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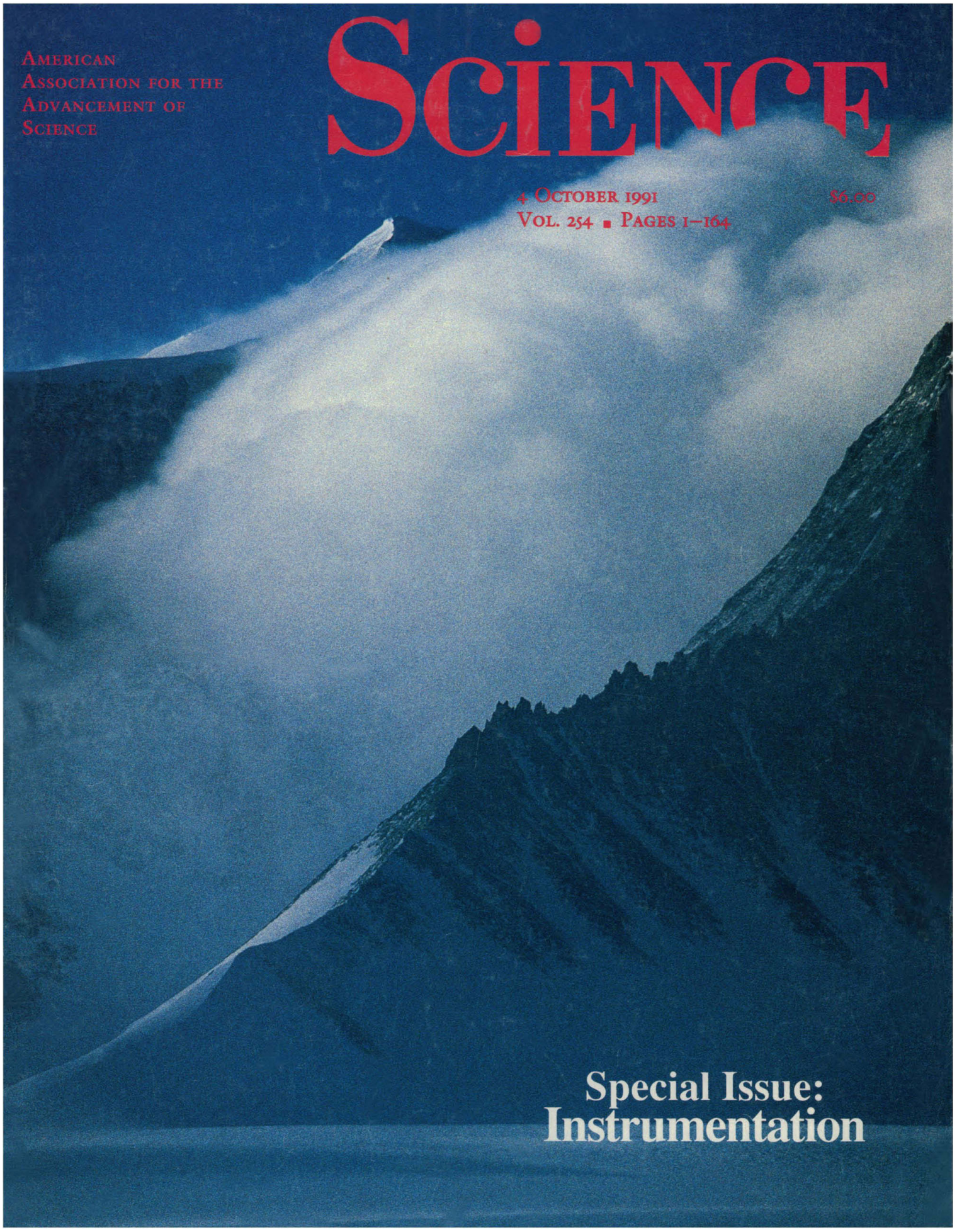

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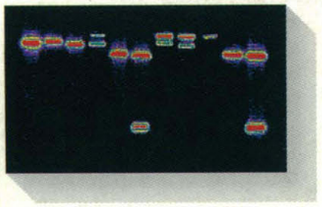

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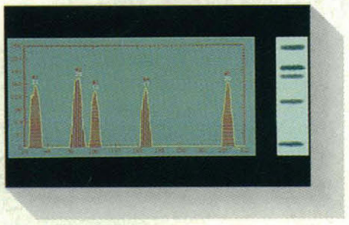

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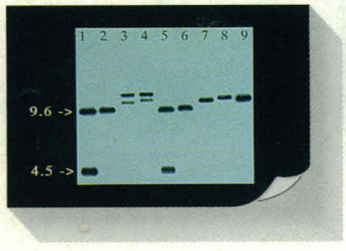

