4 MARCH 1983 · VOL. 219 · NO. 4588

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SCIENCE

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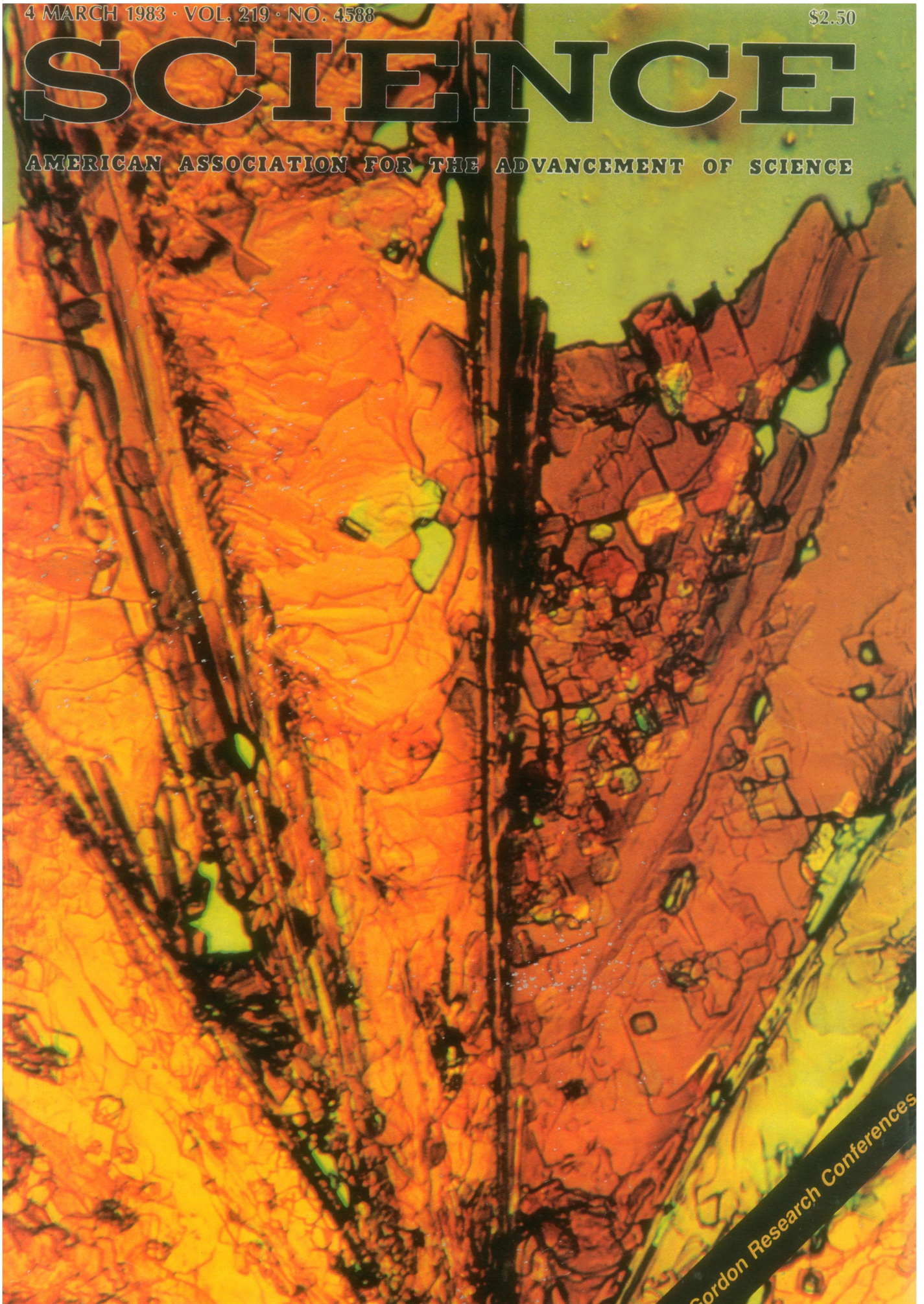
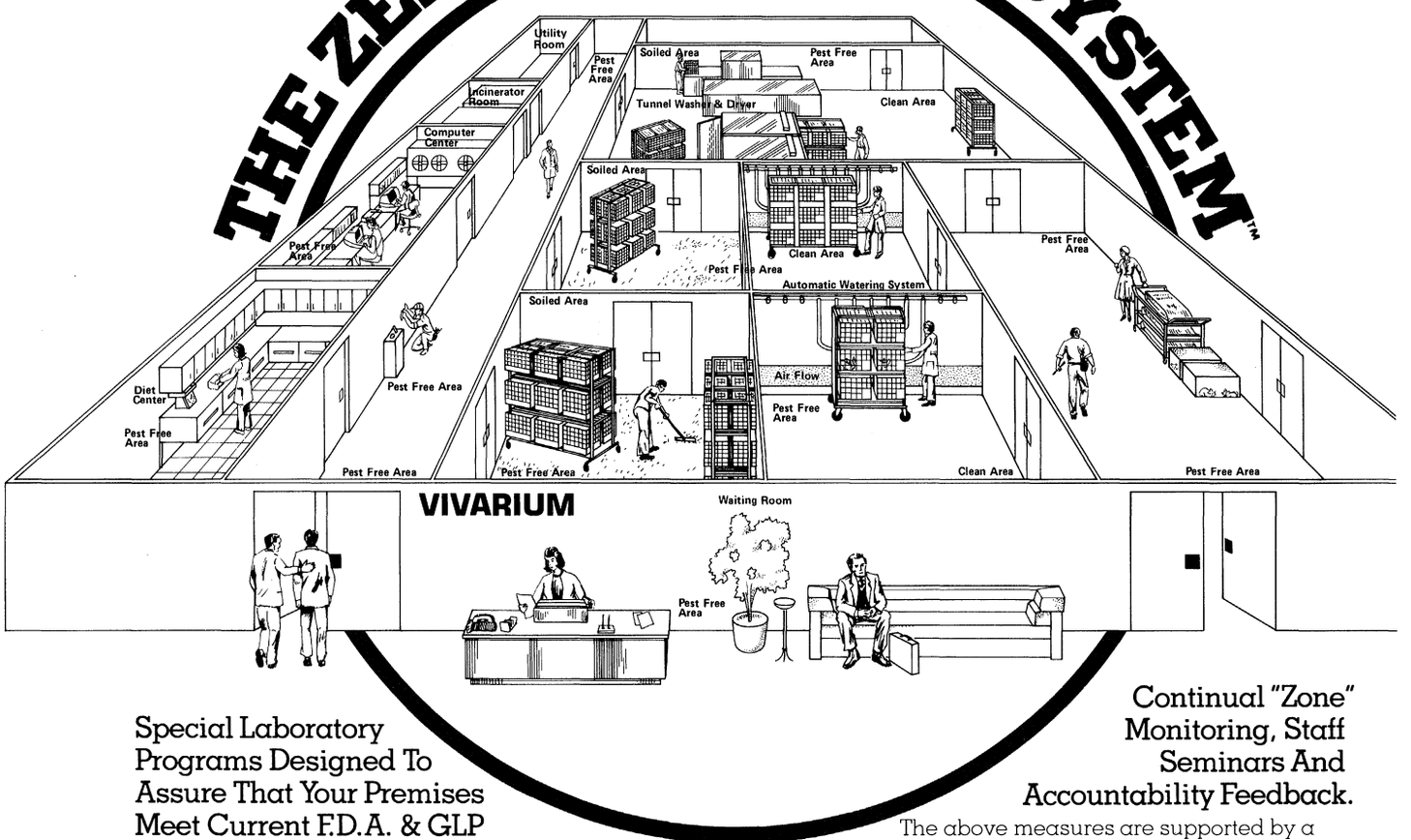


