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SCIENCE



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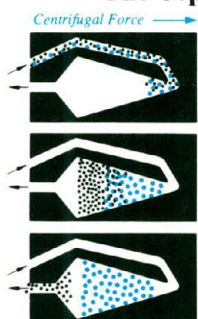
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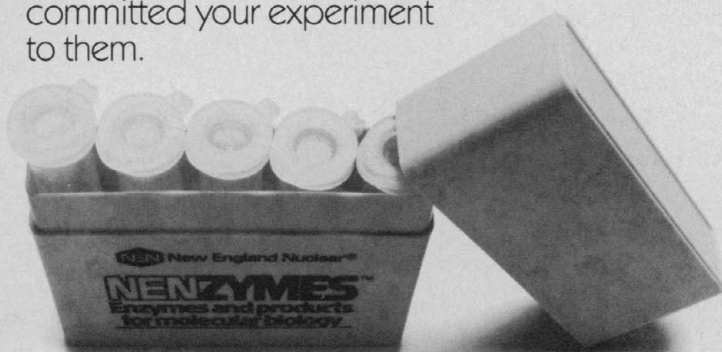
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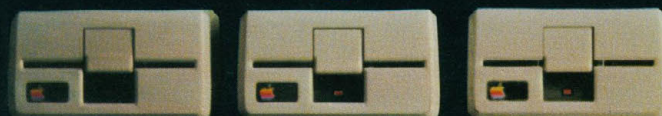
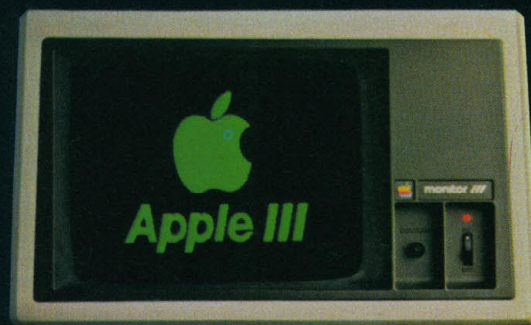
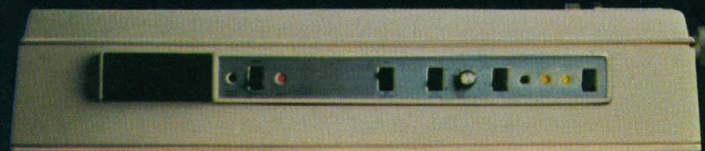
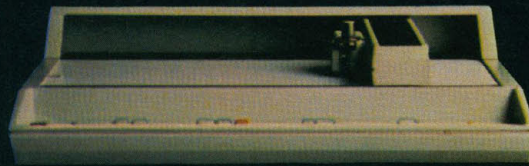
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COVER

Giant bladder kelp, *Macrocystis pyrifera*. Marine plants and animals, as well as other organisms that encounter water stress, utilize a small number of organic molecules as the dominant intracellular osmotic agents ("osmolytes"). Polyhydric alcohols, amino acids and their derivatives, urea, and methylamines are the major osmolytes in virtually all water-stressed species except the halophilic bacteria. The selective advantages of these organic osmolyte systems include the establishment of a cellular microenvironment compatible with macromolecular structure and function. See page 1214. [Craig Cary, Scripps Institution of Oceanography, La Jolla, California 92037]