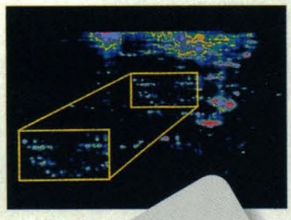

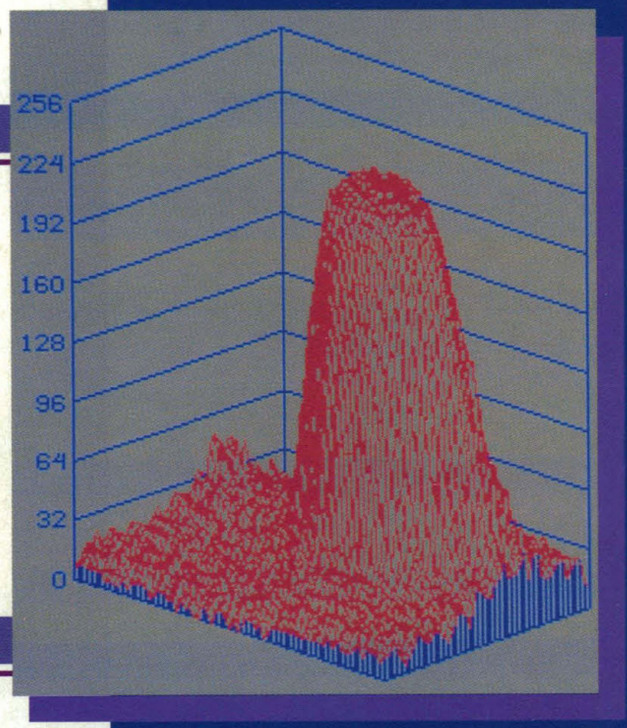

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1. Fox, J.S. (1989). *Strategies* **2**: 53-55
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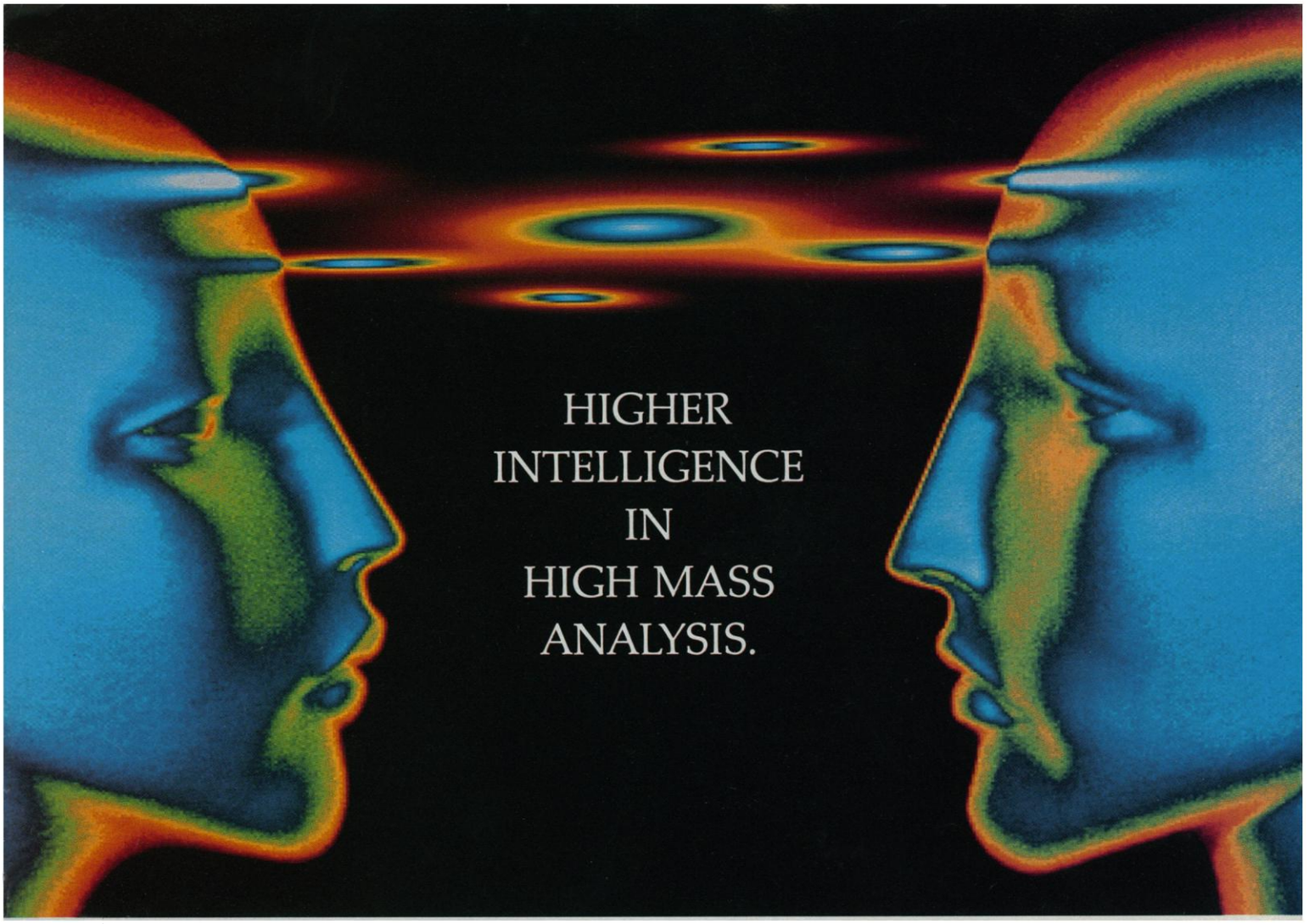

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COVER A cloud pouring over the western face of the Sentinel Range, Ellsworth Mountains, Antarctica. Fission-track analysis of samples from the Vinson Massif, Antarctica's highest mountain (4897 meters; 8 kilometers south of this photo), indicates that the Ellsworth Mountains were uplifted more than 4 kilometers during the Early Cretaceous (between 141 and 117 million years ago) and that at least 1.8 kilometers of relief has persisted since then. See page 92. [Photo by Ed Stump]

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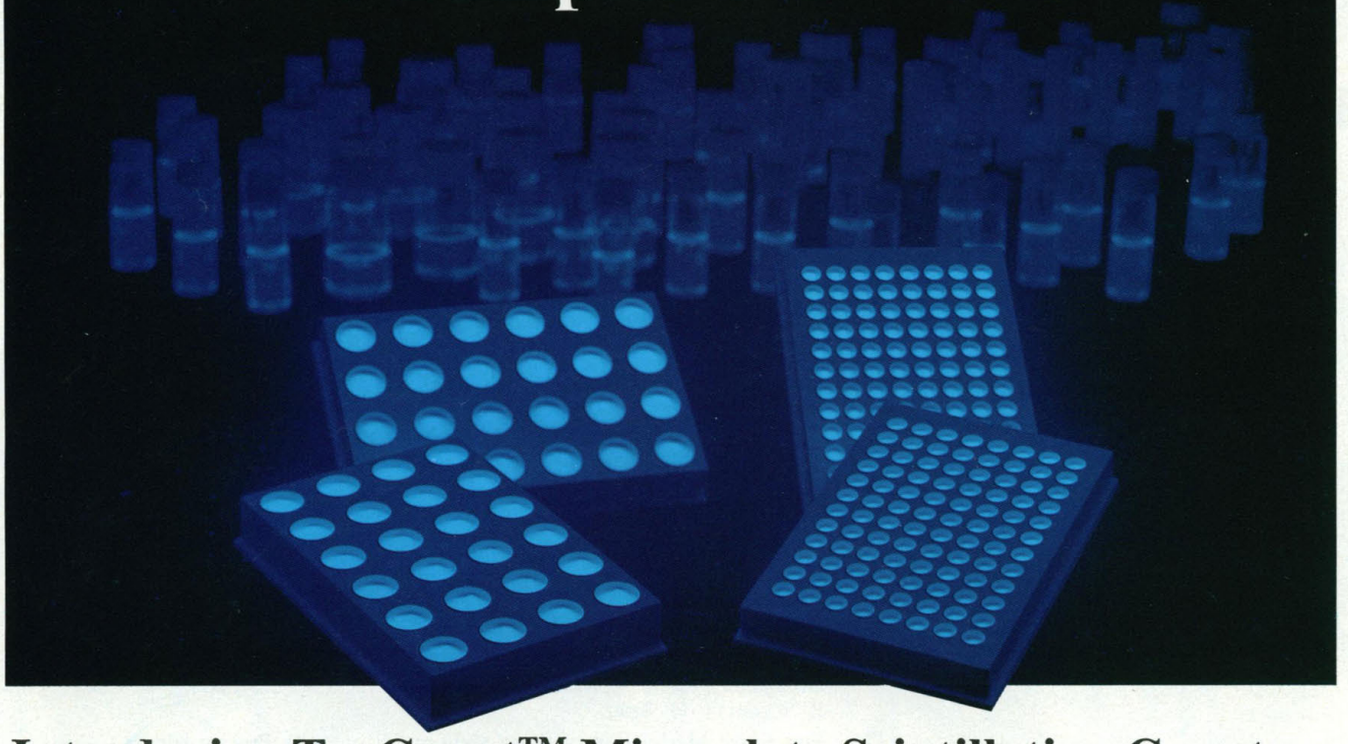

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This Week in
SCIENCE

Alar update

Can an apple a day keep the doctor away if the apple has been sprayed with the chemical Alar? For the past 2 years, since the Alar scare peaked, Alar-treated apples have been off the market, but animal studies to assess the toxic or carcinogenic effects of Alar and one of its metabolic products have continued. The latest findings are soon to be released, but the debate is not likely to end with the new reports (page 20). Many groups, including the Environmental Protection Agency, the World Health Organization, apple growers, environmentalists, Alar's manufacturer, and news organizations are taking part in this battle for which there appears to be no easy route to consensus.

Rearranged genes

Do gene rearrangements like those that occur in the immune system for producing functional immunoglobulins occur in other tissues during development? Matsuoka *et al.* report that such rearrangements can also take place in brain and spinal cord tissues (page 81). A *lacZ* gene was injected into fertilized mouse oocytes; its product could be produced only if a recombination event occurred to bring necessary regulatory genes next to *lacZ*. The "reporter" gene was detected in specific regions of the brain and spinal cord in the transgenic mice. An understanding of the types of genes that rearrange during development and the spatial and temporal patterns of such rearrangements could begin to explain how the central nervous system forms and matures.

Geologic evolution of West Antarctica

The rocks in the largest mountain range of West Antarctica, the Ellsworth range (cover), were uplifted some 4 kilometers and unroofed during the Early Cretaceous (page 92). Although the exact time for the uplift cannot be determined, fission-track dating measurements constrain this event to at least 141 million years ago. The uplift was completed during a 20-million-year period and since then additional uplift has not exceeded 3 kilometers; at least 1.8 kilometers of relief have been maintained. Fitzgerald and Stump discuss the contribution of these data to modelers' efforts to piece together the tectonic events that have played a part in the geologic evolution of West Antarctica, which is intimately tied to the breakup of the supercontinent Gondwana.

