and dynamic considerations in the design of peptide hormone agonists and antagonists"; Richard T. Olson, "Synthesis of triostin depsipeptide antibiotics and their intercalation with deoxynucleic acid." Special lecture (I. J. Greenblatt, chairperson): Stanley M. Garn, "The chemistry of living together."

*7 August.* To market, to market (Murray Weiner, chairperson): This session will be dedicated to short presentations on very recent developments of important new IND or equivalent entities (subjects to be announced).

## Metal Hydrides, Formation and Properties

*Tilton School*

Ted B. Flanagan, chairperson; G. G. Libowitz, vice chairperson.

*20 July.* (G. Libowitz, discussion leader): E. Wicke, "A personal view of the major problems and directions of future research on metal hydrides"; P. Rudman, "The rate of hydrogen solution and the rate of hydride formation (decomposition)." (M. Pick, discussion leader): L. Schlapback, "The role of the chemisorbed hydrogen intermediate and the kinetics of the chemisorbed→ dissolved hydrogen transition."

*21 July.* (H. Wipf, discussion leader): H. K. Birnbaum, "Factors determining the magnitudes of diffusion constants of hydrogen in various solids and the detailed pathways." (D. Papaconstanpopoulis, discussion leader): J. Weaver, "The factors which determine the binding energies of hydrogen to the interstice and how the binding changes with hydrogen content." (S. Moss, discussion leader): H. Piesl, "The static and dynamic consequences of the dissolved hydrogen on the metal lattice."

*22 July.* (W. A. Oates, discussion leader): H. Wenzl, "The H-H interaction and elastic distortion caused by hydrogen in ordered and disordered hydride phases." (Discussion leader to be announced): T. Shober, "Hydride transitions." (C. Hall, discussion leader): F. D. Manchester, "Statistical thermodynamic models for hydrogen solution and hydride formation."

*23 July.* (J. Rush, discussion leader): D. K. Ross, "Optic mode frequencies of hydrogen in metals." (Discussion leader to be announced): S. Rundqvist, "The interstices which are occupied by H atoms in metal-nonmetal compounds and why these are the preferred ones."

*24 July.* (J. Rhyne, discussion leader): D. Westlake, "The interstices which are occupied in intermetallic compounds and why these are the preferred ones." Final session to be announced.

If someone wishes to make a *brief* contribution to a session, he or she may wish to contact the discussion leader for that session in advance to reserve a time slot. If a discussion leader is not as yet listed for the session, he or she may write to the chairperson who will provide the name of the discussion leader. In addition, there will be poster sessions on Tuesday and Wednesday from 4 to 6 p.m. Those wishing to contribute posters should include the poster title and an outline of the contents in their application. A selection will be made if there are too many posters.

## Micelles and Macromolecular Catalysis

*Brewster Academy*

E. H. Cordes, chairperson; J. Kerry Thomas, vice chairperson.

*13 July.* Micellar catalysis I: Dr. Hernan Chaimovich, "Quantitative analysis of micellar effects on chemical reactions and equilibria"; Laurence Romsted, "Reactive counter ion surfactants." Micellar catalysis II: Umberto Tonellato, "Kinetics of reactions catalyzed by functional micelles"; Robert Moss, "Stereochemical control of micellar cleavage reactions."

*14 July.* Micellar catalysis III: B. Robinson, "Reaction kinetics in micellar and microemulsion systems"; Yukito Murakami, "Stereochemical control of reactions by membrane models." Membrane models: Toyoki Kunitake, Yoshio Okahata, "Organization and characterization of synthetic bilayer membranes"; Iwao Tabushi, "Material and electron transport across artificial membranes."

*15 July.* Structures of biological micellar aggregates: David Atkinson, "The molecular organization of plasma lipoproteins"; Emil Thomas Kaiser, "The rational design of lipid-binding peptides and polypeptides." Physical chemistry of micelles I: Jacques E. Desnoyers, "Thermodynamic properties of surfactants and microemulsions"; E. D. Goddard, "Micellization of surfactants in the presence of macromolecules."

*16 July.* Physical chemistry of micelles II: George Benedek, "The size and shape of simple and mixed micelles of bile salts and lecithin"; Josip Kratohvil, "Micellar growth in solution of bile salts." Spectroscopy in micellar systems: L. J. Cline Love, "The micelle stabilized triplet state"; Eric Oldfield, "NMR studies of synthetic and biological membranes."

*17 July.* Micelles and analytical chemistry: Daniel Armstrong, "Practical and theoretical aspects of pseudophase chromatography"; Willie Hinze, "Uses of micelle and vesicle systems in chemical analysis."

## Microbiological Degradation

*Brewster Academy*

Antonio H. Romano, chairperson; Joseph J. Cooney, vice chairperson.

*27 July.* (Douglas W. Ribbons, discussion leader): George A. Jacoby, "Aspects of plasmid behavior"; Peter A. Williams, "Role of plasmids in biodegradation." (Prakash Masurekar, discussion leader): Sharon Shoemaker, "Chemical feedstocks from biomass."

*28 July.* (J. Gregory Zeikus, discussion leader): J. H. Slater, "Microbial interactions and the selection of microorganisms in the natural environment"; John A. Breznak, "Biochemical bases for symbiosis between termites and their intestinal microbiota." (Bland S. Montenecourt, discussion leader): Lars G. Ljungdahl, "Physiology of thermophilic and extreme thermophilic microorganisms that degrade starch and cellulose."

*29 July.* (Joseph J. Cooney, discussion leader): Ronald M. Atlas, "Measurement of microbial hydrocarbon degradation in environmental samples"; David C. White, "Sensitive analytical methods for the biomass, metabolic activity, and community structure of marine detrital and benthic microbiota." (Robert H. Brink, discussion leader): Victor W. Saeger, "Assessment of biodegradation

potential of chemicals—an industrial point of view."

*30 July*. (Arthur M. Kaplan, discussion leader): L. Nicholas Ornston, "Natural history of a degradative metabolic pathway"; Barry G. Hall, "Experimental evolution of new metabolic functions." (Antonio H. Romano, discussion leader): Holger W. Jannasch, "Chemosynthesis at deep sea hydrothermal vents."

*31 July*. Douglas E. Eveleigh, Summary of the conference and final discussion.

Poster sessions will be held on Tuesday and Wednesday afternoons from 4 to 6 p.m. Those wishing to present posters should submit a brief abstract by 15 May 1981 to F. K. Pfaender, Department of Environmental Science and Engineering, University of North Carolina, Chapel Hill, North Carolina 27514.

## Molecular Collisions, Dynamics of

*Holderness School*

R. J. Cross, chairperson; W. E. Gentry, vice chairperson.

*27 July*. (R. B. Bernstein, chairperson): R. N. Zare, "Study of dynamics in multiphoton processes"; E. J. Heller, "Photodissociation and intramolecular dynamics." (J. M. Farrar, chairperson): I. Koyano, "State-selected ion-molecule reactions using TESICO"; C. Y. Ng, "Molecular-beam photoionization mass spectroscopy."

*28 July*. (E. F. Greene, chairperson): Y. T. Lee, "Review of recent results of molecular-beam experiments." (A. Kuppermann, chairperson): J. C. Light, "Review of the quantum theory of reactive scattering."

*29 July*. (D. R. Herschback, chairperson): Speakers and subjects to be announced. (W. L. Hase, chairperson): R. A. Marcus, "Review of the dynamics of long-lived complexes."

*30 July*. (W. H. Miller, chairperson): H. F. Schaefer, "How much do we really want to know about potential-energy hypersurfaces"; Donald Truhlar, "Variational transition-state theory." (G. Scoles, chairperson): Panel and floor discussion on the ultimate state-sensitive detector.

*31 July*. (J. L. Kinsey, chairperson): M. Faubel, "Measurement of inelastic cross sections of time-of-flight methods."

## Molecular Energy Transfer

*Brewster Academy*

Thomas F. George, chairperson.

*29 June*. Reactions and energy transfer at solid surfaces (discussion leader to be announced): John C. Tully, "Chemical dynamics at solid surfaces"; W. Henry Weinberg, "Catalytic reactions over well-characterized metallic surfaces"; Jimmie D. Doll, "Dynamics of gas/solid-surface processes." Spectroscopy at solid surfaces (Horia I. Metiu, discussion leader): Ming C. Lin, "Kinetics and dynamics of hydroxyl radical desorption from a platinum catalyst surface"; George C. Schatz, "Theories of surface-enhanced Raman spectroscopy"; Jeffrey I. Steinfeld, "Reactions of laser-generated free radicals at semi-conductor surfaces."

*30 June*. Intramolecular energy transfer, radiationless transitions and unimolecular reactions (F. Fleming Crim, discussion leader): Sighart F. Fischer, "Vibrational lifetimes and Fermi resonances in polyatomic molecules"; Stuart A. Rice, "Inter- and intramolecular energy transfer"; Paul W. Brumer, "Classical and quantum intramolecular dynamics in small molecules." Reactions, energy transfer and spectroscopy in liquids (discussion leader to be announced): Steven A. Adelman, "New principles in condensed-phase chemistry with applications"; Geraldine A. Kenney-Wallace, "Picosecond perspectives on spectroscopy and reactions in liquids"; Peter G. Wolynes, "Quantum dynamics in liquids."

*1 July*. Interaction of intense laser radiation with collision dynamics (John C. Light, discussion leader): Michael G. Raymer, "The spectrum of light scattered by atomic vapors: Collisional redistribution and saturation"; Frederick H. Mies, "Quantum theory of atomic collisions in intense laser fields." Electronic energy transfer in gases (Paul L. Houston, discussion leader): William H. Miller, "To what extent can current theoretical models accurately describe the dynamics of electronic energy transfer in molecular gases?"; William H. Breckenridge, "Energy transfer exit channels in the collisional quenching of electronically excited metal atoms."

*2 July*. Vibrational and rotational energy transfer in gases (David A. Micha, discussion leader): Anthony J. McCaffery, "Reorientation by elastic and rotationally inelastic collisions"; Joel M. Bowman, "Classical-limit sudden approximation analyses of rotational rainbows." Chemical reactions of excited gas-phase species (William C. Stwalley, discussion leader): John C. Polanyi, "Dynamics of nonadiabatic reactions"; Michael Baer, "Quantum mechanical analysis of electronically nonadiabatic chemical reactions."

*3 July*. Multiphoton excitation of gas-phase molecules (Richard B. Hall, discussion leader): Richard B. Bernstein, "Multiphoton excitation, ionization and fragmentation of gaseous molecules"; Robert E. Wyatt, "Computational studies of multiphoton excitation in model systems and in small molecules."

Poster session: 1 July.

## Molecular Pathology

*Plymouth State College*

Harold F. Dvorak, chairperson; Julia Philips-Quagliata, vice chairperson.

### Host Defense in Neoplasia

*20 July*. The tumor microenvironment. Components of tumor stroma (P. Guillino, chairperson): P. Guillino, "The tumor interstitial space"; L. Liotta, "Tumor collagen"; H. Dvorak, "Fibrin deposition in human and animal tumors"; P. Ward, "Tumor invasion and metastasis: The role of cell motility." Cells of the tumor microenvironment (J. Haskill, chairperson): J. Haskill, "The inflammatory cells that infiltrate tumors as judged by tumor disaggregation studies"; A. M. Dvorak, "The cells that infiltrate tumors as judged by electron microscopy"; A. Bhan, "Lymphocyte and macrophage identification in tissue sections with monoclonal antibodies and immunofluorescence and immunoperoxidase techniques"; S. J. Galli, "The microvasculature as a target in immunologically mediated tumor rejection."

*21 July*. Immunologically mediated tumor cell destruction I (C. Henney, chairperson): L. Reid, "Interferon and tumor growth and metastasis in mice"; E. Borden, "Interferon: Therapeutic experience in cancer patients"; C. Henney, "NK cells: Nature of target cell susceptibility." Immunologically mediated tumor cell destruction II (I. J. Fidler, chairperson): S. Cohen, "Lymphokines and tumors"; A. Schroit, "Macrophage surface–liposome interactions"; G. Poste, "Activation of macrophages to the tumoricidal state by liposomes containing immunomodulators"; I. J. Fidler, "Eradication of metastases by the systemic administration of liposomes containing immunomodulators."

