Science and Engineering: Diversity and Convergence

AAAS Annual Meeting

Los Angeles, 26–31 May 1985

Preliminary Program

Public Lectures

Keynote Address. Patterns of Convergence in Contemporary Science (26 May, 8:30 p.m., Bonaventure).
MURRAY GELL-MANN (*R.A. Millikan Professor of Theoretical Physics, California Institute of Technology*).

Molecular Approaches to Behavior (27 May, 1:30 p.m., Hilton).
DANIEL E. KOSHLAND, JR. (*Professor of Biochemistry, University of California, Berkeley; Editor,* Science, *AAAS*).

George Sarton Memorial Lecture. The Scientist and the Public: Historical Reflections (27 May, 8:30 p.m., Bonaventure).
DANIEL J. KEVLES (*Professor of History, California Institute of Technology*)

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, University of Texas at 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 Institute*).

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 Emeritus, California Institute of Technology*).

AAAS President's Lecture. Brain, Behavior, and Health (29 May, 8:30 p.m., Bonaventure).
DAVID A. HAMBURG (*President, AAAS; President, Carnegie Corporation of New York*).

Arms Control and Star Wars: Problems and Prospects (30 May, 1:30 p.m., Hilton).
SIDNEY D. DRELL (*Lewis M. Terman Professor, Deputy Director, and Executive Head of Theoretical Physics, Stanford Linear Accelerator Center, Stanford University*).

Five Minutes, Mr. Pythagoras! (30 May, 8:30 p.m., Bonaventure).
ADRIAN MALONE (*Independent TV Producer and President, Adrian Malone Productions, Inc., Los Angeles*).

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

Workshops

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

Building a Learning Society (26 May, 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.

Popular Science Communication in Developing Countries: Some Case Studies (26 May, H): Puppets and popular science, Indonesia, teaching science journalism teachers abroad, science feature service for Asia, sounds of science, Eskimos, bowhead whales, high-tech versus appropriate medical treatment, developing countries.

Rethinking National Security: Exploring New Approaches, Searching for Common Ground (26 May, H): Discontinuous change, national security frustrations, members of Congress, network television reports, peace activists, generals, discovering commonality, absorbing data on cognitive and noncognitive levels, application of methodology to field.

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

Youth Symposium

Annual Youth Symposium (29 May, California Museum of Science and Industry).

1. General Interest

Frontiers of Neuroscience (27 May, 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).

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

Frontiers in Science and Technology to Aid Disabled People (28 May, B): R&D for the visually impaired, computers and 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.

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

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

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

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

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

2. Physical and Mathematical Sciences

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

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

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

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

Chemically Solvable Problems (30 May, B): Sherlock Holmes, werewolves and vampires, art conservation, radiocarbon dating, chemical detectives, the FDA and DEA.

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

3. Earth and Planetary Sciences

Geology and Your National Parks Vacation (27 May, 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.

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

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

Comparative Planetology (29 May, B): Surfaces, climate, tectonics, craters and impacts, volcanoes, greenhouse and antigreenhouse effects, magnetospheres.

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

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

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

4. Engineering, Computing, and Information

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

Engineering Applications of Supercomputers (27 May, H): Hydrodynamics of fluidization, modeling, computational chemistry, numerical simulations, chemically reacting turbulent flows, engine flow, combustion processes, applied mechanics.

Symbolic Mathematical Computation on Modern Computers (28 May, H): Manipulation, microcomputers and personal computers, SMP system, applications in universities, undergraduate mathematics education.

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

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

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

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

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

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

Global Potentialities of Gas Fuels and Feedstocks (31 May, 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.

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

5. Environmental Issues

Application of Biotechnology: Environmental and Policy Issues (27 May, B): Species models, ecological release, natural regulation, infectious spread, risk assessment and management, Congress, industrial viewpoint, social responsibility.

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

Active Mitigation of Industrial Wastes by Repository Characteristics (28 May, 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.

Environmental Aspects of Genetically Altered Viruses (29 May, 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.

Environmetrics 85: Statistical Methods in Analysis of Acid Deposition Data (29 May, B): Trend, impact detection, modeling, space-time processes, North American wet data, spatial pattern of precipitation, interpretations.

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

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

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

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

Toxicology and Risk Assessment, Part II (31 May, 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.