Mutation in familial Alzheimer's disease

In a family whose members are at risk for early-onset Alzheimer's disease development of dementia and the deposition of amyloid co-occur with a point mutation in the gene for the amyloid precursor protein (APP) (page 97). In families such as the one studied the disease is inherited in an autosomal-dominant fashion. The first sign of disease typically is loss of short-term memory when individuals are in their early 40s. The cognitive problems worsen and by their late 40s or early 50s affected individuals are dead. Murrell *et al.* identify the point mutation as a single base change that results in the substitution of a phenylalanine for valine in the membrane-spanning domain of APP. In several other families with early-onset Alzeimer's disease, an isoleucine has been reported to replace this same valine. Taken together, these data strengthen the case that mutations at this position can cause some cases of Alzheimer's disease.

Chemoattractant for neutrophils

When tissues are injured or inflamed, circulating neutrophilic cells leave the blood stream and respond to the damage. What endogenous factors promote the transmigration of neutrophils across the vessel wall to such sites? With a model system Huber *et al.* found that a variant form of interleukin-8 (IL-8) that is released by activated endothelial cells orchestrates the migration (page 99). The IL-8 molecules induce changes in the expression of several proteins of the neutrophils and in so doing promote neutrophil attachment to and subsequent release from the vessel wall. A shallow chemotactic gradient of IL-8 developed across the endothelial layer and was essential for directed neutrophil movement.

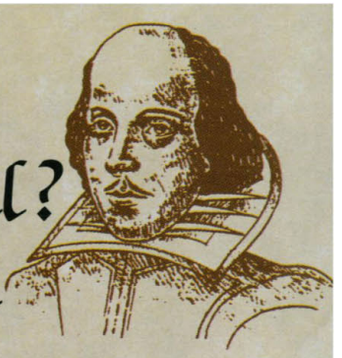
CFTR model

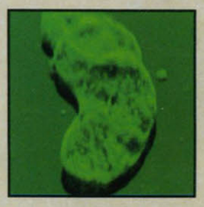
The cystic fibrosis gene encodes a multifunctional protein, CFTR, that has structural elements in common with transport proteins of a variety of organisms. For example, the LIV-I system of *Escherichia coli*, which transports leucine and other neutral branched amino acids into bacteria, contains domains that are similar to those of CFTR. Gibson *et al.* observed how mutations changed the ability of LIV-I to transport leucine into cells (page 109). The mutations resembled known mutations in CFTR that have been observed in patients with cystic fibrosis. Some mutations completely inhibited leucine transport; others greatly altered the kinetics of transport. One mutation that is benign in cystic fibrosis had no effect on transport by LIV-I. If, as suggested by these results, the LIV-I system and CFTR are functionally similar, LIV-I could be an apt model in which to test structure-function relations in this superfamily of proteins. ■ RUTH LEVY GUYER

Instrumentation

This special issue includes five articles (pages 43 to 80) that describe new technologies and the problems they are designed to address. An overview and discussion of the interplay of developments in science and technology is the subject of Brauman's editorial (page 9).

To Confocal or not to Confocal? There is no Question





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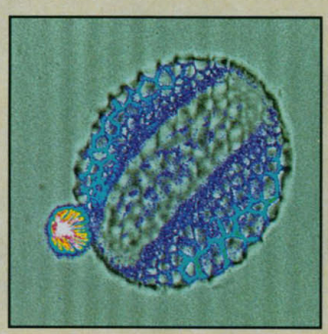
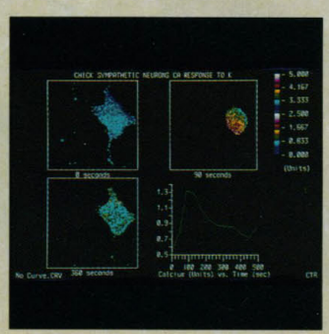
3-Dimensional Reconstruction. *Soybean root suspension culture labeled with DiO demonstrating 180 degree azimuth — 90 degree elevation rotation.*



Confocal Phase-Merge Image. *Fluorescence and phase image overlay of plant pollens labeled with acridine orange.*



Confocal Quantitation and Localization of Ca^{2+}. *Calcium response to potassium as a function of time in a 1μ confocal optical slice of an Indo-1 labeled chick sympathetic neuron. (Courtesy of Dr. Arun R. Wakade, Dept. of Pharmacology, Wayne State Univ.)*

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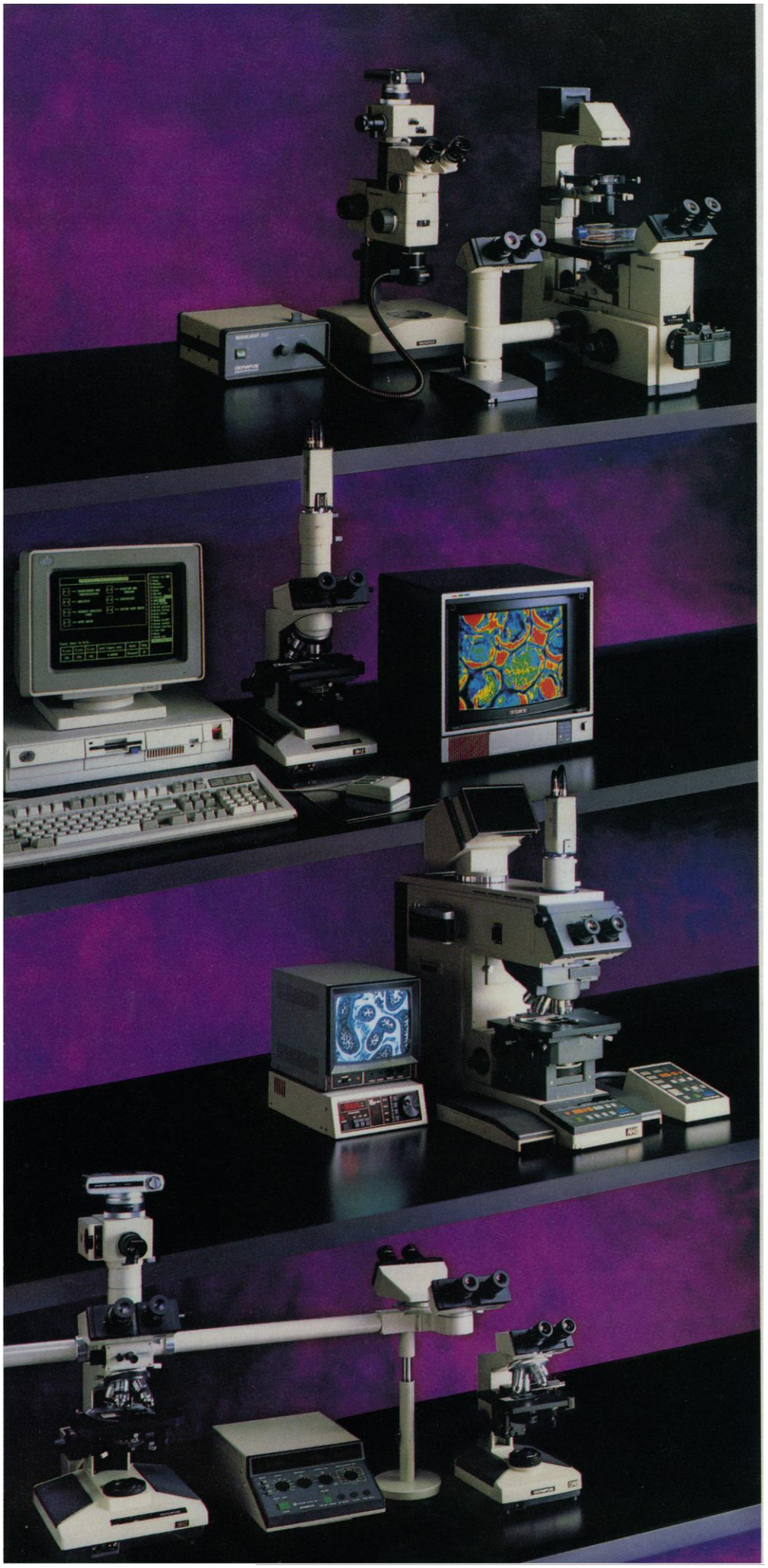

