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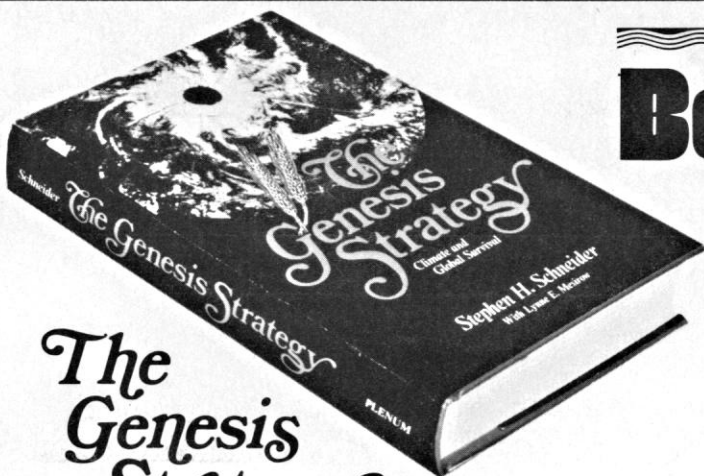
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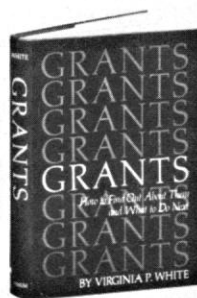
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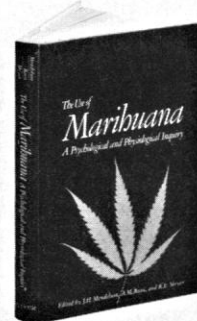
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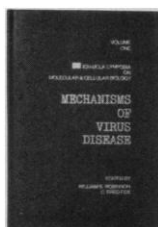


