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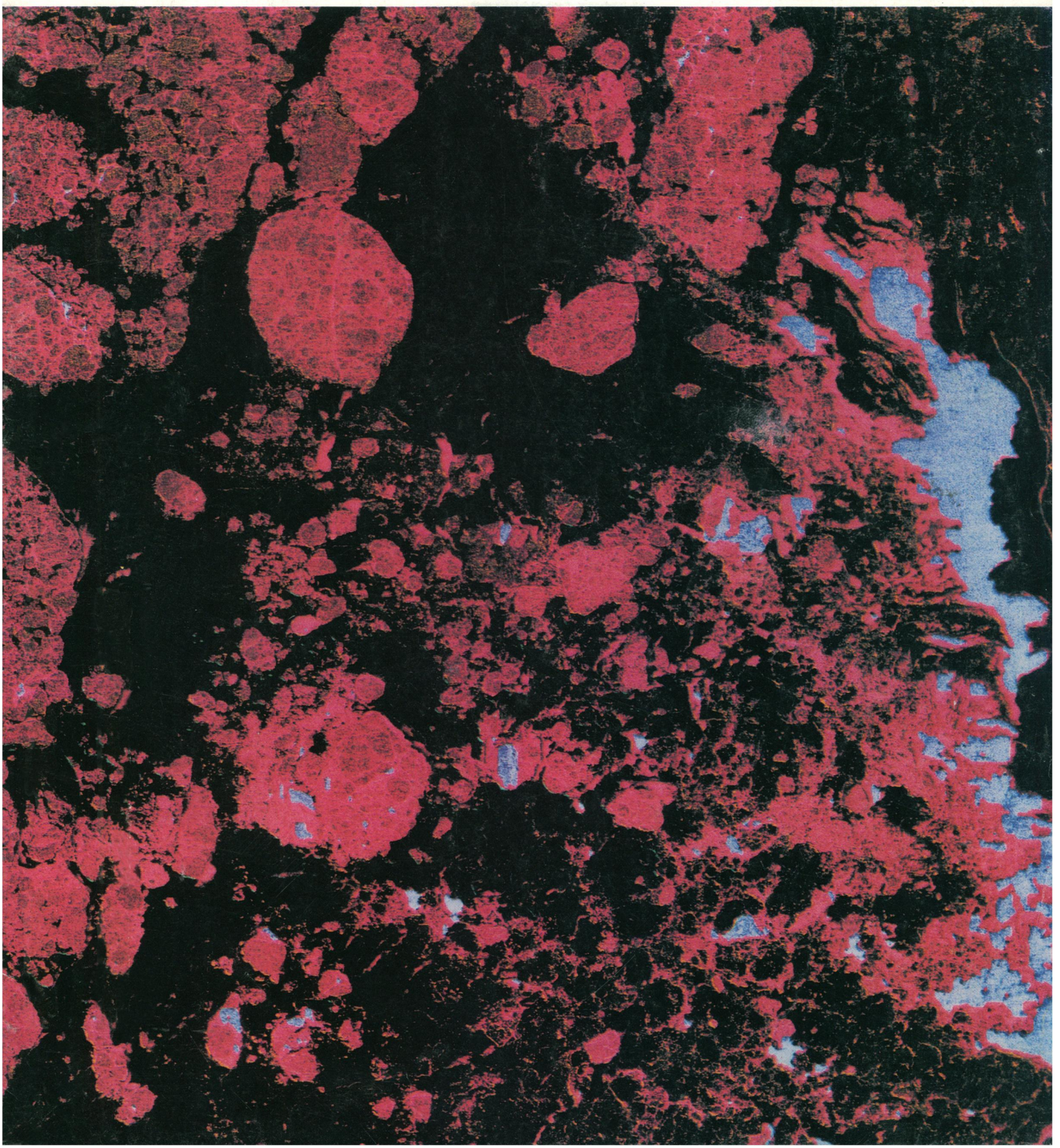

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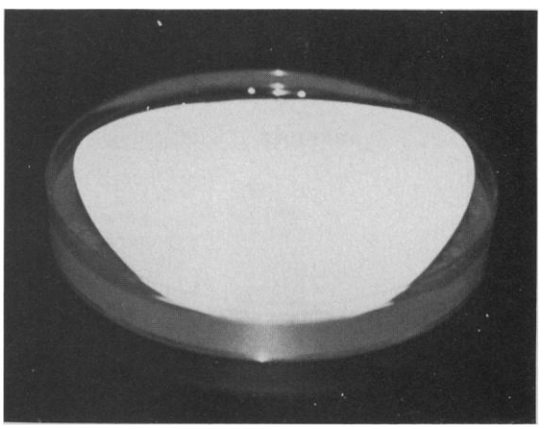

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SCIENCE

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COVER

Color-classified Seasat synthetic aperture radar image of pack ice in the Beaufort Sea west of Banks Island, Northwest Territories, Canada (4 October 1978). The image is a combination of the color-classified image and the original image and shows the following separable ice classes: red, multiyear ice; black, new or grease ice; yellow, young or pancake ice; and bluish-white, open water. See page 371. [W. F. Weeks, Snow and Ice Branch, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire 03755]