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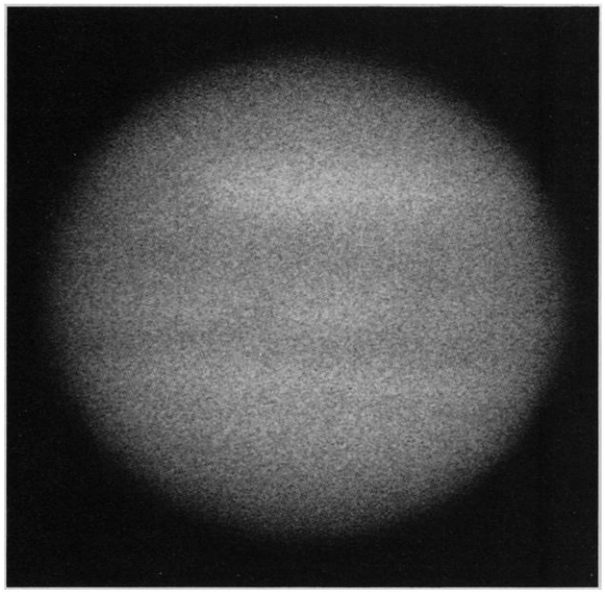

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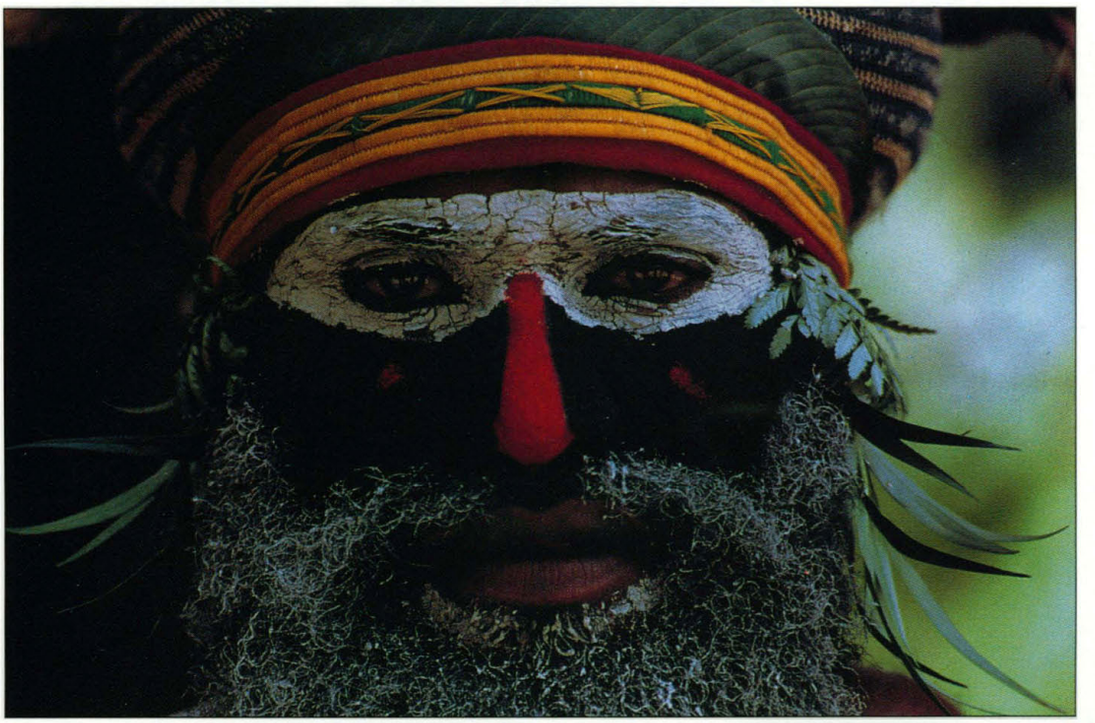

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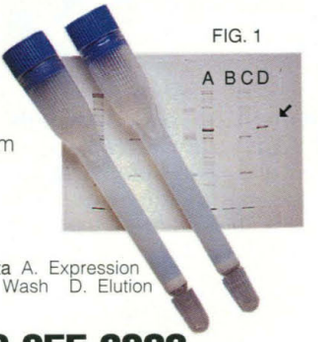

Figure 1: Expression Data A. Expression B. Flow Through C. Wash D. Elution

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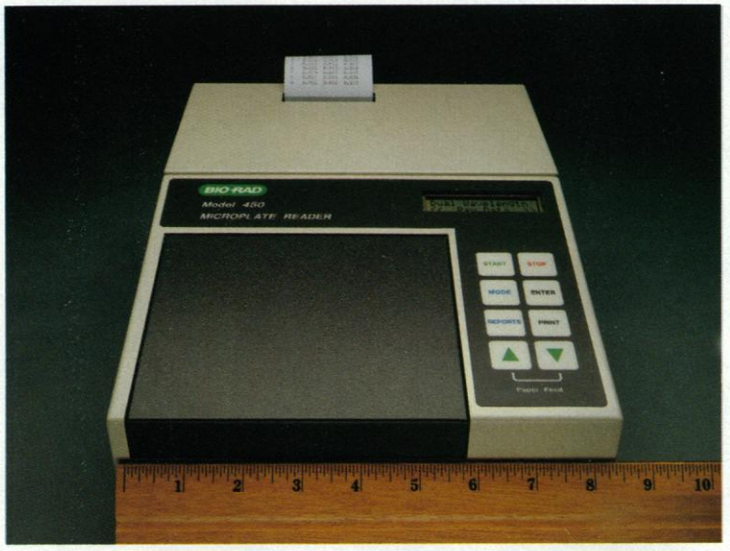

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*patent pending. *mRNA model courtesy of* BIOSYM

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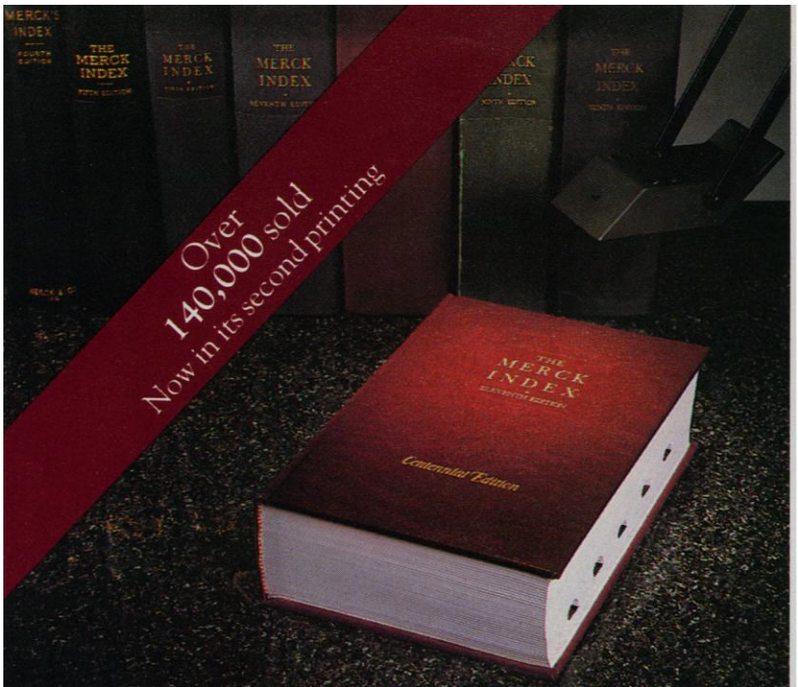

