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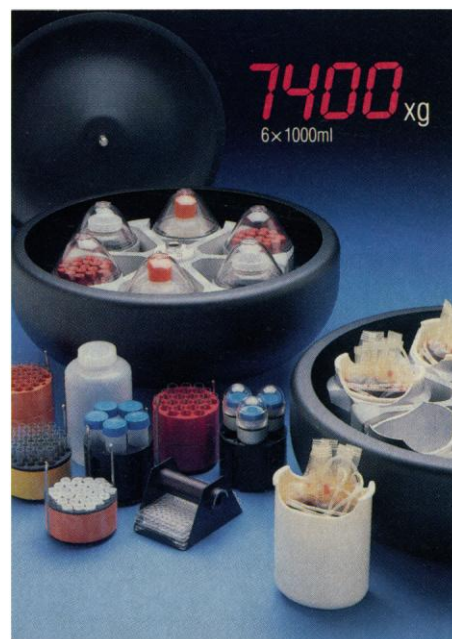
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This Week in SCIENCE

Venusian lithosphere

TECTONIC styles and heat-loss mechanisms may be common to Earth and Venus, two planets that also are similar in size, density, and position in the solar system (page 1380). Head and Crumpler review topographic and morphologic signatures of lithospheric movement and spreading on Earth and describe analogous structures on Venus in the western Aphrodite Terra region. Numerous features similar to those at plate boundaries in ocean basins on Earth were found in this highland region, suggesting that it is a spreading center. The lithospheric plates on Earth are segmented, laterally mobile, and continuously recycling, and heat loss from Earth is a consequence of the plate recycling process. Lithospheric movement on Venus and heat loss from the planet could prove to be comparable. The other terrestrial planets (Mars and Mercury) and the moon contrast with Earth and Venus; they have only a single global unsegmented lithospheric plate and lose heat by conduction.

Patchwork metabolism for degrading pollutants

BACTERIA have been developed through the use of genetic engineering technology that are capable of growing on and degrading mixtures of environmental pollutants (page 1395). When organisms, even those that can degrade single toxic compounds, are exposed to pollutant mixtures, dead-end products are often generated that get routed into nonproductive biochemical pathways; further degradation is inhibited, and bacteria stop growing. Rojo *et al.* describe procedures for designing theoretically workable pathways for degrading pollutant mixtures, the patchwork assembly of appropriate enzymes and gene regulators from several different bacteria into a single bacterial strain, and the successful degradation of mixtures of methylaromatic and chloroaromatic compounds by the newly "evolved" strain. Unlike parent strains from which the compo-

nents were taken, patchwork strains fully metabolized and grew well on mixtures of toxic compounds. These strategies can be applied to the production of various types of bacteria and to the assembly of degradation pathways for many types of pollutant environmental mixtures.

Amazonian species diversity

AMAZONIA has one of the highest species diversities anywhere in the world (page 1398). The climatic refuge theory, postulated in 1969, attributed this richness to the formation of forest refuges during relatively dry periods in the Pleistocene Epoch; in such refuges, in isolation, diverse species could have evolved. Räsänen *et al.* argue that the uplift of the Andes mountains, which changed river paths and floodplain locations, played a major role during the Quaternary Period and before in producing and supporting diversified ecosystems in western Amazonia. Radar images of portions of Brazil, Peru, Colombia, and Ecuador along with stratigraphic data show that, during the region's evolution, migrating rivers and floodplains at times would have isolated small aquatic and land-based communities, thus promoting local speciation, and at other times would have joined together once separate ecosystems, thus enhancing local species diversity.

Marker for familial polyposis coli

HUNDREDS of colon polyps develop early in life in individuals with familial polyposis coli (FPC) and, if the polyps are not removed, there is a high risk that colorectal adenocarcinoma will develop by age 40 (page 1411). Leppert *et al.* describe experiments in which the gene for FPC has been linked to a marker on the long arm of chromosome 5, in or near the 5q22 region. This work brings the identification and the isolation of the gene for FPC one step closer. A probe for the

FPC gene will make possible identification of at-risk individuals and genetic comparisons of FPC-affected individuals with others who have related diseases, such as Gardner syndrome, in which along with the adenomatous colon polyps, benign growths appear elsewhere in the body (Together, the incidence of these two syndromes is 1 in 12,000 in Europe and North America). In addition, because colon cancer is common (the lifetime risk for it is near 5% in North America) and because the adenomatous polyp represents an intermediate stage in development of such carcinomas, understanding changes in the FPC gene may be crucial to defining steps in development of colon cancer.

Roles for HDL in Chagas' disease

CHAGAS' disease is common in Latin America; it begins as an acute infection but leads to chronic heart and intestinal problems (page 1417). It is caused by the parasite *Trypanosoma cruzi*. New data suggest that serum high-density lipoprotein (HDL), a transporter of cholesterol, may also play some part in pathogenesis. The epimastigote stage of the parasite that multiplies in the gut of a blood-sucking insect and the trypomastigote that infects mammalian cells both have the enzyme neuraminidase on their surfaces; enzyme activity is typically low in epimastigotes but is high in trypomastigotes. Neuraminidase activity was known to be inhibitable by a serum component named cruzin, and cruzin has now been shown to be structurally and functionally the same as HDL. Prioli *et al.* suggest that the binding of HDL to the epimastigote may fill a nutritional need, because the multiplication rate, which is slow for epimastigotes grown in lipoprotein-depleted medium, can be restored by the addition of HDL; epimastigotes cannot make their own cholesterol. Exposure of trypomastigotes to HDL blocks neuraminidase activity and enhances infectivity; neuraminidase and the receptors for HDL are thus in close association on the parasite's surface.



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The Omnipotence Scandal

There is a new scam for obstructing progress on complex problems that can be called "The Omnipotence Scandal." The first step is to take a complex problem and imply that an obvious solution is at hand. It is also implied that some public official, if not omnipotent, is close to it, and therefore it is a scandal that the proper course of action has not been implemented. When, however, a solution is proposed, it is denounced because it fails to meet some previously unrevealed and necessary criterion.

A good example is the problem of the homeless. On one side there are taxpayer groups who on Monday, Wednesday, and Friday say that it is outrageous that the streets are cluttered with the unsightly and the unsanitary. On Tuesday, Thursday, and Saturday the same groups denounce budget excesses and oppose "throwing money at the problem." On the other side are the civil liberties groups, who on Monday, Wednesday, and Friday say that it is outrageous that a wealthy, affluent country cannot show the compassion to take care of its helpless. On Tuesday, Thursday, and Saturday these same groups declare that any attempt to provide food and shelter to these people against their will is an invasion of their liberty.

The problem of the homeless is extremely complex. They are not a homogeneous group. Some are nice people down on their luck; some are not so nice and survive by petty crimes, if not worse; some are mentally deranged; and some are harmless but impractical rebels against the work ethic. Some want food and shelter; others prefer the life of freedom, with poverty and petty crime as possible concomitants.

All would agree that restricting people's liberty because they look unattractive and are marching to a different drummer is inappropriate, but individuals do not have a right to turn city gutters into public bathrooms or to make sidewalks and museums into private bedrooms. Research on this group, reported in *Science* and elsewhere, indicates that an appropriate solution for one segment will not apply to another. Moreover, the placing of individuals in appropriate categories will be difficult. There is no neat and simple solution, and the officials who have to cope with the problems of the homeless are far from omnipotent. Solutions will require compassion, firmness, compromises on competing "rights," and money. The second-guessers who demand immediate solutions and then block all reasonable efforts are either impractical or hypocritical.

There are many other problems in our society that are equally complex—the treatment and prevention of AIDS, the release on bail of suspects with previous prison records, the policy on loans to developing countries, and the rights of adoptive and natural parents. None is going to be solved by a simplistic formula; all will require public funds. We need not weep for public officials (they are paid to take criticism). Society cannot afford, however, to have decent or imaginative compromises vetoed by those who demand an ethical or financial purity that is unattainable.

The problem of the homeless could be easily solved if they would have the good manners to starve or freeze in some obscure place where they could be forgotten. This is not going to occur. They keep appearing on the streets, in hallways, on hot air vents, reminding our consciences that action is required. A wealthy society should not sleep well at night if it cannot make some sacrifice to help those who cannot help themselves. Plans are being developed and implemented in cities like New York. Those who believe they are too lavish and those who believe they are too cheap, those who do not believe there should be any coercion, and those who believe there should be a great deal more should be heard, but only if they present some more comprehensive and intelligent plan than that proposed by the public official. Simply finding one part of a plan unacceptable is insufficient.

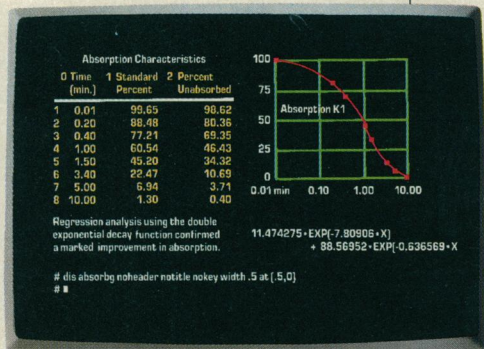
In complex problems of this sort, what is a scandal is that individuals demand on Monday, Wednesday, and Friday that the problem be solved, and on Tuesday, Thursday, and Saturday block any reasonable alternative. Those who want to solve a complex problem should not be deterred by those who prefer indignation to implementation. Only if we recognize that the solution to complex problems will inevitably be less than perfect can we ignore the Utopian who would await perfection and move on to helping the hapless.

—DANIEL E. KOSHLAND, JR.