Gordon Research Conferences

THE ZERO-PEST ZONE SYSTEM™



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Safeguard invaluable test procedures. "The Zero-Pest Zone System" permanently eliminates injurious encroachment by unwanted laboratory pests through safe means that do not affect your test results.

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AN EXPANDED COMPETITION

- **Due to an overwhelming response, Sohio has extended the deadline for entering its $10 million national competition among colleges and universities in support of Centers for Scientific Excellence. All entries are due by April 1.**

- **Sohio has also expanded the scope of the competition to include more research categories as listed below.**

Sohio recognizes the crucial need to strengthen research in scientific areas of critical importance to its future and the nation's long term economic productivity. The objective of this competition is to encourage high quality, innovative, university-based research, in partnership with industry.

Winners of the competition will be eligible for up to $2,500,000 over a five-year period, depending upon the type and extent of research undertaken. Research proposals will be judged by a panel of Sohio scientists and representatives from the academic/scientific community. The initial requirement for entry shall be a five page prospectus of proposed research in one of the following fields:

Surface Science
(including electrochemistry, colloid science, surface corrosion, and heterogeneous catalysis).

Separation Science
(including membrane technology, selective adsorbents).

Control Theory & System
(including information processing, data base engineering; sensing).

Agri-science & Technology
(including plant genetics, cellular and molecular biology, chemical regulators, biomass conversion).

Metal Extraction Science & Technology
(including leaching, insitu extraction, solvent extraction and ion exchange, electrometallurgy and high temperature processes).

Structural Engineering, Arctic Engineering, Offshore Platform Design, & Geotechnical
(including properties and behavior of steel and concrete structures in sea ice and deep ocean waters, seafloor geotechnical properties and sea ice movement and physical properties of ice).

Petroleum Reservoir Science & Technology
(including enhanced oil recovery processes, rock/fluid interactions, fluid mechanics and reservoir modelling.)

Geophysical & Geologic Science
(including geochemistry, paleontology, palynology, three component seismology, monitoring of EOR using surface seismic, and artificial intelligence used for exploration interpretation).

Mining Technology
(including slope stability, rock mechanics, blasting, mine planning, reserve modelling, robotics and mine ventilation).

Photoconversion Science & Technology
(including photovoltaics, photochemistry, laser induced chemistry or catalysis).

Synthetic Fuels
(including syngas production and conversion, coal chemistry, shale retorting, and oil upgrading).

Materials Science
(including polymers, ceramics, composites, amorphous materials).

For additional information, contact Ms. Jennifer Frutchy at (216) 575-8479 or write: Director, Corporate Contributions, The Standard Oil Company (Ohio), The Midland Building, 840-T, Cleveland, Ohio 44115.

SOHIO The Standard Oil Company (Ohio)

ISSN 0036-8075

4 March 1983

Volume 219, No. 4588

SCIENCE

SCIENCE is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. *Second-class postage (publication No. 484460) paid at Washington, D.C., and at an additional entry. Now combined with* **The Scientific Monthly**® Domestic individual membership and subscription (51 issues): $48. Domestic institutional subscription (51 issues): $85. Foreign postage extra: Canada $24, other (surface mail) $27, air-surface via Amsterdam $55. First class, airmail, school-year, and student rates on request. Single copies $2.50 ($3 by mail); back issues $3 ($3.50 by mail); Biotechnology issue, $5 ($5.50 by mail); classroom rates on request. **Change of address:** allow 6 weeks, giving old and new addresses and seven-digit account number. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $1 per copy plus $0.10 per page is paid directly to CCC, 21 Congress Street, Salem, Massachusetts 01970. The identification code for *Science* is 0036-8075/83 $1 + .10. **Postmaster:** Send Form 3579 to *Science*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

COVER

Fluorescein. Fluorescent dye used by ophthalmologists to help identify injuries to the cornea. [Courtesy of Michael D. Isenberg, M.D., Vallejo, California] See page 1095 for program of Gordon Research Conferences.

