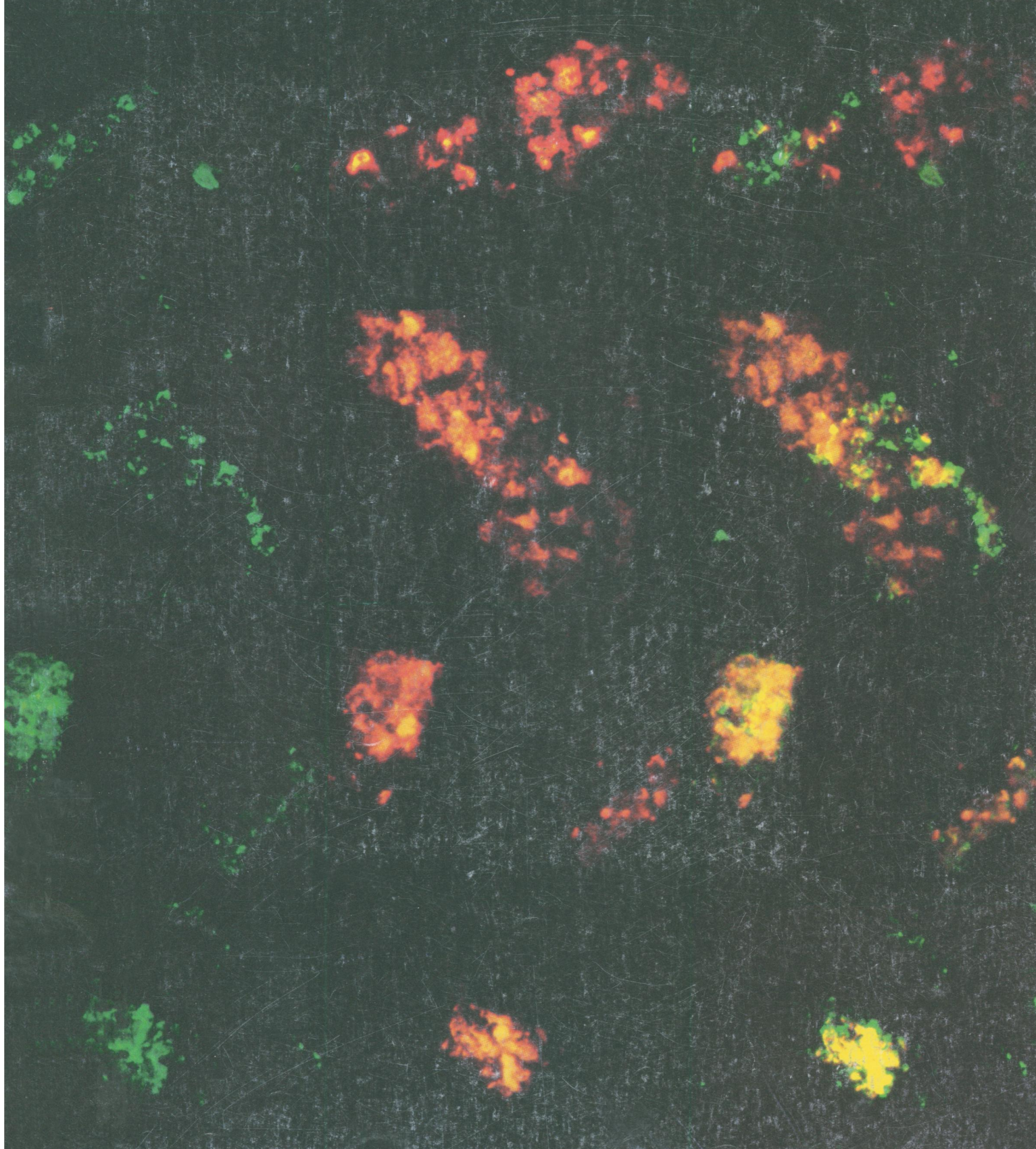


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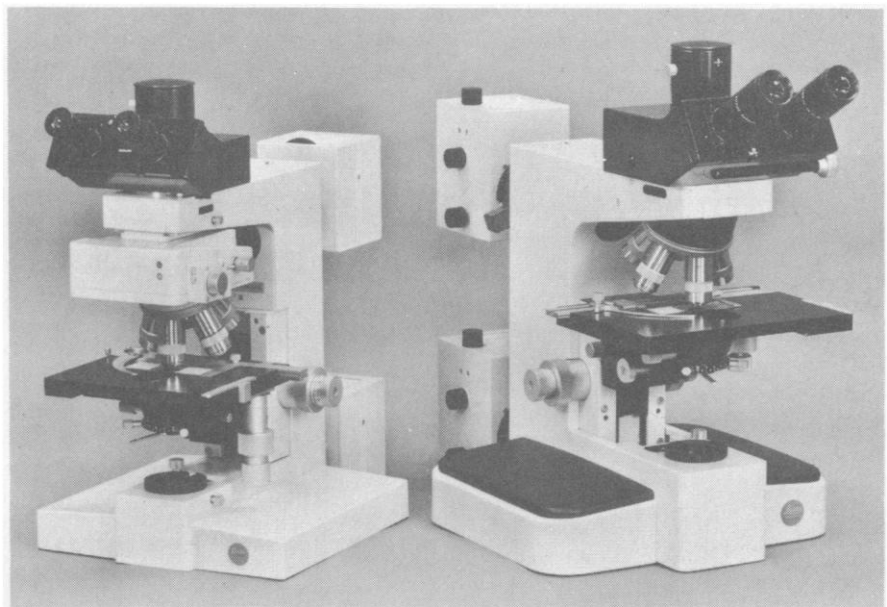
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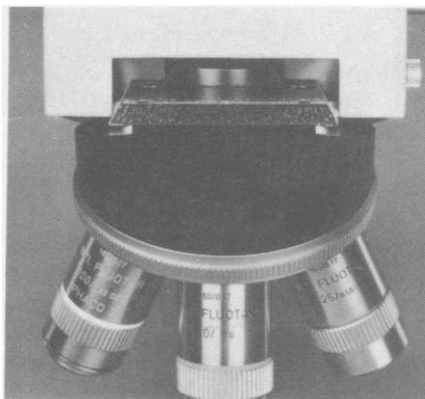


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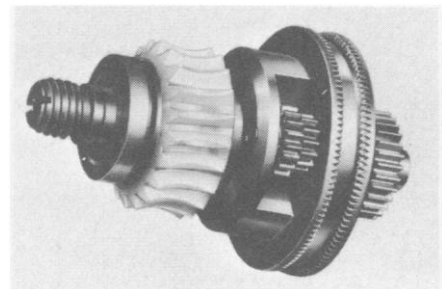
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LETTERS	Human Rights: Visiting the Soviet Union; <i>D. P. Cruikshank</i> ; <i>C. DeLisi</i> ; Cuban Health Care: <i>T. E. Morgan</i> ; Animal Rights in the Laboratory: <i>F. M. Loew</i> . . .	482
EDITORIAL	The Federal Government and Innovation	487
ARTICLES	Surface Science: <i>G. A. Somorjai</i>	489
	Biological Activity of Some Oxygenated Sterols: <i>A. A. Kandutsch</i> , <i>H. W. Chen</i> , <i>H.-J. Heiniger</i>	498
	Human Issues in Human Rights: <i>R. W. Kates</i>	502
NEWS AND COMMENT	Andrus in Alaska: A Tour of the Wild Estate	506
	<i>Briefing</i> : The Canceled Computer: Were Carter's Facts Right? In Vitro Infant Raises Tempest in Test Tube; Tank Can Run, Shoot, and Vanish in a Puff of Smoke	510
	China's "Four Modernizations" Lead to Closer Sino-U.S. Science Ties	512
	Encounters with the Third World Seen in Allocating Frequencies	513
RESEARCH NEWS	Tumor Promoters: Carcinogenesis Gets More Complicated	515
	New Moons: Encounters of the Serendipitous Kind	516
BOOK REVIEWS	Edward Jenner's Cowpox Vaccine and The Conquest of Smallpox, reviewed by <i>G. L. Geison</i> ; Microbial Interactions, <i>M. Dworkin</i> ; The Chemistry	