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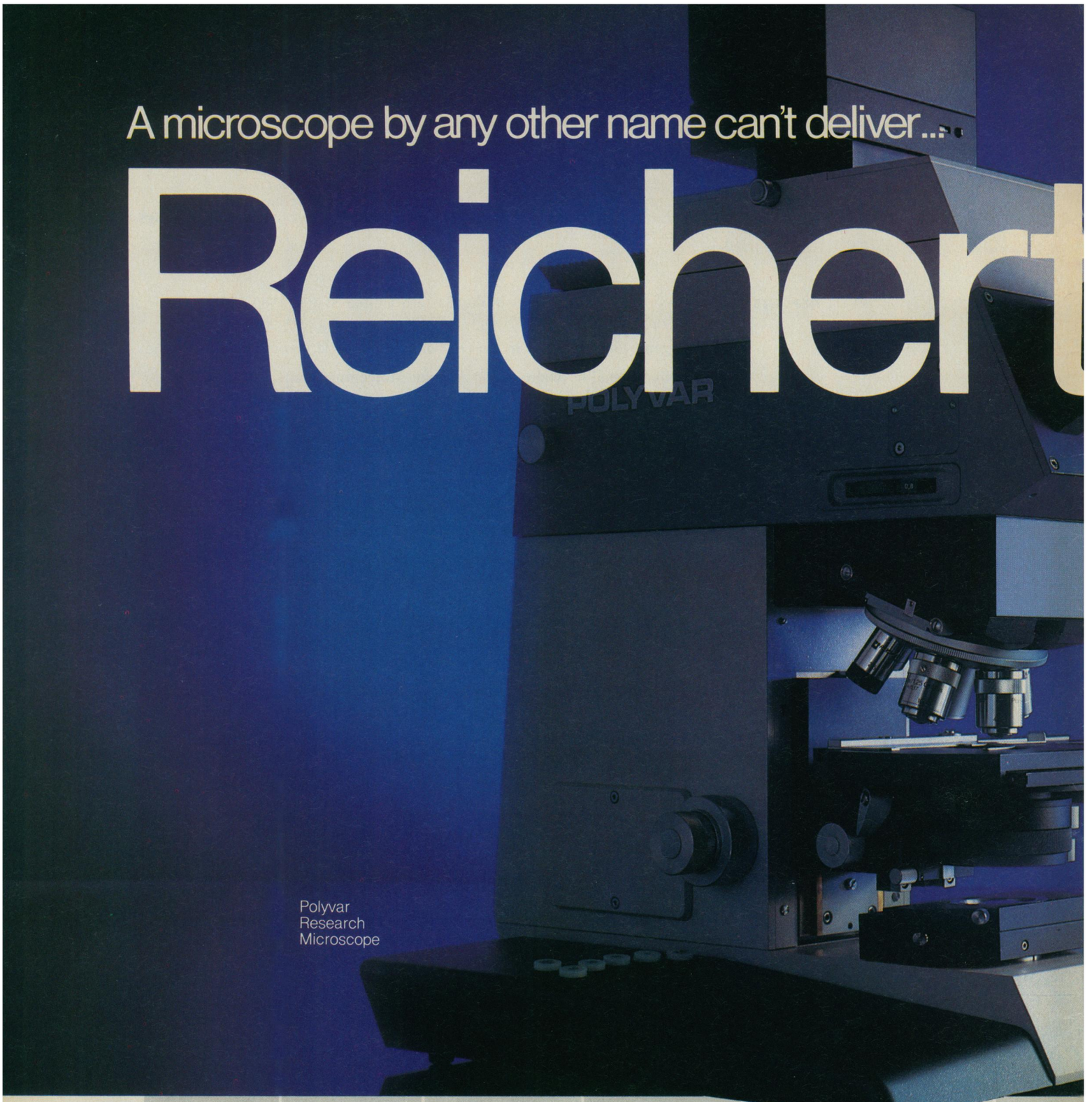

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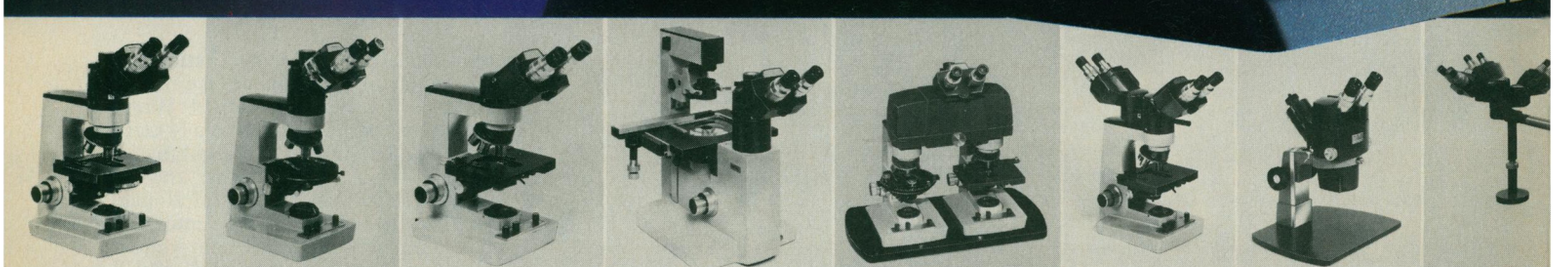

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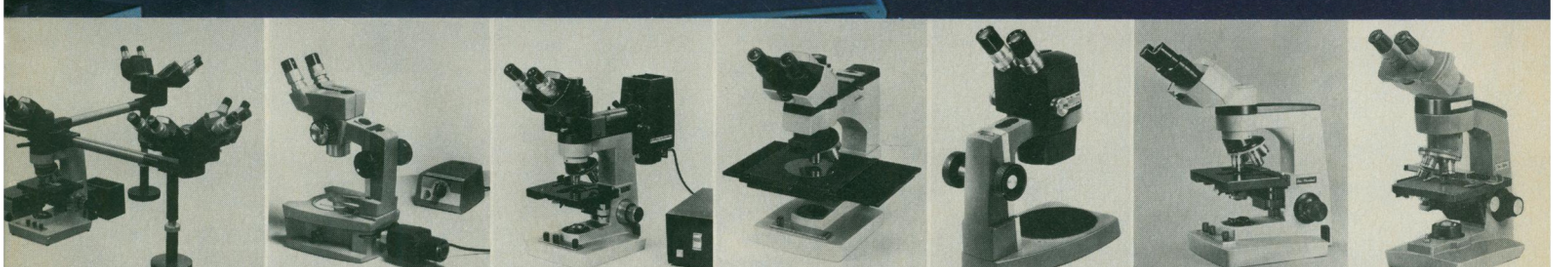