6. Biological Sciences, General

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

Urban Ecology (28 May, H): The peregrine falcon, ratahabitatadata, 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.

Bio-organic Chemistry of Insect Hormones and Pheromones (29 May, H): Affinity labeling, biosynthesis, houseflies, biochemical models, perception and catabolism, photoaffinity labeling, ecdysteroid receptors, neuropeptides, physiological inactivation.

New Frontiers: Petroleum and the Arctic Environment (30 May, 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.

Recent Integrations of Research on Biological and Social Living Systems (30 May, B): Evolution, adaptability theory, tools, synergy, energy, emergy, eclecticism.

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

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

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

7. Cell and Molecular Biology

Gene Expression in Reptilian Systematics (27 May, H): Ancestral perspective, vertebrates, reptiles, phylogenetic and systematic patterns, creatine kinase expression, lactate dehydrogenase expression, tissue-specific expression, crocodilians.

Control of Cellular High-Energy Phosphate Production (28 May, 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.

Protein Engineering (29 May, H): Interactive graphics, manipulation, cut and paste, computer graphics, artificial intelligence, structure-function relationships, Betabellin, directed mutagenesis, and wild type, mutant, and synthetic proteins.

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

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

Current Concepts of Lectins Emphasizing Health and Disease (31 May, 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.

8. Biomedical Technology

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

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

Advances in Medical Imaging (28 May, 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.

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

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

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

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

Marine Biotechnology and Marine Natural Products: Prospects for the Americas (31 May, H): Commercial development, chemical resources, Mexico, chemosynthetic production, deep sea hydrothermal vents, molecular cloning, virulence genes, fish pathogens, food and medical resources production.

9. Neuroscience and Cognition

Convergence of Neuroscience, Ethology, and Cognitive Psychology? (27 May, B): Neural circuitry, instructive or selective learning, language learning and experience, animal communication, scientific communication.

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

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

Advances in Cognitive Science (29 May, H): Decision theory, biology, Darwinian selection, nervous system, selective networks, parallel computer architectures, nonmonotonic reasoning, discourse structure, computation models, Gabor holography, novelty, redundancy.

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

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

10. Medical Sciences

Trace Element Metabolism in Man (27 May, B): Nutrition, physiological aspects, chromium, copper nutriture, selenium and zinc metabolisms, immune response.

New Applications of Molecular Biology to Human Genetic Disease (28 May, 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.

Perspectives in Management of Lung Cancer (29 May, 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.

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

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

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

Space Medicine and Drug Therapy in Space (31 May, B): Perspectives, performance considerations, pharmacokinetics of drugs, space motion sickness, pharmacological considerations of bone loss, orthostatic intolerance, countermeasure development.

Pathogenesis of Human T-Cell Lymphotropic Viruses (31 May, 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.

11. Health Care

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

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

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

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

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

Homophobia and Social Attitudes: Their Impact on AIDS Research (29 May, 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.

Oral Care of the Elderly: An Interaction of Foods, Nutrition, and the Aging Process (30 May, 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.

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

12. Agriculture and Food

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

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

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

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

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

The Origins of Plant Cultivation in World Perspective (29 May, H): Food production, the Near East, prehistoric plant domestication, temperate Europe, African agriculture, Southeast Asia, Mesoamerica, South America, desert North America, eastern North America.

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

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

13. Sociology

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

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

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

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

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

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

Pornography: New Approaches and Justifications for Regulating? (31 May, B): Legitimate violence, sexual inequality, effects of mass media content, relationship between adult entertainment and rape, a feminist perspective, policy and legal implications of protection.

14. Anthropology and Demography

The Study of Language as Cultural and Cognitive Systems (27 May, 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.

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

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

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

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

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

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

How People Spend Time: Kids, Women, and Men in Cross-Cultural Perspective (29 May, 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.

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

Scientific Issues in the 1990 Census (31 May, B): Decennial census, sampling, regression models, census undercount, errors, apportionment, fund allocations, and collecting, processing, and tabulating data quickly.

15. Economics and Industry

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

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

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

Comparable Worth: Perspectives from the Social Sciences (28 May, B): Legal aspects, policy capturing, respect for the individual, labor perspectives, public policy issues.

Moving Industry into Space (28–29 May, 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.

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

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

Manufacturing in the Twenty-first Century (31 May, B): Key technologies, robotics, intelligent CAD systems, case study at Hughes Aircraft, new economics, education, implementation problems, public policy issues.