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of Gold, *C. F. Shaw III*; Earthquakes, *B. F. Howell, Jr.*; Books
Received and Book Order Service 519

REPORTS	Interstellar Cloud Material: Contribution to Planetary Atmospheres: <i>D. M. Butler, M. J. Newman, R. J. Talbot, Jr.</i>	522
	DNA Structure: Evidence from Electron Microscopy: <i>J. D. Griffith</i>	525
	Histidine Transfer RNA Levels in Friend Leukemia Cells: Stimulation by Histidine Deprivation: <i>M. Litt and K. Weiser</i>	527
	Virus-Induced Diabetes Mellitus: Reovirus Infection of Pancreatic β Cells in Mice: <i>T. Onodera et al.</i>	529
	Toxicity of a Furanocoumarin to Armyworms: A Case of Biosynthetic Escape from Insect Herbivores: <i>M. Berenbaum</i>	532
	Choice Behavior in Rhesus Monkeys: Cocaine Versus Food: <i>T. G. Aigner and R. L. Balster</i>	534
	Electrical Stimulation of the Amygdala as a Conditioned Stimulus in a Bait-Shyness Paradigm: <i>A. G. Phillips and F. G. LePiane</i>	536
	Vasectomy Increases the Severity of Diet-Induced Atherosclerosis in <i>Macaca fascicularis</i> : <i>N. J. Alexander and T. B. Clarkson</i>	538
	Proctodeal Feeding by Termitophilous Staphylinidae Associated with <i>Reticulitermes virginicus</i> (Banks): <i>R. W. Howard</i>	541
	Disulfiram Enhances Pharmacological Activity of Barbitol and Impairs Its Urinary Elimination: <i>M. Sharkawi and D. Cianflone</i>	543
	Iconic Storage: The Role of Rods: <i>E. H. Adelson</i>	544

PRODUCTS AND MATERIALS	Pump Driven by Magnetic Stirrer; Infrared Microscope; Acid Bath Heaters; Desk-Top Computer; Microcomputer-Based Liquid Chromatographs; Microelectrode Instrumentation; Literature	548
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COVER

Sections of pancreas from five mice (arranged vertically) stained with fluorescein-labeled antibody to reovirus and rhodamine-labeled antibody to insulin. When viewed with fluorescein filters, cells containing viral antigens appeared green (left column). When the same sections were viewed with rhodamine filters, insulin-containing β cells in the islets of Langerhans appeared orange (middle column). Double-exposure photography (right column) shows viral antigens in β cells. Transition from top to bottom reveals a progressive increase in the number of β cells infected with reovirus. See page 529. [T. Onodera *et al.*, National Institute of Dental Research, Bethesda, Maryland]

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of these groups and individuals that the Animal Welfare Act (1967 and amendments) needs strengthening, today's mounting objections deal more with the assumed right of *Homo sapiens* to inflict any pain or discomfort (however "necessary") upon other species than with simply providing them with acceptable caging, food, and veterinary care. In short, credence is being lent in many literate and informed circles to the assertion that exploitive "speciesism" (analogous to racism and sexism) on the part of man is a violation of animal rights (1). The equivocal nature of safety tests in animals of chemicals like saccharin and pesticides have led many to conclude that testing, as opposed to innovative research, is biologically wasteful and cruel and should be eliminated or severely curtailed. Existing techniques that do not involve animals, such as those in which bacterial mutations are detected or tissue culture or computer simulation methods are used, are said to be ignored by traditional scientists. It is reported that the National Institutes of Health are drafting new regulations (2) requiring grant and contract applicants to justify their use of animals.

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F. M. LOEW

*Division of Comparative Medicine,
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1. P. Singer, *Animal Liberation* (Avon, New York, 1977).
2. "Grant applications and contract proposals shall indicate whether animals are involved in the proposed activity and should state the rationale for using animals. . . . The research should be such as to yield fruitful results for the good of society, not feasible by other methods or means of study, and not random or unnecessary in nature." From "Responsibility for care and use of animals" (Manual issuance 4206, National Institutes of Health, Bethesda, Md., 1977).
3. *Fed. Am. Sci. Public Interest Rep.* 30, 1 (No. 8) (October 1977).