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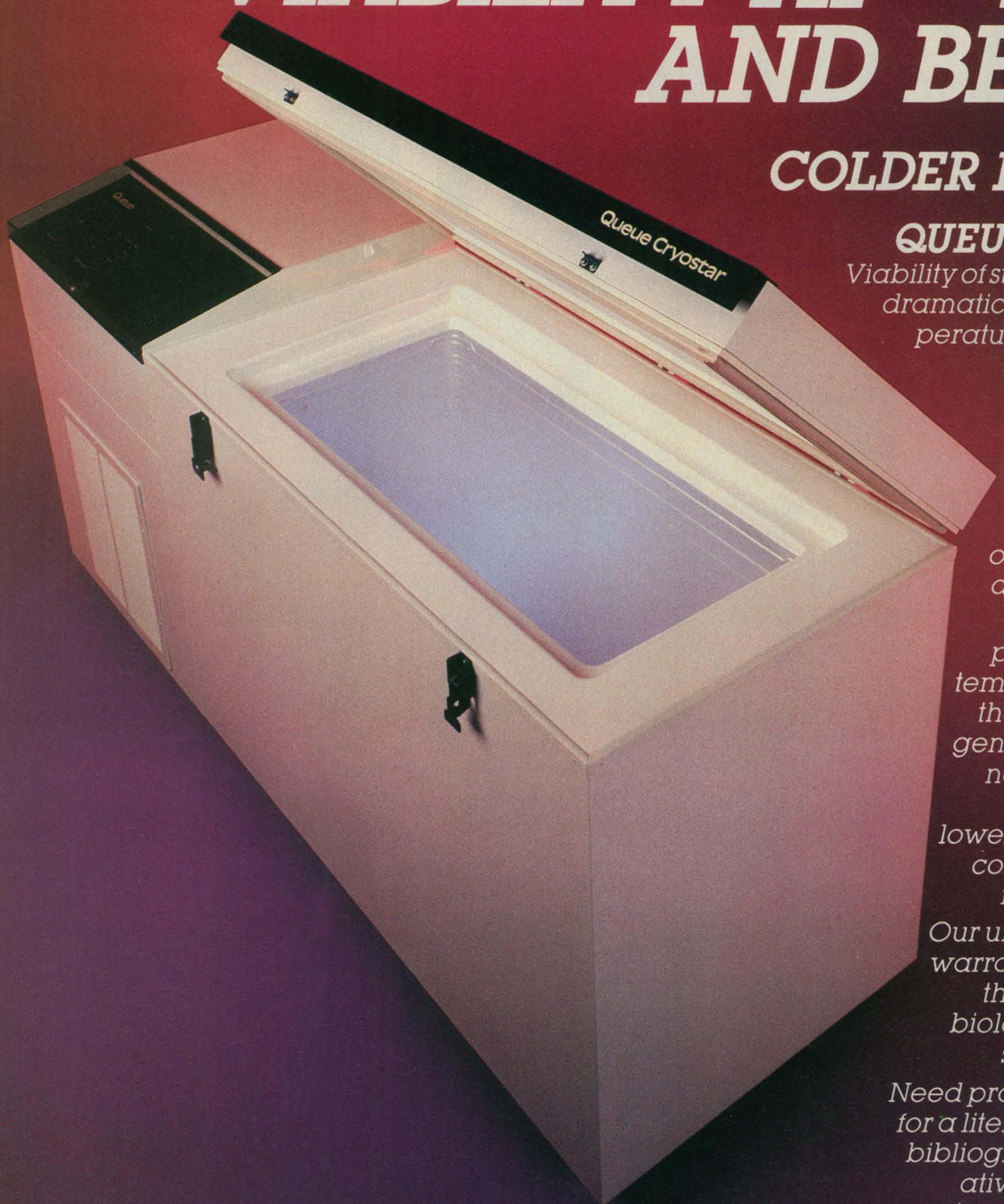

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NOAA's R&D Budget

President Reagan's budget for fiscal year 1985 proposes a reduction of about 32 percent [from $244 million to $165 million (*1*)] in research and development funding for the National Oceanic and Atmospheric Administration (NOAA). This Draconian cut occurs in the same budget that proposes a 28 percent increase in R&D funding for defense, a 14 percent increase for the National Science Foundation (NSF), and an 11 percent increase for R&D in the Environmental Protection Agency (*1*). Similar cuts have been proposed in President Reagan's budget each year since fiscal year 1981. Congressional leaders have resisted these efforts to disembowel NOAA, and the result has been a compromise, with actual funding reduced about 15 percent in constant dollars from fiscal years 1980 to 1984.

Some of the cuts proposed in the President's current budget will have direct and serious consequences for major national objectives if they are implemented. The following are examples.

1) Funds for acid precipitation research by NOAA are reduced from $2.9 million to $2.1 million (*2*), while the budget for the multiagency National Acid Precipitation Assessment Program increases from $27 million to more than $55 million (*3*). Authors of the Acid Precipitation Act, recognizing that NOAA's data resources and its comprehensive understanding of atmospheric processes are vital to the program, authorized $5 million for coordination of research by NOAA. These funds have not been appropriated, and the scheduled cut would reduce NOAA's role from 11 percent to 4 percent of the national program.

2) Funding for NOAA research on understanding climate changes is reduced by about $3.3 million. These cuts in research by the lead agency for the National Climate Program are scheduled just at the time that research is producing new knowledge and new insights at an unprecedented rate and climate has become a focus of scientific interest.

3) NOAA's solar-terrestrial research program ($3.1 million) is scheduled for termination. NOAA and the Department of Defense jointly operate the Space Environmental Service Center to provide vital information on solar eruptions and their effects on communications and the near-earth space environment. Termination of NOAA research would have far-reaching effects on the operation of the center that would adversely affect NASA, the Department of Defense, industry, and the public.