*22 July*. More complex tumor-host interactions (J. Phillips-Quagliata, chairperson): J. Phillips-Quagliata, "Hybird resistance to tumors"; R. Lynch, "Myeloma cell regulation"; F. Wheelock, "Tumor dormancy." Tumor products that affect the host inflammatory and immunologic mechanisms I (H. F. Dvorak, chairperson): D. Senger, "Tumor secreted vascular permeability factor"; S. Gordon, "Tumor secreted procoagu-

lants I''; A. Carvalho, ''Tumor secreted procoagulants II.''

*23 July*. Tumor products that affect host inflammatory and immunologic mechanisms II (R. Cotran, chairperson): R. Cotran, M. Gimbrone, ''Macrophage products and endothelial cell proliferation''; L. Liotta, ''Type IV collagenase is a tumor product''; P. Guillino, ''Prostaglandins and angiogenesis''; A. Senselau, ''Purification of a tumor angiogenesis factor.'' (R. Snyderman, chairperson): R. Prehn, ''Immune stimulation''; general discussion.

*24 July*. Tumor products that affect host inflammatory and immunologic mechanisms III (R. Roblin, chairperson): R. Roblin, ''Tumor plasminogen activators''; N. Orenstein, ''Cryptic plasminogen activators''; J. Feder, ''Methods of large-scale tissue culture suitable for tumor cell mediator preparation and purification''; R. Snyderman, ''Tumor produced inhibitors of mononuclear cell accumulation.''

**Molecular Pharmacology**

*Plymouth State College*

L. D. Kohn, chairperson; Gerald Fischback, vice chairperson.

*22 June*. Tetanus toxin: Current studies on mode of action and role as neural specific marker (M. C. Hardegree, session coordinator): ''Overview and current mode of action of tetanus toxin including studies on toxin induced neurotransmitter release in cultured neural cells''; ''Toxin effects on membrane potential in cultured nerve cells''; ''Toxin as specific neural marker''; ''Tetanus toxin induced changes in lipid methylation in neuronal and thyroid cell membranes''; ''Tetanus toxin effects on $Ca^{++}$ transport in synaptosomes''; ''Retrograde transport of tetanus toxin.'' Structure and function of receptors for tetanus toxin (L. D. Kohn, session coordinator): ''Structure/function of thyrotropin (TSH), and tetanus receptor and relationship to other agents (interferon, and cholera toxin)''; ''Structure/function of interferon receptor''; ''Structure/function of cholera toxin receptor''; ''Adenosine diphosphate (ADP) ribosylation and mechanism of interferon and thyrotropin (TSH).''

*23 June*. Monoclonal antibodies as specific neuronal markers or as agents to understand neuronal receptors function (M. Schneider, session coordinator): ''Monoclonal antibodies as markers of cell types''; Monoclonal antibodies to ganglion cells—specific markers of small numbers of neurons or even individual neurons''; ''Monoclonal antibodies to acetylcholine receptor''; ''Monoclonal antibodies to defined lipids''; ''Monoclonal antibodies to synaptic vesicles''; ''Monoclonal antibodies to neuromuscular junctions''; ''Monoclonal antibodies as markers of cell position in the retina.'' Cellular internalization of neurotropic ligands, toxins, and hormones: Mechanisms; biologic function; and fate (John Middlebrook, session coordinator): ''Cell surface interactions of diphtheria toxin''; Internalization mechanisms''; ''Effects of environmental *p*H on internalization''; ''Lysozomal processing of internalized ligands''; ''Tetanus toxin internalization; interactions with cytoskeleton components'': ''Nerve growth factor internalization mechanisms.''

*24 June*. Acetylcholine receptor structure and function (Arthur Karlin, session coordinator): ''Expression of acetylcholine receptor genes''; ''Recent structural and reconstitution studies of acetylcholine receptor.'' $Ca^{++}$ transport across membranes and role of $Ca^{++}$ in ligand induced message transmission (Evelyn Grollman, session chairperson): ''$Ca^{++}$ transport in neural cells and synaptosomes''; ''$Ca^{++}$ transport in synaptic vesicles: Effect of tetanus toxin on sodium/Ca exchange mechanisms not adenosine triphosphate/calcium exchange mechanisms''; ''Mechanisms of neurotransmitter release''; ''Calcium interactions with components of the calmodulin system.''

*25 June*. Acetylcholine and toxin interactions with the cell membrane and the acetylcholine response (Gerald Fischbach, session coordinator): ''Couplings between cholinergic binding and ion permeation''; ''Acetylcholine modulation of voltage sensitive currents''; ''Relation between neuronal bungarotoxin binding sites and acetylcholine receptors''; ''Changes in acetylcholine channel function during development''; ''Models of acetylcholine receptor interactions.'' Structure-function of opiate peptides and their receptors (Werner Klee, session coordinator): ''Multiple opiate receptors''; ''Biosynthesis of receptors''; ''Role on GTPase and receptor coupling mechanisms.''

*25 June*. Electrophysiologic response coupling and acetylcholine, hormone, and toxin receptors (Gerald Fischbach, session coordinator). Endorphins and enkephalins: Recent studies in mechanism of action as a neurotransmitter (Werner Kell, session chairperson).

*26 June*. Ligand induced lipid modulation (Fusano Hirata, session chairperson; Ephraim Yavin, session co-chairperson): ''Ligand induced lipid methylation and membrane fluidity''; ''Chemotaxis, methylation, and electrochemical ion gradients''; ''Gangliosides in neural development.'' Speakers to be announced.

**Molten Salts and Metals**

*Brewster Academy*

William W. Warren, chairperson; O. Kleppa, vice chairperson.

*17 August*. Static liquid structure: P. A. Egelstaff, ''Liquid structure as a function of state conditions''; H. Ruppersberg, ''Observation of chemical short-range order in binary liquids.'' Short report: J. Dupuy, ''Metal-molten salt solutions: Local and extended order, correlation with transport properties.'' Liquid dynamics: J. W. Halley, ''Recent developments in the dynamics of molten salts''; G. N. Paptheodorou, ''Raman spectroscopic studies of molten salts: Bulk salts, solutes, and interfaces.''

*18 August*. Surface and interfaces: S. A. Rice, ''Experimental and theoretical investigation of liquid metal surfaces''; R. Evans, ''The surface properties of molten salts and metals''; T. R. Griffiths, ''E.A.S. (Electronic Absorption Spectroscopy): A new versatile and informative technique for studying the corrosion of metals by molten salts.'' Solutions and the metal-nonmetal transition: M. P. Tosi, ''Dilute solutions of alkali metals and alkali halides: Results by charged hard-spheres models''; W. van der Lugt, ''Knight shifts and resistivities of some liquid lithium alloys.'' Short reports: M. Gaune-Escard, ''Temperature and concentration dependence of the activity in alkali-metal-salt solutions''; P. B. Littlewood, ''F-centers and the metal-nonmetal transition in liquid Cs-Au alloys.''

*19 August*. Molten salt battery development: E. J. Cairns, ''Molten salt batteries''; I. W. Jones, ''Liquid electrodes in the sodium-sulfur battery''; T. G. Bradley, ''Recent progress in the development of the Li alloys/$FeS_2$ system at General Motors''; D. R. Vissies, ''Electrode processes in the Li-Al/FeS battery system.'' Poster session: Recent developments in the physics and chemistry of molten salts and metals and applications for batteries, fuel cells, thermal storage, and so forth. Persons interested in contributing a poster are asked to contact the conference chairman.

*20 August*. Chloroaluminates: W. E. Haupin, ''Challenges facing the aluminum industry''; J. J. Auborn, ''Aluminum chloride–sodium–sulfur cells.'' Short report: M. Blander, ''Fundamental studies of chloroaluminates.'' Phase transitions: A. Rahman, ''Molecular dynamic studies of homogeneous nuclea-

tion in fluids"; R. W. Hockney, "Molecular dynamics experiments on alkali halide crystal melting." Short report: F. Hensel, "Liquid-vapor phase transition in metallic fluids."

*21 August*. Liquid crystals and glasses: J. Jonas, "NMR studies of ionic mesophases of organic salt melts"; D. Ravaine, "Disorder effects on the ionic conduction mechanism in glasses: The example of $ZrF_4$-based glasses."

**Muscle Proteins**

*Holderness School*

R. S. Adelstein, chairperson; E. W. Taylor, vice chairperson.

*29 June*. Structure of the actin-myosin cross-bridges (H. E. Huxley, chairperson). Cross-bridge probes and measurements of the active site of myosin (J. Gergley, chairperson).

*30 June*. Regulation of contraction: Troponin-tropomyosin (E. W. Taylor, chairperson). Reconstruction of the actin-myosin-tropomyosin complex; isozymes of contractile proteins (S. Lowey, chairperson).

*1 July*. Regulation of contraction: Phosphorylation (R. S. Adelstein, chairperson). The mechanism of the actomyosin ATPase activity (E. Eisenberg, chairperson).

*2 July*. The mechanics of cross-bridge action (R. J. Podolsky, chairperson). Poster discussion session.

*3 July*. Summary (A. F. Huxley, chairperson).

**Natural Products**

*New Hampton School*

Robin D. G. Cooper, chairperson; David E. Cane, vice chairperson.

*20–24 July*. J. B. Baldwin, "Recent advances in biosynthesis of β-lactan antibiotics"; P. Fuchs, "The cytochalasin pyramid"; G. Keck (subject to be announced); L. Mander, "The total synthesis of gibberellin"; K. Nakanishi, "Isolation and structural studies of bioactive compounds"; S. Narang, "Total synthesis of human proinsulin gene and its cloning in *Escherichia coli* bacteria"; P. Scheuer, "Chemical marine ecology"; B. Sharpless, "Usefulness of asymmetric epoxidation in natural product synthesis"; R. Southgate, "Some aspects of the chemistry of natural and synthetic olivanic acid derivatives"; C. Cimarusti, "Chemistry of novel β-lactans"; R. V. Stevens, "Studies on the stereospecific total synthesis of alkaloids"; Liang Xiaotian (subject to be announced).

**Neural Plasticity**

*Brewster Academy*

Steven Arch, chairperson; Bruce McEwen, vice chairperson.

*20 July*. Developmental processes: Evidence for the regulation of developmental plasticity in embryologic and regenerating preparations will be considered.

*21 July*. Molecular processes: The roles of calcium, nucleotides, and macromolecules in the regulation and alteration of neuronal functioning will be discussed.

*22 July*. Synaptic processes: Phenomena such as habituation, long-term potentiation, and classical conditioning will be evaluated in terms of synaptic function and its modulation.

*23 July*. Central processes: Principles of organization underlying complex behaviors and memory and learning will be presented and evaluated.

*24 July*. A final session will be devoted to critical and synthetic discussions among the session leaders and conferees with the goal of evaluating the accomplishments, prospects, and areas of fruitful interaction among the research efforts examined during the week. Session participants will include S. Arch, Ira Black, Martha Bohn, R. J. DeLorenzo, Linda Dokas, Adrian Dunn, Y. H. Ehrlich, W. H. Gispen, Graham Hoyle, Michael Iuvone, Gary Lynch, H. R. Mahler, Richard Mark, H. Matthies, Bruce McEwen, J. Meyer, T. C. Rainbow, Steven Rose, Robert Roth, A. Routtenberg, Victor Shashoua, James Truman, D. L. Wilson.

**Nonlinear Optics and Lasers**

*Brewster Academy*

David Auston, chairperson; Robert A. Fisher, Curt Wittig, and Alfred Laubereau, co-vice chairpersons.