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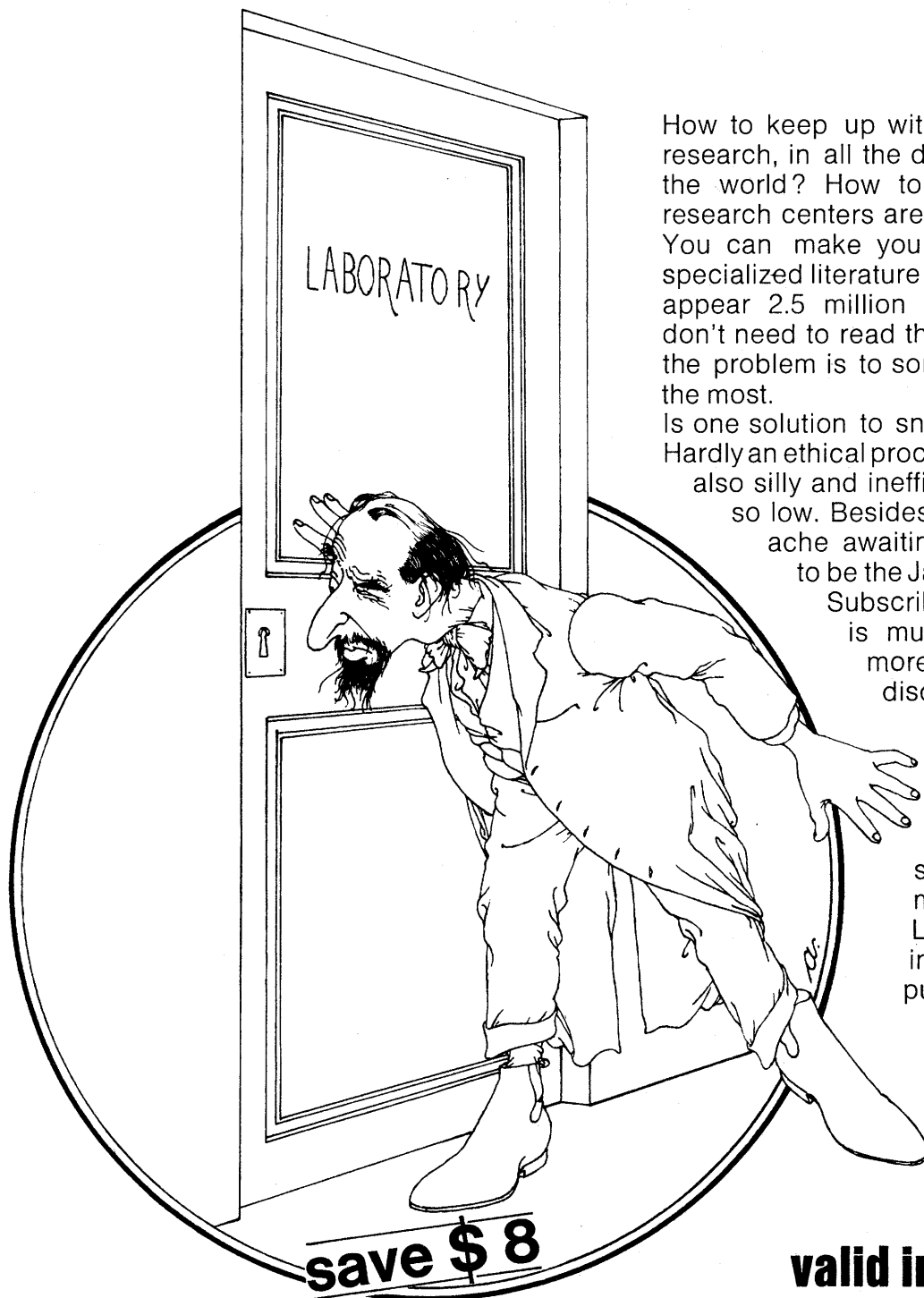
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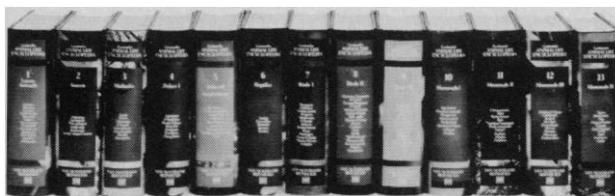
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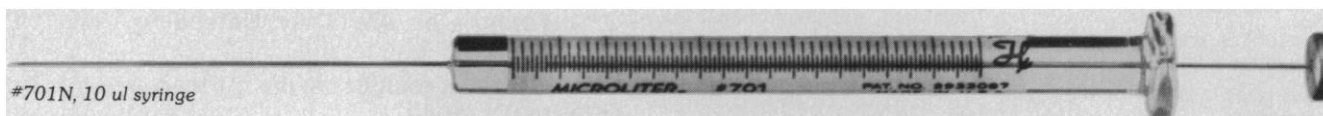
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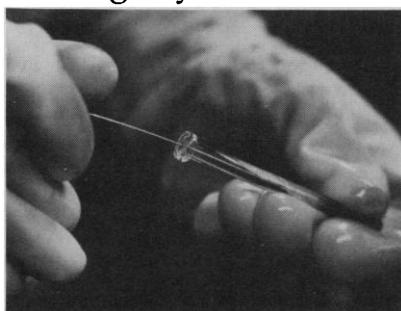
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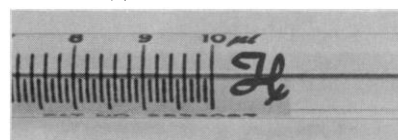
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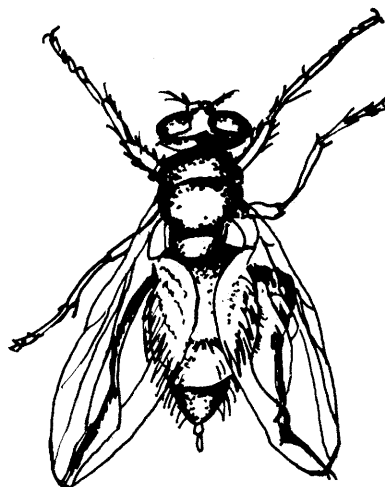
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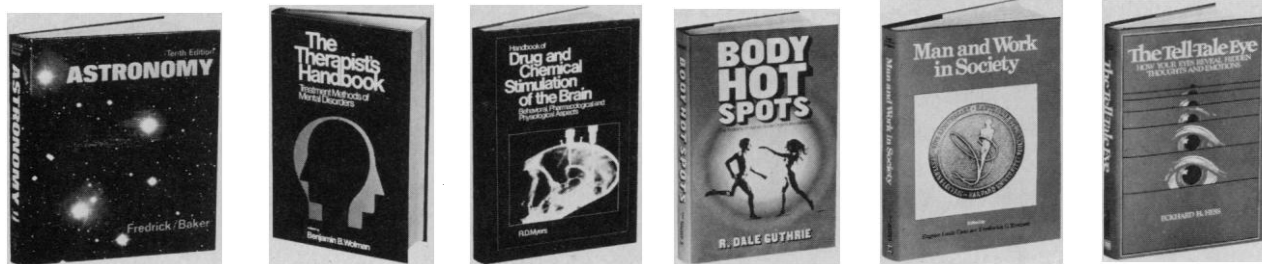
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Age at Issue	MALE FEMALE	25 30	30 35	35 40	40 45	45 50
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Cash Dividend End of First Year*		97	113	142	188	265
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*Subsequent yearly dividends will be in the same amount, according to TIAA's current dividend scale which is not guaranteed.