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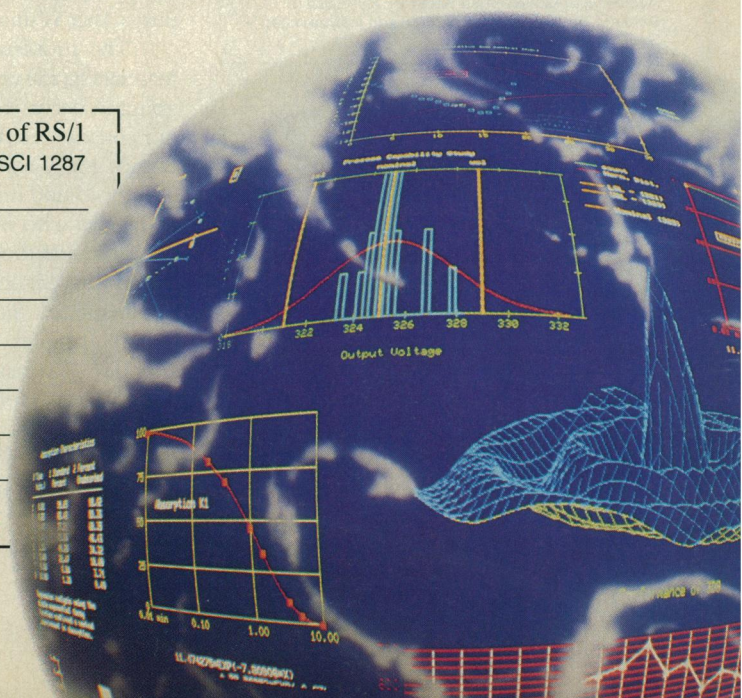
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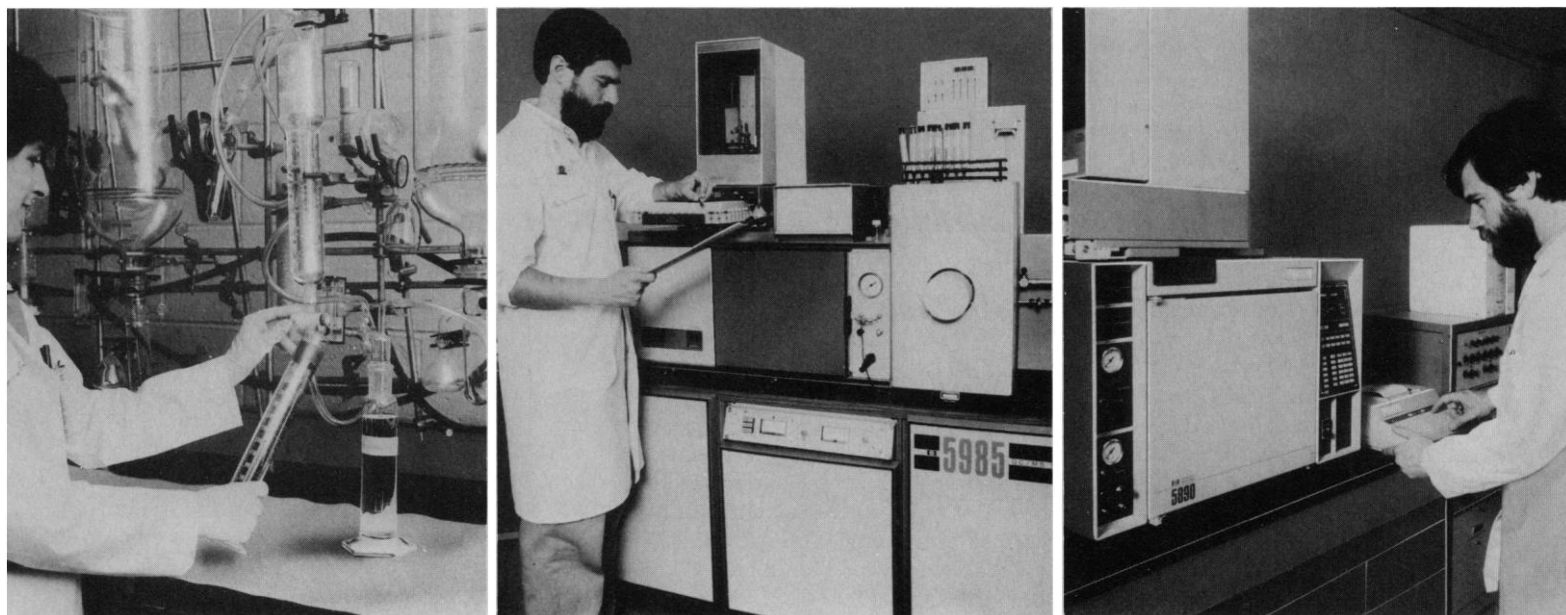
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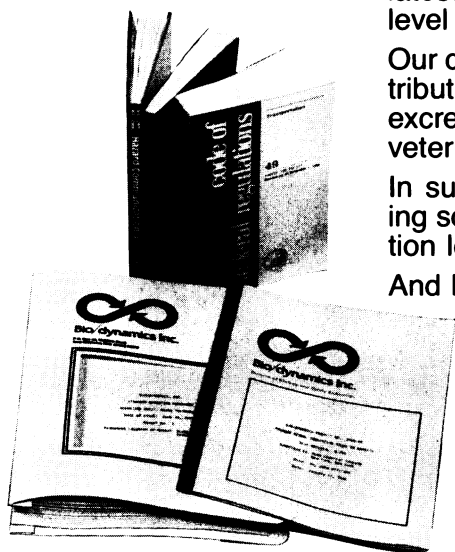
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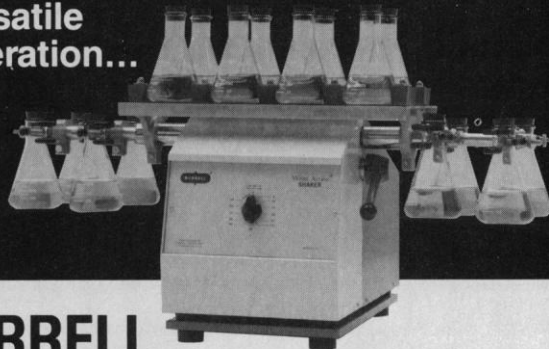
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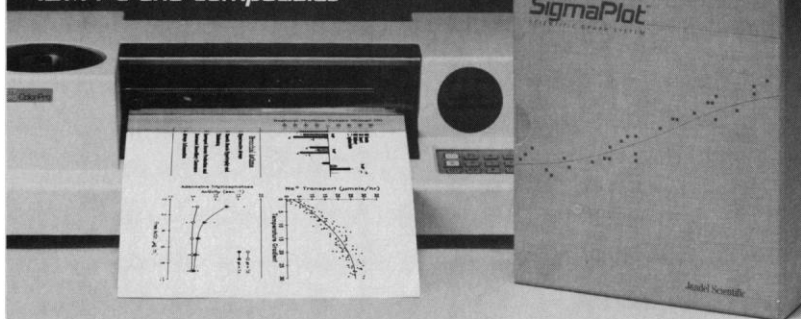
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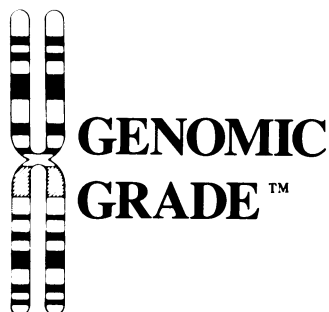
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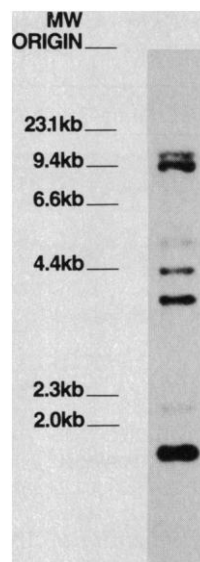


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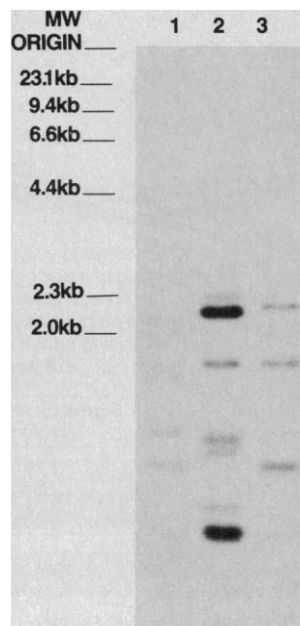
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David P. Ruelle is a Professor at the Institut
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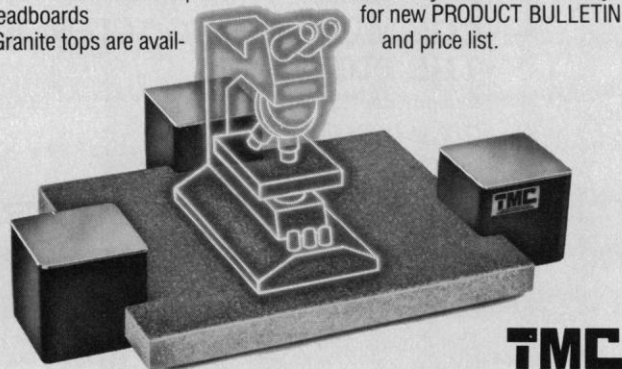
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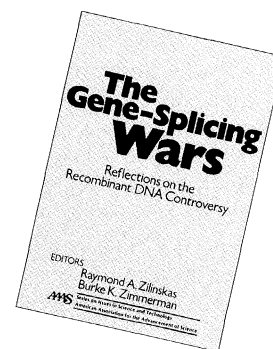
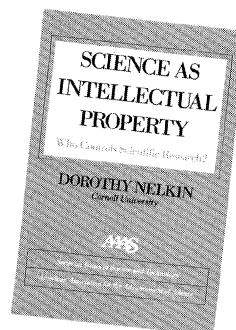
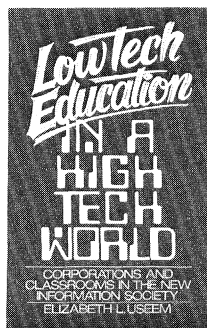
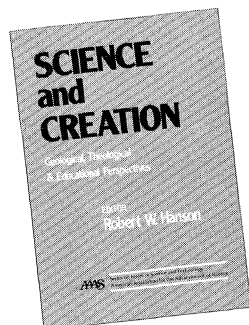
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Keynote Address: Molecular Biology Reaches Maturity (2/11, Thu/8:30pm)

David Baltimore (Director, Whitehead Institute for Biomedical Research and Professor of Biology, MIT)

Human Generation: Fact, Foible, and Fable (2/12, Fri/1pm)

John D. Biggers (Professor of Physiology and Biophysics and Member, Laboratory of Human Reproduction and Reproductive Biology, Harvard Medical School)

Fragile Economic Equilibria (2/12, Fri/1pm)

Lawrence H. Summers (Professor of Economics, Harvard Univ.)

Current Issues in AIDS (2/12, Fri/8:30pm)

C. Everett Koop (Surgeon General, Deputy Assistant Secretary of Health, and Director of the Office of International Health, U.S. Public Health Service, U.S. Dept. of Health and Human Services)

Origami of Proteins (2/13, Sat/1pm)

Jane Richardson (Medical Research Associate Professor, Depts. of Biochemistry and Anatomy, Duke Univ. Medical Center, Durham, NC)

Scaling Pattern and Process in Marine Ecosystems (2/13, Sat/1pm)

Robert E. Ricklefs (Professor, Dept. of Biology, Univ. of Pennsylvania, Philadelphia)

George Sarton Memorial Lecture: Boundaries and Categories—A Taxonomist Looks at History (2/13, Sat/8:30pm)

Stephen Jay Gould (*Professor of Geology, Agassiz Museum of Comparative Zoology, Harvard Univ.*)

Mathematics and Physics: Uneasy but Preordained Collaborators (2/14, Sun/1pm)

Raoul H. Bott (*Professor of Mathematics, Harvard Univ.*)

Soviet Science (2/14, Sun/1pm)
Yevgeny Velikhov (*Vice-President, Academy of Sciences of the USSR, Moscow*)

AAAS President's Address: Voices from the Pipeline (2/14, Sun/8:30pm)

Sheila E. Widnall (*AAAS President and Abby Rockefeller Mauze Professor of Aeronautics and Astronautics, MIT*)

Gene Mapping and the Study of Disease: "Reverse" and "Forward" Genet-

ics of Chronic Granulomatous Disease (CGD) (2/15, Mon/1pm)

Stuart H. Orkin (*Leland Fikes Professor of Pediatric Medicine, Harvard Medical School and Division of Hematology, Children's Hospital, Boston*)

The Geneva Nuclear and Space Talks: Status and Prospects for Agreement (2/15, Mon/1pm)

Edward L. Rowny (*Ambassador, Special Advisor to the President and Secretary of State for Arms Control Matters, U.S. Dept. of State*)

I Physical Sciences & Technology

10. Frontiers of the Physical Sciences

10-1. Frontiers of the Physical Sciences, 1988 (2/13, Sat/am-pm). Number theory; climate change; particle physics; life processes; cosmic strings; remote sensing. *Rolf M. Sinclair, Alexander Vilenkin, Gary W. Petersen, Sheldon Glashow, Herman Feshbach, John Tate, Gerald R. North, William N. Lipscomb*

10-2. Soviet Science (2/14, Sun/am-pm). *Yevgeny Velikhov, Alvin W. Trivelpiece*

11. Mathematics

11-1. American Mathematics Entering Its Second Century (2/13, Sat/am-pm; 2/14, Sun/am-pm). Mathematical modeling; groups, symmetry, and randomness; spaces of dimensions two, three, and four; mathematics and the physical sciences. *Hyman Bass, George Daniel Mostow, George F. Carrier, David Allen Hoffman, Percy Diaconis, John W. Morgan, James A. Yorke, William P. Thurston, Robion C. Kirby, Daniel G. Quillen, James G. Glimm, David Mumford, Charles S. Peskin, John Conway*

12. Computing; Intelligent Systems

12-1. Logic Programming: PROLOG and Beyond (2/12, Fri/pm). Current systems; extensions of Horn Logic; implementation; semantic frameworks. *Wiktor Marek, Anil Nerode, Henryk Jan Komorowski, Jean H. Gallier*

12-2. Expert Systems and the Law (2/13, Sat/am). Risk assessment, management, and allocation; responsibility. *Michael S. Baram, David A. Rice, Joseph Fiksel, Randall Davis, Vincent Covello*

12-3. Expert Systems in Development: Advances and Applications (2/13, Sat/pm). Agrotechnology transfer; university curricula; data base access; water/sanitation budgets; medical diagnosis. *Stephen R. Ruth, Charles K. Mann, James Jones, Victor Doherty, Donald Lauria*

12-4. The Role of Uncertainty in Computer Performance Modeling (2/14, Sun/pm). Probabilistic modeling of workloads; optimization of work-scheduling algorithms and data structures. *Teunis J. Ott, Daniel D. Sleator, Edward G. Coffman, Jr., Will E. Leland, Tom Lighton*

12-5. Cognitive Engineering: Understanding Human Behavior in Complex Worlds (2/15, Mon/am). Modeling human performance; safety; supervisory control; workstation design concept. *Donald O. Weitzman, Richard W. Pew, Jens Rasmussen, David D. Woods, Thomas B. Sheridan*

12-6. Technology and the Social Context: A New Partnership (2/15, Mon/pm). Educational software; computer-supported collaboration; social aspects of long-distance networks. *Andee Rubin, Bertram Bruce, Denis Newman, Lucy A. Suchman, Terry Crowley, Randy H. Trigg, Harry Forsdick, Robert Tinker*