*3 August*. Nonlinear optics of interfaces: Y. R. Shen, "Nonlinear optics at an interface"; R. P. van Duyne, "Surface-enhanced Raman scattering"; P. F. Liao, "Surface-enhanced Raman scattering from lithographically produced surfaces"; C. V. Shank, "Surface-enhanced Raman scattering in ultra-high vacuum." Coherent transients: S. R. Hartmann, "Laser-induced reordering processes in atomic vapors"; E. L. Hahn, "Mixed-state quantum beats by Stark switching"; R. G. DeVoe, "Long-lived coherent spectroscopy in solids."

*4 August*. Nonlinear spectroscopic techniques and applications: S. Akhmanov, "New effects and methods in nonlinear polarization spectroscopy of molecules and solids"; N. Bloembergen, "Generation of coherent four-wave mixing signals by incoherent collisions." Optical phase conjunction: R. W. Helwarth, "Self-oscillating optical structures and optical processing using a photorefractive mirror"; M. Ducloy, "Nonlinear Doppler-free spectroscopy by degenerate four-wave mixing"; B. J. Feldman, "UV phase conjugation"; D. G. Steel, "Atomic coherence effects in degenerate four-wave mixing."

*5 August*. VUV, XUV, and x-rays: S. E. Harris, "Anti-stokes radiation for XUV spectroscopy and lasers"; J. Bokor, "New results on four-wave parametric generation of coherent VUV"; J. A. Golovchenko, "X-ray standing waves and interferometry at crystal surfaces." Applications to photochemistry and photophysics: R. E. Smally, "Supersonic beams of metallic clusters"; Matveetz, "Picosecond nonlinear photochemistry of biomolecules"; G. Hancock, "Detailed studies of photophysical and photochemical processes via laser spectroscopy."

*6 August*. Picosecond phenomena: L. F. Mollenauer, "Solitons in optic fibers"; R. L. Fork, "Subpicosecond spectroscopy of semiconductors." New lasers, materials and novel interactions: P. E. Toschek, "The two-photon laser and related interactions"; R. R. Freeman, "Doubling of laser light in isotropic media"; R. L. Carman, "Visible harmonics in plasma produced by a $CO_2$ laser"; P. F. Moulton, "Advances in transition metal-doped lasers."

*7 August*. Short reports on recent results.

Participants interested in contributing a paper to either the Friday morning session on recent results or other sessions (including two poster sessions) should directly contact the chairman, D. H. Auston, Bell Laboratories, ID-456, Murray Hill, New Jersey 07974. Telephone: 201-582-3188. Papers will be considered for presentation up to the time of the conference.

**Nuclear Chemistry**

*Colby Sawyer College*

Amand Faessler, chairperson; Luciano Moretto, vice chairperson.

*15 June*. (Ch. Briancon, discussion leader): D. Schwalm, "High spin states and their electromagnetic properties"; J. D. Garrett, "Systematics of rotating frame quasiparticle orbits in the rare earth nuclei." (J. Hamilton, discussion leader): G. Leander, "Description of the continuum gamma rays after heavy ion fusion reactions"; D. Sarantites, "The

first results from the spin spectrometer crystal ball."

*16 June.* (V. Paar, discussion leader): A. Arima, "New results from the interacting boson approximation"; R. Broglia, "Can the interacting boson approximation be applied to strongly deformed nuclei?" (J. Talmi, discussion leader): M. Moshinsky, "Confrontation of microscopic and macroscopic nuclear collective models"; J. Wood, "Recent results of the UNISOR collaboration."

*17 June.* (Ch. Goodman, discussion leader): D. Horen, "Investigation of magnetic resonances with nucleons"; A. Richter, "Inelastic electron scattering, magnetic excitations and the magnetic suspectability of nuclei." (F. Stephens, discussion leader): J. M. Moss, "Investigation of the precritical behavior of nuclei by proton scattering"; H. Muther, "How reliable is the theoretical description of pion condensation?"

*18 June.* (D. Ward, discussion leader): M. B. Goldberg, "Investigation of g-factors in excited states"; O. Hausser, "Measurements of nuclear moments in excited states." (L. Moretto, discussion leader): F. Asaro, "Worldwide extraterrestrial and abnormal components in rocks relevant to the Cretaceous-Tertiary extinctions"; H. Mazurski, "The space exploration of Saturn."

*19 June.* (P. Kienle, discussion leader): T. T. Sugihara, "Possible uses of massive transfer in spectroscopy"; H. Bohn, "Gamma spectroscopy after heavy ion transfer reactions."

**Nuclear Structure Physics**

*Plymouth State College*

Peter Axel, chairperson; John Negele, vice chairperson.

*10 August.* Nuclear reactions with pions: J. Schiffer, "Puzzles in pion absorption"; I. Halpern, "Puzzles in pion scattering." Contributed talks. Fundamental interactions: G. T. Garvey, "Tests of basic symmetries with the aid of nuclei"; speaker to be announced, "Experimental information about and theoretical implications of a finite neutrino mass."

*11 August.* New insights into nuclear collective modes: S. Austin, "Experimental determination of charge exchange modes"; B. R. Mottelson, "The role of the delta resonance in nuclear collective modes." Near the frontiers: S. Frankel, "Ultra relativistic p-$\alpha$ and $\alpha$-$\alpha$ collisions in intersecting storage rings (32 GeV protons and 63 GeV alphas)"; G. E. Brown, "Quark bags and nucleon-nucleon forces."

*12 August.* Transport phenomena in low energy heavy ion reactions: J. Randrup, "Theories of dissipation and nucleon exchange"; W. U. Schroder, "Experimental observations of mass and energy transport." Non-equilibrium phenomena in intermediate energy heavy ion reactions: C. K. Gelbke, "Light particle emission"; speaker to be announced, "Other new reaction mechanics"; contributed talks.

*13 August.* Exact calculations of light nuclei: S. A. Koonin, "Recent advances in Monte Carlo methods"; J. Zabolitsky, "Selected new results"; contributed talks. Culture session: speaker and topic to be announced.

*14 August.* Recent experimental results with emphases on electromagnetic interactions: speaker and title to be announced; contributed talks.

**Nucleic Acids**

*New Hampton School*

Michael Chamberlain and Marvin Caruthers, co-chairpersons.

*8 June.* DNA/RNA construction technology (Michael Smith, chairperson). DNA/RNA structure (Sung-Hou Kim, chairperson).

*9 June.* DNA/RNA protein complexes (Peter von Hippel, chairperson). DNA/RNA multiprotein complexes (Bruce Alberts, chairperson).

*10 June.* Prokaryotic transcription and regulatory elements (Richard Losick, chairperson). Eukaryotic transcription and regulatory elements (Robert Tjian, chairperson).

*11 June.* Complex DNA regulatory elements (Gerald Smith, chairperson). Gene organization and development (Phillip Leder, chairperson).

*12 June.* Recombinant DNA technology and the expression of cloned genes (David Botstein, chairperson).

**Organic Photochemistry**

*Proctor Academy*

Frederick D. Lewis, chairperson; Samir Farid, vice chairperson.

*3 August.* (Donald R. Arnold, discussion leader): Nicholas J. Turro, "Magnetic isotope and magnetic field effects on photochemical reactions in micellar solutions"; Josef Michl, "Mechanistic photochemistry at low temperatures." (Samir Farid, discussion leader): Bernard M. Bigot, "Photochemical insights from theoretical potential energy surfaces."

*4 August.* (N. C. Yang, discussion leader): R. Marshall Wilson, "Photochemistry with an argon ion laser: The synthesis and chemistry of organic peroxides"; Paul A. Wender, "Recent progress in synthetic organic photochemistry." (Paul J. Kropp, discussion leader): Manfred P. Schneider, "Photolysis of azocompounds: Mechanism and synthetic applications": Harry A. Morrison, "The photochemistry and photobiology of urocanic acid—bane or boom?"

*5 August.* (Edwin A. Chandross, discussion leader): Arnsost Reiser, "Photocycloaddition in polymer matrices and in organic glasses"; Mitchell A. Winnik, "Applications of organic photochemistry to problems of motion in polymers." (Frederick D. Lewis, discussion leader): Tomas J. Meyer, "Electron transfer in ground and excited states."

*6 August.* (Paul Margaretha, discussion leader): Gary B. Schuster, "Dynamics of photochemically generated carbenes"; Juan C. Scaiano, "Kinetic aspects of triplet energy transfer." (Anthony M. Trozzolo, discussion leader): David I. Schuster, "Ten Gordon Conferences: A retrospective view of organic photochemistry and its practitioners."

*7 August.* (R. Srinivasan, discussion leader): Richard B. Bernstein, "Laser multiphoton ionization and fragmentation of organic molecules."

**Organic Reactions and Processes**

*New Hampton School*

Seemon H. Pines, chairperson; Robert A. Holton, vice chairperson.

*13 July.* Warren W. Kaeding, "Shape-selective zeolite catalysts"; Harold Hart, "Polysubstituted aromatics and bis-aryne equivalents"; Philip Lau, "Regio-selective functionalization of aromatic amines"; Philip E. Eaton, "Recent work with unusual ring systems."

*14 July.* James R. Bartels-Keigh, "Elimination reactions of $\alpha$-substituted thymines"; Franklin A. Davis, "Oxygen transfer reactions of oxaziridines"; Joseph F. Bunnett, "The organic chemistry of electrons."

*15 July.* Mieczyslaw Makosza, "Two phase systems: Applications in organic synthesis and mechanistic considerations"; John T. Lai, "Hindered amine syntheses by phase transfer catalysis"; Steven L. Regen, "Triphase catalysis."

*16 July.* John K. Stille, "Organic reactions catalyzed by group VIII transition metals"; K. Barry Sharpless, "Mechanism of the titanium-catalyzed asymmetric epoxidation of allylic alcohols"; Alfred Bader, "Chemistry and art."

*17 July.* Robert A. Moss, "Adventures in carbene chemistry"; John A. Hyatt, "Sulfonyl fluoride group in synthesis: New reagents and synthetic methods."

**Parasitism, Immunological and Molecular Aspects of**

*Colby-Sawyer College*

Alan Sher, chairperson; Anthony Cerami, vice chairperson.

*3 August*. Mechanism of disease (Kenneth Warren, chairperson): Diane Pratt, Franklin A. Neva, Barry Bloom, Richard Olds, Ronald Pelley, speakers. Special problems in studying the biochemistry of intracellular parasites (Irwin Sherman, chairperson): Stephen Meshnick, Elmer Pfefferkorn, K. P. Chang, Carol Nacy, Dennis Dwyer, speakers.

*4 August*. Mechanisms of protective immunity against protozoa (Ruth Nussenweig, chairperson): Jacques Mauel, Nadia Nogueria, Richard Carter, Louis Pereira da Silva, Anthony Allison, speakers. Identification and isolation of functional parasite antigens (Louis H. Miller, chairperson): Ruth Nussenzweig, Russell Howard, Araxi Kilejian, David Snary, and Michael Parkhouse, speakers.

*5 August*. Molecular pharmacology of parasitism (John Eaton, chairperson): Anthony Cerami, C. C. Wang, Cy Bacchi, Joseph Marr, Nikolas Muller, speakers. Recent advances in the biochemistry and cell biology of parasites (Mary Rifkin, chairperson): Winston Gutterridge, Fred Opperdoes, George Hill, Carlos Gitler, John Caulfield, speakers.

*6 August*. Mechanisms of protective immunity against helmith infection (S. R. Smithers, chairperson): Andre Capron, Alan Sher, Diane McLaren, R. Hanna, speakers. Regulation of the immune response to parasites (Daniel G. Colley, chairperson): James G. Howard, Eric Ottesen, David Sacks, Raymond Kuhn, speakers.

*7 August*. Recent advances in the molecular biology of parasites (George Cross, chairperson): Piet Borst, Paul Englund, Larry Simpson, Frank Richards, speakers.