4) Research in ocean thermal energy conversion ($0.5 million) and ocean mineral research ($2 million) is to be terminated. The Sea Grant Program ($36.5 million), which links university expertise and local marine development and protection activities, is slated for termination. These steps would almost eliminate NOAA's R&D on nonliving resources.

5) Research on living marine resources is reduced by 56 percent (from $72 million to $32 million); at the same time funding for this research by NSF and the Fish and Wildlife Service is increased by 10 percent ($50 million to $55 million) (*4*).

The implications of these cuts for national policies concerning acid precipitation, climate changes, operations in space, and development and protection of marine resources have received little attention. The scientific community has had no opportunity to review these or other budget reductions or to comment on their consequences. Summaries, such as the recent review of shifts in science priorities by G. A. Keyworth, II (Articles, 6 Apr., p. 9) have overlooked these issues.

The NOAA budget presented to Congress is part of the Department of Commerce budget and is subject to the judgments and priorities of department staff. The Commerce budget is monitored in the Office of Management and Budget by staff sensitive largely to nonscientific issues; when the budget reaches Congress, authorization and appropriation bills are drawn up by committees whose primary concerns lie in areas other than scientific research. When the budget reaches the floor of Congress, the NOAA roles in interagency R&D programs are likely to be obscure, and members of Congress may easily overlook R&D programs. For these reasons NOAA, as a large science-based agency within a business-oriented department, is in an anomalous and weak position.

Budget decisions would be much more likely to reflect broad national interests if NOAA were an independent agency, as proposed by President Reagan in June 1983 (in his proposal to create a Department of International Trade and Industry), and if legislation were adopted defining more clearly NOAA's mission and its crucial role with respect to other agencies having related missions.

ROBERT G. FLEAGLE
Department of Atmospheric Sciences, University of Washington, Seattle 98195

References and Notes

1. *Research and Development Funding in the Proposed Fiscal Year 1985 Budget* (Congressional Budget Office, U.S. Congress, Washington, D.C., March 1984).
2. These and subsequent NOAA budget numbers are based on *FY 1985 NOAA Congressional Submission Budget Estimates* (Office of Oceanic and Atmospheric Research, NOAA, Rockville, Md., February 1984).
3. F. A. White, *Bull. Am. Meteorol. Soc.* **65**, 374 (1984).
4. *Comparison of FY 84–85 Funding in Atmospheric and Oceanic Research for NOAA, NSF, NASA and Selected Agencies* (Office of Oceanic and Atmospheric Research, NOAA, Rockville, Md., February 1984).

Patents and Research Freedom

Jeffrey L. Fox, in his article "Patents encroaching on research freedom" (News and Comment, 8 June, p. 1080), discusses a recent decision by the U.S. Court of Appeals for the Federal Circuit, *Roche Products Inc.* v. *Bolar Pharmaceuticals Co., Inc.* The title and tone of the article seem to us to imply that the decision somehow threatens research.

The court's decision crystallizes old law; it does not create new law. The decision ruled as infringement the unfair use of the patentee's invention by those who merely copy for their own profit. Specifically, the decision ruled that, during the 17 years of exclusivity, the use of a patented pharmaceutical compound for the purpose of testing or investigating it for drug approval constitutes patent infringement.

In the article an attorney for Bolar is quoted as saying that this opinion could "negate the experimental use exception, unless it's for pure amusement." The court's decision does not inhibit truly experimental use. Indeed, the decision reinforces its legitimacy by convincingly citing precedents.

Bolar did not even contend that its commercial use of Roche's invention would fall within the traditional experimental use exception; rather, Bolar contended that the exception should be expanded. But the court felt that "unlicensed experiments conducted with a view to the adaption of the patented invention to the experimentor's business is a violation of the rights of the patentee. . . . We cannot construe the experimental use rule so broadly as to allow a violation of the patent laws in the guise of 'scientific inquiry,' when that inquiry has definite, cognizable, and not insubstantial commercial purposes."

Thus the court correctly recognized that true "scientific inquiry" is exempted from patent infringement by the traditional "experimental use" exception. Neither the court's holding nor its language gives rise to any suggestion that true "scientific inquiry" would be restricted. But the court also recognizes that labeling commercial activities as "scientific inquiry" does not make them such. A generic drug house's use of the patented invention—not for the purpose of true scientific inquiry but for the purpose of generating data for its own business purposes—was clearly and properly held to violate the laws.

We hope these comments place the significant decision of the Court of Appeals for the Federal Circuit in the proper perspective. The enforcement of patent laws against copyists will serve as an incentive to research and to those who financially support it. Nothing in the law or in the court's recent decision will inhibit true "scientific inquiry."

KENNETH P. BERKOWITZ
Public Policy and Communications,
Hoffmann–La Roche,
Nutley, New Jersey 07110

Factoring Work

I would like to correct several statements in the article by Gina Kolata, "Factoring gets easier" (Research News, 2 Dec. 1983, p. 999).