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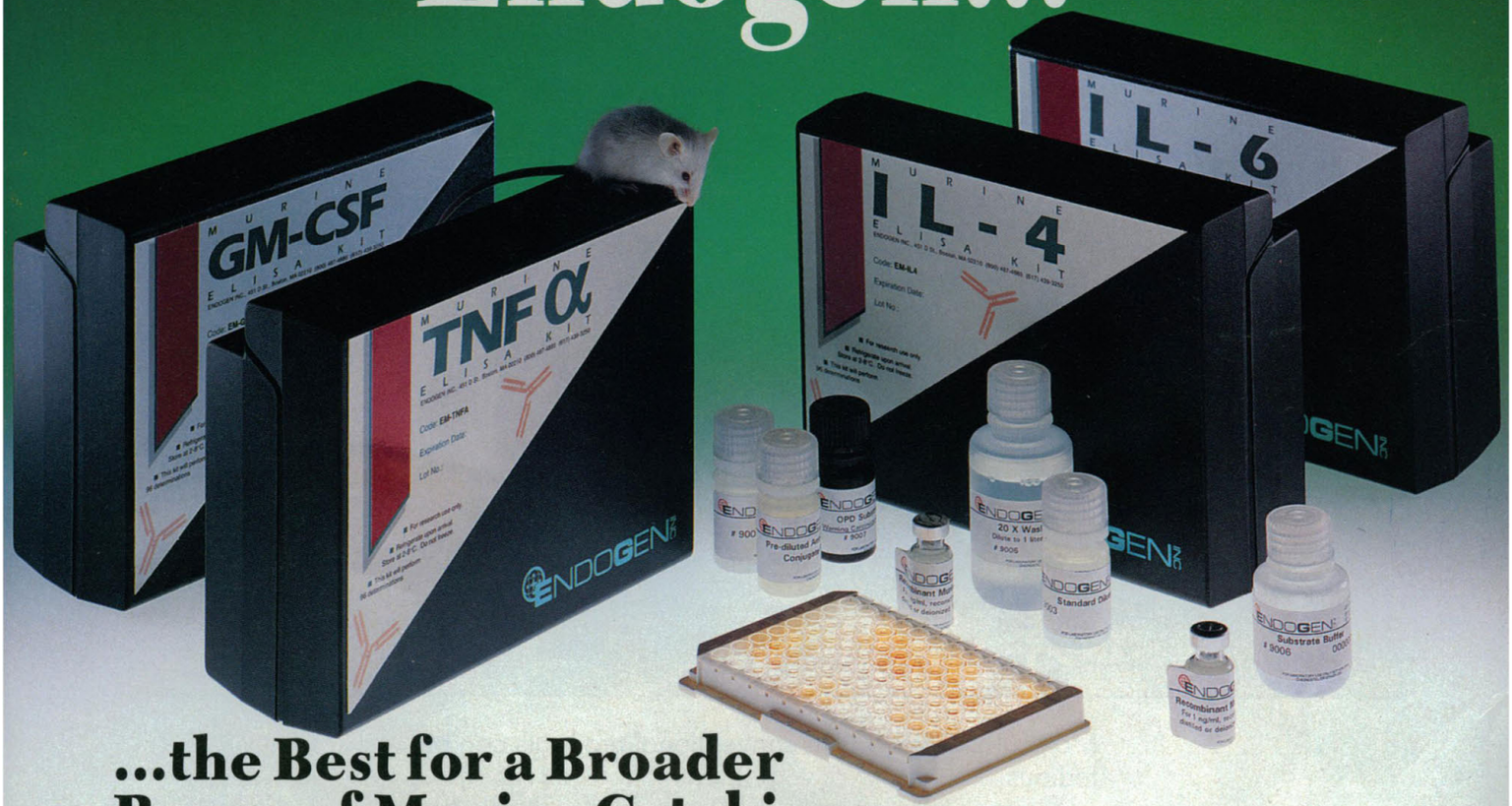

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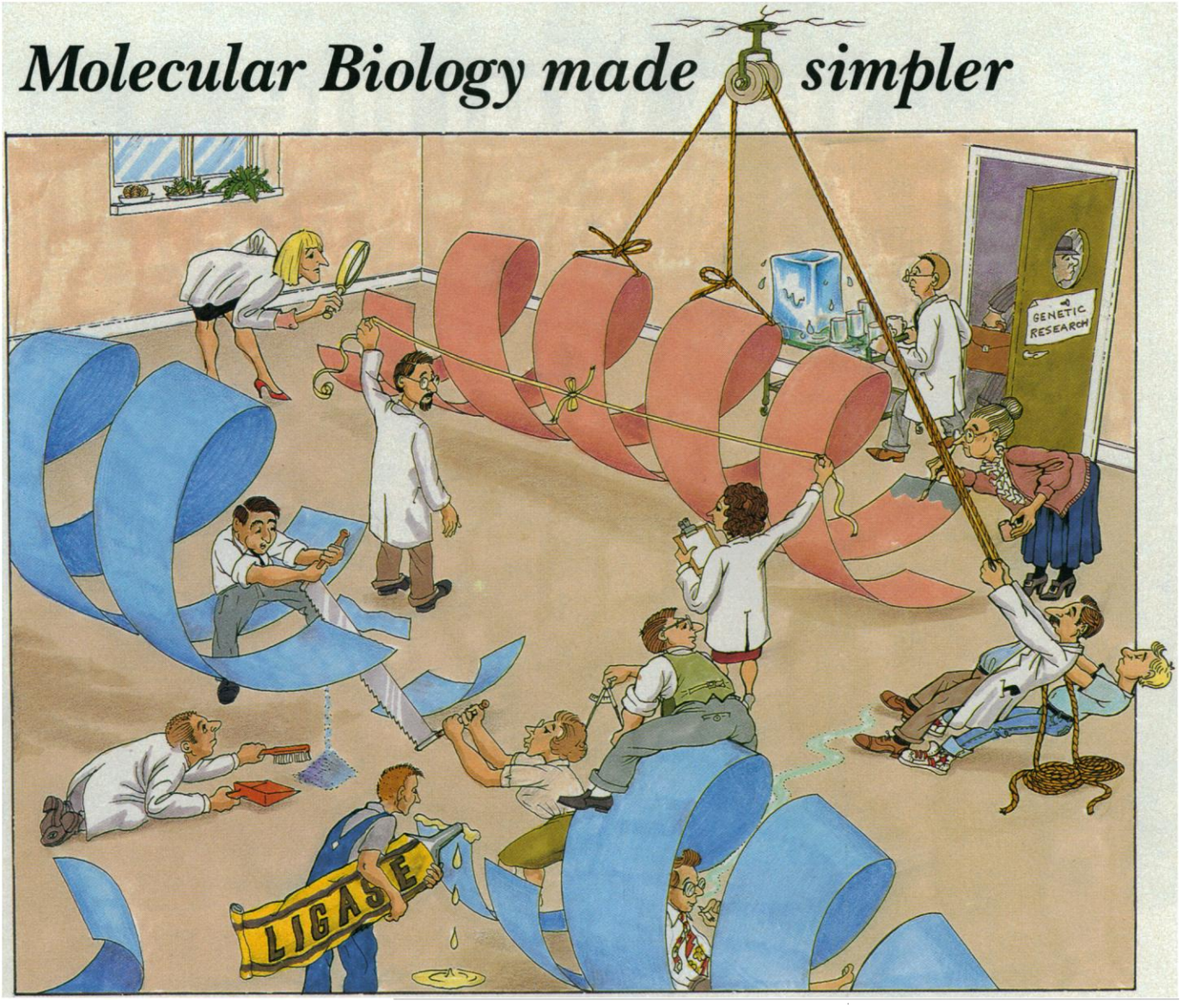

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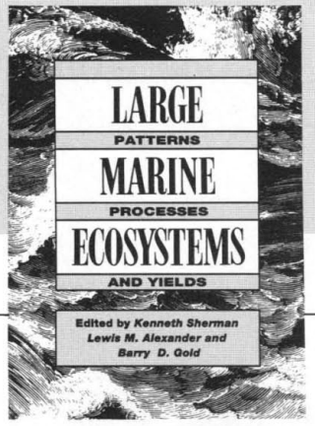

Large Marine Ecosystems

Patterns, Processes, and Yields

Kenneth Sherman, Lewis Alexander, and Barry Gold, editors

1990; 247 pp.; Softcover;
ISBN #0-87168-384-9
(indexed and illustrated)
#90-30S; $34.95 (AAAS members $27.95)

Large marine ecosystems (LMEs) — the relatively narrow ocean zones that produce nearly 95% of the world's useable marine biomass — are becoming increasingly stressed by both natural and anthropogenic changes, arousing major international concern about potentially negative ecologic and economic effects.

