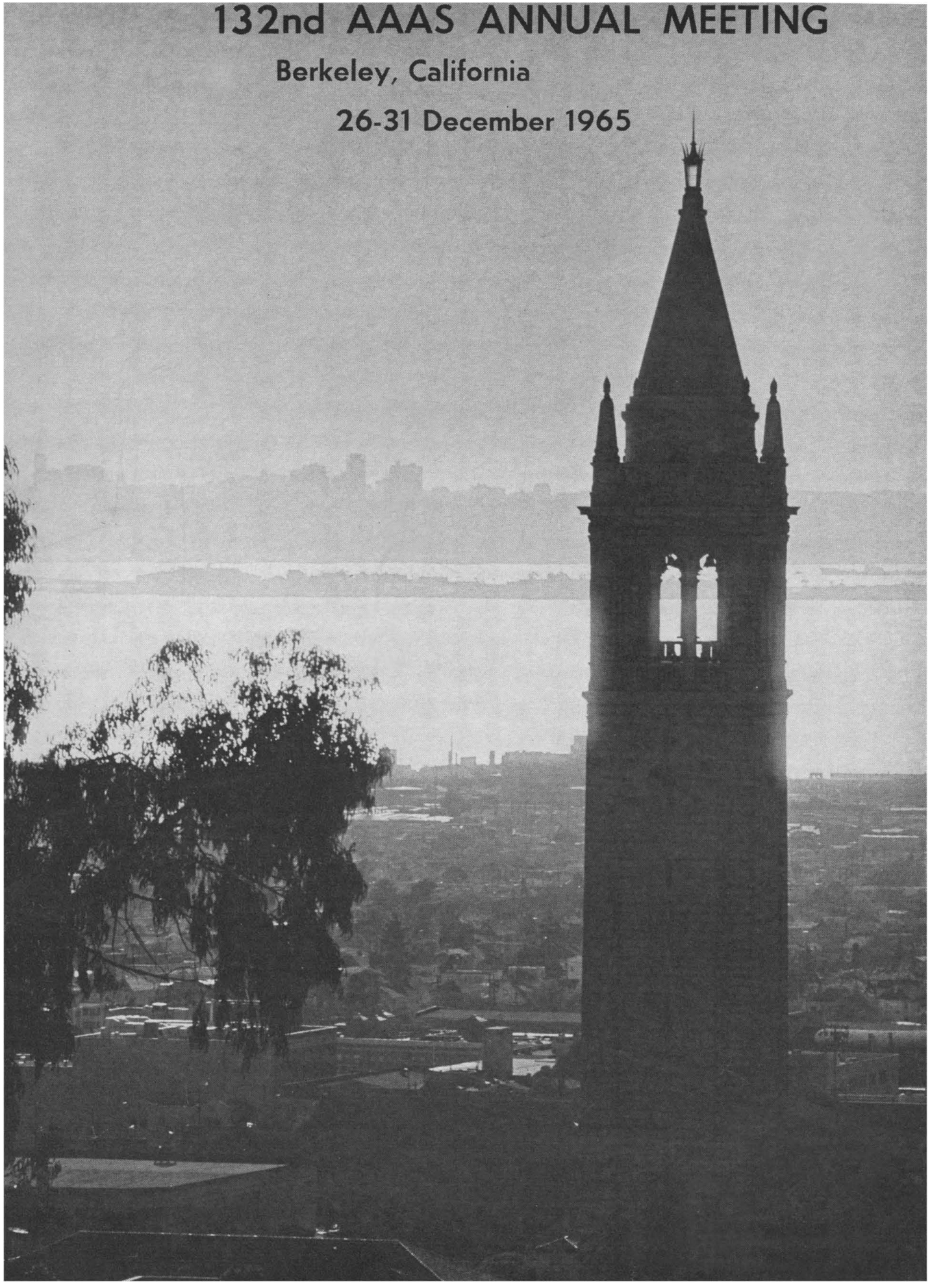
132nd AAAS ANNUAL MEETING

Berkeley, California

26-31 December 1965



AAAS Special Sessions

One of the characteristic and most important features of the annual meetings of the Association is the series of outstanding general addresses by distinguished scientists, sponsored by the Association or by organizations that meet regularly with it. These special events are open to the general public.

Moving Frontiers of Science. Part I. 26 Dec., evening. "Significant advances in human evolutionary studies," F. Clark Howell, Sibley professor of anthropology, University of Chicago. "A new look at the earth's magnetic field," Norman F. Ness, assistant head for Fields and Plasmas, Space Sciences Division, National Aeronautics and Space Administration. Laurence M. Gould, chairman, AAAS Board of Directors, will preside.

Special Illustrated Lecture. 27 Dec., "The Lawrence Hall of Science," Harvey E. White, director, Lawrence Hall of Science. (The lecture will be repeated on 29 Dec.)

AAAS Distinguished Lecture. 27 Dec., evening. "Genetics and cultural change," George W. Beadle, president, University of Chicago. H. Bentley Glass, member, AAAS Board of Directors, will preside.

Moving Frontiers of Science. Part II. 28 Dec. "The physiological basis of mental activity," Jerome Y. Lettvin, research associate, Department of Electrical Engineering, Massachusetts Institute of Technology. "Some aspects of low temperature physics," William M. Fairbank, professor of physics, Stanford University. John A. Wheeler, member, AAAS Board of Directors, will preside.

Sixth George Sarton Memorial Lecture. 28 Dec. "The Accademia dei Lincei (1603), the forerunner of modern academies of science," Stillman Drake, municipal financing consultant, San Francisco, California. Walter Orr Roberts, member, AAAS Board of Directors, will preside.

AAAS Presidential Address and Reception. 28 Dec. The speaker will be Laurence M. Gould, retiring president of AAAS. The subject of the speech will be "Antarctica—continent of international science." Preceding the address, Donald H. McLaughlin, general chairman of the Berkeley meeting, will speak briefly. AAAS awards will be announced.

Joint Annual Address of the Society of the Sigma Xi and the United Chapters of Phi Beta Kappa. 29 Dec., evening. "The logic of the mind," J. Bronowski, deputy director, Salk Institute for Biological Studies, San Diego. Alfred S. Romer, president elect, AAAS, will preside.

Annual Illustrated Lecture of the National Geographic Society. 30 Dec., evening. "The fight to save the grizzly bear," Frank Craighead, Environmental Research Institute, Boiling Springs, Pennsylvania, and John Craighead, Montana Cooperative Wildlife Research Unit, University of Montana. Laurence M. Gould will preside.

AAAS General Sessions

The general sessions are broad interdisciplinary programs, sponsored by the Association as a whole or by sections, committees, or affiliates of AAAS; they are given here in chronological sequence.

Physiological Control of Conception and its Implications. Symposium, program of the AAAS committee on Science in the Promotion of Human Welfare.

Part I. 26 Dec. Walter Modell (Cornell University School Medical College, New York, New York, will preside and present introductory remarks. "The control of conception by hormonal steroids," Gregory Pincus, Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts. "Public health implications," Stephen Plank, Harvard School of Public Health, Cambridge, Massachusetts.

Part II. 26 Dec. "Changes in sexual technology and social structure—a sociologic assessment," Martin Loeb, University of Wisconsin, Madison. "Psychological factors in choice and utilization of contraception," George Pollock, Institute for Psychoanalysis, Chicago, Illinois. "Cultural implications of modern methods of control of conception," Rhoda Métraux, American Museum of Natural History, New York, New York. Summary by René Dubos, Rockefeller University, New York, New York.

Civil Defense. Symposium, program of the AAAS Committee on Council Affairs. Henry Eyring will preside.

Part I. 27 Dec. "The basic case for civil defense," Fred A. Payne, Marquardt Corporation, Van Nuys, California. "Civil defense as insurance and as military strategy," Wolfgang K. H. Panofsky, Stanford University. "The effect of civil defense on strategic planning," Owen Chamberlain, University of California, Berkeley. "The possible effectiveness of civil defense," Eugene P. Wigner, Princeton University.

Part II. 27 Dec. "Medical aspects of civil defense," Victor Sidel, Massachusetts General Hospital, Boston. "The agricultural problems of civil defense," John Howard Rust, University of Chicago. "The factors affecting biological recovery from nuclear attack," Barry Commoner, Washington University, St. Louis, Missouri.

Part III. 27 Dec. Panel discussion. Anatol Rapoport, University of Michigan, will act as moderator. Panel members include all participants of Parts I and II.

Interdisciplinary Symposium in the Biological-Behavioral Sciences: Behavior, Brain, and Biochemistry, Part I. Behavior, Brain and RNA. 27 Dec. Joint program of the Committee on Meetings, AAAS Section I-Psychology, and the Western Psychological Association. David Krech, University of California (Berkeley), will preside and present introductory remarks. "Chemical studies on memory fixation in goldfish," Bernard W. Agranoff, Roger E. Davis, and John J. Brink, University of Michigan. "Macromolecular synthesis and neuronal function," Henry R. Mahler and Walter J. Moore, Indiana University. "Autoradiographic studies on the effects of behavioral treatments on the protein metabolism of the brain," Joseph Altman, Massachusetts Institute of Technology. "Some effects of RNA, actinomycin, and puromycin on learning in the carp," Stanley Batkin, Kaiser Medical Center and University of Hawaii; Robert E. Cole, William T. Woodard, and John B. Paul, University of Hawaii. "The effects of conditioned avoidance training on RNA synthesis in mouse brains," J. Zemp, J. Wilson, K. Schlesinger, and E. Glassman, University of North Carolina. "Drug enhancement of nucleic acid synthesis, learning, and memory," N. Plotnikoff and A. J. Glasky, Abbott Laboratories, North Chicago, Illinois; and L. Simon, Illinois State Pediatric Institute, Chicago, Illinois. "Drug facilitation of learning—problems of strain and species," Lewis Petrinovich and Edward M. Eisenstein, State University of New York at Stony Brook. "Gene action in the central nervous system," Benson E. Ginsburg, University of Chicago. "Behavioral effects of phenylketonuria in rats and monkeys," V. J. Polidora, University of Wisconsin. Discussion, Eugene Rob-

erts, City of Hope Medical Center, Duarte, California.

Interdisciplinary Symposium in the Biological-Chemical Sciences: Recent Advances in Nucleic Acid and Protein Chemistry, Part I. 27 Dec. Joint program of the Committee on Meetings, AAAS Section C-Chemistry, and the California Section of the American Chemical Society, cosponsored by AAAS Section N-Medical Sciences. Arranged by a committee consisting of Wendell M. Stanley, Michael J. Chamberlin, R. D. Cole, Charles A. Dekker, and C. Arthur Knight, University of California (Berkeley). R. D. Cole and C. A. Dekker will preside. "Techniques in studying the primary structure of proteins," George Stark, Stanford University. "Relations of structure to function in enzyme action," Daniel Koshland, University of California, Berkeley. "Ribonucleic acids: structures and optical properties," Ignacio Tinoco, Jr., University of California, Berkeley. "Repair replication of damaged nucleic acids in vivo," Philip Hanawalt, Stanford University.

AAAS Day—Interdisciplinary Symposium in the Biological-Behavioral Sciences: Behavior, Brain, and Biochemistry, Part II. Behavior, Brain Anatomy, ACh, and Other Chemical Mediators. 28 Dec. David Krech will preside. "Brain weight and behavior in mice," Thomas H. Roderick, Cynthia C. Wimer, and Richard E. Wimer, Jackson Memorial Laboratory, Bar Harbor, Maine. "Effects of rearing in the dark on dendritic fields of stellate cells in visual cortex," Paul D. Coleman, University of Maryland School of Medicine, Baltimore. "Role of central catecholamines in the modulation of behavior," Guy M. Everett, Abbott Laboratories, North Chicago, Illinois. "Effects of environmental complexity on the norepinephrine content of the developing rat brain," E. Geller, Veterans Administration Center of Los Angeles; A. Yuwiler, University of California, Los Angeles; and J. F. Zolman, University of Kentucky Medical School. "Effects of chronic administration of electroconvulsive shock on behavior, brain weight, and brain chemistry," Gordon T. Pryor and Leon S. Otis, Stanford Research Institute, Menlo Park, California. "The hippocampus, brain-acetylcholine, and habituation," Peter L. Carlton, Rutgers University. "Anticholinesterase and the dissolution of memory," J. Anthony Deutsch, New York University. "Heredity, environment, learning, and the brain," Edward L. Bennett, Marian C. Diamond, David Krech, and Mark R. Rosenzweig, University of California, Berkeley. Discussion by Mark R. Rosenzweig.

AAAS Will Meet You at the San Francisco Airport!

The large majority of those who will fly to the AAAS Berkeley Meeting will deplane at the San Francisco International Airport. For the convenience of these passengers, the Barrett Company, with its regular airport limousines, will provide a special service—direct, inexpensive transportation to the Berkeley campus, at $1.50 for each person —beginning Sunday, 26 December.

The Barrett Company has agreed to transport any group of six or more persons who have gathered at their ticket window, on the Ground Level of the Central Terminal Building of the airport. As traffic increases, an hourly, or even more frequent, schedule will be maintained.

Look for the large sign by the Barrett Ticket Office.

AAAS Meeting Direct Transportation to Berkeley

Like most large airports, each major airline has its own baggage claim facilities. Porter service will be available for those who need it to get to the central terminal building.

In Berkeley, passengers will be discharged at the ASUC Student Center, which is AAAS Headquarters. Here there will be registration facilities and housing information. Local taxis will be necessary to reach the separate hotels, motels, and Residence Halls, although some of these are only two or three short blocks away from the Student Center. For other data on transportation, see the sections on Housing, Hotels, and Transportation in this issue.

Interdisciplinary Symposium in the Biological-Chemical Sciences: Recent Advances in Nucleic Acid and Protein Chemistry, Part II. 28 Dec. Wendell M. Stanley will preside. "Structure and function of the DNA from bacteriophage λ." David Hogness, Stanford University. "Subunit structures of proteins and their importance for control processes," John Gerhart, University of California, Berkeley. "Hereditary human gamma globulin groups—biological and biochemical aspects," Hugh Fudenberg, University of California Medical Center, San Francisco, and University of California, Berkeley. "Evolutionary and taxonomic studies with enzymes," Allan Wilson, University of California, Berkeley.

At the end of this session there will be the presentation of a John Scott Award of the City of Philadelphia Board of Directors of City Trusts to Alexander Kolin, University of California Medical School, Los Angeles, for his invention of the electromagnetic flow meter. Wendell M. Stanley will make the presentation.

Interdisciplinary Symposium in the Physical-Biological-Agricultural Sciences: Implications of Weather Modification on Ground Level Climatology. (Part III of Section O's seven-session symposium, Ground Level Climatology.) 28 Dec. Joint program of the AAAS Committee on Meetings and AAAS Section O-Agriculture, cosponsored by AAAS Sections F-Zoological Sciences and G-Botanical Sciences, and by the American Meteorological Society, Ecological Society of America, and the Society of American Foresters. Arranged by Robert H. Shaw, Iowa State University of Science and Technology, Ames, Iowa. "The present state of weather modification," Paul Julian, National Center for Atmospheric Research, Boulder, Colorado. "The effect on physical processes in the microclimate," W. E. Marlatt, Colorado State University. "The effect on the biological equilibrium in the plant community," R. H. Whittaker, Brookhaven National Laboratory, Upton, Long Island, New York. "Weather modification and forest fires," D. M. Fuquay, U.S. Forest Service, Missoula, Montana.

Interdisciplinary Symposium in the Mathematical-Social-Economic Sciences: The Mathematical Bases of Eco-

nomic Planning. 28 Dec. Joint program of the Committee on Meetings and AAAS Section A-Mathematics and K-Social and Economic Sciences. Arranged by Ithiel De Sola Pool, Massachusetts Institute of Technology. Wassily Leontief, Harvard University, will preside. "Public investment in optimal economic growth," Kenneth J. Arrow, Stanford University; and Mordecai Kurz, Hebrew University, Jerusalem. "The organizational economics of planning," Jacob Marschak, University of California, Los Angeles. Paper by Sukhamoy Chakravarty, Delhi School of Economics, Delhi, India. Paper by L. V. Kantorvich, Academy of Sciences, Moscow, U.S.S.R.

Interdisciplinary Symposium in the Medical Sciences: Materials Science in Dentistry, Medicine, and Pharmacy. Joint program of AAAS Sections Nd-Dentistry and Np-Pharmaceutical Sciences, cosponsored by AAAS Section N-Medical Sciences, and by the American Dental Association; American College of Dentists; International Association for Dental Research, North American Division; American Society of Oral Surgeons; American Association of Colleges of Pharmacy; American College of Apothecaries; American Pharmaceutical Association, Scientific Section; American Society of Hospital Pharmacists; and the National Association of Boards of Pharmacy. Arranged by John Autian, University of Texas College of Pharmacy, and Col. Peter M. Margetis, Walter Reed Army Medical Center.

Part I. 28 Dec. John Autian will preside. "Introduction to the subject," Robert I. Leininger, Battelle Memorial Institute, Columbus, Ohio. "Advances in the use of plastic materials for implants," Fred Leonard, Walter Reed Army Medical Center. "Problems in the use of materials for implants," Patrick G. Laing, University of Pittsburgh.

Part II. 29 Dec. Peter M. Margetis will preside. "Advances in the use of plastics for dental prosthesis," Ralph W. Phillips, Indiana University, Indianapolis. "Development of standards for plastics to be used in pharmacy and medicine," John Autian. "The Food and Drug Administration's role in the use of plastic materials," Earl L. Meyers, Food and Drug Administration, Washington, D. C.

Evolving Water Law: The Growing Conflict between Federal and State Governments, Part I. 29 Dec. Symposium, program of the Committee on Desert and Arid Zones Research. Arranged by Joel E. Fletcher, Utah State University. Fletcher will preside at this two-part symposium.

Part I. "The growing need for large interstate and international projects such as NAWAPA," George D. Clyde, well-known consultant on water problems, Salt Lake City, Utah. "Physical aspects of state water rights administration," Wayne D. Criddle, Salt Lake City, Utah. "Water rights in a state water plan," Harvey O. Banks, San Francisco, California.

Part II. "Physical problems associated with water rights on interstate projects," Harold T. Nelson, U.S. Bureau of Reclamation, Boise, Idaho. "The Federal viewpoint regarding western water rights," Frank J. Barry, solicitor, U.S. Department of the Interior, Washington, D.C. "Proposed legislation affecting federal-state water rights," Frank E. Moss, U.S. Senator, State of Utah. "Summary," by Wendell B. Anderson, Utah State University, Logan.

AAAS Science Theatre

The AAAS Science Theatre, a permanent feature of the Association's annual meeting, presents each year a selection of the latest domestic and foreign scientific films throughout the meeting period. Programs are repeated at different times to increase the opportunities for those attending the sessions to see particular films. Malcolm S. Ferguson, National Institutes of Health, Bethesda, Maryland, and Alec M. Hughes, British Association for the Advancement of Science, London, assisted Marlyn Lippard, AAAS staff member, in the planning of the film program for this year.

The AAAS Science Theatre may be reached by passing through the Exposition, on the lower level of the ASUC Student Center. **Admission is restricted to those persons who wear the AAAS Convention Badge. Young people under 16 are not registered and thus not admitted to the Science Theatre.**

The following is a schedule of the film program. The titles of the films are in italics; the names of the producers follow.

Monday 27 December 10 a.m. to 2 p.m.

The Modern Balance. Dick Roberts for Mettler Instrument Corporation.

Beyond All Barriers. American Telephone and Telegraph Company.

A New View of Corticosteroid Action in Inflammatory Dermatoses. Davidson Films.

Mechanism of Life. Sakura Motion Picture Company, Ltd., Japan.

Laser and Living Cells. Marcel Bessis, France. (Distributed by Merck Sharp and Dohme.)

The Perception of Life. By Stephen Toulmin and June Goodfield for the Nuffield Foundation Unit for the History of Ideas.

The NASA Biosatellite Program—Between the Atom and the Stars. National Aeronautics and Space Administration.

Observations of the Primordial Germ Cells of the Mouse. R. J. Blandau and Roy Hayaski.

Strangeness Minus Three. British Broadcasting Corporation.

Monday 27 December 2 p.m. to 6 p.m.

Sea Lab I. U.S. Navy.

The Photosynthesis and Respiration Cycle. Churchill Films.

The Tidal Zone. United World Films, Inc.

Conscience of a Child. National Educational Television under the auspices of the American Psychological Association.

Heartbeat—A Story of Heart Research Progress around the World. National Heart Institute, National Institutes of Health.

Biochemistry and Molecular Structure. Wexler Film Productions for the Chemical Education Material Study.

The Perfection of Matter. Stephen Toulmin and June Goodfield for the Nuffield Foundation Unit for the History of Ideas.

In a Frog's Eye. WGBH-TV for the National Educational Television, and available through the Audio Visual Center of Indiana University.

Jungle Fowl in India and Ceylon. N. E. Collias and Elsie C. Collias, University of California, Los Angeles.

The Input/Output Structure of the American Economy. Scientific American.

Tuesday 28 December 10 a.m. to 2 p.m.

Sea River. U.S. Department of the Interior, Geological Survey.

Human Disorientation—Experimental Rotating Environments. U.S. Navy.

Computer Sketchpad. WGBH-TV Boston for the National Educational Television, and available through the Audio Visual Center of Indiana University.

Antarctic Biology. Herbert Ullmann for Coronet Instructional Films.

Extra Vehicular Activity. National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, Texas.

Air Pollution. U.S. Senate Public Works Committee.

Tsunami. U.S. Department of Commerce, Environmental Science Services Administration, Coast and Geodetic Survey.

Red Jungle Fowl in Thailand. N. E. Collias, University of California, Los Angeles.

The Mystery of Stonehenge. CBS News.

Tuesday 28 December 2 p.m. to 6 p.m.

Ranger IX Television Pictures of the Moon. Jet Propulsion Laboratory.

An Einstein Thought Experiment—Sound Signal Portion. Audio-Visual Production Division, Wayne State University.

Lasers. The Princeton Report with Charles H. Townes, M.I.T., as technical adviser.

Dolphins That Joined the Navy. U.S. Navy.

Electrons in Harness. Mullard Limited by Verity Films Ltd., in association with the Film Producers Guild, England.

Battle of the Bugs. Ken Middleham Productions.

International Indian Ocean Expedition. Screen Presentations.

Symbolic Control. IIT Research Institute.

Secrets of Life. Under the supervision of Dean Naumov, Faculty of the Biological Sciences, Moscow State University.

The Story of the Penguins. Under the supervision of Dean Naumov.

Above the Horizons. National Film Board of Canada for American Meteorological Society.

Wednesday 29 December 10 a.m. to 2 p.m.

Same as Monday 27 December 10 a.m. to 2 p.m.

Wednesday 29 December 2 p.m. to 6 p.m.

Same as Monday 27 December 2 p.m. to 6 p.m.

Thursday 30 December 9 a.m. to 1 p.m.

Same as Tuesday 28 December 2 p.m. to 6 p.m.

Thursday 30 December 1 p.m. to 3:30 p.m.

Laser and Living Cells. Marcel Bessis, France. Distributed by Merck Sharp and Dohme.

The NASA Biosatellite Program—Between the Atom and the Stars. National Aeronautics and Space Administration.

Gannet City. N. Tinbergen, Oxford, and based on the work of J. B. Nelson. (Silent with English titles.)

An Einstein Thought Experiment—Sound Signal Portion. Audio-Visual Production Division, Wayne State University.

Battle of the Bugs. Ken Middleham Productions.

Though the Earth Be Moved. Audio-Visual Planning Division, Office of Civil Defense.

Electronic Process in Crystals and Living Organisms. Tokyo Cinema Company, Inc., for Matsushita Electric Industrial Company, Ltd., Japan.

Exposition of Science and Industry

The AAAS Annual Exposition of Science and Industry will be held on the lower level of the Student Center. In the best interests of both the attendees and the exhibitors, **only registrants can be admitted to the Exposition—and children under 16 are neither registered nor admitted**. Hours: 27–29 Dec., 10 a.m. to 6 p.m.; 30 Dec., 9 a.m. to 5 p.m.

The following is a listing of exhibitors at this year's meeting.

Books and Publications. Academic Press, Inc.; American Education Publications, Inc.; American University Press Services, Inc.; Americana Corporation; BioSciences Information Service of Biological Abstracts; Blaisdell Publishing Company; Cambridge University Press; Columbia University Press; Combined Book Exhibit, Inc.; F. A. Davis Company; Doubleday & Company, Inc.; Earth Science Curriculum Project; Encyclopaedia Britannica; W. H. Freeman & Company; Golden Press, Inc., Educational Division; Great Books of the Western World; Grolier Incorporated; Hafner Publishing Company, Inc.; Harcourt, Brace & World, Inc.; Harper & Row Publishers; Harvard University Press; D. C. Heath and Company; Houghton Mifflin Company; Institute for Scientific Information; Lea & Febiger; J. B. Lippincott Company; The Macmillan Company; McGraw-Hill Book Company; McGraw-Hill Book Company, Webster Division; C. V. Mosby Company; National Geographic Society; National Press; The New American Library, Inc., Oxford University Press; Pergamon Press; Prentice-Hall, Inc.; Reinhold Book Division; W. B. Saunders Company; Silver Burdett Company; Special Libraries Association Translations Center; J. W. Stacey, Inc.; University of California Press; D. Van Nostrand Company, Inc.; Wadsworth Publishing Company, Inc.; John Wiley & Sons, Inc.; World Publishing Company; and Yale University Press.

Industrial. Hewlett-Packard Company; Litton Industries, Electron Tube Division; Lockheed Missiles & Space Company; 3M Company; Northern Electric Company Limited; and Pacific Telephone.

Instruments and Supplies. Wm. Ainsworth & Sons, Inc.; American Optical Company, Instrument Division; Aquarium Systems, Inc.; Baird-Atomic, Inc.; Beckman Instruments, Inc.; Beckman & Whitley, Inc.; Bio-Rad Laboratories; Biotronics, Inc.; Carolina Biological Supply Company; Davidson Films; EDEX Corporation; Ednalite Research Corporation; General Biological Supply House, Inc.; Graf-Apsco Company; Iconix Incorporated; Kensington Scientific Corporation; Labindustries; Lane Science Equipment Company; LaPine Scientific Company; E. Leitz, Inc.; Lipshaw Manufacturing Company; Macalaster Scientific Corporation; Mechanical Enterprises, Inc.; Mettler Instrument Corporation; Miles Reproducer Company, Inc.; MISCO Scientific; Mistaire Laboratories; Perkin-Elmer Corporation; Pharmacia Fine Chemical, Inc.; Precision Scientific Company; Red Lake Laboratories, Inc.; Schultz & Gibbens; Ivan Sorvall, Inc.; Southern Precision Instrument Company; Systron-Donner Corporation; Technical Associates; Technical Instrument Company; John Tyler; Van Waters & Rogers, Inc.; Ward's Natural Science Establishment, Inc.; Welch Scientific Company; West Coast Scientific Sales & Service Company; Western Scientific Associates; and Wilkens Instrument and Research, Inc.

Special. Air Force Office of Scientific Research; Coca-Cola Company; Council for Tobacco Research-U.S.A.; Division of Air Pollution, Public Health Service; Division of Research Grants, Public Health Service; National Institute of Dental Research; National Park Service; National Science Foundation; Oak Ridge Institute of Nuclear Studies; Office of Naval Research; U.S. Department of Commerce, Clearing House for Federal, Scientific, and Technical Information; U.S. Public Health Service; and Smithsonian Institution.

AAAS Business Sessions

Board of Directors. The Board of Directors of the Association will meet in a private suite in the Claremont Hotel, 28 December, at 9 a.m.

Council of the Association. The Council of the Association will meet Thursday morning, 30 December, at 9 a.m. in the Pauley Ballroom B, ASUC Student Center. All members of the Council have been notified individually.

Subjects to be considered by the Council (in addition to the agenda prepared) usually are first brought before the Board of Directors through the Executive Officer. During the meeting communications for the Board of Directors should be submitted in writing and left at the mail desk at the Claremont Hotel. Such communications should be addressed to Dael Wolfle.

Section Officers' Luncheon and Business Meeting. A luncheon and brief planning session for the 1966 meeting will be held on 28 December at the Howard Room, Men's Faculty Club. Dael Wolfle and Raymond L. Taylor are cochairmen.

Registration

Main Registration-Information Center. The AAAS Main Registration-Information Center will be located on the street level, or second level, of the Student Center. It will be open 26 December, 8 a.m. to 10:30 p.m., and 27–30 December, 8 a.m. to 8 p.m., except Thursday, 30 December, when it closes at 5 p.m.

Badges and *General Programs* may also be obtained at the supplementary registration desks, but the Main Registration is the only place to receive supplementary literature and maps. Advance registrants (who have received programs and badges prior to the meeting) are urged to visit the Main Registration, at any convenient time, to receive these items.

Supplementary Registration Desks. For the convenience of those attending the 132nd meeting, there will be two supplemenatry registration desks—one at the Claremont Hotel and the other at the entrance to the Exhibits. These will be open as follows: Claremont Hotel: 26 Dec., 5 p.m. to 10 p.m.; 27–29 Dec., 8 a.m. to 8 p.m. Exhibits Entrance: 27–29 Dec., 10 a.m. to 6 p.m.; 30 Dec., 9 a.m. to 5 p.m.

Astronomers' Registration

Members of the American Astronomical Society should register with the AAS representative in the Main Registration area. Such registrants will pay an additional $3 fee for which they receive a convention badge with the name of the society, the last-minute AAS Program, and a set of Abstracts. Advance registrants who have paid the full $8 "double registration" should call at the Main Registration area for the AAS Program and Abstracts.

Registration Fee

The AAAS registration fee, which has been kept at a minimum, is $5. A spouse or child who does not want a separate program may register for $2 if he or she registers at the same time as the regular registrant. Each regular registrant will receive a receipt, a convention badge, and the *General Program*—the only publication containing the programs of the 20 AAAS sections and of the 89 participating organizations. Any person who purchases an advance copy of the *General Program* but does not register in advance and who then attends the meeting has agreed to complete his registration, and is expected to do so, by paying $2 at the Main Registration Center or at one of the supplementary registration desks; after this he will receive his convention badge and the accompanying privileges.

As already noted, *young people under 16 cannot be registered.*

The AAAS convention badge indicates that you are participating fully in this 132nd convention of the Association. The badge should be worn throughout the meeting because (i) it reminds others to register; (ii) it is needed for admission to the Annual Exposition of Science and Industry, the Science Theatre, and the reception that follows the AAAS presidential address; and (iii) it aids in locating friends.

Visible Directory of Registrants. The directory will be located on the street level, or second level, of the Student Center; it is open day and night.

The registration cards of all registrants are placed alphabetically in the directory soon after registration. The cards of advance registrants will have been completely alphabetized prior to the meeting. All other cards are filed to the second or third letter of the surname. Members of the press, exhibit personnel, and guests are also listed in the directory—on blue cards instead of yellow.

Mail, Telegrams, and Messages

Mail and telegrams addressed in care of the AAAS will be held at the AAAS office on the street level of the Student Center. Telephone and personal messages will also be filed alphabetically in the AAAS office, and the names for whom they are intended will be posted on a bulletin board near the AAAS office. The Association assumes no responsibility for the delivery of mail or of telegrams.