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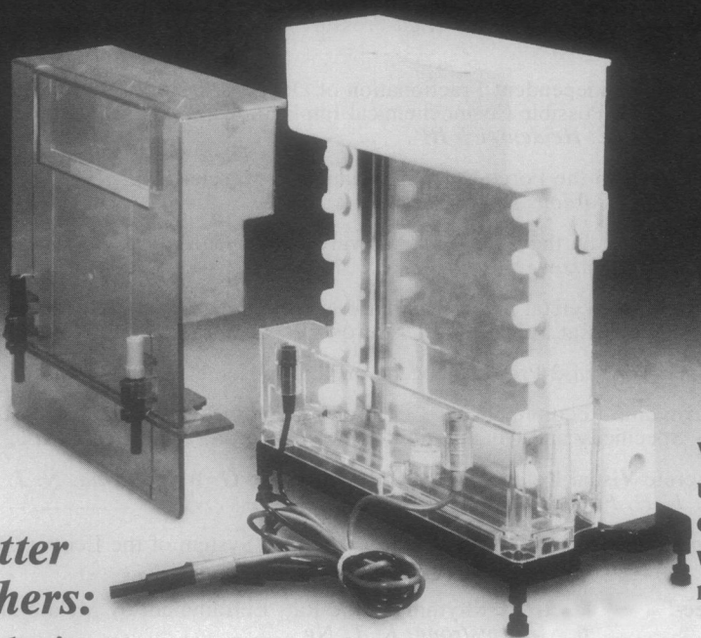

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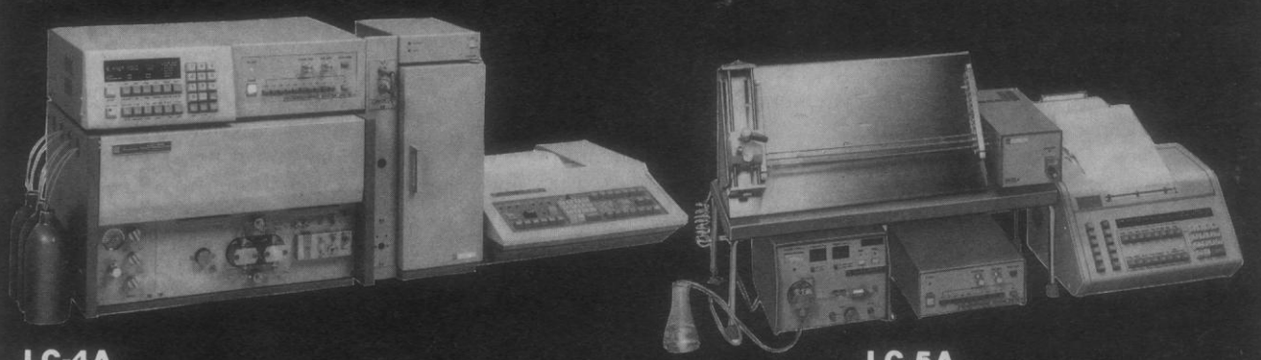

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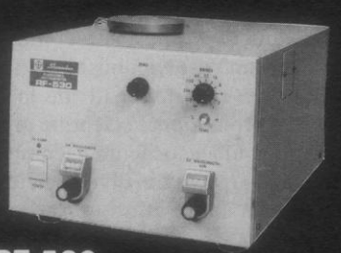