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Annual Premium		\$258	\$288	\$373	\$530	\$774
Cash Dividend End of First Year*		101	108	140	185	254
First Year Net Payment		\$157	\$180	\$233	\$345	\$520

*Dividends at end of years two through five will be in the same amount, according to TIAA's current dividend scale which is not guaranteed.

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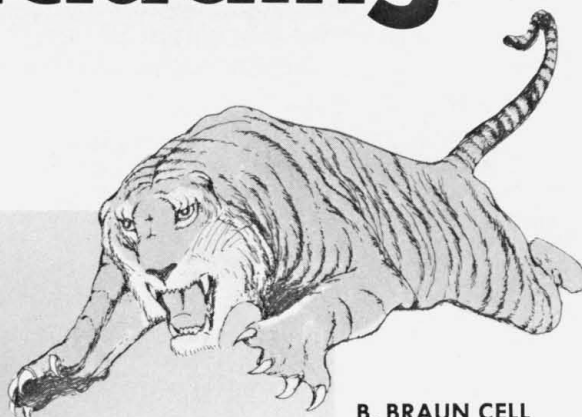
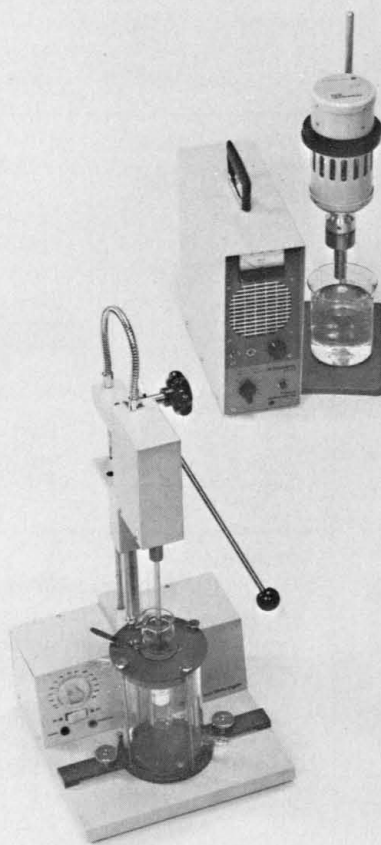
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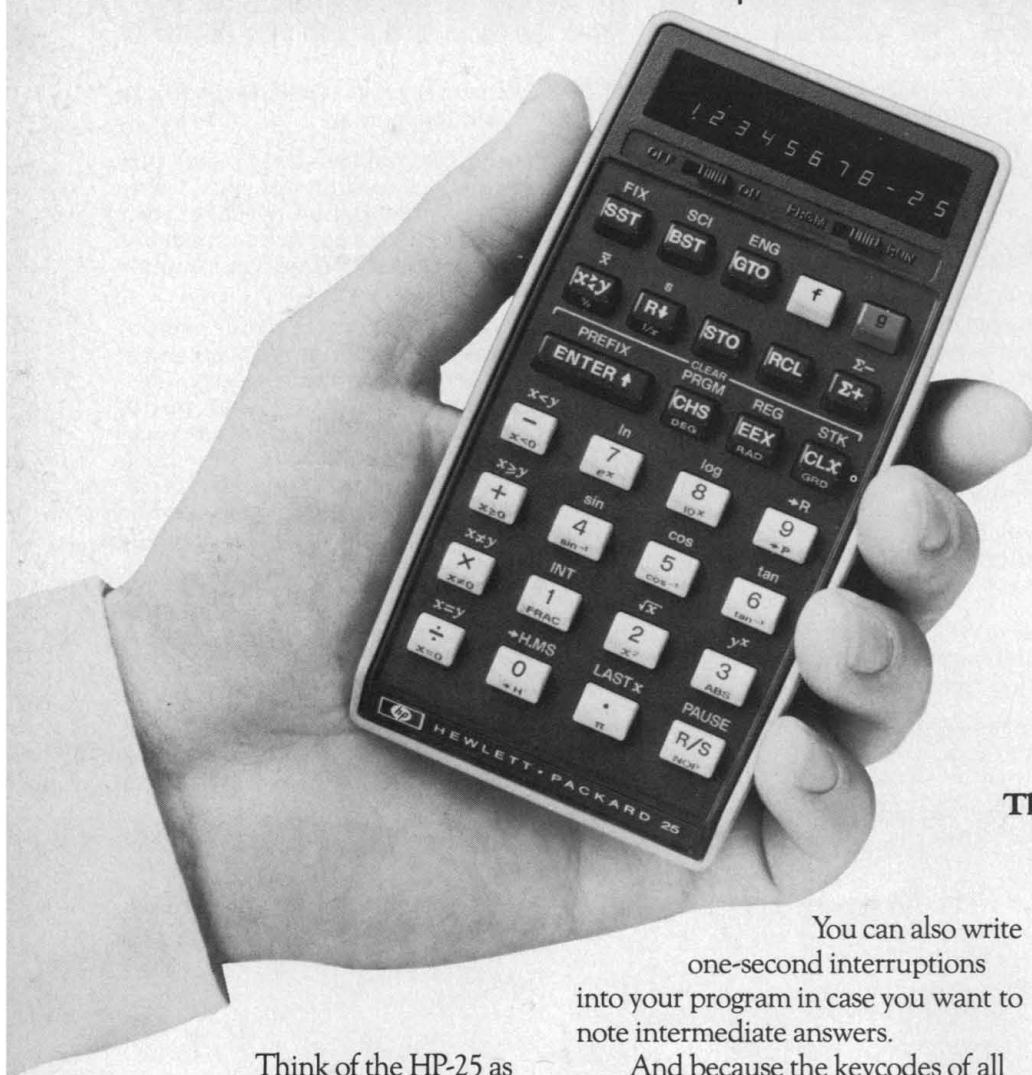
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1.5	13	37.5	35.6	36.6
2.5	20	35.0	34.1	32.9
3.5	26	31.0	31.3	32.3
5.0	33	29.8	19.9	28.2
7.5	43	24.1	10.7	22.4
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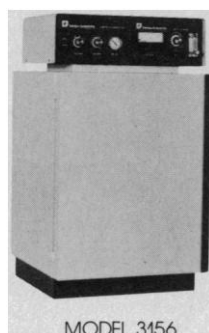