Society Dinners and Luncheons

Tickets to the dinners or luncheons of any Section or any participating society are obtainable both from its representatives, either during preceding sessions or, in many cases, at the Main Registration-Information center on the ground level of the Student Center. For a list of all meal functions, consult the Daily Summary in the *General Program.*

AAAS and Society Headquarters

The Associated Students of the University of California Student Center is the official headquarters of the AAAS. It is where the Council of the Association will meet and where other business sessions will be held. The Pressroom—for receipt of authors' abstracts and the only source of press releases—is on the fourth level. Here, too, will be press and radio-TV interviews.

The AAAS office, Main Registration-Information Center, Visible Directory of Registrants, AAAS Science Theatre, and the Annual Exposition of Science and Industry also are all in the Student Center.

Because this is a campus meeting and the Student Center is AAAS Headquarters, no hotel is the headquarters of any section or society, except the Society of the Sigma Xi at the Claremont. (A few groups that very much wished to be together, however, have

been accommodated in the Residence Halls.) Societies that required a headquarters for committee meetings, or lounges, were assigned the following rooms on the campus.

American Astronautical Society, California 102; American Nature Study Society, Birge 467; American Society of Zoologists, Wheeler 24; Botanists' Headquarters, Life Sciences Building 2023; Herpetologists' League, Life Sciences Building 4005; National Association for Research in Science Teaching, LeConte 210; National Association of Biology Teachers, LeConte 363; National Science Teachers Association, Birge 475; Psychologists' Headquarters, Dwinelle, 134; Sigma Delta Epsilon, Stevens Room in Student Center; and Society of Systematic Zoology, TV Area in Student Center.

Housing

On facing pages in the advertising section of this issue of *Science* are two AAAS "house ads," each with a coupon at the bottom. One of these coupons is for **advance registration** and/or an order for the *General Program*; that coupon should be sent to the AAAS Office in Washington, D.C., but advance registration must be closed 10 December because of delays caused by heavy Christmas mail.

The other page announcement presents the variety of sleeping accommodations available in Berkeley; it has a coupon to be used in applying for a reservation for a room in a hotel, a motel, or in the luxurious new Residence Halls of the University of California. **All reservations for any type of accommodations must be mailed directly to the AAAS Housing Bureau, Post Office Box 210, Berkeley, California 94701**. It is essential that the application for the room reservation be *mailed* because the coupon, or a close copy thereof, is necessary to show that the applicant plans to attend the AAAS meeting at a special convention rate. If the application is for a hotel or motel room, a small deposit (quite customary in California) of $5.00 per person is required. The deposit is credited to the hotel bill and is entirely refundable if a room reservation should be cancelled not later than ten days prior to the arrival date stated. Checks for deposits should be made payable to the "AAAS Housing Bureau."

Dating the housing application coupon is a good idea since all applications are carefully filled in the order of their receipt. All applications for room reservations will be accepted and processed promptly. A confirmation will be sent within 10 days.

Residence Halls. Since this year's meeting is on a campus, the University's new Residence Halls, located one short block from the southern edge of campus, not only are appropriate and particularly convenient but they are decided bargains in combined lodging and meals. Use of the Residence Halls is a privilege that only a University-centered, scientific or educational conference may have. Since it is assumed that a majority of the attendance from out-of-town will choose to stay in these modern, well-constructed structures, they are described first.

Attractive in decor, the reception rooms, halls, and individual bedrooms are also spacious and well furnished. Closets, which may contain student possessions, are locked, but special multiple garment-holders are fastened on each door.

Each room has twin beds but is available for single occupancy if desired.

With two in a room, the daily rate per person is $6.50 without meals, $7.50 with both breakfast and luncheon included. With one person in a room, the daily rate is $7.50 without meals and $8.50 with breakfast and luncheon. Since no meals can be served 31 December, the special rate for the night of 30 December would be $5 each, double; $6, single.

Couples and children not under 14 may occupy rooms. Families can have adjacent (but not interconnecting) rooms. Members of a participating society, if they book largely at the same time, or if a definite number of rooms is contracted for, can all be housed together in a portion of the same unit.

Though there are no private baths, there are quite adequate facilities on each floor. Beds are made, rooms cleaned, and waste baskets emptied by the maid service. Although the university's linen is not changed after one moves in (because of the brevity of the meeting), fresh or additional towels are available.

There are many mechanical conveniences, such as coin operated washers and dryers and vending machines for coffee, milk, candy, fresh fruit, sandwiches, pastry, cigarettes—and, also stamps and newspapers.

Change may be obtained at the switchboard in each unit which will be open daily from 8 a.m. to 10:30 p.m. for incoming calls and distribution of mail—a convenience and service not found at many campus meetings. Pay telephones for outgoing calls are conveniently located.

The Residence Hall reservation deadline date is 10 December (so that staff and supplies can be scheduled). After confirmation of a Residence Hall room, actual registration or assignment upon arrival in Berkeley will be at the Hall between 8 a.m. and 10:30 p.m., 26–28 December, inclusive. Total charges for room, with or without meals, are collected at the time of registration; thereafter, no refund for partial rent or meals is possible. Parking is 50¢ per day and includes overnight parking in lots nearby. Attendees not staying in the Halls may park, *but in daytime only*; the fee is 50¢. There is no check-out time for guests, since they will have paid in advance at the time of registration. Room keys are left at the lobby desk upon departure.

Hotels. The three Berkeley hotels which are cooperating with the AAAS and which are recommended will be described briefly. As is customary, all hotels require a deposit to be sent with the reservation application coupon to the AAAS Housing Bureau in Berkeley. (Checks should be made payable to "AAAS Housing Bureau.") This deposit of $5 per person is credited toward the hotel bill, and it is refundable if the reservation should be cancelled *not later than ten days before arrival date.*

Claremont (Ashby Avenue-Tunnel Road and Claremont Avenue) (300 rooms). A resort-type of hotel in 20-acre, beautifully landscaped setting. Magnificent view of San Francisco Bay Area and Golden Gate. Shops, bar, and cocktail lounge. About 1 mile —uphill—from the central part of the campus where the AAAS meeting is located, so that a car is a decided convenience. Some taxis are available, and one of Hertz rental car offices is located at the hotel. Outdoor parking is free for all guests.

Durant (Southeast corner of Durant Avenue and Bowditch Street) (200 rooms). Closest to campus entrance, Telegraph Avenue and Bancroft Way, and one short block to southern edge

of campus. Cocktail lounge. Two blocks from most kinds of shops. Parking: lot, 50¢ per night; garage, $1.

In addition to the regular singles and doubles listed in the "house ad" announcement, there is a limited number of rooms with a connecting shower, in pairs with twin beds in one room and a double bed in the other. The rate for these rooms is $5.50, single occupancy; double $7.50.

Shattuck (Shattuck Avenue at Allston Way) (250 rooms). In downtown area, one block from the western entrance of the campus, or about four blocks from the ASUC Student Center. No bar or cocktail lounge, but liquor available for functions or by room service. Public parking lots nearby.

The Claremont and Durant Hotels are completely booked at this time.

Motels. The motels named in the announcement are the larger ones in Berkeley. The number in parentheses indicates the number of units. There are other excellent but smaller motels. Most of the motels are on University Avenue and, by bus or car, are about 5 to 15 minutes from the campus. Parking free for guests.

Transportation from the East. In time or in cost, a trip to California from an eastern city is not much more costly nor time-consuming than a *round trip* from the East to a Midwestern city. If one can make two shorter trips per year, he can afford to visit California! For years Californians who attend scientific meetings in the East have reminded their colleagues that it is no further from New York to San Francisco than it is from the Golden Gate to the Narrows between Brooklyn and Staten Island!

San Francisco and Oakland, on the east side of the Bay, are served at frequent intervals by major transcontinental air lines—American, United, TWA, and also Delta. San Francisco has more flights, but Oakland may be particularly convenient for passengers who leave from, or transfer at, Chicago. The fare is the same to either city for any class of transportation.

Berkeley has a heliport which can be reached by helicopter from either San Francisco or Oakland airport. Time about 12 or 8 minutes, respectively. Fare purchased locally, $9.00 or $7.50, respectively, but if part of entire ticket, about $5.00. (Taxi fare from heliport uptown is about $2.) Some of the hotels and motels now have telephones at the heliport and operate courtesy cars.

There are airport limousines that travel from the San Francisco airport to the Oakland bus terminal—fare $1.20—from which a taxi to the Berkeley hotels or the Residence Halls costs about $2.60. Better still, for the convention, the Barrett airport limousines at San Francisco (whenever there are six or more passengers bound for Berkeley) will drive directly to the ASUC Student Center; fare $1.50 each. Finally, it is possible for a party of one to four to hire a taxicab at the San Francisco airport and travel directly to any point in Berkeley for about $14—running time about 50 minutes.

From the Oakland airport, the limousine service provides direct transportation from all flights to any hotel or the Residence Halls in Berkeley for $2—running time about 45 minutes. Taxicab fare about $7.50. As at most airports, it saves time and sometimes money for persons attending a scientific meeting to hire a taxicab that will carry four for the price of one.

Table 1 is intended to give the prospective attendee at this year's AAAS meeting the approximate travel time and round-trip cost between Chicago, Washington, and New York and San Francisco-Oakland.

Oakland-Berkeley is the western terminal of the Union Pacific and Southern Pacific railroads, while San Francisco is the terminus for the transcontinental bus lines. National highway routes 40 and 50 unite at the eastern end of the Oakland-San Francisco Bay Bridge.

Local Transportation. The local connections between the Berkeley hotels, motels, and Residence Halls and the San Francisco and Oakland airports have been discussed in the preceding section.

Berkeley Taxis. Since most of the people in Berkeley—whether faculty or students, workers or visitors—have cars, there are relatively few taxis. But there are some, which can be ordered in advance or found outside of the hotels. There will be a taxi stand on Bancroft Street, very near the ASUC Student Center. Rental cars are available at all airports and at the Claremont Hotel—and they can be telephoned for from any other location. Rental cars secured at either the San Francisco or Oakland airport can be turned in in Berkeley without an extra charge.

Buses. The bus service in Berkeley is efficient, and once the routes, stopping places, and schedules become familiar, they will be helpful. Local fares 25¢.

Buses are not necessary to get from the Durant, Residence Halls, or Shattuck to the ASUC Student Center and the Sather Gate entrance to the campus. The Alameda-Contra Transit District buses connect with all East Bay points and they cross into San Francisco. From Shattuck and University Avenues, they run to San Francisco and return at 15-minute intervals between 5 a.m. and 10 p.m. and then at 30-minute intervals until midnight. Fare 50¢.

Eating Places. Since the University operates on a nonprofit basis, the price of food—in the Dining Commons and Residence Halls—is correspondingly low. It has been mentioned before that for those who stay in the Residence Halls, breakfast and luncheon combined is but $1.00 per person per day. The food in the hotels is good and the prices reasonable. There are seafood and specialty restaurants throughout Berkeley. At AAAS Headquarters in the Student Union, a list of "places to eat" will be available.

AAAS Public Information Service

The general public must be kept informed, whenever feasible, of the results of the scientific research and development that it supports, directly or indirectly. Organized science and the individual scientist must have the understanding and support of intelligent citizens in all walks of life if they are to contribute effectively to the advancement of American democracy. It is, of course, equally important that information concerning advances in science be disseminated clearly and accurately and without sensationalism. Progress in this direction in recent years has been in most instances outstanding, thanks largely to members of the National Association of Science Writers, other accredited science reporters, managing editors of American newspapers, and program managers of radio and television stations.

One of the four objectives of the AAAS is to try to increase public understanding and appreciation of the importance and promise of the meth-

ods of science in human progress. For this reason, and to protect authors of papers from being misquoted by the press, the Association maintains a public information service for each of the annual meetings. In the interest of accuracy and completeness, science writers frequently wish to discuss various research results with investigators during the meeting. If an author is asked to cooperate in this respect or to participate in a press conference, he is encouraged to do so—not only for his own protection, but also for the benefit of science in general. Scores of science writers will be covering this scientific convention from the pressroom in the Student Center. News stories filed by them will be published and broadcast throughout the world. The assistance of authors in helping to make these stories accurate is earnestly solicited by the Association.

The AAAS public information staff for the Berkeley meeting will include Edward G. Sherburne, Jr., Kneeland A. Godfrey, Jr. (full-time staff members), and Thelma Heatwole (consultant, Philip Morris, Inc.). The Local Committee on Public Information is headed by Richard P. Hafner, Jr. (public affairs officer, University of California, Berkeley).

Local Committees

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Vice Chairman

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Alan W. Searcy, vice chancellor, University of California, Berkeley.

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Cornelius H. Siemens, president, Humboldt State College, Arcata.

J. E. Wallace Sterling, president, Stanford University, Palo Alto.

Mathematics (A)

Monday 27 December

Vice-Presidential Address. Wallace Givens (Argonne National Laboratory and Northwestern University; secretary of Section A) will preside. The direction of mathematics development in relation to the other sciences, Bernard Friedman (University of California, Berkeley; vice president for Section A).

The New Mathematics. Symposium, program of Section A, cosponsored by the Conference Board of the Mathematical Sciences. Arranged by Wallace Givens, who will also preside. *The School Mathematics Study Group*: The role of science in the School Mathematics Study Group Program, Edward G. Begle (Stanford University); Science in the junior high school mathematics curriculum, William Sandmann (Harvey Mudd College); SMSG and mathematical physics, Victor Twersky (Sylvania Electronics Defense Laboratories, Mountain View, California); and Principles of computer science in the high school mathematics curriculum, Elliott I. Organick (University of Houston). Coordination of mathematics with science, Paul C. Rosenbloom (Teachers College and Columbia University). What is important about the "new mathematics"?, Max Bieberman (University of Illinois Committee on School Mathematics).

American Mathematical Society (A1)

Wednesday 29 December

Contributed Papers I. General. On real numbers having normality of order k, C. T. Long (Washington State University). Jessen's theorem on Riemann sums for locally compact groups, K. A. Ross and K. R. Stromberg (Uni-

versity of Oregon). Simultaneous interpolation and approximation in normed linear spaces, Frank Deutsch (Pennsylvania State University). On a functional equation, Abe Sklar (Illinois Institute of Technology). Conditions for the nonsingularity of partitioned matrices, J. L. Brenner (Stanford Research Institute). Dirac's relativistic theory of electron in energodynamics, M. Z. v. Krzywoblocki (Michigan State University).

Contributed Papers II. Analysis I. Positive solutions of a quadratic integral equation, G. H. Pimbley (Los Alamos Scientific Laboratory). Formulation of axially symmetric solutions of Laplace's equation, J. E. Rosenthal (Melpar, Inc., Falls Church, Virginia). Regular degeneration of certain systems of linear partial differential equations with constant coefficients, L. E. Bobisud (University of New Mexico). A general Perron integral, P. S. Bullen (University of British Columbia). Analytic functions of polynomial growth on a polycylinder I, D. E. Myers (University of Arizona). An extension of Pólya's theorem on power series with integer coefficients, R. M. Robinson (University of California, Berkeley).

Contributed Papers III. Algebra, Logic, and Foundations. Two theorems about 1-predictable sets of tapes, Peter Kugel (Technical Operations Research, Inc., Burlington, Massachusetts). Extensions of the hyperarithmetic hierarchy, Joseph Harrison (Stanford University). A theorem on recursively enumerable classes and splinters, P. R. Young (Stanford University). On Dehn's result on the conjugacy problem, Seymour Lipschutz (Temple University). A universal property of completions of an ordered set, Jorg Mayer (University of New Mexico).

Invited Address. Biharmonic boundary value problems, T. M. Cherry (University of Melbourne, Australia, and University of Washington).

Contributed Papers IV. Geometry and Topology. A new local property of embeddings, O. G. Harrold (Florida State University). Proximate retracts, A. L. Yandl (Western Washington State College). A paracompact semimetric space which is not an M_3-space, R. W. Heath (Arizona State University). On unions of two convex sets, R. L. McKinney (University of Alberta). Remarks on nearest points in Hilbert spaces, Victor Klee (University of Washington).

Contributed Papers V. Analysis II. On the local holomorphic hull of a real submanifold in several complex variables, R. O. Wells, Jr. (Rice University). Level curves of harmonic functions, Leopold Flatto and D. J. Newman (Yeshiva University) and H. S. Shapiro (University of Michigan). The general plateau problem with free boundary, L. J. Lipkin (University of California, Berkeley). A note on the transformation theory for measure space, Robin Chaney (Western Washington State College).

Association for Computing Machinery (A2)

Wednesday 29 December

New Developments for the Use of Computers in Scientific Computation, with Particular Emphaiss on On-Line Systems. Symposium, program of the Association for Computing Machinery and cosponsored by Section A. Arranged by Harry D. Huskey (University of California, Berkeley), who will also preside. Recent developments in pattern recognition, Frank Marzocco (Michigan State University). What are on-line computing systems?, David Evans (University of California, Berkeley).

Demonstration of On-Line Computing. Description and demonstration of MAP, a language for on-line mathematical analysis on the Project MAC computer at the Massachusetts Institute of Technology, Roy Kaplow and John Brackett (Massachusetts Institute of Technology). The time-sharing computer of Project GENIE at Berkeley, Wayne Lichtenberger (University of California, Berkeley).

Thursday 30 December

Applications of Computers to Natural Language Processing. Symposium, program of the Association for Computing Machinery and cosponsored by Section A. Arranged by Anthony G. Oettinger (Harvard University), who will also preside. Progress in automatic information retrieval, Gerard Salton (Cornell University). Publish (rationally) or perish, David G. Hays (The RAND Corporation, Santa Monica, California). Answering English questions by computer, Robert F. Simmons (Systems Development Corporation, Santa Monica, California). The evolution of animal languages, William H. Bossert (Harvard University).

Conference Board of the Mathematical Sciences (A3)

The Conference Board of the Mathematical Sciences is a joint sponsor of the symposium, The New Mathematics (27 Dec.).

National Council of Teachers of Mathematics (A4)

Tuesday 28 December

Concurrent Session I. Elementary School Mathematics. Frantisek Wolf (University of California, Berkeley) will preside. Mathematics: a fascinating adventure, John L. Marks (San Jose State College).

Concurrent Session II. Secondary School Mathematics. Jens L. Lund (University of California, Berkeley) will preside. From counting to . . ., William G. Chinn (Stanford University).

Concurrent Session I. Elementary School Mathematics. Kenneth C. Skeen (Diablo Valley College, Concord, California) will preside. The Cambridge Report—twenty years or tomorrow?, Lloyd V. Rogers (Crittenden School, Mountain View, California).

Concurrent Session II. Secondary School Mathematics. James R. Smart (San Jose State College) will preside. The amateur mathematician, Brother U. Alfred (St. Mary's College, California).

General Assembly. Veryl Schult (U.S. Office of Education, Washington, D.C.) will preside. Greetings by George A. Crosby (National Council of Teachers of Mathematics, Washington, D.C.). Mathematics for grades one and nine, Max Beberman (University of Illinois).

Society for Industrial and Applied Mathematics (A5)

Thursday 30 December

New Applications in Mathematics and Their Implications for Mathematical Education. Symposium, program of the Society for Industrial and Applied Mathematics and cosponsored by Section A. Arranged by James H. Griesmer (IBM Research Center, Yorktown Heights, New York). B. H. Colvin (Boeing Scientific Research Laboratories, Seattle) will preside. Mathematical methods in operations research, George B. Dantzig (University of California, Berkeley). Some unsolved

problems, Victor Klee (University of Washington). Probabilistic models in the behavioral sciences, Leo Katz (Michigan State University).

Physics (B)

Monday 27 December

Physicists' Luncheon and Vice-Presidential Address. Joint session of Section B and Sigma Pi Sigma. Stanley S. Ballard (secretary of Section B and past president of Sigma Pi Sigma) will preside. Physics in the last 20 years, Emilio Segrè (University of California; vice president for Section B).

Invited Papers on Teaching and Research in Physics. Emilio Segrè will preside. The commission on college physics, Matthew Sands (Stanford University). Current problems in particle physics, Edwin M. McMillan (University of California, Berkeley).

American Astronautical Society (B1)

Wednesday 29 December

Recent Developments in Space Flight Mechanics. Part I. Paul B. Richards (General Precision, Inc., Little Falls, New Jersey) will preside and present introductory remarks. Welcome by George W. Morgenthaler (Martin Company, Denver, Colorado; president, American Astronautical Society). Trajectory design for mission analysis, Stanley E. Ross (NASA Office of Manned Space Flight, Washington, D.C.). The hodographic theory of Newtonian mechanics, Samuel P. Altman (General Electric Company, Philadelphia, Pennsylvania). Recent developments in analytical celestial mechanics, Richard F. Arenstorf (NASA Marshall Space Flight Center, Huntsville, Alabama).

Recent Developments in Space Flight Mechanics. Part II. Jack Lorell (Jet Propulsion Laboratory, California Institute of Technology) will preside and present introductory remarks. Optimization problems in powered space flight, Theodore Edelbaum (Analytical Mechanics Associates, Cambridge, Massachusetts). Trajectory determination from observational data, John D. Anderson (Jet Propulsion Laboratory, California Institute of Technology). Principles and developments in passive attitude control, Daniel B. DeBra (Stanford University). Flight dynamics of planetary entry, Rodney C. Wingrove (NASA Ames Research Center, Moffett Field, California).

American Meteorological Society (B2)

The American Meteorological Society is a cosponsor of the following programs: Section O's seven-session symposium on Grand Level Climatology (27-30 Dec.) and the four-session symposium on Weather Modification of the 5th Berkeley Symposium on Mathematical Statistics and Probability (27-28 Dec.).

Sigma Pi Sigma, National Physics Honor Society (B3)

Sigma Pi Sigma is a cosponsor of the program of Section B.

Chemistry (C)

Monday 27 December

Non-Protein Neurotoxins. Symposium. Arranged by Harry S. Mosher (Stanford University), who will also preside. Saxitoxin, Henry Rapoport (University of California, Berkeley). Batrachotoxin (Kokoi venom), John Daly (National Institutes of Health, Bethesda, Maryland). Ciguatera and related toxins, Paul Scheuer (University of Hawaii).

Recent Developments in the Study of Energy Transfer. Arranged by George C. Pimentel (University of California, Berkeley) and Harmon W. Brown (Varian Associates, Palo Alto, California).

Part I. George C. Pimentel will preside. Studies of intra- and intermolecular energy transfer including transfer with rare earth chelates, M. A. El-Sayed (University of California, Los Angeles). Intramolecular energy transfer and luminescence of transition metal complexes, Glenn A. Crosby (University of New Mexico). Vibration and rotation energy transfer processes detected by the emission of photons, Herbert P. Broida (University of California, Santa Barbara). Vibrational relaxation, William A. Klemperer (Harvard University).

Part II. Harmon W. Brown will preside. Quantum conversion in photosynthesis, Ellen Weaver (Stanford University). ESR of gas phase radicals, John Q. Adams (Chevron Research Company, Richmond, California). Spin energy transfer, Harden McConnell (Stanford University). Electronic and vibrational excitons in crystals of aromatic molecules, G. Wilse Robinson (California Institute of Technology).

Thursday 30 December

Contributed Papers I. Arranged by John W. Otvos (Shell Development Company, Emeryville, California). Fred H. Stross (Shell Development Company) will preside. The accurate measurement of sorption isotherms at elevated pressures by tracer-pulse chromatography, R. J. Carr, F. Helfferich, G. C. Mull, and D. L. Peterson (Shell Development Company). Fusion techniques in chemical microscopy, F. T. Jones (Western Regional Research Laboratory, Albany, California). The separation of diazonium salts by thin layer chromatography, Roy J. Gritter (IBM, San Jose, California). Chromatographic separations on polyurethane gels, E. A. Woycheshin and C. Gustavson (Aerojet-General Corporation, Sacramento, California). Determination of lipids of in vivo *M. tuberculosis*, William T. Miller (Regis College, Denver, Colorado). The evaporation of solvents from resin films, G. M. Sletmoe (Shell Development Company, Emeryville, California).

Contributed Papers II. John W. Otvos will preside. The aggregation of polypeptides in relatively non-polar media, J. C. Powers, Jr., and W. L. Peticolas (IBM, San Jose, California). On the mechanism of metal chelate catalysis in the reaction between alcohols and isocyanates, A. E. Oberth and R. S. Brunner (Aerojet-General Corporation). The measurement of fluorescent lifetimes and self-quenching cross sections of the B state of I_2, Ara Chutjian and Leo Brewer (University of California, Berkeley). Effect of charge transfer complexing on the donor phosphorescence, K. B. Eisenthal (IBM, San Jose, California). Energy transfer in photo and radiation chemical *cis-trans* isomerization of octene-2, Morton A. Golub and C. L. Stephens (Stanford Research Institute, Menlo Park, California). Depolarized light and differential thermal analyses of some polyolefin transitions, E. M. Barrall and E. J. Gallegos (Chevron Research Company, Richmond, Calif.). Optical absorption study of copper diffusion in cadmium sulfide, W. Szeto and G. A. Somorjai (University of California, Berkeley).

American Chemical Society (C1)

The California Section is a cosponsor of the entire program of Section C.

Astronomy (D)

Section D is a joint sponsor of the entire program of the American Astronomical Society.

American Astronomical Society (D1)

Two Council Meetings will take place on 27 December.

The following is an outline of the program: two sessions of contributed papers, 28 Dec.; special session on chemical abundances, session for contributed papers, and AAS dinner, 29 Dec.; special session on planetary atmospheres, session for contributed papers, and concurrent session for late papers, 30 Dec.

Wednesday 29 December

Helen B. Warner Prize Lecture. Leo Goldberg (president, AAS) will preside. Studies of stellar magnetism: past, present, and future, George W. Preston (Lick Observatory).

Astronomical Society of the Pacific (D2)

The Society is a cosponsor of the program of the American Astronomical Society.

Geology and Geography (E)

Monday 27 December

Dinner and Vice-Presidential Address. Joint program of the Association of Pacific Coast Geographers, Section E, and other geographical and geological societies represented at the Berkeley meeting. Arranged by James J. Parsons (University of California, Berkeley) and Homer Aschmann (University of California, Riverside; president of APCG). Aschmann will preside. International scientific collaboration in the Arctic, Trevor Lloyd (McGill University).

Wednesday 29 December

Tertiary Provincial and Immigrant Terrestrial Vertebrates. Symposium, program of Section E and cosponsored by the Geological Society of America. Arranged by Charles A. Repenning (U.S. Geological Survey, Menlo Park, California), who will also preside. Speculations on endemism in terrestrial West Coast Paleogene mammals, Malcolm C. McKenna (American Museum of Natural History, New York, N.Y.). New World origins of Old World camels, S. David Webb (University of Florida). Evolution and regional endemism of the talpid *Scapanus (sensu lato)*, J. Howard Hutchison University of California, Berkeley). Late Tertiary mammal succession, Mojave Desert region, Southern California, Richard H. Tedford (University of California, Riverside). Zoogeographic significance of capybaras in Arizona, John F. Lance (University of Arizona). Late Cenozoic vertebrate faunas of the Anza-Borrego Desert area of Southern California, Theodore Downs (Los Angeles County Museum) and John A. White (California State College, Long Beach).

Extraterrestrial Sedimentologic Processes. Symposium, program of Section E and cosponsored by the Geological Society of America. Arranged by Jack R. Van Lopik (Texas Instruments, Inc., Dallas, Texas), who will also preside. Fundamentals of terrestrial sedimentology, Donn S. Gorsline (University of Southern California). Shock sedimentology, Wayne Roberts (Boeing Company, Seattle, Washington). Ultrahigh vacuum adhesion of rock powders, John W. Salisbury and Joel E. M. Adler (Air Force Cambridge Research Laboratories, Bedford, Massachusetts). Telescopic evidence of the absence of of water erosion and sedimentation on Mars and some resulting mineralogy, Clyde Tombaugh (New Mexico State University). The Martian yellow clouds, John A. Ryan (Douglas Aircraft Co., Santa Monica, California). Photo-geology of planetary sedimentary processes, John F. Cronin (Air Force Cambridge Research Laboratories) and John B. Adams (Jet Propulsion Laboratory, California Institute of Technology).

Committee Meeting. Harry S. Ladd (vice president, Section E) will preside.

Arctic Institute of North America (E1)

The Institute is a joint sponsor of the symposium of the Western Society of Naturalists (FG7), Polar Lore since 1954 (29 Dec.).

Association of American Geographers (E2)

Monday 27 December

Papers in Cultural Geography in Honor of Carl O. Sauer. Program of the Association of American Geographers and cosponsored by Section E, Association of Pacific Coast Geographers, and the Geological Society of America. Arranged by Marvin W. Mikesell (University of Chicago). James J. Parsons (University of California, Berkeley) will preside.

Part I. Introduction by Marvin W. Mikesell. Athabaskan expansion in the Southwest, Homer Aschmann (University of California, Riverside). From Hacienda to Ejido: Pablillo, Nuevo Leon restudied, Samuel N. Dicken (University of Oregon). The American scene, David Lowenthal (American Geographical Society).

Part II. Plant transfer and ensuing change in regional agricultural economy, Joseph E. Spencer (University of California, Los Angeles). The *Mithan (Bos frontalis)* in culture and history, Frederick J. Simoons (University of Wisconsin). Seafaring in the Indian tradition, David E. Sopher (Syracuse University). The role of cultural origin in the variable geographical impact of three centuries of British settlement overseas, Andrew H. Clark (University of Wisconsin).

Tuesday 28 December

The Remote Sensing of the Environment. Symposium, program of the Association of American Geographers and cosponsored by Section E. Arranged by James P. Latham (Florida Atlantic University, Boca Raton), who will also preside. Applications of multispectral sensing, Robert N. Colwell (University of California, Berkeley). Pedologic aspects of remote sensing, Jack R. Van Lopik. Trends in ONR-sponsored remote-sensing research, John L. Place (Office of Naval Research, Washington, D.C.). Qualitative analysis of selected infrared imagery, C. E. Olson, Jr. (University of Michigan). The application of remote sensors to geologic study, William A. Fischer (U.S. Geological Survey, Washington, D.C.) and Peter C. Badgley (National Aeronautics and Space Administration, Washington, D.C.). Geographic integration of imagery patterns, James P. Latham.

Association of Pacific Coast Geographers (E3)

The Association is a cosponsor of all programs in geography.

Geological Society of America (E4)

For details of the sessions cosponsored by the Geological Society of America, see programs of Sections E and E6.

National Geographic Society (E5)

Thursday 30 December

Annual Illustrated Lecture. For details, see Special Sessions.

National Speleological Society (E6)

Wednesday 29 December

Limestone Hydrology. Symposium, program of the National Speleological Society and cosponsored by Section E and the Geological Society of America. Arranged by George W. Moore (U.S. Geological Survey, Menlo Park, California), who will also preside. Initiation of groundwater flow in jointed limestone, Stanley N. Davis (Stanford University). Chemical equilibrium between the water and minerals of a carbonate aquifer, William Back (U.S. Geological Survey, Washington, D.C.), Rodney N. Cherry (U.S. Geological Survey, Ocala, Florida), and Bruce B. Hanshaw (U.S. Geological Survey, Washington, D.C.). Bedding-plane anastomoses and their relation to cavern passages, Ralph O. Ewers (Cincinnati Museum of Natural History). Groundwater flow systems in the carbonate rocks of Nevada, George B. Maxey and Martin D. Mifflin (University of Nevada). Central Kentucky karst hydrology, R. A. Watson (Washington University).

