

# Science and Engineering: Diversity and Convergence

## AAAS Annual Meeting

Los Angeles, 26–31 May 1985

*The Los Angeles Hilton and the Westin Bonaventure*

## Preconvention Program

### Youth Symposium

Special program for high school students (29 May, 9:00 a.m.–3:00 p.m. (California Museum of Science and Industry).

Speakers to be announced.

### Public Lectures

**Keynote Address: Patterns of Convergence in Contemporary Science** (26 May, 8:30 p.m., Bonaventure).

MURRAY GELL-MANN (*R. A. Milliken Professor of Theoretical Physics, California Inst. of Technology, Pasadena*).

**Molecular Approaches to Behavior** (27 May, 1:30 p.m., Hilton).

DANIEL E. KOSHLAND, JR. (*Professor of Biochemistry, Univ. of California, Berkeley, and Editor, Science, AAAS, Washington, DC*).

**George Sarton Memorial Lecture: God, Man, and Genetics: Historical Reflections** (27 May, 8:30 p.m., Bonaventure).

DANIEL J. KEVLES (*Professor of History, California Inst. of Technology, Pasadena*).

**The Employment Effects of High Technology** (28 May, 1:30 p.m., Hilton).

RAY MARSHALL (*Bernard Rapoport Centennial Professor of Economics and Public Affairs, Lyndon B. Johnson School of Public Affairs, Univ. of Texas, Austin*).

**A Scientific View of Human Nature and Human Evolution** (28 May, 8:30 p.m., Bonaventure).

JONAS SALK (*Distinguished Professor in International Health Sciences, The Salk Inst., San Diego, CA*).

**Phi Beta Kappa Lecture: The Quest for the Origin of the Elements** (29 May, 1:30 p.m., Hilton).

WILLIAM A. FOWLER (*Institute Professor of Physics Emer., California Inst. of Technology, Pasadena*).

**AAAS President's Lecture: Brain, Behavior, and Health** (29 May, 8:30 p.m., Bonaventure).

DAVID A. HAMBURG (*President, AAAS, and President, Carnegie Corp. of New York, NY*).

**Arms Control and Star Wars: Problems and Prospects** (30 May, 1:30 p.m., Hilton).

SIDNEY D. DRELL (*Professor, Deputy Director, and Executive Head of Theoretical Physics, Stanford Linear Accelerator Center, Stanford Univ., Menlo Park, CA, and Co-Director, Stanford Center for International Security and Arms Control*).

**Five Minutes, Mr. Pythagoras!** (30 May, 8:30 p.m., Bonaventure).

ADRIAN MALONE (*Independent Television Producer and President, Adrian Malone Productions, Inc., Los Angeles, CA*).

### 1. General Interest

**Frontiers of Neuroscience** (27 May, 9:00 a.m., B): Cell lineage and number, developing mammalian CNS, transmitter regulation, neuronal activity in the CNS, higher brain function, human cerebral function, positron-emission tomography (PET).

Floyd E. Bloom, Karl Herrup, Roger A. Nicoll, Steven P. Wise, Michael E. Phelps.

**Frontiers of the Social Sciences: The Control Revolution—Technology and Economy of the Information Society** (27 May, 2:30 p.m., B): Revolution or evolution, control technology, artificial intelligence, software in the future, technology and economy, research perspectives.

James R. Beniger, Charles N. Brownstein, Melvin Kranzberg, Langdon Winner, Hayward R. Alker, Jr., Alan Kay.

**Frontiers in Science and Technology to Aid Disabled People** (28 May, 9:00 a.m. and 2:30 p.m., B): R&D for the visually impaired, computers with the hearing-impaired, custom devices to provide speech, microcomputers in education and employment, technology for the workplace, rehabilitation technology in agriculture, third world countries, recreation options, functional electrical stimulation, robotics research and application.

Martha Ross Redden, Peter Axelson, Samuel M. Genensky, Richard G. Stoker, John B. Eulenberg, Lawrence Scadden, Susan Phillips, Bill Field, Ralf Hotchkiss, Donald R. McNeal, Lawrence Leifer.

**The Frontiers of the Natural Sciences** (29 May, 9:00 a.m. and 2:30 p.m., B): Infrared astronomy, molecular design, numerical simulations, quantum fields, Darwin's dilemma, molecular genetics, bacteria and plants, linear programming.

**Hotel Codes:** B = Westin Bonaventure  
H = Los Angeles Hilton

Rolf M. Sinclair, William A. Fowler, J. William Schopf, Mary Good, Douglas J. Scalapino, Baruch T. Soifer, Sharon R. Long, Michael Saks.

**The Status of Science and Technology in China's Modernization (30 May, 9:00 a.m., B):** Evolving policy, role of statistics, ethical norms and research, Sino-U.S. exchanges, role of basic research.

Denis Fred Simon, Shi Guanghui, Richard P. Suttmeier, Leo Orleans, Cheng Yishen, Tsao Chingyang, Zhao Tzu-huang, Thomas Fingar.

**Science for the Naked Eye; or, The Physics of Everyday Experience, XII (30 May, 9:00 a.m. and 2:30 p.m., B):** Lie detectors, solar-powered flight, wine and lasers, computer-made musical sounds, artificial smarts and the arts, Van Gogh's *Starry Night*.

Rolf M. Sinclair, William Iacono, Janice L. Brown, Philip J. Wyatt, John R. Pierce, Harold Cohen, Albert Boime.

**Science Discovery in Japan (30 May, 2:30 p.m., B):** Expanding commitment to basic research, national and international attention, transformation of activity, major areas of research, successes envisioned, advancements contributing to research internationally.

Tod Herbers, Warren Hegg; remaining speakers to be announced.

**Chemistry Is Fun! (31 May, 9:00 a.m., B):** Triboluminescence, Avogadro's avocados, the magic of chemistry.

Joseph A. Marcello, Jeffrey I. Zink, Lucy T. Pryde, John D. Hostettler.

## **2. Physical and Mathematical Sciences**

**Lasers and the Interplay of Science and Technology: A Twenty-fifth Anniversary Symposium (27 May, 9:00 a.m., B):** Atomic resonance, quantum electronics, laser development from university and industry perspectives.

Joan L. Bromberg, Nicolaas Bloembergen, Paul Forman, Charles H. Townes, George F. Smith, Margaret B.W. Graham, Arthur H. Guenther, Robert W. Hellwarth, Robert Seidel.

**Interacting Galaxies and Quasars (27 May, 2:30 p.m., B):** Observations, theory, activation of quasars by galaxy interactions.

John B. Hutchings, Francois Schweizer, Alar Toomre, Ronald D. Ekers.

**The Super Accelerator: A New Window on the Universe (28 May, 9:00 a.m., B):** Particle physics—past, present, and future—building the superconducting super collider (SSC), experiments at the SSC.

Rolf M. Sinclair, Stanley G. Wojcicki, Leon Lederman, J. David Jackson, Maury Tigner, Roy F. Schwitters.

**Soap Films and Their Relatives (28 May, 2:30 p.m., B):** Nonuniqueness, nonfiniteness, spherical shells, anisotropic surface energies, interfaces, minimal surfaces, minimal surface forms.

Jean E. Taylor, Frank Morgan, Taylor G. Wang, John W. Cahn, Frederick J. Almgren, Jr.

**Chemically Solvable Problems (30 May, 9:00 a.m. and 2:30 p.m., B):** Sherlock Holmes, werewolves and vampires, art conservation, radiocarbon dating, chemical detectives, the FDA and DEA.

Thomas Cairns, Robert H. Dinegar, David H. Dolphin, Rainer Berger, Clifton E. Meloan, Jerry D. Nelson.

**Elementary Particle Physics Comes of Age (31 May, 9:00 a.m., B):** Electron positron colliders, proton decay, cosmology.

Saul Krasner, Hugh J. Costello, George H. Trilling, Maurice Goldhaber, Andreas Albrecht.

## **3. Earth and Planetary Sciences**

**Geology and Your National Parks Vacation (27 May, 9:00 a.m., B):** Canyonlands of the Colorado Plateau, geological education, urban national parks, the Golden Gate National Recreation Area, Yosemite, granitic and glacial grandeur, Hawaii, volcanic wonderland, natural laboratories, gates of the arctic.

J. Thomas Dutro, Jr., Stanley S. Beus, Clyde Wahrhaftig, Alan E. Leviton, Michele Aldrich, Robert Tilling.

**How Can Science Be Used More Effectively to Protect Natural Resources in the National Parks? (28 May, 9:00 a.m., B):** Building a science program, grizzlies, geysers, Yellowstone National Park, livestock grazing, managing for uncertainty, ecological reserves, limitations of science, politics and values.

Phyllis Myers, John Dennis, Robert Barbee, James G. Teer, David M. Graber, Michael Mantell.

**Comet Halley and Cosmic Kin: Diminutive Worlds of Ice, Rock, and Metal (28 May, 2:30 p.m., B):** Physical nature of comets and asteroids, origin of the solar system, International Halley Watch, spacecraft missions, comets and asteroids as natural resources.

Steven J. Ostro, Jonathan C. Gradie, Laurel L. Wilkening, Ray L. Newburn, Jr., David Morrison, Brian T. O'Leary.

**Comparative Planetology (29 May, 9:00 a.m. and 2:30 p.m., B):** Surfaces, climate, tectonics, craters and impacts, volcanoes, greenhouse and antighreenhouse effects, magnetospheres.

Louis D. Friedman, Bruce C. Murray, James Head, Eugene Shoemaker, Michael Carr, Carl Sagan, O. Brian Toon, George Siscoe.