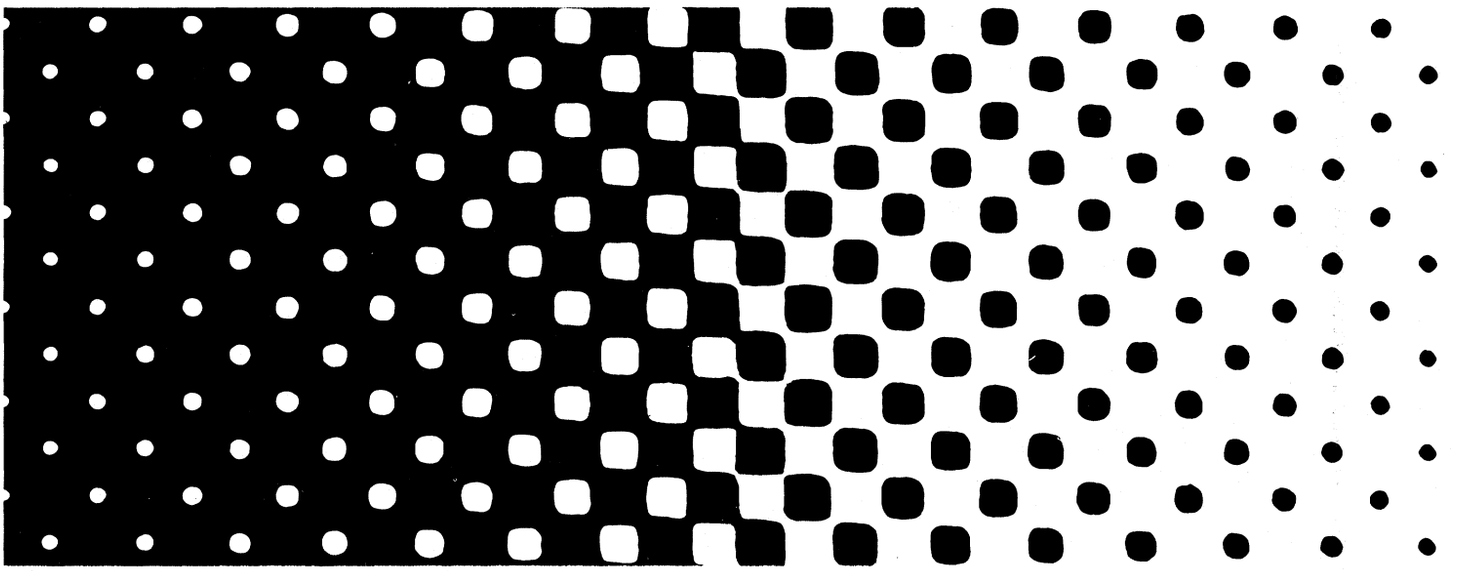
A group of us has been occupied with factoring integers for decades. This activity has been carried out independently of the American Mathematical Society (AMS), which has never sponsored our work, and of the yearly meeting of computational mathematicians in Winnipeg. The AMS has recently published our book of tables of factorizations (the Cunningham Project), which we gave to them. The manuscript was in camera-ready form. The factoring work is still ongoing; it is not work that has been "closed off" because of this publication.

Since the first computers were introduced some 35 years ago, mathematicians—certainly number theorists—have exploited computer hardware to solve their problems, using ingenious ideas of various kinds to gain speed. This is nothing new.

It was D. H. Lehmer and his father D. N. Lehmer who were involved with building sieves at the University of California and elsewhere to work on number theory problems. My associate in 1971 was Michael Morrison, not "John" Morrison.

JOHN BRILLHART
Department of Mathematics,
University of Arizona,
Tucson 85721

B M B



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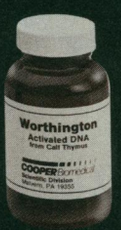

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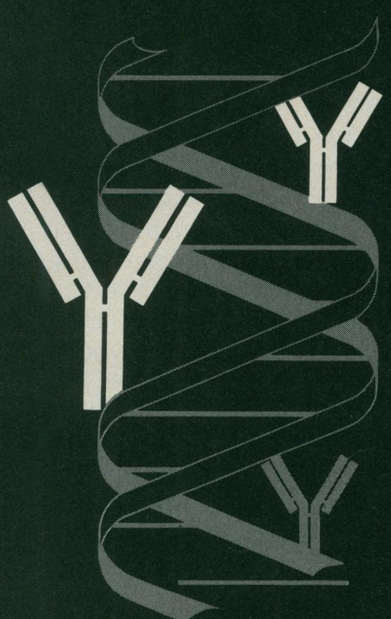

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27 July 1984, Volume 225, Number 4660 **SCIENCE**

Science Finds Its Voice

The 150th national meeting of the AAAS (24 to 29 May) set out to do what comes naturally for a large organization that exists to advance science. It showcased the scientific disciplines, crisscrossed fields of science, and converged international perspectives on the prospects for discovery and application of knowledge. It mingled the gray eminences of science with the lesser known and the often overlooked and tumbled with practiced agility through the hoops of policy controversy. The sole throwback to the years of polarization and internal divisions was provided, almost unseen, by a lunch-hour demonstration on behalf of animal welfare.