**Periodontal Diseases**

*Colby-Sawyer College*

A. Sampath Narayanan and Roy C. Page, co-chairpersons.

*20 July*. Normal structure and pathogenesis, morphological aspects (M. A. Listgarten, discussion leader): P. R. Garant, "Ultrastructural studies of periodontal ligament fibroblasts"; R. Baron, "Alveolar bone remodeling"; H. E. Schroeder, "Pathogenesis." Microbial etiology (S. S. Socransky, discussion leader): J. Slots, "Correlation between microbial flora and clinical manisfestations"; B. F. Hammond, "Pathogenic microbial components and products."

*21 July*. Host response (B. R. Ranney, discussion leader): R. J. Genco, "Antibody-PMN axis"; R. C. Page, "Lymphocyte and monocyte function." Fibroblast function and regulation (G. R. Martin, discussion leader): A. H. Melcher, "Fibroblasts of periodontal tissues"; H. Seppa, "Chemotaxis."

*22 July*. Connective tissue alterations, collagen (R. G. Crystal, discussion leader): A. S. Narayanan, "Collagen types and composition"; P. Bornstein, "Transcriptional and translational control"; R. B. Crystal, "Overview." Collagenase (E. A. Bauer, discussion leader): Jean-Michel Dayer, "Cell-cell interactions"; H. Welgus, "Enzymology of vertebrate collagenases."

*23 July*. Mechanisms of bone resorption (Ernest Hausmann, discussion leader): Ernest Hausmann, "Overview"; P. Goldhaber, discussant; K. Nuke, "Bone resorption factors in gingival tissue"; J. M. Goodson, discussant; David J. Baylink, "Coupling factor"; C. L. Trummel, discussant. G. Cahill, "Diabetes."

*24 July*. Clinical applications (R. C. Oliver, discussion leader): R. G. Schallhorn, "Risk assessment and treatment selection"; J. Lindhe, "Prospects for tissue regeneration."

**Phagocytes**

*Plymouth State College*

Bernard M. Babior, chairperson; Thomas P. Stossel, vice chairperson.

*20 July*. Lipid mediators I (G. Weissmann, chairperson): S. Hammarstrom, E. J. Goetzl, W. Scott, C. W. Parker, speakers. Lipid mediators II (C. W. Parker, chairperson): G. Weissmann, N. Pinckard, J. McCord, B. Gomperts, speakers.

*21 July*. Chemotaxis I (T. P. Stossel, chairperson): E. Schiffmann, J. Neidel, J. Gallin, M. Pike, speakers. Chemotaxis II (P. A. Ward, chairperson): T. Hugli, T. Deuel, E. Becker, S. Zigmond, speakers.

*22 July*. Parasites I (R. B. Johnston, Jr., chairperson): A. B. Kay, R. Bass, A. Dessein, A. C. Allison, speakers. Parasites II (G. Keusch, chairperson): H. Murray, N. Nogueira, D. Wyler, speakers.

*23 July*. Oxygen-independent killing mechanisms (M. Baggiolini, chairperson): H. R. Kaback, P. Henkart, P. Elsback, M. Baggiolini, speakers. Oxygen-dependent killing mechanisms (S. J. Klebanoff, chairperson): C. Foote, E. D. Thomas, H. S. Rosen, R. I. Lehrer, speakers.

*24 July*. NAD(P)H oxidase (M. L. Karnovsky, chairperson): T. G. Gabig, B. Babior, J. Badwey, D. Roos, A. Segal, speakers.

**Photosynthesis, Biochemical Aspects of**

*Kimball Union Academy*

Richard E. McCarty, chairperson; Paul A. Loach, vice chairperson.

*20 July*. Pigment-protein complexes (R. Clayton and C. Artznen, discussion leaders): W. Butler, P. Loach, E. Gantt, J. Bennet, A. San Pietro, J. Barber, P. Thurnber. Primary electron transfer reactions (W. Parson and B. Ke, discussion leaders): K. Sauer, B. Dimer, M. Evans, J. Anesz.

*21 July*. Quinones, cytochromes and iron-sulfur proteins in secondary electron transfer. Reconstitution, cytochromes and quinone-binding proteins (A. Trebst and G. Hauska, discussion leaders): N. Nelson, C. Artzen, A. Baccarini-Melandri, J. Biggins, W. Oettmeier, D. Krogmann. Q cycles and cyclic electron flow (G. Hind and P. L. Dutton, discussion leaders): B. Bouges-Bocquet, A. Crofts, B. Velthuys, D. Arnon, W. Cramer.

*22 July*. Generation and uses of the electrochemical proton gradient (M. Avron and C. Sybesma, discussion leaders): J. M. Galmiche, W. Junge, B. A. Melandri, D. Ort, P. Graber, D. Knaff, S. Izawa. $O_2$ evolution (G. Chenaie and C. Yocum, discussion leaders): D. Winget, Govindjee, G. Renger, H. E. Akerlund, N. Bishop.

*23 July*. ATPase complex. Structure and function of the subunits (N. Nelson and A. Jagendorf, discussion leaders): Y. Miokohata,C. Carmeli, R. McCarty, R. Vallejos, C. Andreo. Reconstitution, regulation and nucleotide binding (C. Carmeli and H. Strotmann, discussion leaders): B. Selman, J. Mills, M. Baltscheffsky, P. Graber, N. Shavit, Z. Gromet-Elhanan, R. Dilley.

*24 July*. Molecular biology and assembly of photosynthetic membranes (N. H. Chua, discussion leader): L. Bogorad, A. T. Jagendorf, I. Ohad.

**Physical Metallurgy**

*Proctor Academy*

George T. Hahn, chairperson; David N. Seidman, vice chairperson.

**Basic Mechanisms of Complex Failure Processes**

*6 July*. Failure of crystals: Cleavage (R. Thomson, chairperson): V. Vitek, "Analysis of transcrystalline and intercrystalline cleavage"; S. M. Ohr, "Ob-

An application blank for attendance at the Gordon Research Conferences may be found on page 1229. A summary of the program is on pages 1208 and 1209.

servations of cleavage"; discussion. Rupture of heavily strained and hardened crystals (chairperson to be announced): H. G. F. Wilsdorf, "Mechanisms of rupture in heavily strained crystals"; G. Lufjering, "Mechanism of rupture in hardened crystals"; R. Asaro, "Strain localization and rupture of precipitation hardened crystals"; discussion. Failure of interfaces (J. Knott, chairperson): C. J. McMahon, Jr., "Mechanisms of intergranular fracture"; M. P. Seah, "Analysis of intergranular fracture"; discussion.

*7 July*. Void nucleation and growth at second phase particles (J. D. Embury, chairperson): A. Melander, "Basic mechanisms of void nucleation and growth at 2nd phase particles"; G. R. Speich, W. Spitzig, "Void nucleation and growth during monotonic loading"; P. F. Thomason, "Crack nucleation and growth at inclusions during cyclic loading"; discussion. Analysis of fracture toughness (R. O. Ritchie, chairperson): J. F. Knott, "Analysis of microstructural contributions to fracture toughness"; D. M. Parks, "Mechanics and mechanisms of fracture processes"; discussion.

*8 July*. Stage I fatigue (C. Laird, chairperson): H. Mughrabi, "Analysis of stage I fatigue in crystals"; P. Neumann, "Track initiation in fatigue"; discussion. Mechanisms of environmentally assisted failure (H. Birnbaum, chairperson): C. Briant, "Mechanisms of hydrogen assisted failure"; J. Scully, "Hydrogen and stress corrosion cracking"; discussion. Analysis of stable crack extension (J. Williams, chairperson): A. Thomson, "Analysis of cyclic crack growth"; N. Pugh, "Analysis of stress corrosion crack growth"; R. O. Ritchie, "Analysis of corrosion fatigue"; discussion.

*9 July*. Failure under dynamic conditions (D. A. Shockey, chairperson): H. Rogers, "Analysis of failure under shock loading conditions"; discussion. Impingement and cavitation erosion (S. Wiederhorn, chairperson): J. W. Edington, "Mechanisms of erosion in ductile metals"; W. F. Adler, "Mechanisms of erosion"; discussion. Analysis of wear I (D. Kuhlmann-Wilsdorf, chairperson): N. Suh, "Delamination theory of wear"; A. W. Ruff, "Observations of wear"; discussion.

*10 July*. Analysis of wear II (J. J. Wert, chairperson): D. Wheeler, "Mechanisms of adhesive wear"; discussion. Abrasion and fretting (T. H. Kosel, chairperson): D. J. Duquette, "Analysis of fretting mechanisms"; O. B. Bingsbo, "Analysis of abrasion"; discussion.

## Physical Organic Chemistry

*Brewster Academy*

Heinz D. Roth, chairperson; Martin Saunders, vice chairperson.

*8 June*. (G. Kramer, discussion leader): R. H. Grubbs, "Mechanisms of metal catalyzed reactions of hydrocarbons"; D. L. Thorn, "Properties and reactivities of hydrido formyl and hydrido carbomethoxy complexes of iridium"; J. W. Suggs, "Ligand design and synthesis." (C. Collins, discussion leader): J. W. Larsen, "Relationships between coal structure and reactivity"; N. C. Deno, "Coal—a problem in chemical structure."

*9 June*. (M. Saunders, discussion leader): O. L. Chapman, "Matrix isolation studies of unstable intermediates"; J. M. McBride, "ESR studies of solid state radical pair reactions"; C. S. Yannoni, "Solid state high resolution NMR studies of carbonium ions." (T. Fukunaga, discussion leader): J. A. Pople, "Theoretical studies of simple reaction potential surfaces"; H. F. Schaefer, III, "Molecular quantum mechanics applied to physical organic chemistry."

*10 June*. (S. Farid, discussion leader): P. E. Eaton, "Recent work with novel ring systems"; P. S. Engel, "Photochemistry and thermochemistry of azoalkanes"; M. P. Schneider, "Decomposition of *1*-pyrazolines: Mechanism and synthetic applications." (J. Bargon, discussion leader): W. C. Herndon, "Chiral interactions in diesters and lanthanide complexes"; L. M. Jackman, "Hydrogen bonds in solution—internuclear distances and deuterium quadrupole coupling constants"; R. C. Haddon "Studies in hydrogen bonding."

*11 June*. (E. Wasserman, discussion leader): R. M. Kellogg, "Model studies of enzymes"; R. A. Firestone, "Mechanism-based enzyme inhibitors using the allyl sulfoxide-sulfenate rearrangement"; V. Chowdhry, "Photoaffinity labeling of biological systems." (H. D. Roth, discussion leader): G. Maier, "News about exotic molecules."

*12 June*. (J. J. Bloomfield, discussion leader): E. Vogel, "Bridged annulenes"; M. S. Platz, "Kinetic studies of carbenes and biradicals"; J. Wirz, "Spectroscopic and kinetic investigations of biradicaloid reaction intermediates."

## Plant Cell and Tissue Culture

*Proctor Academy*

F. Meins, chairperson; I. M. Sussex, vice chairperson.

*22 June*. Regeneration of plants from cultured cells (I. K. Vasil, session chairperson): G. B. Collins, "In vitro facilitated wide hybridization and gene transfer in trifolium"; I. K. Vasil, "Somatic embryogenesis in cereals and grasses"; I. Potrykus, "Progress in developing single-cell systems with cereals." The molecular and cellular basis for organogenesis in vitro (I. M. Sussex, session chairperson): T. A. Thorpe, "Physiological and biochemical aspects of organogenesis in vitro"; R. Sung, "Genetic programs of embryogenesis in culture"; I. M. Sussex, "Seed proteins as markers for embryogenesis in vitro."

*23 June*. Genes affecting the proliferation and differentiation of cultured cells (M. Hanson, session chairperson): F. Constable, "Variation and formation of secondary products"; D. W. S. Mok, "Identification of genetic factors regulating cytokinin metabolism in *Phaseolus*"; M. Hanson, "Genes affecting hormone responses of cultured plant cells." Properties of mutants generated in culture (C. E. Green, session chairperson): C. E. Green, "Inheritance and expression of mutants selected in maize tissue culture"; A. Muller, "Genetic and biochemical characterization of mutant plants regenerated from nitrate reductase deficient tobacco cell cultures"; T. Bingham, "Selection of ethionine resistance in a diploid alfalfa cell line: Regeneration of an unexpected array of variant plants."