**Meeting the Challenge of Global Change (30 May, 9:00 a.m., B):** U.S. plans for an International Geosphere-Biosphere Program, long-term records, environmental change, life sciences, biogeochemical cycles, the hydrological cycle.

John A. Eddy, Harold Mooney, John Imbrie, Michael B. McElroy, Roger Revelle.

**Climatic Changes from Primordial to Modern Times: Evidence, Causes, and Human Significance (30 May, 2:30 p.m., B):** Early earth, planetary evolution, ice ages, interglacials, mechanisms, astronomical causes, human history, implications for modern society.

William W. Kellogg, J. Murray Mitchell, Jr., Hal G. Marshall, J.C.G. Walker, John Imbrie, Sharon Nicholson, John M. Wallace, Robert Kates, William E. Riebsame.

**Environmental Consequences of the Changing Atmospheric Composition (31 May, 9:00 a.m., B):** Trace substances, greenhouse effect, theory, observation, biological responses, agricultural implications, socioeconomic response, human factors.

Boyd R. Strain, Lester Machta, Stephen H. Schneider, David Pimentel, William W. Kellogg.

## **4. Engineering, Computing, and Information**

**Evolutionary Computing (27 May, 9:00 a.m., H):** Three principles of programming, fault tolerance, reaction-diffusion neurons, genes, nervous system development, storage, retrieval, biological systems, stochastic neural network.

Harold M. Hastings, Michael Conrad, Algirdas Avizienis, Roberto R. Kampfnier, Ralph J. Greenspan, F. Eugene Yates, Donald O. Walter, Kirstie Bellman, Stefan Waner.

**Engineering Applications of Supercomputers (27 May, 2:30 p.m., H):** Hydrodynamics of fluidization, modeling, computational chemistry, numerical simulations, chemically reacting

turbulent flows, engine flow, combustion processes, applied mechanics.

Sheila E. Widnall, George Lea, Dimitri Gidaspo, M. Syamlal, Y.C. Seo, J.O. Arnold, James J. Riley, Ralph W. Metcalfe, Roger Krieger, Mel Callabresi, W. Fichtner, R.K. Smith.

**Symbolic Mathematical Computation on Modern Computers (28 May, 9:00 a.m., H):** Manipulation, micro and personal computers, SMP system, applications in universities, undergraduate mathematics education.

Paul S. Wang, Richard Pavelle, David R. Stoutemyer, Paul M. Davies, Paul Zorn.

**The Impact of Computing Technology and Information Accessibility on the Scientific Method (28 May, 2:30 p.m., H):** Medicine, randomized or observational studies, neuropharmacology, expert systems, statistical advice, implementation, social impact.

Nancy Flournoy, Lloyd D. Fisher, Gerald A. Young, Loren Cobb, Michael E. Tarter, John Sobolewski.

**Energy Efficiency in Buildings and Indoor Air Quality (29 May, 9:00 a.m., B):** Progress, insulations, windows, daylighting systems performance, thermal mass, envelope systems, impact of improvements.

Ted S. Lundy, Robert L. Sonderegger, Arthur R. Rosenfeld, David L. McElroy, Stephen E. Selkowitz, George E. Courville, David T. Grimsrud.

**Exposure to Indoor Air Pollutants and Their Health Effects (29 May, 2:30 p.m., B):** Office buildings, total human exposure, monitoring methodologies, refining estimates, epidemiological research and approaches, toxicological assessments.

Scott R. Baker, Steven D. Colome, James M. Melius, Wayne R. Ott, P. Barry Ryan, James H. Ware, Joellen Lewtas, Dean B. Baker.

**The Impact of Computers on Society Revisited (30 May, 9:00 a.m., H):** Work environment, management, children, psychological culture, hardware, software, and peopleware.

Donald O. Weitzman, Tapas K. Sen, Joseph Weizenbaum, Sherri Turkle, James D. Baker, Hubert L. Dreyfus, Stuart E. Dreyfus.

**Microcomputer Applications for Developing Countries (30 May, 2:30 p.m., H):** Public health, public policy planning, energy policy formulation, selection, micro-based business packages.

Stephen R. Ruth, Donald Lauria, Charles Mann, Phillip Palmedo, Jack Fritz.

**Information Technology for Our Future: The Vision, the Reality (31 May, 9:00 a.m., H):** Myriad roles, government, society, communications satellites, pragmatics of use, videotex technologies, urban and rural markets, changing world.

Robert L. Chartrand, Joseph Becker, Elizabeth L. Young, Jacques F. Vallee, James H. Holly.

**Global Potentialities of Gas Fuels and Feedstocks (31 May, 9:00 a.m., H):** International Gas Study, East-West trade, Europe, North American market, Asian gas policy, natural gas development in the Soviet Union, transport, compressed natural gas, energy security, future gaseous fuels, methanol and ethanol fuels.

Pincas Jawetz, Holger Rogner, Benjamin Schlesinger, Jonathan P. Stern, Mikhail A. Styrikovich, Thomas Gold, Pierre Moulin, Charles K. Ebinger, Herbert H. Heitland.

**Energy Issues for Less-Developed Countries (31 May, 1:30 p.m., H):** Renewable technologies, China, India, West Africa, Brazil, food production, oil importing nations, Latin America, economy, land use, macroeconomic adjustments.

Ram P. Chaturvedi, David Pimentel, Wallace E. Tyner,

Walter Vergara, John R. Krummel, Donald W. Jones, Peter M. Meier, Robert Nathans, J.S. Rao.

## 5. Environmental Issues

**Application of Biotechnology: Environmental and Policy Issues (27 May, 9:00 a.m. and 2:30 p.m., B):** Species models, ecological release, natural regulation, infectious spread, risk assessment and management, Congress, industrial viewpoint, social responsibility.

John R. Fowle III, Gregory A. Daneke, Morris A. Levin, Philip J. Regal, Frances E. Sharples, Stephan J. Risch, Bruce R. Levin, Mark A. Harwell, Bernadine H. Bulkeley, Anthony Robbins, George B. Rathmann, Terri L. Goldberg.

**Manipulating Grazing Ecosystems with Fire (28 May, 9:00 a.m., B):** Rangeland, tall grass prairie, wildlife, intermountain basins, southern forest ecosystems.

Gary R. Evans, Henry Wright, Clinton E. Owensby, Charles J. Scifres, Steve C. Bunting, Dale D. Wade, Clifford E. Lewis, David Schimel.

**Active Mitigation of Industrial Wastes by Repository Characteristics (28 May, 9:00 a.m. and 2:30 p.m., B):** Inorganic waste streams, biodegradation, hydrocarbons, subsurface materials, natural barriers, high-level radioactive waste, geohydrological environments, hard rock repositories, performance criteria and modeling, shallow land burial sites, biological transfer processes, oceanic bottom boundary layer, monitoring, national policy, recovery, treatment, disposal alternatives.

Michalann Harthill, Michael C. Kavanaugh, R. Rhodes Trussell, John T. Wilson, Barbara H. Wilson, Marion S. Bedinger, Fred A. Donath, Vern C. Rogers, Dana R. Kester, Arthur R.M. Nowell, Charles D. Hollister, Stacy L. Daniels, Thomas R. Kitsos.

**Environmental Aspects of Genetically Altered Viruses (29 May, 9:00 a.m., B):** Viral spread and virulence, mammalian endogenous retroviral sequences, regulation of expression, adenovirus vectors, transgenic mice containing SV40, tumors of the choroid plexus, risk assessment.

Daphne Kamely, Bernard N. Fields, Malcolm A. Martin, Phillip A. Sharp, Arnold J. Levine, James W. Falco.

**ENVIRONMETRICS 85: Statistical Methods in Analysis of Acid Deposition Data (29 May, 9:00 a.m., B):** Trend, impact detection, modeling, space-time processes, North American wet data, spacial pattern of precipitation, interpretations.

Donald L. Thomsen, Jr., Paul Switzer, James V. Zidek, Peter Guttorp, Anthony P. Olsen, Steven K. Seilkop, Peter L. Finkelstein.

**Resource Information for Soil and Water Conservation Decisions (29 May, 2:30 p.m., B):** Global perspective, information requirements, rational decisions, new technologies, monitoring, delivery and use.

Marion F. Baumgardner, Ralph J. McCracken, Harold E. Dregne, Grant F. Walton, Forrest G. Hall, Christian J. Johannsen.

**Coping with the Risks from Chemical Hazards: Barriers to Compensation (30 May, 9:00 a.m., B):** Courtroom interpretation, low-level exposures, toxicology, literature, diagnostics, treatment, compensation, proposed solutions, pollution liability insurance.

David W. Schnare, Martin T. Katzman, Avraham C. Moskowitz, David B. Katzin, Ronald F. Markson.

**Inherent Limitations to the Regulation of Toxic Substances (30 May, 2:30 p.m., B):** Risk assessment, economics, impact analyses, alternatives, legal, policy, and political limits.

Warren R. Muir, Christine Chaisson, David Menotti, George Eads, David Gushee.

**Toxicology and Risk Assessment, Part I (31 May, 9:00 a.m., B):** Man, molecules, receptor theories, biochemical correlates, absorption kinetics, consumption data bases, dietary modeling, estimating exposure, clinical evidence, environmental illness.

Christine F. Chaisson, Dennis P. Hsieh, J. Alexander Bralley, Robert T. Koda, Barbara J. Petersen, William J. Rea.

**Toxicology and Risk Assessment, Part II (31 May, 1:30 p.m., B):** Utilizing data, acute versus chronic risk, complementary data, pesticide residues, food, legal tolerance versus estimated actual dietary exposure, utilizing information, decision-making, societal implications.

Alan L. Porter, Tom S. Miya, Ted Farber, Anthony Guarino, Richard C. Schwing, Jerry R. Lucietta, Christine F. Chaisson.