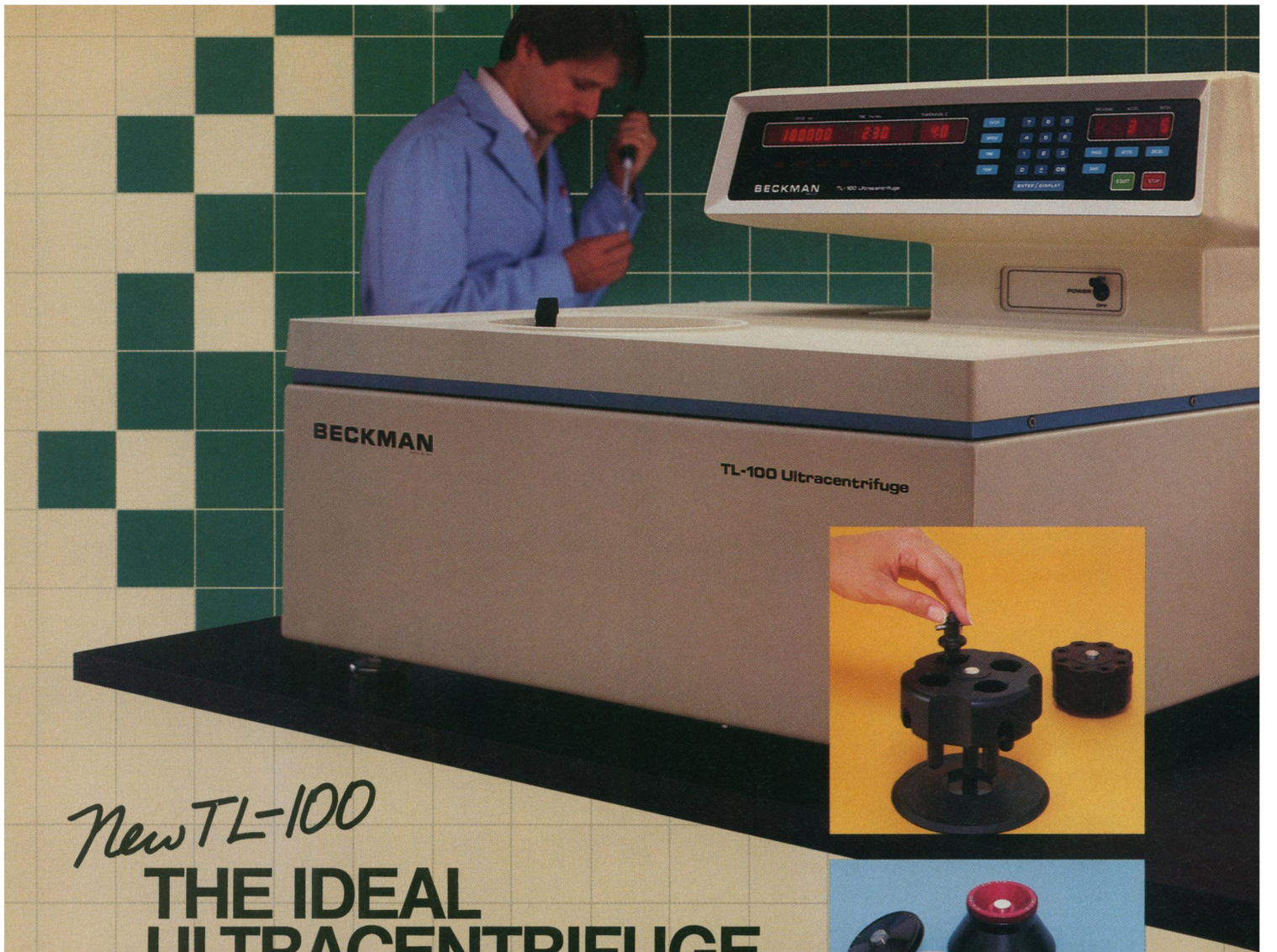
The annual meeting is the venue for convocations of the AAAS Council, which is the ultimate governing body. It is at council meetings that officers become accountable, and it is in this parliamentary setting that the AAAS speaks, as it were, *urbi et orbi*, through resolutions presented and adopted. Although such proclamations are of indeterminate effect, taken as such they serve to put the AAAS on record and to reinforce subsequent initiatives of material significance to the concerns of the members.

It is of more than passing interest that all four of the resolutions adopted at the 1984 meeting of the council bore on the theme of freedom with responsibility. The first resolution, presented by the Medical Scientists Committee of the National Institutes of Health, drew attention to the targeting of scientists for harassment or repression of their work and called on the AAAS to reaffirm its commitment to the fundamental rights of scientists. A second resolution, presented by the AAAS Committee on Scientific Freedom and Responsibility, took up the issue of openness in science and technology against an emerging background of overt and subtle pressures on institutions and firms and urged affiliated societies and academic centers to examine their policies and restate their adherence to freedom of inquiry and expression. A third resolution, sponsored by the same committee, focused on the general dangers to science and national security inherent in governmental thrusts toward restriction of communication and publication of unclassified research. A final resolution came to the defense of the scientific and human rights of Andrei Sakharov and Yelena Bonner, calling upon the Soviet government to end their present isolation and urging affiliates and individual members to register their concerns with the Soviet authorities.

Although George Orwell was never mentioned as these resolutions were brought up, discussed, and voted on, there is significance to the council's concentration on the state of scientific freedom and human rights in 1984 to the exclusion of other matters that absorbed crowded sessions in New York, notably those on the risks of nuclear arms. The potential violence from nuclear warfare, tangible and quantifiable, which has been the subject of repeated resolutions at prior council meetings, gave place to concern for actual and demonstrable violence to individuals and for outspoken resistance to imposed limits on open communication of unclassified research. The four resolutions show a remarkable unity of substance and thrust, and they say a great deal about the contradictions of the times: exuberance in the pursuit of discovery and knowledge, science and scientists as trustees of the human instinct for inquiry and truth, the dilemmas in the relation of political power to the ungovernable dynamics of free scholarship, and the enforceability of guarantees of individual freedoms under laws and conventions.

In a greening public park near the White House there has long been a sculpture bearing the legend, "And freedom shrieked as Kosciuszko fell." Lest its meaning decay, it is well that science find its voice.

—WILLIAM D. CAREY



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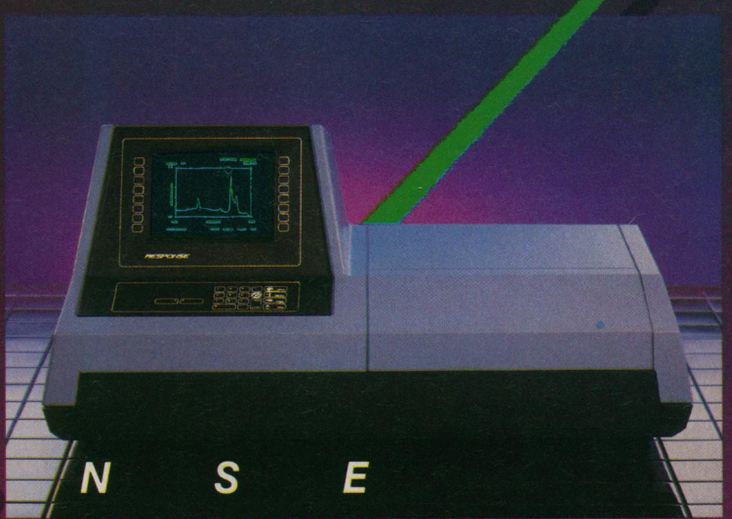