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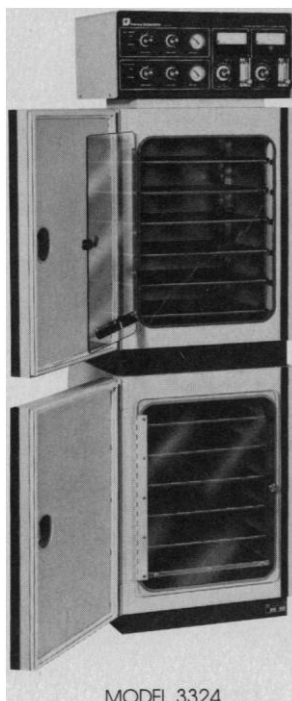
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LETTERS

SIPI Expansion

John Walsh's fine article (News and Comment, 9 Apr., p. 122) accurately describes the program and activities of the Scientists' Institute for Public Information (SIPI). I would make only one amendment. It is possible to infer from the article that the movement to consider economic issues as part of our charge was taken *in spite* of Barry Commoner's wishes; as any reader of Commoner's writings knows, he has been the nation's leader in identifying the economic consequences of first our environmental policies, and now our energy policies. To infer that this leadership has not been felt in the activities and program of SIPI, for which Commoner serves as chairman of the board of directors, would be a mistake. His leadership has been felt in all areas of work, and particularly in the area of energy (Commoner is also co-chairman of SIPI's Task Force on Energy Options).

ALAN MCGOWAN

*Scientists' Institute for Public Information,
49 East 53 Street, New York 10022*

I regret that in John Walsh's account of the development of SIPI (Scientists' Institute for Public Information) he was unable—doubtless due to the constraints of space—to discuss the important role which the AAAS Committee on Science in the Promotion of Human Welfare, of which Barry Commoner was the first chairman, played in launching the science information movement and the formation of SIPI. The additional strength that the AAAS gave to the young movement in a series of cooperative ventures was a crucial element in its growth, and Barry Commoner was the link between an awakening social conscience within the Association and a series of specific tasks undertaken by local groups, coordinated by the activities of SIPI.