## **6. Biological Sciences, General**

**Some Mathematical Questions in Biology: Plant Biology (27 May, 9:00 a.m. and 2:30 p.m., H):** Computer simulations, branching, evolution of plants, stomate fields in leaves, modeling, crop growth, photosynthetic dynamics, adaptation, environmental variability, life-cycle models, population processes.

Robert M. Miura, Louis J. Gross, Karl J. Niklas, Richard H. Rand, J.L. Ellenson, John H.M. Thornley, Hal Caswell, Jonathan Roughgarden.

**Urban Ecology (28 May, 9:00 a.m. and 2:30 p.m., H):** The peregrine falcon, rathabitatadata, skunks, mammals, public health implications, dogs, coyote, traditional and electronic surveillance techniques, impacts of alternate energy developments, local and migratory birds, coastal systems, wetlands, freshwater marshes, Coyote Hills experience, management, wildlife—past, present, and future.

June Lindstedt-Siva, Brian James Walton, Michael A. Recht, Dennis L. Clayton, Alan M. Beck, William O. Wirtz II, Robert L. McKernan, Ralph W. Schreiber, Michael B. McCrary, Richard E. Pieper, Dorothy F. Soule, Mikihiro Oguri, John D. Soule, Donald L. Hey, Joshua N. Collins, Vincent H. Resh, Kherin Klubnikin, Keith G. Hay.

**Bioorganic Chemistry of Insect Hormones and Pheromones (29 May, 9:00 a.m., H):** Affinity labeling, biosynthesis, houseflies, biochemical models, perception and catabolism, photoaffinity labeling, ecdysteroid receptors, neuropeptides, physiological inactivation.

Glenn D. Prestwich, Gary J. Blomquist, Richard G. Vogt, John D. O'Connor, David A. Schooley.

**New Frontiers: Petroleum and the Arctic Environment (30 May, 9:00 a.m., H):** Studies—past, present, and future—role of the environmental scientist, whiteouts, strong prevailing winds, industrial viewpoint, oil spill containment and cleanup, development, residential concerns.

Gunter E. Weller, John F. Schindler, Donald M. Schell, Hans O. Jahns, William E. Westermeyer, Thomas F. Albert.

**Recent Integrations of Research on Biological and Social Living Systems (30 May, 9:00 a.m. and 2:30 p.m., B):** Evolution, adaptability theory, tools, synergy, energy, emergence, eclecticism.

James Grier Miller, Kenneth E. Boulding, Michael Conrad, Peter A. Corning, Bela H. Banathy, Howard T. Odum, Kjell Samuelson.

**Decade of the Tropics (30 May, 2:30 p.m., H):** Agricultural frontier, South America, myths, land-use change, Caribbean forests, forest fragments, management, American forests, the Palcazu example, future prospects, problems, priorities.

Otto T. Solbrig, Harold A. Mooney, Arturo Gomez-Pompa, Ariel E. Lugo, Thomas E. Lovejoy, Gary S. Hartshorn, Peter H. Raven.

**Mycorrhizae: Natural Promoters of Plant Growth (31 May, 9:00 a.m., H):** Physiological diversity, ectomycorrhizae, allelopathy, forest growth, forestland management, vesicular-arbuscular mycorrhizae, agriculture, reforestation, fungus spore dissemination.

Robert T. Brown, Caroline S. Bledsoe, Charles E. Cordell, Suzanne M. Schwab, Gary Hunt.

**Rates of Evolution (31 May, 1:30 p.m., H):** Upper limits, morphological change, natural selection, molecular clock, molecular and organismal evolution, mosaic evolution, homeostasis.

G. Ledyard Stebbins, Walter M. Fitch, James W. Valentine, John H. Gillespie, Allan C. Wilson.

## **7. Cell and Molecular Biology**

**Gene Expression in Reptilian Systematics (27 May, 9:00 a.m. and 2:30 p.m., H):** Ancestral perspective, vertebrates, reptiles, phylogenetic and systematic patterns, creatine kinase expression, lactate dehydrogenase expression, tissue-specific expression, crocodilians.

Donald G. Buth, Robert W. Murphy, Gregory S. Whitt, Michelle K. Kettler, Herbert C. Dessauer, Michael J. Braun, Michael M. Miyamoto, Llewellyn D. Densmore, Jack W. Sites, Jr., Carl S. Lieb, C. Ben Crabtree, Ronald H. Matson, Steven D. Werman.

**Control of Cellular High-Energy Phosphate Production (28 May, 2:30 p.m., H):** Theory analysis, mitochondrial respiratory control, oxygen dependence, mitochondrial oxidative phosphorylation in vivo and in vitro, heart high-energy phosphate metabolism, mitochondrial creatine kinase, bioenergetics in vivo.

William E. Jacobus, Joseph M. Tager, Ronald J.A. Wanders, Albert K. Groen, Carlo van Roermund, Peter Plomp, Arthur Verhoeven, Roelof van der Meer, David F. Wilson, Marie Erecinska, Jane M. Vanderkooi, Koenraad M. Vandegaer, Randall W. Moreadith, David M. Diffley, George K. Radda.

**Protein Engineering (29 May, 9:00 a.m. and 2:30 p.m., H):** Interactive graphics, manipulation, cut-and-paste, computer graphics, artificial intelligence, structure-function relationships, Betabellin, directed mutagenesis, wild type, mutant, and synthetic proteins.

Eli D. Schmell, Michael T. Marron, Richard J. Feldmann, Robert C. Ladner, Robert Langridge, Bruce W. Erickson, John H. Richards, Joseph Kraut.

**The Human Chromosome (30 May, 9:00 a.m., H):** Genomic rearrangements, cancer, sister-chromatid exchanges, mutagenic carcinogens, human linkage map, DNA markers, regulation of gene expression, human X chromosome, cytogenetic epidemiology.

Marvin A. Kastenbaum, William J. Schull, Jorge J. Yunis, Sheldon Wolff, Raymond L. White, Larry J. Shapiro, Michael A. Bender.

**Biology of the Aging Cell (30 May, 2:30 p.m., H):** Cellular senescence, genome reorganization, dividing cells, chromatin organization, differentiation, aging cell surface.

Robert O. Kelley, Samuel Goldstein, Alvaro Macieira-Coelho, Robert T. Dell'Orco.

**Current Concepts of Lectins Emphasizing Health and Disease (31 May, 9:00 a.m., H):** Bacterial surface lectins, infectious disease, histochemistry, clycoconjugates, normal and diseased cells, diagnostic microbiology, tumor cells, lymphomyeloid cells, therapeutic uses, Discoidin I, cell-substratum

adhesion, migration, humoral and cell membrane associated lectins, invertebrates, animal lectins.

Edwin L. Cooper, M.H. Ravindranath, Nathan Sharon, S.S. Spicer, B.A. Schulte, R.J. Doyle, Michel Monsigny, C. Kieda, A.C. Roche, Samuel H. Barondes, W.R. Springer, D.N.W. Cooper, Gerado R. Vasta, Elias Cohen, J.C. Paulson.

## 8. Biomedical Technology

**Cerebral Blood Flow: Mathematical Models and Physical Methods (27 May, 9:00 a.m., H):** Dynamical image analysis, statistical analysis, kinetic data, tracer kinetic modeling, positron emission tomography (PET), xenon-enhanced computed tomography, mapping.

Charles C. Duncan, Aldo Rescigno, James H. Matis, Sung-Cheng Huang, David Gur, Joseph H. Battocletti.

**Biomaterials for Intraocular Implants: Problems and Opportunities (28 May, 9:00 a.m., H):** Lens design, pathology, biocompatibility, immunology, future implants, science and regulation, intraocular polymers and chemical, physical, and biological properties.

Eugene P. Goldberg, Philip C. Hessburg, David J. Apple, J. Reimer Wolter, Pierre Blais, Akio Yamanaka, Katsuhiko Nakamaie.

**Advances in Medical Imaging (28 May, 2:30 p.m., H):** Present and future directions of NMR, MR of the head, MR body, cardiovascular imaging, pulse sequences, magnetic resonance imaging, chemical shift imaging, millisecond CT scanning, positron emission tomography (PET), imaging neuroreceptors, the living human brain.

Alexander R. Margulis, Ian L. Pykett, Meredith A. Weinstein, Charles B. Higgins, Thomas F. Meaney, Bruce R. Rosen, Douglas P. Boyd, Bruce H. Brundage, Michael E. Phelps, Henry N. Wagner, Jr.

**A Preview of Engineering Systems of 1990: Making Implants for Humans Using Biotechnology (29 May, 9:00 a.m., H):** Microbial reactors, future biomaterials, requirements and applications, artificial organs.

Wayland C. Griffith, Henry McGee, Jr., David F. Ollis, James C. McRea, Clark Colton.

**New in Vitro Assays for Allergen Specific IgE and IgG4 Antibodies (30 May, 9:00 a.m., H):** Test problems, food functions, immune complexes, food allergies, synthesis by lymphocytes, enzyme immunoassay, honey bee venom.

Georges M. Halpern, Zack H. Haddad, Robert N. Hamburger, Douglas C. Heiner, Sudhir Gupta, John R. Scott, Alex Lucas.

**Microbial and Molecular Genetics of Entomopathogens: Biotechnical Advances (30 May, 2:30 p.m., H):** Entomocidal bacilli, plasmids and gene transfer systems, organization, regulation, *Bacillus thuringiensis*, insect viruses, polyhedrin gene, baculovirus expression vectors, commercial prospectuses.

Robert M. Faust, Helen R. Whiteley, Lois K. Miller, Max D. Summers, David W. Miller.