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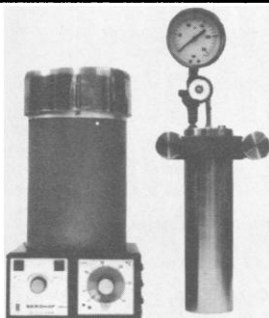
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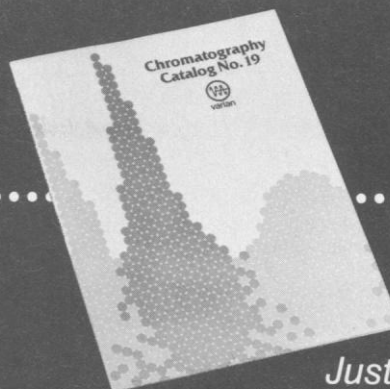


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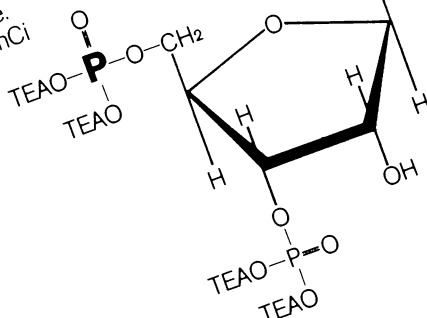


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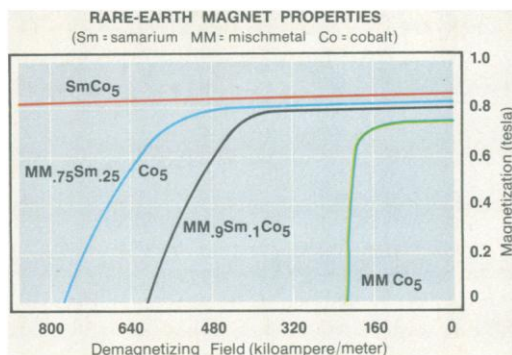
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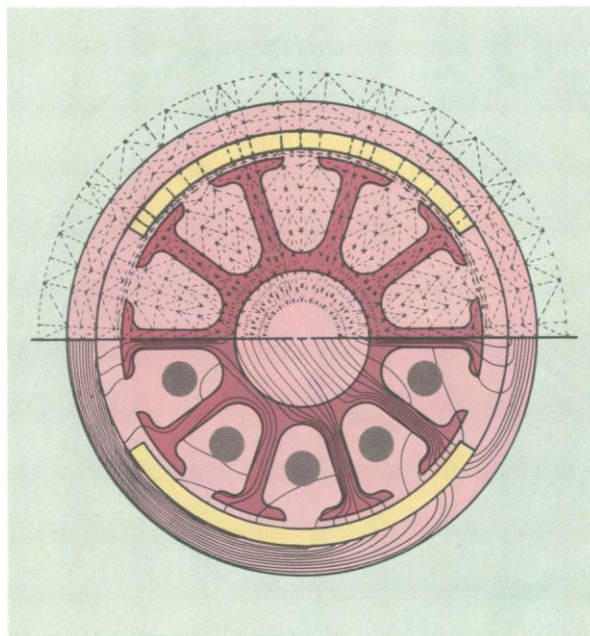


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The Federal Government and Innovation

In the recent third annual AAAS R & D Policy Colloquium, "R & D in the Federal Budget," about half the agenda was devoted to university-government relationships, the other half to industrial research and development. Attention to the business sector is timely; the United States has lost its ability to compete in many products involving technology. This contributes to a sinking dollar, inflation, and unemployment.

Speakers at the symposium, including President Carter's Science Adviser, Frank Press, emphasized that a major factor has been a lack of innovations. In the past, new high-technology products were an important source of prestige and of a favorable balance of payments. Innovations also fostered gains in employment and productivity.