MARGARET MEAD

*American Museum of Natural History,
Central Park West at 79th Street,
New York 10024*

Hayflick's Achievements

The article "Hayflick's tragedy: The rise and fall of a human cell line" by Nicholas Wade (News and Comment, 9 Apr., p. 125) focuses on accusations concerning Leonard Hayflick's handling of ampules of WI-38 cells and suggests that the charges made as a result of a Nation-

al Institutes of Health investigation, unless refuted, "... could have severe repercussions on [Hayflick's] reputation as a scientist." Furthermore, Wade's article states that because stocks of WI-38 are limited, "credit for the next generation of vaccines will go to MRC-5 instead of to Hayflick and WI-38."

These comments do not sufficiently value Len Hayflick's long record of influential scientific research. Even if MRC-5 is used instead of WI-38, much credit should go to Hayflick for having most clearly demonstrated the properties of normal human cells in tissue culture (1). His work refuted the 50-year-old dogma that normal cells could be immortal in tissue culture (2) and was vigorously attacked by traditionalists throughout the 1960's. He did not give up, and his studies were repeated over and over again; they now are generally accepted. In fact, the development and definition of MRC-5 was one of many confirmations of Hayflick's studies, relying extensively on his techniques (3).

Besides this important work in the field of tissue culture, Hayflick proposed that the limited growth capacity of cultured human cells makes them a valuable model for studies of senescence. This greatly excited the field of gerontology and inspired much current research testing Hayflick's hypothesis that aging is programmed by the limited proliferative capacities of normal cells.

Surely these accomplishments secure Hayflick's reputation as one of the important scientists of our generation, regardless of the current investigation.

DAVID E. HARRISON

*Jackson Laboratory,
Bar Harbor, Maine 04609*

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PCB's: How Toxic?

Polychlorinated biphenyls (PCB's) are recognized as ubiquitous environmental contaminants. In 1973, this worldwide problem resulted in a decision by the Organization for Economic Cooperation and Development to control the use and disposal of PCB's (1). At present, both the U.S. and Canadian governments are preparing legislation for the control of toxic substances.