13. Physics

13-1. The New Atomic, Molecular, and Optical Physics and Its Impact on Society (2/13, Sat/am-pm). Hydrogen bonds; lasers in medicine, propulsion, and surface science; femtosecond and nonlinear optics; directed energy weapons. *Michael S. Feld, J.I. Steinfeld, Dana Anderson, Nicolaas Bloembergen, Daniel Kleppner, Erich P. Ippen, Richard M. Osgood, Alan Eckbreth, Carter Kittrell, William Klemperer, Ramachandra R. Dasari*

13-2. Nuclear Physics: From Quarks to Supernovae (2/14, Sun/am). Electromagnetic structure; hadronic matter; heavy-ion collisions; supernova collapse. *John W. Negele, Herman Feshbach, Jerry Cooperstein, Ernest J. Moniz, Nicholas P. Samios*

13-3. New Facilities for Condensed Matter Physics (2/14, Sun/pm). Syn-

chroton, advanced neutron, low-temperature, and high magnetic field facilities. *Herman Feshbach, Rolf M. Sinclair, Robert Birgenau, Ralph M. Moon, Jr., Peter A. Wolff, David Moncton, Robert C. Richardson*

13-4. The New Superconductivity (2/15, Mon/am-pm). Chemistry; superconductivity theory; small- and large-scale applications. *Rolf M. Sinclair, Michael Tinkham, K. Alex Müller, Praveen Chaudhuri, John M. Rowell, Angelica Stacey, Robert Palmer, Philip W. Anderson, Adriaan M. De Graff*

14. Astronomy; Space Science

14-1. International Cooperation on Large-Scale Space Ventures (2/12, Fri/am). Manned Mars expeditions; lunar base; political routes. *James R. Powell, Charles R. Pelligrino, Harrison Schmitt, Bruce Murray, Gregory Marinak*

14-2. Supernova 1987a: A New Star for Astrophysics (2/12, Fri/pm). Light; neutrinos. *Robert P. Kirshner, J. Craig Wheeler, John Bahcall, Larry Sulak*

14-3. The New Big Eyes (2/13, Sat/am). Design; funding; construction plans. *Margaret J. Geller, Goetz Oertel, Robert P. Kirshner, Jerry E. Nelson, James Roger Angel, Loderwijk Woltjer*

14-4. Our Home Galaxy: Exploring the Milky Way (2/13, Sat/pm). Age; formation; core power. *Virginia Trimble, George B. Field, James W. Truran, Jr., Martin J. Rees, Leo Blitz, Leonid Ozernoy*

14-5. The Solar-Terrestrial System (2/15, Mon/am). Solar activity; interplanetary medium; magnetosphere, atmosphere, and ionosphere responses. *Martin Walt, Edward J. Smith, Raymond G. Roble, Neil R. Sheeley, Jr., Daniel N. Baker*

14-6. Particle Physics and the Early Universe (2/14, Sun/pm). Big bang cosmology; inflationary universe model; dark matter; structure formation. *Alan H. Guth, Lawrence M. Krauss, Edmund Bertschinger*

15. Geology & Paleontology

15-1. Earth in the Universe: Extraterrestrial Effects on Our Planet (2/14,

Sun/am-pm). Astrophysical influences; catastrophic bombardment. *Bevan M. French, Jay M. Pasachoff, Richard A. F. Grieve, Robert C. Reedy, Eugene M. Shoemaker, Richard A. Goldberg, David M. Raup, Laurence A. Soderblom, John Imbrie, Kenneth Brecher, John Eddy, Ronald G. Prinn*

15-2. Decade of North American Geology: New England and Maritime Canada Highlights (2/15, Mon/am). Appalachians; seismicity; continental shelf. *Allison R. Palmer, J. Thomas Dutro, Jr., Leonardo Seeber, Kim D. Klitgard, Philip H. Osberg, Peter Robinson, Charlotte E. Keen*

15-3. The Dawn of Animal Life; or, Aliens Here on Earth? Paleobiology of the Ediacaran Fauna (2/15, Mon/pm). Taxonomy; preservation of specimens; community trophic structure. *Mark A. S. McMenamin, Adolf Seilacher, Mikhail A. Fedonkin, Richard J. F. Jenkins, Guy M. Narbonne*

16. Atmospheric & Hydrospheric Sciences

16-1. Prospects for Mitigating Climatic Warming by Carbon Dioxide Control (2/12, Fri/am). Nuclear process heat; emissions reduction; global reforestation; enhanced biological productivity. *Leon Green, Jr., Gregg Marland, Roger C. Dahlman, Meyer Steinberg, Heiko Barnert, Paul Kasten, Klaus Knizia, Bruno Quebedeaux*

16-2. Antarctic Ozone Depletion (2/12, Fri/pm). Three decades of observation; aircraft and satellite use; chemical processes; environmental policy implications. *Mario J. Molina, Susan Solomon, Joseph Farman, Robert T. Watson, Mark R. Schoeber, Malcom Ko, Adrian Tuck*

16-3. The Arctic Ocean and Its Global Context (2/13, Sat/am). Physical oceanography; air-sea-ice interaction; biology; paleoceanography; acoustics. *John M. Edmond, Knut Aagaard, James Morison, Walker Smith, Garrett Brass, Ira Dyer*

16-4. Prediction in Atmospheric Sciences and Relations to Other Disciplines (2/13, Sat/pm). Prediction capabilities for atmospheric and oceanic events; comparison with models and methodo-

logies from other disciplines. *Tzvi Gal-Chen, Norman J. Rosenberg, Donald L. Gilman, Frederick Sanders, George C. Tiao*

17. Arms Control & National Security

17-1. Directed Energy Weapons (2/12, Fri/am). Reports from the American Physical Society, Office of Technology Assessment, and Strategic Defense Initiative Organization; architectural issues; particle beam weapons. *Caroline L. Herzenberg, Alexander DeVolpi, R. Bruce Miller, C.K.N. Patel, Louis C. Marquet, Jeremiah Sullivan, Anthony Fainberg*

17-2. Arms Control at the Crossroads (2/12, Fri/pm). Crisis stability; Strategic Defense Initiative; peace strategies; armament reductions. *Herman Feshbach, Rolf M. Sinclair, Jerome B. Wiesner, Kurt Gottfried, Bruce Parrott, Wolfgang K.H. Panofsky, Edwin E. Salpeter*

17-3. The New Force Reduction Negotiations in Europe: Problems and Prospects (2/13, Sat/am). After INF; West German perspectives; French role; U.S. goals. *Jonathan Dean, Jane Sharp, Wolfgang Pordzik, Jean Klein, John Roper*

17-4. China and Arms Control (2/13, Sat/pm). Strategic forces modernization; nuclear strategy; attitudes toward international arms control efforts; China as a nuclear supplier. *Herbert York, Neil Joeck, Zhen-Qiang Pan, Michael Brenner, Di Hua, Robert Sutter, Bruce Larkin*

17-5. Nuclear Risk Reduction Centers: An Operational Evaluation of Their Potential Effectiveness (2/14, Sun/am). U.S.-Soviet agreement; congressional role; military influence. *Sidney N. Graybeal, Kenneth N. Luongo, Michael Krepon, Noel Gayler, Robert Bell, William Ury, Walter B. Slocombe*

17-6. Defenses Against Nuclear Weapons: Strategic Defense Initiative, Anti-Tactical Ballistic Missile, and Air Defense Initiative (2/14, Sun/pm). Ballistic missile defense; tactical missile defense in the Middle East and Europe; air-launched strategic nuclear weapon defense. *W. Thomas Wander, Kenneth N. Luongo, Ashton Carter, Ivo Daalder, Dean Judd*

17-7. From MaRVs to Microwaves: Future Nuclear Weapons and the Arms Race (2/15, Mon/am). Mobile missile survivability; feasibility of effective ballistic missile defenses; new war-head designs; third-generation nuclear weapons. *Peter A. Clausen, Michael C. Brower, Theodore B. Taylor, Matthew Bunn, Robert S. Norris*

18. Science & Technology Policy

18-1. Science in Chile: A New Phase (2/12, Fri/am). U.S.-Chile scientific cooperation in biomedical research, seismology, marine science, arid lands, minerals, biotechnology, and micro-computer education. *James W. Rowe, Luis Vargas, John D. Negroponte, Cyrus McKell, Karen McNally, Cristian Orrego, Ramon Latorre, Claudio Teitelboim, Harry G. Barnes, Jr.*

18-2. Science Advice to the Next President of the United States (2/13, Sat/am-pm). Function and qualifications; relation to the President and Congress; liaison with universities, industry, and the science community. *George Bugliarello, William T. Golden, Paul M. Doty, Joshua Lederberg, Lewis M. Branscomb, George A. Keyworth II, H. Guyford Stever, John H. Gibbons,*

William D. Carey, Roland W. Schmitt, Holly L. Gwin

18-3. Public Participation in Decision Making for Science and Technology: Methods, Opportunities, and Pitfalls (2/14, Sun/am). Nuclear power; international efforts; biotechnology; mediation; state science academies; museums. *Harold P. Green, Emilio Q. Daddario, Rosemary A. Chalk, Allie Quinn, Robert B. Lanman, Warren R. Muir, Lawrence E. Susskind, Sheila Jasanoff, Thomas G. Dignan, Jr., Ellen K. Silbergeld, Richard N.L. Andrews*

18-4. US-USSR Collaborative Research on Energy Conservation R&D Issues (2/15, Mon/am). Electrical systems and devices; integrated techniques; buildings and the indoor environment; materials production and utilization; macroeconomic implications models. *Dennis F. Miller, Robert Socolow, Thomas Stelson, James W. Litchfield, John K. Hulm, Robert W. Campbell, Nicholas Grant*

19. Popular Science

19-1. Chemistry Is Fun! (2/12, Fri/am). Interactive and classic classroom demonstrations. *Jerry A. Bell, Ethel L. Schultz, Ronald Perkins, Patricia Samuel, Valerie Wilcox*

19-2. Science and Humor (2/12, Fri/pm). Origin; acceptability; women in science. *Caroline L. Herzenberg, John Dowling, Norman R. Farnsworth, Jerome Rothstein, Sidney Harris, Helen C. Davies*

19-3. Technological Competition and the America's Cup: Pushing Back the Frontiers of Sailing (2/13, Sat/am). Design principles; fluid mechanics; computer performance predictions; instrumentation; meteorology. *Albert H. Teich, James W. Curlin, R. Leland Davis, John S. Letcher, Jr., Nils Salvesen, David S. Greeley, Britton Chance, Jr., Richard McCurdy*

19-4. The Face of New England: A Geologist's View (2/13, Sat/pm). Mountains; valleys; coastline; glaciation. *J. Thomas Dutro, Jr., Jon C. Boothroyd, James W. Skehan, Wallace A. Bothner, Dabney W. Caldwell, Joseph T. Kelley*

19-5. Science for the Naked Eye; or, The Physics of Everyday Experience, XV (2/14, Sun/am-pm). Cetacean communication; human anatomy; physics of dance; cosmology; photographic image; violins. *Rolf M. Sinclair, Gabriel Weinreich, Kenneth L. Laws, John J. McCann, Lynn W. Jelinski, Theodore W. Lucas, Edward Harrison*

Poster Sessions

Friday, 12 February

Seminar Poster Papers

The Protein Folding Problem
Frontiers of Marine Ecosystem Research

Contributed Papers

Physical Sciences
Life Sciences

Saturday, 13 February

Seminar Poster Papers

Frontiers of Reproductive Biology

Contributed Papers

Behavioral and Social Sciences

American Junior Academy of Science

Research papers by high school students

Sunday, 14 February

Seminar Poster Papers

The Protein Folding Problem
Frontiers of Marine Ecosystem Research
Frontiers of Reproductive Biology

All contributed papers will be presented in poster format in Exhibit Hall A of the Hynes Convention Center.

II Life Sciences & Technology

20. Frontiers of the Life Sciences

20-1. Frontiers of the Life Sciences (2/14, Sun/am). Cancer ontogeny; neural basis of memory; plant resistance mechanisms; genetic basis of biological rhythms. *Judith H. Willis, Patricia S. Goldman-Rakic, Michael M. Rosbash, Philip Leder, Roger N. Beachy*

21. Frontiers of Reproductive Biology

21-1. Frontiers of Reproductive Biology (2/12, Fri/am-pm; 2/13, Sat/am-pm; 2/14, Sun/am-pm). (See description in the Seminar section, overleaf.)

22. The Protein Folding Problem

22-1. The Protein Folding Problem (2/12, Fri/am-pm; 2/13, Sat/am-pm; 2/14, Sun/am-pm). (See description in the Seminar section, overleaf.)

23. Frontiers of Marine Ecosystem Research

23-1. Frontiers of Marine Ecosystem Research (2/12, Fri/am-pm; 2/13, Sat/am-pm; 2/14, Sun/am-pm). (See description in the Seminar section, overleaf.)