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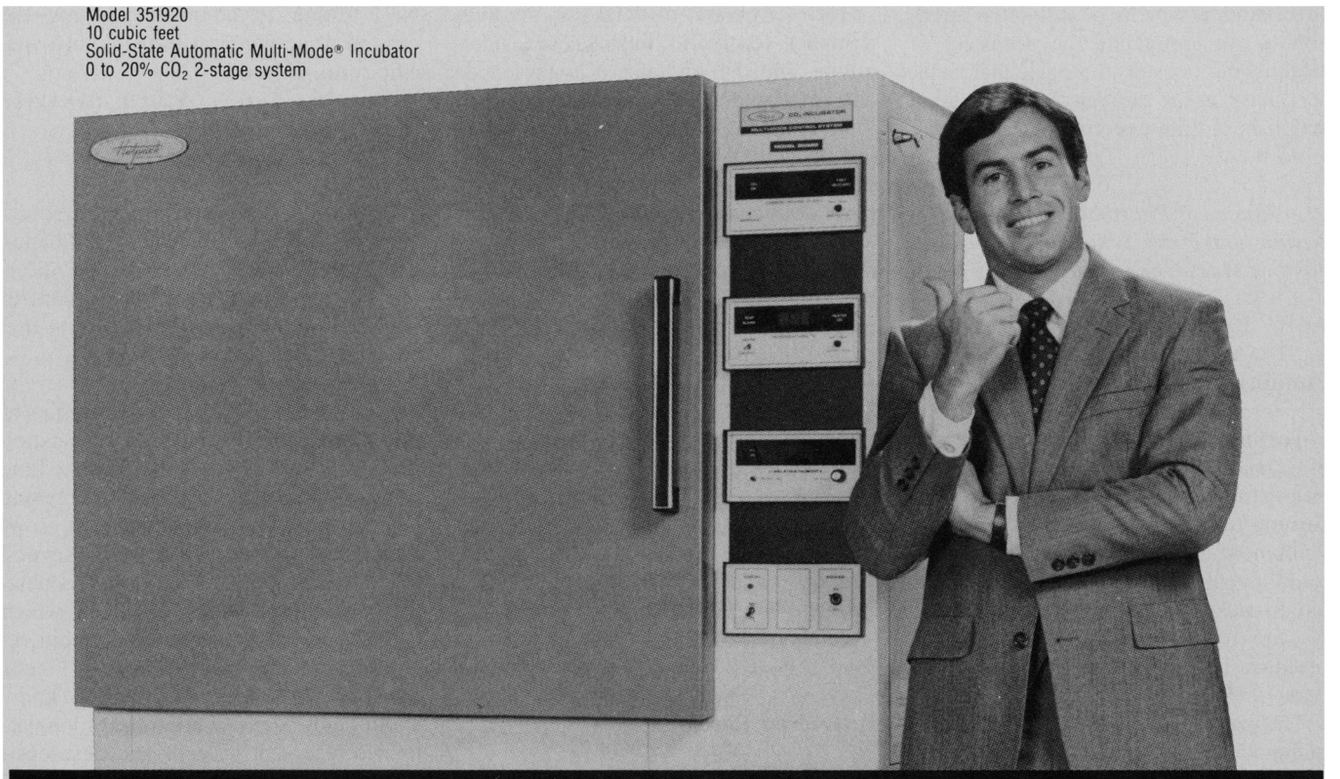

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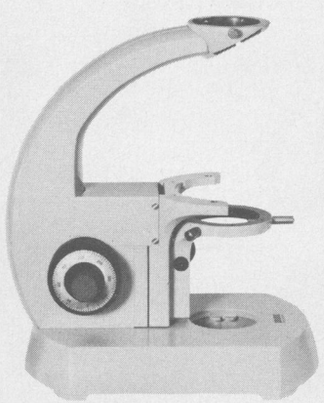

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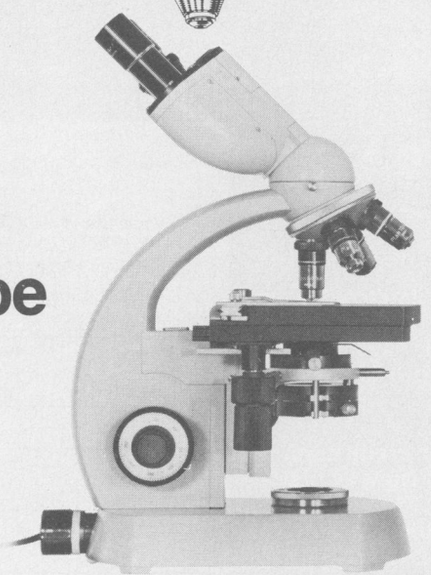

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4 March 1983, Volume 219, Number 4588 **SCIENCE**

International Competition in High Technology

The Japanese are moving vigorously toward a national goal of world domination in semiconductors. They recognize that excellence in this area will carry with it leadership in computers, telecommunications, robotics, aerospace, and other high-technology industries. Our government seems paralyzed. Its behavior is in contrast to the financial help and other encouragement that the Japanese government bestows on its electronics industry. In addition to effectively restricting importation of competing items, the Japanese government fosters industrial cooperation in research and development both by authorizing and by subsidizing it.