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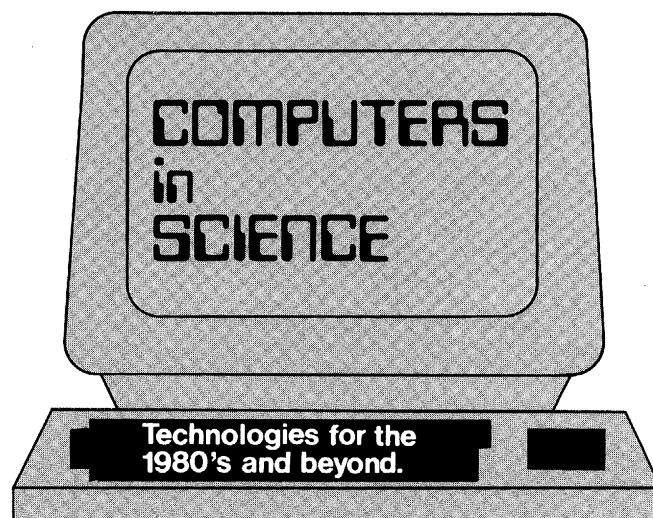
The conference's primary objective is to provide information on how changing computational technologies will influence future scientific research. Sessions will examine state of the art applications of existing technologies to specific areas of research as well as the impact of new developments on scientific research in the decades ahead.

Each conference day is devoted to a specific topic with lectures and presentations providing in-depth coverage of the subject:

- **Tuesday, December 7th — Products of the Technological Revolution: Building Blocks of Future Computer Systems.** A look at the underlying technology of future computer systems, emphasizing hardware developments and their role in providing powerful, distributed systems.
- **Wednesday, December 8th — Computational Systems: Man/Machine Synergism and the Conduct of Scientific Research.** Discussion on building useful research and development systems, focusing on the interaction of scientists with computers.
- **Thursday, December 9th — Scientific Communication and Collaboration: Conducting Research in the New Computational Environment.** An examination of the influence of computers, on how research is conducted, covering scientific collaboration, communication, resource sharing and the sociology of research in a new computational environment.

On Monday, December 6th, the day immediately preceding the main conference three Tutorials will be presented on the subjects of hardware, software, and communication technology. The Tutorials will provide intensive instruction on these subjects to provide a background for the main conference sessions to follow.

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Microelectronics — Dr. Gordon Moore, Chairman of the Board/CEO, Intel Corp.

Personal Computers — Dr. Adele Goldberg, Principal Scientist/Area Manager, Software Concepts Group, Xerox Palo Alto Research Center

Local Area Networks — Dr. Robert M. Metcalfe, Chairman of the Board, 3COM Corp.

Shared Resources — Dr. C. Gordon Bell, Vice President of Engineering, Digital Equipment Corp.

Wednesday, December 8th — Morning Lectures:

Symbols and Software for Science — Prof. Edward A. Feigenbaum, Dept. of Computer Science, Stanford University

Methodology of Programming — Dr. Ira Goldstein, Manager, Application Technology Dept., Computer Research Center, Hewlett-Packard

Expert Systems/Artificial Intelligence — Prof. Bruce G. Buchanan, Dept. of Computer Science, Stanford University

Computer Graphics — Prof. Robert Langridge, Dept. of Pharmaceutical Chemistry, University of California, San Francisco

Thursday, December 9th — Morning Lectures:

General Perspectives — Dr. Ralph E. Gomory, IBM Vice President and Director of Research

Evolution of Computer Networks — Dr. Robert Kahn, Director, Information Processing Techniques, Defense Advanced Research Projects Agency

Scientific Collaborations — Lynn Conway, Research Fellow/Manager, VLSI System Design Area, Xerox Palo Alto Research Center