*24 June*. The nature of cellular variation in culture (R. Phillips, session chairperson): R. Phillips, T. J. McCoy, "Implications of chromosomal instability in plant cell and tissue cultures"; H. Dulieu, "Use of marker genes for screening variants after regeneration of plants from cell culture"; P. Filner, "Heritable variations in urease during urea-limited growth." Transmission of variation to regenerated plants (T. Orton, session chairperson): B. Gill, "Cytogenetic basis of protoclonal variation in potato"; T. Orton, "Transmission of genetic variability from tissue culture to regenerated plants"; E. Wernsman, "Variability in plant genotypes induced by tissue culture."

*25 June*. Plant tissue culture as a tool for genetic engineering (N. Federoff, session chairperson): M. van Montagu, "The Ti plasmid of *Agrobacterium tumefaciens* as vector for genetic engineering in plants"; A. N. Binns, "Attenuation and teratoma formation in crown

gall tumors"; N. Federoff, "Transposable genetic elements in maize." Special evening lecture: speaker to be announced, "DNA transformation of cultured mammalian cells."

*26 June*. Applications of plant tissue culture for crop improvement—an assessment: D. Duvic, introductory talk and round table discussion.

**Plant Molecular Biology**

*Proctor Academy*

Joe L. Key, chairperson; Mary-Dell Chilton, vice chairperson.

*8 June*. Structure and transcription of the nuclear genome (W. Thompson, chairperson): M. Groudine, "Chromatin structure and regulation of gene expression"; S. Spiker, "Structure of transcriptionally active chromatin in plants"; T. J. Guilfoyle, "In vivo and in vitro transcription by RNA polymerase II: A model system using cauliflower mosaic virus DNA." Expression of nuclear genes in developing systems (L. S. Dure, III, chairperson): G. Galau, "Messenger RNA populations in cotton embryogenesis"; R. Goldberg, "The organization and expression of developmentally regulated genes in soybean."

*9 June*. Structure of nuclear genes (J. Bedbrook, chairperson): T. Hall, "Structure of a phaseolin gene"; K. A. Marcker, "Leghemoglobin gene structure." External stimuli and the regulation of gene expression (J. Key, chairperson): J. Key, F. Schoffl, "Heat shock and altered transcription/translation in soybean"; M. Freeling, "The anaerobic proteins and their genes in maize"; E. Tobin, "Light regulation of gene expression in *Lemna*."

*10 June*. Molecular biology of chloroplasts (J. Rochaix, chairperson): L. Bogorad, "The chloroplast chromosome"; N. Chua, "Synthesis and assembly of chloroplastproteins." Transformation and vectors (J. Hicks, chairperson): M. D. Chilton, "Development of the pTi $T_{37}$ as a vector for engineering plant cells"; J. Schell, "Transfer of inheritable genes to plants by a modified Ti plasmid"; S. Dellaporta, "Transformation of plant protoplasts by liposome-encapsulated DNA."

*11 June*. Transformation and vectors (M. D. Chilton, chairperson): J. Hicks, "Construction of new eukaryotic plasmid vectors"; R. Davis, "Analysis of cloned corn DNA fragments: Prospects for construction of a vector"; J. Rochaix, "Attempts to establish a transformation system in *Chlamydomonas*"; S. Howell, "Cauliflower mosaic virus as a vector for plant genetic engineering." Viruses and viroids (chairperson to be announced): H. Sanger, "Structure and replication of viroids"; T. Diener, "Recent advances in viroid research"; R. Goodman, "Gemini viruses: Single strand DNA viruses of plants."

*12 June*. Transposable elements (B. Burr, chairperson): G. Fink, "Transposable elements in yeast"; S. Levings, "Transposable elements in the mitochondrial genome of maize"; N. Federoff, "Transposable elements in maize."

**Physics of Steady-State Plasma Confinement: Advanced Methods**

*Holiday Inn, Ventura, California*

T. K. Chu, chairperson; James Drake, vice chairperson.

*22 June*. Radiation loss and impurities: E. Hinnov, "Impurities in tokamaks"; E. Marmar, "Transport rates determined from injected elements"; H. W. Drawin, "Atomic physics processes in tokamak plasmas." Radio-frequency wave heating and beta limits: D. Hwang, "ICRF heating in the PLT tokamak"; M. Murakami, "Resistive MHD phenomenon at high poloidal beta"; W. Hooke, "Lower hybrid wave heating experiment with phase-arrayed wave guides."

*23 June*. Current drive: T. Yamamoto, "Measurement of electron velocity distribution in the JFT-2 current-drive experiment"; K. L. Wong, "Current drive by lower hybrid waves in a torus without ohmic current"; S. Luckhardt, "Current drive experiment in versator." Field reversal devices: D. Baker, "The ZT-40 experiment with a metal liner"; M. Yamada, "Plasma formation in proto S-1 spheromak"; M. Schaffer, "OHTE."

*24 June*. Stellarators: K. Uo, "Neutral beam injection in the high-shear heliotron E"; H. Renner, "Energy balance of the zero-current experiment in W VII-A"; J. L. Johnson, "Modular stellarator." Stellarators and mirrors: A. Schlutor, "Optimizing the stellarator beta"; P. Catto, "Transport in nonaxisymmetric mirrors."

*25 June*. Toroidal and nontoroidal reactors: W. Stodiek, "Large tokamaks"; D. Jassby, "Toroidal reactors as a neutron source"; F. Ribe, "Mirror and toroidal reactors." EBT: Y. C. Lee, "Stability of the EBT configuration"; L. Bighel, "The 28-GHZ wave heating in EBT-S."

*26 June*. Mirrors: J. Ferron, "Loss-cone instability experiment"; D. Post, "Nearly axisymmetric tandem mirrors."

**Point and Line Defects in Semiconductors**

*Plymouth State College*

George D. Watkins, chairperson; Pierre M. Petroff, vice chairperson.

*13 July*. Structure of extended defects (A. Bourret, discussion leader): J. Spence, "Structures of dislocation cores in semiconductors"; J. W. Corbett, "From point defects to small aggregates in silicon"; T. Y. Tan, "From aggregates to dislocations in silicon." Point defects (silicon) (R. N. Hall, discussion leader): L. C. Kimerling, "Transition elements in silicon"; N. Inoue, "TEM study of point defect reactions in silicon."

*14 July*. Theory of point defects (A. M. Stoneham, discussion leader): J. Dow, "Effects of environment on deep levels"; G. DeLeo, "Theory of interstitial transition elements in silicon"; J. Joannopoulos, "Bonding coordination defects in chalcogenides." Poster session: 4 to 6 p.m. Grain boundaries and point defect–dislocation interactions (W. Schroter, discussion leader): B. Carter, "Grain boundary structures in silicon"; J. Desseaux, "Impurity decoration of dislocation cores in silicon."

*15 July*. Point defects (III-V compounds) (J. Schneider, discussion leader): B. Cavenett, "ODMR studies of defects in III-V compounds"; D. Pons, "Irradiation induced defects in GaAs"; A. Mircea, "Deep levels in InP." Degradation mechanisms (C. Henry, discussion leader): S. Yamakoshi, "Degradation in quaternary LEDs"; other speakers to be announced.

*16 July*. Electrical properties of dislocations (H. Queisser, discussion leader): S. Marklund, "Theory of the electronic structure of dislocations"; P. Hirsch, "Core structures and the electrical and mechanical properties of dislocations"; R. Labusch, "Dislocations and electrical conductivity in CdS"; after banquet speaker to be announced.

*17 July*. Hydrogen in crystalline and amorphous silicon (D. V. Lang, discussion leader): B. Faughnan, "Hydrogen passivation in polycrystalline silicon"; D. Biegelsen, "Defects in hydrogenated amorphous silicon."

**Polyamines, Chemistry and Biology of**

*Kimball Union Academy*

Seymour S. Cohen, chairperson; Anthony Pegg, vice chairperson.

*29 June*. Biosynthesis and metabolism of adenosylmethionine (U. Bachrach, discussion leader): G. Cantoni, A. Pegg, J. Giovanelli, S. Shapiro, A. J. Ferro,

speakers. Polyamines and genetic controls: (E. Herbst, Discussion Leader): M. Cohn, R. Davis, G. Kuehn, speakers.

*30 June*. Chemical problems (J. Coward, discussion leader): B. Ganem, R. Abeles, L. Yip, J. Coward, Speakers. Plants and microorganisms: (V. Zappia, discussion leader): T. A. Smith, G. Tait, C. Bacchi, V. R. Villaneuva, D. Adams, speakers.

*1 July*. Biosynthetic enzymes and inhibitors (J. Janne, discussion leader): J. Mitchell, A. Raina, O. Heby, P. McCann, speakers. Polyamine structure and cell survival: Round table: (D. Morris, O. Heby, chairpersons): G. Tait, T. Oshima, V. Zappia, A. Galson, G. G. Shaw, participants.

Poster session: S. Cohen *et al.*, A. Tyagi, C. Tabor, F. Schuber, Y. Gazitt, A. Roch. Additional poster presentations are solicited.

*2 July*. Degradative systems and secondary metabolites (G. Cantoni, discussion leader): N. Seiler, L. Lorand, G. Quash, D. W. Lundgren, I. Raisfeld, speakers. Medical and clinical aspects: (L. Marton, discussion leader): T. Oka, S. Baylin, D. Russell, R. Campbell, J. Koch-Weser, speakers.

*3 July*. Polyamines in nucleic acids, proteins and viruses (S. Cohen, discussion leader): A. Rich, J. Parello, K. Igarashi, C. Levy, D. Lockshon, speakers.

## Polymer Colloids

*Tilton School*

R. M. Fitch, chairperson; J. W. Vanderhoff, vice chairperson.

*13 July*. (W. Ropp, discussion leader): A. Rembaum, "Immunospecific systems"; P. Bagchi, "Adsorption of immunoglobulins at a model latex/aqueous electrolyte interface." (B. R. Vijayendran, discussion leader): G. B. Benedek, "Measurements of the cluster size distribution in a system of coated polystyrene latex spheres cross-linked by antibodies"; Th. Tadros, "Steric stabilization and adsorbed polymers."

*14 July*. (M. Normura, discussion leader): L. Landoll, S. Ahmed, R. Fitch, "Amphiphilic, surface-active cellulose derivatives"; I. Michaeli, "Polyelectrolyte clusters." (R. Potter, discussion leader): T. G. M. van de Ven, "Microrheology and interparticle interactions"; F. J. Micale, "Electrokinetic properties of polymer colloids aqueous and nonaqueous systems."

*15 July*. (J. Goodwin, discussion leader): Short contributions; Z. Adamczyk, "Particle deposition from flowing sols." (A. Robertson, discussion leader): R. H. Ottewill, "Neutron scattering"; Derek Rance, "Colloidal aspects of vinyl chloride polymerization."

*16 July*. (I. Piirma, discussion leader): Z. H. Liu, "Thermodynamics of the interface"; J. Guillot, "Thermodynamic approach to emulsion copolymerization." (R. M. Fitch, discussion leader): J. Th. G. Overbeek, "Stability in polar organic media."

*17 July*. (J. W. Vanderhoff, discussion leader): V. I. Yeliseyeva, "Regulation of polymer properties and particle morphology"; A. Klein, "Coreshell emulsion copolymerization."

## Polymers

*Colby-Sawyer College*

Otto Vogl, chairperson; Burton C. Anderson, vice chairperson.

*29 June*. (Catherine S. H. Chen, discussion leader): Eric Baer, "The nature of irreversible deformation mechanisms in polymeric solids." (Takeo Saegusa, discussion leader): Kazuo Yamaguchi, "Progress in the technology of polyethylene production." Poster session: (Burton C. Anderson, discussion leader). (William J. Bailey, discussion leader): Paolo Galli, "High yield polypropylene catalysts and optimization of polypropylene process"; Arthur Langer, "Lewis base chemistry in supported polypropylene catalysis"; S. T. Voong, "Radical polymerization initiated with amine derivatives."