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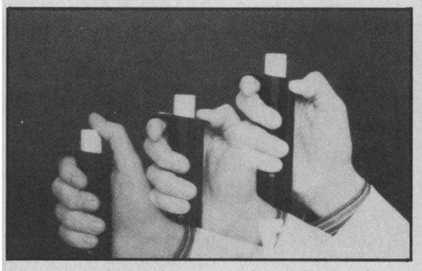

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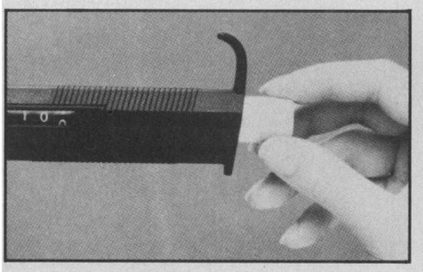

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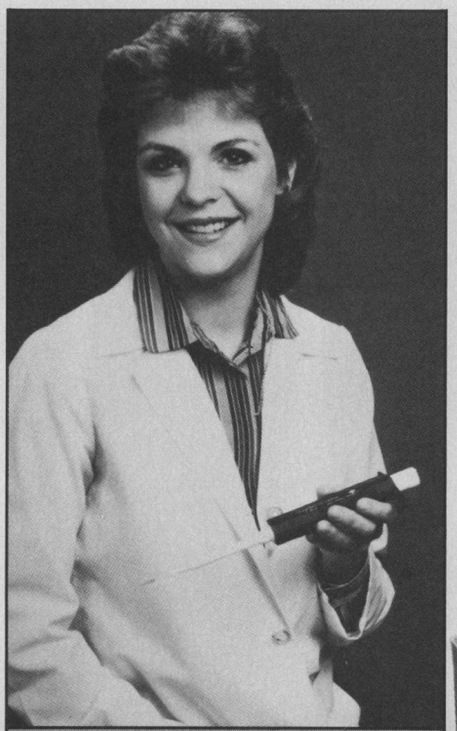
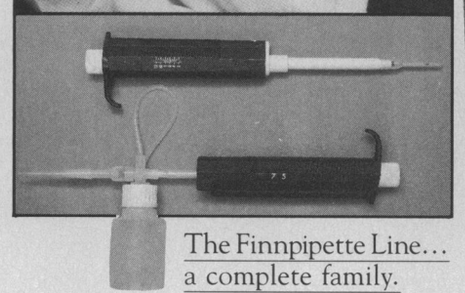
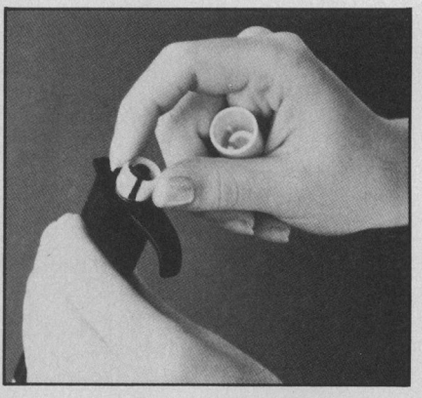
Computerized verification of accuracy with every digital Finnpipette. Enclosed in every package is a computer printout from the factory showing precise accuracy and reproducibility of the actual pipette you purchase.

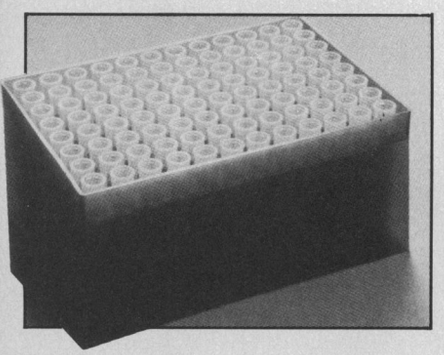




The Finnpipette Line... a complete family. Choose from a complete line of pipettes. . . positive displacement for superb accuracy. . . fully-adjustable digitals as well as fixed volume models. And. . . a versatile fully-adjustable bottle dispenser. Plus. . . accessories, tips and parts kits for do-it-yourself repair should you choose not to take advantage of our full service capabilities.



Do-it-yourself recalibration. Quickly and easily. You can make repairs just as fast. Included in each package is a maintenance kit with easy-to-follow diagrams.



Valuable trade-in offer. Order a Finnpipette and we'll take your old pipette in trade. In exchange, we'll give you a case of 10 boxes of our Finntips®-in-Trays. A $48 value. Each box contains 96 tips vertically packed in trays. Both tips and trays are autoclavable.