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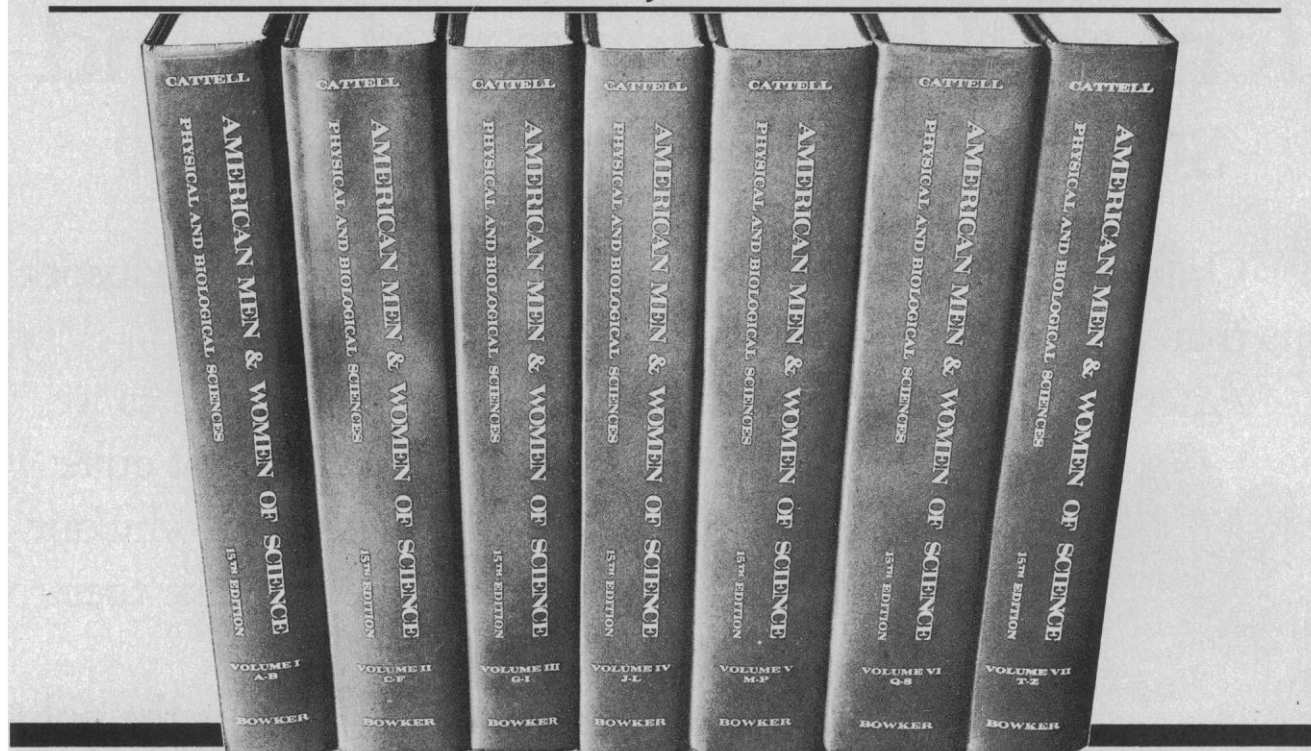
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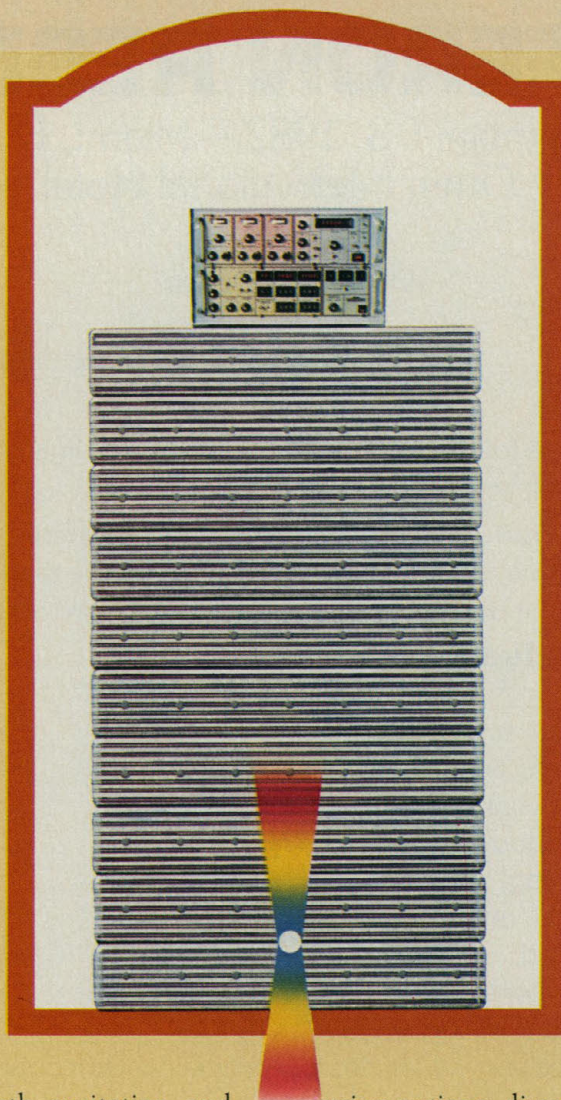