16. Behavioral Sciences

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

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

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

Biological and Behavioral Research in Early Adolescence (28 May, 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.

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

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

Infant Imitation (29 May, B): Facial imitation, newborn infants, evidence for imitation, early infancy, term and preterm neonates, learning to imitate.

Sexuality and Disability (29 May, B): Psychosexual adjustment, medical aspects, education, counseling.

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

Microcomputer Impacts on Psychotherapy (31 May, B): Test interpretation, professional or government control, self-help software, utilization in the private practice of psychology and psychiatry, computerized instrumentation.

17. Science and Technology Education

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

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

The Changing Face of Science (28 May, 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.

Disabled Scientists: Role Models for Educational and Career Planning (29 May, 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.

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

Electronic Delivery Systems and Engineering Education (30 May, 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.

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

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

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

18. Science Communication and Responsibility

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

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

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

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

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

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

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

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

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

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

19. Science and Technology Policy

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

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

Applied Research and Technology Policy: A Time for Action? (28 May, 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.

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

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

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

Measuring the Impact of Science and Technology on Development in Third World Nations (31 May, 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.

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

20. Arms Control and National Security

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

Reducing Nuclear Arms: What Is Required? (27 May, B): Realities of negotiating, U.S.–Soviet relations, nongovernment communication with the Soviet Union, suggestions for leadership, a view from abroad, a view from Capitol Hill.

Nonproliferation: What Next? (28 May, B): New approaches, problem countries, role of the IAEA, policy options, the UNA study.

The Comprehensive Test Ban: Why Not Now? (28 May, 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.

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

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

STARTs, Stops, and Star Wars: Report on Current Negotiations (30 May, 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.

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

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

Power, Change, and Security Decisions: Anthropological Perspectives (31 May, 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.

Coming Soon

Tours and Special Events: The 22 March issue of *Science* will list tours and other special events arranged by the Los Angeles Advisory Committee for Annual Meeting registrants.

Preconvention Program: The 5 April issue of *Science* will feature expanded symposium listings (including names of speakers), exhibit and poster session schedules, the Science Film Festival, and more.

Meeting Information

The 1985 Annual Meeting will be held in two downtown Los Angeles hotels, located within three blocks of each other:

The Westin Bonaventure (B), 404 South Figueroa Street: Public lectures (evening) and symposia; workshops (Sunday, 26 May only); the Annual Meeting Exhibit; poster sessions (contributed papers); Science Film Festival; business meetings and social functions; registration, information, and ticket desks; member resource center; resource rooms for disabled and minority registrants; speakers' room; employment information; message center; and AAAS headquarters office.

Los Angeles Hilton (H), 930 Wilshire Boulevard: Public lectures (midday) and symposia; workshops (Sunday, 26 May only); business meetings and social functions; registration and information desks; AAAS newsroom; and AAAS headquarters office.

Hotel Reservations. The AAAS has reserved a block of hotel rooms at special reduced rates at both the Westin Bonaventure and the Los Angeles Hilton hotels. **These special rates are guaranteed only when reservations are made through the AAAS Housing Bureau before 3 May 1985.** Please read and fill out carefully the housing form on page 1217 in this issue. Room assignment will be delayed if any information is omitted from the form.

Do not be a "No-Show!" If you have made a reservation and find that you cannot keep your commitment, write to or call the Housing Bureau or hotel and cancel.

Advance Registration. Registration categories and fees are listed on the advance registration form on page 1216 in this issue. **You may charge your registration fee to your VISA or MasterCard.**

Advance registrants, please note: In mid April we will mail to you an expanded preconvention program, your badge and registration receipt together with a voucher for your registration packet. Present the voucher at the Advance Registrants' desk at either the Westin Bonaventure or the Los Angeles Hilton to receive the program book, condensed program (foldout), and abstracts volume. The registration areas will be open during the following hours:

Sunday, 26 May	12 noon–6:00 p.m.
Monday through Thursday, 27–30 May	8:00 a.m.–6:00 p.m.
Friday, 31 May	8:00 a.m.–12 noon

Registration Refunds. The AAAS will refund advance registration fees for all cancellations received by letter or telegram before 17 May 1985. **No refunds will be made on cancellation notices received after that date.** Refunds will be mailed from the AAAS offices in Washington after the Annual Meeting.