**Uses of Synthetic DNA in Biology and Medicine (31 May, 9:00 a.m., H):** History, chemical synthesis, cDNA, gene cloning, site-directed mutagenesis, radiolabeled probes, point mutation detections, assembly, expression, *Escherichia coli*, probing biological functions.

John J. Rossi, Bruce E. Kaplan, Anna B. Studencki, Sid Suggs, John H. Richards.

**Marine Biotechnology and Marine Natural Products: Prospects for the Americas (31 May, 1:30 p.m., H):** Commercial development, chemical resources, Mexico, chemosynthetic produc-

tion, deep sea hydrothermal vents, molecular cloning, virulence genes, fish pathogens, food and medical resources production.

James W. Rowe, Rita R. Colwell, William H. Fenical, Marcial L. Lizarraga Partida, Holger W. Jannasch, Jorge Crosa, Daniel E. Morse.

## 9. Neuroscience and Cognition

**Noninvasive Regional Brain Chemistry (27 May, 2:30 p.m., B):** Positron emitters, imaging distribution, regional brain metabolism, positron emission tomography (PET), NMR.

Bernard W. Agranoff, Alfred P. Wolf, Michael E. Phelps, Louis Sokoloff, Thomas F. Budinger.

**Emerging Application of Neurosciences in Neurology and Psychiatry (28 May, 9:00 a.m., B):** Opioid peptides, mental disorders, human and animal studies, cholinergic agents, Alzheimer's disease, epilepsy, positron emission tomography (PET), magnetic resonance spectroscopy, research.

Jack D. Barchas, Philip A. Berger, Kenneth L. Davis, Jerome Engel, Jr., Monte S. Buchsbaum, Glen R. Elliott.

**Advances in Cognitive Science (29 May, 9:00 a.m. and 2:30 p.m., H):** Decision theory, biology, Darwinian selection, nervous system, selective networks, parallel computer architectures, nonmonotonic reasoning, discourse structure, computation models, Gabor holography, novelty, redundancy.

Manfred Kochen, William S. Cooper, George N. Reeke, Jr., Gerald M. Edelman, Howard L. Resnikoff, John McCarthy, Barbara J. Grosz, David Rumelhart, Karl Pribram, Robert K. Lindsay.

**Unified Integration of the Computer with the Brain for Perception Acquisition and Recognition (30 May, 9:00 a.m., H):** Man-machine communication, improving user input, handwriting, speech recognition, cockpit concepts, Pigeon's analysis, natural images, generic principles.

Robert S. Ledley, Victor W. Zue, Stephen J. Boies, Thomas A. Furness, John Cerella, Douglas H. Williams.

**Current Theories and Findings on Cognitive Abilities (30 May, 2:30 p.m., B):** Domains, psychology, measurement of abilities, interaction of theory and technology, intelligence testing, spatial and inductive reasoning.

John B. Carroll, Marcy Lansman, Earl B. Hunt, James W. Pellegrino, John L. Horn.

## 10. Medical Sciences

**Trace Element Metabolism in Man (27 May, 9:00 a.m., B):** Nutrition, physiological aspects, chromium, copper, nutrition, selenium metabolism, zinc metabolism, immune response.

Herta Spencer, Edward V. Ohanian, Walter Mertz, Leslie M. Klevay, Orville A. Levander, William R. Beisel.

**New Applications of Molecular Biology to Human Genetic Disease (28 May, 9:00 a.m., B):** Genetic linkage, Huntington's disease, linkage map, DNA markers, affective disorders, new genetic methods, prospects for therapy, retroviral vectors, and psychological, ethical, and practical implications.

Allan J. Tobin, Nancy S. Wexler, James F. Gusella, Raymond L. White, Kenneth K. Kidd, Inder M. Verma.

**Perspectives in Management of Lung Cancer (29 May, 9:00 a.m., B):** Internal radiation, pulmonary lobe, P-32 labeled ion exchange resin microspheres, intra-arterial radiation therapy, porphyrins, lasers, predictive laboratory assays, chemotherapy, radioactive monoclonal antibodies.

Lyman A. Brewer III, J.G. Llauro, Florian W. Zielinski, Oscar J. Balchum, Lawrence Weisenthal, Lelio G. Colombetti.

**Perceived Self-Efficacy: Basic Research and Applications in Behavioral Medicine (29 May, 2:30 p.m., B):** Mechanisms, cardiac efficacy, postcoronary rehabilitation, pain control, smoking cessation, phobic dysfunctions, stress reactions.

Albert Bandura, C. Barr Taylor, Ann M. O'Leary, Carlo C. DiClemente, S. Lloyd Williams.

**Neuromodulation of Immunity and Hypersensitivity (30 May, 9:00 a.m., B):** Regional innervation, lymphoid tissue, cellular interactions, primary sensory neurons, molecular basis, sensory neuropeptide interactions, lymphocytes immunotransmitters.

Edward J. Goetzl, David L. Felten, Thomas M. Jessell, J. Edwin Blalock, Donald G. Payan, Allan L. Goldstein.

**Blood Transfusion, Immunity, and Cancer (30 May, 2:30 p.m., B):** Antitumor immunity, survival relationships, surgical treatment, recurrence, peripheral T-cell subsets, natural killer cytotoxicity, cancers of the breast, rectum, colon, and lung.

Paul Ian Tartter, David M.A. Francis, S. David Nathanson, Roger S. Foster, Jr., Neil Blumberg, Giorgio P. Martinelli.

**Pathogenesis of Human T-Cell Lymphotropic Viruses (31 May, 1:30 p.m., B):** HTLV isolation, molecular biology of HTLV strains, molecular mechanism of pathogenesis, seroepidemiology and epidemiology of HTLV-associated diseases, disease in HTLV endemic regions of Japan.

Robert C. Gallo, Myron Essex, Anthony Fauci, Flossie Wong-Staal, William Haseltine.

## **11. Health Care**

**Does Quartz Cause Cancer? (27 May, 9:00 a.m., B):** Natural history, theories, fibrogenic and carcinogenic activities, pathogenic mechanisms, hypotheses, epidemiologic evidence, exposed workers, cancer in Finland, health standards.

David F. Goldsmith, Tee L. Guidotti, Umberto Saffiotti, David H. Wegman, Kari Kurppa, Philip J. Landrigan.

**Alcoholism: Questions for Science? Decisions for Health? (27 May, 2:30 p.m., B):** Trends, neurotransmission, identifying individuals, response to ethanol, sons of alcoholics, controls, differences in sensitivity, education of health professionals.

Manert H. Kennedy, Floyd E. Bloom, Henri Begleiter, Marc Schuckit, V. Gene Erwin, Sam Guze.

**Medical Science: Alternative Insights and Approaches (28 May, 9:00 a.m., B):** Historical concepts, Medical Nemesis revisited, well-being, old medicine, hidden health care system, dimensions in healing.

Rustum Roy, Barbara Duden, Ivan Illich, John L. McKnight, Lowell S. Levin, Norman Cousins.

**Impact of Cancer in the Year 2000 (28 May, 2:30 p.m., B):** Mortality, morbidity, impact reduction, viewpoint from the National Cancer Institute, accurate estimates, laboratory leads, molecular biology, new therapeutic techniques.

Albert B. Lowenfels, James E. Enstrom, Larry G. Kessler, John C. Bailar III, John Cairns, Jonathan W. Uhr.

**Children of the City: Strategies for Improving the State of Their Health (29 May, 2:30 p.m., B):** Infant death, urban task forces, effective interventions, Watts area, community-based interventions, enhancing community efforts, public policy imperatives.

Vijaya L. Melnick, Frederick C. Green, Robert Schlegal, Joseph A. Bellanti, Charlotte S. Catz, Dan Maldonado.

**Homophobia and Social Attitudes: Their Impact on AIDS Research (29 May, 2:30 p.m., H):** The ethical imperative, validity requirements, research, treatment, perspectives from a researcher and clinician, federal response, role of public health officers, AIDS-phobia, prevention concerns, health

care and social services delivery concerns, research methodologies, heterosexual bias in research.

Walter Westman, Amy Ross, Walter F. Batchelor, Alexandra Levine, David Talbot, Shirley Fannin, James Ferels, Stephen F. Morin.

**Oral Care of the Elderly: An Interaction of Foods, Nutrition, and the Aging Process (30 May, 9:00 a.m. and 2:30 p.m., B):** Nutrient requirements, dental status, behavioral ramifications, dietary choices, consumption factors, dental caries, food marketing opportunities, trace elements, periodontal disease, bone loss, management, the edentulous elderly.

Erling Johansen, John J. Hefferren, R. Craig Shulstad, Harold H. Sandstead, Howard H. Chauncey, Sidney Epstein, Robert L. Rizek, Peter A. Magowan, Sol Silverman, Jr., Athena Papas, Roy S. Feldman, Krishan K. Kapur.

**Nutritional Views of Cancer (31 May, 9:00 a.m., B):** Salted fish, nasopharynx, Chinese, fat, dietary carcinogens, anticarcinogens.

Paul Hochstein, Brian E. Henderson, James F. Mead, Bruce N. Ames.

## **12. Agriculture and Food**

**Social Ethics, Agricultural Change, and Agricultural Research (27 May, 9:00 a.m., H):** Public health impact, agricultural production, institutional hegemony, misinformation, organizational complexities, publicly supported research, interests, responsibilities.

Kenneth A. Dahlberg, Rachelle D. Hollander, Molly J. Coye, William S. Friedland, Theodore L. Hullar, William H. Aiken, William A. Stiles, Jr., John B. Cobb, Jr., Bill L. Harriott, William B. Lacy.