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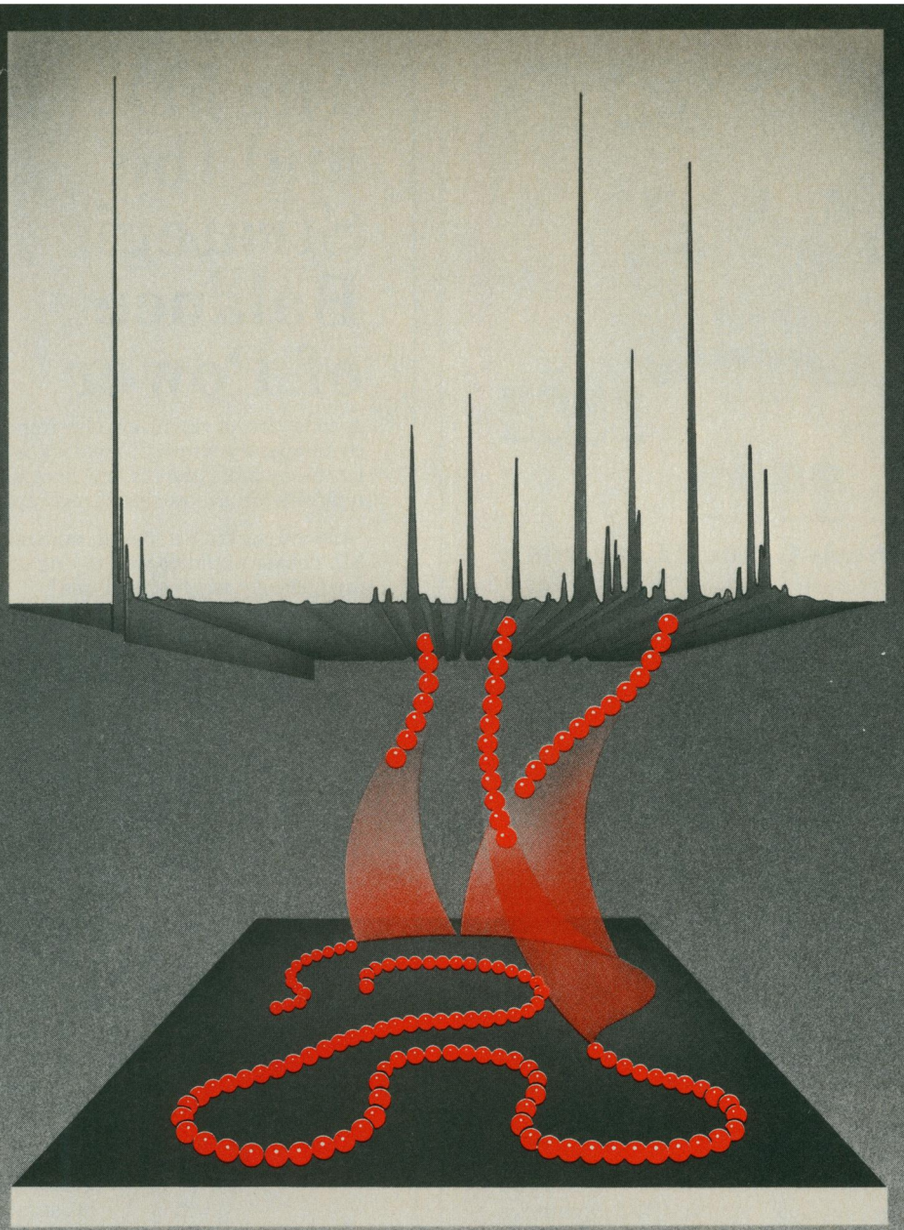

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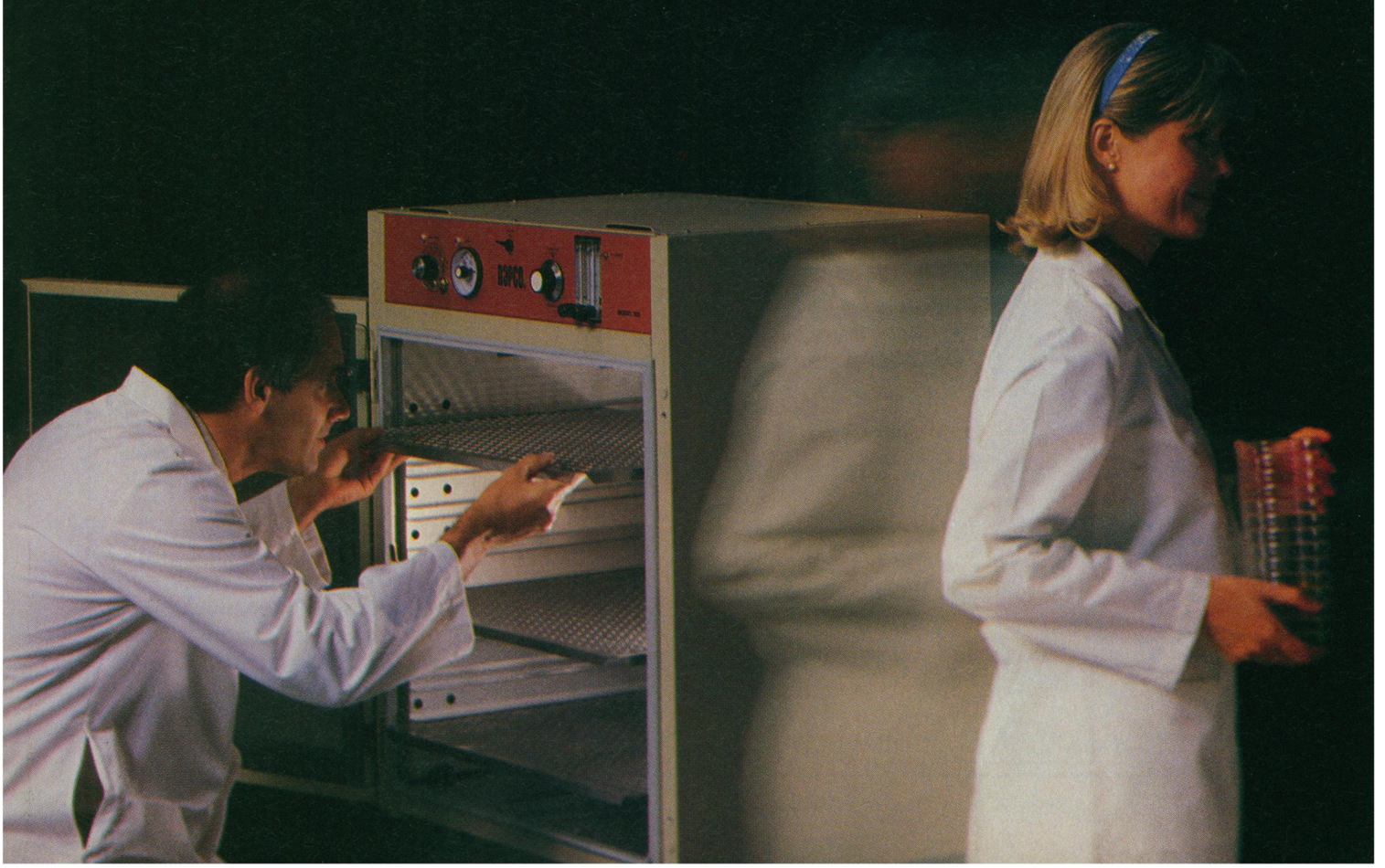

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