Speleologists' Dinner. Kenneth N. Laidlaw (Berkeley, California) is chairman. Following the dinner, an illustrated report will be presented on the 1965 International Speleological Congress in Yugoslavia.

Zoological Sciences (F)

Monday 27 December

Biologists' Smoker. Joint program of Sections F and G-Botanical Sciences and all biological societies. Arranged by W. M. Laetsch (University of California, Berkeley). All biologists are cordially invited.

Wednesday 29 December

Zoologists' Dinner and Vice-Presidential Address. Joint session of Section F and all participating zoological societies. Theodore H. Bullock (president, American Society of Zoologists) will preside. Molecular mechanisms of temperature adaptation as a factor in speciation, C. Ladd Prosser (University of Illinois; vice president, Section F).

American Fisheries Society (F1)

Tuesday 28 December

Recent Studies in the Sacramento-San Joaquin Estuary. Symposium. Arranged by Harold K. Chadwick (California Department of Fish and Game), who will also preside. Sediment of the Bay, Raymond Krone (University of California, Davis). Effects of hydrology on zooplankton in the Sacramento-San Joaquin Delta, Jerry Turner (California Department of Fish and Game). Observed relationship between benthic animals and water quality, Philip Storrs (University of California, Berkeley). Changes in striped bass migrations in the estuary, Harold K. Chadwick (California Department of Fish and Game). Movements of fish and shrimp in the salinity gradient, David Ganssle (California Department of Fish and Game).

American Society of Zoologists (F2)

Monday 27 December

Molecular Mechanisms of Temperature Adaptation. Part I. Joint program of Section F and the Division of Comparative Physiology of the American Society of Zoologists and cosponsored by the Society of General Physiologists. Arranged by C. Ladd Prosser, who will also present introductory remarks. T. C. Broyer (University of California, Berkeley) will preside. The present status of the sulfhydryl hypothesis of freezing resistance, J. Levitt (University of Missouri). The pattern of biochemical processes associated with the seasonal adaptation of tree cells to freezing, David Siminovitch (Canada Department of Agriculture). Biochemical significance of the correspondence between temperature conditions of existence of species and protein thermostability, B. Y. Alexandrov (Komarov Botanical Institute, Academy of Sciences, Leningrad).

Concurrent Symposium. Hypothalamic Control of the Anterior Pituitary. Part I. Program of the Division of Comparative Endocrinology. Arranged by Donald S. Farner (University of Washington, Seattle), who will also preside and present introductory remarks. Releasing factors in hypothalamic control of the anterior pituitary in mammals, Joseph Meites (Michigan State University). Pharmacological inhibition of ACTH secretion in mammals, Leola Lorenzen (University of California, San Francisco). Hypothalamic control of the release of prolactin in birds, Clifford Kragt (Michigan State University). Hypothalamic control of the release of prolactin—comparative aspects, C. S. Nicoll (National Cancer Institute, Bethesda, Maryland). The vascular relationships between the hypothalamus and the anterior pituitary in birds, Arturs Vitums (Washington State University).

Contributed Papers A. Developmental Biology I. R. R. Hathaway (University of Utah) will preside. Histone and DNA synthesis in synchronously dividing *Tetrahymena pyriformis*, John A. Hardin and David T. Lindsay (University of Georgia). Electrophoretic identity of chromosomal and ribosomal histones from chicken liver, David T. Lindsay (University of Georgia). RNA and protein synthesis in *Urechis caupo* oöcytes, Meredith C. Gould (Stanford University). Demonstration of polyribosomal aggregates and amino-acid incorporation in post-mitochondrial supernatants from unfertilized eggs of *Sabellaria cementarium*, John E. Winesdorfer (University of Washington). Incorporation of amino acids into protein by non-nucleate, nucleate, and poly U-treated sea urchin eggs, Albert Tyler (California Institute of Technology). Deoxyribonucleic acid content of unfertilized sea urchin eggs, Lajos Piko and Albert Tyler (California Institute of Technology). Initiation and mechanism of C^{14}-uridine uptake after fertilization in *Strongylocentrotus purputratus* eggs, Joram Piatigorsky (California Institute of Technology). Electrophoretic studies of protein synthesis in sea urchin development, Melvin Spiegel, Hironobu Ozaki, and Albert Tyler (California Institute of Technology). Differences in the microsome complexes of unfertilized and fertilized sea urchin eggs revealed by chemical dissection followed by electron microscopy, Catherine Anderson Verhey (University of

Illinois), Frank H. Moyer (Washington University), and Ray M. Iverson (Miami).

Concurrent Session for Contributed Papers B. Invertebrate Zoology I. Robert P. Higgins (Wake Forest College) will preside. *Araneus* silk production, David B. Peakall (SUNY Upstate Medical Center, Syracuse, New York). *Araneus* web construction, Peter N. Witt (SUNY Upstate Medical Center). *Araneus* web geometry, Charles F. Reed (Temple University). Growth and variations in *Xiphocaris elongata* (Decapoda, Atyidae), with reference to differences possibly associated with elevation, C. W. Hart, Jr. (Academy of Natural Sciences, Philadelphia). The larval development of the coconut crab, *Birgus latro* (L.), reared in the laboratory, Ernst S. Reese (University of Hawaii). The influx of *Gonodactylus falcatus* (Stomatopoda) into the coral head habitat which had previously been occupied by *Pseudosquilla ciliata* on Oahu, Hawaii, Robert A. Kinzie, III (University of Hawaii). Biological implications of the food habits of some Indo-West Pacific Doridacea (Nudibranchia, Mollusca), David K. Young (University of Hawaii). Population studies on the land isopod *Hyloniscus riparius*, William A. Hirst and Charles F. Lytle (Pennsylvania State University). Interpopulation variations in a cave crayfish (*Oronectes pellucidus*), Thomas C. Jegla, Thomas L. Poulson, and Martha Riser Cooper (Yale University).

Concurrent Session for Contributed Papers C. Experimental and Radiation Biology. Peter Abramoff (Marquette University) will preside. Relation of age and weight to liver enzyme activity, E. H. Avery and R. A. Freedland (University of California, Davis). Immunochemical studies of human myoglobin heterogeneity, Helen R. Strausser and Rose A. Bucsi (Rutgers University). Actinomycin D: effect on the primary immune response in rats, Peter Abramoff and Camille Hintzke (Marquette University). Some aspects of echolocation in the porpoise *Steno bredanensis*, Kenneth S. Norris and William Evans (University of California, Los Angeles). Analysis of locomotory response to olfactory stimulation—shark and fish, H. Kleerekoper (McMaster University). An examination of the validity of the x-ray dose-frequency criterion as traditionally employed in specific-loci mutagenesis in *Drosophila melanogaster*, Sara H. Frye (University of Texas). Distribution and retention of Cs^{137} in the body of *Drosophila melanogaster* adults, J. M. Carpenter and M. S. Wilkins (University of Kentucky). The effect of roentgen irradiation on the gills of adult axolotl (*Siredon mexicanum*) Victor V. Brunst (Roswell Park Memorial Institute, Buffalo).

Animal Behaviorists' Luncheon. Joint program of the Animal Behavior Society, the ASZ Division of Animal Behavior and Sociobiology, and the ESA Section of Animal Behavior and Sociobiology.

Molecular Mechanisms of Temperature Adaptation. Part II. Malcolm Gordon (University of California, Los Angeles) will preside. Thermal stability of proteins in relation to heat resistance of poikilotherms, Kenneth Read (Boston University). Associated changes in protein thermostability during evolution, B. P. Ushakov (Institute of Cytology, Academy of Sciences, Leningrad). Organization of metabolism during temperature compensation, P. W. Hochackha (Duke University).

Concurrent Symposium. Hypothalamic Control of Anterior Pituitary. Part II. Program of the Division of Comparative Endocrinology. Arranged by Donald S. Farner (University of Washington). Charles H. Sawyer (University of California, Los Angeles) will preside. Direct effects of light on the hypothalamus, Robert D. Lisk (Princeton University). The hypothalamus in the photoperiodic control of gonadal cycles in birds, Fred Wilson (Kansas State University). Hypothalamic regulation of thyrotropin secretion in amphibians, William Etkin (Albert Einstein College of Medicine, New York). Relationships between the preoptic olfactory system, preoptic nucleus, and hypothalamic neurosecretion in fish, Aubrey Gorbman, T. J. Hara, and A. Jasinski (University of Washington). Neuroendocrine mechanisms controlling the anterior pituitary—a résumé, William F. Ganong (University of California, San Francisco).

Session for Contributed Papers D. Developmental Biology II. F. H. Wilt (University of California, Berkeley) will preside. Dipteran salivary gland metamorphosis, a self-regulating system, H. Laufer, B. Rao, and Y. Nakase (University of Connecticut). Bioenergetics and RNA synthesis: actinomycin D and cyanide effects on early *Fundulus* development, C. E. Wilde, Jr., and R. B. Crawford (University of Pennsylvania and Mt. Desert Island Biological Laboratory). Bioenergetics and RNA synthesis in *Fundulus* embryos: effects of anaerobic metabolism, R. B. Crawford and C. E. Wilde, Jr. Chick lens differentiation in vitro in the presence of actinomycin D, A. K. Katoh (Argonne National Laboratory). A relationship between increased protein synthesis and loss of melanin synthesis in monolayer cultures of chick retinal pigment cells, J. R. Whittaker (University of California, Los Angeles). Cell division in the mechanics of sea urchin gastrulation, Donald A. Kaplan (University of California, Los Angeles). Ultrastructural study of ascidian metamorphosis: blood cell migration across the epidermis, Leslie M. Grimm and Richard A. Cloney (University of Washington, Seattle). Formative movements in teleost embryos, William W. Ballard (Dartmouth College). Development of the rat blastocyst, Allen C. Enders and Sandra Schlafke (Washington University School of Medicine). Calcium ion-binding by embryonic cell surfaces, Michael Collins (Johns Hopkins School of Medicine).

Concurrent Session for Contributed Papers E. Invertebrate Zoology II. Charles F. Lytle will preside. Separation of sea urchin coelomocyte types by centrifugation, Jon Lindsay, R. B. Loyns, and R. L. Bacon (University of Oregon Medical School, Portland). Analysis of shell-boring behavior of muricid gastropod *Urosalpinx cinerea* (Say) by means of color motion picture and microhydrophone recording of radular sounds, Melbourne R. Carriker and Barry Martin (Marine Biological Laboratory, Woods Hole, Massachusetts). A sea anemone parasitic as a larva in a ctenophore, Sears Crowell (Indiana University). The growth rate of the rock-boring clam *Penitella penita*, John W. Evans (University of Oregon). A laboratory study of growth and the timing of sexuality in the colonial marine hydroid *Obelia longissima*, Richard L. Darby (University of Oregon). Comparative behavioral studies of some grapsoid crabs, Howard O. Wright (University of California, Berkeley). Intra- and extracellular photosynthetic products of zooanthellae from reef corals, Leonard Muscatine (University of California, Los Angeles). Daily locomotor activity in two phalangid genera, Leiobunum and Phalangium, Arlan L. Edgar and Hansen A. Yuan (Alma College). Studies of the eyestalks of cave crayfish, Thomas C. Jegla (Yale University).

Concurrent Session for Contributed Papers F. Cytology and Genetics. E. J. DuPraw (University of California, Davis) will preside. Possible role of chelation in enhancement of radiosulfate accumulation by kidney cortex in vitro, Ingrith J. Deyrup-Olsen (University of Washington). Preliminary observations of the effect of actinomycin D on oögenesis in *Drosophila melanogaster*, Edward H. Brown and James H. Sang (University of Illinois). DNA labeling and x-irradiation studies of the phosphatase-positive peripheral cells in the nasal (salt) glands of ducklings, Richard A. Ellis (Brown University). The ultrastructure of human chromosomes, E. J. DuPraw. Presence of an unusual phase-dense body during mitosis of cultured salamander cells, Frederick H. Kasten (Pasadena Foundation for Medical Research). Isolation of protozoan structures for electron microscope observation, Lauren E. Rosenberg and J. Norman Grim (University of California, Davis). A study of the "sex ratio" condition in *Drosophila bifasciata*, Elaine A. Leventhal (Yale University). Induction of gene expression in paramecium by cell-free culture fluid, Irving Finger and Carol Heller (Haverford College). A genetic study of scleral ectasia in a family of linebred dogs, Lee Ford (Canine Genetics Consultant Service, Parkland, Washington).

Concurrent Session for Contributed Papers G. Comparative Physiology I. Donald Kennedy (Stanford University) will preside. Reversal mechanism in the heart of the tunicate *Ciona intestinalis*, Margaret Anderson (Stanford University). Variation in the motor output pattern of the flying locust, Ingrid Waldron (University of California, Berkeley). Phase relationships between motor units during flight and preparation for flight in hawk moths, Ann E. Kammer (University of California, Davis). Central control of tonic muscles in the crayfish abdomen, William H. Evoy and Donald Kennedy (Stanford University). Localization of receptor types in the propodite-dactylopodite organ (PDO) of the crab, *Cancer irroratus* Say, Bernard Hartman and Edward G. Boettiger (University of Connecticut). Lateral inhibition in a simple eye, Michael J. Dennis (Stanford University). Cross-regenerated taste nerves in the rat, Bruce Oakley (University of California, Los Angeles). Cation and anion stimulation of electrolyte receptors of the blowfly, *Phormia regina*, Richard A. Steinhardt (Columbia University). Evoked ribonucleic-acid changes in insect central neurons, Melvin J. Cohen and Jon W. Jacklet (University of Oregon).

Tuesday 28 December

Symposium. Molecular Mechanisms of Temperature Adaptation. Part III. A. Glenn Richards (University of Minnesota) will preside. Biochemical correlates of temperature acclimation, K. P. Rao (University of California, Los Angeles). Temperature adaptation and the nervous system of fish, M. H. Baslow (University of Hawaii) and Eugene Agalides (General Dynamics Electric Corporation). ATPase differences in relation to temperature tolerance of reptiles, Paul Licht (University of California, Berkeley). Temperature adaptation in relation to muscle ATPase activity in insects, John A. Mutchmor (Iowa State University).

Concurrent Symposium. Neurosecretion of Invertebrates Other Than Insects, Part I. The Nature and Localization of Neurosecretory Substances. Program of the Divisions of Invertebrate Zoology and Comparative Endocrinology. Arranged by Clarence J. Goodnight and Dona J. Fowler (Western Michigan University). This program is dedicated to the memory of Ernst Scharrer, pioneer investigator in neurosecretion. Clarence J. Goodnight will preside and present introductory remarks. Isolation and identification of cardioexcitor hormone from pericardial organs of *Cancer borealis*, Frank A. Belamarich and Robert Terwilliger (Boston University). Specific effects of pericardial organ neurosecretory substances on the lobster cardiac ganglion, Ian M. Cooke (Harvard University). Survey of the evidence for neurosecretion in gastropod molluscs, Leonard Simpson (Diablo Valley College, Concord, California) and Howard A. Bern and Richard Nishioka (University of California, Berkeley). Localization of phosphatases in the neurosecretory cells of certain pulmonate gastropods, Nancy J. Lane (Yale University).

Session for Contributed Papers H. Comparative Endocrinology I. Gregory Pincus (Worcester Foundation for Experimental Biology) will preside. Effect of long days on the hypophyseal and gonadal cycles of *Lal mumia* (Estrilda amandava), P. D. Tewary and J. P. Thapliyal (Banaras Hindu University, Varnasi, India). Gonadal steroid hormones in phalaropes in comparison with those of certain other birds, E. Otto Höhn and S. C. Cheng, (University of Alberta). Hormonal influence on glucose active transport into hamster liver cells, Harry A. Kent, Jr. (University of Georgia). Some aspects of ovarian physiology in cretin rats, Floyd Hunter and Grace Robbin (Brown University). Intraocular ovarian isografts in castrate and intact male and female rats, Henry C. Browning (University of Texas, Houston). Effects of gonadotropin on ovarian medullary cords in the striped skunk, *Mephitis mephitis*, Berton J. Leach, Joel M. Taubin, and William Gadbois (George Washington University). Gonadotropin preparations and superovulation in the mouse, Allen H. Gates and Adrian Dronkert (Stanford University School of Medicine). Effects of bovine cerebral fractions on the ovulatory response of immature rat ovaries to PMS, Thomas F. Hopkins and Gregory Pincus (Worcester Foundation for Experimental Biology). The effects of long-term administration of a norethynodrelmestranol combination (Enovid^{R}), Sayid M. Husain and Gregory Pincus (Worcester Foundation for Experimental Biology).

Concurrent Session for Contributed Papers I. Comparative Physiology II. Arthur Martin (University of Washington) will preside. Free amino acids in developing encysted embryos of *Artemia salina*, David N. Emerson (University of South Dakota). The role of free amino acids in the intracellular isosmotic regulation in the sipunculid *Golfingia gouldii*, Raghunath A. Virkar (University of California, Irvine). Accumulation and assimilation of amino acids by the brittle star, *Ophiactis simplex*, Grover C. Stephens and Raghunath A. Virkar (University of California, Irvine). Osmotic regulation in the Euryhaline crab *Rhithropanopeus harrisi*, Ralph I. Smith (University of California, Berkeley). Evaporative water loss in birds: a modified method for determination, Robert C. Lasiewski (University of California, Los Angeles). Plasma and urine osmolality in some desert and swamp-dwelling mammals, George C. Dewey, Hans Elias, and Peter M. Elias (University of California Medical School, San Francisco). Urine flow and composition in the vampire bat, William N. McFarland and William A. Winsatt (Cornell University). The cuticular intima of the locust rectum: its properties and role in the excretory

process, J. E. Phillips (University of British Columbia). Effects of inhibitors on active transport by intestinal segments, Sister Alice Marie Fox (Clarke College, Dubuque, Iowa).

Concurrent Session for Contributed Papers J. Developmental Biology III. A. J. Haggis (Reed College) will preside. Naturally occurring phases of cellular dispersion and reaggregation during early vertebrate development, John P. Wourms (Stanford University). Conditioned medium and heart muscle differentiation: contrast between explants and disaggregated cells in a defined medium, Herbert P. Gordon (University of Pennsylvania). Organ culture of *Xenopus laevis* larval skin, Joseph W. Vanable, Jr. (Purdue University). Studies on nerve regrowth and selective nerve-muscle connections in fishes, H. L. Arora and R. W. Sperry (California Institute of Technology). Temporal factors controlling the migration and localization of neural crest cells in the chicken embryo, James A. Weston and Sarah L. Butler (Western Reserve University). Expression of specific pteridines in amphibian xenoplastic neural crest transplants, Joseph T. Bagnara and Christina M. Richards (University of Arizona). The fate of xenogenic whole larval implants in the newt, *Diemictylus viridescens*, Nicholas Cohen (University of Rochester). Factors affecting the isolation and action of a mitogenic agent, the second factor, Rolf E. Huff, Joe T. Preston, and Samuel A. Ramirez (Texas Technological College). Frog oöcyte ferroproteins: their physical and immunochemical properties and involvement in fertilization, George W. Nace, John C. Hegenauer, and Marie Coon (University of Michigan).

Concurrent Session for Contributed Papers K. Invertebrate Zoology III. Cadet Hand (University of California, Berkeley) will preside. Rejection of body wall xenografts exchanged between pairs of earthworms, *Lumbricus terrestris* and *Eisenia foetida*, Edwin L. Cooper (Center for Health Sciences, Los Angeles). Development of nematocysts in the cnidaria, James A. Westfall (University of California, Berkeley). A new look at the orthonectids, with special reference to patterns of ciliation, Eugene N. Kozloff (Lewis and Clark College, Portland, Oregon). Preliminary observations on the dinoflagellate *Gyrodinium sp.* in culture, William G. Hand and Demorest Davenport (University of California, Santa Barbara). Differences in larval developmental rate in males and females of the giant mosquito, *Toxorhynchites rutilus*, Charles E. Jenner and Anne B. McCrary (University of North Carolina). Ultrastructure of the protonephridium of the trochophore larva of *Serpula vermicularis* (Annelida, Polchaeta), Sister Johanna Pemerl (University of Washington). Fine structure of the "heart" of *Strongylocentrotus purpuratus and S. drobachiensis*, Richard A. Boolootian, Allen Bell, and James L. Campbell (University of California, Los Angeles). Reproductive cycle of a brooding starfish, *Leptasterias hexactis*, Fu-Shiang Chia (Sacramento State College).

Concurrent Session for Contributed Papers L. Vertebrate Morphology I. Richard J. Baldauf (Texas A & M University) will preside. Stereology of the renal corpuscle of desert and swamp deer mice, George C. Dewey, Hans Elias, and Kipley-Ray Appel (San Carlos, California). A comparative study of the intrasphenoid segment of the avian internal carotid artery and intercarotid anastomosis, Julian J. Baumel and Leroy B. Gerchman (Creighton University). Comparative anatomy of the mammalian rental medullary blood supply, E. W. Pfeiffer and Ronald H. Plakke (Western Reserve University). Angiocardiographic studies of the anuran double circulation, Charles S. Angell and Florencio A. Hipona (Yale University). Ovary of the sea otter, *Enhydra lutris* L., Akhouri A. Sinha (Wisconsin State University). Histology of the upper digestive tract of the Japanese quail, R. L. Warner, L. Z. McFarland, and W. O. Wilson (University of California, Davis). Efferent projections of cochlear nuclei of the pigeon, Robert L. Boord (University of Delaware).

Luncheon and Business Meeting. Program of the Division of Comparative Physiology.

Session for Contributed Papers M. Comparative Physiology III. Denis L. Fox (Scripps Institution of Oceanography) will preside. Physiological retention of cholesterol when fed and injected into adult male and female mice, John M. Mallette and Ivan R. Davis (Tennessee A and I State University, Nashville). Liver glycogen metabolism in starved and refed rats, Phillip Sheeler and Albert A. Barber (San Fernando Valley State College, Northridge, California). Shunt mechanism enzymes in the tissues of the Weddell seal, George H. Fried, C. Ray, J. Hiller, S. Rabinow, and W. Antopol (Beth Israel Medical Center, New York, New York). Alterations of enzyme activities in hereditary avian muscular dystrophy, G. H. Cardinet, III, R. A. Freedland, L. M. Julian, and W. S. Tyler, (University of California, Davis). Lipid mobilization induced by estradiol-17B in the lizard *Uta stansburiana*, William E. Hahn (University of Washington). Immunoelectrophoretic study of insect hemolymph, Sister Loretta Terando and Dorothy Feir (St. Louis University). Histochemical and pharmacological indications that dopamine may be a neurohumor in molluscs, Daryl Sweeney (University of Illinois). Comparative metabolic fractionation of carotenoids in three flamingo species, Denis L. Fox and Thomas S. Hopkins (Scripps Institution of Oceanography, La Jolla). Insoluble protein of the crayfish cuticle, J. Ross Stevenson (Kent State University). Kinetics of DPN entry into, and exit from, Mitochondria, J. L. Purvis and M. D. Greenspan (University of Rhode Island).

Concurrent Session for Contributed Papers N. Comparative Endocrinology II. Lawrence I. Gilbert (Northwestern University) will preside. Inhibition of melanin-dispersing hormone release from frog pituitaries by brain extracts of frog and rat, C. L. Ralph and Sumathy Sampath (University of Pittsburgh). In vitro hormonal studies on the epidermal melanocytes of adult frog skin, Mac E. Hadley (Brown University). Ultrastructure of the crustacean androgenic gland, David Shaw King (University of California, Berkeley). The morphology of the corpus allatum-corpus cardiacum complex of adult *Drosophila melanogaster* females, S. K. Aggarwal and R. C. King (Northwestern University). Humoral potentiation of nerve cord shortening in the greater wax moth, *Galleria mellonella* (L.), Rudolph L. Pipa (University of California). Nutrition and endocrine function in egg maturation of *Sarcophaga bullata*, Jerrel L. Wilkens (University of California, Los Angeles). Endocrine activation of protein metabolism during egg maturation in an insect, Franz Engelman (University of California, Los Angeles). Hormonal control of carbohydrate metabolism in the cockroach, *Leucophaea maderae*, A. Wayne Wiens and Lawrence I. Gilbert, (Northwestern University). The proteinaceous na-

ture of an insect hormone, *Bursicon*, Gottfried Fraenkel, Catherine Hsiao, and I. M. Seligman (University of Illinois). The role of the neurosecretory system in the reproductive physiology of the cockroach, *Brysotria fumigata*, Robert H. Barth, Jr. (University of Texas).

Wednesday 29 December

Molecular Mechanisms of Temperature Adaptation. Part IV. Symposium. Paul Dehnal (University of British Columbia) will preside. Thermal adaptation of metabolism in anuran amphibians: some physical and biochemical studies, L. D. Bishop (California Institute of Technology). Kinetic analysis of temperature adaptation in *Drosophila* pupae, Roger Milkman (Syracuse University). Relative stability of proteins and protein aggregates from thermophilic bacteria, Henry Koffler (Purdue University). Some properties of thermolysin, a protease from a thermophile bacterium, Hiroshi Matsubara (University of California, Berkeley).

Concurrent Symposium. Neurosecretion of Invertebrates Other Than Insects, Part II. Cyclic Physiological Processes and Neurosecretion. Frank A. Brown (Northwestern University) will preside and present introductory remarks. Separation and purification of crustacean eyestalk hormones, L. H. Kleinholz (Reed College). Neurosecretory control of pigmentary effectors in crustaceans, Milton Fingerman (Tulane University). Pigmentary rhythms as indicators of neurosecretion, H. Marguerite Webb (Goucher College). The cyclic production of 5-hydroxytryptamine in the opilionid, Dona J. Fowler and Clarence J. Goodnight (Western Michigan University).

Concurrent Symposium. Problems in Invertebrate Embryology. Part I. Program of the Divisions of Developmental Biology and Invertebrate Zoology. Arranged by Robert L. Fernald (University of Washington). Segmentation and organogenesis in *Limnoria lignorum* (Rathke) (Isopoda), Jarl-Ove Strömberg (University of Lund, Sweden, and Friday Harbor Laboratories, University of Washington). Segment formation and segregation of primordial germ cells during normal development of *Spirorbis* (Serpulidae, Polychaeta), Herbert E. Potswald (University of Washington). Fine structure of the developing lens of the cephalopod, John Arnold (Iowa State University).

Session for Contributed Papers O. Comparative Endocrinology III. Aubrey Gorbman (University of Washington) will preside. On the function of the purple cells of the anterior pituitary of *Rana pipiens*, Robert Ortman (City College of New York). Fine structure of the adenohypophysis of the bat, *Myotis lucifugus*, Yasuo Kobayashi (SUNY, Downstate Medical Center, Brooklyn, New York). Correlative light and electron microscopy of bat islets of langerhans in hibernating and non-hibernating states, Nakazo Watari and Lawrence Herman (SUNY, Downstate Medical Center, Brooklyn, New York). Testicular fine structure in the California slender salamander during the postnuptial regression of the testis, A. Kent Christensen (Stanford University). The effect of radio-thyroidectomy on growth rates of juvenile steelhead trout (Salmo gairdneri) and Chinook salmon (*Oncorhynchus tshawytscha*), David O. Norris (University of Washington). Metabolic response to the thyroxine in a frog and a toad, Michael J. Maher (University of Kansas). The effect of exposure to a thermal gradient on the metabolic response to thyroxine in a lizard, Daniel C. Wilhoft (Rutgers University). Alterations in the liver of the hypothyroid chick, James G. Snedecor and Helen J. Radowicz (University of Massachusetts). Effects of simulated altitude on the iodine metabolism of rats, Gilles La Roche and C. L. Johnson (University of California, Berkeley).

Concurrent Session for Contributed Papers P. Vertebrate Morphology II. Malcolm R. Miller (University of California, San Francisco) will preside. The middle ear of the California sea lion (Zalophys californianus) and its adaptation to diving, Stewart Odend'hal (University of California, Davis). The identification otoliths in vertebrates by x-ray diffraction, Jonathan Parsons (Edsel B. Ford Institute for Medical Research, Detroit, Michigan). Adaptation of the chimpanzee hand to terrestrial locomotion, Russel H. Tuttle (University of Chicago). Marsupial evolution during the cretaceous, William A. Clemens (University of Kansas). Experimental analysis of the avian passive perching mechanism, Walter J. Bock (Columbia University). The basic adaptations of scansorial rodents, Stuart O. Landry, Jr. (SUNY Harpur College, Binghamton, New York).

Concurrent Session for Contributed Papers Q. Comparative Physiology IV. Frederick Crescitelli (University of California, Los Angeles) will preside. Photoperiodic refractoriness: reevaluation and interpretation, William M. Hamner (University of California, Los Angeles). Light sensitivity of the pineal gland in blinded *Fundulus Heteroclitus*, Peter K. T. Pang (Yale University). Photic control in *Pyrophorus*, F. E. Hanson and John Buck (National Institutes of Health, Bethesda, Maryland). Photic signalling in the firefly *Photinus consanguineus*, John Buck and Elisabeth M. Buck (National Institutes of Health, Bethesda, Maryland). Oxygen requirements of firefly luminescence, Amelia S. Arneson, Margaret K. Peterson, and John Buck (National Institutes of Health, Bethesda, Maryland). A survey of visual pigments of tropical fresh water fishes, Shirley Schwanzara (University of Oregon, Eugene). Thyroxine-induced changes in the proportions of visual pigments, Frederick W. Munz and Richard T. Swanson (University of Oregon). Mitosis in the rabbit ocular lens epithelium, cultured by the Merriam-Kinsey method, Walter L. Wilson, Clifford V. Harding, and Jean R. Wilson (Oakland University, Rochester, Michigan). The relation between gill cholinesterase and sodium regulation in four brachyuran crabs, J. R. Linton, R. A. Bayne, and F. A. Pidalla (University of South Florida, Tampa).

Luncheon and Business Meeting. Program of Division of Comparative Endocrinology.

Luncheon. Program of Vertebrate Morphology.

Symposium. Molecular Mechanisms of Temperature Adaptation. Part V. Thomas Jukes (University of California, Berkeley) will preside. Cold-sensitive mutants: a tool for studying the phenomenon of the minimal temperature of growth of bacteria, John L. Ingraham (University of California, Davis). Temperature-sensitive enzymes and enzyme-forming systems in psychrophilic microorganisms, J. L. Stokes (Washington State University). Adaptive temperature responses of microorganisms, J. Christophersen (Institut der Milchforschungs., Kiel, Germany). Heat production in plants, Walter D. Bonner (University of Pennsylvania).

Neurosecretion of Invertebrates Other Than Insects. Part III. Osmotic Regulation and Neurosecretion. Fred I. Kamemoto (University of Hawaii) will preside and present introductory re-

marks. Uptake of water in the land crab, *Gecarinus lateralis*, during the molt cycle, Dorothy E. Bliss and Stefanie M. E. Wang (American Museum of Natural History and Albert Einstein College of Medicine, New York). Neurosecretion and salt and water balance in the annelida and crustacea, Fred I. Kamemoto and Kenneth N. Kato (University of Hawaii). The ontogeny of osmoregulation and its neurosecretory control in the decapod crustacean, *Rhithropanopeus larrisii*, Fred Kalber (City College of New York) and John Costlow (Duke University).