**Agricultural Markets: Bane or Benefit to Small Farm Sector Development? (27 May, 2:30 p.m., H):** Conceptual issues, middleman strategies, integration dynamics, markets and marketplaces in development, marketing systems, rural development, consumer goods distribution.

Timothy J. Finan, Roger W. Fox, Stuart M. Plattner, Norbert Dannhaeuser, William O. Jones, Judith Tendler.

**Technology Transfer in Agriculture: The Comparative Advantage (28 May, 9:00 a.m., H):** Maintenance, effectiveness, the American Agricultural Technology Delivery system, extension client impact, knowledge transfer, implications of emerging technologies, diffusion systems.

James J. Zuiches, Irwin Feller, James A. Christenson, Paul D. Warner, Michael J. Phillips, J.D. Eveland, James M. Meyers.

**Agricultural Mechanization: Implications of the California Rural Legal Assistance (CRLA) Suit Against the University of California (28 May, 2:30 p.m., H):** Land-grant university roles, mechanical tomato harvester technology, cooperative extension service programs, industrial research, social impacts, research priorities.

Irwin Feller, J. Patrick Madden, F. Aloysius Wood, Leo E. Lucas, Arland Pauli, Lawrence M. Busch.

**Technological Opportunities for Increasing Food Production by Limited-Resource Farmers: Aquaculture and Botanical Pest Control (29 May, 9:00 a.m., H):** Water harvesting, community-managed fish ponds, Panama, economic constraints, technology transfer, green mussel, Thailand, plant derivatives, chemistry, plant extracts, village-level processing.

Saleem Ahmed, Joseph J. Molnar, Bryan L. Duncan, Leonard L. Lovshin, Edward W. McCoy, Ramesh C. Saxena, Martin Jacobson, Bruce Koppel.

**The Origins of Plant Cultivation in World Perspective (29 May, 2:30 p.m., H):** Food production, the Near East, prehistoric

plant domestication, temperate Europe, African agriculture, Southeast Asia, Mesoamerica, South America, desert North America, eastern North America.

C. Wesley Cowan, Patty Jo Watson, Naomi F. Miller, Robin Dennell, Jack R. Harlan, J.M.J. de Wet, Gary W. Crawford, Virginia Popper, Deborah M. Pearsall, Paul E. Minnis.

**Engineering with Mammalian Embryos (30 May, 9:00 a.m., H):** Fertilization, culture, microsurgery, viruses, addition of genes, genetic perspective.

George E. Seidel, Jr., Howard S. Teague, Neal L. First, Gary B. Anderson, Richard A. Bowen, Thomas E. Wagner, William D. Hohenboken.

**New Directions for Bioscience in Agriculture (31 May, 9:00 a.m., H):** Research climate, molecular genetics, animal science, plant science, plant diseases, insect pests.

James E. Tavares, Ralph W.F. Hardy, Robert M. Goodman, William R. Pritchard, Robert H. Burris, Milton Zaitlin, Walter E. Bollenbacher.

### 13. Sociology

**Criminal Careers and "Career Criminals": Report of the National Academy of Sciences' Panel on Research on Criminal Careers (27 May, 9:00 a.m., B):** Participants, measurement, individual rates, policy uses of criminal-career knowledge, research agenda.

Alfred Blumstein, Christy A. Visher, Jacqueline Cohen, Jeffrey A. Roth, James Q. Wilson, Albert J. Reiss, Norval Morris, Richard L. Linster.

**Regional Restructuring in the United States (28 May, 9:00 a.m., B):** Technological capability, R&D, interregional trade and growth, international division of labor, energy, environmental resources, regional growth.

Roger Bolton, Edward J. Malecki, Shelby Gerking, Norman Glickman.

**Forecasting of Complex Systems in the Social and Natural Sciences (28 May, 2:30 p.m., B):** Predictability, weather, climate, forecasting errors, critical assessment, mass transit systems.

Richard C. Rockwell, Stephen H. Schneider, Kenneth C. Land, Richard C.J. Somerville, Richard A. Berk, Thomas F. Cooley, Martin Wachs.

**The Future of Medicare and Public Support for Health Care (29 May, 9:00 a.m., B):** Long-term policy options, impact of prospective payment system, long-term care issues.

David Mechanic, Linda Aiken, Paul B. Ginsberg, Joseph P. Newhouse, Carroll L. Estes.

**Revising National Retirement Policy: What Economic Roles for Older Adults? (29 May, 2:30 p.m., B):** Education, new productive roles, third quarter of life, labor force opportunities and requirements, capacities of older adults.

Robert Morris, Scott A. Bass, Lydia Bronte, Malcolm Morrison, David Peterson.

**Social Experiments: Where Have We Been and Where Are We Going? (30 May, 9:00 a.m., B):** Economic behavior, law enforcement, randomized field experiments, education, training and employment, technical assistance, large-scale social experimentation.

Richard A. Berk, Ann D. Witte, Lawrence W. Sherman, Robert F. Boruch, Stephen E. Fienberg, Howard E. Freeman.

**Pornography: New Approaches and Justifications for Regulating? (31 May, 9:00 a.m., B):** Legitimate violence, sexual inequality, effects of mass media content, relationship be-

tween adult entertainment and rape, a feminist perspective, policy and legal implications of protection.

Joseph E. Scott, Larry Baron, Murray A. Straus, Edward Donnerstein, Daniel G. Linz, Catharine A. MacKinnon, John H. Weston.

### 14. Anthropology and Demography

**The Study of Language as Cultural and Cognitive Systems (27 May, 9:00 a.m. and 2:30 p.m., B):** Sociocultural process, sources of language, time in language, world view, learning and language change, Edward Sapir, drift in semiotic perspective, psychological and psychiatric perspectives, West Coast tribes, social structural transformations.

Harvey Pitkin, Grace H. Yeni-Komshian, Peg Griffin, Michael Cole, Elizabeth Bates, Victoria A. Fromkin, Paul Kay, Charles A. Ferguson, William O. Bright, Michael Shapiro, Michael Silverstein, Paula G. Rubel, Abraham Rosman.

**A Comparative Look at Arid Land Demography and Ecology in China, India, and the Sahel (28 May, 9:00 a.m., B):** Demographic change, management, problems, economic aspects, Sahelian land concentration, population growth in Rajasthan, India.

Priscilla Reining, Brian Spooner, Judith Banister, Liu Shu, Stephen P. Reyna.

**Sign Language Studies of Great Apes (28 May, 9:00 a.m., B):** Symbolic reference in an orangutan, communication skills, cross-fostered chimpanzees, signs of conversations, developmental trends, replies of chimpanzees to Wh-questions.

Thomas E. Van Cantfort, H. Lyn Miles, James B. Rimpau, Roger S. Fouts, Deborah H. Fouts, R. Allen Gardner, Beatrix T. Gardner.

**Use, Abuse, and Renewability of China's Arid Lands (28 May, 2:30 p.m., B):** Geomorphology, deserts, rangelands, challenges, opportunities, water management, plans and progress for development, Xinjiang, A.R.

Cyrus M. McKell, Priscilla Reining, Carol S. Breed, Bill E. Dahl, Ren Jizhou, Robert M. Hagan, Tan Qicheng.

**Primate Societies: Recent Advances in Behavioral Research on Wild Primates (28 May, 2:30 p.m. B):** Vocalizations, relation to human language, long-term social relationships, migration, intergroup relations, life-history variation.

Barbara B. Smuts, Robert Seyfarth, Dorothy Cheney, Paul H. Harvey.

**Religion and Ideology in the Function and Management of Aggression and Cooperation in Biocultural Evolution (29 May, 9:00 a.m., B):** War, peace, role of religion, secular to religious leadership in Iran, symbolism, rhetoric, revolution, limitations of institutionalized religion.

Solomon H. Katz, Kenneth E. Boulding, Ralph W. Burhoe, Alice B. Kehoe, William O. Beeman, Elise Boulding, Ward H. Goodenough.

**Population Growth and Economic Development in Developing Nations: Scientific and Policy Issues (29 May, 2:30 p.m., B):** Density, farming systems, innovations, technical change, population pressures, saving, investment, food, agricultural technology in England, family planning program efforts, future prospects.

Thomas J. Espenshade, Prabhu L. Pingali, Hans P. Binswanger, Allen C. Kelley, T. N. Srinivasan, Richard L. Sullivan, Julian L. Simon, W. Parker Mauldin, Robert J. Lapham, Paul Demeny, Richard A. Easterlin.

**How People Spend Time: Kids, Women, and Men in Cross-Cultural Perspective (29 May, 2:30 p.m., B):** Division of labor, patterns of time allocation, Native South Americans, culture



change, allocation of time in space, Highlands of Papua New Guinea, complex societies.

Allen Johnson, Daniel R. Gross, Nancy M. Flowers, Joshua Rubin, Lawrence S. Grossman, Roert L. Munroe, Ruth Munroe, Luis Locay.

**Population Growth, Resource Use, and Environmental Change: Interrelationships (30 May, 9:00 a.m. and 2:30 p.m., B):** Global interactions, Africa, dilemmas in Asia, Latin America, effects of ignoring interrelationships, population pressure, China, reforestation, agriculture, tropical forests.

Charles V. Kidd, Roger Levien, Fred Sai, Ronald B. Ridker, M. Anandakrishnan, Kirk Rogers, Liu Shu, Michael S. Teitelbaum, Mahendra Shah, David Pimentel, Paul Demeny, Walter Parham.

**Scientific Issues in the 1990 Census (31 May, 9:00 a.m. and 1:30 p.m., B):** Decennial census, sampling, regression models, census undercount, errors, apportionment, fund allocations, and collecting, processing, and tabulating data quickly.