The United States has tough antitrust laws that in the past have served to stifle cooperation between companies in research. In consequence, there is a tremendous waste of scarce resources of people and excessive duplication of effort in our industrial research. Companies often must rediscover the same phenomena. There are at least two types of applied research. One is highly specific and product-oriented. Companies prefer to keep that work secret from each other. A second type is closely akin to good basic research. Its goal is to work out procedures and production techniques of general applicability. That kind of research and development should be shared and its costs borne by cooperating companies.

A new consortium of companies proposes to do just that. They have agreed to participate in the Microelectronics and Computer Technology Corporation (MCC). Admiral Bobby R. Inman (retired) has been elected president and chief executive officer of the corporation. The founding shareholders are Advanced Micro Devices, Control Data Corporation, Digital Equipment Corporation, Harris Corporation, Honeywell, Motorola, NCR Corporation, National Semiconductor Corporation, RCA, and Sperry Corporation. A substantial number of other companies have expressed interest but are holding back largely because of fear of antitrust proceedings. The Justice Department has been reassuring, but lawsuits are cheap to file and costly to defend.

Initially, MCC will concentrate on four advanced, long-range programs. Their stated objectives include:

- Electronic computer-aided design and computer-aided manufacture (CAD-CAM): Major advances in electronic CAD-CAM design tools will be integrated into a system that encompasses the spectrum of design needs from concept and simulation to the design and layout of microelectronic chips containing up to 10 million elements.
- Software productivity: This MCC program will develop techniques, procedures, and tools based on expert and knowledge-based systems in order to gain an order-of-magnitude improvement in the effectiveness of both systems and application software development processes.
- Advanced computer architecture: This 8- to 10-year program will focus on knowledge-based architectures and artificial intelligence and their applications. Its range of applications includes image analysis and design automation of very large scale parallel computing structures as well as data-flow techniques, pattern recognition and manipulation, and development of expert knowledge and inferencing systems.
- Microelectronics packaging: The objective will be more cost-effective techniques for interconnecting components, using future complex chips that contain 1 million or more circuit elements.

The Bell System and IBM are sufficiently big and entrenched that they are secure for at least a while. But smaller companies such as those in MCC are unlikely to prosper in the longer term if they must go it alone. The Japanese will target their products one by one. These companies have been innovative and have created jobs. A strong MCC would solve part of their future problems by facilitating innovation and cutting costs. Congress should quickly modify antiquated antitrust laws to permit industrial cooperation in applied research.—PHILIP H. ABELSON

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Please provide all of the following: nominee's vita or resume; summary of accomplishment(s); detailed description of contribution(s); 2 or 3 examples of publications or other evidence of contribution(s); three letters of reference; and, names of 3 to 5 additional references. Nominations must be received no later than October 15, 1983. Supporting material must be received no later than November 1, 1983.

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Trends and Topics

- R&D in the FY 1984 budget
- Congressional reactions
- Industry R&D funding
- International competition
- Human resources
- Research partnership

Current Data

Registrants will receive *R&D in the FY 1984 Budget: A Preliminary Analysis* in advance of the Colloquium and *AAAS Report VIII: Research and Development, FY 1984,* by Willis H. Shapley, Albert H. Teich, and Jill P. Weinberg (including Colloquium highlights), following the meeting. *Congressional Action on R&D in the FY 1984 Budget* will be sent in the fall.

Informed Debate

Leaders from:

- The White House
- Federal R&D agencies
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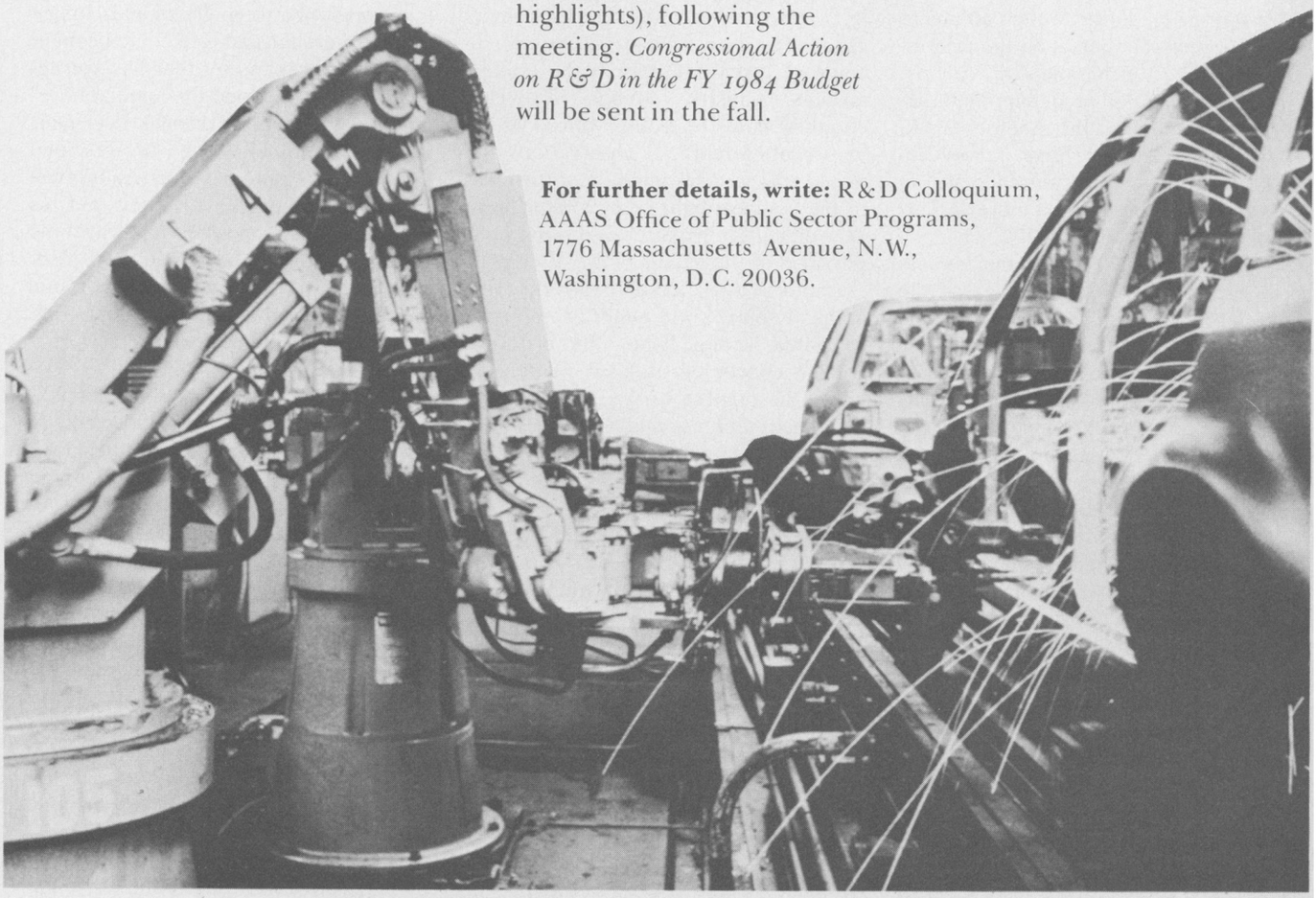
For further details, write: R&D Colloquium, AAAS Office of Public Sector Programs, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.



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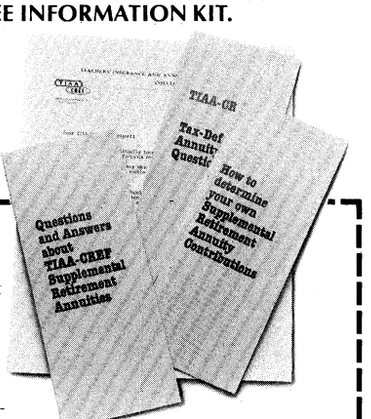

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sion leader): Frank N. Kelley and J. D. LeMay, "Physical properties and structural characterization of epoxy networks"; S. Sternstein, "Inhomogeneous swelling phenomena in composites." Special afternoon session: Poster presentations. (Armand F. Lewis, discussion leader): Eric S. W. Kong, "Effects of enthalpy and volume relaxation processes on the mechanical integrity of network epoxies and their carbon–fiber-reinforced composites"; Stephen D. Senturia, "Cure monitoring and postcure evaluation of thermosets with low-frequency dielectric measurements."