Concurrent Symposium. Problems in Invertebrate Embryology. Part II. Program of the Divisions of Developmental Biology and Invertebrate Zoology. Arranged by Robert Fernald (University of Washington), who will also preside. Developmental studies in lophophorates, Russel L. Zimmer (University of Southern California). Cytoplasmic filaments and cell movements in ascidian metamorphosis, Richard A. Cloney (University of Washington). The role of embryonic cells in asexual reproduction and regeneration in tunicates, Gary Freeman (University of Illinois).

Session for Contributed Papers R. Comparative Endocrinology IV. Rodney T. Houlihan (Pennsylvania State University) will preside. Sodium metabolism in *Fundulus kansae* in fresh water and during adaptation to sea water, Jon G. Stanley and W. R. Fleming (University of Missouri). Effect of hypophysectomy on ammonia excretion by *Fundulus kansae*, Richard L. Swallow and W. R. Fleming (University of Missouri). Effect of estradiol on serum calcium and phosphate in freshwater turtles, Nancy B. Clark (University of Connecticut). Effects of glucose, epinephrin, or glucagon upon serum glucose levels in the goldfish *Carassius auratus* L., Jack E. Young and Walter Chavin (Wayne State University). Suppression of adrenal corticoid production in vitro by corticosterone or aldosterone administration in the American bullfrog (*Rana catesbeiana*), George D. Piper and Roger Deroos (University of Missouri). The effect of the monoamine oxidase inhibitor, tranylcypromine, on adrenocortical secretion in dogs, Peter C. Johnson, Leola C. Lorenzen, Edward G. Biglieri, and William F. Ganong (University of California, San Francisco). Influence of pregnant mare serum on life-maintenance in the adrenalectomized female rat, Richard I. Weiner and Rodney T. Houlihan (Pennsylvania State University). Plasma testosterone levels of the adult male rhesus monkey, John A. Resko (Oregon Regional Primate Research Center, Beaverton, Oregon). Fluorometric confirmation of the effect of serotonin on gastrointestinal motility, Daniel Kimbrough (Birmingham-Southern College). Apparent adaptation of the adrenal medulla to different sustained demands for secretion, Bruce L. Welch (College of William and Mary).

Concurrent Session for Contributed Papers S. Vertebrate Morphology III. Keith S. Thomson (Yale University) will preside. Growth and organization of the scales in the teleostei, Howard McCully (University of North Dakota). The labial glands of the Colubridae, Aaron M. Taub (Pennsylvania State University). Preliminary report on intervertebral articulations of salamanders, David B. Wake (University of Chicago). Unusual dermal modifications of the skull of the hylid frog *Triprion petasatus*, Linda Trueb (University of Kansas). Comparative osteology in the genus *Bufo*, Joseph A. Tihen (University of Notre Dame). Demonstration and description of dry anatomical preparations that relate bones, ligaments, muscles, and integument, Milton Hildebrand (University of California, Davis).

Thursday 30 December

Neurosecretion of Invertebrates Other Than Insects. Part IV. Physiological Processes and Neurosecretion as Related to Ecdysis and Reproduction. Dorothy E. Bliss (American Museum of Natural History and Albert Einstein College of Medicine, New York) will preside and present introductory remarks. Nucleic acid metabolism in a crustacean, Dorothy M. Skinner Cook (New York University School of Medicine). Neurosecretion and moulting in parasitic nematodes, K. G. Davey (McGill University). Neurosecretion in the leech brain and its possible role in reproduction, Irvine R. Hagadorn (University of North Carolina). The gamete shedding substances of starfishes—a physiological-biochemical study, Alfred B. Chaet (American University).

Concurrent Symposium. The Vertebrate Ear. Part I. Program of the Division of Vertebrate Morphology. Arranged by Richard J. Baldauf (Texas A&M University). Robert H. Denison (Chicago Natural History Museum) will preside and present introductory remarks. The otic region of the skull in the rhipidistian-amphibian transition, Keith S. Thomson (Yale University). The middle ear—morphological types among amphibians and reptiles, Everett C. Olson (University of Chicago). The gross morphology of the cochlear duct in lizards and snakes, Malcolm R. Miller (University of California, San Francisco). Discussion by Irwin L. Baird (University of Tennessee). Summation by Robert H. Denison.

Concurrent Symposium. Problems in Invertebrate Embryology. Part III. Program of the Division of Developmental Biology. Arranged by Anthony C. Clement (Emory University). Arthur H. Whiteley (University of Washington) will preside. Experimental analysis of development in freshwater pulmonates, John B. Morrill (College of William and Mary). Morphogenic influence and cellular interaction in mosaic development, James N. Cather (University of Michigan). The ultrastructure of blastomeres in mosaic eggs and correlates of morphogenic potential, Walter J. Humphreys (University of California, Berkeley).

Concurrent Symposium. Modern Approaches to the Study of Adenohypophyseal Structure and Function. Part I. Program of the Division of Comparative Endocrinology. Arranged by Walter Chavin, who will preside and present introductory remarks. Structural and functional aspects of the pituitary gland in fishes, Martin Schreibman (Brooklyn College). Cytology of the amphibian and reptilian pituitary glands, J. N. Dent (University of Virginia). Histochemical and cytochemical studies of the pituitary gland, S. B. Fand (Veterans Administration Hospital, Buffalo, and State University of New York College at Buffalo). Perspectives in anterior pituitary structure and function: electron microscopic localization of hydrolytic enzymes, R. E. Smith (Stanford University and Veterans Administration Hospital, Palo Alto, California).

Session for Contributed Papers T. Comparative Physiology V. James Heath (University of Illinois) will preside. Torpidity in reptiles, Philip J. Regal (University of California, Los Angeles). Oxygen consumption and body temperature in relation to ambient temperature in the Mexican deer mice, *Peromyscus thomasi* and *P. megalops*, Guy G. Musser and

Vaughan H. Shoemaker (University of Michigan). Thermoacclimatory variations in the plasma proteins of the goldfish, *Carassius auratus*, Arthur H. Houston and James C. Fenwick (Marquette University). High temperature tolerances of *Bufo hemiophrys* and *B. cognatus*, William D. Schmid (University of North Dakota). The effect of temperature acclimation on the tissues of *Salmo gairdneri* (rainbow trout), J. M. Dean and J. D. Berlin (Pacific North-Laboratory-Battelle Northwest, Richland, Washington). Evaporative water loss and salt excretion in the fish-eating bat, *Pizonyx vivesi*, Roger E. Carpenter (San Diego State College). Swimming of the telotroch ciliate, *Opisthonecta henneguyi*, Esther M. Hendrix and Theodore L. Jahn (University of California, Los Angeles). Telemetry of heart rate from eight avian species, J. A. Gessaman, G. E. Folk, Jr., and M. C. Brewer (University of Illinois) Acclimation to sodium loading by the lizard nasal salt gland, James R. Templeton (University of Montana).

Concurrent Session for Contributed Papers U. Developmental Biology IV. J. M. Denuce (University of Michigan) will preside. Enzyme studies of a lozenge allele of *Drosophila melanogaster*, E. Ed. Peeples and C. P. Oliver (University of Texas). Disc electrophoresis of α-amylase isozymes in *Drosophila melanogaster*, Winifred W. Doane (Yale University). The ontogeny of the multiple molecular forms of hemoglobin in the chicken under normal and experimental conditions, Jarid Simons (Yale University). The ontogeny of sperm specific lactate dehydrogenase, Erwin Goldberg and Christopher Hawtrey (Northwestern University). Whale lactic dehydrogenase, Richard B. Lyons and Gerald I. Erickson (University of Oregon Medical School, Portland). Cholinesterase in the brain of the cecropia silkmoth in relation to the control of neurosecretion and diapause, David G. Shappirio, Daniel M. Eichenbaum, and Bruce R. Locke (University of Michigan). Alteration in subcellular structure of metamorphosing insect intestinal cells, Donald W. Misch (University of North Carolina). An experimental study of adipose tissue of *Drosophila melanogaster*, F. M. Butterworth, Dietrich Bodenstein, and R. C. King (University of Virginia). Cuticular differentiation brought about by one level of a concentration gradient in *Galleria mellonella*, Hildegard F. Stumpf (University of Rochester).

Concurrent Session for Contributed Papers V. Ecology and Evolution. Rezneat M. Darnell (Marquette University) will preside. Population trends of rhesus monkeys (*Macaca mulatta*) in India, Charles H. Southwick (Johns Hopkins University) and M. Rafiq Siddiqi (Aligarh Muslim University). Gravid female shark (*Carcharhinus leucas*) in fresh water of Rio San Juan, Nicaragua, Thomas B. Thorson (University of Nebraska). Ecological specificity in two sympatric species of the blennioid genus *Hypsoblennius*, John S. Stephens, Jr. (Occidental College, Los Angeles). A quantitative laboratory study of behavioral differences with applications to the ecology of two sympatric species of *Hypsoblennius*, Robert K. Johnson (Occidental College, Los Angeles). An alternative to the "ultimate factor" hypothesis of population control in microtine rodents, David A. Mullen (University of California, San Francisco Medical Center, School of Medicine). Termination of summer and winter diapause in *Daphnia*, Raymond G. Stross (University of Maryland). Serological comparison of four species of fishes of the genus *Poecilia*, Peter Abramoff, Rezneat M. Darnell, and Joseph S. Balsano (Marquette University). Morphological comparison of three species of the genus *Poecilia*, Rezneat M. Darnell, Bruce Menzel, and Peter Abramoff (Marquette University). The selective advantage of mimicry in a natural tropical environment, Lincoln P. Brower (Amherst College) and L. M. Cook (Manchester University, England).

Luncheon and Business Meeting. Program of Division of Invertebrate Zoology.

The Vertebrate Ear. Part II. Symposium. Thomas S. Parsons (University of Toronto) will preside and present introductory remarks. The origin of the mammalian middle ear, James A. Hopson (Yale University). Ear structure and function in modern mammals, Douglas B. Webster (New York University). Evolution of the sense of hearing in vertebrates, Willem A. Van Bergeijk (Bell Telephone Laboratories). Summation by Alfred W. Crompton (Yale University).

Concurrent Symposium. Modern Approaches to the Study of Adenohypophyseal Structure and Function. Part II. J. N. Dent (University of Virginia) will preside. Comparative chemistry of anterior pituitary gonadotropins, Harold Papkoff (University of California, Berkeley). Preparation, properties and function of secretory granules from rat anterior pituitary glands, W. H. McShan (University of Wisconsin). Application of radioimmunoassay to the study of growth hormone and ACTH secretion, Seymour Glick (Maimonides Hospital, Brooklyn, New York). Metabolic studies with growth hormone and prolactin preparations, E. E. McGarry and John Beck (Royal Victoria Hospital, Montreal).

Session for Contributed Papers W. Comparative Physiology VI. Paul Licht (University of California, Berkeley) will preside. Respiration rate of the thermophilic mite, *Thermocarus nevadiensis*, Austin Phelps (University of Texas). Oxygen uptake rates of a wild and a laboratory maintained isolate of *Trypanosoma lewisi*, D. R. Lincicome and A. A. Warsi (Howard University). The effect of digenetic trematode parasitism on the oxygen consumption of the freshwater pulmonate snail *L. stagnalis*, Frederick G. Duerr (University of South Dakota). Pulmonary and cutaneous gas exchange in anurans, Walter G. Whitford and Victor H. Hutchinson (New Mexico State University). Growth and carbon metabolism of euphausiid crustaceans, Reuben Lasker (Fishery-Oceanography Center, La Jolla, California). Response of the bowfin, *Amia calva*, to exposure to air, Richard M. Matter and W. R. Fleming (University of Missouri). Aerodynamic properties of the flesh fly *Sarcophaga bullata* (Diptera), James L. Baird, Jr. (Lafayette College, Easton, Pennsylvania). Metabolism during running and diving in *Iguana iguana*, Walter R. Moberly (University of Michigan). Studies in the mineral metabolism of the crab, *Podophthalmus vigil*, Bryant T. Sather (University of Hawaii).

Concurrent Session for Contributed Papers X. Miscellaneous Zoology. J. A. Zischke (St. Olaf College) will preside. A study of certain aspects of the use of sodium arsenite and copper sulfate in aquatic nuisance control, W. H. Osness and C. J. Antonie (University of Wisconsin). Observations on the development of first-generation schizonts and merozoites of *Eimeria bovis*, Datus M. Hammond and John V. Ernst (Utah State University). The effects of *Echinostoma revolutum* larval infection on the growth and reproduction of the snail host *Stagnicola*

palustris, James Albert Zischke and Deloris Palmquist Zischke (St. Olaf College). Differentiation in the fly foot: coordinated changes in giant foot pad cells and chromosomes, tenent hair cells, and hemocytes, Joan M. Whitten (Northwestern University). Variability in structure and context in certain calls of the canary, Kenneth Olsen and James Mulligan (St. Louis University). Imprinting in an altrical bird: the mourning dove (*Zenaidura macroura*), Erich Klinghammer (University of Chicago). Some methodological considerations in the gradual vs. one-trial learning controversy, Edward M. Eisenstein and Doris L. Eisenstein (State University of New York, Stony Brook). Cultivation and nutrition of *Hypsibius arcticus* (phylum Tardigrada). Background and general methods, Selden C. Hall, Jr., and Ellsworth C. Dougherty (Indiana University).

Concurrent Session for Contributed Papers Y. Developmental Biology. V. C. P. Dagg (Roscoe B. Jackson Memorial Laboratory) will preside. Development of the lens of a snail, *Helix aspersa*, Richard M. Eakin (University of California, Berkeley). Ultrastructural localization of alkaline phosphatase in the nervous system of the developing chick, K. T. Rogers (University of California, San Francisco). Influence of thyroxine on ossification of the parasphenoid bone in the skull of *Rana pipiens*, Norman E. Kemp and Judith A. Hoyt (University of Michigan). Specificity of sodium chloride in the stimulation of growth in the salt glands of ducklings, Clarence C. Goertemiller, Jr., and Richard A. Ellis (University of Rhode Island). An organogenic block produced in culture, C. Ward Kischer (University of Texas M. D. Anderson Hospital and Tumor Institute, Houston). Persistence of mesonephroi in chick embryos given aminoguanidine sulfate at four days of incubation, Maria Consolacion R. Ronquillo and Ray L. Watterson (University of Illinois). A gross morphological and histological study of induced tumors in the microöligochete *Enchytraeus fragmentosus* Bell, 1959, Philip R. Gabe (University of California, Berkeley). Renal tumor transmission in frog embryos by subcellular fractions, Kenyon S. Tweedell (University of Notre Dame). Frog lysozyme: interpretation of differences between adult and embryonic enzymes in explanation of tumor susceptibility, John C. Hegenauer, Yasuji Amano, and George W. Nace (University of Michigan). Regulation of pacemaker activity in embryonic chick heart cells isolated in tissue culture, Robert L. Dehaan (Carnegie Institution of Washington).

Animal Behavior Society (F3)

Sunday 26 December

Session for Contributed Papers. Animal Behavior I. Miscellaneous. Ernst S. Reese (University of Hawaii) will preside. Comparative behavior of robber flies, Robert Lavigne and Frank Holland (University of Wyoming). The etholodgy of the grapsid crab, *Metapograpsus messor* (Forskol), Angela Kay Brownscombe (University of Hawaii). An ethological study of the rock crab *Grapsus grapsus* (family Grapsidae) with emphasis on behavior variations during ontogeny and with habitat, Garland E. Johnson, (Hoover High School, Fresno, California). Comparative behavior in two species of shore crab (*Hemigrapsus*), Lowell T. Crow and Wallace G. Heath (Western Washington State College). Locomotion of the herbivorous gastropod *Strombus canarium* and its escape response to the predatory gastropod *Connus textile*, Alan J. Kohn (University of Washington). Motility of chick embryos in the absence of sensory input, Viktor Hamburger (Washington University). Isolation-induced changes in brain biogenic amines, Anne-Marie S. Welch (College of William and Mary). The effects of food deprivation of rats on swimming to exhaustion, Edward T. Uyeno (Stanford Research Institute, Menlo Park, California). Reversible disruption of barpressing for food during continuous low current brain stimulation in the rat, David V. Reynolds (Stanford Research Institute). Digestive transit time and open-field behavior of rats, Ethel Tobach, H. S. Berman, P. S. Gold, K. Thomas, and R. Haber (American Museum of Natural History). Voluntary alcohol consumption and intoxication in chimpanzees and orang-utans, Francis Fitz-Gerald, M. Ashton Barfield, and R. J. Warrington (Yerkes Primate Center, Atlanta).

Monday 27 December

Recent Findings in the Experimental Analysis of Aggression. Part I. Symposium, joint program of the Animal Behavior Society, the ESA Section of Animal Behavior and Sociobiology, and the ASZ Division of Animal Behavior and Sociobiology; cosponsored by Section I-Psychology. Arranged by John A. King (Michigan State University) and Roger E. Ulrich (Western Michigan University). John A. King will preside. Some endocrine aspects of defeat by fighting in mice, Frank Bronson (Jackson Memorial Laboratory). Conditioned and unconditioned aggression in the Siamese fighting fish, Travis Thompson (University of Minnesota Medical School). Pain as a cause of aggression, Roger E. Ulrich.

Animal Behaviorists' Luncheon.

Recent Findings in the Experimental Analysis of Aggression. Part II. John A. King will preside. Reinforcement of aggression through intracranial stimulation, Thomas Stachnik (Illinois Wesleyan University). Evoking and inhibiting aggressive behavior by radio stimulation in monkey colonies, Jose M. R. Delgado (Yale University). Aggression: a review, John P. Scott (Bowling Green University).

Tuesday 28 December

Session for Contributed Papers. Animal Behavior II. Learning Phenomena. Jerry Hirsch (University of Illinois) will preside. Effects of the presence or absence of slime on classical conditioning in planarians, James V. McConnell and George J. Mpitsos (University of Michigan). A relationship between conditioning and communication in honey bees, Dennis L. Johnson and Adrian M. Wenner (University of California, Santa Barbara). Shape discrimination in the Siamese fighting fish *Betta splendens*, James C. Braddock and Veronica A. Cerny (Michigan State University). Evidence for a short-term memory in goldfish, Roger E. Davis (University of Michigan). The *Drosophila* maze, Louis Levine and Lester Wolk (City College, City University of New York). Effect of forebrain ablation on the acquisition of a conditioned avoidance response in the teleost fish *Tilapiah* L. *macrocephala*, Lester R. Aronson and Harriet Kaplan (American Museum of Natural History). An experimental study of tool-using and string manipulation in Darwin's finches and other song birds, Robert Bowman and George Millikan (San Francisco State College). Auditory discrimination in the mynah: an FR schedule test, J. H. Grosslight and W. C. Zaynor (Kent State University). The discrimination of orientation in the laughing gull, *Larus atricilla*, L. Susan Schmerler and Jack Hailman (Institute of Animal Behavior, Rutgers University). Motivation of food-running in jungle-

fowl chicks, Jerry A. Hogan (University of Toronto).

Concurrent Session for Contributed Papers. Animal Behavior III. Agonistic and Territorial Behavior. George W. Barlow (University of Illinois) will preside. Effects of proximity on the aggressive behavior of crayfish, H. William Lunt (University of Illinois). Aggressive behavior in male mice, Louis Levine (City College, City University of New York). Changing patterns of behavior with increasing density in freely growing populations of house mice (*Mus musculus*), James A. Lloyd and John J. Christian (Albert Einstein Medical Center, Philadelphia). Adrenal gland weights of prairie deermice from populations with a long duration of asymptote, C. Richard Terman (College of William and Mary). Predatory behavior of rats at Eniwetok Atoll, William B. Jackson and Michael L. Carpenter (Bowling Green State University). Behavioral differences between wild and domestic strains of the paradise fish, *Macropodus opercularis*, Ronald W. Ward (Johns Hopkins University). The effects of domestication on the behavior of the prairie deermouse (*Peromyscus maniculatus bairdii*), Edward O. Price (Michigan State University). Function of territory size in mating success of booming *Tympanichus cupido pinnatus*, Robert J. Robel (Kansas State University). Social organization of the California sea lion, Richard S. Peterson and George A. Bartholomew (University of California, Los Angeles). The orang-utan in Sabah, Richard A. Davenport, Jr. (Yerkes Regional Primate Research Center).

Undergraduate Instruction in Animal Behavior. Invited papers, joint program of the Animal Behavior Society, the ESA Section of Animal Behavior and Sociobiology, and the ASZ Division of Animal Behavior and Sociobiology. Arranged by John D. Cunningham (Florida State University), who will also preside. *Introduction*: Comparative psychology, psychobiology, biopsychology, animal behavior, ethology—what's in a name?, Ethel Tobach (American Museum of Natural History). *The Content of Introductory Courses in Animal Behavior*: A zoologist speaks, James Braddock (Michigan State University). A psychologist speaks, Gordon Bermant (University of California, Davis). The establishment of a department of psychobiology, James McGaugh (University of California, Irvine). *The Teaching Laboratory in Animal Behavior Courses*: The introductory laboratory, George W. Barlow (University of Illinois). Field studies in bird behavior, David E. Davis (Pennsylvania State University). Equipment and techniques for studying mouse behavior, John Fuller and Richard Wimer (Jackson Laboratory, Bar Harbor, Maine). Audio-visual aids in the teaching of animal behavior, Edwin M. Banks (University of Illinois). The operation and use of research stations, Peter Marler (University of California, Berkeley). Summary and analysis by Martin Schein (Committee on Undergraduate Education in the Biological Sciences, Washington, D.C.). *The Animal Behavior Content of General Courses*: General biology courses, Gerald Scherba (California State College at San Bernardino). Introductory zoology courses, John Kerr (University of Georgia). Introductory psychology courses, Rollin H. Denniston (University of Wyoming). *Summer Institutes in the Teaching of Animal Behavior*: Summary and analysis of three summer institutes, Allen Stokes (Utah State University).

Wednesday 29 December

Session for Contributed Papers. Animal Behavior IV. Territorial and Parental Behavior. Gilbert Gottlieb (Dorothea Dix Hospital, Raleigh, North Carolina) will preside. Territorial behavior in *Callicebus* monkeys, William A. Mason (Delta Regional Primate Research Center, Covington, Louisiana). Intergroup relations among vervet monkeys, Thomas S. Struhsaker (University of California, Berkeley). The effects of acquaintance in Irus macaques, Nicholas S. Thompson (University of California, Berkeley). Social contact and the use of space by psychiatric patients, Aristide H. Esser (Rockland State Hospital, Orangeburg, New York). Dynamics of parental behavior in the black-chinned mouth breeder, *Tilapia macrocephala* (Pisces: Cichlidae), John R. Oppenheimer and George W. Barlow (University of Illinois). Quantification of maternal nest building in the rat, Rhoda E. Taylor, Victor H. Denenberg, and M. X. Zarrow (Indiana University, Kokomo). Self-licking as a stimulus for mammary development in the pregnant rat, Lorraine L. Roth and Jay S. Rosenblatt (Rutgers University). Observations on maternal behavior in the harbor seal, Frederick M. Hart, Terrell C. Newby, and Robert A. Arnold (University of Washington). Species identification by avian neonates relative effectiveness of maternal auditory and visual stimulation, Gilbert Gottlieb (Dorothea Dix Hospital, Raleigh, North Carolina). Cultural acquisition of a specific learned response among rhesus monkeys, Gordon R. Stephenson (University of Wisconsin).

Session for Contributed Papers. Animal Behavior V. Sexual Behavior. Frank A. Beach (University of California, Berkeley) will preside. Sexual activity and longevity, Walter Lener (Nassau Community College, New York). Regulation of mating activity in the milkweed bug (*Oncopeltus*) by temperature and photoperiod, Roy L. Caldwell and Hugh Dingle (University of Iowa). Drosophilid mating behavior: the behavior of decapitated females, Herman T. Spieth (University of California, Davis). Effects of isolation on reproductive behavior in the pipid frog, *Xenospus laevis*, George B. Rabb and Mary S. Rabb (Chicago Zoological Park, Brookfield, Illinois). Evolution of male courtship behavior in fishes of the American genus *Cyprinodon*, Robert K. Liu (University of California, Los Angeles). Variations in the reproductive behavior of *Etroplus maculatus*, O. Anne E. Rassa (University of Hawaii). The role of the gonad in the control of sexual behavior in the female guppy, *Poecilia reticulata* Peters, N. Robin Liley (University of British Columbia). Hormonal control of mating behavior in male quail, Frank A. Beach and Nelson Inman (University of California, Berkeley). Effects of preoptic lesions on the sexual behavior of male fowl, Ronald J. Barfield (Rutgers University). Localization in brain of reproductive behavior responses to progesterone in ring doves, Barry R. Komisaruk (Rutgers University). Sexual reversibility in neonatally castrated male rats, David A. Edwards and Richard E. Whalen (University of California, Irvine). Mating behavior of male dogs after restricted social contact in puppyhood, Frank A. Beach (University of California, Berkeley). Mating behavior in adult, *Macaca mulatta*, Robert E. Kuehn and William C. Young (Oregon Regional Primate Research Center, Beaverton).

Thursday 30 December

Session for Contributed Papers. Animal Behavior VI. Communication, Light Effects. Peter Marler (University of California, Berkeley) will preside. An analysis of the honey bee recruitment dance, Adrian M. Wen-

ner and Patrick H. Wells (University of California, Santa Barbara). Sound communication with the bullfrog, *Rana catesbeiana*, Robert R. Capranica (Bell Telephone Laboratories). An evaluation of the song of the black-capped chickadee, Keith L. Dixon and Raymond A. Stefanski (Utah State University). Loss of vocalization caused by lesions in the nucleus mesencephalicus lateralis of the redwinged blackbird, Jerram L. Brown (University of Rochester). Visibility and reinforcement as variables influencing the underwater click vocalizations of a California sea lion, Ronald J. Schusterman (Stanford Research Institute). Vocal communication in wild baboons, Stuart A. Altmann and Jeanne Altmann (Yerkes Regional Primate Center). Observations on acclimation behavior in the symbiosis of anemone fish and sea anemones, Richard N. Mariscal (University of California, Berkeley). Some effects of light on the formation of aggregations in the planarian *Phagocata gracilis*, James H. Reynierse (University of Nebraska). Rhythmic activity of bluefish, *Pomatomus saltatrix*, in relation to light, Bori L. Olla (Sandy Hook Marine Laboratory, New Jersey). Effects of A-diurnal lighting and feeding on the rat's activity cycle, Robert C. Bolles (Hollins College). The day-night behavior of grizzly bears, A. C. Gessamen, G. E. Folk, and J. A. Gessamen (University of Illinois).

Session for Contributed Papers. Animal Behavior VII. Orientation and Navigation. Helmut E. Adler (American Museum of Natural History) will preside. Possible correlation of Stanhopea orchid odor profiles with pollinator behavior, Rheinhold A. Rasmussen and Caloway H. Dodson (Walter Reed Army Medical Center, Washington, D.C.). Further observations on the swarming behavior of *Anarete* sp. (Diptera: Cecidomyiidae), H. C. Chiang (University of Minnesota). Studies on the behavior of the sea urchin, *Arbacia punctulata*, Richard A. Boolootian and Arvin H. Cantor (University of California, Los Angeles). Water balance and behavior of acarines, G. W. Wharton (Ohio State University). Olfaction and orientation in fishes, H. Kleerekoper (McMaster University, Ontario). Orientation of homing white bass, Arthur D. Hasler, H. F. Henderson, R. M. Horrall, and E. S. Gardella (University of Wisconsin). Homing and orientation in the painted turtle, *Chrysemys picta marginata*, Stephen T. Emlen (University of Michigan). Airplane tracking of single homing pigeons, Martin Michener and Charles Wolcott (Harvard University). Initial orientation in pigeon homing related to magnetic contours, Louis C. Graue (Bowling Green State University). Computer simulation of bird migration, Helmut E. Adler and Barry P. Adler (American Museum of Natural History). The influence of wind direction on the arrival of migratory birds at a coastal concentration point, Helmut C. Mueller (University of Wisconsin). Some aspects of under-ice diving behavior in the Weddell seal, Gerald L. Kooyman (University of Arizona). Circadian activity rhythms in female harvester ants, Elwood S. McClusky (Loma Linda University).

Herpetologists' League (F4)

Wednesday 29 December

Contributed Papers I. Variation in *Sympholis lippiens*, Max Hensley (Michigan State University). Relationships within the genus *Notophthalmus*, John S. Mecham (Texas Technological College). Variation in the copperhead of Brazos County, Texas, Ernest C. Tanzer (Lamar State College of Technology, Beaumont, Texas). The evolution of the salamander tongue, Philip J. Regal (University of California, Los Angeles). The distribution of *Ascaphus truei* in California, Richard B. Bury (Sacramento State College). The dilemma of Mexican herpetology, William E. Duellman (University of Kansas). An electrophoretic study of ranid muscle proteins, Oliver W. Johnson (Arizona State College). Duvernoy's gland in *Dispholidus typus* (Smith), Aaron M. Taub (Pennsylvania State University).

Contributed Papers II. Thermal acclimation in anuran amphibians as a function of latitude, Bayard H. Brattstrom (California State College at Fullerton). Diel activity in plethodontid salamanders, Robert E. Gordon (University of Notre Dame). The relation of body size and substrate color to color change, Kenneth S. Norris (University of California, Los Angeles). The annual cycle of density and biomass in a Nevada population of *Uta stansburiana*, and a gross estimate of annual respiratory metabolism, Bruce W. Kowalewsky and Frederick B. Turner (University of California, Los Angeles). Age and size in *Uta stansburiana*, Donald W. Tinkle (University of Michigan). Reproduction and population dynamics of a tropical skink, *Mabuya multifasciata*, Angel C. Alcala (Stanford University). Further studies on homing behavior of *Sceloporus orcutti*, Joel D. Weintraub (University of California, Riverside). Ecological studies of *Pseudemys scripta* in Panama, John M. Legler and Edward O. Moll (University of Utah).

Thursday 30 December

Contributed Papers III and Business Meeting. Radiation effects on a natural population of *Anolis gundlachi* in Puerto Rico, Clayton S. Gist and Frederick B. Turner (University of California, Los Angeles). Absorbed doses in a Nevada population of irradiated lizards, and seasonal differences in activity, Joseph R. Lannom and Frederick B. Turner (University of California, Los Angeles). Changes in adherence of toepads in the lizard *Anolis carolinensis*, Robert H. S. Glaser (San Francisco State College). Some problems presented by squamate epidermis, Paul F. A. Maderson (University of California, Riverside). Sounds produced underwater and in air by a salamander and three species of turtles. William E. Evans and Howard W. Campbell (University of California, Los Angeles). Environmental effects on plasma protein components of the genus *Bufo*, Frederick W. Schuierer (Cabrillo College).

Society of Systematic Zoology (F5)

This is the 17th annual meeting of the Society. The program is cosponsored by the Pacific Section of the Society of Systematic Zoology.

The Zoologists' Library and Book Lounge will be open throughout the meetings as a lounge and informal meeting place.

Monday 27 December

Systematic Studies of Collections Made on the Galapagos International Scientific Project. Symposium, program of the Society of Systematic Zoology, and cosponsored by the American Society of Zoologists. Arranged by R. L. Usinger (University of California, Berkeley), who will also make introductory remarks.