Barbara A. Bailar, John G. Keane, Benjamin F. King, Peter A. Bounpane, Daniel Melnick, William P. Butz, David A. Freedman, William C. Navidi, Eugene P. Ericksen, Michael J. Rich, Stephen E. Fienberg.

## **15. Economics and Industry**

**Methods for Measuring Technological Advance (27 May, 9:00 a.m., B):** Heterogeneous products, technology output measures, innovation indicators, automobile market, aggregate indicators.

Donald E. Buzzelli, Arthur J. Alexander, Theodore J. Gordon, Ernst R. Berndt, Kenneth E. Knight.

**Human Factors Contributions to Nuclear Power Safety: A Progress Report (27 May, 9:00 a.m., H):** Engineering activities, national laboratories, NRC and DOE nuclear safety, industry-sponsored research, power utility safety activities, Three Mile Island, a consultant's experiences.

Richard J. Hornick, William W. Banks, Joseph L. Seminara, Allan M. Stave, Julien M. Christensen, Daniel B. Jones.

**Living and Working in Space: The Human Factors of Space Station Design (27 May, 2:30 p.m., H):** Lessons, extended spaceflight, human adaptations, stresses of isolated and confined environments, enhancing human productivity, simulation studies, role of architecture.

James A. Wise, Mary B. Connors, Yvonne Clearwater, B. J. Bluth, Maria K. Junge, Marc Cohen.

**Moving Industry into Space (28 May, 2:30 p.m. and 29 May, 9:00 a.m. and 2:30 p.m., H):** NASA's initiatives, commercialization, Europe's future, the Reagan Administration, collaboration, 3-M's venture, space boosters, General Dynamics' initiatives, man-tended space platform, upper stages for the space shuttle, Rockwell's initiatives, Spacelab Mission One, electrophoresis operations, metallic vapor transport in microgravity.

Morrie Schneiderman, Mickey A. Farrance, Barry D. Gold, Isaac T. Gillam, Reimar Luest, Richard H. Shay, John M. Logsdon, Lester C. Krogh, Lee Scherer, Maxime A. Faget, David W. Thompson, John Peller, Charles R. Chappell, Charles D. Walker, Lodewijk Van Den Berg, Taylor Wang.

**Government Support for Industrial Research: Does It? Can It? Should It? (29 May, 9:00 a.m., B):** Government-industry relations, conduct, exploitation, R&D, major changes in government support.

Herbert I. Fusfeld, George E. Brown, Jr., Peter Cannon, Ronald Cape, D. Bruce Merrifield, Ray Moshy.

**Comparable Worth: Perspectives from the Social Sciences (29**

**May, 9:00 a.m., B):** Legal aspects, policy capturing, respect for the individual, labor perspectives, public policy issues.

Sheila M. Pfafflin, Nadine Taub, Susan W. Stang, Robert M. Guion, Wesley R. Liebttag, Lorel E. Foged, Helen Remick, Donald J. Treiman, Michele A. Wittig.

**The Futurists Speak: Science and Technology to the Year 2000 (30 May, 2:30 p.m., H):** Information technology, U.S. business, freedoms and fetters, patents, technology forecasting, shaping trends, government, universities, space research, space station.

Mary Ellen Mogee, Roy Amara, Jack M. Nilles, William G. Wells, Jr., Kenneth J. Frost.

**Manufacturing in the Twenty-first Century (31 May, 9:00 a.m. and 1:30 p.m., B):** Key technologies, robotics, intelligent computer-assisted design systems, case study at Hughes Aircraft, new economics, education, implementation problems, public policy issues.

Janice E. Greene, Joel D. Goldhar, Charles A. Rosen, Michel A. Melkanoff, Henry Graf, Robert J. Caulfield, Bela Gold, Roger N. Nagel, Harry Thompson, Ed Zschau, Jordan Baruch.

## **16. Behavioral Sciences**

**Work Experience and Psychological Development Through the Life Span (27 May, 9:00 a.m., B):** Becoming a worker, working in teenage America, job satisfaction, age and gender variation, social stratification, transmission of values, family, cross-national assessment.

Jeylan T. Mortimer, Kathryn Borman, Ellen Greenberger, Michael D. Finch, Geoffrey Maruyama, Melvin L. Kohn, Kazimierz M. Slomczynski, Carrie Schoenbach.

**The Effect of Number, Order, and Spacing of Siblings on Child and Adult Outcomes (27 May, 2:30 p.m., B):** Biological, psychological, sociological, and economic perspectives.

David M. Heer, James V. Higgins, Robert B. Zajonc, Judith Blake, Paul Taubman.

**Day Care Quality: What It Means for Children's Lives (27 May, 2:30 p.m., B):** Forms and features, quality issues, different experiences, effects on school-aged children, policy perspectives.

Deborah L. Vandell, Thomas J. Tighe, Alison Clarke-Stewart, Kathleen McCartney, Deborah A. Phillips, Jay Belsky.

**Biological and Behavioral Research in Early Adolescence (28 May, 9:00 a.m., B):** Hormone level, psychological behavior, sex differences, cognitive abilities and preference, contributions of family processes, psychosocial development, longitudinal studies, vulnerability, resilience, and normal, diabetic, and psychiatrically ill adolescents.

Beatrix A. Hamburg, Editha D. Nottelmann, Anke A. Ehrhardt, Stuart T. Hauser, Emmy Werner.

**Expression and the Physiology of Emotion (28 May, 2:30 p.m., B):** Autonomic nervous system specificity, facial expression, cerebral asymmetry, dimensions in facial and autonomic responses.

Paul Ekman, Robert W. Levenson, Richard J. Davidson, Robert M. Krauss, Lois E. Putnam, John I. Lacey.

**The Meaningful Silence of American Sign Language: Structure, Acquisition, and Effect on Brain Organization (28 May, 2:30 p.m., B):** Natural acquisition, effect of early sensory and linguistic experience, neural development, impact of research, American deaf community.

Patricia B. Launer, Ursula Bellugi, Helen J. Neville, James E. Tucker.

**Infant Imitation (29 May, 9:00 a.m., B):** Facial imitation,



newborn infants, evidence for imitation, early infancy, term and preterm neonates, learning to imitate.

Thomas J. Tighe, Andrew N. Meltzoff, Eugene Abravanel, Tiffany M. Field, Tom G. R. Bower, Robert B. McCall.

**Sexuality and Disability (29 May, 2:30 p.m., B):** Psychosexual adjustment, medical aspects, education, counseling.

Frank J. Padrone, Ronald M. Cannella, Martha Ross Redden, Sanders W. Davis, Nancy L. Esibill, Marilyn Rousso.

**Research on Mind and Media: Developmental and Educational Issues (31 May, 9:00 a.m., B):** Growing up, computers, children's cognitive processing, television, video games, implications for learning, educational policy.

Patricia M. Greenfield, Sherry Turkle, Aletha C. Huston, John C. Wright, Aimee Dorr.

**Microcomputer Impacts on Psychotherapy (31 May, 1:30 p.m., B):** Computer-based test interpretation, professional or government control, self-help software, utilization in the private practice of psychology and psychiatry, computerized instrumentation.

Karen B. Levitan, Raymond D. Fowler, Dennis M. Kowal, Lorraine D. Eyde, James H. Johnson, Marjorie Toomin, Hershel Toomin.

## **17. Science and Technology Education**

**Computers in Education: Where Have the Equity Issues Gone? (27 May, 9:00 a.m., H):** Technology, research, views from Minnesota, intervention.

Shirley M. Malcom, Cora B. Marrett, Andrew R. Molnar, Marlaine E. Lockheed, Ronald E. Anderson, Kay F. Gilliland, Leslie R. Wolfe.

**Science Teacher Education at Museums (27 May, 2:30 p.m., H):** Exhibits, physics, physical science, professional development programs, workshops, gifted students, elementary and secondary educators.

Yolanda S. George, Bonnie VanDorn, Christopher De Latour, William C. Schmitt, Mary B. Hyman, Gerald F. Popperwell, Phyllis S. McGrath, George W. Tressel.

**The Changing Face of Science (28 May, 9:00 a.m. and 2:30 p.m., H):** Status of women and minorities, statistical picture of women and minorities, affirmative action, race, universalism, educational institutions, effective models, research and training, urban context, interdisciplinary models, biomedical research, Puerto Rican scientists, statewide efforts.

Yolanda S. George, H. Kenneth Bechtel, Franklin D. Hamilton, Vijaya L. Melnick, Thomas Cole, Jr., Betty Vetter, Alan Fechter, Sue Berryman, Evelyn F. Keller, Jerry Gaston, Willie Pearson, Jr., Frederick Humphries, Julius Jackson, Manuel Gomez, Leon Henkin, Eugene Cota-Robles.

**Disabled Scientists: Role Models for Educational and Career Planning (29 May, 12:00 noon, California Museum of Science and Industry):** Biologist as industry executive, computer scientist as college professor, physicist in the defense industry, public health administrator for nonprofit organization, students and administration, crossing barriers, aid of technology.

Virginia W. Stern, Herbert W. Hoffman, John J. Gavin, Bruce Hillam, June M. Rooks, Judith E. Heumann, Mark L. Stern, Louis Herrera.

**Future Educational Delivery Systems: Technology in Education (29 May, 2:30 p.m., H):** Computer, systems view, institutionalizing change, transfer of new technologies, appropriate use of technology, cost-effective automated learning systems.

Lee N. Bolen, Alfred Bork, Bela H. Banathy, Jim Mecklenberger, Paul L. Evans, Rod Daynes.

# ***Register Early! Ensure Your Place at the Most Exciting Scientific Event This Year***

Forms are on pages 62 and 63.