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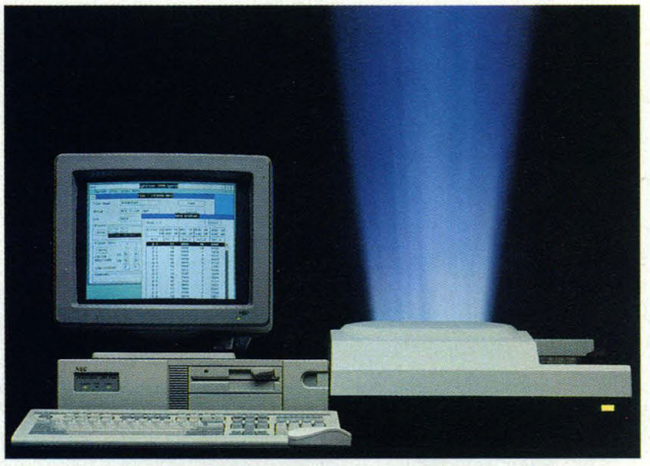

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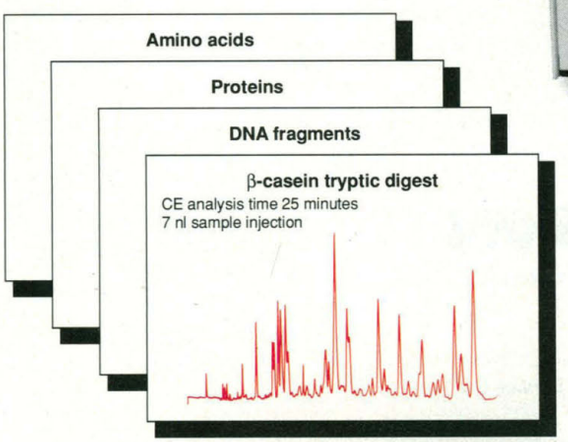

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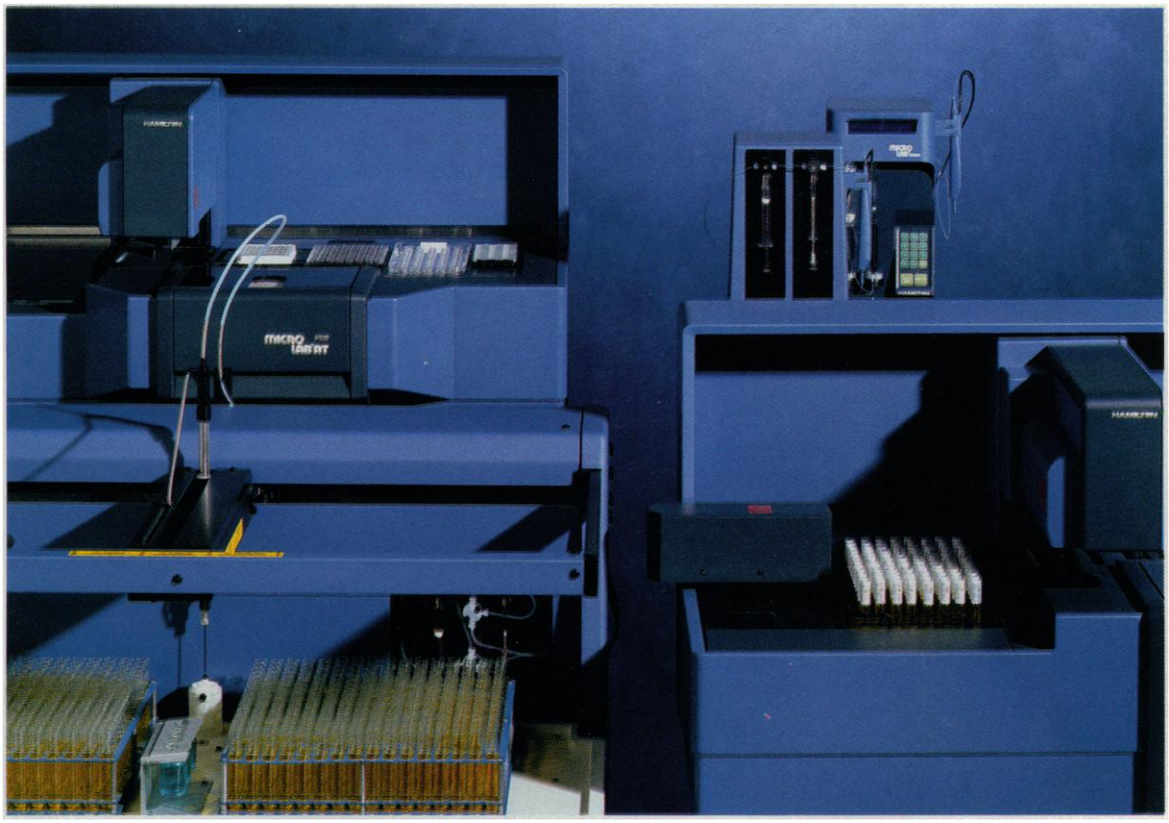

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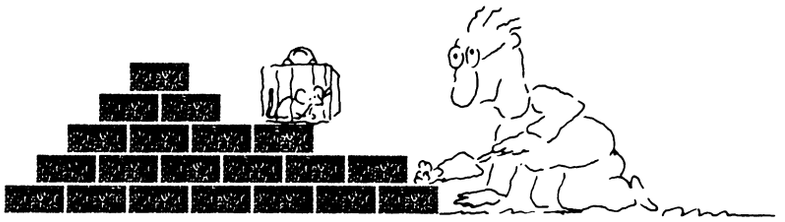

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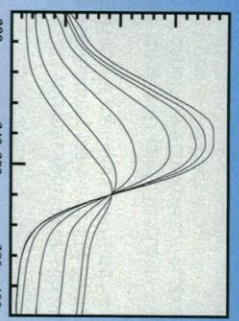

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❑ Regular—$82 ❑ Student[2]—$47 ❑ Postdoctoral[2]—$57 ❑ Retired—$47 ❑ K-12 teacher[2]—$57

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Meeting registration fee[4] ..... $_____

Membership dues[3] (if joining now) ..... $_____

Total amount ..... $_____

❑ Check enclosed[5] ❑ VISA ❑ MasterCard
(no other cards accepted)

❑ Original institutional purchase order attached

Credit card number

Exp. date _____ Signature _____

MAILING INSTRUCTIONS (10 January deadline[1])

Mail to: AAAS '92, P.O. Box 630285, Baltimore, MD 21263.
Or fax (credit card payments only) to 202-289-4021.

PROGRAM SUMMARY

AAAS☆92

The AAAS Annual Meeting

6–11 February 1992, Chicago

Join your colleagues from across the country and around the world as they converge on Chicago next February for AAAS☆92 — the 158th national meeting of the American Association for the Advancement of Science.

We've given the meeting a face-lift this year by streamlining the symposia into 22 "tracks," most of which run for the duration of the meeting. You can select a single track to follow throughout, or choose sessions from different tracks to suit your particular interests.

Either way, you'll find a cross-disciplinary exchange of unmatched caliber — no other meeting attracts professionals from such a wide variety of disciplines. This is the consummate synergy of the sciences, where you'll explore ways in which the sciences interconnect and learn how advances in other fields impact upon your own. Register now!