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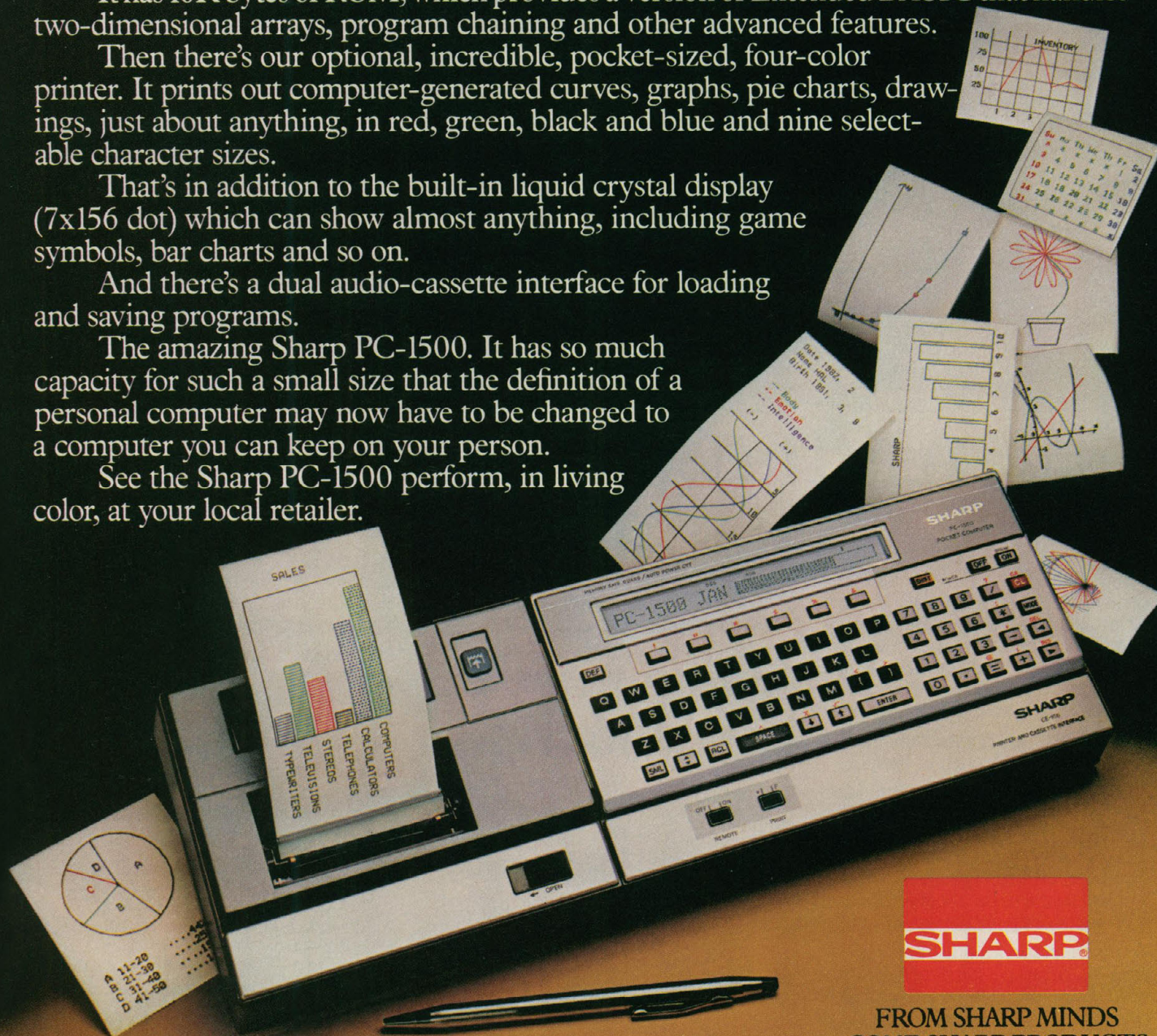
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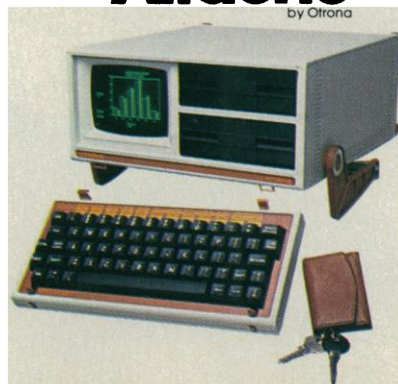
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