**Electronic Delivery Systems and Engineering Education (30 May, 9:00 a.m. and 2:30 p.m., H):** Wired university, nationwide instructional television, TVI-tutored videotape instruction, microcampus, continuing education, graduate education, students in industry, studio production of videotapes, long-range planning, professional societies.

Thelma Estrin, Andrew S. Molnar, Douglas E. Van Howeling, Lionel Baldwin, Kenneth Down, Eileen Matz, Robert W. DeSio, Ilene Birkwood, Jack Munushian, Richard Noyes, Anthony Rigas, Dorothy Deringer.

**Science and Mathematics Education Reform: The New Wave (30 May, 2:30 p.m., H):** Critical issues, reform in California, reform and technology in Maryland, states address the nation.

Alphonse Buccino, Frank Collea, Michael Sullivan, Beverly Anderson.

**Science Education for the Nonscientist (31 May, 9:00 a.m., H):** High school students, college freshman, challenges, perspectives, elementary school teachers, zoos, television.

Marvin Druger, William R. Cary, William C. Ritz, Lora A. LaMarca, Ira Flatow.

**Controversial Issues in Content and Control of High School Science Textbooks (31 May, 1:30 p.m., H):** Biologist, publicist, and teacher perspectives, misconceptions, the theoretical to the actual in textbooks.

Ann C. Howe, Kathleen S. Johnston, Jack L. Carter, Gary D. Eisenberger, Jane B. Kahle, Juliana Texley, John A. Moore.

## **18. Science Communication and Responsibility**

**The International Popularization of Science: Reporting the News and Effecting Change in Developing Countries (27 May, 9:00 a.m., H):** International science communication, broadcasting abroad, efforts to improve communication, Asian approaches, drama and change in Indonesia, traditional mass media, modern messages.

James Cornell, David Spurgeon, Martin E. Redfern, Bob Huggan, Adlai J. Amor, Monique de Meuron Landolt, Howard J. Lewis, Carol L. Rogers.

**Military Research and the University: Questions of Responsibility (27 May, 2:30 p.m., H):** Newton to Reagan, big science, academic freedom, uses of research, University of California and national laboratories.

Rosemary Chalk, Nicholas H. Steneck, Leonard M. Rieser, George Gamota, David Korn, William R. Frazer, Gordon Kane.

**Hollywood and Science: The Image of Science in Television and Films (28 May, 9:00 a.m., H):** Images of radiation, constructive dissemination of information, how to incorporate new ideas in programming, reflections on science and scientists.

Rae S. Goodell, David Kalson, George Gerbner, George Comstock, Ni Yang, Spencer R. Weart, J. Ronald Milavsky, Helen Hernandez, Leonard Nimoy.

**When Trimesters Collide: Constitutional Theory Versus Clinical Reality (Abortion and Fetal Viability) (28 May, 2:30 p.m., B):** Right of choice, delivery room realities, rethinking the viability standard, dimensions of moral obligation.

Philip L. Bereano, Burt Neuborne, Richard G. Wilkins, Robert Hayashi, Nancy K. Rhoden, Vicki Michel, William A. Thomas, Marc Lappe.

**Fraud in Science and the Pressure to Publish (29 May, 9:00 a.m., H):** Lies and white lies, statistics, connection between fraud and publishing, possible systems, dealing with possible misconduct.

Marcia Angell, Carlton B. Chapman, Edward J. Huth, John C. Bailar III, Patricia Woolf, William F. Raub.

**Science, Ethics, and Film (29 May, 2:30 p.m. and 5:30 p.m., B):** Nursing, consent and access, documentary film production, genetic screening, professional code of ethics, words of advice, Manhattan Project, human dimension in science.

Rosemary Chalk, Patricia Curlin, Ben Achtenberg, Sandra C. Walker, Jeffrey Kirsch, Steve Lucas, Jon Else.

**Scientists as Human Rights Advocates (30 May, 9:00 a.m., B):** Forensic science, psychiatric aspects of torture, genetic screening, missing children of Argentina, rights, responsibilities, ethics in anthropological research.

Kathie McCleskey, Thomas Eisner, Clyde C. Snow, Louis Jolyon West, Mary-Claire King, Gerald Berreman, Joel Primack.

**Scientific Freedom and National Security: Is There a Conflict? (30 May, 2:30 p.m., B):** Open science, Soviet acquisition, restricted communication, freedom in a competitive world, advancement of technology.

Stephen B. Gould, Herbert F. York, Richard N. Perle, Donald N. Langenberg, Jan Herring, Boyd McKelvin, Mitchel B. Wallerstein.

**Ethics of Animal Research: Philosophy and Practice (31 May, 9:00 a.m., B):** Research history, antivivisection in America, social and cultural background, issues in research, NIH approach, review of research, public participation in decision-making.

Andrew N. Rowan, J. Wesley Robb, Susan E. Lederer, Franklin M. Loew, Jerrold Tannenbaum, Charles McCarthy, Harlyn O. Halvorson.

**Inventions: Science and Literature (31 May, 1:30 p.m., B):** Scientists as writers, science writing as literature, reciprocities, international reunion, from Donne to recombinant DNA.

Bonnie Bilyeu Gordon, Phillips Salmon, Alan P. Lightman, Timothy Ferris, George S. Rousseau, Miroslav Holub, Ray Bradbury, Roger Bingham.

## 19. Science and Technology Policy

**Science as a Basis for Public Policy (27 May, 9:00 a.m., B):** Abstractions, fragments, slices of reality, combining the findings of various sciences, mechanisms, institutions.

Amitai Etzioni, Gilbert S. Omenn, Don K. Price, Aaron Wildavsky, Charles Wolf, Jr.

**Frontiers of Science, Technology, and Society (STS): Tutorial Reviews for the Nonspecialists (27, 28, and 29 May, 12:20 p.m.–1:40 p.m. each day, H):** Past and future science education, reliable information, information technology, health and healing in America, user parameters, evaluating technologies, the federal and state roles in technology policy.

Rustum Roy, F. James Rutherford, Melvin Kranzberg, Ivan Illich, Kenneth F. Knight, George E. Brown, Jr., Edmund G. Brown, Jr.

**Recent Developments in U.S. Science Policy (27 May, 2:30 p.m., B):** Peer review, apparent trends, interest groups, health and safety risk controversies, a view from the inside.

Edward J. Woodhouse, Daryl Chubin, Wil Lepkowski, Daniel Metlay, Joseph Morone, Marcel Chotkowski LaFollette.

**Applied Research and Technology Policy: A Time for Action? (28 May, 9:00 a.m. and 2:30 p.m., H):** R&D in the budget, public sector financing, federal role, private sector investments, separate forms of support, civilization's "odd couple," technology transfer, technical education, engineers in Washington, National Technology Foundation, importance of coherent federal support.

Albert H. Teich, Howard Gobstein, Christopher T. Hill, John Alic, Jill H. Pace, Willis H. Shapley, Susan E. Cozzens, John M. Logsdon, Marcia G. Rorke, F. Karl Willenbrock, Trudy Solomon, Jordan J. Baruch, Donald Frey, Carroll W. Pursell, George E. Brown, Jr., Mary L. Good.

**Scientific Praxis in Risk Management (29 May, 9:00 a.m., H):** Assessing environmental exposures, defining adverse health effects, lead, thresholds, de minimis risk concepts, limitations of summary data.

C. Richard Cothorn, David W. Schnare, Frank J. Letkiewicz, William A. Coniglio, William L. Marcus, Robert J. Golden, Nina I. McClelland, Gwendolyn L. Ball.

## Schedule of Contributed Papers

The contributed papers will be presented in **poster session format only**; there will be no slide sessions. Abstracts for the individual papers will be found in the *Abstracts of Papers* volume, which is available on-site to all registrants. The poster sessions will be held in the Exhibit Hall at the Westin Bonaventure Hotel; they are scheduled as follows:

**Poster Session I (28 May, 11:30 a.m.–1:00 p.m.).**  
American Junior Academy of Science:  
Research Papers by High School Students.

**Poster Session II (28 May, 1:30 p.m.–3:00 p.m.).**  
General Biology.

**Poster Session III (29 May, 11:30 a.m.–1:00 p.m.).**  
Biomedical Sciences.

**Poster Session IV (29 May, 1:30 p.m.–3:00 p.m.).**  
Neuroscience and Behavioral Science.

**Poster Session V (30 May, 11:30 a.m.–1:00 p.m.).**  
Physical Sciences, Mathematics, and Technology.

**Earthquake Prediction and Response as an Issue in Science and Public Policy (30 May, 9:00 a.m., H):** Regional and local perspectives, state policy, federal scientist and university scientist's perspective, Peru prediction.

W. Henry Lambright, Paul J. Flores, Richard Andrews, John Filson, Karen McNally, Richard Olson.

**Causation and Compensation for Alleged Victims of Nuclear Testing and Other Exposures (30 May, 2:30 p.m., H):** Two cultures in the courtroom, probabilities of causation, Congress, law, radioepidemiology, radiation litigation, toxic chemical exposure.

Stuart C. Black, Bruce S. Jenkins, Seymour Jablon, Ronald Preston, Glenn E. Schweitzer.

**Measuring the Impact of Science and Technology on Development in Third World Nations (31 May, 9:00 a.m. and 2:30 p.m., H):** Assessing impact, citation counts as indicators of contributions, measuring capacity, household socioeconomic status, regional socioeconomic development levels, Brazil, economic returns, training in agricultural research, ambient social consequences, modernization.

Archibald O. Haller, Muni Anandakrishnan, Hiroko Morita-Lou, Manfred Kochen, Subbiah Arunachalam, Davidson Frame, James Mullin, Michael J. Moravcsik, Frederick L. Bates, Charles D. Killian, Walter Gillis Peacock, Tarcizio Rego Quirino, Antonio Flavio Dias Davila, Jairo Eduardo Borges-Andrade, Luiz Jose Maria Irias, Frederick C. Fliegel, Manoel M. Tourinho, Ang How-Ghee, Alejandro Portes.