*30 June*. (Fred Bailey, discussion leader): Norman Gaylord, "Polymerization of non-polymerizable monomers through exitation and activation." (George B. Butler, discussion leader): David A. Tirrell, "Interaction of polymeric drugs on the cellular level"; R. R. Matheson, Jr., "Anisotropic solutions and melts of semirigid polymer chains." (Joseph C. Salamone, discussion leader): Emory Meneffee, "Crosslink determination of network polymers by endgroup analysis after partial degradation"; Gerhard Kossmehl, "New developments in conductive aromatic polymers"; Ioan Negulescu, "New developments in reactions of conjugated dienes."

*1 July*. (Vivian T. Stannett, discussion leader): Ingo Luderwald, "Pyrolysis mass spectrometry for the study of polymer structures." (John W. Spiewak, discussion leader): Joseph P. Kennedy, "Macromolecular engineering by carbocationic techniques." Short presentations on novel developments: (Eli M. Pearce, discussion leader): Alan E. Tonelli, "$^{13}C$ and $^{19}F$ NMR chemical shifts and polymer microstructures"; Mikio Takahashi, "Oligomers in high pressure polyethylene"; Amitava Gupta, "Assessment of durability of UV screening acrylic polymers using flash kinetic spectroscopy"; Koichi Hatada, "Studies of polymerization mechanisms using perdeuterated monomers"; Gregory B. McKenna, "Deformation and failure behavior of ultrahigh molecular weight polyethylene."

*2 July*. (R. Gilbert, discussion leader): James L. White, "Rheological behavior of pure and filled polymer melts and solutions." (Ronald Eby: discussion leader): Richard Gaylord, "Confined chain problems in polymer physics." (Charles G. Overberger, discussion leader): Hargobind Khorana, "Synthetic nucleic acids and current recombinant DNA work."

*3 July*. (Morton Litt, discussion leader): David M. Wiles, "Hindered amine light stabilizers for polyolefins"; L. Guy Donaruma, "Polymeric nitroso compounds." (James McGrath, discussion leader): Rudolf E. Cais, "NMR investigation of the structure and reactions of polyhaloethylenes."

## Proteins

*New Hampton School*

Brian W. Matthews and Carl Frieden, co-chairpersons.

*22 June*. Protein folding and dynamics I (David Phillips, chairperson): K. W. Wuthrich, subject to be announced; A. Hagler, "Water structure around proteins"; F. M. Richards, subject to be announced. Protein folding and dynamics II: (R. Baldwin, chairperson): O. B. Ptitsyn, subject to be announced; speakers to be announced.

*23 June*. Protein structure and function I (David Davies, chairperson): Tom Alber, "Yeast triosephosphate isomerase"; Charles Stout, "7-Fe ferredoxin"; Markus Grutter, "Phage lysozyme structure, stability and evolution." Protein structure and function II: (Robert Huber, chairperson): R. A. Dwek, subject to be announced; S. J. Remington, "Citrate synthase"; J. N. Jansonius, "Aspartate aminotransferase."

*24 June*. DNA/protein interactions (Tom Steitz, chairperson): Carl Pabo, "Probing repressor/operator complexes by chemical methods"; T. Steitz or D. McKay, "Structure of CAP and its binding to DNA"; D. Ohlendorf and W. Anderson, "Structure of cro repressor and its binding to DNA"; J. Wang, "DNA unwinding"; A. Klug, "Chromatin structure." Protein self assembly I:

(Tom Pollard, chairperson): Ed Korn, "Actin"; Annemarie Weber, "Actin"; Klaus Weber, "Intermediate filaments."

*25 June*. Protein self assembly II (chairperson to be announced): Les Wilson, "Tubulin and microtubules"; H. Sternlicht, "Tubulin"; Peter Steinert, subject to be announced. Oligomeric proteins: Jean Lamy, "Hemocyanin"; Howard Schachman, "Aspartate transcarbamylase."

*26 June*. Proteins in membranes (Gordon Hammes, chairperson): Richard Henderson, "Bacteriorhodopsin"; Eric Oldfield, "NMR of lipids and proteins"; Elliott Elson, "Motions of proteins in membranes."

**Purines, Pyrimidines, and Related Compounds**

*Plymouth State College*

John A. Montgomery, chairperson; Gertrude B. Elion, Raymond L. Blakley, and Morris J. Robbins, vice chairpersons.

*29 June*. The nucleotides of adenine and related compounds (George B. Brown, chairperson): L. Lee Bennett, Jr., "Purine nucleoside kinases"; Leroy B. Townsend, "Adenosine analogs"; Alexander Hampton, "Nucleosides and nucleotides as selective inhibitors of adenine nucleotide phosphotransferase"; Thomas A. Krenitsky, "The enzymatic synthesis of purine nucleosides." Wolfgang Pfleiderer, "Recent improvements in oligonucleotide synthesis"; Jiri Zemlicka, "Chemistry and biology of *O*-aminoacylnucleosides"; Leon Lerner, "A synthesis of 4′,5′-unsaturated nucleosides related to decoynine."

*30 June*. Thymidylate biosynthesis and metabolism: Daniel V. Santi, "Studies with thymidylate synthesis"; Frank Maley, "Substrate binding sites in relation to the structure of thymidylate synthetase"; Mathias P. Mertes, "Inhibition of thymidylate biosynthesis." Deoxyribonucleosides and the reductase (Raymond L. Blakley, chairperson): Raymond L. Blakley, "Enzymatic synthesis and evaluation of analogs of deoxyadenosine"; Joseph G. Cory, "The properties and control of mammalian ribonucleotide reductase"; Morris J. Robins, "Specific chemical deoxygenation of ribonucleosides to 2′-deoxyribonucleosides."

*1 July*. *S*-Adenosylmethione and related compounds (James K. Coward, chairperson): James K. Coward, "Inhibitors of the enzymes of methyl transfer"; Peter K. Chiang, "*S*-Adenosylhomocysteine hydrolase: A pharmacologic target for the inhibition of transmethylations"; Todd M. Savarese, "Analogs of 5′-(methylthio) adenosine as potential chemotherapeutic agents." Unusual nucleosides and nucleotides from nature: Ramakrishnan Nagarajan, "Bioactive carbohydrate derivatives from nature"; Girish B. Chheda, "Chemistry and biology of unusual nucleosides"; K. Nakanishi, "Isolation and structural studies of bioactive compounds."

*2 July*. Viral and parasite enzymes and their inhibition (Gertrude B. Elion, chairperson): Y.-C. Cheng, "The behavior of nucleoside analogs and their phosphorylated derivatives on herpes virus induced enzymes"; Erik De Clercq, "Evaluation of antiviral agents"; John A. Secrist III, "4′-substituted nucleosides related to nucleocidin. Synthesis and antitrypanosomal activity"; Donald J. Nelson, "The properties of parasite enzymes." Non-glycosyl nucleoside analogs: Y. F. Shealy, "Carbocyclic analogs of pyrimidine nucleosides"; Kyoichi A. Watanabe, "A new ring transformation reaction and its applications to C-nucleoside synthesis"; Robert Vince, "Carbocyclic analogs of purine nucleosides"; Robert Klein, "C-nucleosides of 9-diazopurines."

*3 July*. New types of nucleoside analogs and biologic mechanisms: Alexander Block, "Induction of tumor cell differentiation as a mechanism of nucleoside action"; Roland K. Robins, "Synthesis and antitumor activity of some novel nucleosides"; John A. Montgomery, "Studies on nucleotide analogs containing reactive functions."

**Quantitative Structure Activity Relationships in Biology**

*Plymouth State College*

Albert Leo, chairperson; Stefan Unger, vice chairperson.

*13 July*. Enzymes (F. J. Zeelen, chairperson): S. Dietrich, E. Coats, "Dihydrofolate reductase"; J. J. Godfroid, "Platelet activating factor"; H. Weinstein, "Simulations of enzyme-substrate interactions"; A. A. Aaviksaar, "Linear free energy relationships in enzymes." Poster session I (P. Magee, chairperson): P. Jurs, A. Leo, "Computation of partition coefficient from molecular structures by fragment addition"; M. Cory, H. Johnson, "Computer calculation of lipophilicity"; R. Franke, "Solvent dependence of Log P"; P. J. Taylor, "Rationalizations of heterocyclic partition coefficients"; R. Hyde, "Receptor binding and distribution in QSAR modelling"; E. Lien, "QSAR in pharmacokinetics and pharmacodynamics"; J. K. Seydel, "Quantitative structure pharmacokinetic relationships"; L. Kier, L. Hall, "Electronic significance of valence molecular connectivity"; L. Hodes, "Computer selection of compounds for large scale antitumor screening."

*14 July*. Receptors (Peter Goodford, chairperson): P. B. M. W. M. Timmermans, "Alpha-adrenoceptors"; P. Pratesi, C. Silipo, A. Vittoria, "Muscarinic receptors"; P. Berntsson, "Mathematical-empirical models in QSAR of dihydropyridine antihypertensives"; J. Collins, "Electronic density patterns in diverse anxiolytics." Topography-topology (S. H. Unger, chairperson): A. T. Hagler, "Conformation and dynamics of biomolecules"; V. Madison, "Graphics and energetics study of solvation effects on peptide conformation"; G. Marshall, "Conformational analysis and amide bond replacement in peptides"; J. E. Dubois, "DARC-PELCO system and QSAR."

*15 July*. Receptor mapping (A. Verloop, chairperson): A. Verloop, "Comparison of STERIMOL, MSD and distance geometry approaches to QSAR"; G. M. Crippen, "Distance geometry calculation of binding sites"; A. J. Hopfinger, "Molecular shape analysis: Dihydrofolate reductase inhibitors"; D. Pensak, "Results with DuPont QSAR system." Poster session II (P. Magee, chairperson): R. Langridge, "Real-time color graphics"; M. Wise, "Dynamic lattice-oriented molecular modeling system"; K. Enslein, "Models of carcinogenicity, teratogenicity, mutagenicity and biodegradability"; A. J. Stuper, "A computer system for QSAR studies"; F. Darvas, "Presumption of a common mechanism of action in QSAR"; W. W. Moss, "Multivariate classification of I. R. spectra of drugs"; T. Fujita, "QSAR of pyrethroid insecticides"; P. Magee, "The range concept: A herbicidal example"; M. Kuchar, "QSAR of antiinflammatory acids"; W. Denny, "9-Anilinoacridines: Measures of bioactivity for antitumor drugs."

*16 July*. Pharmacodynamics and kinetics (H. Kubinyi, chairperson): H. Rytting, "Steric, conformation and debye effects on solution thermodynamics and group contributions of esters"; E. Tomlinson, "Thermodynamics of functional groups in partition and liquid chromatography"; J. C. Dearden, "Rate constant or partition coefficient?"; S. S. Davis, N. H. Anderson, "Resolution of Log P into enthalpy and entropy components."

Mechanism based inhibitors (W. Dunn, chairperson): A Krantz, "Suicide inhibitors and drug design"; P. R. Andrews, "Design of transition state analogue enzyme inhibitors"; S. R. Wilson, "Application of Cambridge data file in medical chemistry."

*17 July*. Multivariate techniques (R. Franke, chairperson): P. Lewi, "Multivariate drug-activity mapping"; S. Wold, W. Dunn, "Multivariate QSAR's: Conditions for applicability"; R. Cramer, "Correlation of biological data with BC (DEF) parameters."

**Quantum Solids and Fluids**

*Plymouth State College*

A. M. Goldman and C. M. Varma, cochairpersons.

*29 June*. A. Aharony, "Theory of random axis antiferromagnets"; J. Kinsel, "Monte Carlo studies of spin glass transitions"; J. Maletta, "Neutron scattering in insulating spin glasses."