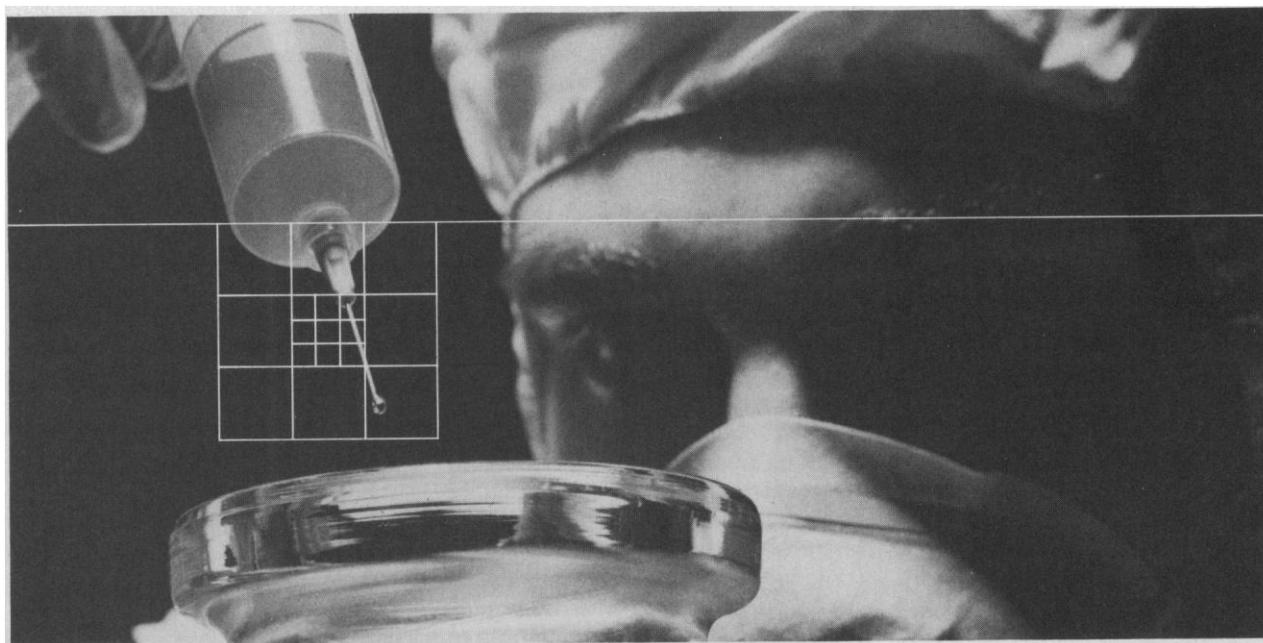
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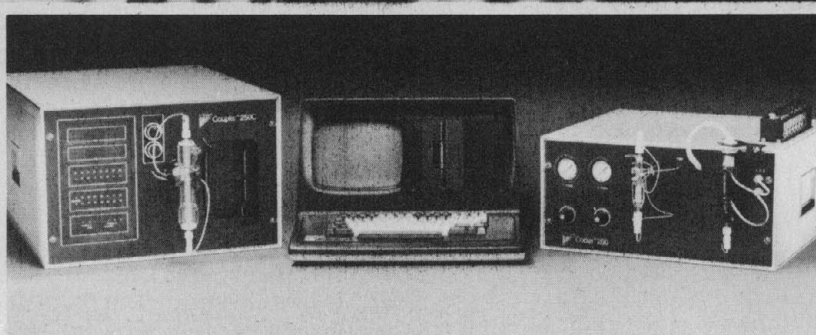
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