**Science and Technology Policies for Third World Development: Past Promises and Future Prospects (31 May, 1:30 p.m., H):** Mood of optimism, advances in microelectronics and biotechnology, past successes and failures, institution building, institutional innovations required.

Geoffrey Oldham, Kurt Hoffman, Victor Rabinowitch, Norman Girvan, Victor Urquidi, John Hurley, Haile Lul Tebicke, Kunmo Chung.

## **20. Arms Control and National Security**

**Star Wars and the Strategic Defense Initiative: The Technology and Politics of Weapons in Space (27 May, 9:00 a.m., B):** National security, arms control, ballistic missile defense, military planning, NATO alliance, U.S.-Soviet relations.

Jeffrey Boutwell, Marvin Goldberger, Donald Hafner, Gerold Yonas, Richard Garwin, John Toomay, David Holloway.

**Reducing Nuclear Arms: What Is Required? (27 May, 2:30 p.m., B):** Realities of negotiating, U.S.-Soviet relations, non-government communication with the Soviet Union, suggestions for leadership, a view from abroad, a view from Capitol Hill.

Anne H. Cahn, Paul C. Warnke, Robert Kaiser, Ruth S. Adams, Maj. Britt Theorin.

**Nonproliferation: What Next? (28 May, 9:00 a.m., B):** New approaches, problem countries, role of the IAEA, policy options, the UNA Study.

Herman Pollack, Mohamed I. Shaker, Gerard C. Smith, Leonard S. Spector, Lawrence Scheinman, Elliot L. Richardson, Glenn T. Seaborg, Lewis A. Dunn, Alvin M. Weinberg.

**The Comprehensive Test Ban: Why Not Now? (28 May, 2:30 p.m., B):** Lessons from the negotiations, problems with negotiating, essential testing for the United States, nuclear arms race, nonproliferation implications, and state-of-the-art seismic network data collection, transmission and handling technologies.

Richard A. Scribner, Kenneth N. Luongo, Wolfgang Panofsky, Herbert York, Jack Evernden, Paul Stokes, Philip Coyle, Gerard Smith.

**The Philosophical and Technical Bases of Treaty Verification (29 May, 9:00 a.m., B):** Verification, compliance, advantages and limitations, national technical means, cooperative or in-country measures, Soviet view.

Milo D. Nordyke, Colin S. Gray, Walter B. Slocombe, Warren Heckrotte, Richard N. Perle, Judith K. Grange.

**Arms Control: Does It Have a Future? (29 May, 2:30 p.m., B):** Evaluation factors, social and political factors, nuclear arms control.

Sidney N. Graybeal, Richard A. Scribner, Walter B. Slocombe, Steve Ballard, Albert Carnesale, Leon Sloss, Herbert Scoville.

**STARTS, Stops, and Star Wars: Report on Current Negotiations (30 May, 9:00 a.m., B):** Approaches for the future, confidence-security building measures in Europe, Stockholm Conference on Disarmament in Europe, specific proposals, strategic, medium-range, and space weapons negotiations.

Richard A. Scribner, Brewster Denny, Rodney Nichols, James Goodbe, Sidney D. Drell, William J. Perry, Condoleeza Rice.

**Avoiding Nuclear War (30 May, 2:30 p.m., B):** Harvard's Avoiding Nuclear War Project, forces, technology, political developments affecting likelihood of war, policy recommendations.

Graham T. Allison, Albert Carnesale, Joseph S. Nye.

**Scientists and Nuclear Weapons (31 May, 9:00 a.m., B):** Nuclear fission, Soviet scientists, the nuclear arms control process.

Lawrence Badash, David Holloway, Allen Greb.

**Power, Change, and Security Decisions: Anthropological Perspectives (31 May, 1:30 p.m., B):** Compromise, rhetoric, good and evil, Iran, United States, peace and war issues, great social revolutions, inducement to military participation, tribal societies, communist ethic, spirit of China's party cadres, images of the other.

Mary LeCron Foster, Robert A. Rubinstein, William O. Beeman, Mary Catherine Bateson, Valery Tishkov, Walter Goldschmidt, Jack M. Potter, Peter Worsley, M. Margaret Clark, Ronald Cohen.

## **Workshops**

**Roles of Scientific Societies in the Career Development of Members (26 May, 9:00 a.m., H):** Impact of participation, promoting opportunities, underrepresented groups, communication and interaction between societies and members, inter-Association policy and programs.

Paula Quick Hall, Diana L. Martinez, Ronald E. Mickens, Nancy Felipe Russo, Anne B. Swanson, Gail S. Young, John B. Slaughter.

**Building a Learning Society (26 May, 9:00 a.m. and 1:30 p.m., B):** Social imperatives, regaining civic virtue, social responsibility of a scientist, Norfolk, Virginia International Symposium, role of schools, benefits to be derived, translating ideas into action.

Lawrence Senesh, Albert L. Ayars, Leslie Lipson, Owen Chamberlain, Ellen C. Morris, J. David Bowick, Robert D. Beam.

**Popular Science Communication in Developing Countries: Some Case Studies (26 May, 1:30 p.m., H):** Puppets and popular science, Indonesia, teaching science journalism teachers abroad, science feature service in Asia, sounds of science,

eskimos, bowhead whales, high-tech versus appropriate medical treatment, developing countries.

James Cornell, Minique de Meuron Landolt, Bob Huggan, Adlai J. Amor, Martin E. Redfern, John G. Blair, Harry Nelson.

**Rethinking National Security: Exploring New Approaches, Searching for Common Ground (26 May, 1:30 p.m., H):** Discontinuous change, national security frustrations, members of Congress, network television reports, peace activists, generals, discovering commonality, absorbing data on cogni-

tive and noncognitive levels, application of methodology to field.

John D. Marks and Richard A. Scribner.

**Solutions for Entry-Level Scientists: Developing Employment Options in the Eighties (26 May, 1:30 p.m., H):** Baby boom members, constructive employment, oversupply of new scientists and engineers, academic positions, national laboratories, strategies and options.

Gene A. Nelson, Susan W. Miller, Betty Vetter, D. Kenneth Baker.

## AAAS Science Film Festival

The Science Film Festival continues to be a popular feature of the AAAS Annual Meeting. The Festival presents a unique collection of recent educational and entertaining films that deal with the natural and social sciences, the technologies derived from them, and the social issues they raise. The 1985 Festival includes a wide variety of productions in each of these subject areas.

The Science Film Festival will run from 10:00 a.m. to 5:00 p.m., Monday, 27 May, and 10:00 a.m. to 4:30 p.m., Tuesday through Thursday, 28–30 May, in the San Francisco Ballroom of the Westin Bonaventure. Admission is free. Expected times are shown below; exact times and detailed information about the films presented at the Festival will be available in the Annual Meeting Program.

### Monday, 27 May

- 10:00 a.m. The Year of the Wildebeest
- 10:35 a.m. The Voice of Cape Cod
- 10:52 a.m. Ethics in the Computer Age
- 11:17 a.m. Principles of Orbit
- 11:32 a.m. The Math/Science Encounter
- 12:01 p.m. Sun, Cities, and Smog
- 12:31 p.m. The Ritual of the Mounds
- 1:04 p.m. The Sea: A Quest for Our Future
- 2:06 p.m. The Temperate Rain Forest
- 2:27 p.m. Energy in Orbit
- 2:41 p.m. My Mother, My Father
- 3:19 p.m. The Acorn Woodpecker
- 3:33 p.m. Orbital Shapes and Paths
- 3:48 p.m. Albert Szent-Györgyi: A Special Gift
- 4:23 p.m. The Other Bridge

### Tuesday, 28 May

- 10:00 a.m. The Henderson Avenue Bug Patrol
- 10:20 a.m. Sound of Sunshine, Sound of Rain
- 10:39 a.m. Protecting Endangered Animals
- 10:59 a.m. As a Blind Person
- 11:33 a.m. What's It Like to Work with Computers?
- 11:57 a.m. Song Dog
- 12:29 p.m. Hazardous Waste: The Search for Solutions
- 1:09 p.m. The Living Mosaic: The Taupulip Biotic Province

- 1:41 p.m. The Navigators: Pathfinders of the Pacific
- 2:45 p.m. Seeds of Survival
- 3:17 p.m. Rendezvous
- 3:32 p.m. China: The Year of the Counting

### Wednesday, 29 May

- 10:00 a.m. A Nature Walk at Low Tide
- 10:17 a.m. Over the Hill to the Moon
- 10:30 a.m. A Clone of Frogs
- 10:51 a.m. The Faces of Yellowstone
- 11:21 a.m. Day Star
- 11:42 a.m. Flight to the Planets
- 11:57 a.m. Images of the Wild
- 12:24 p.m. A Small Body of Still Water
- 12:45 p.m. Sargasso Sea: Unique Deep Ocean Environment
- 1:14 p.m. River Town
- 1:47 p.m. The Old Quabbin Valley
- 2:20 p.m. Where I Want To Be
- 2:55 p.m. Hungry for Profit

### Thursday, 30 May

- 10:00 a.m. Flight of the Whooping Crane
- 11:04 a.m. Being Obese
- 11:33 a.m. Signs of the Apes, Songs of the Whales
- 12:35 p.m. Navigating in Space
- 1:08 p.m. The Baking Deserts
- 2:08 p.m. The First Fifty Years: Reflections on U.S.–Soviet Relations
- 3:11 p.m. Talking Turtle