The concern over PCB's is based on two factors, namely their environmental

the housing authority

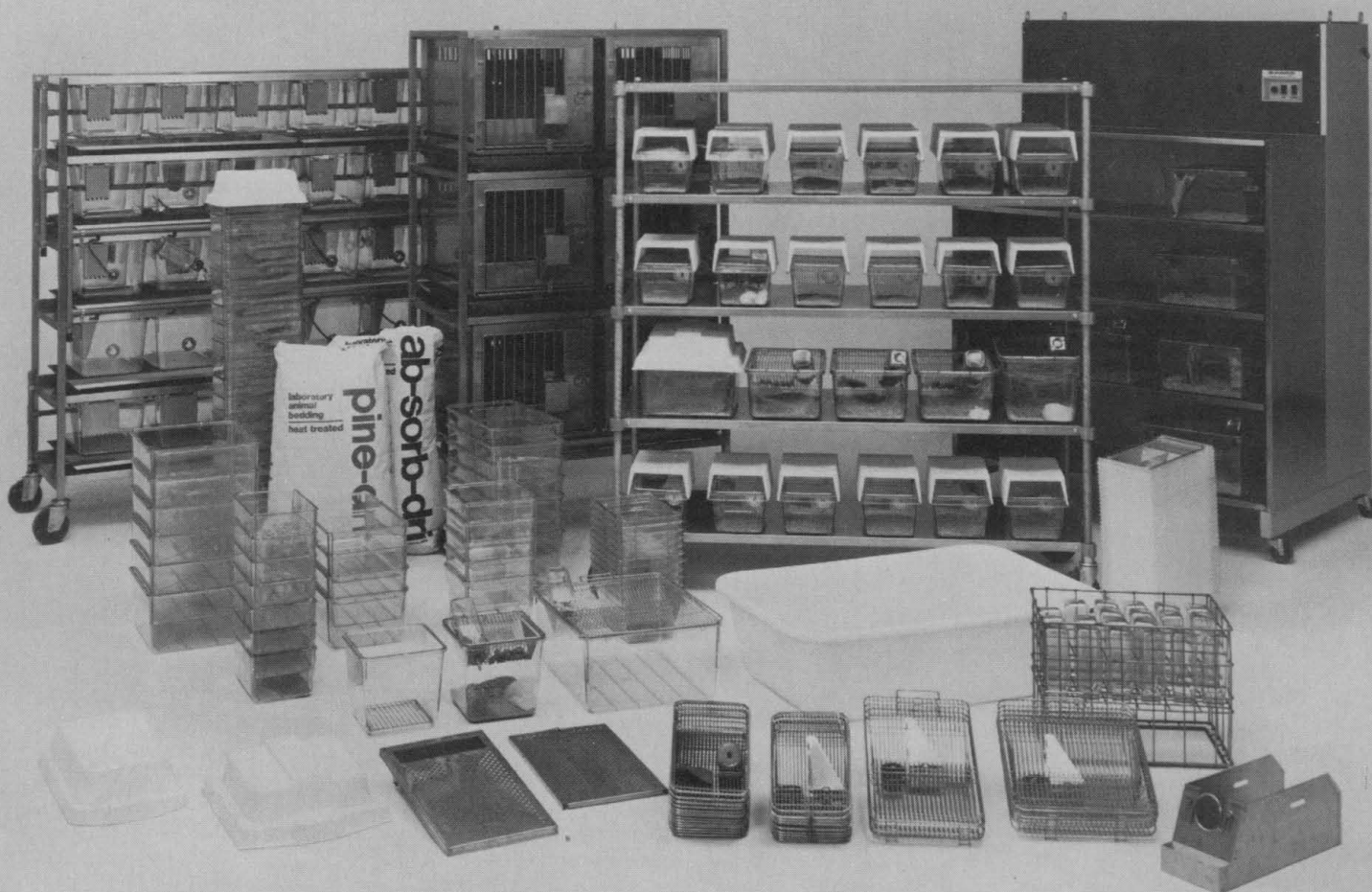
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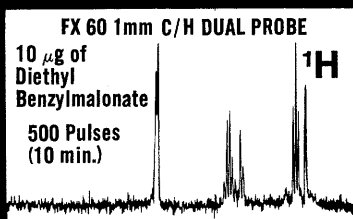
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persistence and their toxicity. Recent results, however, cast doubts on the latter. Bowes *et al.* (2) observed concentrations of highly toxic polychlorinated dibenzofurans (PCDF's) ranging from 0.1 to 0.5 microgram per gram in all but one of the North American PCB's (Aroclor). Earlier studies by Vos *et al.* (3) had indicated that only PCB's manufactured in Japan (Kanechlor) and Europe (Clophen, Phenochlor) contained such impurities. In addition, PCDF's and other by-products were recently found in "pure" PCB isomers (4).

The toxicity of PCDF's exceeds that of PCB's by approximately four to six orders of magnitude. Their presence in PCB's has, therefore, significant bearing on toxicity studies on PCB's, commercial mixtures, and isomer preparations alike. Yet, in only a small proportion of the scientific reports on this subject is the problem of PCDF impurities in PCB's discussed. Obviously, the degree of this contamination is variable with the origin and probably also with other details of the manufacturing processes.

I strongly recommend, therefore, that in all future toxicity studies and for as many past studies as can be documented, precise information on the PCB's used (source, date of manufacture, lot number, and so forth) be recorded. I further recommend that past experiments for which such information is available be reevaluated in view of the strong possibility of the presence of PCDF's and their overriding toxic effects.

KLAUS L. E. KAISER

Environment Canada,
Canada Centre for Inland Waters,
Burlington, Ontario L7R 4A6

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Membrane Protein Assay

We have recently been informed that the detergent Lubrol PX, which is an important component in our new immunoelectrophoretic assay for membrane proteins (Reports, 8 Aug. 1975, p. 469), is no longer commercially available. We have tested other nonionic detergents and find that Triton N-101 (Rohm and

Haas) and Emulophogene BC 720 (GAF) may be substituted for the Lubrol PX with comparable results. Another detergent, Triton X-100, is not quite as effective in this technique since some sodium dodecyl sulfate still enters the agarose-antibody layer. When analyzing heavily loaded gels, we use a 6- to 8-millimeter strip of the detergent, 1.7 percent in agarose, slightly wider than the dimension recommended in our report, for the best results.

DAVID S. PAPERMASTER
CAROLYN A. CONVERSE*
SUSAN S. COPPOCK

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School of Medicine,
Yale University,
New Haven, Connecticut 06510

*Present address: University of Glasgow, Glasgow, Scotland.