25 August. (Garth L. Wilkes, discussion leader): James P. Bell, "Epoxy resin heterogeneities: Nodules and rubber particles"; James E. McGrath and Garth L. Wilkes, "Elastomeric polysiloxane-modified epoxy networks." Banquet and business meeting. (John K. Gillahm, discussion leader): John E. Sohn, "Development of an elastomer-modified epoxy coating material"; John T. Quinlivan, "Thermoset resins: Applications and needs in the commercial aircraft industry.

26 August. (Frank Kelley, discussion leader): A. J. Kinloch and S. J. Shaw, "Toughened epoxies: Mechanics of deformation and fracture"; Donald L. Hunston and W. D. Bascom, "Effects of formulation on the failure behavior of rubber-modified epoxies."

Toxicology and Safety Evaluations

Kimball Union Academy

Robert Scala, chairperson; Frank N. Dost, vice chairperson.

1 August. Study of toxicant action at the cellular level—active oxygen (Michael A. Gallo, discussion leader): Stephen D. Aust, "Lipid peroxidation—a mechanism of toxicity"; Wayne M. Levin, "Cytochromes P450—strain and tissue differences in the rat and possible functional consequences." Bruce A. Freeman, "Superoxide effects."

2 August. Study of toxicant action at the tissue/organ level (Frank G. Standaert, discussion leader): William J. Waddell, "Pharmacokinetics of fetus and placenta"; Jeanne M. Manson, "Initial cellular reactions in birth defects." Gabriel L. Plaa, "Nontumor effects of toxicants on the liver."

3 August. Study of toxicant action at the whole animal level (Robert W. Naismith, discussion leader): John G. Babish, "Role of stressors, especially nutrition in modifying toxicant and detoxifying systems"; Ronald B. Herberman, "Toxicology of monoclonal antibodies/hybridomas." H. Locksley Trenholm, "Mycotoxins."

4 August. Study of toxicant action at the population level (A. Wallace Hayes, discussion leader): Philip S. Guzelian, "Use of biochemical and molecular genetic approaches"; Michael J. Rosenberg, "Surveillance of reproductive outcomes in the population." Robert E. Gosselin, "A clinical study."

5 August. Underlying concepts of risk assessment (Frank N. Dost, discussion leader): David G. Hoel, "Problems in trans-species extrapolation"; Jeremiah Lynch, "Setting workplace exposure limits."

Trichothecenes: Chemistry, Mycology and Toxicology

Plymouth State College (N)

R. M. Eppley, chairperson; C. J. Mirocha, vice chairperson.

13 June. Mycology—occurrence and significance of trichothecene-producing fungi (P. Mislivec, discussion leader): P. E. Nelson, T. A. Toussoun, W. Marasas. Production of trichothecenes by fungi (A. Ciegler, discussion leader): Y. Ueno, J. D. Miller.

14 June. Chemistry—structure and synthesis (W. R. Roush, discussion leader): Ch. Tamm; B. B. Jarvis. Analytical methods (A. E. Pohland, discussion leader): P. M. Scott, C. W. Thorpe; S. Swanson.

15 June. Analytical methods—mass spectral, immunoassay and other detection methods (G. Bennett, discussion leader): F. S. Chu; J. A. Sphon and J. Gilbert. Natural occurrences of the trichothecenes in foods and feeds worldwide (R. M. Eppley, discussion leader): J. I. Pitt, D. D. Xuda, R. V. Bhat, T. Yoshizawa (short presentations).

16 June. Toxicology—metabolic fate and mode of action (C. J. Mirocha, discussion leader): T. Yoshizawa and C. S. McLaughlin. Toxicity and pathophysiology (S. Watson, discussion leader): R. W. Wannemacher, Jr., and D. L. Bunner.

17 June. Mechanism and kinetics of toxicity (W. Buck, discussion leader): P. M. Newberne, and R. M. G. Hamilton; R. Cole. Scheduled poster sessions will be coordinated with the formal program. All participants are invited to present a poster related to their current work. Please include the title of your poster, the applicable program session, and a brief outline or abstract with your conference application. Participants are encouraged to prepare to participate in the open discussion periods.