24. AIDS

24-1. AIDS: An Overview (2/12, Fri/am). Epidemiology; legal issues; economics; education strategies; ethics; international and U.S. aspects. *Daniel E. Koshland, Jr., James W. Curran, Bernard M. Dickens, David E. Bloom, Richard W. Price, Harvey V. Fineberg, Anthony S. Fauci, Peter Piot, LeRoy Walters*

24-2. AIDS Virology (2/12, Fri/pm). HIV genetics, molecular biology, and pathogenetic mechanisms; host re-

sponses; vaccine development; simian models. *Martin S. Hirsch, Myron E. Essex, William A. Haseltine, Norman L. Letvin, Jerome E. Groopman*

24-3. The Epidemiology of HIV Infection: Transmission and Natural History (2/13, Sat/am). Homosexual, heterosexual, perinatal, and indirect transmission. *Nancy Mueller, Kenneth Mayer, Brian Sullivan, William Blattner, Robert Ryder*

24-4. Clinical Management of HIV Infection and AIDS (2/13, Sat/pm). Patient management; associated infections; antiviral therapy; challenges to health care system. *Deborah Cotton, Donald Craven, Kenneth Mayer, Davis Allen, Robert Schooley*

24-5. Modeling the Spread and Demographic Impact of AIDS (2/14, Sun/am). Epidemic models and statistics; prospective African impact; a decade of U.S. experience; evaluating prevention and control strategies. *Joseph E. Potter, Michael A. Stoto, Victor G. DeGruttola, John P. Bongaarts, Jeffrey E. Harris, Robert M. May*

24-6. Applying Behavioral Science to Control the AIDS Epidemic (2/14, Sun/pm). Risk behaviors distribution and determinants; U.S. and international agendas for AIDS behavioral research. *Lloyd J. Kolbe, Rosemary Chalk, Manuel Carballo, Ron Wilson, Kevin O'Reilly, Charles Turner, William Darrow*

24-7. The Social Consequences of AIDS (2/15, Mon/am). Impacts on schools and communities; federal policies; gender relations; effects on African societies. *Richard Berk, Yasmine Ergas, Francis Paine Conant, Linda A. Valleroy, David L. Kirp, Beth E. Schneider*

24-8. A National Strategy for AIDS (2/15, Mon/pm). Education and prevention; health care provision and financing; public policy and public health. *June E. Osborn, Mervyn*

Silverman, Edward N. Brandt, Jr., Harvey V. Fineberg

25. Biomedical Sciences

25-1. Stress and Immunity (2/12, Fri/am). Endocrine control; immunopotential; behavioral modification; methionine-enkephalin; psychological disorders. *Nemat Khansari, Anthony J. Murgo, Steven E. Locke, Frank Blecha, Keith W. Kelley, Nicholas P. Plotnikoff, H. Hugh Fudenberg*

25-2. Impact of Chemical Research Towards the Discovery of Modern Medicine (2/12, Fri/pm). Infectious disease, cardiovascular, allergy, and inflammation therapeutics; enzyme inhibition. *A.K. Ganguly, Eugene H. Cordes, Barrie Hesp, Paul A. Bartlett*

25-3. Analysis of Human Genetic Disease (2/13, Sat/am). Localizing genes responsible for genetic disease; understanding cystic fibrosis. *Michael C. Dean, Lap-Chee Tsui, Richard C. Boucher, Ray White, Helen Donis-Keller, Kathy Klinger, George F. Vande Woude, Francis S. Collins*

25-4. Mapping the Human Genome (2/15, Mon/am-pm). Methods and approaches; applications to diagnosis—genetic disorders, muscular dystrophy, cancer; completion by the year 2000. *Victor A. McKusick, C. Thomas Caskey, Louis M. Kunkel, Webster K. Cavenee, Leroy E. Hood, James F. Gusella, Charles R. Cantor, James D. Watson, David Botstein, Raymond L. White, Maynard V. Olson, Cynthia C. Morton*

25-5. Genes and Development (2/12, Fri/am). RNA splicing and gene structure; *Drosophila* sex determination; round worm cell lineage. *Phillip A. Sharp, Robert Horvitz, Thomas W. Cline, Welcome Bender*

26. Public Health

26-1. Cancer Risk Assessment and Government Regulation to Protect Public Health (2/12, Fri/am). Risk assessment methodology; EPA policies; legal challenges; communicating to the public. *Don G. Scroggin, Erik Rifkin, Peter W. Preuss, Roger O. McClellan, Bruce N. Ames, Ellen K. Silbergeld*

26-2. U.S. Infant Mortality from Different Perspectives (2/12, Fri/pm). Medical, social-demographic, health care, and legislative/public policy perspectives. Charles B. Nam, Richard E. Behrman, Isaac W. Eberstein, Milton Kotelchuck, Carol Browner

26-3. Engineered Organisms in the Environment: Progress Towards Biotechnology Assessment (2/14, Sun/am). Risk assessment; federal regulation; media controversy. Sheldon Krimsky, Daphne Kamely, Trevor V. Suslow, Philip Regal, Luther Val Giddings, Arthur Kelman

26-4. Effects of Intensive Exercise on Female and Male Reproduction: Mechanisms and Significance (2/14, Sun/pm). Hypothalamic dysfunction; estrogen metabolism; reproductive defects; reduced cancer risk. Rose E. Frisch, Robert Barbieri, Jack Fishman, Rachel C. Snow, David C. Cumming, Tenley E. Albright

27. Ethical Issues in Bioscience

27-1. Employee Drug Testing: Scientific and Legal Perspectives (2/12, Fri/am-pm). Drug-screening techniques; federal and industry perspectives; potential medical, policy, and legal problems. Albert H. Teich, Michael A. Peat, Mark A. de Bernardo, John Grabowski, Lawrence Miike, Donald Ian Macdonald, George D. Lundberg, Allan Adler, Edward A. Kaufman, Harold P. Green, Betty-Ann Hoener

27-2. Ethicality and Bioethics in Dentistry (2/13, Sat/pm). Education; practice; administration; research. Clifton O. Dummett, William F. Raub, Paul Goldhaber, Erling Johansen, Michael A. Heuer, Erik D. Olsen, Bruce J. Baum

27-3. Health Services for the Treatment of Torture and Trauma Survivors (2/14, Sun/am). Treatment and rehabilitation programs in the United States, Canada, and England; medical and psychiatric diagnosis. Kari E. Hannibal, Janet G. Gruschow, Elena O. Nightingale, Glenn R. Randall, Helen Bamber, Richard F. Mollica, Genevieve Cowgill

27-4. Human Linkage Testing: The

New Ethical Issues (2/14, Sun/pm). Clinical uses; ethical, legal, and theological issues. Doris Teichler Zallen, J. Robert Nelson, Haig H. Kazazian, Jr., Philip R. Reilly, Eric S. Lander, Marc A. Lappe

27-5. Science, Engineering, and Ethics: The State of the Art (2/15, Mon/am-pm). Educational efforts—precollege to professional; ethics research in engineering, social science, medicine, the environment, and publishing. Rachelle D. Hollander, Rosemary Chalk, Arthur L. Norberg, Robert J. Swartz, Deborah G. Johnson, Patricia K. Woolf, Pam Seidenman, Steven H. Goldman, Albert H. Teich, Roger Kasperson, Susan P. Snyder, Sheldon Krimsky, Nicholas H. Steneck, Stephen H. Cutcliffe, Patricia A. Rose, Joan E. Seiber, Robert J. Swartz

28. Ecology & Ecosystems

28-1. The Central Role of Soils in the Biosphere (2/12, Fri/am). Biological processes; water quality; landscape analysis; ecosystem science. Dennis R. Keeney, Robert F. Barnes, Harry B. Pionke, Wesley M. Jarrell, Robert G. Woodmansee, David C. Coleman, Gary W. Petersen

28-2. Biological Diversity: The Quantification and Maintenance of Genetic Resources (2/12, Fri/pm). Genetic resource studies from forest, crop plant, and animal populations. Joel I. Cohen, Stephen Smith, Michael S. Strauss, Gene Namkoong, Garrison Wilkes, Stephen J. O'Brien

28-3. Biology and Impact of Africanized Honeybees: Implications for the United States (2/13, Sat/am). Biology, management, and economic impact in Latin America and Africa; predictions for the United States. Suzanne W.T. Batra, Sarah J. Locke, David J.C. Fletcher, Al Dietz, David W. Roubik, Orley R. Taylor

28-4. Landscape Corridors: Structure and Function (2/13, Sat/pm). Structure and function as biological, physical, and human perception/management entities. Joan Iverson Nassauer, Gary W. Barrett, H. Gray Merriam, Richard E. Chenoweth, Bernard J. Niemann, Jr., Richard T.T. Forman

28-5. Microbial Ecology: A Useful Base for Regulating Genetically Engineered Microbes (2/14, Sun/am-pm). DNA probes; rhizobium model; LacZY marker; synergism/antagonism; regulatory requirements. William E. Marshall, James M. Tiedje, David J. Drahos, J.A. van Veen, Gunter Pahlow, David M. Weller, J. Howard Slater, Charles Hagedorn, Dwayne C. Savage, Nancy J. Tomes, Robert B. Nicholas, Julieann Lindemann, Morris Levin, John H. Payne

29. Agriculture

29-1. Advances in Nonbiomedical Biotechnology (2/13, Sat/am). Agriculture; novel bioprocess techniques; pollution control; bioengineering. Daphne Kamely, Winston J. Brill, Theodor Kawana, Thomas R. Dashiell, Gregory A. Petsko, Ananda M. Chakrabarty

29-2. The Study of Agrarian Systems: Standardizing Measurement and Minimum Data Sets (2/13, Sat/pm). Climate; soils; crops; labor; economics; regional-level data. Emilio F. Moran, John Nicholaides III, Francis Paine Conant, Christine Gladwin, Robert McC. Netting, Gene C. Wilken, Sutti Ortiz, Peggy Bartlett, Anna Roosevelt

29-3. Alternative Approaches to a More Sustainable Agriculture (2/14, Sun/am). Physical/biological aspects and economic viability in the United States and Third World; U.S. agricultural policy. William Lockeretz, Garth Youngberg, J. Patrick Madden, Robert H. Miller, Kenneth A. Cook, Richard R. Harwood

29-4. The Long-Term Viability of U.S. Agriculture: People, Resources, and Policy in a Global Context (2/14, Sun/pm). Social and institutional shifts; resource and environmental impacts; economics; technology development. Joseph J. Molnar, William W. Marion, Linda K. Lee, Luther G. Tweeten, Robert Rodale, Robert T. Fraley, Stewart Smith

29-5. Application of Biotechnology to Biological Control of Plant Pathogens and Pests (2/15, Mon/am). Insect resistance; rhizosphere competence; fungal and bacterial antagonists. Ralph Baker, P.E. Dunn, Gary E. Harman, Michael J. Adang, Jaleed Ahmad, Lois K. Miller, Joseph W. Kloepper

Seminars

These seminars require a separate fee in addition to the Annual Meeting registration. See the Advance Registration Form for price information.

21. Frontiers of Reproductive Biology

Organized by a faculty committee of the **Laboratory of Human Reproduction and Reproductive Biology, Harvard Medical School, John D. Biggers** (Chair)

Session I: Gametogenesis

(2/12, Fri/am) Presider: **Anthony R. Bellvé** (Columbia Univ. College of Physicians & Surgeons)

Molecular Biology of Spermatogenesis - **Anthony R. Bellvé**

Cell Biology of Oogenesis - **Richard M. Schultz** (Univ. of Pennsylvania)

Folliculogenesis - **Anne N. Hirshfield** (Univ. of Maryland School of Medicine)

Plenary Lecture - Human Generation: Fact, Foible, and Fable (2/12, Fri/1pm). Speaker: **John D. Biggers**

Session II: Fertilization and Egg Activation

(2/12, Fri/pm) Presider: **David Epel** (Hopkins Marine Station, Stanford Univ.)

How the Sperm Triggers Development of the Egg - **David Epel**

Receptor Mediated Fertilization in Mammals - **Paul M. Wassarman** (Roche Institute of Molecular Biology)

Cell Lineage in the Early Mammalian Embryo - **Janet Rossant** (Mt. Sinai Hospital and Univ. of Toronto)

Session III: Implantation

(2/13, Sat/am) Presider: **Dale J. Benos** (Univ. of Alabama)

Transport Processes in the Blastocyst - **Dale J. Benos**

Variety of Implantation Mechanisms - **Allen Enders** (Univ. of California, Davis)

Interferons and Maternal Recognition of Pregnancy - **R. Michael Roberts** and **Kazuhiko Imakawa** (Univ. of Missouri, Columbia)

Session IV: Molecules Regulating Reproduction

(2/13, Sat/pm) Presider: **R.L. Brinster** (Univ. of Pennsylvania)

Transgenic Mice and the Study of Reproduction - **R.L. Brinster**

Molecular Biology of Gonadotropins - **William W. Chin** (Harvard Medical School)

Estrogen and Progesterone Receptors: Dynamics and Actions in Target Cells - **Benita S. Katzenellenbogen** (Univ. of Illinois)

Session V: Neuroendocrinology

(2/14, Sun/am) Presider: **Frederick Naftolin** (Yale Univ.)