Cell Bank Established

To facilitate research on cell genetics in relation to aging, a bank of mutant and normal cells has been established by the National Institute on Aging (NIA) at the Institute for Medical Research in Camden, New Jersey. Cell cultures are developed and banked in response to research needs. Recommendations of general policy, specific policy, and selection of classes of cells or specific cell lines are made by an advisory committee. Most lines are of human origin, but a limited number of nonhuman lines with unique or valuable genetic characteristics will be accepted. Cultures are grown without antibiotics after primary culture and stored in liquid nitrogen at early passage.

This NIA Mutant Cell Bank is working in close cooperation with the National Institute of General Medical Sciences Genetic Mutant Cell Repository established at the same institution. The purpose of that repository is the study of hereditary diseases.

In addition to the responsibility for a cell repository, an annual workshop on cell culture and somatic cell genetics as they relate to aging research is held each year in May. Suggestions, inquiries, and contributions to the NIA cell bank are invited.

WARREN W. NICHOLS
Department of Cytogenetics,
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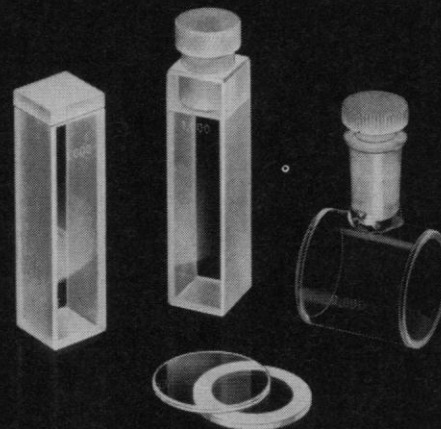


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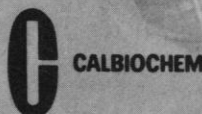
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Cost-Effective Health Care

Private and government expenditures for health are now devouring a substantial part of the gross national product. In spite of considerable evidence that the health care system is not cost-effective, the prospect is for continued growth. In 1950 funds spent for health were \$12 billion. In 1975 they reached \$118.5 billion. Until 1965 the government spent only nominal amounts for health care. With the advent of Medicare and Medicaid, the federal treasury became an engine of inflation of health costs. Federal expenditures rose rapidly to \$34 billion in 1975, and this led to enhanced costs for the private system also.

Articles have appeared in which authors seek to identify specific causes for the increase—for example, soaring hospital costs. For the most part they miss the main point. When the major fraction of medical costs is borne by a third party, demand for care is practically infinite. Patients urgently seek treatment, even surgery, on the basis of trivial symptoms. Distraught relatives hope to prolong the lives of moribund loved ones. Fearing malpractice suits, many physicians practice medicine defensively, ordering more tests and procedures than they otherwise would.

The public assumes that large expenditures for health care will bring better health. This assumption is questionable. During the early part of this century life expectancy in the United States steadily increased, but it reached a plateau in 1954. In 1967 W. H. Forbes explored the relation between national expenditures in behalf of health and actual results. He concluded that we could halve or double the total expenditures without changing longevity.* This was in a year when only \$42 billion was spent.

Since 1967 others have pointed out that most of the deaths in the age range 10 to 70 either are due to degenerative diseases or are fatalities arising from accidents, suicide, or homicide. The big killers are coronary heart disease, cancer, and stroke. Treatment of these diseases is often costly. Their incidence is related in part to life-style, for example, sedentary living, poor diet, obesity, smoking.