— ***Robin Yeaton Woo**, AAAS Meetings Director*

Featured Speakers

Ellen M. Brennan, *United Nations,* Urbanization: The megacities

Robert H. Coombs, *UCLA,* Drug-impaired physicians

Robert T. Fraley, *Monsanto,* Commercialization of genetically modified plants

Haim Harari, *Weizmann Institute of Science,* Math and science: Language of the future

Maureen M. Henderson, *Hutchinson Cancer Research Center,* Preventative dietary measures for heart disease and cancer

Susan B. Horwitz, *Albert Einstein College of Medicine,* Taxol: Mechanism of action and resistance

John R. Huizenga, *Univ. of Rochester,* Cold fusion unmasking

Donald Jensen, *U.S. Coast Guard,* Cleaning up the Persian Gulf oil spill

Solomon Katz, *Univ. of Pennsylvania,* Global impact of foods discovered in the New World

Hans Mark, *Univ. of Texas,* Henry the Navigator and the early days of exploration

David McNeill, *Univ. of Chicago,* Gesture and narrative: The importance of the right hemisphere

Margaret Mellon, *National Wildlife Federation,* Biotechnology to improve the quality of meat

Kevin O'Reilly, *Centers for Disease Control,* AIDS intervention that works

D. Eugene Redmond, *Yale Univ.,* Replacement parts of the damaged brain: Fetal neurons for Parkinson's Disease?

Sue Savage-Rumbaugh, *Georgia State Univ.,* Primate communication

George H. Scherr, *Chem-Orbital,* Irreproducible research: The making of a scientist

Stephen H. Schneider, *National Center for Atmospheric Research,* Global warming debate: Has anything changed in the last decade?

E.W. Shell, *Auburn Univ.,* Aquaculture: An ecosystems perspective

Thomas Sheridan, *MIT,* Human factors of telerobots and teleoperation

Susan Solomon, *NOAA,* Atmospheric chemistry and the ozone hole

Chauncey Starr, *Electric Power Research Institute,* The role of nuclear power and alternatives in the greenhouse problem

Warren M. Washington, *National Center for Atmospheric Research,* Uncertainties of global-change predictions with coupled climate models

Spencer R. Weart, *American Institute of Physics,* Out of the nuclear fire into the global frying pan: Changing images of science and catastrophe (George Sarton Award Lecture)

Symposia

(The 200+ sessions are organized into 22 tracks as indicated below.)

Molecular Evolution and Genetics: Evolution of Temperature Adaptation ✦ Genetics and Evolution of Aging ✦ Molecular Biogeography ✦ Speciation ✦ Primate Evolution ✦ Molecular Evolutionary Rates: Patterns and Processes ✦ Population Genetics of Microorganisms ✦ Genetic Information ✦ Evolutionary Genetics of Transposable Elements ✦ DNA Repair in Plants Responding to Stress and Ozone Depletion

Mathematics, Communication, and Information Processing: Patterns and Order ✦ Wavelets and Their Applications ✦ Electronic Networking and the Research Process ✦ Digital Library for Scientific Research ✦ Statistics Don't Lie, but... ✦ Parallel Processing (2 sessions) ✦ Statistical Modeling and Analysis ✦ Mathematics and Computers ✦ Visualization of Supercomputer Applications

Industry and the Changing Workforce: Immigration to the United States ✦ Managing Diversity in the Technical Workforce ✦ Changing Work and Family Roles in an Aging Society ✦ Gray Labor ✦ Human Factors in the Automation Age (2 sessions) ✦ Transnational R&D Cooperation (3 sessions) ✦ Economic Future for the Midwest Economy: Forecasting Models of Chicago and Michigan

Medicines and Technologies of the Future: Zoopharmacognosy: Medicinal Plant Use by Wild Apes and Monkeys ✦ Drug Development and Industrial Use of Natural Products ✦ Drugs: From Laboratory to Patient ✦ The Ethics and Ethos of Clinical Trials ✦ Augmented Tissue Regeneration ✦ Critical Materials ✦ Revolution in Microscopy (3 sessions) ✦ New Technology for Persons with Disabilities

(continued on next page)

Employment Exchange

AAAS is inviting corporate, government, and academic recruiters representing a wide spectrum of scientific disciplines to review resumes and to interview job candidates on site at AAAS☆92.

If you are a current job seeker, a student planning to graduate by June 1992, or an employer with positions to be filled, and wish to take advantage of this program, contact: Jacquelyn Roberts, AAAS Employment Exchange, 1333 H Street, NW, Room 1163, Washington, DC 20005 (phone: 202-326-6737).

Symposia *(continued)*

Climate and Global Change: Sun, Earth, and Society ✦ Uncertainties of Global Change Forecasts (2 sessions) ✦ Mitigation and Adaptation Response to Our Changing Planet (2 sessions) ✦ Polar Climate (2 sessions) ✦ Climate Change on the Great Lakes Basin ✦ Violent Storms in the Sky over the Midwest

Patterns of Life in Urban and Rural America: Assessing the Urban Infrastructure (2 sessions) ✦ Spatial Patterns in the Modern Metropolis ✦ Race, Class, and the Urban Environment ✦ Urban Violence ✦ The Future of Rural America (3 sessions)

Crisis in Health Care: The Right to Health Care (2 sessions) ✦ Disparities in Minority Health ✦ Infant Mortality ✦ Human Error in Medicine (2 sessions) ✦ AIDS and Conflicts in Rights and Responsibilities in Health Professional-Patient Relationships ✦ AIDS and Human Rights ✦ Aging: Coping with Nonfatal Conditions ✦ Measurement Issues in Alzheimer's Disease

Preserving World Peace: Arms Control in a Changing World ✦ Post-Cold War Arms Trade ✦ The Future of Smart Weapons ✦ Understanding and Preventing International Terrorism ✦ Tactical and Ballistic Missile Defenses ✦ Environmental Dimensions of Security ✦ Security in Latin America ✦ Security on the Pacific Rim ✦ Nuclear Deterrence in the Developing World

Environmental Modeling and Policy: Mathematical Modeling and Environmental Concerns ✦ Long-Range Externalities: Global Warming and Nuclear Waste Disposal (2 sessions) ✦ Field Work: The Long and the Short of It ✦ Economics, Environment, and Trade ✦ Research and Environmental Quality ✦ Federal Government Support for Environmental Research

Ethics and Research Policies: Computers and Ethics in Medicine ✦ Confidentiality in Databases ✦ Contrasting Cultures of Law and Science ✦ International Law and Environmental Ethics ✦ Responsibilities of Research Management ✦ Integrity and Misconduct in Science (2 sessions) ✦ The Future of the Research University ✦ The Future of the National Laboratories ✦ The Future of Industrial Research ✦ Too Many Researchers? Too Little Funding?

Physics — From Fermi to the Future: Particle Physics on the Prairie ✦ High-Energy Physics ✦ Nuclear Risk Perception ✦ Nanostructures ✦ Atomic Physics ✦ State-of-the-Art Introductory Physics Lab ✦ Teaching Discovery-Based Physics

Register Now!
Use registration form on page 128.

Fantastic Voyages — From Columbus to the Cosmos: Natural Philosophy and Cosmology in the 15th and 16th Centuries ✦ Geography and Navigation ✦ Natural History Discoveries and Impacts on Human Populations ✦ Archaeology in Columbus's First Settlements ✦ Evolutionary Change of American Indian Societies Following European Contact ✦ International Space Year Activities ✦ Astronomical Exploration from Antarctica (2 sessions) ✦ New Worlds Close Up

Feeding the World: Animal and Plant Genomic Research (2 sessions) ✦ Managing Genetic Resources (2 sessions) ✦ Microbial Ecology and Soil Nitrogen ✦ Agricultural Use of Residuals ✦ Low-Fat Meat: Human Implications ✦ Avoiding Meat Shortages ✦ Biotic Crises of Exotics Introduced in the Great Lakes ✦ Generic Advertising of Food Products

Waging War Against Pollution: Environmentally Benign Manufacturing ✦ Catalysts: Keys to Protecting the Environment ✦ Biotechnology Against Environmental Pollution ✦ New Physical-Chemical Approaches to Pollution Control ✦ Turning Swords into Superfund Sites: Weapons Destruction ✦ Minorities and Environmental Hazards ✦ Recycling ✦ Future Research Directions in Hazardous Waste Remediation

Psychology and Child Development: Advances in Developmental Theory ✦ Science of Psychoanalysis ✦ Electrophysiology of Language Comprehension ✦ Cognition and Communication in Infants ✦ Human Growth Patterns ✦ Neurobiology of Communication (2 sessions) ✦ The Psychobiology of Emotion