Part I. Robert T. Orr (California Academy of Science) will preside. Interisland differentiation in the display

patterns of Galapagos iguanid lizards, Charles C. Carpenter (University of Oklahoma). The Galapagos land snail fauna, A. G. Smith (California Academy of Sciences, San Francisco). The insect fauna of the Galapagos—general features, Cerambycidae and pollination, E. G. Linsley (University of California, Berkeley).

Part II. R. L. Usinger will preside. Otitidae (Diptera) of the Galapagos, George Steyskal (U.S. Department of Agriculture, Washington, D.C.) Origins and composition of the Cirripedan fauna of the Galapagos Archipelago, V. A. Zullo (Marine Biological Laboratory, Woods Hole, Massachusetts). The salt-marsh *Aedes taeniorhynchus* of the Galapagos, John Belkin (University of California, Los Angeles). Studies on Galapagos ascidians, D. P. Abbott (Hopkins Marine Station, Pacific Grove, California). Calliphoridae of the Galapagos, M. T. James (Washington State University). The first Embioptera from the Galapagos, E. S. Ross (California Academy of Sciences, San Francisco). The Hemiptera-Heteroptera of the Galapagos Islands, P. D. Ashlock (Bernice P. Bishop Museum, Honolulu, Hawaii). The hermatypic coral *Leptoseris* in the Galapagos, J. W. Durham (University of California, Berkeley). Thrips of the Galapagos, S. F. Bailey (University of California, Davis).

Coffee Hour (4 p.m.). All systematists and their guests are invited.

Tuesday 28 December

What Should We Teach in Systematics? Arranged by Howell V. Daly (University of California, Berkeley), who will also preside and present introductory remarks. How I learned to be a taxonomist, Joel W. Hedgpeth (Marine Science Laboratory, Newport, Oregon). Systematics as a liberal arts subject, L. H. Shinners (Southern Methodist University). Systematics and the levels-of-organization approach, Peter H. Raven (Stanford University). Fossil systematics, Walter Youngquist (University of Oregon). How should systematic entomology be taught? Evert I. Schlinger (University of California, Riverside). The importance of field exercises in the teaching of systematics, Royal D. Suttkus (Tulane). Concluding remarks by Howell V. Daly.

Wednesday 29 December

Contributed Papers I. Jerome G. Rozen, Jr. (American Museum of Natural History) will preside. Significance of the rock record in evolutionary taxonomy, Peter U. Rodda (University of Texas). The systematic status of the subclass Amphigastropoda, Ellis L. Yochelson (U.S. Geological Survey, Washington, D.C.). Reconstructions of the molluscan common ancestor: a methodological critique, Michael T. Ghiselin (Marine Biological Laboratory, Woods Hole, Massachusetts). Biological and paleontological observations on *Nubecularia lucifuga* Defrance (protozoa), Zach M. Arnold (University of California, Berkeley). Comments on the geographical distribution of ophidioid fishes from below 2000 meters, Daniel M. Cohen (U.S. Fish and Wildlife Service, Washington, D.C.). A taxonomic study of avian hemoglobins, Charles G. Sibley (Yale University). The evolution of geographic song types in western American populations of the western flycatcher (*Empidonax difficilis*), Ned K. Johnson (University of California, Berkeley). The classification of snakes, Herndon G. Dowling (New York Zoological Park, New York, N.Y.). Radiation of toads (*Bufo*) in western North America: new evidence from hybridization experiments, W. Frank Blair (University of Texas).

Contributed Papers II and Annual Business Meeting. Jerome G. Rozen, Jr., will preside. Regional trends in geographic variation, Leslie F. Marcus (Kansas State University). Numerical analysis of mammalian distributions, Edwin M. Hagmeier (University of Victoria). The sorting center as a coherent influence in systematics, I. Eugene Wallen (Smithsonian Institution). Recent developments in numerical cladistics, R. R. Sokal and J. H. Camin (University of Kansas). The use of numerical taxonomy in the classification of the luciliini (Diptera: Calliphoridae), John H. Shepard and Maurice T. James (Washington State University). Correspondence and lack of correspondence of numerical and classical methods in blow fly taxonomy (Diptera: Calliphoridae), Maurice T. James and John H. Shepard. Numerical taxonomy and the subspecies of the camel cricket *Ceuthophilus guttulosus* Walker, David C. Eades (University of Illinois). Origin of the oral primary spines of cidaroid Echinoidea, Bertha M. Cutress (University of Puerto Rico). Asexual reproduction in some Boloceroididae (Coelenterata), Charles E. Cutress (University of Puerto Rico).

Thursday 30 December

Contributed Papers III. Jerome G. Rozen, Jr., will preside. Historical aspects of studies on the Brachiopoda by E. S. Morse, Ralph W. Dexter (Kent State University). On the anatomy of *Caobangia billeti* Giard, a freshwater sabellid (Polychaeta, Annelida) from southeast Asia, Meredith L. Jones (Smithsonian Institution, Washington, D.C.) Should there be a phylum Aschelminthes?, Ellsworth C. Dougherty (University of California, Berkeley). The logical foundations of biological classification, David Lee Hull (University of Wisconsin-Milwaukee). Biochemical differentiation of the sibling black widow species *Latrodectus mactans* and *L. variolus*, John David McCrone (Florida Presbyterian College, St. Petersburg). Speciation in New Guinea, with reference to Coleoptera, J. Linsley Gressitt (Bishop Museum, Honolulu, Hawaii). Isolating mechanisms in the genus *Oxacis* (Coleoptera, Oedemeridae), Ross H. Arnett, Jr. (Catholic University of America). Concordant and discordant characters in *Berosus* species: egg cases, larvae, and adults (Coleoptera: Hydrophilidae), Eileen R. Van Tassell (Catholic University of America). Biosystematics of the *Culex pipiens* complex in California (Diptera), Wilfred G. Iltis (University of California, Davis). Problems in the systematics of freshwater cyclopoid copepods, Edward B. Reed (Colorado State University, Ft. Collins). *Troglocarcinus crescentus* (Edmondson), a second crab of the Corallicolous family Hapalocarcinidae (Crustacea, Decapoda) from the eastern Pacific, John S. Garth (University of Southern California) and Thomas S. Hopkins (University of California, San Diego).

Biological Data Retrieval and Computer Analysis. Symposium, program of the Society of Systematic Zoology and cosponsored by the American Society of Zoologists, BIO, and Section U-Statistics. Arranged by Gilbert L. Voss (University of Miami, Florida), who will preside at Parts I and II and present introductory remarks.

Part I. A bio-numeric code application in handling complex and massive faunal data, Harvey R. Bullis, Jr. (Bureau of Commercial Fisheries, Bascagoula, Mississippi). Computer processing of biological and environmental data in marine benthic ecological studies, Robert H. Parker (Marine Bio-

logical Laboratory, Woods Hole, Massachusetts). Data processing, the natural history library, and the future, Mary A. Huffer and Jeane Chandler Smith (Smithsonian Institution, Washington, D.C.). A system for biological data processing, John A. Jones (University of Miami). Criteria for a system of biological "numericlature," Frank J. Little, Jr. (University of South California).

Part II. Data processing in systematics, Robert R. Sokal (University of Kansas). Taxonomic structure from randomly obtained characters, F. James Rohlf (University of California, Santa Barbara). An approach to organizing data into homogeneous groups, Jerrold Rubins (IBM Corporation).

Zoological and Botanical Sciences (FG)

American Society of Limnology and Oceanography (FG1)

The Pacific Section of the Society is a joint sponsor of the symposium, Bays and Estuaries (27 Dec.).

American Society of Naturalists (FG2)

Monday 27 December

Reconstructions of Past Biological Environments. Part I. Symposium, program of the American Society of Naturalists and cosponsored by Sections F-Zoological Sciences and G-Botanical Sciences and by the Society for the Study of Evolution. Arranged by Carl L. Hubbs (Scripps Institution of Oceanography, La Jolla, California), who will preside. Evidence on extraterrestrial life and on the origin of life on earth, Harold C. Urey and Bartholomew Nagy (University of California, San Diego). Organic geochemistry and the record of ancient life, T. C. Hoering and Philip Hauge Abelson (Carnegie Institution of Washington). Tertiary floras and ancient topography, Daniel Axelrod (University of California, Los Angeles). Paleolimnology, Daniel A. Livingstone (Duke University).

Naturalists' Luncheon, Business Meeting, and Presidential Address. H. Bentley Glass (State University of New York, Stony Brook) and H. Clark Dalton (New York University) will preside. The naturalist—changes in outlook over three centuries, H. Bentley Glass (president, American Society of Naturalists).

Reconstructions of Past Biological Environments. Part II. H. Bentley Glass will preside. Quaternary hydrography and fish life of the now arid American West, Robert Rush Miller (University of Michigan). Palynological inferences and Quaternary environments in arid lands, Peter J. Mehringer (University of Arizona). Population dynamics and communities in the past, Edward S. Deevey (Yale University). Late Pleistocene environments and Early Man in the New World, Fred Wendorf (Southern Methodist University) and James J. Hester (National Institutes of Health). Commentary by Preston E. Cloud, Jr. (University of California, Los Angeles).

BIO (Biomedical Information-Processing Organization)

The program of BIO is included in the Statistics (U) Section.

Biometric Society, ENAR

The program of the Biometric Society is included in the Statistics (U) Section.

Ecological Society of America (FG3)

Monday 27 December

One-Day Field Trip to Santa Cruz Mountains. Peter Raven (Stanford University) will be the leader of this trip. This trip to the Santa Cruz Mountains will include Big Basin State Park (redwood forest) and the Ben Lomond Sand Hills.

Session for Contributed Papers I. Aquatic and Marine Ecology I. Francesco B. Trama (Rutgers University) will preside. The interrelationship of organic nitrogen, protein, chlorophyll, and total organic content of fluvial seston, Francesco B. Trama. Variations in photosynthetic assimilation ratios in natural, marine phytoplankton communities, Herbert Curl, Jr., and L. F. Small (Oregon State University). The relative contribution of particulate chlorophyll and silt to the extinction of light off the coast of Oregon, Herbert Curl, Jr., and L. F. Small. Controlled fluctuating salinity and temperature acclimation in fish and crabs, Wallace G. Heath (Western Washington State College, Bellingham). Field experiments on competition between two ecologically similar intertidal gastropods, Stoner B. Haven (University of California, Berkeley). Distribution of a commensal polynoid on a keyhole limpet, John B. Palmer (University of Oregon). The ubiquitous diatom, W. W. Wornardt, Jr. (Esso Production Research Company, Houston, Texas). Preliminary characterization of *Thalassomyces* sp., a parasite of the nervous system of the bathypelagic glass shrimp, *Pasiphaea emarginata*, S. B. Collard and E. R. Noble (University of California, Santa Barbara).

Animal Behaviorists' Luncheon. Joint program of the Animal Behavior Society, the ASZ Division of Animal Behavior and Sociobiology, and the ESA Section of Animal Behavior and Sociobiology.

Session for Invited Papers. Population and Community Bioenergetics. Arranged by Oscar H. Paris (University of California, Berkeley). R. T. Paine (University of Washington) will preside. Dynamics and energetics of populations of Brown hydra, Thomas C. Griffing (University of Notre Dame). The energetics of a free population of hydra, Adam Łomnicki and L. B. Slobodkin (University of Michigan). Energy transfer by *Diaptomus oregonensis* at varying concentrations of food, S. Richman (Lawrence University). Variables affecting maintenance cost in experimental isopod populations, Stephen Hubbell (University of California, Berkeley). Size composition, local distribution, and energetics in a population of starfish, Robert T. Paine. An energy budget for a *Spartina* salt marsh, John M. Teal (Woods Hole Oceanographic Institution). Energy flow through the arthropod populations of soil communities, Manfred D. Engelmann (Michigan State University). Territoriality and food limitation in the genus of tree squirrels *Tamiasciurus*, C. C. Smith (University of Washington). Marshes as producers of food for blackbirds, Gordon H. Orians (University of Washington).

Session for Contributed Papers II. Aquatic and Marine Ecology II. R. A. Boolootian (University of California, Los Angeles) will preside. Effects of food species and quantity on the dynamics of a laboratory population of rotifers, Charles E. King (Yale University). Density regulation in a natu-

ral population of the pond snail, *Lymnaea elodes*, Robert M. Eisenberg (Rice University). Growth rate and size distributions of natural populations of *Tegula funebralis*, Peter W. Frank (University of Oregon). Test diameter changes in natural populations of the sea urchin, *Strongylocentrotus purpuratus*, Thomas A. Ebert (University of Oregon). Distribution and abundance of echinoderm larvae in the North Sea, Stephen R. Geiger (University of Southern California). The reproductive cycles of *Thyone briareus, Asterias forbesi*, and *Asterias vulgaris* at Cape Cod, Massachusetts, R. A. Boolootian and V. G. Turner (University of California, Los Angeles, and Marine Biological Laboratory, Woods Hole, Massachusetts). The effect of overcrowding on growth and development in echinoderm larvae, Vilia Turner (University of California, Los Angeles, and Marine Biological Laboratory, Woods Hole, Massachusetts). Distribution patterns within natural populations of *Olivella biplicata*, their underlying behavioral mechanisms, and their ecological significance, D. Craig Edwards (University of Chicago).

Panel Discussion. Ecological Implications of the Rampart Canyon Dam. Arranged by Stephen H. Spurr (University of Michigan), who will also preside. Panel members: A. Starker Leopold (University of California, Berkeley), William S. Benninghoff (University of Michigan), and Gordon Watson (U.S. Fish and Wildlife Service, Juneau, Alaska, and University of Michigan).

Tuesday 28 December

Session for Invited Papers. Diversity and Abundance in Natural Communities. Part I. Arranged by Oscar H. Paris (University of California, Berkeley). Richard B. Root (Cornell University) will preside at Parts I and II. Diversity and productivity in a phytoplankton community, Ian E. Efford (University of British Columbia). Measurements of diversity and stability in fossil Cladoceran populations, Clyde E. Goulden (Yale University). Diversity and abundance in the gastropod genus *Conus*, Alan J. Kohn (University of Washington). Species diversity of desert lizards, Eric R. Pianka (University of Washington). Shorebirds and habitat diversity, Harry R. Recher (University of Washington, Pennsylvania). A model of species-diversity based on partially overlapping niches, George Chaniot (University of California, Berkeley). Diversity and patchiness, Monte Lloyd (University of California, Los Angeles).

Human Ecologists' Luncheon.

Session for Invited Papers. Diversity and Abundance in Natural Communities. Part II. Richard B. Root will preside. The maintenance of diversity in tropical rain forests and coral reefs, Joseph H. Connell (University of California, Santa Barbara). Aspects of tropical species diversity, Robert MacArthur (Princeton University). Species-diversity problems in plant communities, R. H. Whittaker (Brookhaven National Laboratory, Upton, New York, and University of California, Irvine). The complementary species density of North American mammals vs. amphibians and reptiles, A. Ross Kiester (University of California, Berkeley). The guild concept and community analysis, Richard B. Root.

Session for Contributed Papers III. Human Ecology. E. S. Rogers (University of California, Berkeley) will preside. Human ecology as a unifying science, Edward S. Rogers (University of California, Berkeley). Hospital and ambulance service areas in Pennsylvania: an isometric approach, Ernest M. Kuhinka (Department of Public Welfare, Harrisburg, Pennsylvania). Human ecology: as applied science, George B. Happ (Principia College, Elsah, Illinois).

Wednesday 29 December

Primary Productivity and Mineral Cycling in Natural Ecosystems. Part I. Arranged by Stanley P. Gessel (University of Washington), who will also preside at Parts I and II.

Part I. The bio-mathematical model approach to estimates of forest productivity, Kenneth J. Turnbull (University of Washington). The complete tree method of determining the productivity of forest ecosystems, Harold Young (University of Maine). Problems associated with the assessment of forest productivity by photosynthetic methods, David R. M. Scott and Richard B. Walker (University of Washington). Tension lysimeter techniques for monitoring mineral cycling and water movement in forest ecosystems, Stanley P. Gessel and Dale W. Cole (University of Washington). Measurement of respiration of a forest by carbon dioxide accumulation during temperature inversion, G. M. Woodwell and W. R. Dykeman (Brookhaven National Laboratory). Fertility-productivity relationships in several western Oregon forest soils, Denis P. Lavender and D. Waring (Oregon State University). Estimating biomass and productivity in fir-spruce-birch stands, G. L. Baskerville (Department of Forestry of Canada, Fredericton, New Brunswick).

Part II. Productivity of redwood forests and chaparral in California, Paul J. Zinke (University of California, Berkeley). Time sequence of ecosystem productivity in the Mount Shasta area, California, Hans Jenny and R. Glauser (University of California, Berkeley). Productivity cycles on the Alaskan arctic tundra, Arnold M. Schultz (University of California, Berkeley). Elemental efficiency in mineral cycling within a forest ecosystem, Dale W. Cole and Stanley P. Gessel. Elements in Fern Lake, Washington, Sigurd M. Olsen and Paul Olson (University of Washington). The influence of sphagnum mosses on the available nutrients and temperature of northern aspect soils of interior Alaska, Paul Heilman (University of Alaska). Elemental composition of stream water after burning of logging debris in a small watershed, Richard Frederickson (U.S. Forest Service, Portland, Oregon).

Thursday 30 December

One-Day Field Trip to Mount Tamalpais and Point Reyes Peninsula. Herbert Baker and Frank Pitelka (University of California) are leaders. This one-day trip to Mount Tamalpais, the San Andreas Fault, Inverness Ridge, and Point Reyes Peninsula will provide an opportunity to see a variety of California coastal communities including mixed evergreen forests, redwood forests, chaparral, northern oak woodland, Douglas fir forests, northern coastal scrub, coastal grassland, coastal strand, and salt marsh. Both plant and animal life will be discussed by Herbert Baker and Frank Pitelka.

Session for Contributed Papers IV. Physiological Ecology. Boyd R. Strain (University of California, Riverside) will preside. Effect of past and prevailing temperatures on the carbon dioxide exchange capacities of some woody desert perennials, B. R. Strain and Valerie C. Chase (University of California, Riverside). Thermal control of primary productivity in Hot Springs of Yellowstone and Iceland, Thomas D. Brock and M. Louise

Brock (Indiana University). An hypothesis of nondormancy in seeds, T. W. Daniel (Utah State University). Utilization of a thermal gradient device in the correlation of germination temperature optima with germination pattern in the field, Richard H. Wagner (Brookhaven National Laboratory and Pennsylvania State University). Lichens and fungi able to remove moisture from low humidity atmospheres, E. D. Rudolph (Ohio State University). Seed germination in *Marah* (Cucurbitacae) related to environmental features, R. A. Schlising (University of California, Berkeley). Photoperiodic and temperature effects on growth, flowering, and dormancy of widely distributed populations of Oxyria, W. D. Billings, P. G. Godfrey, and R. D. Hillier (Duke University). Photosynthesis in leaves and stems during early ontogeny of *Pinus radiata*, Elmer B. Hadley (University of Illinois). Differential environmental responses of three conifers in relation to lower elevational limits, Robert D. Wright (University of Redlands). Another mobile laboratory, B. R. Strain. Longevity of bristlecone pine (*Pinus aristata*), C. W. Ferguson (University of Arizona).

Session for Contributed Papers V. Animal Ecology I. W. Lidicker (University of California, Berkeley) will preside. Trophic links between isopods and the grassland food web, Oscar H. Paris (University of California, Berkeley). Factors influencing the biological half-life of radionuclides in isopods, Anne Sikora and Oscar H. Paris (University of California, Berkeley). An examination of Morris' method as a measurement of density response, G. W. Salt (University of California, Davis). The effects of temperature on three species of planorbid snails, Josefina Z. Sevilla (University of Michigan). The ecology of the coconut crab, *Birgus latro* (L.), Ernst S. Reese (University of Hawaii). Chorus structure in some neotropical frogs, William E. Duellman (University of Kansas). Life history features of the swamp cricket frog in the Chapel Hill (North Carolina) region, Douglas G. Alexander (Chico State College, California). Changes in population density of a Panamanian lizard, Owen J. Sexton (Washington University). On the function of the black peritoneum of reptiles, Warren Porter (University of California, Los Angeles). Some observations of earthworms casting activity as related to soil catenal position and manipulation of drop residues, Richard E. Puetz and Francis D. Hole (University of Wisconsin).

Session for Contributed Papers VI, Vegetation. P. V. Wells (University of Kansas) will preside. Ecological investigations of the cryophytic algae communities in the Front Range, Colorado, Clifford C. Amundsen (University of Colorado). Significance of a wood rat midden deposit of late full-glacial age from the Chihuahuan Desert, P. V. Wells. Twenty-eight years of grazing protection in California annual grassland, Keith L. White (University of California, Berkeley). Ordination of shadscale zone vegetation of southeastern Utah, T. Singh and N. E. West (Utah State University). Alpine vegetation and active frost polygons on a high plateau in California, Richard S. Mitchell and Robert M. Lloyd (University of California, Berkeley). Plant succession on sand dune deflation plains, Alfred Wiedemann (Oregon State University). Forest patterns and environment at Grand Canyon, Arizona, Patricia J. Rand (University of Arkansas). A physiognomically-based system for describing grassland habitats, with special reference to grassland birds, John A. Wiens (University of Wisconsin). Time, a new concept in ecosystem analysis, Rudolf W. Becking (Humboldt State College, Arcata, California).

Session for Contributed Papers VII. Animal Ecology II. C. A. Istock (University of Rochester) will preside. Population trends of rhesus monkeys (*Macaca mulatta*) in India, Charles H. Southwick (Johns Hopkins University) and M. Rafiq Siddiqi (Aligarh Muslim University, India). Some refinements of the home-range concept, Lowell Adams, J. R. Audy, and Stanley D. Davis (University of California, San Francisco). Population limitation and the evolution of complex life cycle phenomena, Conrad A. Istock. Competitive exclusion in a small mammal community, Walter Sheppe (California Academy of Sciences, San Francisco). Energy dynamics of Colorado pikas, Donald R. Johnson (Minot State College, North Dakota). An experimental study of environmental factors affecting home range and activity of *Microtus pennsylvanicus*, H. W. Ambrose (Cornell University). The use of feeding detritus as an index to population trends of the Kaibab squirrel, Joseph G. Hall (San Francisco State College). Some changes in the mourning dove prior to autumnal migration, William D. Schmid (University of North Dakota, Grand Forks).

Mountain Lake Biological Station "Alumni" (FG4)

Wednesday 29 December

Annual Breakfast Meeting. Former students, investigators, and staff are invited to attend.

Society for the Study of Evolution (FG5)

The Society is a cosponsor of the symposium of the American Society of Naturalists (FG2), Reconstructions of Past Biological Environments (27 Dec.).

Society of General Physiologists (FG6)

The Society is a cosponsor of the five-session symposium of Section F-Zoological Sciences and the American Society of Zoologists, Molecular Mechanisms of Temperature Adaptation (27–29 Dec.).

Western Society of Naturalists (FG7)

Monday 27 December

Bays and Estuaries of the Pacific Coast. Status and Prospects. Symposium, joint program of the Western Society of Naturalists and the Pacific Section of the American Society of Limnology and Oceanography. Arranged by Joel W. Hedgpeth (Oregon State University), who will also preside. Bays in the environment of cities, Harold Gilliam (San Francisco *Chronicle*). Bays and marinas of Southern California, Donald J. Reish (University of San Francisco). Biological aspects of San Francisco Bay, Francis P. Filice (University of San Francisco). Effects of the California water plan on the estuary of San Francisco Bay, George Warner (California Department of Fish and Game). Studies in the Yaquina Bay estuary, Herbert F. Frolander (Oregon State University). A prospect of Puget Sound, Clifford A. Barnes (University of Washington). The session will conclude with

comments by the presiding panel which includes Michael Waldichuk (Fisheries Research Board of Canada), Wheeler J. North (California Institute of Technology), and others.

Wednesday 29 December

Polar Lore Since 1954. The Arctic. Symposium, joint program of the Western Society of Naturalists and the Arctic Institute of North America. Arranged by James M. Craig (San Jose State College).

Part I. M. C. Britton (Office of Naval Research, Washington, D.C.) will preside. The tundra as a homeostatic system, Arnold Schultz (University of California, Berkeley). Distribution of Arctic marine copepods, E. H. Grainger (Arctic Biological Station). Adaptation of the marine fauna to Pleistocene and Arctic conditions, M. J. Dunbar (McGill University). Operational temperatures in Arctic warm and cold blooded animals, Laurence Irving (University of Alaska). Some Arctic adaptations in plants, D. B. O. Savile, (Central Experimental Farm, Ottawa, Canada).

Part II. I. E. Wallen (Smithsonian Institution) will preside. Pliocene-to-Recent polar ice in the Antarctic, O. L. Bandy (University of Southern California). Ecological studies of vegetation at Hallett Station, Antarctica, Emanuel D. Rudolph (Ohio State University). Fish fauna of the Antarctic, Jay Savage (University of Southern California). Investigations of circadian rhythms, Takashi Hoshizaki (University of California, Los Angeles). Zooplankton standing crop in the Atlantic sector of the Antarctic Ocean, Thomas L. Hopkins (University of Southern California).

Thursday 30 December

Session for Contributed Papers I. Arranged by James M. Craig (San Jose State College). H. D. Heath (California State College at Hayward) will preside. Use of chromosomes in sciurid taxonomy, Dallas A. Sutton (Chico State College). The relationship of carotenoid pigments to skin color in several color phases of the asteroid echinoderm, *Henricia leviuscula* (Stimpson), Thomas S. Hopkins (Scripps Institution of Oceanography). Ecological relations of Uhler's western conenose, *Triatoma p. protracta*, in Griffith Park, Los Angeles, Sherwin F. Wood (Los Angeles City College). Migration of *Trichinella spiralis* larvae into malignant striated muscle tissue, T. D. Pitts, W. H. Clark, and P. Johnson (Loyola University of Los Angeles). Median axes, and areas of home ranges of the North American red squirrel, Carl O. Mohr (University of California, Berkeley). The effect of chloral hydrate on a gull and sparrow, Jack T. Tomlinson (San Francisco State College). On the biology of the psilostome *Trematode sphaeridiotrema Globulus* Rudolphi, 1819, Ralph W. Macy (Portland State College). Observations on a population of the macropod marsupial, *Potoros tridactylus* (Kerr), George E. Heinsohn (Lewis and Clark College).

Concurrent Session for Contributed Papers II. John H. Thomas (Stanford University) will preside. Ultraviolet light absorption by magnesium in photosynthesis, Matilda M. Brooks (University of California, Berkeley). Fossil fruits and seeds of the Rancho La Brea Pleistocene deposits, Bonnie C. Templeton (Los Angeles County Museum). Peat in the High Sierra Nevada, Joel F. Gustafson (San Francisco State College). Coordinated dispersal of an angiosperm parasite and its host, Peter R. Atsatt (University of California, Los Angeles). Environmental control of reproduction in two species of the Arochaetium-Rhodochorton complex, John A. West (University of Washington). Occurrence of sexuality in a marine planktonic diatom, Richard L. Steele (University of Washington). A preliminary study of the inshore benthos off Samoa, California, John De Martini (Humboldt State College). Temporal and spatial distributions of epibenthic mytilid populations in Quicks Hole, Massachusetts, Jack B. Pearse (Marine Biological Laboratory, Woods Hole, Massachusetts, and Humboldt State College).

Session for Contributed Papers III. A. W. Pritchard (Oregon State University) will preside. Echinoderms collected from an ice island during its drifts along the east Greenland coast, Rey Stendell (University of Southern California). Fish-grazing and outer reef flat primary production at Eniwetok, Marshall Islands, Gerald J. Bakus (University of Southern California). A preliminary report on brachyuran and anomuran crabs from Eltanin Antarctic cruises, John S. Garth and Janet Haig (University of Southern California). Genera of stylochonidae (Chonotrichida: Ciliata) possessing a marsupium, Yuk-Maan Leung (University of Southern California). The functional morphology of the neogastropod mantle cavity, Edmund H. Smith (University of the Pacific). An unciliated ciliate, Eugene N. Kozloff (Lewis and Clark College). Description of serial blood sampling techniques and a preliminary report on the role of the eyestalk in blood ionic regulation in the crayfish, *Pacifastacus leniusculus*, David E. Kerley (Oregon State University). On the biogeography of Hawaiian shore barnacles, William A. Newman (Scripps Institution of Oceanography, La Jolla, California).

Concurrent Session for Contributed Papers IV. George T. Oberlander (San Francisco State College) will preside. Studies on the growth and reproduction of *Zonaria Farlowii*, L. Liddle, A. Dahl, and M. Neushul (University of California, Santa Barbara). Two unique sponges from deep Antarctic waters, Frank J. Little, Jr. (University of Southern California). The ecology of pelagic amphipoda in the waters off southern California, Gary J. Brusca (University of the Pacific). *Placobranchus lanthobapsus* Gould, a dominant reef-dwelling Indo-Pacific gastropod harboring symbiotic algae, Richard W. Greene (University of California, Los Angeles). Some aspects of nitrogen excretion in the ascidian, *Molgula manhattensis*, James R. Nolfi (University of California, Berkeley). The influence of sea urchins on algal competition, Robert L. Vadas (University of Washington). Changes in a freshwater coastal lake after flooding by the Arctic Ocean, Floyd E. Durham (University of Southern California). Organic aggregates formed from dissolved organic matter by bubbling, Richard T. Barber (Stanford University).

Botanical Sciences (G)

Wednesday 29 December

Contributed Papers I. William A. Jensen (University of California, Berkeley) will preside. Enhancement of leaf senescence by AMO-1618, a plant growth retardant and its reversal by gibberellin and kinetin, Manfred Ruddat (University of Chicago) and Richard P. Pharis (University of Alberta). Kinetics of the winter decline of conifer photosynthesis, Richard P. Pharis and Henry Hellmers (Duke University). An electron microscopic study of crystal-containing cells in the fruits of *Malpighia glabra*, Howard J.

Arnott (University of Texas). RNA and protein synthesis in auxin-induced cell elongation of plant tissues, Joe L. Key (Purdue University). Loss of dispersibility in the Hawaiian flora, Sherwin Carlquist (Claremont Graduate School). Evolutionary patterns in the holly-fern (*Polystichum*) of western United States, W. H. Wagner, Jr. (University of Michigan). Terpenes as taxonomic characters with especial reference to introgression in *Salvia*, William A. Emboden, Jr. (San Fernando Valley State College).

Contributed Papers II. Ernest M. Gifford (University of California, Davis) will preside. Fine structure of cambium, L. Srivastava (Simon Fraser University, Burnaby, British Columbia). Nucleic acid synthesis in isolated nuclei from peanut cotyledons, Joe H. Cherry, C. T. Duda, and Hanna Chroboczek (Purdue University). EPR signals in spinach chlorplasts at low temperatures, Russell B. Faucett and Power B. Sogo (Pomona College). A fermentative, CO_2-requiring, anaerobic watermold, Abraham H. Held and Ralph Emerson (University of California, Berkeley). Ultrastructural investigations of onion (variety Excel) roots and paper infected with *Pyrenochaeta terrestris*, W. M. Hess (Brigham Young University). Formation of dwarf cells by yeasts other than *Saccharomyces carlsbergensis*, John G. Kleyn (University of Puget Sound). RNA composition and metabolism in pollen, Robert G. Stanley (University of Florida). Observations on the biology of *Marsilea* sperm, Harbert V. Rice and W. M. Laetsch (University of California, Berkeley). A study of cell growth in *Fucus gardneri* Silva (-*Fucus furcatus*), Edward G. Pollock (San Fernando Valley State College). The genetic control of gibberellin production by the fungus *Gibberella fujikuroi* (Saw.) Wr., Kelvin Spector and Bernard O. Phinney (University of California, Los Angeles). The role of "Chibnalls Root Hormone" in the levels of RNA, protein, and chlorophyll in tobacco leaves, Niel A. Brad (I.B.M., Bethesda, Maryland) and Arthur Wallace (University of California, Los Angeles).