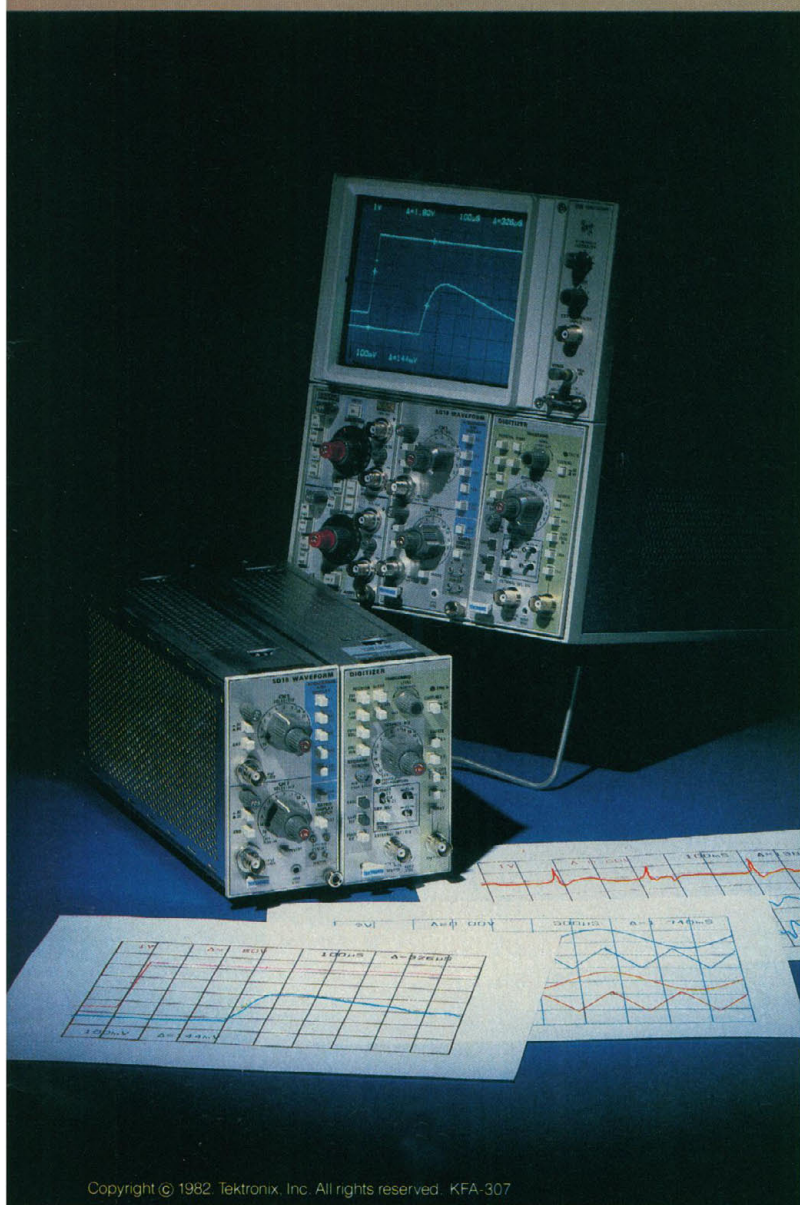
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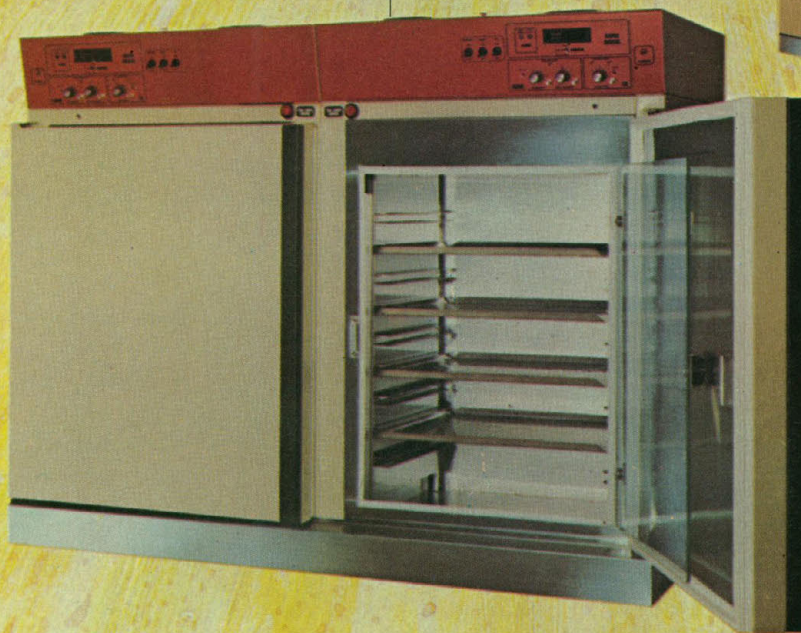
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Handcuffing Science