Sexual Differentiation of the Brain - **Frederick Naftolin**

Neuroendocrine Control of the Menstrual Cycle - **Ernst Knobil** (Univ. of Texas Medical School, Houston)

Biology of the Inhibin Family of Protein Hormones - **Wylie Vale** (The Salk Institute)

Session VI: Reproductive Technology

(2/14, Sun/pm) Presider: **Neal L. First** (Univ. of Wisconsin)

Animal Biotechnology - **Neal L. First**
In vitro Fertilization and Embryo Transfer - **Barry D. Bavister** (Univ. of Wisconsin)

Reproductive Biology of Endangered Species - **Kurt Benirschke** (Univ. of California, San Diego)

22. The Protein Folding Problem

Organized by **Jonathan A. King** (MIT) and **Lila M. Gierasch** (Univ. of Texas Health Science Center, Dallas)

Session I: Structural Themes in Native Proteins

(2/12, Fri/am) Presider: **George D. Rose** (Hershey Medical Center, Pennsylvania State Univ.)

Loops and Turns in Globular Proteins - **George D. Rose**

Structural Determinants of Protein Folds - **Cyrus Chothia** (Medical Research Council, Cambridge, England) and **Donald Bashford** (Harvard Univ.)

The Water Structure Surrounding Proteins - **Martha M. Teeter** (Boston College)

Higher Order Structure in Fibrous Proteins - **Barbara Brodsky** (Univ. of Medicine and Dentistry of New Jersey)

Session II: Interactions and Conformations of Amino Acids in Peptides

(2/12, Fri/pm) Presider: **Daniel S. Kemp** (MIT)

Peptide Conformations in Crystals - **Isabella L. Karle** (Naval Research Lab.)

Alpha-Helix Formation by Short Peptides in Water - **Susan Marqusee** (Stanford Univ. School of Medicine)

Folding of Peptide Fragments of Proteins in Water Solution - **Peter E. Wright, H. Jane Dyson, and Richard A. Lerner** (Research Institute of Scripps Clinic)

Structure-Function Relationships in Lipid-Protein Interaction - **James T. Sparrow** and **Antonio M. Gotto, Jr.** (Baylor College of Medicine)

The Role of the Signal Sequence in Protein Secretion - **Lila M. Gierasch**; and **C. James McKnight, David Hoyt**, and **Maria Rafalski** (Univ. of Delaware)

Session III: Workshop - Recovering Active Proteins

(2/12, Fri/eve) Presider: **Peter Kim** (Whitehead Institute for Biomedical Research)

Production of Bovine Pancreatic Trypsin Inhibitor Folding Mutants in *E. coli*

- **Stephen Anderson** (Genentech, Inc.)
Analysis of the Role of Disulfide Bonds in Folding Using Peptides - **Terrence G. Oas** (Whitehead Institute for Biomedical Research) and **Peter Kim**

Aggregation of Intermediates in the Folding of Bovine Growth Hormone - **David N. Brems** (Upjohn Co.)

Inclusion Bodies from Proteins Produced at High Levels in *E. coli* - **Jeff Stock** (Princeton Univ.)

Folding of a Multidomain Oligomeric Protein: The Beta₂ Subunit of *E. coli* Tryptophan Synthase - **Michel E. Goldberg**, **Anne Murray-Brelier**, and **S. Blond** (Institut Pasteur)

Session IV: Intermediates in Protein Folding and Unfolding

(2/13, Sat/am) Presider: **C. Robert Matthews** (Pennsylvania State Univ.)

De Novo Design of Helical Proteins - **Lynne Regan**, **James D. Lear**, **Zelda Wasserman**, and **Siew Peng Ho** (E.I. du Pont de Nemours & Co.)

Does the Unfolding Transition of Two-Chain, Coiled-Coil Proteins Involve a Continuum of Intermediates? - **Alfred Holtzer**, **Marilyn Emerson Holtzer**, and **Jeffrey Skolnick** (Washington Univ.)

A Stable Folding Intermediate in the Folding of the Alpha Subunit of Tryptophan Synthase: An Alpha/Beta Barrel Protein - **C. Robert Matthews**

Mutations That Alter the Energetics of the BPTI Folding Pathway - **David P. Goldenberg** (Univ. of Utah)

Proline Isomerization and Folding of Yeast Cytochrome c - **Barry T. Nall** (Univ. of Texas Health Science Center, San Antonio)

Plenary Lecture: Origami of Proteins (2/13, Sat/1pm). Speaker: **Jane Richardson** (Duke Univ. Medical Center)

Session V: Protein Folding in vivo (2/13, Sat/pm) Presider: **Linda L. Randall** (Washington State Univ.)

Temperature-Sensitive Folding Mutations - **Jonathan A. King**, **Bentley Fane**, **Cameron Haase-Pettingell**, and **Robert Villafane** (MIT)

The Modulation of Protein Folding

During Export of Protein in *Escherichia coli* - **Linda L. Randall**

The Folding and Assembly of a Trimeric, Eukaryotic Membrane Protein: Influenza Virus Hemagglutinin - **Joseph F. Sambrook**, **Karen McCammon**, **Mark Segal**, **Pat Gallagher** and **Mary Jane Gething** (Univ. of Texas Health Science Center, Dallas); and **Janet Hearing** (SUNY, Stony Brook)

Human Collagen Maturation Defects - **Peter H. Byers** (Univ. of Washington)

The Selective Degradation of Abnormal Proteins in Bacterial and Animal Cells - **Alfred L. Goldberg** (Harvard Medical School)

Session VI: Modeling Protein Folding and Structure

(2/14, Sun/am) Presider: **Jiri Novotny** (Massachusetts General Hospital)

Theoretical Studies of Protein Structure - **Fred E. Cohen**, **Lydia Gregoret**, **Donald Kneller**, **Irwin D. Kuntz**, and **Fernando Bagan** (Univ. of California, San Francisco)

Simulation of the Crystal of *Streptomyces griseus* Protease A - **Arnold T. Hagler**, **Frank Avbelj**, and **David H. Kitson** (The Agouron Institute); and **John Moulton** (Univ. of Alberta)

Prediction of Polypeptide Segments Using Conformational Search - **Robert E. Bruccoleri**, **Jiri Novotny**, and **Edgar Haber** (Massachusetts General Hospital)

Applications of Hydrophobic Moments and Atomic Solvation Parameters (ASPs) to Understanding Protein Folding and Ligand Binding - **David Eisenberg**, **Morgan Wesson**, and **Mason Yamashita** (UCLA)

Strategies for Computer-Aided Protein Design - **Carl O. Pabo** (Johns Hopkins Univ. Medical School)

Supercomputing Opportunities for the Protein Folding Problem - **Larry L. Smarr** (National Center for Super Computing Applications and Univ. of Illinois)

Session VII: Protein Design - What Can We Get Away With?

(2/14, Sun/pm) Presider: **Lila M. Gierasch**

Diacylaminoepindolidiones as Templates for Beta-Sheets - **Daniel S. Kemp** and **Benjamin Bowen** (MIT)

Subtilisin: What We Can and Can't Get Away With - **James A. Wells**, **Paul Carter**, **Brian C. Cunningham**, **David B. Powers**, **John Burnier**, **Richard R. Bott**, and **Mark M. Ultsch** (Genentech, Inc.); and **Colin Mitchinson**, **Robert M. Caldwell**, **Thomas P. Graycar**, and **David A. Estell** (Genencor, Inc.)

A Genetic Approach to the Analysis of Membrane Protein Topology - **Jon Beckwith**, **Dana Boyd**, and **Karen McGovern** (Harvard Medical School); **Colin Manoil** (Univ. of Washington); **Jose Luis San Milan** (Centro estal Ramon Y Cajal, Madrid); **Susan Froshauer** (Yale Univ. Medical School); and **Neil Green** (Univ. of California, San Francisco)

Catalytic Antibodies - **Peter Schultz** (Univ. of California, Berkeley)

Closing Comments: Where Do We Go from Here? - **Thomas E. Creighton** (Medical Research Council, Cambridge, England)

23. Frontiers of Marine Ecosystem Research

Organized by **Kenneth Sherman** (NOAA/National Marine Fisheries Service Northeast Fisheries Center), **Judith P. Grassle** (Marine Biological Lab.), and **Barry D. Gold** (AAAS Office of International Science)

Session I: Recruitment, Dispersal, and Gene Flow

(2/12, Fri/am) Presider: **Judith P. Grassle**

Environmental Mediation of Larval Fish Ecology and Recruitment Processes: Probing the Scales of Physical-Biological Relationships - **Christopher T. Taggart** (Dalhousie Univ. and Bedford Institute of Oceanography)

The Relative Importance of Hydrodynamical Processes and Habitat Selection by Settling Larvae in the Distribution Patterns of Benthic Marine Invertebrates - **Cheryl Ann Butman** (Woods Hole Oceanographic Institution) and **Judith P. Grassle**

Numerical Simulation of the Advection of Vertically Migrating Herring Larvae in the North Sea - **Joachim Bartsch** and

Jan Backhaus (Univ. of Hamburg, West Germany)

Dispersal and Recruitment of Airborne and Waterborne Propagules Within Topographically Complex Boundary Layers - **James E. Eckman** (Skidaway Institute of Oceanography)

The Magnitude and Consequences of Dispersal in *Drosophila* Species - **Jerry A. Coyne** (Univ. of Chicago)

Session II: Recruitment, Dispersal, and Gene Flow

(2/12, Fri/pm) Presider: **Cheryl Ann Butman**

Gene Flow and Genetic Differentiation of Natural Populations - **Montgomery Slatkin** (Univ. of California, Berkeley)

Mitochondrial DNA Diversity: Revealing Gene Flow Among Species, Populations, and Schools in the Marine Environment - **Andrew E. Dizon** (NOAA/National Marine Fisheries Service Southwest Fisheries Center)

Gene Flow and Pelagic Larval Dispersal - **Richard K. Koehn** (SUNY, Stony Brook)

The Evolution of Fish Populations in Response to Fishing Pressure - **David Policansky** (National Research Council)

Patterns in the Structure of Patchy Communities: The Interplay of Recruit-

ment, Disturbance, and Ecological Interaction - **Hal Caswell** (Woods Hole Oceanographic Institution)

Theme Lecture: Basic and Applied Marine Ecosystem Research in Relation to Global Change (2/12, Fri/6:30pm). Speaker: **William E. Evans** (NOAA)

Session III: Recruitment, Dispersal, and Gene Flow

(2/13, Sat/am) Presider: **Judith P. Grassle**

Spatial Variation in Recruitment in the Rocky Intertidal: Physical Transport Versus Behavior - **David S. Wetthey** (Univ. of South Carolina)

Behavioral Responses of Larvae to Environmental Factors - **Richard B. Forward, Jr.** (Duke Univ. Marine Lab.)

Limited Dispersal and the Genetic Architecture of Colonial Marine Invertebrate Populations - **Richard K. Grosberg** (Univ. of California, Davis)

Neurological Basis for Substrate Selectivity in Marine Invertebrates - **Robert D. Burke** (Univ. of Victoria)

Causes of Recruitment Variation to Barnacle Populations in Central California - **Steven D. Gaines** (Brown Univ.) and **Jonathan Roughgarden** (Stanford Univ.)

Plenary Lecture: Scaling Pattern and Process in Marine Ecosystems (2/13, Sat/1pm). Speaker: **Robert E. Ricklefs** (Univ. of Pennsylvania)

Session IV: Biodynamics of Large Marine Ecosystems

(2/13, Sat/pm) Presider: **Brian J. Rothschild** (Chesapeake Biological Lab., Univ. of Maryland)

Physical-Optical-Biological Scales Relevant to Recruitment in Large Marine Ecosystems - **Thomas D. Dickey** (Univ. of Southern California)

Direct Simulation of the Effects of Turbulence on Planktonic Contact Rates - **Thomas R. Osborn** and **Yidekatsu Yamazaki** (Johns Hopkins Univ.)

Biodynamics Theory in Relation to Recruitment in Large Marine Ecosystems - **Brian J. Rothschild**

Application of Molecular Genetic Techniques to Study Recruitment Problems in Marine Ecosystems - **Dennis A. Powers** and **Thomas T. Chen** (Johns Hopkins Univ.)