Thursday 30 December

Plant Biology Today. Advances and Challenges. Part I. Symposium, joint program of Section G and the Botanical Society of America, Pacific Section, and cosponsored by the Botanical Society of America. Arranged by Warren H. Wagner, Jr. (University of Michigan) and Janet R. Stein (University of British Columbia). Warren H. Wagner, Jr., will preside. Soil diversity and the distribution of plants, A. R. Kruckeberg (University of Washington). Palynology and the botanical sciences, Estella B. Leopold (U.S. Geological Survey, Denver, Colorado). Speculations on the origin and the relationships of the hornworts and thalloid liverworts, Johannes Proskauer (University of California, Berkeley).

Botanists' Luncheon and Vice-Presidential Address. Warren H. Wagner, Jr., will preside. The Galapagos Islands in retrospect—and prospect, Ira L. Wiggins (California State College at Fullerton; vice president for Section G).

Plant Biology Today. Advances and Challenges. Part II. Janet R. Stein will preside. Laticifer cells, Paul Mahlberg (Indiana University). Structure and differentiation in blue-green algae, Norma J. Lang (University of California, Davis). Chromosomal variation and evolution, G. Ledyard Stebbins (University of California, Davis).

Botanical Society of America (G1)

The Botanical Society of America is cosponsor of the symposium, Plant Biology Today (30 Dec.).

Botanical Society of America, Pacific Section (G2)

The Botanical Society of America, Pacific Section, is a joint sponsor of the symposium, Plant Biology Today (30 Dec.).

Anthropology (H)

Monday 27 December

Kinship in India. Symposium, program of Section H and cosponsored by the American Anthropological Association. Arranged by Stephen A. Tyler (University of California, Davis). John Gumperz (University of California, Berkeley) will preside at Parts I and II.

Part I. Kinship and marriage among the Hill Maria Gonds, Edward Jay (California State College, Hayward). Satta marriage, a Himalayan adaptation to a shortage of marriageable girls, John T. Hitchcock (University of California). Kinship in Punjab, Charles Morrison (University of Rochester). Tribe, caste, and kin: the Santal, Martin Orans (University of California, Riverside).

Part II. The meaning of kinship in village India, David G. Mandelbaum (University of California, Berkeley). Father's brother in Indian kinship: a study in role variation, William McCormack (Duke University). Parallel and cross in proto-Dravidian kinship terminology, Stephen A. Tyler (University of California, Davis). The symposium will be summarized by John Gumperz.

Wednesday 29 December

Current topics in Human Variation. Interdisciplinary Studies at the University of Wisconsin. Symposium, program of Section H and cosponsored by the American Anthropological Association. Arranged by William S. Laughlin, who will also preside. The interpretation of variation in early man, J. T. Robinson (University of Wisconsin). Variation in linearly distributed populations, William S. Laughlin. Genetical foundations of variation within and between populations, R. H. Osborne (University of Wisconsin, Madison).

Concurrent Symposium. Mathematical Anthropology. Program of Section H, cosponsored by the American Anthropological Association. Arranged by Paul Kay (Center for Advanced Study in the Behavioral Sciences, Stanford, California), who will preside at Parts I and II.

Part I. Algebra and Logic. Grafik, a generalized notation for kinship analysis, John Atkins (University of Washington). The algebra of kinship evolution, John Paul Boyd (University of Califorina, Irvine). The use of cultural code rules in the study of lexical systems, William Geoghegan (Stanford University). Formalization and the construction of ethnographies, Roger M. Keesing (University of California, Santa Cruz). Multiple meaning and paraphrase, Volney Stefflre (University of California, Los Angeles).

Part II. Probability and Statistics. Markov chains in Ethiopia, Hans Hoffman (State University of New York at Binghamton). The history of non-zero concordance, Robert M. Kozelka (Williams College) and J. M. Roberts (Cornell University). Utility, commitment and pattern, John M.

Roberts and Robert M. Kozelka. Problems in the study of endogamy, A. Kimball Romney (Stanford University). Ergodic processes in cultural evolution, Anthony F. C. Wallace (University of Pennsylvania).

Concurrent Symposium. Drinking Patterns in Latin America. Part I. Program of Section H, cosponsored by the American Anthropological Association. Arranged by Henry F. Dobyns (Cornell University). William Madsen (Purdue University) will preside. Drinking patterns in Latin America: a review, Henry F. Dobyns. A comparison of drinking patterns in three Hispanic cities, Paul H. Ezell (San Diego State College). Chicha: popular brews in the Andes, Mario C. Vazquez (Cornell University).

Vice-Presidential Address of Section H. Eleanor Leacock (Polytechnic Institute of Brooklyn; secretary of Section H) will preside. Explanation in anthropology, Albert C. Spaulding (University of Oregon; vice president for Section H).

Dutch Treat Cocktail Party.

Thursday 30 December

Mathematical Anthropology. Part III. Computer Techniques. Paul Kay will preside. A computer simulation of the division of labor, Roy G. D'Andrade (Center for Advanced Study in the Behavioral Sciences, Stanford, California). The shape of narrative concern in Japanese folk tales, B. N. Colby (Museum of New Mexico, Santa Fe). Computer methods in kinship studies, John P. Gilbert (University of North Carolina). Summary remarks will be made by Paul Kay.

Concurrent Symposium. Drinking Patterns in Latin America. Part II. William P. Mangin (Syracuse University) will preside. The rhythms of drinking patterns in a coastal Mestizo community in Peru, Allan R. Holmberg (Cornell University). Drinking and work in an Andean Mestizo town, Paul L. Doughty (Indiana University). Peasants, politics, and patterns of drinking in two Bolivian communities, Dwight B. Heath (Brown University). Stress patterns of Mexican-Americans in south Texas and a Mestizo town in the Valley of Mexico, William Madsen (Purdue University).

Contributed Papers I. Archaeology and Physical Anthropology. N. Ross Crumrine (California State College) will preside. Contributions of F. W. Putnam to the development of anthropology in California, Ralph W. Dexter (Kent State University). Historic sites and closed systems, Richard B. Lane (Canadian Department of Northern Affairs and National Resources). Neutron activation analysis of Hopewellian pattern: a preliminary report, James B. Griffin and A. A. Gordus (University of Michigan). Paleolithic and Mesolithic occupancy in the Batn el Hagar: some results of the 1964-65 Colorado Nubian Expedition, Gordon W. Hewes (University of Colorado). Ancient and modern Mayo fishing practices, N. Ross Crumrine and Lynne S. Crumrine. The patterns of adaptation of tropical forest cultures within the Amazon Basin: a review, Donald W. Lathrap (University of Illinois). The age of the hominid-pongid divergence as determined by quantitative immunochemical methods, Vincent Sarich (University of California, Berkeley).

Drinking Patterns in Latin America. Part III. Dwight B. Heath (Brown University) will preside. Uses of alcoholic beverages in a Barriada of Lima, William P. Mangin (Syracuse University). The use of alcoholic beverages in urban Brazil: religious and ethnic factors, Roger C. Owen (University of California, Santa Barbara). The use of alcoholic beverages in urban Brazil: class factors, José Pastore (University of Wisconsin).

Session for Contributed Papers II. Culture and Personality, Social Psychiatry, and Medicine. A. Laura Nader (University of California, Berkeley) will preside. An investigation of the Chinese program integrating traditional and modern medicine, Ailon Shiloh (Hebrew University–Hadassah Medical School, Jerusalem, Israel). Social norms and consensus, Thomas J. Scheff (University of California, Santa Barbara). Levi-Strauss vs. Freud on totemism: data from Ponape, J. L. Fischer (Center for Advanced Study in the Behavioral Sciences). The effects of a religious culture's values on the psychodynamics of personality, E. Mansell Pattison (University of Washington). Culture symbols and cognitive processes, Martha Pingel Taylor (Colorado Women's College, Denver). Body image concepts, personal space, and spatial behavior, Mardi J. Horowitz (Mount Zion Hospital and Medical Center, San Francisco). Animal communication and the scientist, Roger W. Pease, Jr. (College of Wooster, Ohio).

American Anthropological Association (H1)

The Association is a cosponsor of Section H's symposia.

Psychology (I)

Wednesday 29 December

Behavioral Genetics. Symposium, program of Section I and cosponsored by the Western Psychological Association. Arranged by Gerald E. McClearn (University of Colorado), who will also preside. Research with twins: an integration of findings, Steven G. Vandenberg (University of Louisville). Polygenic multivariate models in behavioral genetics, William Meredith (University of California, Berkeley). Genetics and behavior in mental retardation, V. Elving Anderson (University of Minnesota). Heredity and the psychopharmacology of memory, James L. McGaugh (University of California, Irvine). Behavior genetics and development, John DeFries (University of Illinois).

Verbal Learning. Acquisition Variables and Processes. Symposium, program of Section I and cosponsored by the Western Psychological Association. Arranged by Benton J. Underwood (Northwestern University). Leo J. Postman (University of California, Berkeley) will preside. Optional mediation, Kent Dallett (University of California, Los Angeles). The role of mediating associations in the acquisition process, Rudolph Schulz (State University of Iowa). The two-stage analysis of paired-associated learning, Geoffrey Keppel (University of California, Berkeley) Latent verbal learning, Leonard M. Horowitz (Stanford University). Utilization of structure on learning, Neal F. Johnson (Ohio State University). The role of syntactical constraints in learning connected material, William Epstein (University of Kansas).

Vice-Presidential Address. Frank W. Finger (University of Virginia; secretary, Section I) will preside. Some implications of implicit associative responses, Benton J. Underwood (vice president, Section I).

Thursday 30 December

Research on the Modification of Deviant Behavior in Children. Symposium, program of Section I and cosponsored by the Western Psychologi-

cal Association and the Society for Research in Child Development. Arranged by Leonard Krasner (State University of New York at Stony Brook), who will also preside. The psychotherapeutic application of modeling procedures, Albert Bandura (Stanford University). Operant reinforcement analysis of autistic children, Charles B. Ferster (Institute for Behavioral Research, Silver Spring, Maryland). The application of operant procedures in the modification of behavior of retarded children in a free society situation, James R. Lent (University of Kansas Bureau of Child Research, Parsons, Kansas). The establishment of stimulus functions in schizophrenic children, O. Ivar Lovaas (University of California, Los Angeles). Treatment of behavioral deficits in culturally-deprived juvenile delinquents, Arthur W. Staats (University of Wisconsin).

How Does a Child Learn to Talk? Symposium, program of Section I and cosponsored by the Western Psychological Association and the Society for Research in Child Development. Arranged by Dan I. Slobin (University of California, Berkeley), who will also preside. Speakers: David McNeil (University of Michigan) and David S. Palermo (Pennsylvania State University). Discussant: Susan M. Ervin-Tripp (University of California, Berkeley).

Society for Research in Child Development (I1)

The Society is a cosponsor of two symposia of Section I (30 Dec.).

Western Psychological Association (I2)

The Association is a cosponsor of Section I's program.

Social and Economic Sciences (K)

Wednesday 29 December

Vice-Presidential Address of Section K at Awards Luncheon of the American Criminological Society. Walter C. Reckless will preside. International criminal statistics, Thorsten Sellin (University of Pennsylvania; vice president, Section K).

American Economic Association (K1)

Sunday 26 December

Invited Papers. Economic Analysis and Policy Making. Program of the American Economic Association and cosponsored by Section K. Arranged by Richard R. Nelson (RAND Corporation, Santa Monica, California), who will also preside. Diagnosis of rising unemployment, 1957-62—an essential prelude to policy decision making, Barbara Berman (University of Maryland) and Edward Kalachek (Washington University). The fiscal policy decisions of 1963-64, Charles Cooper (RAND Corporation). The role of investment and growth theory, Richard Attiyeh (Yale University).

American Political Science Association (K2)

Monday 27 December

Invited Papers. Systematic Studies of the Characteristics of, and Interaction in, the World Communist System. Program of the American Political Science Association, cosponsored by Section K. Arranged by H. Field Haviland, Jr. (Brookings Institution, Washington, D.C.). Jan F. Triska (Stanford University) will preside. Integration and community-building among the fourteen Communist party-states, David D. Finley (Colorado College). Arms and insecurity in the Soviet-American dyad, Richard A. Brody (Stanford University). Implications of the Sino-Soviet controversy, Robert C. North (Stanford University). Commentators: M. George Zaninovich (University of California, Berkeley), Thomas W. Milburn (Northwestern University), and Thomas W. Wolfe (RAND Corporation).

American Society of Criminology (K3)

Six sessions of papers are planned as part of the Society's program: I, Crime and Poverty, 28 Dec., Stephen Schafer (Ohio University) presiding; II, Problems of the Custody and Treatment of Dangerous and Abnormal Offenders, 28 Dec., Bernard L. Diamond (University of California, Berkeley) presiding; III, New Approaches in Correctional Treatment, 29 Dec., Richard A. McGee (Youth and Adult Corrections Agency, Sacramento, California) presiding; IV, Research in Criminology, 29 Dec., Marvin Wolfgang (University of Pennsylvania) presiding; V, New Frontiers in Police Administration, 29 Dec., John P. Kenny (Department of Justice, State of California) presiding; and VI, New Approaches in the Administration of Justice, 30 Dec., Gerhard O. W. Mueller (New York University) presiding.

American Sociological Association (K4)

Wednesday 29 December

Invited Papers. Place of Social Scientists in Policy Formation in Developing Societies. Program of the American Sociological Association, cosponsored by Section K and the Population Association of America. Arranged by William H. Form (Michigan State University), who will also preside. Social scientists and policy making in development administration, Joseph La Palombara (Yale University). Social science and policy formation: case of Southeast Asia, Gayl D. Ness (University of Michigan). Structural prerequisites for the policy sciences, Amitai Etzioni (Center for Advanced Study in the Behavioral Sciences, Stanford, California). Discussant: James A. Mau (Yale University).

Metric Association (K5)

A two-session annual meeting is planned (29 Dec.). Papers will follow the meeting.

National Institute of Social and Behavioral Science (K6)

Tuesday 28 December

Contributed Papers. Program of the National Institute of Social and Behavioral Science, with the collaboration of Section K. Arranged by Donald P. Ray (National Institute of Social and Behavioral Science). W. Glenn Campbell (Stanford University) will preside. Crisis management: on the influence of strategic factors in crisis decision-making, David C. Schwartz (University of Pennsylvania). Concepts of social science and social change in the U.S.S.R., Peter R. Senn (Wright Junior College of Chicago). Current trends in French politics and the role of France in world affairs, Elijah Ben-Zion Kaminsky (Arizona State

University). Japan and the future of the American alliance, Douglas H. Mendel, Jr. (University of Wisconsin, Milwaukee). Inflation in Japan—a problem of contemporary economic growth, Robert S. Ozaki (California State College). Cabinet instability in Kerala since the communist administration: some implications for politics and government in India, John W. Spellman (University of Washington).

Population Association of America (K7)

Wednesday 29 December

Statistics of Mental Health. Symposium, program of the Population Association of America and cosponsored by Section U-Statistics, the American Sociological Association, and the American Statistical Association. Arranged by Everett S. Lee (University of Pennsylvania). Richard Morgan (Bureau of Biostatistics, State of California) will preside. Measurement of mental disorder, Alex Richman (University of British Columbia). Psychiatric case registers—problems and possibilities, Kurt Gorwitz (Department of Mental Hygiene, State of Maryland). Approaches to the epidemiology of mental disorder—the area of agreement, Everett S. Lee.

Society for the Scientific Study of Religion (K8)

Monday 27 December

Session I. Religion and the Natural Sciences. Religious constraints and stimulants to the development of Science, John Dillenberger (Graduate Theological Union). The early modern revolution in science and philosophy: neglected Catholic backgrounds, Benjamin Nelson (State University of New York, Stony Brook). Discussants: Lewis Feuer (University of California, Berkeley) and Bernard Loomer (Berkeley Baptist Divinity School).

Session IIA. The Scientific Study of Religion Exemplified. Religion and emotional valence: a report on sport parachutists, Samuel Z. Klausner (Bureau of Social Science Research, Inc., Washington, D.C.). The anatomy of religious committment, Rodney Stark (University of California, Berkeley).

Session IIB. Panel. The Compatibility of Religious and Social Scientific Perspectives. Robert Lee (San Francisco Theological Seminary) will be moderator. Discussants: Ralph Lane (University of San Francisco), Charles Y. Glock (University of California, Berkeley), and Gertrude J. Selznick (University of California, Berkeley).

History and Philosophy of Science (L)

What Can Philosophy Do For Science? Symposium, six sessions. Joint program of Section L and the Philosophy of Science Association. Arranged by C. West Churchman (University of California, Berkeley) who is also presiding at the six sessions. Speakers will be I, Ernst Mayr (Harvard University), T. A. Cowan (Rutgers University), and George Dantzig (University of California, Berkeley), 27 Dec. II, Chauncey Leake (University of California Medical Center, San Francisco), Samuel Silver (University of California, Berkeley), and Paul Lieber (University of California, Berkeley), 27 Dec. III, C. W. Churchman, Roger Sisson (University of Pennsylvania), and Marjorie Grene (University of California, Davis), 29 Dec. IV, Joseph Tussman (University of California, Berkeley), J. S. Minas (University of Waterloo, Waterloo, Ontario, Canada), P. Ratoosh (University of California, Berkeley), and Edward Manier (University of Notre Dame), 29 Dec. V, Comments and Discussions, 30 Dec. VI, Comments and Discussions, 30 Dec.

Philosophy of Science Association (L1)

The Association is a joint sponsor of Section L's entire program (27–30 Dec.) and a cosponsor of a program of the Society for the History of Technology (27 Dec.).

Science Courses for Baccalaureate Education Project (L2)

Tuesday 28 December

Program: V. L. Parsegian (Rensselaer Polytechnic Institute) will preside. Report on progress of the project and of the two pilot classes, by associates of the project (open discussion). What philosophical ideas should be part of undergraduate education?, Henry Margenau (Yale University).

Society for General Systems Research (L3)

This is the 11th annual general meeting of the Society.

Monday 27 December

Contributed Papers I. Arranged by T. C. Helvey (University of South Florida), who will also preside. Discontinuous, feedback-mediated edge information transmission in the human visual system, Kenneth Gaarder (Saint Elizabeths Hospital, Washington, D.C.). Epicosm modeling for systematizing the cosmos—via combinatoric formulas, S. C. Dodd (University of Washington). Adaptive categorization, Antonio M. Silvestri and Peter Kugel (Technical Operations Research, Burlington, Massachusetts). A comparison of the complexity of testing thematic hypotheses in the physical sciences and the social sciences, Frederick B. Wood, Campbell, California). Theoretical evaluation of systemic analysis within the balance model, Pulivelil M. George (University of Alberta, Edmonton).

Panel. Mathematics of General Systems. Arranged by Mihajlo D. Mesarovic (Case Institute of Technology), who will also preside. Panel members: Michael Arbib (Stanford University), Mihajlo D. Mesarovic (Case Institute of Technology), Thomas G. Windeknecht (Case Institute of Technology), A. Wayne Wymore (University of Arizona), and Lotfi A. Zadeh (University of California, Berkeley).

Tuesday 28 December

Contributed Papers II. Arranged by T. C. Helvey (University of South Florida), who will also preside. General systems analysis of political development, S. Naparst (Berkeley, California). Sociophysiological differentiation, B. L. Welch (College of William and Mary). An integration of set theory, information theory, and graph theory with general systems theory: variables, Elizabeth S. Maccia *et al.* (Ohio State University). Major features of scientific advance, Milton Marney (Research Analysis Corp., McLean, Virginia).

General Systems Approach in the Public Sector. Symposium, arranged by Robert P. Zieke (Aerospace Corporation, San Bernardino, California), who will also preside. A demographer looks at Southern California, S. Chandrasekhar (Population Research Institute, Gandhinagar, Madras, India).

Civil control systems involving police, fire department, and emergency services, W. Herrmann (University of Southern California) and Herb Isaacs (System Development Corporation, Los Angeles). Studies in technical transfer of defense research to public service, Milan Radovic (Stanford Research Institute). A regional information system for public and private policy decision making, John V. Gifford, Jr. (Association of Bay Area Governments).

Wednesday 29 December

The Psychiatric Sciences. The Potential Contribution of General Systems Research. Symposium, arranged by John MacIver (U.S. Steel Corporation), who will also preside. Living systems, James G. Miller (University of Michigan). Programming strategies in computer-assisted interviewing, John A. Starkweather (University of California School of Medicine). Systems in human communication, Albert E. Scheflen (Eastern Pennsylvania Psychiatric Institute and Temple University Medical Center). Computer models of personal belief systems, Kenneth Mark Colby (Stanford University). Discussant: William Gray (Boston, Massachusetts).

Nets—Social, Neuronic, and Others. Symposium, arranged by W. Ross Ashby (University of Illinois), who will also preside. Applications of the probabilistic theory of graphs, Anatol Rapoport (University of Michigan). Nets in physics, especially in statistical mechanics, Elliott W. Montroll (University of Maryland). Complex nets from a simple viewpoint, Crayton C. Walker (University of California, Los Angeles). Behavioral states and developed images, John B. Calhoun (National Institutes of Health, Bethesda, Maryland). The physical structure of experience, James T. Culbertson (California State Polytechnic College, San Luis Obispo).

Thursday 30 December

General Systems Theory and Education. Symposium, arranged by Ronald G. Jones (University of Alberta).

Part I. Ludwig von Bertalanffy (University of Alberta) will preside. Systems analysis as a basis for teaching unified social science, Alfred Kuhn (University of Cincinnati). General systems theory as the basis for a theory of instruction, Felix F. Kopstein (Educational Testing Service, Princeton, New Jersey). Language and field: general systems and English, Edward R. Fagan (Pennsylvania State University). Systems theory and management decision-making, Paul S. Greenlaw (Pennsylvania State University). Implications of general systems theory for librarianship and higher education, Dan Bergen (University of Maryland).

Part II. Gerald M. Weinberg (IBM Systems Research Institute, New York) will preside. A systems approach to decision-making, R. Oliver Gibson (State University of New York, Buffalo). The role of general systems theory in the structure and teaching of unified science, Edward F. Haskell (Council for Unified Research and Education, New York, New York) and Harold G. Cassidy (Yale University). General systems theory and theory construction in education, Elizabeth S. Maccia, George S. Maccia, James F. Andris, and Kenneth R. Thompson (Ohio State University). Variations in pupil achievement associated with administrative levels in school organization, T. Barr Greenfield (Ontario Institute for Studies in Education, Toronto, Canada). Structures, the unity of culture, and general education, Ronald G. Jones (University of Alberta) and Giorgio Tagliacozzo (U.S. Information Agency, Washington, D.C.).

Society for the History of Technology (L4)

Monday 27 December

Invited Papers. Toward a Philosophy of Technology. Program of the Society for the History of Technology, cosponsored by the Philosophy of Science Association, will be held in San Francisco. Arranged by Melvin Kranzberg (Case Institute of Technology). C. West Churchman will preside. The structure of thinking in technology, Henryk Skolimoswski (University of Southern California). The confusion between science and technology in standard philosophies of science, Joseph Agassi (University of Illinois and Boston University).

Engineering (M)

Monday 27 December

Engineering Film Theatre. Arranged by Charles F. Savage (General Electric Company, New York, New York). The following films will be repeated on 28 and 29 December. *The Petrified River* (Union Carbide). *High Speed Photography in Nuclear Reactor Development* (Argonne National Laboratories). *Domains and Hysteresis in Ferromagnetic Materials* (Bell Telephone Laboratories). *Minus 320* (U.S. Steel). *Extravehicular Activity—Gemini IV* (NASA Manned Spacecraft Center). *Gemini Mission Simulator* (NASA Manned Spacecraft Center). *Streetcar in the Sky* (TRW Space Technology Laboratories). *Aerodynamic Aspects of Project Mercury* (NASA Center). *Vela Program* (Sandia Corp.). *Engineering with Glass* (Corning Glass Works). *The Magic Molecule* (Phillips Chemical Company). *Microelectronic Reading for the Blind* (Stanford Electronic Laboratories). *Computing for Fun* (Bell Telephone Laboratories). *Memory Devices* (Bell Telephone Laboratories). *Principles of the Transistor* (Indiana University). *Submarine Cable Systems Development* (Bell Telephone Laboratories). *Taming a New Frontier* (International Harvester Co.). *Project Mohole* (Oil Information Committee). *Men, Ice, and Steel* (U.S. Army Engineer Waterways Experiment Station). *New Water for a Thirsty World* (U.S. Department of the Interior).

Wednesday 29 December

Systems Engineering in Agriculture. Symposium, arranged by Robert E. Stewart (Ohio State University), who will preside at Parts I and II.

Part I. The use of simulation methodology for the solution of operational system problems, Thomas H. Rockwell (Ohio State University). The development of planning procedures for armored weapon systems, Seth Bonder (University of Michigan).

Part II. Data needs for agricultural systems analysis, Herbert N. Stapleton and Kenneth K. Barnes (University of Arizona). Application of activity network techniques to a farm machinery scheduling problem, David A. Link (North Carolina State University). A systems approach in harvesting alfalfa hay, Kenneth Von Bargen (University of Nebraska).

Thursday 30 December

Extraterrestrial Life. Part I. Problems of Life on Mars. Arranged by Paul Rosenberg (Paul Rosenberg Associates, Pelham, New York). Harold C. Urey will preside. Life detection experiments, George L. Hobby (Jet Propulsion Labo-

ratory). Models of Martian life, Wolf Vishniac (University of Rochester). Is there life on earth, Carl Sagan (Harvard University and Smithsonian Astrophysical Observatory). Some aspects of the origin of life on mars, Stanley L. Miller (University of California San Diego, La Jolla).

Extraterrestrial Life. Part II. Communication with Extraterrestrial Intelligence. Bernard M. Oliver (Hewlett-Packard Co., Palo Alto) will preside. History of efforts to communicate with extraterrestrial intelligence, Walter Sullivan (New York *Times*). The search for a rationale for interstellar communications, Stephen H. Dole (RAND Corporation). Interstellar communication, Bernard M. Oliver. Aspects of the problem of extraterrestrial intelligence, Carl Sagan.

Medical Sciences (N)

Wednesday 29 December

Symposium on Mode of Action of Steroid Hormones. Five-part symposium.

Part I. Glucocorticoids. Arranged by Henry A. Lardy (University of Wisconsin). C. N. H. Long (Yale University) will preside. Orientation to the symposium, Henry Lardy. Early work and recent developments, C. N. H. Long. The regulation of tryptophan oxidation by hydrocortisone and tryptophan oxidation, W. Eugene Knox and M. M. Piras (Harvard University Medical School). Mechanisms involved in induction of hepatic enzymes by hydrocortisone, Francis T. Kenny, Wesley D. Wicks, Darold D. Holten, and William L. Albritton (Oak Ridge National Laboratory). Glucocorticoids and glucose interactions with liver, adipose tissue, and thymus cells, Allen Munck (Dartmouth College). Studies on the mechanism of glucocorticoid action, Philip Feigelson and Muriel Feigelson (Columbia University). Regulation of gluconeogenesis by adrenal steroids and other factors, Paul Ray, David Foster, Paul Walter, and Henry Lardy (University of Wisconsin). Action of glucocorticoid hormones on carbohydrate-metabolizing enzymes, George Weber (Indiana University, Bloomington).

Section N Luncheon.

Vice-Presidential Address of Section N. Robert E. Olson (Saint Louis University School of Medicine; secretary of Section N) will preside. My life with CO_2, A. Baird Hastings (Scripps Clinic and Resident Foundation, La Jolla, California; vice president for Section N).

Part I. Glucocorticoids (continued). C. N. H. Long will preside. Studies of the mechanism of the effects of cortisol on lymphoid tissue, Abraham White (Albert Einstein College of Medicine, New York, New York). A unified theory of glucocorticoid action: relationship to liver metabolism, Richard W. Schayer (National Institutes of Health).

Part II. Aldosterone. Roy Maffly (University of California Medical Center) will preside. Stimulation of RNA and protein synthesis, in vivo, in the rat by aldosterone, Harold E. Williamson, J. B. Hook, and T. R. Castles (University of Iowa). Studies on the mode of action of aldosterone, Geoffrey W. G. Sharp and Alexander Leaf (Harvard Medical School). Studies on the identification of the molecular receptor for aldosterone, Darrell D. Fanestil (University of California Medical Center). The role of metabolic pathways in the action of aldosterone, Grace Fimognari (University of California Medical Center).

The Genetic Code. Symposium, arranged by Robert E. Olson (Saint Louis University School of Medicine). Israel R. Lehman (Stanford University) will preside. Advances in our understanding of the genetic code, Marshall Nirenberg (National Institutes of Health). Polynucleotide synthesis and the genetic code, Gobind Khorana (University of Wisconsin).

Thursday 30 December

Part III. Estrogens. E. A. Doisy (St. Louis University) will preside and present introductory remarks. Estrogen receptors in target tissues, Ellwood V. Jensen (University of Chicago). Studies on the early action of estrogens, Jack Gorski, Angelo Notides, and David Toft (University of Illinois). Regulation of uterine metabolism by estrogen-induced alterations in the cellular environment, Clara Szego (University of California, Los Angeles). Current status of theories regarding estrogen action, Claude A. Villee and Dwain Hagerman (Harvard University Medical School). Estrogen-induced phosvitin formation in roosters, Olga Greengard (New England Deaconess Hospital).

Part IV. Androgens. Ralph Dorfman (Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts) will preside. Regulation of ribonucleic acid and protein biosynthesis by androgens, Charles D. Kochakian, Takao Hama, and Jiri Dubovsky (University of Alabama Medical Center). Testosterone and template RNA in the prostrate gland, Shutsung Liao, R. W. Barton, and Alice H. Lin (University of Chicago). Effects of estrogens on nucleic acid metabolism and enzyme activity in interstitial cells of the testis, L. T. Samuels, R. A. Huseby, T. Uchikawa, and J. L. Van Lancker (University of Utah College of Medicine). NAD biosynthesis and redox rearrangement as an early part of androgen action, Carl Ritter, Carol Love, and Jerrold Elkin (University of Pennsylvania).

Part V. Progestational Agents. Henry A. Lardy will preside. Progesterone and pseudopregnancy in the rat, Walter Wiest (Washington University). Steroidal control of fertility in mammals, Gregory Pincus (Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts).