In the mellow last days of August, even as the National Academy of Sciences' panel on Scientific Communication and National Security rolled up its sleeves to work on its report, our military authorities launched a surprise strike resulting in the suppression of papers scheduled to be read at a major conference on optical instrumentation.

Exercising its oversight of Defense-funded research and development contracts, the military summarily embargoed the presentation of about 100 papers whose titles in a number of instances unwisely included language suggestive of military applications. Although the affair is being smoothed over, there can be little doubt that the continued prospects for open discussion of leading-edge unclassified work now dwell in a no-man's-land of confusion and disarray, subject to further incursions at any time. The humiliation visited on the sponsoring engineering society is no small matter and one that will be taken to heart by other scientific and engineering organizations. Of more significance, if the raid at San Diego was more than an aberrant case of fractured communications, is an emergent tilt toward reliance upon preemptive powers. Should this be so, we are seeing a new face of the defense research funding system which, over many decades, contributed on an enviable scale to the open search for and sharing of knowledge.

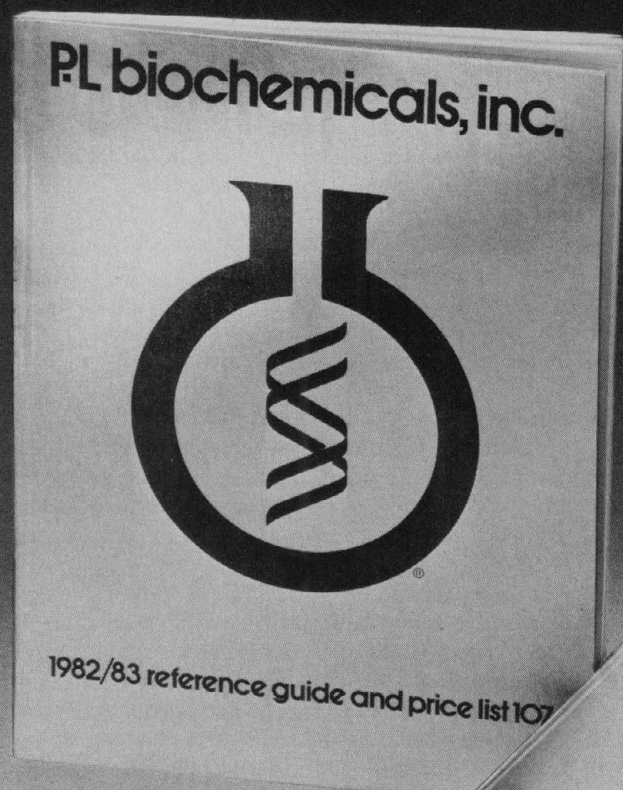
Such a transformation would go far to undo the postwar terms of reference that assured comity and stability to relationships between the scientific and technical communities and the defense establishment. If acceptance henceforth of Defense Department support for significant but unclassified work must carry with it implicit or explicit acquiescence in the suppression of disclosure, will scientists and engineers be prepared to travel that road with the specter of ambushment no farther distant than the next professional meeting? What conference planner will consider inviting foreign participants lest they be suspected carriers of unclassified tidings to delight an insatiable KGB?