*30 June*. C. A. Angell, "Phenomenology of the melting of glasses"; M. H. Cohen, "Low temperature properties of glasses"; S. Kirkpatrick, "Computer simulation of frustration in glasses."

*1 July*. R. C. Dynes, "Tunneling study of electronic correlation and localization"; P. W. Anderson, "Electronic localization and correlation."

*2 July*. S. Doniach, "2D-dirty superconductors"; R. Birgeneau, "Commensurate-incommensurate transitions in 2D systems"; T. M. Rich, "Pinning and associated phenomena in CDW systems."

*3 July*. B. I. Halperin, "Summary."

**Red Cells**

*Plymouth State College*

Vernon M. Ingram and William A. Eaton, chairpersons.

*15 June*. Globin gene structure (Vernon M. Ingram, chairperson): Oliver Smithies, "History of globin gene duplication"; Bernard Forget, "Structural features of the DNA flanking the human globin genes"; Jerry Lingrel, "Structural organization of the goat globin genes." Hemoglobin (H. Franklin Bunn, chairperson): Attila Szabo, "What does it mean to 'understand' hemoglobin?"; James Hofrichter, "Conformational dynamics and geminate recombination in hemoglobin"; Sherman Beychok, "Relation between exons and function in hemoglobin."

*16 June*. Membrane structure (Samuel E. Lux, chairperson): Vincent T. Marchesi, "Spectrin"; Daniel Branton, "Protein interactions on the red cell membrane"; Donald C. Wiley, "Structure of membrane protein from influenza virus." Sickle cell disease (William A. Eaton, chairperson): Alan N. Schechter, "Intracellular hemoglobin S polymerization"; Joseph A. Walder, "Inhibition of hemoglobin S polymerization."

*17 June*. Globin gene expression (Gary Felsenfeld, chairperson): Harold Weintraub, "Chromatin structure and gene activity"; William I. Wood, "Chromatin structure in vinicity of chicken β-globin genes"; Richard A. Flavell, "Expression of hemoglobin genes"; Jeffrey Ross, "Beta-globin messenger RNA processing in normal and thalassemic human cells"; Irving M. London, "Regulation of eukaryotic protein synthesis by heme and by protein kinases." Stem cell culture and differentiation (G. Stamatoyannopoulos, chairperson): Constance Eaves, "Mechanisms regulating the self-renewal function of hemopoietic stem cells"; Philip Fialco, "Stem cell origin and clonal development of human hematologic neoplasms"; Alan Bernstein, "Malignant stem cell clones in Friend leukemia"; Arthur Axelrad, discussant.

*18 June*. Membrane transport (Guido Guidotti, chairperson): Zvi I. Cabantchik, "Anion transport protein of red cells"; Gunter Blobel, "Transport of proteins across membranes"; Harden M. McConnell, "Membrane-membrane recognition." After dinner speaker to be announced.

*19 June*. Transfer of genes into cells (Arthur Bank, chairperson): R. Daniel Camerini-Otero, "Fate of genes and DNA transferred into mouse cells"; Arthur W. Nienhuis, "Expression of exogenous genes in transformed cells"; Barbara Wold, "DNA transformation of human globin sequences." Poster session chairpersons: Jerry Dodgson, David Housman, Douglas Ingall, David Nathan.

**Remote Sensing of Earth's Surface from Space**

*Colby-Saywer College*

John Estes, chairperson; Arch Park, vice chairperson.

*10 August*. Scene radiation analysis (J. Smith, discussion leader): K. Coulson, R. Lyon, C. J. Tucker, speakers.

*11 August*. Mathematical pattern recognition and image analysis (L. Guseman, discussion leader): W. Coberly, P. Swain, P. Anuta, participants.

*12 August*. Information utilization and evaluation (L. Eisgruber, discussion leader): C. Vars, P. Mantey, F. Hall, participants.

*13 August*. Resource evaluation (J. Taranik, discussion leader): C. Elachi, speaker.

*14 August*. Future perspectives (J. Estes, discussion leader): R. MacDonald, R. Holmes, D. Langrebe, participants.

**Separation and Purification**

*Colby-Sawyer College*

Joseph D. Henry, Jr., chairperson; Jay Sobel, vice chairperson.

*10 August*. Advances in chromatography (Eli Grushka, discussion leader): Csaba Horvath, "Physiochemical basis of reverse phase chromatography"; Phyllis Brown, "Mechanisms of reverse phase retention of nucleic acid components"; George Guiochon, "Mass transfer and efficiency in narrow bore liquid chromatography columns"; Phillip C. Wankat, "Moving feed point preparative chromatography."

*11 August*. Particle separations: Surface and colloid effects (Thomas W. Healy, discussion leader): Thomas W. Healy, "Forces on colloidal particles: Aggregation in simple and complex dispersions"; Dennis C. Prieve, "Migration of particles induced by chemical gradients and its application to solid/liquid separation"; Douglas W. Fuerstenau, "Separation of fine particles by flotation"; Mark P. Freeman, "Electrofiltration."

*12 August*. New approaches in adsorption (Joshua S. Dranoff, discussion leader): Ronald S. Eisinger, "Electrosorption"; Michael R. Ladisch, "Polysaccharide adsorbents for ethanol-water separation." Membrane processes (William Eykamp, discussion leader): Stephen L. Matson, "Coupling separation and enrichment to chemical conversion in a membrane reactor"; Anthony G. Fane, "Unsteady state characteristics of ultrafilter performance."

*13 August*. Supercritical fluid extraction (Robert C. Reid, discussion leader): G. Brunner, "Solute extraction from solid substrates: Food and biochemical applications"; Klaus Niemann, "Solute extraction from liquid substrates: Heavy fractions from coal liquefaction and coking processes"; Robert C. Reid, "New problems and research areas in supercritical fluid extraction."

*14 August*. Absorption with reactive solvents (George Blytas, discussion leader): Guido Sartori, "Sterically-hin-

dered amines for $CO_2$ removal from gases"; Gary T. Rochelle, "Enhancement of $SO_2$ absorption in $CaCO_3$ slurry by buffer and alkali additives."

**Physics and Chemistry of Solids**

*Holderness School*

W. F. Brinkman and T. H. Geballe, co-chairpersons.

*6 July*. Charge density waves in transition metal chalcogenides (F. DiSalvo, chairperson): J. Bardeen, J. Steeds, G. Gruner, speakers. Further studies of charge density waves (D. Eastman, chairperson): D. E. Moncton, M. V. Klein, speakers.

*7 July*. Artificial layered materials (J. E. Hilliard, chairperson): M. B. Brodsky, J. B. Ketterson, D. B. McWhan, speakers. The properties of incommensurate insulators (D. S. Fisher, chairperson): J. D. Axe, M. E. Fisher, speakers.

*8 July*. Novel materials (A. Jacobson, chairperson): Z. Fisk, R. M. Fleming, P. Chu, speakers. Properties of the incommensurate spin density waves in Cr (G. Shirane, chairperson): E. Fawcett, S. A. Werner, speakers.

*9 July*. Organic conductors (A. Heeger, chairperson): K. Bechgaard, W. M. Walsh, Jr., R. L. Greene, H. Gutfreund, speakers. Structural aspects of graphite intercalation (N. Bartlett, chairperson): R. Clarke, speaker.

*10 July*. 2-Dimensional phase transition in graphite intercalation compounds (E. Block, chairperson): P. W. Stephens, J. Villain, speakers; T. M. Rice, conference summary.

**Collisionless Shocks in Space, Astrophysical, and Laboratory Plasmas**

*Brewster Academy*

M. Walt, chairperson; S. Shawhan, vice chairperson.

*22 June*. Theory of collisionless shocks (B. Sonnerup, discussion leader): C. Kennek, "Collisionless shocks and MHD turbulence"; N. Krall, "Shock waves above the critical Mach number"; D. Montgomery, "Electrostatic shocks and double layers." Astrophysical shocks (R. Kulsrud, discussion leader): C. McKee, "Structure of shocks in astrophysics"; D. Eichler, "Collisionless shocks and particle acceleration in astrophysics"; F. Seward, "X-ray observation of supernova remnants."

*23 June*. Bow shocks in space plasmas (V. Formisano, discussion leader): E. Greenstadt, "Dynamics of the 3-dimensional shock"; J. Scudder, "Distribution functions of particles in shocks"; C. Russell, "Planetary bow shocks." Laboratory experiments (D. Morse, discussion leader): H. Griem, "Survey of laboratory experiments with collisionless shocks."

*24 June*. Interplanetary shocks (J. R. Jokipii, discussion leader): F. Neubauer, "Magnetic field variations at interplanetary shocks"; E. Smith, "ISEE-3 observations of interplanetary shocks"; M. Dryer, "Shock waves generated by solar flares." Particle acceleration (M. Scholer, discussion leader): T. Armstrong, "Shock acceleration of interplanetary particles"; G. Paschmann, "Particle distribution near the earth's bow shock."

*25 June*. Waves and turbulence: D. Gurnett, "Observations of waves in solar system shocks"; P. Gary, "Microinstabilities associated with the bow shock." Theory and simulation (G. Haerendel, discussion leader): D. Forslund, "Computer modeling of the earth's bow shock"; K. Papadopoulos, "Critical problems in the physics of magnetosonic shocks."

*26 June*. Summary session and panel discussion (S. Shawhan, discussion leader).

**Statistics in Chemistry and Chemical Engineering**

*New Hampton School*

William G. Hunter, chairperson; Toby J. Mitchell, vice chairperson.

*27 July*. (Donald A. Gardiner, moderator): George E. P. Box, "The sampling Eve and the Bayesian Adam in relation to data analysis and robustness." (Spencer M. Free, Jr., moderator): David G. Hoel, "Chemical kinetics and health risk assessment."

*28 July*. (A. Baines, moderator): Anthony C. Atkinson, "Regression diagnostics and transformation with an accent on graphics." (Joan R. Rosenblatt, moderator): David L. Duewer, "Exploratory classification analysis in chemistry."

*29 July*. (Anne Barton, moderator): Jerome H. Friedman, "Projection pursuit techniques for data analysis." (Herman Sahrmann, moderator): A. Bruce Hoadley, "The quality measurement plan: Empirical bayes control charts."

*30 July*. (Richard Stolarski, moderator): George C. Tiao, Gregory C. Reinsel, "Do chlorofluorocarbons deplete stratospheric ozone? A statistical analysis." (Donald B. Rubin, moderator): Douglas A. Zahn, "(How) Can statistical consultants be trained?"

*31 July*. (Anastasios Tsiatis, moderator): Garrett Brauer, Edward A. Sylvestre, "Techniques for specifying calibration models and protocols: An application in clinical chemistry."

**Structural Macromolecules—Collagen**

*Plymouth State College*

Arthur Veis and Liselotte Fessler, co-chairpersons.

*6 July*. Collagen distribution—gene expression: (T. Linsenmayer, chairperson): S. Gay, K. van der Mark; Collagen characterization—structural and chemical aspects: (K. Kuhn, chairperson): E. J. Miller, S. Dixit.

*7 July*. Molecular biology. Nuclear related events: (B. Olsen, chairperson): H. Boedtker, B. deCrombugghe, P. Tolstechev; Molecular biology. Translation related events: (J. Rosenbloom, chairperson): L. Lukens, D. Horlein, J. Bateman.

*8 July*. Fibrillogenesis, collagen behavior in solution: (J. Engel, chairperson): G. D. Gletcher, J. Chapman, K. Piez; Extracellular processing: (B. Goldberg, chairperson): C. Lapiere, H. Sage, P. Scott.

*9 July*. Collagen–non-collagen component interactions, cell surface proteins: (R. O. Hynes, chairperson): R. Timpl, E. Engvall. Gunter Blobel, "Protein secretion and membrane interactions."

*10 July*. Collagen remodeling, turnover: (R. Crystal, chairperson): T. Harris, L. Liotta, E. Bauer, speakers.

All participants are invited to bring a poster related to their current work. An informal poster session will be held in relation to each of the program sessions. Please indicate the title of your contribution and give a brief outline or abstract in your conference application. Session chairmen will select discussants on this basis.