For nearly two decades after World War II, the United States was a leader in fostering research and development. Expenditures for R & D rose to 3 percent of the gross national product (GNP). At the same time, Western Europe and Japan were only gradually recovering from the war. But while trading rivals continued a vigorous effort to catch up, the United States ceased to expand its support of R & D. In constant dollars, the level of effort has been static for more than a decade and now represents only 2.2 percent of the GNP. While governments in other countries such as Japan worked closely with industry to foster innovations and exports, the United States adopted a hostile attitude toward business, subjecting it to thousands of costly regulations. For example, in the making of steel, companies must comply with more than 5000 regulations issued by 27 different federal agencies.*

A similar level of federal intervention prevails in other industries, and it represents only part of the problem: states and municipalities have added further burdens. The cost of federal regulations, which is passed on to consumers, has been estimated as high as \$100 billion a year and it is increasing. The higher cost fosters inflation at home and inability to compete abroad.

One of the effects of creating this vast structure of federal regulations has been an enormous concentration of power in Washington. In contrast, vice-presidents for R & D of major companies tend to be subdued and anxious. One of them told me he devoted 90 percent of his efforts to matters dictated by regulations or anticipated regulations. The time required to proceed from research to the introduction of an innovative product is 10 years or more. In the meantime, who knows what regulations may be imposed?

Other factors discouraging innovation include high interest rates and tax policies. In Japan, companies can write off capital expenditures in 3 to 5 years. Here, 10 years or more is common.

The result of the current climate is that many major companies are concentrating their R & D on improvements in existing processes and products. At the same time, the creation of small high-technology companies has virtually ceased.

Frank Press, who is fully aware of the trends in innovation, has brought the matter to the President's attention. In consequence, a major domestic policy review has been launched. The Cabinet-level study will be undertaken by a committee drawn from 15 federal departments, agencies, and offices. The committee will be chaired by Secretary of Commerce Juanita Kreps, with day-to-day coordination by Jordan Baruch. During the study industry, labor, and public interest groups will have an opportunity to make inputs.

The initiative of Press and the good intentions of President Carter are to be applauded. But the committee is loaded with representatives of the regulators. They will be merely acting as humans if they seek to escape blame. Even so, the policy review will surely have constructive consequences as the committee looks at the government's role in inhibiting innovation.

—PHILIP H. ABELSON

*Council on Wage and Price Stability, *Catalog of Federal Regulations Affecting the Iron and Steel Industry* (Government Printing Office, Washington, D.C., 1976).

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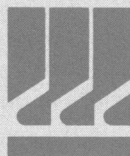
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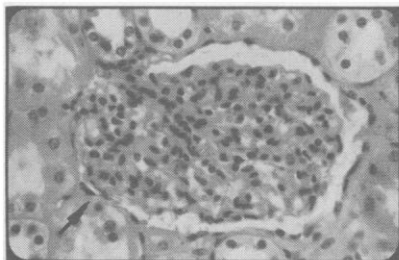
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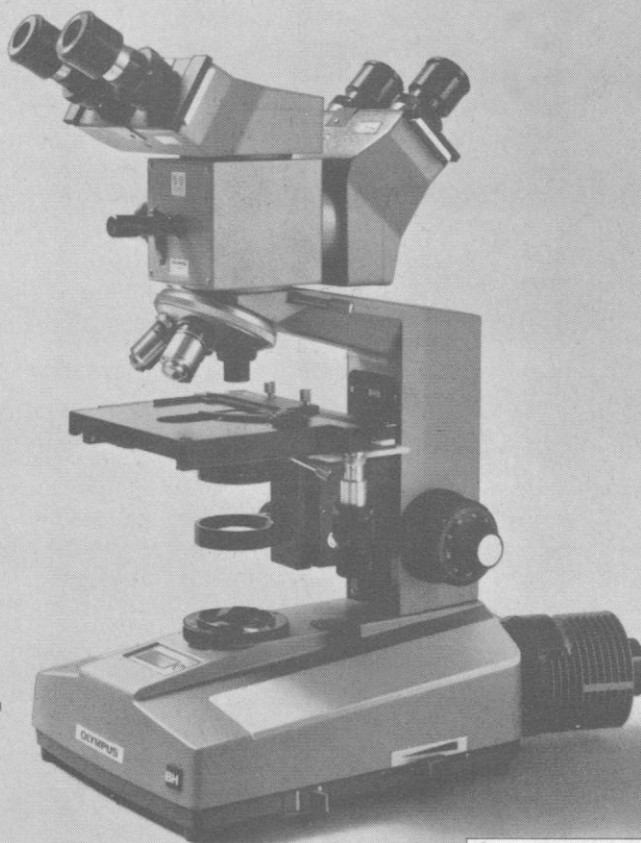
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Acid Bath Heaters