Multiscale Biophysical Characteristics of Large Marine Ecosystems - **Gene C. Feldman** (NASA-Goddard Space Flight Center)

Community Interactions Within Experimental Marine Ecosystems - **Jeffrey**

Call for Seminar Papers

Deadline for Abstracts: 4 January 1988

Presenting a contributed paper at a seminar poster session is **open only to registrants of that seminar**. For each accepted paper, a bulletin board will be provided for display of text and graphics. Abstracts of papers, if prepared in the format described, will be copied and distributed to all seminar registrants. **Preparation of abstracts:** ■ Copy must be typed on white paper to fit within a 5" square. Use typewriter or letter-quality printer. ■ Indent, space, underline, and capitalize as in the example; do not double-space text. ■ Use reproducible black ink for all hand-lettering. ■ Do not box abstract or cut and paste it onto another piece of paper. **Transmittal:** ■ Outside the 5" square, type the seminar's title and your complete name, mailing address, and phone number. ■ Send original plus 2 copies **with your advance registration form** to: Seminars, AAAS Meetings Office, 1333 H Street, NW, Washington, DC 20005.

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5 inches (12.7 cm)

Indent Five Spaces and Type Title in Upper and Lower Case Letters and Underline. AUTHOR'S NAME IN UPPER CASE (Institution Name in Upper and Lower Case), SECOND AUTHOR (Institution).*

Double-space and type abstract. The full width of the column of typed material should be 5 inches (12.7 cm) and must not extend beyond that. The total length of the material, from top of title to bottom of footnotes must not exceed 5 inches (12.7 cm). Abstracts which exceed these parameters will be returned. All special symbols and signs which must be hand lettered (e.g., π) should be rendered in reproducible black ink as clearly and carefully as possible. The entire submission should be of camera-ready quality so that it can be photographed, turned into a plate, and printed. The printed abstract will be about 2/3 the size of the typed version. Avoid paragraphing as this wastes space. However, you may use your allotted space to neatly letter in equations and diagrams as you deem necessary,

$$\Gamma_{\lambda\mu}^{\lambda} = \frac{1}{2} g^{\mu\sigma} \left(\frac{\partial g_{\sigma\lambda}}{\partial x^{\mu}} + \frac{\partial g_{\sigma\mu}}{\partial x^{\lambda}} - \frac{\partial g_{\lambda\mu}}{\partial x^{\sigma}} \right)$$

$$R_{\mu\nu} = \frac{\partial \Gamma_{\mu\lambda}^{\lambda}}{\partial x^{\nu}} - \frac{\partial \Gamma_{\mu\nu}^{\lambda}}{\partial x^{\lambda}} + \Gamma_{\lambda\lambda}^{\sigma} \Gamma_{\mu\sigma}^{\lambda} - \Gamma_{\lambda\nu}^{\sigma} \Gamma_{\mu\sigma}^{\lambda}$$

as indicated in this example.

*Double-space and type footnotes.

B. Frithsen and **Candace A. Oviatt**
(Graduate School of Oceanography, Univ.
of Rhode Island)

Growth, Survival, and Recruitment in
Large Marine Ecosystems - **Geoff C.
Laurence** (NOAA/National Marine
Fisheries Service Northeast Fisheries Cen-
ter)

Session V: Perturbation and Yield of Large Marine Ecosystems

(2/14, Sun/am) Presider: **Kenneth
Sherman**

Structure and Dynamics of the Biomass
of Polar Marine Ecosystems - **Gotthilf
Hempel** (Alfred Wegner Institut für Polar-
forschung)

Long-Term Variations in Abiotic and
Biotic Conditions in the Ecosystems of
the Barents and Norwegian Seas -
Anatoly A. Elizarov and **V.M. Borisov**
(VNIRO, USSR)

Environmental Influence on Recruit-
ment and Biomass Yields in the Norwe-

gian Sea Ecosystem - **Snorre Tilseth**
(Institute of Marine Research, Norway)

Decadal Biomass Yields and Environ-
mental Perturbations in the West
Greenland Sea Ecosystem - **Erik Buch**
(Greenland Fisheries Research Institute,
Denmark) and **Vagn Hansen** (Danmarks
Fiskeri-og Havundersogelser, Denmark)

Interrelationships Between the Physical
Oceanography, Biological Oceanogra-
phy, and Fishery Yields on the North-
west Shelf of Australia - **Keith
Sainsbury**, **P. Craig**, and **C. Crossland**
(Commonwealth Scientific and Industrial
Research Organisation, Division of Fisher-
ies Research, Australia)

Biomass Yield Potential of the Banda
Sea Ecosystem - **Jenne Zijlstra** (Nether-
lands Institute for Sea Research)

Application of Image Analysis in
Demographic Studies of Marine Zoo-
plankton in Large Marine Ecosystems -
Mark Berman (NOAA/National Marine
Fisheries Service Northeast Fisheries Cen-
ter)

Session VI: Theory and Manage- ment of Large Marine Ecosystems

(2/14, Sun/pm) Presider: **Lewis M.
Alexander** (Univ. of Rhode Island)

Predator-Prey Dynamics in Large
Marine Ecosystems - **Simon A. Levin**
(Cornell Univ.)

Biomass Potential of Large Marine
Ecosystems - **Nicholas J. Bax** and **Taivo
Laevastu** (NOAA/National Marine
Fisheries Service Northwest and Alaska
Fisheries Center)

Productivity, Perturbations, and Op-
tions for Biomass Yields in Large
Marine Ecosystems - **Kenneth Sherman**

Geographic Perspectives in Manage-
ment of Large Marine Ecosystems -
Lewis M. Alexander

Interrelationships of Science and Law in
the Management of Large Marine
Ecosystems - **Martin Belsky** (Albany
Law School)

Presenting the

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John Hynes Memorial Convention Center, Boston

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Friday, 12 February

10:00am An Animated Atlas of the
World, Walt Disney Edu-
cational Media

10:10am Birth Control: Your Re-
sponsibility, Your
Choice, Professional Re-
search Inc.

10:25am Future Jobs on the Fron-
tier of Space, Lucerne
Media

10:50am Alcohol Abuse and
Teens: The Turning
Point, AIMS Media

11:25am Here Today . . . Where
Tomorrow? Mobius Media
Corp.

1:00pm Eating Disorders: The
Slender Trap, AIMS Media

1:25pm The Desert Doesn't
Bloom Here Anymore,
Coronet Films & Video

2:30pm Atomic Physics and Real-
ity, Jørlunde Films

3:15pm Dolphins of the Orange
Coast, Orange Coast Col-
lege

3:40pm Sail Wars! Coronet Films
& Video

Saturday, 13 February

10:00am Why Planes Crash,
Coronet Films & Video

11:05am Lab Safety: The Accident
at Jefferson High, Barr
Films

11:25am AIDS, Walt Disney Edu-
cational Media

11:45am Order from Chaos: The
Surprising Consequences
of Randomness, Beacon
Video

1:15pm The Most Important Pro-
gramme in the World,
Television South

1:45pm Leprosy Can Be Cured!
Coronet Films & Video

2:50pm Atoms to Quarks,
Annenberg/CPB Collection

3:25pm Rape: The Boundaries of
Fear, Centre Productions,
Inc.

4:00pm How Babies Get Made,
Coronet Films & Video

Sunday, 14 February

10:00am Geologic Time, Encyclo-
paedia Britannica Educa-
tional Corp.

10:30am About AIDS, Pyramid
Film & Video

10:50am Henry Ford's American
Dream, Coronet Films &
Video

11:25am Trumpeter Blues: A
Swan's Story, Trailwood
Films

12:50pm Other People's Garbage,
Documentary Education-
al Resources

1:55pm The Rebirth of
Whitewood Creek, Cot-
tonwood Productions

2:25pm Discussions in Bioethics,
Pyramid Film & Video

3:30pm N!ai, The Story of a
!Kung Woman, Document-
ary Educational Resources

Monday, 15 February

10:00am The Sunbaskers, The
Media Guild

10:30am A Thousand Cranes,
Wombat Productions

11:30am "Star Wars": Search for
Security, Educational
Film & Video Project

1:05pm Amate—The Great Fig
Tree, Benchmark Films
Inc.

1:40pm The Origin of the Moon,
Motion Picture/Video Pro-
duction

1:55pm The Dinosaurs and the
Cosmic Collision,
Coronet Films & Video

2:30pm Biomedicine Rebuilds
the Human Anatomy,
Science Screen Report

2:45pm Flood Forecasting, En-
cyclopaedia Britannica
Educational Corp.

3:10pm To Taste a Hundred
Herbs, New Day Films

4:15pm AIDS in Your School,
Journal Films

III Behavioral & Social Sciences

30. Frontiers of the Social Sciences

30-1. Current Controversies in Science and Technology: Late-Breaking News (2/14, Sun/pm). *George W. Tressel, Marcel C. LaFollette, Patricia S. Curlin*

30-2. Frontiers in the Social Sciences: Negotiation in, About, and for the Resolution of Conflict in the Classroom (2/15, Mon/am). Discipline; negotiation; bullies; peer groups. *Priscilla Reining, Amitai Etzioni, Audrey Champagne, David W. Johnson, James Silverberg, Terry Barnett, J. Patrick Gray, Roger Fisher, Dan Olweus*

31. Brain System Processes

31-1. High-Level Vision: Interdisciplinary Approaches to Object Recognition (2/12, Fri/am). Selective attention; spatial relations; computational models; invariant visual primitives; pictorial descriptions. *Stephen M. Kosslyn, David G. Lowe, Irving Biederman, Robert Desimone, Shimon Ullman*

31-2. Neurobiological Approaches to an Understanding of the Dementias (2/12, Fri/pm). Diagnosis; cognitive studies; neurobiology and molecular pathology and genetics of Alzheimer's disease. *Joseph B. Martin, Donald L. Price, James F. Gusella, Dennis J. Selkoe, John H. Growdon, Suzanne H. Corkin*

31-3. Surgical Treatment of Epilepsy: Basic and Clinical Mechanisms (2/13, Sat/am). Anterior temporal lobectomy; neurochemistry of the epileptic focus; positron emission tomography. *Bruce P. Hermann, Allen R. Wyler, Suzanne Nadi, William H. Theodore, Dietrich P. Blumer*

31-4. Language and Mental Representation (2/13, Sat/pm). Phonology;

semantics; syntax; cognition. *Samuel J. Keyser, Morris Halle, David Pesetsky, Alan Prince, Richard Larson*

31-5. The Role of Affect in Cognition and Behavior (2/14, Sun/am). Emotional processes; social development; cognition hypothesis. *Bert S. Moore, Thomas J. Tighe, Gary E. Schwartz, Jerome Kagan, Alice M. Isen, Michael J. Mahoney, George Mandler*

31-6. Neurobiological Bases of Personality (2/14, Sun/pm). Neurogenetic adaptive mechanisms; appetitive/aversive motivation; cerebral glucose correlates; genetic and social causes. *C. Robert Cloninger, Auke Tellegen, Don C. Fowles, Lindon J. Eaves, Richard J. Haier*

31-7. Memory Functions of the Hippocampus (2/15, Mon/am). Human memory storage mechanisms; memory deficits during aging; Alzheimer's disease. *John F. Disterhoft, Carol A. Barnes, Larry R. Squire, Gary W. Van Hoesen, Theodore W. Berger*

31-8. Literacy: Clues to Brain Function (2/15, Mon/pm). Dyslexia; brain organization and processing management; Brain Electric Activity Mapping. *Anneliese A. Pontius, Frank H. Duffy, Martin F. Gardiner, Albert M. Galaburda*

32. Psychology

32-1. Human Factors for Scientists with Disabilities (2/12, Fri/am). Electronic messaging; speech recognition; hearing-impaired communication; personal projections with colleagues. *Virginia W. Stern, Ted Barber, Hadi Madjid, Emik A. Avakian, Vinton G. Cerf, Katherine D. Seelman, Patty O'Briant Anderson, Robin Kinkad*

32-2. Gender and Cognitive Skills: Cross-Cultural and Ecological Perspectives (2/12, Fri/pm). International differences; mathematics achievement; spatial ability. *Louise S. Tighe, Gila*

Hanna, Anne D. Pick, Max Lummis, Nora S. Newcombe, George M.A. Stanic, Diane F. Halpern, Maryann Baenninger

32-3. Cross-Cultural Comparisons of Mathematics Education and Achievement (2/13, Sat/am). Teaching practices, cultural traditions, and attitudes in the United States, Japan, China, and Taiwan. *Thomas J. Tighe, James W. Stigler, Hiroshi Azuma, Harold W. Stevenson, Kenneth J. Travers, Herbert P. Ginsburg*