It is not just the unfortunate handling of the affair at San Diego that is unnerving. The timing is no less to be deplored. What has been needed is a breathing spell to reduce the tensions and the controversy of last winter, and an opportunity for balance to be struck between the needs for national security and the requirements for scientific and technical communication. The latest failure of restraint undeniably constitutes a setback to peacemaking efforts.

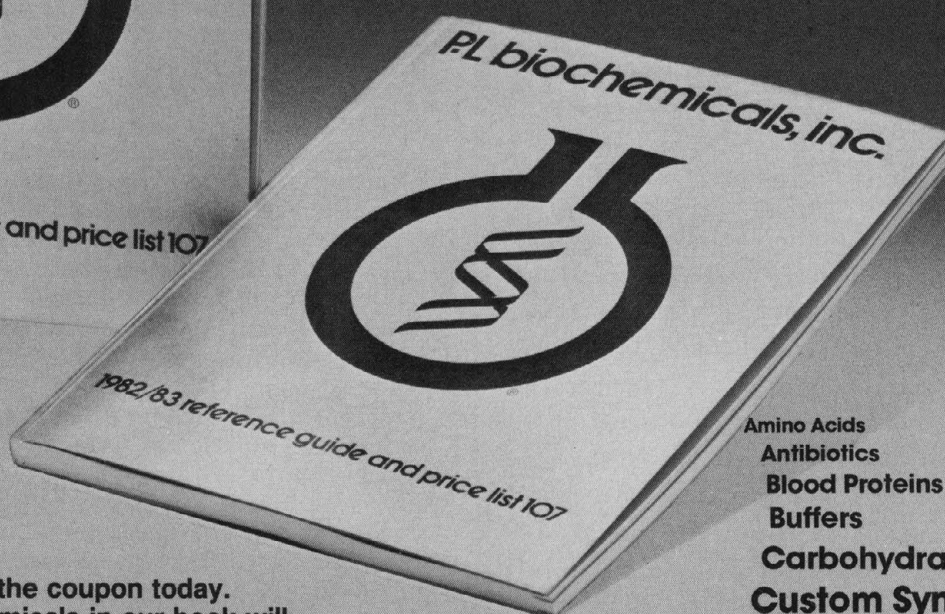
The relationships between the government and the scientific and technical communities continue to be sorely troubled as the fixation on the "hemorrhage" of technology hardens. Even as the pipeline war has unsettled the Atlantic diplomatic consensus, it appears that the crucial domestic consensus between science and national defense is being tested severely. It becomes increasingly clear that a formula must be found to set up an institutional umpire with authority to see to it that checks and balances are put in place and understood on both sides. It will not do to continue to have a variety of government agencies taking matters into their own hands without coordination, indifferent to the consequences.

There is one other, and quite vital, point that must not be lost sight of. When a proper concern for the national security is burdened by clumsy execution, something is subtracted from the fundamental respect that is owed the necessary goal of safeguarding defense secrets. Once confidence in the judgment and the management of the security process is shaken, its integrity is served badly. The defense authorities have very good reason to know that the scientific community has proved its respect for the national security through three hot wars and a long cold war. That respect must be reciprocated.—WILLIAM D. CAREY

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