**Structural Polymers, Chemical Characterization of**

*Tilton School*

David H. Kaelble, chairperson; Clayton A. May, vice chairperson.

*8 June*. Informal reports of results on round-robin characterization problem (Richard J. Hinricks, discussion leader). Informal assessment and appraisal of round-robin characterization problem (Clayton May, discussion leader).

*9 June*. Chemorheology (John Gillham, discussion leader): Judy M. Thuen, "Chemorheology characterization to solve problems in processing of compos-

ites"; Richard J. Hinricks, "Concepts for materials optimization to meet composite processing requirements." Epoxy resin systems (Frank Kelley, discussion leader): Robert Sacher, "Advances in techniques for evaluating chemical composition of curing epoxy systems"; Gary Hagnauer, "Advances in HPLC (high performance liquid chromatography) techniques for evaluating epoxy prepregs."

*10 June*. Polyimide resin systems (Tito Serefini, discussion leader): Phil Young, "Characterization methods for determining the cure mechanism of polyimides"; Berny Hunter, "Cure mechanisms in PMR 15 and LARC 115 polyimide resins." Polymers in circuit boards (Frank Karasz, discussion leader): Debby Hadad and Tony Wereta, "Chemical characterization of highly staged circuit board materials"; Paul Dynes, "Physiochemical separation and characterization of epoxy circuit board systems."

*11 June*. Structural adhesives (Fred Eirich, discussion leader): Michael Doyle, "Chemical characterization and replication of structural adhesives"; Jim Carpenter, "Chemical acceptance criteria for aerospace structural adhesives." Quantitative NMR spectroscopy (Musa Kamal, discussion leader): Chet Poranski, "High resolution NMR structure analysis of thermoset resins."

*12 June*. Nanosecond pulsed excitation spectroscopy (James Guillet, discussion leader): Armi Gupta, Jovan Moacanin, "Pulsed excitation spectroscopy for characterization of structural polymers"; Jovan Moacanin, Ami Gupta, "Molecular characterization by transient thermal lancing."

Informal afternoon discussion groups (1:30 to 3:00 p.m.): Tuesday: Problems in characterizing new material systems (Judy Chen, discussion leader). Thursday: Interpretation of chemorheology (John Gillham, discussion leader).

## Thermodynamic Analysis

*Colby-Sawyer College*

K. S. Spiegler, chairperson; Elias P. Gyftopoulos, vice chairperson.

*27 July*. Fundamentals of second-law analysis I: (Discussion leader to be announced). Fundamentals of second-law analysis II: (Rysgard Gajewski, discussion leader).

*28 July*. Fuel and power limitations in net-energy analysis (N. Georgescu-Roegen, discussion leader). Separation processes (E. N. Lightfoot, discussion leader).

*29 July*. Application of non-equilibrium thermodynamics to second-law analysis (D. G. Miller, discussion leader). Solar application—heating and cooling (Discussion leader to be announced).

*30 July*. Analysis of chemical and mechanical equipment (H. K. Openheim, discussion leader). Exegetic analysis of synfuel processes (L. T. Fan, discussion leader).

*31 July*. Utilization of waste heat (discussion leader to be announced).

## Thin Films and Solid Surfaces

*Colby-Sawyer College*

Gottfried Haacke, chairperson; Charles B. Duke, vice chairperson.

### Solar Energy Applications

*13 July*. Hydrogenated amorphous thin films I (S. Wagner, session chairperson): J. C. Knights, "Preparation and structural analysis of a-Si:H films"; G. Weiser, "Optical investigations of a-Si:H films"; D. E. Carlson, "Electrical transport properties in thin-film a-Si:H solar cells." Hydrogenated amorphous thin films II (D. L. Morel, session chairperson): F. W. Smith, "Doped and undoped hydrogenated amorphous carbon films"; F. H. Cocks, "Hydrogenated amorphous boron thin films."

*14 July*. Polycrystalline silicon films (H. J. Hovel, session chairperson): S. C. Danforth, J. F. Haggerty, "Controlled nucleation and growth of large-grained polycrystalline silicon films"; F. G. Satkiewicz, "Characterization of polycrystalline, thin-film silicon solar cells by secondary ion mass spectrometry"; C. H. Seager, "Electronic transport properties of grain boundaries in semiconductors:" Gallium arsenide thin films (C. B. Duke, session chairperson): D. C. Reynolds, "Characterization of GaAs expitaxial films by high-resolution optical spectra."

*15 July*. CdS/$Cu_xS$ films (K. W. Boer, session chairperson): K. A. Jones, "The effects of morphology and crystal defects on the photovoltaic properties of CdS-based solar cells"; L. C. Burton, "$Cu_2S$/$Zn_{1-x}Cd_xS$ heterojunction measurements and analysis"; P. McLeod, "Reactive sputtering of $Cu_xS$ films." IIV and ternary materials (J. J. Loferski, session chairperson): L. L. Kazmerski, "Progress in thin-film copper-ternary photovoltaic research"; A. Catalano, "Grain boundary effects in zinc phosphide solar cells."

*16 July*. Selective absorber surfaces (J. A. Thornton, session chairperson): H. G. Craighead, "Solar absorbing films employing microscopic surface texturing"; D. D. Allred, "Chemical vapor deposited materials for high-temperature photothermal conversion"; C. G. Granqvist, "Radiative heating and cooling with spectrally selective surfaces." Reflector surfaces (C. H. Lampert, session chairperson): A. W. Czanderna and K. Masterson, "Interface research in reflector systems."

*17 July*. SIS structures (J. C. C. Fan, session chairperson): A. K. Gosh, "Heterostructure solar cells involving thin-film conducting oxides"; J. Shewchun, "The nature of the conducting oxides and interfacial layers in semiconductor-insulator-semiconductor structures."

Poster sessions will be held Tuesday and/or Wednesday afternoon. Conference participants are encouraged to contribute to these sessions. Those wishing to make contributions should contact the conference chairperson: G. Haacke, American Cyanamid Company, Stamford, Connecticut 06904. Telephone: 203-348-7331, extension 329.

## Toxicology and Safety Evaluations

*Kimball Union Academy*

John G. Keller, chairperson; James S. Campbell, vice chairperson.

*27 July*. Factors influencing the predictive quality of toxicological studies: (R. Jaeger, discussion leader): E. Gralla, "Species-specific toxicoses with some underlying mechanisms"; M. McKenna, "Comparative pharmacokinetics of industrial chemicals"; H. Grice, D. Krewski, "Selection of doses in chronic toxicity studies."

*28 July*. Pulmonary hypersensitivity to airborne industrial chemicals: (Y. Alarie, discussion leader): M. Karol, "Animal model for organic chemicals"; R. Baigini, "Animal model for inorganic chemicals"; T. Sandberg, "Application of animal model studies for protection of industrial workers."

*29 July*. Female and male reproductive toxicology: (R. Dixon, discussion leader): J. McLachlan, "Assessment of the effects of chemicals on female reproduction—laboratory studies"; A. Haney, "Mechanisms of chemicals affecting female reproduction—clinical aspects"; J. Bedford, "Assessment of the effects of chemicals on male reproduction—laboratory studies"; C. Paulsen, "Clinical aspects and consequences of chemicals affecting male reproduction."

*30 July*. Nutrition and toxicology: (L. Campbell, discussion leader): G. Nolen, "Nutritional factors in non-clinical toxicology"; O. Levander, "Nutritional fac-

tors in heavy metal intoxication"; R. Hall, "Safe at the plate."

*31 July*. Evaluation of ultrastructural toxicological changes: (J. Campbell, discussion leader): P. Lea, "Present technology and developments for the future"; F. de la Iglesia, "Specific models used in evaluating drugs and chemicals."

### Transport Phenomena in Lipid Bilayers and Biological Membranes

*Tilton School*

Sally Krasne, chairperson; Alan Finkelstein, vice chairperson.

*17 August*. Fusion in artificial lipid membranes (A. Parsegian, chairperson): Nejat Duzgunes, "The effect of composition on membrane fusion"; Peter Cullis, "Non-bilayer lipid structure and lipid fusion processes." Fusion in cell membranes (A. Finkelstein, chairperson): R. Pagano, D. Hockstra, "Studies of membrane fusion using energy transfer between fluorescent phospholipid analogues"; R. Ornberg, "Electron microscopic studies of the kinetics of membrane fusion in *Limulus* amebocytes."

*18 August*. Protein mobility and migration in membranes (S. McLaughlin, chairperson): E. Elson, "Cytoskeletal control of membrane protein mobility"; M. Poo, "Lateral migration of cell membrane components induced by electric field." Protein insertion into membranes (P. Mueller, chairperson): H. Schindler, "Incorporation of the acetylcholine-activated channel into planar bilayer membranes"; W. Wickner, "Protein insertion into cell membranes."

*19 August*. Recording from single ionic channels in cell membranes (E. Neher, chairperson): R. Horn, "Analysis of single sodium channel currents in muscle"; G. Yellen, "Properties of single-channel currents in sympathetic ganglion cells." Biophysics of visual transduction processes (W. Hagins, chairperson): J. Korenbrot, "Light-activated release of calcium from intact retinal rods"; W. Hubbell, "Charge movements in disk membranes"; S. Yoshikami, "Interface between biochemistry and biophysics in visual transduction."

*20 August*. Ion and water movements across epithelial membranes (E. Wright, chairperson): K. Spring, "Water movements across epithelial membranes"; T. Zeuthen, "Ion movements across epithelial membrane." Poster session—7:30 p.m.

*21 August*. Anion transport kinetics across red blood cell membranes (R. Gunn, chairperson): P. Knauf, "Niflumic acid interactions with the anion

transporter"; M. Jennings, "Single turnovers of the chloride transporter"; M. Milanick, "Proton sulfate co-transport."

**Vibration Intensities**

*Plymouth State College*

Willis B. Person, chairperson; William T. King and John Overend, vice chairpersons.

*8 June*. Modern experimental aspects (W. T. King, chairperson): Bryce Crawford, Jr., "Infrared intensities: Past and present"; S. Kondo, "Recent experimental studies of infrared intensities." The normal coordinate problem (I. Mills, chairperson): H. F. Schaeffer, "Quantum mechanical calculation of potential functions"; D. C. McKean, "An experimentalist's evaluation of force fields from quantum mechanical calculations."

*9 June*. Quantum mechanical calculations of accurate dipole moment functions (H. F. Schaeffer, III, chairperson): N. S. Hush, "Rigorous calculations: The effect of configuration interaction"; P. Pulay, "Rigorous intensity calculations for medium-sized molecules." Slightly more approximate quantum mechanical calculations of intensities (J. Boggs, chairperson): A. Komornicki, "Gradient methods for ab initio prediction of vibrational intensities for small molecules"; D. Dixon, "Ab initio calculations of infrared intensities by finite difference methods."

*10 June*. Prediction of vibrational intensitites by transfer of intensity parameters (G. Zerbi, chairperson): L. A. Gribov, "Electrooptical parameters"; M. Gussoni, "Transferability of intensity parameters"; W. B. Person, "Atomic polar tensors." Chemical interpretation of intensity results (W. J. Orville-Thomas, chairperson): J. C. Decius, "The charge, charge-flux model for interpretation of intensities"; K. Wiberg, "Chemical significance of intensities."

*11 June*. Intensities of combination of bands and overtones (J. Overend, chairperson): D. Whiffen, "Theory of intensities of higher overtones"; R. L. Swofford, "Experimental measurements of intensities of high overtones." Intensity measurements with diode lasers (R. McDowell, chairperson): A. Mantz, "Line intensity measurements with tunable diode lasers"; M. Mumma, "Measurements on planetary atmospheres."

*12 June*. Infrared intensitites and infrared lasers (K. Fox, chairperson): J. Steinfeld, "Application of vibrational intensities to studies of IR laser induced photochemistry"; D. Dows, "High intensity spectroscopy and laser chemistry."