Native American Origins: Archaeological Forensics (2 sessions) ✦ Native American Remains: Ethical Issues ✦ Fate of the European "Cavepeople" ✦ The Newest World: Original Peopling of North America ✦ South American Paleoindians ✦ Ethnogenesis in the Americas (3 sessions)

Energy for the 21st Century: Magnetic Levitation Transport (2 sessions) ✦ Toward Cleaner, More Efficient Energy (3 sessions) ✦ Biofuels ✦ Nuclear Energy: A Half Century and Beyond (2 sessions)

Research in U.S. National Parks: Efficacy of Long-Term Research in U.S. National Parks (4 sessions)

Science and Math Education — Striving for Excellence: Scientific Research in Science Education ✦ Project 2061: New Standards for Science Literacy ✦ Science and Mathematics Education in Central Cities ✦ Innovation in Precollege Science and Mathematics Delivery ✦ Presidential Awardees Make Science and Math Live! ✦ Revolution in Undergraduate Science and Mathematics Education? ✦ State Systemic Initiatives (2 sessions) ✦ The Access to Algebra Initiative ✦ Science-Teacher Partnerships in Middle School Science and Technology Education

International Issues: Environment and Development: Directions for the 21st Century (3 sessions) ✦ Science in Africa: Setting Research Priorities

Science for Everyone: Pre-Columbian Science: A Modern Perspective (2 sessions) ✦ The Science of Beauty (2 sessions) ✦ Science and Al Capone ✦ Science Is Fun! ✦ Astrology and Other Pseudoscience ✦ Communicating Scientific Knowledge to the Public: Agendas and Messages (2 sessions) ✦ Science for the Naked Eye ✦ Sex Research ✦ Frontiers of the Physical Sciences (2 sessions) ✦ Frontiers of the Social Sciences ✦ Whose Science and Math Is It Anyway? Multicultural Perspectives

Science and Journalism: Science, Labs, and Videotape: Video News Releases in Television Science Coverage ✦ Scientists and Journalists: Antagonists or Symbionts?

Seminars

Cognitive Neuroscience *(3-day seminar, 8–10 February, separate registration required; see registration form):* Information Processing in the Nervous System: Molecular Basis ✦ Conscious and Unconscious Processing of Sensory Information ✦ Selective Attention ✦ Memory ✦ Computational Models ✦ Biology of Language

Computational Chemistry and Molecular Modeling *(3-day seminar, 7–9 February, separate registration required; see registration form):* Computational Chemistry ✦ Drug Design ✦ Rational Molecular Design ✦ Molecular Simulations ✦ Three-Dimensional Databases

Invitation to Exhibit

If your organization provides publications, products, or services that would be of interest to AAAS members, or if you would like to publicize your latest advances in science and technology before an international audience and press corps, you should plan on exhibiting at AAAS☆92.

The meeting serves as an important public forum at which registrants share ideas and information with each other and (through extensive press coverage) with their colleagues around the world. By exhibiting, you can meet face to face with many of the 5,000+ attendees — scientists, educators, and researchers from virtually every field of scientific inquiry.

For additional information, call Stacy Weinberg at 202-326-6462.

Call for Poster Papers & Student Research Award Entries

The poster sessions at AAAS☆92 provide an informal, visually oriented way for you to present contributed papers to a multidisciplinary assembly of your peers. Appropriate topics for posters include any of the 22 symposium tracks or two seminars in the AAAS☆92 program.

If your abstract is accepted, you will be assigned to a poster session and provided with a 4' × 8' bulletin board on which to display graphics and large, easy-to-read text for two hours, during which you can discuss your work one-to-one with interested colleagues. Accepted abstracts will also be published and distributed to all AAAS☆92 registrants.

Student Research Awards: To encourage the development of young scientists and to recognize their achievements in all fields of scientific research, AAAS will feature exceptional research by college, university, and high school students in a special poster session at AAAS☆92. A panel of distinguished scientists will evaluate the student posters and award cash prizes for the top three presentations in *each* of three broad categories: physical sciences, life sciences, and social sciences. Awards for each category are 1st prize—$500; 2nd prize—$250; 3rd prize—$100.

Deadline for abstracts is 1 November 1991. For complete instructions on how to submit abstracts, see the Call for Poster Papers in the 6 September 1991 issue of *Science* magazine, or contact the AAAS Meetings Office, 1333 H Street, NW, Washington, DC 20005 (Phone: 202-326-6450; Fax: 202-289-4021).

Discount Air Fares to AAAS☆92

Fly United Airlines to AAAS☆92 in Chicago and save with low, discount air fares available for travel between 3 February and 14 February 1992.

- ✦ **45% off regular coach fares** published at time of ticket purchase. (In Canada, discounts up to 35%.) No minimum stay needed; 7 days advance purchase required.
- ✦ **5% off lowest promotional round-trip fares,** subject to availability and qualifying conditions; and 5% off first-class fares. (Not available in Canada.)

These special fares are available only through United Airlines' convention reservation desk. Certain restrictions may apply and seats are limited.

To take advantage of this offer, you or your travel agent should call the toll-free number and give the agent the AAAS meeting I.D. number shown below. Also, be sure to inquire about discounted Hertz rental car rates.

Toll-free number: 1-800-521-4041

AAAS meeting I.D. number: 5090W

Call 7 days a week, 7:00 a.m. – 1:00 a.m. Eastern Time for the USA (including Hawaii and Alaska) and Canada.

AAAS☆92 Hotel Reservation Form ✦ *AAAS Annual Meeting, 6–11 February 1992, Chicago*

Send confirmation to:

Name _____
(last name) (first name)

Institution/company _____
(if part of address)

Address _____

City/state/zip/country _____

Phone _____ Fax _____

Other occupant(s) of room _____
(name)

_____ / _____
(name) (name)

Special housing needs due to a disability: ❑ Wheelchair-accessible room

❑ Nonsmoking room Other _____

Late Arrivals (after 6 pm) must be guaranteed with a deposit for the first night plus 12.4% occupancy tax, either by a major credit card or check (payable to the appropriate hotel).

❑ Check enclosed ❑ Credit card _____
(credit card company)

Credit card # |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Exp. date _____ Signature _____

- ✦ **Reservations must be received at the appropriate hotel by 6 January 1992.** (Housing requests received after this date are conditional on room availability.)
- ✦ The hotels will not refund deposits for cancellations received after 31 January 1992.
- ✦ Reservation changes and cancellations must be made directly with the hotel.
- ✦ Children stay free in same room with parents if no extra bed is required. (Age limit: Hyatt, up to 18 years; Fairmont, up to 12 years.) ✦ Check-in time is 3 pm; check-out time is 12 noon.

Room Rates:

Check appropriate box for your choice of hotel and room. Add 12.4% occupancy tax to rates shown.

Hyatt Regency Chicago, Attn: Reservations, 151 East Wacker Drive, Chicago, IL 60601

- ❑ Single (1 person, 1 bed)..... $110
- ❑ Double (2 persons, 1 bed)..... $130
- ❑ Twin (2 persons, 2 beds)..... $130
- ❑ Triple (3 persons, 2 beds)..... $140
- ❑ Quadruple (4 persons, 2 beds)..... $150
- ❑ Suite..... $365 & up

Fairmont Hotel, Attn: Reservations, 200 North Columbus Drive, Chicago, IL 60601

- ❑ Single (1 person, 1 bed)..... $110
- ❑ Double (2 persons, 1 bed)..... $130
- ❑ Twin (2 persons, 2 beds)..... $130
- ❑ Suite..... $250 & up

Arrival & Departure:

List definite arrival/departure dates & times. Reservations are held until 6 pm. *Arrivals after 6 pm must be guaranteed with a deposit for one night plus tax.*

Arrive _____ ❑ Before 6 pm ❑ After 6 pm
(date)

Depart _____ ❑ Before noon ❑ After noon
(date)

Mailing Instructions:

Mail this form to the hotel of your choice (addresses above), together with any necessary deposit.

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