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—RICHARD G. SOMMER

vessel is surrounded by a foil heating element for rapid heat-up. The element is insulated with alumina silicate to concentrate the heat on the liquid. These baths heat at 7°C per minute and a thermistor sensor mounted on the side wall maintains the desired temperature. Corning Glass Works. Circle 702.

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The EAI 1000 is an analog/hybrid computer that features a microprocessor control system directed by its keyboard, removable patch panels, universal trunking, individual analog component monitoring, and modular construction. There are three basic configurations ranging from a four-integrator, six-summer, two-multiplier system to a 12-integrator, 18-summer, six-multiplier system. Two to six special functions such as sine-cosine and vector generators are available. The basic digital logic may be enhanced by an expansion module that also provides a hybrid interface capability for access to more powerful apparatus. Peripherals include an arbitrary function generator, four-channel display oscilloscope, and x-y plotter. Electronic Associates. Circle 700.

Microcomputer-Based Liquid Chromatographs

The 5000 series incorporates a cathode-ray tube and keyboard to display programs and analyses in progress. Operating conditions are available for display and up to nine programs may be



stored for recall. The program parameters may be entered in any sequence and the device will arrange them. The 5000 series pumping system provides stable, repeatable flow patterns. The pulsation inherent in reciprocating pumps has been reduced by microprocessor control and pulse damping. Varian Instrument Division. Circle 698.

Microelectrode Instrumentation

A variety of apparatus is available for the measurement of electric potential or current and impedance in physiologic settings. This includes reversible electrodes, commonly silver-silver chloride half cells, and a salt bridge or electrolyte. The electrodes are constructed with the aid of a pipette puller to fashion glass tips used for various types of probes. An electrometer is used to measure and record the differences in potential detected by the electrodes in position. This is usually a high-impedance dual/differential electrometer. Many applications are discussed in *An Introduction to Microelectrode Techniques and Instrumentation*. W-P Instruments. Circle 697.

Literature

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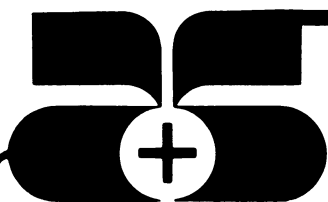
Laboratory Supplies are listed in an encyclopedic catalog that is alphabetically arranged. Dynalab. Circle 704.

Anaerobe Media are featured among more than 400 culture media in a catalog. Carr-Scarborough Microbiologicals. Circle 705.

A Guide to Quality Control Practices for Potable and Wastewater Analysis has sections on sample collection and handling, analysis, verification, and test procedures for measuring the performance of common laboratory instruments. Environmental Resource Associates. Circle 706.

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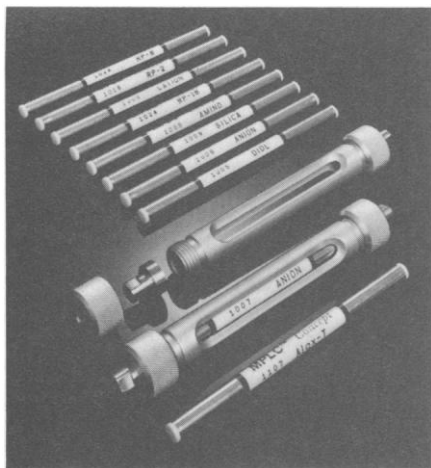
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