32-4. Nonverbal Communication: What Do We Know? (2/13, Sat/pm). Evolutionary approach to expressive behaviors; emotion communication; interaction structure; hand gestures. *Bella M. DePaulo, Robert Rosenthal, Starkey Duncan, Jr., Robert M. Krauss, William R. Charlesworth, Carroll E. Izard, Palmer Morrel-Samuels, Phoebe C. Ellsworth*

33. Anthropology & Archaeology

33-1. The Ethology and Ethnography of Aggression and Nonaggression in Primates (2/12, Fri/am-pm). Perspectives from anthropology, biology, psychology, and sociology; play groups; dominance hierarchies; sports. *James Silverberg, J. Patrick Gray, Carol J. Lauer, Floyd F. Strayer, Barbara B. Smuts, Michael E. Pereira, Frans B.M. de Waal, S.J. Hutt, Donald Stone Sade, Robert K. Dentan, Marc Howard Ross, John D. Baldwin*

33-2. The Evolution of Human Diet (2/13, Sat/am). Paleolithic-Neolithic variation; ecological, nutritional, genetic, and sociocultural factors. *Solomon H. Katz, Jean Mayer, Melvin J. Konnor, Margaret Schoeninger, George J. Armelagos, David Kritchevsky, Nevin Scrimshaw*

33-3. Cognitive Ethnography of Industrialized Society (2/14, Sun/am). Mental arithmetic; folk models; decision making and technology using by social groups. *Willet Kempton, Jeannette L. Blomberg, Jean Lave, Sylvia Scribner, Patricia Sachs, Martin S. Roth, James S. Boster*

33-4. Hunting and Scavenging in Early Human Evolution (2/14, Sun/pm). Archaeological evidence; ecological and

physiological consequences of meat eating; subsistence strategies; predation costs. *Pat Shipman, Sandra L. Olsen, Robert J. Blumenschine, Henry T. Bunn, John Speth*

33-5. Issues in the Scientific Study of Religions: Pathways to Self-Transformation in American Life (2/15, Mon/am). Fundamentalist and evangelical sects; twentieth-century Blacks; addicted teenagers; retirement. *Ward H. Goodenough, Philip Hefner, Roy D. Morrison II, Carl Thune, Jean Heriot, Peter Stromberg, Mark Luborsky*

34. Sociology & Political Science

34-1. A Multidisciplinary View of Distributive Justice (2/12, Fri/am). Democracy; game theory; historical decisions; taxation. *Adam Z. Rose, Guillermina Jasso, Eugene Smolensky, Russell Hardin, Joshua Cohen, Robert Strauss, Marcus Berliant*

34-2. Polling and the 1988 Elections (2/12, Fri/pm). Reliability; electoral dynamics; comparison with the 1960 election; media impacts. *Seymour Martin Lipset, Peter D. Hart, Martin P. Wattenberg, Gary Orren, Everett C. Ladd, Anthony M. Orum*

34-3. Understanding Extreme Poverty and Homelessness (2/13, Sat/am). Estimating numbers; popular characterizations. *Peter H. Rossi, Brian Keenan, David A. Snow, Russell Schutt, Jon Erickson, Charles Wilhelm, Richard Freeman, William Chatlos, Robert Huebner*

34-4. The Integration of Law and Science in Alternative Dispute Resolution (2/13, Sat/pm). Role of the scientist; issue solution through negotiation; mediation. *Phyllis L. Kahn, Albert H. Teich, Gail Bingham, William R. Humm, Robert E. Bowen, Lawrence Susskind, Harold Green*

35. Economics & Industry

35-1. Assessing Scientific and Technical Capabilities in Foreign Countries: Competition and Cooperation (2/12, Fri/am). Business intelligence in R&D planning and corporate strategy; new product introductions; India and Japan.

Theodore W. Schlie, Jean M. Johnson, Jan Herring, David Shonyo, Michael Radnor

35-2. Technological Advance and the Services Industries (2/12, Fri/pm). Role in U.S. economy; operations research; commercially strategic industries; R&D. *Bruce R. Guile, W. Dale Compton, John A. Alic, Faye Duchin, Richard C. Larson, James Brian Quinn*

35-3. Science, Engineering, and Technology Centers: Policy Issues and Future Directions (2/14, Sun/am-pm). Viewpoints of government, universities, and industry; history, planning, and design. *Daniel Berg, Mary Ellen Mogee, Thomas Tolbert, Irwin Feller, Mark V. Nadel, Walter H. Plosila, Denis O. Gray, Peter W. Likins, Lois S. Peters, Debra Rogers, Carl W. Hall, Henry Etzkowitz*

35-4. Interim Results of the MIT Commission on Industrial Productivity (2/15, Mon/am). *Michael L. Dertouzos, Robert M. Solow, Lester C. Thurow, Richard K. Lester*

35-5. Route 128: Miracle or Model? (2/15, Mon/pm). High-tech academic and industrial perspectives; economic development; transfer to other locations. *Edward B. Roberts*

36. Food Resources & Hunger

36-1. Food Security in Arid Lands: Strategies and Development (2/12, Fri/pm). Prehistoric solutions; international trade and the global food economy; remote sensing; biotechnological solutions. *Theodore E. Downing, Priscilla Reining, Cyrus M. McKell, Harold Stults, William J. Hudson, Compton J. Tucker, Paul R. Fish, Hanna J. Cortner*

36-2. The Future of Hunger (2/14, Sun/am). History of human hunger; demography; the "Green-Gene" revolution; environmental and resource threats; Africa's future. *Robert S. Chen, Ellen Messer, Robert W. Kates, Goran S. Hyden, Lucile Newman, Myron B. Fiering, Sara R. Millman, Peter Heywood*

36-3. Scientific Disagreements About World Hunger: Narrowing the Differences (2/14, Sun/pm). Debates on threat of soil erosion and limitations of

the green revolution. *Elise M. Boulding, Donella Meadows, Donald Plucknett, David Pimentel, Richard Harwood, Pierre Crosson*

36-4. The Paradox of World Hunger and Grain Surpluses: The Role of World Trade (2/15, Mon/am). IASA trade model; trade liberalization effects; policy measures. *Donella Meadows, Amy Auerbacher Wilson, Robert Thompson, Ferenc Rabar, T.N. Srinivasan, Klaus Froberg*

37. Science History & Philosophy

37-1. The Edges of Science (2/12, Fri/am). Anthropic principle; Gaia hypothesis; anomalous phenomena. *Rolf M. Sinclair, Heinz R. Pagels, Stephen H. Schneider, Peter A. Sturrock, Don N. Page, Lynn Margulis*

37-2. Science as a System (2/12, Fri/pm). Economic, ethical, aesthetic, and political interaction. *Russell L. Ackoff, Alan M. Barstow, John A. Dillon, Jr., John N. Warfield, Thomas A. Cowan*

37-3. History and Current Status of Mathematical Modeling in Science (2/13, Sat/am). Population ecology; semiconductor physics; hydrologic processes; earth's structure. *David W. Onstad, John H. Woodhouse, Sharon E. Kingsland, Richard P. Hooper, A.M. Dziewonski, Karl Hess*

37-4. The Role of Hypotheses in Science (2/13, Sat/pm). Inference; Bayesianism; probabilification. *Peter Achinstein, Arthur L. Norberg, Lawrence Sklar, John Earman, Abner Shimony*

37-5. Quality Assurance in the Performance of Science (2/15, Mon/am). Avoiding common pitfalls in research design; improving peer review. *Kristine H. Templeman, Katherine L. Bick, William T. Friedewald, Sheila S. Jasanoff, Andrew Sivak, John C. Bailar III, Denise Hays*

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38. Science & Technology Education

38-1. The Roots of Scientific Literacy: Adolescent Socialization to Science and Mathematics (2/12, Fri/am). Impacts of television, computer usage, and museums; career aspirations; measurement of U.S. scientific and mathematics achievement; AAAS and NSF programs. Jon D. Miller, F. James Rutherford, Mary Budd Rowe, Alan Lightman, Patricia Casserly, Thomas Hilton, Robert Suchner, Keith Mielke, Roger L. Nichols, Thomas Hoffer, Valerie Crane, Bassam Shakhshiri, Archie LaPointe

38-2. Informal Science Learning: Processes and Impacts (2/13, Sat/am). Books; television; science-technology centers; NSF study results. Raymond J. Hannapel, Michael Templeton, Edward Chittendon, Phylis Morrison, Bonnie VanDorn, Mark St. John, Valerie Crane

38-3. Hands-on Science Museum Media: Exhibition and Discussion (2/13, Sat/pm). Arousing curiosity; translating for laypersons; collaboration between scientists and popularizers. Sheila Grinell, Bonnie VanDorn, Wendy Pollock, Patricia Curlin, Roger Nichols, Marvin Minsky, Caryl Marsh, James M. McCullough

38-4. Persistent Problems in Science Testing (2/14, Sun/am). Science achievement test quality; representation of science disciplines; science education objectives. Audrey B. Champagne, Ernest W. Kimmel, Jefferson C. Davis, Jr., Joseph D. McInerney, Deborah Muscella, Arnold A. Strassenburg, Rodger W. Bybee

38-5. Demonstration Models That Enhance Technology Literacy (2/14, Sun/pm). Dynamic chaos; engineering experiments; wave propagation; lasers in the Strategic Defense Initiative. Taft H. Broome, Kazuhika Kawamura, Francis Moon, James Williams, James Daugherty

38-6. The Great Debate: Should Science Teachers Be Prepared at the Undergraduate or Graduate Level? (2/15, Mon/am). Perspectives of the classroom teacher, science supervisor, professional association, and university

educator. Victor J. Mayer, Rita W. Peterson, Victor M. Rentel, Carl F. Berger, Lynn Margulis, William T. Peruzzi, Ronald E. Armstrong, LeMoine Motz

38-7. Launching Lives in Science: The Many Paths of Undergraduate Research (2/14, Sun/am). Perspectives of faculty and administrators; student participation. Margaret L.A. MacVicar

W. Workshops

W-1. Cultural Factors in AIDS Overseas (2/11, Thu/am-pm). Focusing on AIDS in the Caribbean, South America, and Africa, this workshop looks at populations at risk, education programs, and ethnographic data sources. Francis Paine Conant, Priscilla Reining, M.T. Leshabiri, Edward C. Green, John F. Oates, Roy Widdus, Nancy Flowers, Christine Obbo, Douglas A. Feldman, Gary Merritt, Richard Parker, Moses Pounds, Mariam K. Slater, Fred Wabwire-Mangen, Edward H. Greeley, Linda A. Valleroy, Brooke G. Schoepf, Ruka-waNkera

W-2. Workshop for Science Books & Films Reviewers (2/12, Fri/am). Designed to give current—and potential—reviewers for the AAAS magazine, *Science Books & Films*, an overview of the journal and the science book and film production industry. Harry L. Holloway, Kathleen S. Johnston, George L. Gibson, Robert V. Blystone, John Dowling, Kathryn Wolff, Wesley Green

W-3. An Examination of Psychosocial Variables That Facilitate Career Success Among Minority Persons with Disabilities (2/12, Fri/pm). Builds on findings of a national study to focus on resources and strategies to increase successful educational programming and employment among disabled minority persons. Sylvia Walker, Judy Kass, Isaac W. Hopkins, Elizabeth Anderson, Jesse Fowler

W-4. Standards for School Mathematics (2/13, Sat/am). An opportunity to hear and comment on draft recommendations from the Commission on Standards for School Mathematics. John A. Dossey, James D. Gates, Shirley

A. Hill, Thomas A. Romberg, James T. Fey

W-5. Communicating with Policy Makers: Strategies for Scientists and Engineers (2/13, Sat/am-pm). Offers practical advice by reviewing the federal budget and legislative cycles, regulatory decision making, and points and timing for effective access to policy makers. Aviava Brecher, Stephen D. Nelson, J. Paul Gilman, William G. Wells, Jr., Anthony Fainberg, Norine Noonan, Andrea B. King, Frederick M. Bernthal, Thomas H. Moss, Heather Huyck, Michael L. Telson, Jack McIver Weatherford, Benjamin Cooper

W-6. Middle School Math: Years of Choice (2/13, Sat/pm). Describes programs around the country to expand out-of-school mathematics education opportunities for middle-school students. Margery Fels Palmer, Yolanda S. George, Heather Johnston Nicholson, James Morrow, Ellen Wahl, J. Arthur Jones, Beatriz Chu Clewell, Charlene Morrow, Ellen M. Pechman

W-7. Precollege Education in Atmospheric Science (2/14, Sun/pm). Describes programs that have developed instructional materials to assist science teachers. David R. Smith, Jack Borden, Steven J. Richards, Ira Geer, John T. Snow, Gerald H. Krockover

W-8. Responding to the Need for Improvement in Science Education: A Leadership Role for Academies of Science (2/14, Sun/pm). An opportunity to hear about model science education programs at several state academies of science. Lynn W. Glass, George C. Shoffstall, Lynn E. Elfner, Russell K. Hobbie, LeRoy R. Lee, Richard E. Pieper

W-9. Workshop on Communicating Science to the Public: So You Want to Be on TV? Scientists Face the Cameras (2/14, Sun/pm). Presents the ABC's of how to make a good appearance on television and how to get your message across to the public. Includes an actual videotaping of an "interview" with a scientist attending the Annual Meeting. Patricia S. Curlin, Ira Flatow, Paula Apsell, David Kalson

W-10. The Public, the Soviets, and Nuclear Arms (2/15, Mon/pm). De-

scribes the Brown University–Public Agenda Foundation project on U.S.–Soviet relations and nuclear risk, involving research on American attitudes, restructuring of the policy debate, and a massive public outreach program. *Richard Smoke, Jan Kalicki, Tony Wagner, John Doble*

W-11. Communicating Science to the Public: Writing Strategies for Scientists and Engineers (2/15, Mon/pm). Writing strategies, information packaging for nonscientists, and hands-on practice at writing a newspaper science story in small group settings under the tutelage of experienced mass media sci-

ence writers. *Sharon Dunwoody, Carol L. Rogers*

W-12. Testifying with Impact (2/14, Sun/am). Role playing and videotaping will be used to show scientists and engineers how to effectively deliver testimony at legislative hearings. *Carol L. Rogers, Stephen D. Nelson, Arch Lustberg*

Meeting Information

Meeting Location

The 1988 Annual Meeting will be held at the **Sheraton Boston Hotel**, 39 Dalton Street, and the **Hynes Convention Center**, 900 Boylston Street, Boston, MA.