Alpha Epsilon Delta (N1)

Preparation for the Practice of Medicine in the Next Decade. Symposium, program of Alpha Epsilon Delta and cosponsored by Sections C-Chemistry, F-Zoological Sciences, N-Medical Sciences, and Nd-Dentistry. Norman F. Witt (University of Colorado) will preside and explain the purpose of the conference. Trends for medical practice in 1975, C. C. Cutting (The Permanente Medical Group, Oakland, California). Preparation of the physician for practice in 1975, John J. Conger (University of Colorado Medical School). Education in the liberal arts college in 1975, Harold S. Jacoby (University of the Pacific, Stockton, California). Competition for admission in the next decade, Robert J. Glaser (Stanford University School of Medicine). Universities and education for health careers, John B. deC. M. Saunders (University of California College of Medicine).

Luncheon and Address. Norman F. Witt will preside. Medicare—impact on medical care, Dwight L. Wilbur (Stanford University School of Medicine). Luncheon tickets ($2.50) may be obtained by writing to Norman F. Witt, Department of Chemistry, University of Colorado, Boulder, by 15 December, or at the University during the symposium.

American Association of Bioanalysts (N2)

Monday 27 December

Session I. Kenneth Vostri (Stanford University) will preside. Virology in the medical laboratory, John Riggs (California State Department of Health, Berkeley). Etiology of glomerulonephritis, L. H. Lindberg (San Jose State College). Identification of group A streptococci in direct throat smears by means of immuno-fluorescence, Nell Hollinger (University of California, Berkeley). Evaluation of fluorescence microscopy for the medical laboratory, William N. Reich (Diagnostic Associates, Walnut Creek, California).

Session II. Hendrik L. Blum (Health Officer, Contra Costa County) will preside. Critique of evaluation procedures for the clinical laboratory, George Highland (Highland Laboratory, Atascadero, California). Significance of serotyping *E. coli* in relation to urinary tract infections, Kenneth Vostri (Stanford School of Medicine). *Panel*: The lag between research findings and laboratory application: A potential detriment to the patient public? *Discussants*: W. Keith Selvey (Selvey Laboratory, San Francisco), Lucien D. Hertert (Hertert Laboratory, San Francisco), Mario Menesini (Educational Consulting Services, Walnut Creek, California), and Oliver F. de Lalla (Lawrence Radiation Laboratory, Livermore, California).

American Physiological Society (N3)

Tuesday 28 December

Oögenesis and Early Embryonic Development. Symposium, program of the American Physiological Society and cosponsored by Section F. Arranged by Ray M. Iverson (University of Miami) and Robert E. Smith (University of California, Los Angeles). Ray M. Iverson will preside. Electron microscope studies on growth and differentiation in oöcytes, R. G. Kessel (State University of Iowa). Biochemical and structural aspects of embryonic development in the crustacean, *Artemia salina*, J. S. Clegg (University of Miami). Ultrastructural biochemical aspects of early tunicate development, Kirby D. Smith and Heinrich Ursprung (John Hopkins University). A comparison of fine structural and functional changes during oögenesis and cleavage in sea urchin and tunicate eggs and embryos, Frank H. Moyer (Washington University).

American Society for Microbiology (N4)

Wednesday 29 December

Session I. Presentation of Papers. Application of Genetics, Physiology, Biochemistry, and Molecular Biology to a Determination of Taxonomic and Evolutionary Relationships among the Protista. Symposium of American Society of Microbiology.

California Veterinary Medical Association (N5)

Monday 27 December

Animals on the Verge of Discovery. This symposium will present to research workers the species of animals recently developed for biomedical research and tell why they are more valuable or better than a laboratory mouse, rat, or rabbit.

Part I. Orland Soave (Stanford University Medical School) will preside. Frontiers in animal research, William R. Pritchard (School of Veterinary Medicine, University of California, Davis). Seals and sea lions in comparative biology, Richard C. Hubbard (Biological Sonar Laboratory, Stanford Research Institute). Miniature swine in biomedical research, Leo K. Bustad (Radiobiology Laboratory, University of California, Davis). Mutant mice as models of neurological disease processes, John Fuller (Jackson Laboratory, Bar Harbor, Maine). The Mongolian gerbil in research, Sigmond T. Rich (University of California Medical School, Los Angeles).

Part II. Sigmond T. Rich will preside. Marsupials as experimental animals, Leslie J. Faulkin (Department of Anatomy, School of Veterinary Medicine, University of California, Davis). Biological studies utilizing Japanese quail (*Coturnix coturnix japonica*), Thomas E. Shellenberger (Stanford Research Institute). Small species of primates in biomedical research, Robert W. Cooper (San Diego Zoological Society, San Diego, California). Ferocious but useful biomedical models, George A. Padgett (Department of Pathology, College of Veterinary Medicine, Washton State University). Perspectives in the development of new animals for research, Clyde Stormont (University of California, Davis).

Dinner and Address. New impressions of U.S.S.R., K. F. Meyer (G. W. Hooper Foundation, San Francisco).

Society for Experimental Biology and Medicine, Pacific Coast Section (N6)

Monday 27 December

Session for Contributed Papers. Ralph W. Brauer (U.S. Naval Radiological Defense Laboratory, San Francisco) will preside. Application of quantitative thin-layer chromatography to a microchemical phospholipase assay, Lawrence F. Eng, Richard W. Tietsort and Bruno Gerstl (Veterans Administration Hospital, Palo Alto, and Department of Pathology, Stanford University). Histochemical localization of hydrolytic enzymes in hereditary avian muscular dystrophy, G. H. Cardinet, III; W. S. Tyler; L. M. Julian; and R. A. Freedland (University of California, Davis). RNA chain initiation by *Azotobacter vinelandii* RNA polymerase, Joseph Krakow and William Horsley (Space Sciences Laboratory, University of California, Berkeley). Serum beta-glucuronidase and N-acetyl-glucosaminidase in human atherosclerosis and diabetes mellitus, Benjamin F. Miller and P. William Curreri (Department of Surgery and Harrison Department of Surgical Research, University of Pennsylvania School of Medicine). Development of catecholamine chain enzymes in the growing rat, Kent Rossman and Ernest P. Noble (Department of Psychiatry, Stanford University School of Medicine). Methionine deficiency in chick embryos, C. R. Grau, G. C. Matteson, and R. E. Austic (University of California, Davis). Acute parathion toxicity in Mallard ducks, Paul B. Lacy, L. Z. McFarland, and R. A. Freedland (University of California, Davis). Antistaphylococcal beta hemolysin antibodies in humans with neurological diseases, Charles T. Uyeda, Bruno Gerstl, and James K. Smith (Veterans Administration Hospital, Palo Alto, and Stanford University). In vitro identification of mouse antibodies against the mouse mammary tumor virus, Phyllis B. Blair (University of California, Berkeley). Effects of hypervolemia upon cardiac output and peripheral resistance in dogs, L. Lukin, (University of California Medical Center, San Francisco). The effects of osmotic stimuli on neurons in the supra-optic nucleus of the rat, Donald Novin and Ross Durham (University of California, Los Angeles). New microtome with vibratory cutting action for sectioning without embedding or freezing, M. D. Persidsky (Presbyterian Medical Center, San Francisco).

Dentistry (Nd)

Monday 27 December

The Behavioral Sciences in Dentistry. Symposium, program of Section Nd and cosponsored by Sections K-Social and Economic Sciences, I-Psychology, and N-Medical Sciences, and by the American Dental Association; American College of Dentists; International Association for Dental Research, North American Division; and the American Society of Oral Surgeons. Arranged by Grant Phipps (State University of New York at Buffalo), who will also preside.

Part I. Opening remarks and welcome by Lloyd F. Richards (vice president for Section Nd). Psychological stress in cleft palate etiology, Sanford Rosenzweig (New York University). An investigation of some of the psychosocial aspects of the "cleft palate problem," Duane C. Spriesterbach (University of Iowa). Problems in the translation of social science theory to field action—the case of fluoridation, Jerome Grossman (California State Department of Public Health). Psychologists in dental research: some social psychological parameters, Richard I. Evans (University of Houston).

Part II. The effect of audio analgesia on pain threshold and pain tolerance, Thomas Morosko (University of Houston). Experimental studies of fear reduction, Peter J. Lang (University of Wisconsin). Stress production and reduction in the laboratory and in life, Richard S. Lazarus (University of California, Berkeley). Psychophysiology of the oral cavity, Donald Giddon (Tufts University). The study of psychological responses to dental extraction in children, DeWitt C. Baldwin, Jr. (Forsyth Dental Center, Boston, Massachusetts).

American College of Dentists (Nd1)

The College is a cosponsor of Section Nd's program.

American Dental Association (Nd2)

The Association is a cosponsor of Section Nd's program.

American Society of Oral Surgeons (Nd3)

The Society is a cosponsor of Section Nd's program.

International Association for Dental Research, North American Division (Nd4)

The Association is a cosponsor of Section Nd's program.

Pharmaceutical Sciences (NP)

The program of Section Np consists of 12 sessions. Program of Section Np and cosponsored by the American Pharmaceutical Association, Scientific Section; American Association of Colleges of Pharmacy; American Society of Hospital Pharmacists; American College of Apothecaries; and the National Association of Boards of Pharmacy.

Sessions I and II. Interdisciplinary Symposium in the Medical Sciences. Materials Science in Dentistry, Medicine, and Pharmacy. Part I, 29 Dec. Part II, 29 Dec. See AAAS General Sessions.

Wednesday 29 December

Session III. Contributed Papers. Hospital Pharmacy I. Arranged by George F. Archambault (U.S. Public Health Service), Don E. Francke, and Joseph A. Oddis (American Society of Hospital Pharmacists, Washington, D.C.). Joseph A. Oddis will preside. Opening remarks and announcements by Joseph P. Buckley (secretary, Section Np). Experiences in establishing a new inpatient prescription system, Jack S. Heard (Marin General Hospital, San Rafael, California). The hospital pharmacist's responsibility relative to automedication—Part II, George F. Archambault. The sodium content of drugs and the cardiac patient, Eric Owyang and Thomas Piepmeyer (University of California, San Francisco Medical Center). Pharmacy residency—a new dimension, Louis P. Jeffrey (Albany Medical Center Hospital) and William B. Jacques (E. R. Squibb & Sons, New York, New York). The medication error problem in hospitals, Kenneth N. Barker (University of Arkansas Medical Center.

Session IV. Luncheon. Arranged by E. R. Squibb & Sons, New York. Coordinated by William B. Jacques.

Session V. Vice-Presidential Address of Section Np. Don E. Francke will preside. Future dimensions, John E. Christian.

Session VI. Contributed Papers. Hospital Pharmacy II. George F. Archambault will preside. Evaluating and implementing medication distribution and control procedures by a multidisciplinary methods improvement committee, Wendell T. Hill, Jr. (Orange County General Hospital, Orange, California). Should pharmaceutical education diversify?, John Autian. Modern concepts in production—control—assay of dialysis solutions, Janet D. McFadyen (Veterans Administration Center, Los Angeles, California). Control of emergency medications—a joint project of the medical staff and the hospital pharmacist, Thomas A. Manzelli and Angelo P. Angelides (Lankenau Hospital Philadelphia, Pennsylvania). Observations on the utilization and degradation of sodium bisulfite in intravenous dextrose solutions, Gerald E. Schumacher and Robert L. Hull (University of California Medical Center, Los Angeles). The endocrine effects of chlordiazepoxide, diazepam, and guanethidine, Edward Superstine (Hadassah Medical Center, Jerusalem, Israel).

Session VII. Reception. Program arranged by Wyeth Laboratories, Philadelphia, Pennsylvania. Coordinated by H. L. Ferrier.

Session VIII. Dinner. Program arranged by McKesson & Robbins, Inc., New York. Coordinated by Rudy Fruscella.

Thursday 30 December

Session IX. Contributed Papers I. Arranged by Joseph P. Buckley. Anne E. Daniels (University of Pittsburgh School of Pharmacy) will preside. A phytochemical study of the root of *Heracleum mantegazzianum* Somier et Levier, Eugene C. Lee, Philip Catalfomo, and Leo A. Sciuchetti (Oregon State University School of Pharmacy). In vivo fibrinolysis with a dialyzable constituent of recalcified human plasma clots, Paul H. Kopper (Washburn University). On the collagenolytic activity of the mammalian pancreas, Anwar A. Hakim (Armour Pharmaceutical Company). The development of processed heterogenous (calf) bone (basic immunology, animal studies, and clinical trials), James A. Dingwall and Ralph A. Heiser (Squibb Institute for Medical Research). Liver regeneration: relation to dose of a toxicant and measure of early toxic response, Junius M. Webb, Emilio Brouwer, Arthur A. Nelson, and Harold V. Lindstrom (Food and Drug Administration, Washington, D.C.). Evaluation of the decongestant activity of 1-phenylephrine and oxymetazoline using a simple and direct

method in humans, Dimitris Papandrianos (Colgate-Palmolive Research Center), Benjamin Calesnick (Hahnemann Medical College and Hospital, Philadelphia, Pennsylvania), J. P. Ryan and Salvatore J. DeSalva (Colgate-Palmolive Research Center). Detection, measurement, and occurrence of 2,3,5-triiodobenzoic acid (TIBA) in plant tissues, J. H. Ware, Barbara McCall, L. W. Ferrara, J. Wallner, and F. A. Hoglan (International Minerals and Chemical Corporation, Skokie, Illinois). Studies on the residue properties and metabolism of 2,3,5-triiodobenzoic acid in plants, R. Sant' Anna, C. E. Breckinridge, A. J. Ohlrogge, and John E. Christian (Purdue University School of Pharmacy). A study of the metabolism of 2,3,5-triiodobenzoic acid in the rat, R. D. Ice, C. E. Breckinridge, and John E. Christian (Purdue University School of Pharmacy). Preliminary studies on the distribution and metabolism of 2,3,5-triiodobenzoic acid (TIBA) in the laboratory rat, A. G. Ebert and J. H. Ware (International Minerals and Chemical Corporation, Skokie, Illinois). Intermediates in the biosynthesis of $\Delta^{9,10}$ from $\Delta^{8,9}$ ergoline alkaloids, Elmore H. Taylor (University of Tennessee). Toxicologic studies on ½ isopropyl ester of a copolymer of vinyl methyl ether and maleic anhydride, R. M. Small, H. M. Worth, P. N. Harris, and R. C. Anderson (Eli Lilly & Company, Greenfield, Indiana).

Session X. Section Np Distinguished Lecture. John E. Christian will preside. Biochemical aspects of mental disease, Bernard D. Brodie (National Heart Institute, National Institutes of Health, Bethesda, Maryland).

Session XI. Symposium. Statistical Methods In Bioassay. Joint program of Sections Np and U-Statistics, and the Biometric Society, ENAR. See Section U3.

Session XII. Contributed Papers II. Arranged by Joseph P. Buckley. Walter B. Severs (University of Pittsburgh School of Pharmarcy) will preside. Effect of complex formation on drug absorption III: the concentration- and drug-dependent effect of a nonionic surfactant, Gerhard Levy, Karen E. Miller, and Richard H. Reuning (State University of New York at Buffalo). Studies on the relationship of functional changes with phosphorylase activity in heart, Naranjan S. Dhalla and Paul L. McLain (University of Pittsburgh School of Medicine). Saccharin derivatives VIII: hypotensive agents, Glenn H. Hamor (University of Southern California School of Pharmacy). Mode of the hypotensive action of cryptenamine, Joseph P. Buckley and Bhagavan S. Jandhyala (University of Pittsburgh School of Pharmacy). Correlated electroencephalographic and behavioral changes under thyroid hormone deprivation, Fred Damarin (Educational Testing Service, Princeton, New Jersey), Robert Lansing (University of Arizona), and J. B. Trunnell (Brigham Young University). Pharmacogenetic studies in mice: CNS stimulants, W. Marvin Davis and William T. King (University of Mississippi School of Pharmacy). Effect of salicylates on metabolism of chlorpromazine in man, Chian Li Huang (University of Mississippi School of Pharmacy). Adrenochrome semicarbazone protection of mice against shock from colon bacillus toxin and from anaphylaxis, Humphrey Osmond, De Witt Hendee Smith, and Erica Spurdle (Bureau of Research in Neurology and Psychiatry, Princeton, New Jersey).

American Association of Colleges of Pharmacy (Np1)

The Association is a cosponsor of Section Np's program.

American College of Apothecaries (Np2)

The College is a cosponsor of Section Np's program.

American Pharmaceutical Association, Scientific Section (Np3)

The Section is a cosponsor of Section Np's program.

American Society of Hospital Pharmacists (Np4)

The Society is a cosponsor of Section Np's program.

National Association of Boards of Pharmacy (Np5)

The Association is a cosponsor of Section Np's program.

Agriculture (O)

The program of Section O consists of a seven-session symposium, Ground Level Climatology. Arranged by Robert H. Shaw (Iowa State University of Science and Technology). Program of Section O, cosponsored by Sections F-Zoological Sciences and G-Botanical Sciences, and by the following societies: American Meteorological Society (Parts I–VII), Ecological Society of America (Parts IV–VII), and Society of American Foresters (Parts I–III).

Monday 27 December

Part I. Contributed Papers. Donald W. Lynch (U.S. Forest Service, Berkeley, California) will preside. Rates of soil freezing and thawing in four river bottom stands in interior Alaska, Leslie A. Viereck (U.S. Forest Service, College, Alaska). Photoperiod as a climatic factor affecting growth of woody plants, Richard F. Watt (U.S. Forest Service, St. Paul, Minnesota). Fluctuation of basal area increment of *Pinnus monticola* in northern Idaho, 1680–1958, Albert R. Stage (U.S. Forest Service, Ogden, Utah). Some preliminary findings on the effects of insolation on white and red fir regeneration, Donald T. Gordon (Pacific Southwest Forest and Range Experiment Station, Redding, California). Influence of mean annual temperature and January-April rainfall on growth and survival of progeny from ten longleaf pine seed sources, Eugene Shoulders (Southern Forest Experiment Station, New Orleans, Louisiana). Evapotranspiration stress and distribution of *Sequoia sempervirens* (D. Donl. Endl.), Richard B. Vasey and Edward C. Stone (University of California, Berkeley). Illumination and temperature within snow cover, James D. Bergen (Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado). Racial variation in slash pine as affected by climatic factors, Anthony E. Squillace (Southeastern Forest Experiment Station, Asheville, North Carolina).

Part II. Symposium. Climatic Elements and Their Ecological Significance. Edward C. Stone (University of California, Berkeley) will preside. Predicted field response based on phytotron performance, Calvin McMillan (University of Texas). The physiological basis for the correlation between tree ring width and climate,

Harold C. Fritts (University of Arizona). Potential evaporation and plant distribution in California, Jack Major (University of California, Davis). Biometeorological inference—thoughts on the search for critical plant-environment interactions, William P. Lowry (Oregon State University).

Tuesday 28 December

Part III. Interdisciplinary Symposium in the Physical-Biological-Agricultural Sciences. Implications of Weather Modification on Ground Level Climatology. See General Sessions.

Wednesday 29 December

Part IV. Ecological Aspects of Ground Level Climatology in Relation to Plants I. Regional Aspects of Ground Level Climatology. Harold F. Heady (University of California, Berkeley) will preside. Some quantitative climatic differences between major citrus-producing areas within the United States that affect fruit growth, development, and maturity, J. E. Newman (Purdue University), W. C. Cooper (Citrus Research, U.S. Department of Agriculture, Orlando, Florida), R. H. Hilgeman (University of Arizona), and M. J. Garber and W. Reuther (University of California, Riverside). Plant species as indicators of ground level climate, J. M. Caprio (Montana State University). Microcolimatology of plains grassland, W. C. Whitman and G. Walters (North Dakota State University). Range vs. forest land-use and yields as related to mid-continental climatic gradients, E. J. Dyksterhuis (Texas A & M University).

Part V. Ecological Aspects of Ground Level Climatology in Relation to Plants II. Applications of Ground Level Climatology. Frederick A. Brooks (University of California, Davis) will preside. Windbreak influence and implications on irrigation and dryland agriculture, N. J. Rosenberg (University of Nebraska). The microclimate, before and after irrigation, L. J. Fritschen (U.S. Water Conservation Laboratory, Tempe, Arizona). Ground level climate in relation to forecasting of plant diseases, J. R. Wallin (U.S. Department of Agriculture, Iowa State University, Ames). Plant climate assay methods and uses, D. E. Gilbert (University of California, Davis).

Thursday 30 December

Part VI. Ecological Aspects of Ground Level Climatology on the Physiology and Performance of Animals I. Animal Climatology. C. F. Kelly (University of California, Berkeley) will preside. Climate and its effects on the physiology and performance of animals. A general introduction, H. D. Johnson (University of Missouri). Microclimate and livestock performance in hot climates, T. E. Bond (U.S. Department of Agriculture, Davis). Livestock performance in cold climates, C. M. Williams (University of Saskatchewan). Climate and its effects on disease, R. W. Dougherty and J. D. Olsen (National Animal Disease Laboratory, Ames, Iowa).

Part VII. Ecological Aspects of Ground Level Climatology on the Physiology and Performance of Animals II. Climatic Physiology. C. M. Winget (Ames Research Center, Moffett Field, California) will preside. Climatic effects on physiological functions, G. C. Whittow (Rutgers University). Environmental temperature and field regulatory mechanisms, W. O. Wilson (University of California, Davis). The effect of the macro- and micro-environment on the biology of mammalian reproduction, L. C. Ulberg (North Carolina State University). Methods of ameliorating adverse effects on physiological functions of animals, R. E. McDowell (U.S. Department of Agriculture, Beltsville, Maryland).

Society of American Foresters (01)

The Society is a joint sponsor of Section O's symposium, Ground Level Climatology, Parts I–III, 27–28 Dec.

Industrial Science (P)

Wednesday 29 December

Computers and Universities. Symposium, program of Section P and cosponsored by Section U-Statistics, Operations Research Society of America, and The Institute of Management Sciences. Arranged by Ralph W. Gerard (University of California, Irvine), who will also preside. Computer-aided instruction, Fred M. Tonge (University of California, Irvine). Research and education in computer science, George E. Forsythe (Stanford University). The computerized library, Martin Cummings (National Library of Medicine, Washington, D.C.). Information networks, Robert Tschirgi (University of California, Berkeley).

Luncheon and Retiring Vice-Presidential Address of Section P. Allen Bonnell (Community College of Philadelphia) will preside. The impact of industrial science on creative growth, R. Holley Keefler (Northern Electric Company, Ltd., Montreal, Canada). Presentation of 1965 Industrial Science Achievement Award by Burton V. Dean (Case Institute of Technology).

State of the Art and the Prospects for Data Gathering, Storage, Transformation, and Retrieval. Symposium, program of Section P and cosponsored by Sections T-Information and Communication and U-Statistics, Operations Research Society of America, and The Institute of Management Sciences. Arranged by J. C. R. Licklider (IBM, Yorktown Heights, New York), who will also preside. Information in the service of the user, Walter M. Carlson (Department of Defense). Plans for information transfer experiments, Carl F. J. Overhage (Massachusetts Institute of Technology). Man-computer interaction in the gathering and use of information, J. C. R. Licklider.

Operations Research Society of America (P1)

The Society is a cosponsor of Section P's program, 29 Dec.

The Institute of Management Sciences (P2)

The Institute is a cosponsor of Section P's program, 29 Dec.

Education (Q)

Sunday 26 December

Contributed Papers I. Arranged by Frederic B. Dutton (Michigan State University). Arnold Lahti (Western Washington College) will preside. Research on teaching and learning medicine: problems and prospects, Steven E. Ross (University of California School of Medicine, San Francisco). Science as art, Morris Goran (Roosevelt University). An interdisciplinary approach to science teaching for gen-

eral education on the college level, Pauline Gratz (Columbia University). Teaching intern program in biology and chemistry, Richard George Yalman (Antioch College). What's needed to improve the writing of scientists and engineers?, William A. Ternent (General Electric Company, Daytona Beach, Florida).

Monday 27 December

International Science Teaching. Symposium, arranged by Arthur H. Livermore (deputy director of education, AAAS). Arthur Roe (National Science Foundation) will preside. Science education in Brazil, Isaias Raw (Instituto Brasileiro de Educacao, Sao Paul, Brazil). New developments in chemical education in Chile, Harold Behrens (University of Chile, Santiago, Chile). Foreign assistance to science education in Latin America, Jesse Perkinson (Pan American Union, Washington, D.C.). Recent developments in science education in Iran, Amanatollah Rowshan-Zaer (University of Teheran, Teheran, Iran). The national science high school project of Turkey, J. Stanley Marshall and Ernest Burkman (Florida State University). The African science workshop, 1965, Jack S. Goldstein (Brandeis University). Continuing education of high school teachers in Japan, Claude A. Welch (Michigan State University). The Nuffield Foundation Science Teaching Project, Eric M. Rogers (Princeton University).

Piaget's Research and Its Implications for Science Education. Symposium, joint session of Section Q and the National Association for Research in Science Teaching. Arranged by Abraham S. Fischler (University of California, Berkeley), who will also preside. A preliminary report on the performance of 5th and 6th graders on a directed learning task: the pendulum, Maurice Belanger (Harvard University). Interrelations of the acquisition of some Piaget-type tasks requiring proportional thinking, Ronald J. Raven (State University of New York at Buffalo).

Measurement of Quality in Education. Symposium, joint program of Sections Q, I-Psychology, and U-Statistics, and the American Education Research Association. Arranged by Lloyd N. Morrisett (Carnegie Corporation of New York). Jack C. Merwin (University of Minnesota) will preside. Assessing the quality of graduate education, Allan M. Cartter (American Council on Education, Washington, D.C.). The quality measurement project in New York State, William Firman (New York State Education Department, Albany). The Pennsylvania plan for educational evaluation, Henry S. Dyer (Educational Testing Service, Princeton, New Jersey). Assessing the progress of education, Ralph W. Tyler (Center for Advanced Study in the Behavioral Sciences, Stanford University). *Discussants*: Charles S. Benson (University of California, Berkeley), John C. Flanagan (American Institutes for Research, Pittsburgh, Pennsylvania), and Alexander M. Mood (U.S. Office of Education).

Vice-Presidential Address of Section Q. Frederic B. Dutton will preside. Inquiry in the high school science laboratory, James A. Rutledge (University of Nebraska; vice president of Section Q).

Contributed Papers II. Arranged by Frederic B. Dutton, who will also preside. Punched card programmed analog computer with application to the teaching of physiology, physics, and chemistry, John S. Jackson and C. T. Maney (University of Kentucky). Learn by playing?, Peter Kugel and Martin F. Owens (Technical Operations Research, Burlington, Massachusetts). The influence of massive rewards on reading achievement in potential school dropouts, Carl A. Clark (Illinois Teachers College, Chicago) and Herbert J. Walberg (Educational Testing Service, Princeton, New Jersey).

Thursday 30 December

Curriculum Development for Elementary School Science. Symposium, joint session of Section Q, the National Association in Science Teaching, and the American Educational Research Association. Arranged by William W. Cooley (University of Pittsburgh), who will also preside. Lawrence Lowery (University of California); Joseph Lipson (University of Pittsburgh). *Discussants*: Maurice Belanger (Harvard University) and William W. Cooley.

Contributed Papers III. Arranged by Frederic B. Dutton. Fred Fox (Oregon State University) will preside. Statistical controls in educational research, Philip H. DuBois (Washington University). A summary of 15 yearly studies of mass media participation by children (1949–65), Paul Witty (Northwestern University). Humanistic efficiency: the program of school science curriculum project, Richard F. P. Salinger (School Science Curriculum Project, Urbana, Illinois). The Delacato interpretation of neurological organization: an empirical study, Melvyn P. Robbins (University of British Columbia). Library people and computer people—progress and problems in communication, R. J. Tritschler (I.B.M., Poughkeepsie, New York).

AAAS Commission on Science Education (Q1)

Thursday 30 December

Panel. Reports from Course Content Projects in the Social Sciences. Program sponsored by the AAAS Commission on Science Education. Arranged by John R. Mayor and Arthur H. Livermore (AAAS, Washington, D.C.) John R. Mayor will preside. Anthropology curriculum study project, Robert Hanvey (University of Chicago). Sociological resources for secondary schools, Robert A. Feldmesser (Dartmouth College). High school geography project, Nicholas Helburn (Montana State College).

Panel. Discussion of Junior High School Science. Joint program of the AAAS Commission on Science Education and the Cooperative Committee on the Teaching of Science and Mathematics. Arranged by John R. Mayor and A. H. Livermore. Robert Jastrow (Columbia University) will preside. *Panel*: Robert Gagné (American Institutes for Research, Pittsburgh), Bentley Glass (State University of New York, Stony Brook), Paul D. Hurd (Stanford University), Frank B. Lindsay (State Department of Education, Sacramento, California), and Richard Netzel (Wisconsin State University, Oshkosh).

American Educational Research Association (Q2)

The Association has arranged a joints session with Section Q on 30 Dec.

California Science Teachers Association, Northern Section (Q4)

The Section is serving as host at the regional meeting of the parent organization, National Science Teachers Association.

Cooperative Committee on the Teaching of Science and Mathematics (Q6)

The Committee is a joint sponsor of a program of the AAAS Commission on Science Education, 30 Dec.

Science Teaching Societies Affiliated with AAAS (Q10)

The following is the coordinated program of: American Nature Study Society (Q3), Central Association of Science and Mathematics Teachers (Q5), National Association for Research in Science Teaching (Q7), National Association of Biology Teachers (Q8), and National Science Teachers Association (Q9), in chronological sequence.

Monday 27 December

Science Teaching Films. Joint program of all science teaching societies. Arranged by J. David Lockard (University of Maryland).

Joint General Session. Implementing Science Programs. Joint program of all science teaching societies. Arranged by Harry K. Wong (Menlo-Atherton High School, Atherton, California), who will also preside. *Platform Guests*: representatives of all science teaching societies. Introduction by Laura M. Doyle (California Curriculum Commission, Sacramento). Finding the core of a science, Clifford Grobstein (University of California, San Diego).

Concurrent Session I. J. Darrell Barnard (New York University) will preside. *Panel*: Hiden T. Cox (California State College, Long Beach), Keith McNab (Sir Francis Drake High School, San Anselmo, California), Herbert A. Smith (Colorado State College), and Walter A. Thurber (Syracuse University).

Concurrent Session II. Arthur L. Costa (Sacramento County Schools) will preside. *Panel*: Willard J. Jacobson (Columbia University), George G. Mallinson (Western Michigan University), Albert Towle (James Lick High School, San Jose, California), and Clyde D. Willson (University of California, Berkeley).

Concurrent Session III. James T. Robinson (Los Angeles County Schools) will preside. *Panel*: Barbara Hopper (Cleveland High School, Reseda, California), Robert Karplus (University of California, Berkeley), Addison E. Lee (University of Texas), and John G. Navarra (Jersey City, N.J., State College).

Concurrent Session IV. Paul deH. Hurd (Stanford University) will preside. *Panel*: Leo Brewer (University of California, Berkeley), Gordon E. Peterson (San Marino, Calif., High School), Wendell M. Stanley (University of California, Berkeley), Celia B. Stendler (University of Illinois), and Matthew F. Vessel (San Jose State College).

Joint Mixer of All Science Teaching Societies. The mixer is provided through the courtesy of publishers—The Macmillan Company; Harper and Row; D. C. Heath; Harcourt, Brace and World; and Silver-Burdett Company.