Tax Deductions for Educational Expenses. U.S. Treasury regulation §1.162-5 allows an income tax deduction for educational expenses (registration fees, cost of travel, meals, and lodging) incurred to (i) maintain or improve skills required in one's employment or other trade or business or (ii) meet express requirements of an employer or a law imposed as a condition to retention of employment, job status, or rate of compensation. This is true even for education that leads to a degree.

Resources for Disabled Registrants. The AAAS, in cooperation with the Los Angeles Advisory Committee, is making every effort to make the Annual Meeting fully accessible to disabled individuals. In addition to hotel rooms which can accommodate wheelchairs, and accessible meeting areas, the following services will be provided through the Resource Room located in the Westin Bonaventure: transportation to and from airports, train stations, and bus terminals; interpreters for the hearing-impaired at all public lectures, and for other sessions on request; special tour and sight-seeing information; audiotaped program highlights for the visually impaired; assistance in movement within and between hotels; and emergency repair for wheelchairs.

Persons needing special accommodations and services are strongly urged to so indicate on the registration and housing forms. *Your early response will help us to plan and serve you better. For additional information, contact Virginia Stern, AAAS Project on the Handicapped in Science, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036 (telephone, 202/467-4497).*

Air Travel to Los Angeles. *United Airlines* and *Delta Airlines* are offering special discount air fares to AAAS Annual Meeting attendants. For details, see page 1215 in this issue.

Airport Buses. Airport buses stop at both the L.A. Hilton and Westin Bonaventure hotels. Buses depart from airport and hotels at intervals of approximately 30 minutes. Travel time is about 45 minutes; one-way ticket price is $6.

Car Rental Discount. *Dollar Rent A Car* offers Annual Meeting attendants the following special convention rates:

Economy Car	$19.95/day ($125/week)
Compact Car	20.95/day (135/week)
Intermediate Car	21.95/day (140/week)
Standard Car	22.95/day (145/week)
Premium Car	23.95/day (150/week)

These special rates are valid from 22 May through 2 June 1985; they include unlimited free mileage. Call **800-421-6868** toll free and identify yourself as attending the AAAS Annual Meeting.

Parking. The two meeting hotels have limited parking space available, for registered guests, at the following rates: Westin Bonaventure, $11/24 hrs.; L.A. Hilton, $12/24 hrs.

Commercial parking garages are also in the World Trade Center, the Arco Plaza, and the Wells Fargo Building, all located near the two hotels. Current rates are $10/day; all rates are subject to change.

Child Care. Meeting attendants who require baby-sitters for infants and small children, or companion care for older children may wish to contact **Community Service Agency, Inc. (818/345-2950).** The agency charges the rates listed below, at 4 hours minimum, plus $3.75 for sitter's transportation cost plus parking fees:

Infant to 2 years	$24 for 4 hrs.
3 years and up	$20 for 4 hrs.
2 children	$21 for 4 hrs.
3 children	$22 for 4 hrs.

Charges for additional hours and special services vary; please inquire at the agency directly. The agency can be called 7 days a week: Mon.–Fri., 7:30 a.m.–9:00 p.m.; Sat. & Sun., 9:00 a.m.–9:00 p.m.

Message Center. The AAAS Message Center will be open during official registration hours. Messages for meeting attendants may be left by calling the Westin Bonaventure hotel, **213/624-1000,** and asking for the AAAS Message Center. The messages will be posted on a board in the registration area.

Bed and Breakfast Accommodations. B&B accommodations are a low-cost alternative to hotel housing, available in private homes and small inns. The reservation and referral service listed below coordinates appropriate B&B housing in accordance with individuals' needs both in the downtown and greater Los Angeles area. Current rates are $35–45 (standard), $46–55 (preferred), and $56–65+ (deluxe) for double occupancy; for singles, deduct $5. Cash, checks, traveler's checks, or money orders only; no credit cards accepted. For further information, current rate card, and housing application, call or write to:

California Houseguests International, Inc.
18533 Burbank Boulevard, No. 190
Tarzana, CA 91356
(818) 344-7878

Note: The Better Business Bureau of Los Angeles lists the company as a member in good standing. However, individuals who make housing arrangements through California Houseguests International do so on their own; the AAAS can not assume any responsibility.