Hotels and

Hotel Reservations

The AAAS has reserved guestrooms at reduced convention rates at the **Sheraton Boston Hotel** (39 Dalton Street, telephone 617/236-2000) and at the **Boston Marriott – Copley Place** (110 Huntington Avenue, telephone 617/236-5800). These special rates are guaranteed only when reservations are made **before 20 January 1988** by using the official housing form appearing in this issue. **Please complete the form and mail it directly to the AAAS Housing Bureau, P.O. Box 490, Boston, MA 02199.**

Please do not be a “No Show”! If you have made a hotel reservation and find that you cannot keep your commitment, notify the Housing Bureau, or—after 20 January—the hotel, and cancel.

Meeting Registration

Advance Registration. AAAS members registering by 20 January 1988 receive a 30% discount on registration fees. Fees may be charged to **VISA** or **MasterCard**; no other credit cards are accepted. Please see the registration form in this issue for categories and fees; note that there is no discount for the Seminars.

In early January, advance registrants will receive a badge and registration receipt, a preliminary program, and a voucher for the registration packet. The voucher may be exchanged at the Advance Registrants' Desk at the Hynes Convention Center (Plaza Foyer) for the full program and abstracts books and other meeting materials. The registration area will be open Thursday through Sunday (11 – 14 February), 8:00 am to 6:00 pm and Monday (15 February), 8:00 am to 12 noon.

One-Day Registration. Members and nonmembers may register on-site—not in advance—for one day at the following rates: regular, \$35; students, retirees, high school teachers, and spouses, \$15. There is no one-day rate for the Seminars.

Registration Refunds. The AAAS will refund advance registration fees for all cancellations received by letter or telegram prior to 20 January 1988. **No refunds will be made on cancellations received after that date.** Refunds will be mailed after the Annual Meeting.

Resource Center

Services for Disabled Registrants. In addition to accessible meeting and hotel rooms, the following services will be provided through the Resource Center located in the Sheraton Boston Hotel: transportation to and from airports, train stations, and bus terminals; interpreters for the hearing-impaired at all plenary lectures and for other sessions on request; audiotaped program highlights for the visually impaired; assistance in moving within and between the meeting facilities and hotels; and emergency repair for wheelchairs. Persons needing special accommodations and services should so indicate on the registration and housing forms. **For additional information, contact** the AAAS Project on Science, Technology, and Disability, 1333 H Street, NW, Washington, DC 20005 (telephone 202/326-6667).

Member Information. AAAS members seeking general information about the Association's many activities or who have questions about their membership will find assistance in the Resource Center.

Resources for Minority Scientists. The Resource Center provides an opportunity for the exchange of information and printed materials relevant to the participation of racial and ethnic minorities in the sciences and in the activities of the AAAS.

Discount Air Fares

For information, see the announcement in this issue.

Ground Transportation

Airport Buses. Three bus companies operate between Logan airport and the Sheraton Boston Hotel: **Airways Transportation, Gray Line Airport Transportation, and Brush Hill Hotel Transportation.** The Marriott operates its own shuttle bus marked “Copley Marriott.” Buses to both hotels stop at all terminals and run between 7:00 am and 7:00 pm, every hour on the hour. Fares range between \$5 and \$6.

Taxis. Rates are \$1 for the first $\frac{1}{4}$ mile, 20¢ for each additional $\frac{1}{4}$ mile. The fare from Logan Airport to the meeting hotels is about \$12. Travel time is approximately 20 minutes, longer during rush hour.

Public Transit. The Massachusetts Bay Transit Authority operates subway and surface transit systems: subway, 60¢; bus, 50¢. “Massport” shuttle bus stops at all airport terminals and provides free transportation to the Airport Station subway stop. Auditorium and Prudential stations are closest to the hotels; ask for directions and transfer information.

Parking. At the Sheraton Boston Hotel, registered guests pay \$12 per 24 hours with in/out privilege; others pay between \$9 and \$13 (no in/out) depending on length of time parked. The Marriott has valet parking for registered guests at \$15 per 24 hours with in/out privilege; the self-parking fee is \$14 per 24 hours, no in/out privilege.

Additional Services

Child Care. Concierges at the Sheraton Boston Hotel or the Boston Marriott – Copley Place can make arrangements with a licensed child-care agency for guests; 24-hour advance notice is requested.

Message Center. A telephone message center will be operated during registration hours in the AAAS registration area at the Hynes Convention Center. Call 617/262-8000 and ask for the AAAS Message Center.

Employment Information. A bulletin board for posting “positions wanted” and “positions open” notices will be located in the registration area. AAAS does not coordinate interactions between applicants and prospective employers.

Advance Registration Form

AAAS Annual Meeting ♦ Boston ♦ 11 – 15 February 1988

S3

Please Print or Type

Name of registrant _____
(Last) (First & initial)

Name of spouse registrant _____
(Last) (First & initial)

Institution/Company _____
(To be printed on badge) (Registrant)

(Spouse registrant)

Mailing address _____
(Street)

(City/State) (Zip code) (Telephone number)

Convention address _____
(Where you can be reached) (Hotel and/or telephone number)

Check days on which you will attend meeting: Thu ☐ Fri ☐ Sat ☐ Sun ☐ Mon ☐

☐ Check here if you need special services due to a handicap. We will contact you before the meeting.

20 January deadline: ■ Register by this date at the advance discount (fees will be higher after 20 January), and we will mail to you in advance your registration badge, receipt, preliminary program, and voucher for the full program and abstracts. ■ Registrations received after 20 January will not qualify for the discount, and materials will be held at the Advance Registrants' Desk at the Hynes Convention Center. ■ Refund requests must be made by letter or telegram to the address below by 20 January and will be honored after the Meeting. **No refunds will be made for cancellations received after 20 January.**

Mail to: AAAS, Annual Meeting Registration
1333 H Street, NW, Washington, DC 20005

Advance Registration Fees:

Annual Meeting (advance discount fees through 20 January 1988¹)

	Regular	Student ²	
AAAS Member	☐ \$65	☐ \$35	\$ _____
Nonmember ³	☐ \$95	☐ \$50	\$ _____
Special category ⁴	☐ \$35	—	\$ _____

Seminars (requires fee in addition to registration fee above)

Reproductive Biology	☐ \$85	☐ \$40	\$ _____
Protein Folding	☐ \$85	☐ \$40	\$ _____
Marine Ecosystems	☐ \$85	☐ \$40	\$ _____
TOTAL ALL LINES			\$ _____

1. After 20 January: Member and nonmember, regular, \$95; student, \$50.
2. Full-time undergrad. and grad. students only.
3. Nonmember registration fee includes introductory 6-month membership with 25 issues of *Science*.
4. Retirees, high school teachers, and spouses may register at this special rate (does not include introductory membership).

☐ Check enclosed ☐ VISA ☐ MasterCard
(No other cards accepted)

Card number _____ Expires _____

Signature _____

Hotel Reservation Form

AAAS Annual Meeting ♦ Boston ♦ 11 – 15 February 1988

Send confirmation to:

Name _____
(Last) (First & initial)

Mailing address _____
(Street)

(City/State) (Zip code) (Telephone number)

Other occupant(s) of room: _____
(Name) (Name)

Indicate special housing needs due to a handicap:

☐ wheelchair accessible room ☐ Other _____

Charge my major credit card (card type): _____

Card No. _____ Expires _____

Signature _____

Hotel Rates (add 9.7% tax): Indicate 1st and 2nd choice of hotel; check appropriate box for type of room desired.

Choice	Hotel	Single	Double	Suites
_____	Sheraton Boston:			
	☐ Standard	☐ \$ 65	☐ \$ 75	☐ \$175 & up
	☐ Tower	☐ \$125	☐ \$150	☐ \$200 & up
_____	Boston Marriott	☐ \$ 79	☐ \$ 99	☐ \$225 & up

Arrival date _____ Time _____

Departure date _____ Time _____

Please list definite arrival and departure dates and times. Rooms will be held only until 6 p.m. unless guaranteed with a credit card. The Housing Bureau will not accept checks.

■ Reservations must be sent to the AAAS Housing Bureau (address below) on this official form by **20 January 1988**. Reservations received after this cut-off date are conditional on space availability.

■ Confirmations will come directly from the hotels. Changes and cancellations must be sent to the Housing Bureau until the cut-off date; after 20 January, deal directly with the hotel.

■ Rollaway bed or extra person in room: Sheraton, \$10; Marriott, \$15.

■ Children free of charge in same room with parents: Sheraton to age 17; Marriott to age 18.

Mail to: AAAS Housing Bureau
P.O. Box 490
Boston, MA 02199

Don't Miss the AAAS Science & Technology Exhibition

AAAS Annual Meeting ♦ Hynes Convention Center ♦ Boston

Discover new products and services. See on-line demonstrations, examine new textbooks and resource materials, and meet face-to-face with representatives from more than 50 publishing companies, computer software manufacturers, government agencies, scientific associations, and other science-oriented organizations.

Friday, 12 February 10:00am–4:00pm & 5:30pm–7:30pm*

Saturday, 13 February 10:00am–4:00pm

Sunday, 14 February 10:00am–3:00pm

While in the exhibit hall, be sure to see the special demonstrations of the new *high temperature superconductors*—compliments of Argonne National Laboratory.

* AAAS invites all Annual Meeting registrants to attend a reception in the exhibit hall on Friday evening from 5:30 to 7:30. Refreshments will be served.

Discount Air Fares to the AAAS Annual Meeting

AAAS has made special arrangements with American Airlines and with Piedmont Airlines to obtain the following discounts for your travel to the AAAS Annual Meeting:

40% off any *regular* coach fare (7 days advance purchase required)

5% off any *discounted* or *promotional* fare (subject to availability or qualifying conditions)

These special savings are available for travel from 8–17 February 1988. To make reservations for these or any other promotional fares, you or your travel agent may call one of the toll-free numbers below and give the appropriate AAAS convention identification.



American Airlines

AAAS Convention I.D.: **STAR File No. S-93281**

From continental U.S.A., Alaska, Hawaii,
Puerto Rico, and Canada

Call toll-free: 1-800-433-1790

(7 days a week, 7:00 a.m.–midnight Central time)



AAAS Convention I.D.: **AAAS**

From continental U.S.A.*

Call toll-free: 1-800-334-8644

(Mon.–Fri., 8:30 a.m.–6:00 p.m. Eastern time)

*In North Carolina and from Canadian area codes 416 and 519

Call toll-free: 1-800-251-5720, ext. 2224

Please note that the special AAAS discounts are available only through the
airline convention desks at the numbers indicated above.

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Which is why the AAAS endorses its own Term Life Insurance Plan—it's the purest and most inexpensive kind of life insurance. Each AAAS member can apply for up to \$240,000 of coverage with generous protection for the family, too.

Interested? Simply contact the Administrator, AAAS Group Insurance Program, 1255 23rd Street, N.W., Suite 300, Washington, D.C. 20037, or call Toll-Free 800/424-9883 (in Washington, D.C. call 202/296-8030). They will be pleased to answer any questions you may have about this valuable member benefit.

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