Tuesday 28 December

American Nature Study Society. Session I. Science Teaching—The Nature Study Approach. Verne N. Rockcastle (Cornell University) will preside. The attitude-building aspect of nature study, John A. Gustafson (State University of New York at Cortland). The nature of understanding, Jim Anderson (Oregon Museum of Science and Industry). The use of mathematical relations in elementary school science, Herbert Mason (University of California, Berkeley). Physical science—an outdoor approach, Herbert D. Thier (University of California, Berkeley). The influence of chemistry in the nature study approach to science, Chester O'Konski (University of California, Berkeley). Nature study—the physical sciences in context, Richard F. P. Salinger (University of Illinois). Caelum mundus for children, William Aho (Walnut Creek School District). Why nature study will return to the curriculum, Roland Case Ross (California State College, Los Angeles).

National Science Teachers Association. Panel. Science for Elementary School Children. Joint session of NSTA and CASMT. Ruth L. Roche (San Fernando Valley State College) will preside. Teaching science in the primary grades, Eugenia Bernthal (Pasadena City Schools). Teaching science in the intermediate grades, Ben Strasser (Los Angeles County Schools). How elementary teachers keep up-to-date in science, Arthur L. Costa (Sacramento County Schools).

American Nature Study Society Luncheon, Presidential Address, and Annual Business Meeting. Howard E. Weaver (president elect, ANSS) will preside. More important than spirit, Verne N. Rockcastle (president, ANSS).

National Association of Biology Teachers Session 1a. Specific Techniques in Biology. Arranged by Richard Beidleman (Colorado College). Arnold Baines (Mills High School, Millbrae) will preside. Teaching genetics concepts using yellow-green soybeans, Nicholas W. Eigsti (Ball State University, Muncie, Indiana). Teaching basic vertebrate anatomy in the laboratory, Darwin R. Thorpe (Compton, Calif., College). The teaching of evolution using Bennett population cages, Marion S. Baran (Riverside-Brookfield, Ill., Township High School). Starch gel electrophoresis utilizing simple equipment, Sister Mary Ivo (School Board of the Chicago Archdiocese).

American Nature Study Society Session II. School Programs in Outdoor Education. H. Seymour Fowler (Pennsylvania State University) will preside. How to teach wilderness conservation, Cecily M. Christy (Sierra Club, San Francisco, California). Function and use of a school zoo, James G. Lawrence (Taylorsville Elementary School, Salt Lake City, Utah). Acquisition of BLM lands for outdoor education, Ben Brisco (Avenal School District, Kings County, California). A college wildlife area and its use, Louis S. Heinrich (American River Junior College, Sacramento). Highlights in a field biology institute, John R. Arnold (Sonoma State College, Rohnert Park, California). Outdoor education programs in California, John F. Shrawder (California Department of Conservation, Sacramento). The modern resident outdoor school, William M. Hammerman (San Francisco State College) and Richard M. Brians (Stanislaus County Department of Education). Total curriculum in outdoor education, Esther R. Railton (California State College at Hayward).

National Science Teachers Association Panel. Science for Preparing Elementary Teachers. Joint program of NSTA and CASMT. Arnold M. Lahti (Western Washington State College) will preside. Recommendations for science courses for elementary teachers, Edwin B. Kurtz (University of Arizona and AAAS). Using the laboratory to prepare elementary teachers to teach science, T. Wayne Taylor (Michigan

State University). Professional education for elementary teachers, Harold E. Tannenbaum (Hunter College).

National Association of Biology Teachers Session 1b. BSCS and Research Participation Programs. Arnold Baines (Mills High School, Millbrae, California) will preside. Stimulating creativity: the BSCS student, Paul Geisert (Oak Park and River Forest, Ill., High School). Preparing a student's guide for the BSCS yellow version, M. Cassandra Hickey (Medford, Mass., High School). Student participation in an NSF-RPP-sponsored ground squirrel study, Arthur A. Biederman (Twality Junior High School, Tigard, Oregon). An experimental institute for elementary teachers, Gladys Kleinmann (Rutgers University).

National Science Teachers Association Panel. Teaching Science in the Junior College. Joint program of NSTA and CASMT. John W. Dunn (Peralta Junior College District, Oakland, California) will preside. New approaches in the biological sciences, James H. Mathewson (San Diego State College). New approaches in the physical sciences, William T. Mooney, Jr. (El Camino College, California).

American Nature Study Society Naturalists' "At Home"—Lenses on Nature (Annual Slide Show). The host is the Western Section of ANSS. Catherine D. Evenson (Lewis and Clark College) will preside. In addition to the showing of slides by members, the program will include the show of Robert Stebbins' Sierra Club film, *Nature Next Door*.

Wednesday 29 December

National Association of Biology Teachers. Teacher Demonstrations. How-To-Do-It Session. Arranged by Roy Rosendahl (Homestead High School, Cupertino, California). Demonstration of operative heart, Norm Arslan (Aragon High School, San Mateo, California). Classroom application of basic training for animals, William L. Brisby (Fillmore Union High School, Fillmore, California). Maintenance and use of marine aquaria, Andrew Browne (Los Altos High School, Los Altos, California). Preservation of vertebrates in salt solution, Gordon Chan (Sir Francis Drake High School, San Anselmo, California). Ecology in the junior high school, Mary Ann Church (Ladera Vista Junior High, Fullerton, California). *Drosophila* cultures on time, Bernard J. Cline (Los Gatos High School, Los Gatos, California). Use of x-ray plants in teaching genetics, Linda Eller (St. Matthews Episcopal Day School, San Mateo, California). Radioisotopes in the high school biology classroom, Glenn M. Farrell (Orange County Superintendent's Office). Do-it-yourself kit for DNA replication and protein synthesis, Larry Flammer (Del Mar High School, San Jose, California). Fertilization and development in sea urchin, Sadako Hayase (Palos Verdes High School, Palos Verdes, California). Bring the world into your classroom—the terrarium, Glen A. Hoggan (Harper and Row, Pleasanton, California). Expressing the thickness of a bubble as an order of magnitude—and—observing a small system using the inquiry method, Frank Lipousky, (Encinal School, Menlo Park, California). Experiments in radiation biology, Stephen Maltz (Chabot College, San Leandro, California). DHEW-it-yourself evolution, Martin Marcus (Peninsula School, Menlo Park, California). Motivation for the teaching of genetics, Gordon Murphy (University of Oregon). The use of the ergograph in showing muscle fatigue, J. J. Olenchalk (Antioch Junior High School, Antioch, California). Scientific art media, Richard E. Reed (Del Vallejo Junior High School, San Bernardino, California). Life in the soil, Sister M. Claire Antoine, CSC (Sisters of Holy Cross, Mountain View, California). Experiments in metabolism, Sister Irene Marie, SND (Notre Dame High School, Marysville, California). Chromatography and electrophoresis, Ivor Smith (University of Texas Dental Branch, Houston). A lot of noise or a little water-respiration, W. J. Spangenberg (Spokane Community College).

American Nature Study Society Session III. Interpretive Naturalist and Visitor Information Programs in the West. Program in cooperation with the Association of Interpretive Naturalists. Howard E. Weaver (University of Illinois) will preside. The municipal naturalist program, Paul F. Covel (Park Department, Oakland). Interpretation—is the regional way the most reasonable way?, O. Christian Nelson (East Bay Regional Parks, Oakland). The interpretive program in the California State Park System, John H. Michael (Division of Beaches and Parks, Sacramento). The function and design of visitor-information centers, Albert H. Culverwell (U.S. Forest Service, Ogden, Utah). National forest visitor information service in California, Emil Koledin (U.S. Forest Service, San Francisco). Trends in interpretation, Russell K. Grater (National Park Service, Sequoia National Park). Training and placement of interpretive naturalists and visitor information specialists—viewpoints of a university administrator, Arnold W. Bolle (University of Montana).

National Science Teachers Association Session I. Invited Address. Joint program of NSTA and CASMT. Observing and evaluating teaching techniques and classroom activities in elementary science, Harold E. Tannenbaum (Hunter College).

The following 3-hour work sessions are joint programs of the National Science Teachers Association and the Central Association of Science and Mathematics Teachers.

NSTA Work Session on Junior College Science Programs I. Technical Science Courses. Frank J. Ziol (Pasadena City College) will preside.

Concurrent NSTA Work Session on Junior College Science Programs II. Courses for Science Majors. Richard A. Lungstrom (American River Junior College) will preside.

Concurrent NSTA Work Session on Junior College Science Programs III. Science for General Education. Herbert Drapkin (Fullerton Junior College) will preside.

Concurrent NSTA Work Session on Junior College Science Programs IV. Repair of Poor Backgrounds in Science and Mathematics. William T. Mooney, Jr. (El Camino College), will preside.

NSTA Session II. Report on Public Law 89-10, Elementary-Secondary Education Act. Speaker, A. Neal Shedd (U.S. Office of Education).

NSTA Session III. Physical Sciences for the Junior High School. Milo K. Blecha (University of Arizona) will preside. Maintaining balance in the junior high school program, John H. Marean (University of Nevada). The earth and space sciences, Albert R. Hibbs (California Institute of Technology). The role of the laboratory in the junior high school, A. Neal Shedd.

National Association of Biology Teachers Report Session. Leland S. McClung (President, NABT) will preside. James T. Robinson, Secretary of NABT, will present the report.

National Association of Biology Teachers Luncheon and Address. Richard G. Beidleman (Colorado College) will preside. Brains and learning, Ralph W. Gerard (University of California, Irvine).

American Nature Study Society Session IV. Natural history of the West with emphasis on the Bay Region. Arthur H. Nelson (San Francisco State College) will preside. Reading the landscape—an introduction to ecology, May T. Watts (Morton Arboretum, Lisle, Illinois). Western rivers and man's impact on them, Stanley B. Mulaik (University of Utah). Regional natural history guides, Arthur C. Smith (California State College at Hayward). Fauna of the Bay Area with special references to the intertidal zone, Howard Cogswell (California State College at Hayward). Intertidal fishes of northern California, Donald Hanham, Jr., and Robert R. Rofen (Aquatic Research Institute, Stockton, California). The distribution and occurrence of vertebrates in the San Francisco Bay area, Ferdinand S. Ruth (Lawrence Hall of Science, University of California, Berkeley). Geology and fossil life—the Irvingtonian fauna of the Bay Region, Wes Gordon (San Lorenzo School District).

National Association of Biology Teachers Session IIa. Teacher Training and Resource Use in Biology. Robert Brandeberry (Aragon High School, San Mateo) will preside. Cytology for in-service biology teachers, Thomas R. Mertens and Jerry J. Nisbet (Ball State College, Muncie, Indiana). Biology methods for in-service teachers, Jerry J. Nisbet and Thomas R. Mertens. Use of community resources in teaching biology concepts at the secondary level. Kenneth J. Bandelier (New Haven, Indiana, High School). New attitudes in science education toward science archives, Myrl C. Lichtenwalter (Wells High School, Chicago, Illinois).

National Science Teachers Association Session IV. Planning a Local Action Program in Science Curriculum Development. Joint program of NSTA and CASMT. Robert A. Rice (University of California, Berkeley) will preside. Developing a program for local action, Albert F. Eiss (associate executive secretary, NSTA). The role of in-service education, Mauri Gould (University of California, Berkeley). The role of evaluation, Paul deH. Hurd (Stanford University).

CETS Session. Improving College Science Programs. Stanley E. Williamson (Oregon State University) will preside. *College Science for General Education*: Biological sciences, James H. Mathewson (San Diego State College); Physical sciences, Arnold A. Strassenburg (University of Kansas); and

Earth-space sciences, Chalmer J. Roy (Iowa State University). The role of the NSTA Commission on the Education of Teachers of Science, Herbert A. Smith (chairman, CETS). Efforts of individual colleges, V. L. Parsegian (Rensselaer Polytechnic Institute).

National Association of Biology Teachers Session IIb. Developments in Biology Teaching. Robert Brandeberry (Aragon High School, San Mateo). A model biology curriculum, Alfred Novak (Stephens College, Columbia, Missouri). Multiple response systems and science teaching, Charles Ostrander (Merced, California, College). New developments in elementary school biology, John D. Cunningham (Florida State University).

National Science Teachers Association Report Session. Reports of Junior College Discussion Groups. Robert A. Rice (University of California, Berkeley) will preside.

Joint Field Trip of American Nature Study Society and National Association of Biology Teachers. The trip includes Lake Merritt, Tilden Nature Areas, Tilden Botanical Garden, Lafayette Reservoir, and Diablo Valley College Science Center. Tom Stayeart (Diablo Valley College) will serve as guide.

Thursday 30 December

Research Tour, All Science Teaching Societies. Arranged by Don Granholm (Cubberly High School, Palo Alto, California). The trip includes a visit to Chevron Research Company, Richmond, and Richmond Field Station, University of California.

Information and Communication (T)

Monday 27 December

Panel. Current Issues in Communication of Science II. The Scientific Meeting and Related Publications. Arranged by Richard Kenyon (American Chemical Society, Washington, D.C.), who will also preside. *Panel members*: Philip H. Abelson (editor, *Science*, AAAS); Walter M. Carlson (Department of Defense, Washington, D.C.), Julius Comroe (School of Medicine, University of California, San Francisco), Norwood Russell Hanson (Yale University), and Michael J. Moravcsik (Lawrence Radiation Laboratory).

Vice-Presidential Address of Section T. Phyllis V. Parkins (*Biological Ab-*

stracts, Philadelphia, Pennsylvania) will preside. The Greeks had a word for it, Robert C. Miller (California Academy of Sciences; vice president for Section T).

Communication in Animals and Men. Symposium, arranged by Robert C. Miller, who will also preside. Communication in monkeys and apes —and man, Peter Marler (University of California, Berkeley). Signaling systems for control of trained marine mammals in the open ocean, W. E. Evans (U.S. Naval Ordnance Test Station, China Lake, California, and University of California, Los Angeles) and F. G. Wood (Naval Missile Center, Point Mugu, California). Biological sonar, Thomas R. Poulter (Stanford Research Institute).

Luncheon and Address. Mark Hopkins and the one-eyed monster, James Day (Station KQED, San Francisco). Price of the luncheon ticket is $3. Persons who will attend should send money (by 17 December) to Ann L. Farren, *Biological Abstracts*, 3815 Walnut Street, Philadelphia, Pennsylvania.

Thursday 30 December

Panel. Strengthening the Scientist's Communicative Skills. Joint program of Section T and the Society of Technical Writers and Publishers. Arranged by Gunther Marx (Illinois Institute of Technology Research Institute, Chicago), who will also preside. *Panel members*: Harold Hornby (NASA Ames Laboratory, Sunnyvale, California), Carl M. Johnson (U.S. Navy Electronics Laboratory, San Diego, California), H. C. McDaniel (Westinghouse Electric Corporation, Pittsburgh, Pennsylvania), James W. Souther (University of Washington), and Milton Silverman (California Wine Research Institute, San Francisco).

National Association of Science Writers (T1)

The program of the Association consists of a business meeting and address, and the annual dinner and announcement of AAAS-Westinghouse Science Writing Awards (27 Dec.).

Society of Technical Writers and Publishers (T2)

The Society has a joint program with Section T, Strengthening the Scientist's Communicative Skills, 30 Dec.

Statistics (U)

Wednesday 29 December

Experiments on Operating Information Systems. Symposium, joint program of Sections T—Information and Communication and U and cosponsored by the American Statistical Association and the Institute of Mathematical Statistics. Arranged by Ezra Glaser (National Bureau of Standards, Washington, D.C.), who will also preside. Experiments with search systems of the U.S. Patent Office, Edward C. Bryant and Donald W. King (Westat Research Analyst, Inc., Bethesda, Maryland). Experiments using graph-theoretic techniques for characterizing users according to professional interests and retrieval effectiveness, Chacko Abraham (Thomas J. Watson Research Center of IBM, Yorktown Heights, New York). *Discussant*: Eugene Wong (University of California, Berkeley).

Thursday 30 December

Vice President's Session. Special Invited Address. Joint session of Section U and 5th Berkeley Symposium on Mathematical Statistics and Probability. Jerzy Neyman (University of California, Berkeley) will preside. The classical problem—goodness of fit, Oscar Kempthorne (Iowa State University).

American Statistical Association (U1)

The Association is a cosponsor of Section U's entire program.

BIO (Biomedical Information-Processing Group) Association for Computing Machinery (U3)

The Biomedical Information Processing Organization is a cosponsor of the two-session symposium of the Society of Systematic Zoology, Biological Data Retrieval and Computer Analysis, 30 Dec.

Biometric Society, Eastern North American Region (U3)

Thursday 30 December

Statistical Methods in Bioassay. Symposium, joint program of Sections Np—Pharmaceutical Sciences and U, and the Biometric Society, ENAR. Arranged by Douglas S. Robson (Cor-

nell University), who will also preside. Using prior information to plan routine assays, Byron William Brown (University of Minnesota). The "up and down method" in bioassay, Wilfred J. Dixon (University of California, Los Angeles). Statistical procedures for quantitative response bioassay when parallelism does not obtain, Charles Philip Cox (Iowa State University) and Paul E. Leaverton (State University of Iowa).

Biometric Society, Western North American Region (U3)

Program cosponsored by Section U.

Session for Contributed Papers I. Dimensions of total and sex-specific mortality in the United States, Harley B. Messinger (University of California, Berkeley). Life testing for biometricians, Benjamin Epstein (statistical consultant, Palo Alto, California). An empirical Bayes approach in routine parallel line assay, Gerald R. Chase (Stanford University). Some additional applications of stochastic models to the effect of antibiotics on bacterial populations, Sven Nissen-Meyer (University of California, Berkeley). Nonparametric tests and estimates of scale in the two-sample problem, Galen R. Shorack (University of Washington).

Studies on Pregnancy and Child Development. Jacob Yerushalmy will preside. (The chairman and all speakers are members of the Division of Biostatistics, School of Public Health, University of California, Berkeley). On the methodology of group comparisons in longitudinal growth studies, John Wingerd. On the relationship of maternal height and weight to pregnancy outcome, Robert Scholtz. Differences in low birth weight infants of short and long gestation, Bea van den Berg and Michael Zwerdling. Factors pertaining to prolonged pregnancy and its outcome, Michael Zwerdling. Fetal, infant, and childhood mortality in relation to mother's previous losses, Roberta Christianson.

Fifth Berkeley Symposium on Mathematical Statistics and Probability (U4)

Monday 27 December

Weather Control. Five-session program of the Weather Modification Section of the 5th Berkeley Symposium on Mathematical Statistics and Probability and cosponsored by Section U

—Statistics and the American Meteorological Society.

The 5th symposium sessions on Carcinogenesis and on Sequential Clinical Trials could not be incorporated into the AAAS meeting and will be held 3–7 January 1966.

Session I. William B. Fretter (University of California, Berkeley) will preside. Welcoming address by Jerzy Neyman. Physical factors in precipitation processes and their influence on the effectiveness of cloud seeding, Morris Neiburger (University of California, Los Angeles). Cloud seeding experiments in Australia, E. J. Smith (Commonwealth Scientific and Research Organization, Sydney, Australia). Weather modification experiments in France, J. Bernier (Laboratoire d'Hydraulique de Chatou, Paris, France). Design and evaluation of randomized wintertime cloud seeding at high elevation, Donald L. Eberly and Lewis H. Robinson (Pacific Gas and Electric Company, San Francisco, California). The Bureau of Reclamation's atmospheric water resources research program, Archie Kahan (U.S. Department of the Interior, Denver).

Session on Information Processing, and Cognition. Cornelius A. Tobias (University of California, Berkeley) will preside. Paper by Mary A. B. Brazier (University of California, Los Angeles). Modeling the formation and use of concepts, percepts, and rules, Walter Reitman (University of Michigan). Elementary perceiver and memorizer III: processes and structures, Edward A. Feigenbaum (Stanford University). Recognition of pattern in periodic binary sequences, Julian Feldman (University of California, Irvine). Measures of self-organization in a system of turing automata, Walter R. Stahl (Oregon Regional Primate Research Center). Quantum noise and information, Hans J. Bremermann (University of California, Berkeley). Mathematical models for neural networks, Violet R. Cane (Cambridge University, England). Adaptive processes and artificial intelligence, Richard Bellman (University of Southern California).

Weather Control, Session II. Morris Neiburger will preside. Summary of results of a randomized cloud seeding project in Arizona, Louis J. Battan and A. R. Kassander, Jr. (University of Arizona). Weather modification experiments in Bavaria, Hans G. Muller (Institut für Physik der Atmosphäre, München, Germany). Statistical as-

pects of the Climax, Colorado, weather modification experiment, Lewis O. Grant (Colorado State University). Some problems with the statistical analysis of weather modification experiments, Wendell Mordy (University of Nevada). Freezing nuclei measurements and their interpretation, Dwight B. Kline (U.S. Weather Bureau, Washington, D.C.)

Session on Astronomy. Rudolph Minkowski (University of California, Berkeley) will preside. Age distribution of galaxies, W. H. McCrea (University of London, England). Evolution of galaxies, E. Margaret Burbidge (University of California, San Diego). Masses of galaxies: singles and in systems, Thornton L. Page (Van Vleck Observatory, Middletown, Connecticut, and Smithsonian Astrophysical Observatory, Cambridge, Massachusetts). Space distribution of dark nebulae, Beverly Lynds (University of Arizona). Correlations between magnetic field, radical velocity, and brightness on the sun, William C. Livingstone (Kitt Peak National Observatory, Tucson).

Session on Demography. Jacob Yerushalmy will preside. Stochastic models for the evaluation of population policies I: approaches to data analysis, Mindel C. Sheps (Columbia University). Stochastic models for the evaluation of population policies II: results of a Monte Carlo program, E. B. Perrin (University of Washington). Estimating the trajectory of a population, Nathan Keyfitz (University of Chicago).

Tuesday 28 December

Weather Control. Session III. Lincoln Moses (Stanford University) will preside. Cloud seeding experiments in Israel, K. R. Gabriel (Hebrew University, Jerusalem, Israel). On an experiment for hail suppression in Switzerland, P. Schmid, (Eidg. Anstalt für das Fortstliche Versuchswesen, Zurich, Switzerland). The design and execution and evaluation of a physical experiment in weather modification, Charles L. Hosler (Pennsylvania State University). Paper by Vujica M. Yevdjevich (Colorado State University). Randomized cloud seeding in the United States, Arnold Court (San Fernando Valley State College, San Fernando, California).

Session on Statistical Theory. Erich L. Lehmann (University of California, Berkeley) will preside. Spectral analysis of line processes, M. S. Bartlett (Uni-

versity College, London, England). On sequences of random events, Walter L. Smith (University of North Carolina). The deterministic-stochastic transition in control problems, and use of maximum and integral transforms, Peter Whittle (University of Manchester, England). Sequences of statistical decision problems, James F. Hannan (Michigan State University). Two action compound decision problems, M. V. Johns, Jr. (Stanford University).

Weather Control. Session IV. Round Table Discussion of Statistical Aspects of the Weather Modification Problem. Lucien LeCam (University of California, Berkeley) will be moderator. *Opening paper*: Variability factor in weather modification evaluation, James E. McDonald (University of Arizona). *Discussants*: Ralph Bradley (Florida State University) and Lincoln Moses (Stanford University). *Closing paper*: Some outstanding problems, Jerzy Neyman and E. L. Scott (University of California, Berkeley).

Session on Chance Mechanisms in Live Organisms. Sanford S. Elberg (University of California, Berkeley) will preside. Problem of single cell vs. multicell origin of a tumor, David Linder (San Francisco Children's Hospital). *Discussant*: W. Buhler (University of California, Berkeley). Stochastic model for the distribution of radioactive material in a connected system of compartments, S. R. Bernard, L. R. Shenton, and V. R. Rao Uppuluri (Oak Ridge National Laboratory). Distribution under LeCam's model of the number of virulent bacteria at time of death of the host, Prem S. Puri (University of California, Berkeley). Comparison of two survival series in the presence of different censoring distributions, Brad Efron (Stanford University).

Weather Control. Session V. James Hughes (Office of Naval Research, Washington, D.C.) will preside. Latent heat of vaporization released experimentally by adding sodium chloride particles to the atmosphere, A. T. Spencer (Woods Hole Oceanographic Institution) and Alfred H. Woodcock (University of Hawaii).

Wednesday 29 December

Session on Decision Theory Applied to Medical Diagnosis. David Blackwell (University of California, Berkeley) will preside. Sequential rank tests, Ralph A. Bradley (Florida State Uni-

versity). Some decision making techniques applicable to medical sciences, John T. Chu (University of Pennsylvania). Decision theoretical comparison of three screening procedures for a single disease, Charles Flagel (Johns Hopkins Hospital). Frequentist decision theoretical approach to automated medical diagnosis, Morris F. Collen and Leonard Rubin (The Permanente Medical Group, Oakland, California). Logical analysis in medical diagnosis, Lee B. Lusted (Oregon Regional Primate Research Center). On the asymptotic behavior of k-means, James Macqueen (University of California, Los Angeles).

Statistical Problems of Genetics. Session I. Spencer W. Brown (University of California, Berkeley) will preside. Stochastic processes reflecting lineage, G. Malecot (University of Lyon, France). The number of isoalleles maintained in a locus, Samuel Karlin (Stanford University). Formation of recombinants of closely-linked loci in a finite population, James McGregor (Stanford University). Linkage and natural selection, Richard C. Lewontin (University of Chicago).

Session II. Everett Dempster (University of California, Berkeley) will preside. The concept of genes being identical by descent, Oscar Kempthorne (Iowa State University). A bacteriophage model, J. Gani (University of Sheffield, England). Models for DNA mediated bacterial transformations, Walter F. Bodmer (Stanford University School of Medicine). Physical abnormalities, chromosome patterns, and fingerprints, F. N. David (University College, London). Statistical analysis of chromosome patterns, D. E. Barton (University College, London).

Session III. Jerzy Neyman will preside. Genetic diversity and diversity of environment: biological aspects, Th. Dobzhansky (Rockefeller Institute). Genetic diversity and diversity of environment: mathematical aspects, Howard Levene (Columbia University).

Thursday 30 December

Session on Statistical Problems of Ecology. Thomas Park (University of Chicago) will preside. Stochastic processes in ecology, Douglas G. Chapman (University of Washington). The role of statistical research in salvaging our deteriorating environment, LaMont C. Cole (Cornell University). The use of

information theory in the study of diversity of biological populations, E. C. Pielou (Department of Forestry, Ottawa, Canada). Seasonal periodicity in ecological populations, J. G. Skellam (The Nature Conservancy, London, England).

Session on Statistical Problems of Epidemiology. Reuel A. Stallones (University of California, Berkeley) will preside. Some results of empirical epidemiological studies, C. C. Spicer (General Register Office, London, England). Space-time contagion, Evelyn Fix (University of California, Berkeley). The distribution of the total size of an epidemic, H. E. Daniels (University of Birmingham, England). Papers by Norman T. J. Bailey (Oxford University) and J. O. Irwin (University of Sydney, Australia).

Institute of Mathematical Statistics (U5)

The Institute is a cosponsor of all sessions of Section U.

Science in General

The following are programs of organizations not affiliated with any single section.

Academy Conference (XI)

Monday 27 December

Business Meeting

Academies of Science between Meetings II: Improvement of Science Teaching. Karlem Riess (Tulane University) will preside. How academies of science can improve science teaching in their own states, John R. Mayor (director of education, AAAS). *Discussants*: Ted F. Andrews, (Commission on Undergraduate Education in the Biological Sciences, Washington, D.C.) and Paul Klinge (Indiana University Foundation).

Open Discussion. The Undergraduate College Curriculum. James A. Rutledge (president elect, Academy Conference) will preside. *Speaker*: Martin W. Schein (Commission on Undergraduate Education in the Biological Sciences, Washington, D.C.). *Discussion leader*: George E. Lindsay (California Academy of Sciences).

Academy Conference Dinner and Presidential Address. J. Teague Self (past president, Academy Conference) will preside. Presentation of Distinguished Service Awards by Clinton L. Baker (Southwestern College, Memphis). Academy highlights—historic and otherwise, Karlem Riess.

Tuesday 28 December

American Junior Academy of Science Program I. Wilmer W. Tanner (Brigham Young University) will preside. Resonant detection of light pressure in air, Timothy Strand (Laurel High School, Iowa). The gravitational separation of ions in solution, Robert E. Galloway (Central High School, Tulsa, Oklahoma). A generalization of the methods of continuous field study, Alan A. Wray (Fayetteville High School, Arkansas). Thirty-day weather forecasting—review of a fifty-month experiment, Grant Eichler (Lyons Township High School, La Grange, Illinois). Water binding by a glycoprotein, Tee Guidotti (Burroughs High School, Burbank, California). An experimental magnetohydrodynamic three-phase alternating current power generator, Aubrey Strode, Jr. (Liberty High School, Bedford, Virginia). Hydrogen isotope substitutions in algae, Varel Freeman (Hinckley High School, Aurora, Colorado). A study of a minimum surface for a volume with base restrictions, Bruce J. Preston (Bayley-Ellard High School, Madison, New Jersey).

American Junior Academy of Science Program II. William W. Scott (National Science Foundation) will preside. Do pesticides used by farmers of the Maniece Bayou drainage district kill fish in the bayous and lakes?, Jim Lloyd Pickren (Lewisville High School, Arkansas). A study of the effect of aspirin on the nervous systems of white rats, Terrance Godar (Marion High School, Iowa). A study of the effects of six drugs on chick embryo development, Cynthia A. Fite (Donart High School, Stillwater, Oklahoma). The auxin factor in hydrotropism, Mary Peg Marsh and Barbara Lee (Regina Dominican High School, Wilmette, Illinois). Reptiles and amphibians of the City and County of San Francisco, David Morafka (Lowell High School, San Francisco, California). Experimentation in genetics, Alice Earlene Mitchell (William Byrd High School, Vinton, Virginia). Skin graft-

ing, Larry Martin (Woodlin High School, Woodrow, Colorado). Natural inhibition in plants, Kurt Meyers, Teaneck High School, New Jersey).

19th Annual Junior Scientists Assembly (31 Dec.). Program chairman is Robert A. Rice (University of California, Berkeley).

Scientific Research Society of America (X2)

Wednesday 29 December

Joint Luncheon of the Society of the Sigma Xi and the Scientific Research Society of America.

Annual Address of the Scientific Research Society of America and Award of the William Procter Prize. William E. Hanford will preside and present the award. *Speaker*: Col. W. H. Pickering (Jet Propulsion Laboratory).

17th Annual Convention of the Scientific Research Society of America. William E. Hanford will preside.

Sigma Delta Epsilon (X3)

The program of the society consists of National Council meetings (I-II, 27 Dec.; III, 30 Dec.) Grand Chapter dinner and meeting (29 Dec.), and luncheon for all women in science. Agnes Hansen (president, Sigma Delta Epsilon) will preside at the luncheon; Mary L. Willard (Pennsylvania State University) will discuss criminalistics.

Society of the Sigma Xi (X4)

Wednesday 29 December

66th Annual Convention of the Society of the Sigma Xi. (Two parts). Farrington Daniels (University of Wisconsin) will preside.

Joint Sigma Xi-RESA Luncheon.

Joint Annual Address of the Society of the Sigma Xi and the United Chapters of Phi Beta Kappa. Alfred S. Romer (president elect, AAAS) will preside. The logic of the mind, J. Bronowski (Salk Institute for Biological Studies, San Diego, California).

United Chapters of Phi Beta Kappa

The program consists of the joint address of Phi Beta Kappa and Sigma Xi (29 Dec.).