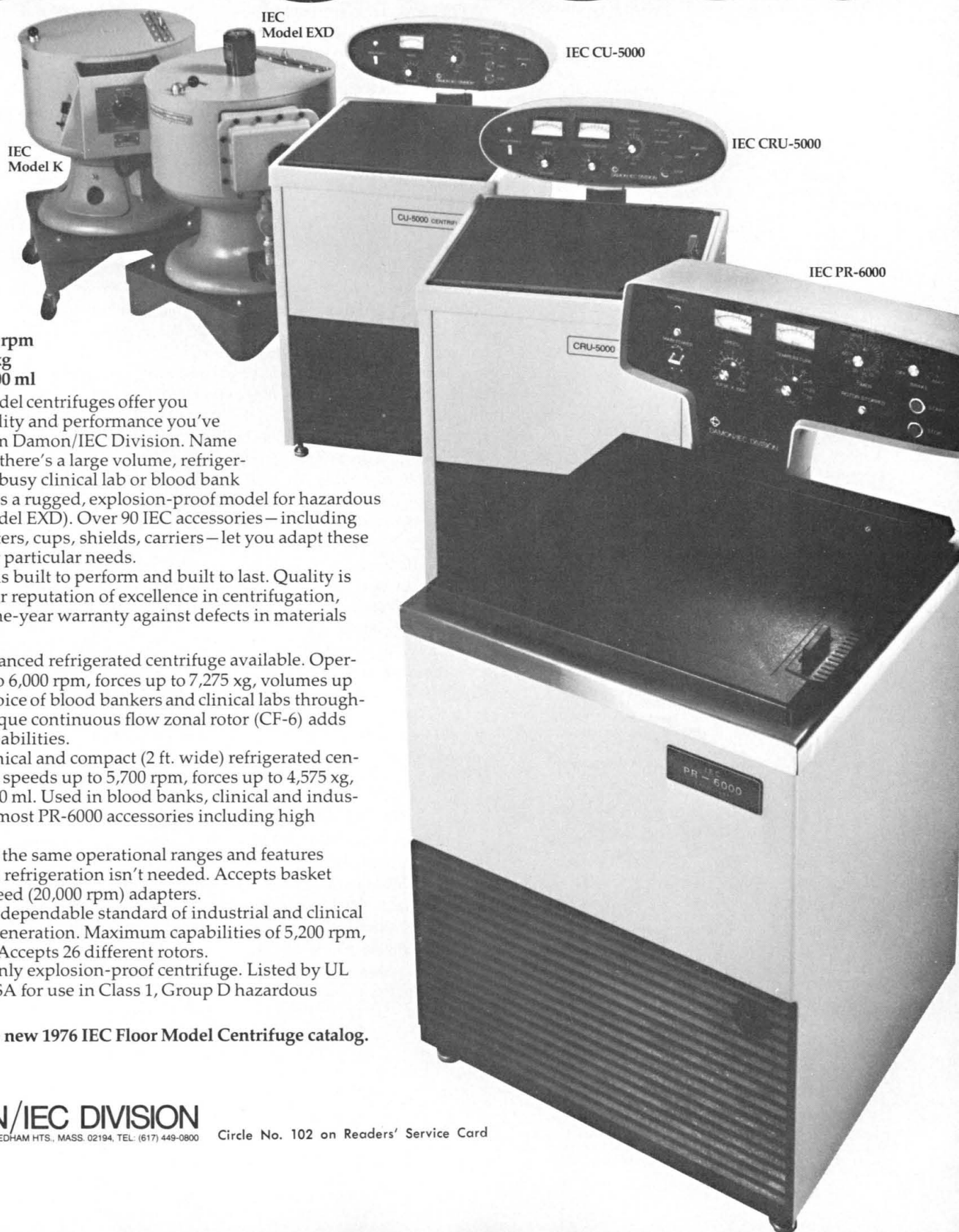
Because treatment of degenerative diseases is not uniformly successful and since the course of some of them can be altered by changes in the patient's behavior, there is increasing interest in preventive medicine. Frederick C. Swartz, M.D., has stated that† "our greatest health problem is in the physical fitness of the Nation. Here the answer is the simplest and the cheapest, has the greatest application, and its reflection on the reduction of morbidity and mortality rates would be immediate and tremendous. It is entirely possible that a well-practiced physical fitness program begun early in life would increase life expectancy by 10 years . . ."

Studies seem to show that longevity depends on a combination of factors. Prominent among them are good nutrition, weight control, abstention from excessive drinking of alcohol and from cigarettes, and getting enough exercise and sleep. Faced with the prospect of giving up smoking and engaging in vigorous exercise, many people would just as soon take their chances. However, others would like to pursue a more prudent course. They would be encouraged to do so if they had specific information about the effort required to increase their life span.‡

Substantially better health cannot be bought with \$118.5 billion. Isn't it time the nation began to pay more attention to approaches that promise great improvement at little cost?—PHILIP H. ABELSON

*Cited in E. J. Burger, Jr., *Journal of Medical Education* 49, 928 (October 1974). †Hearing before the U.S. Senate, Subcommittee on Aging of the Committee on Labor and Public Welfare, 23 April 1975. ‡For further information see *Physical Fitness Research Digest*, Ser. 6, No. 2 (April 1976).

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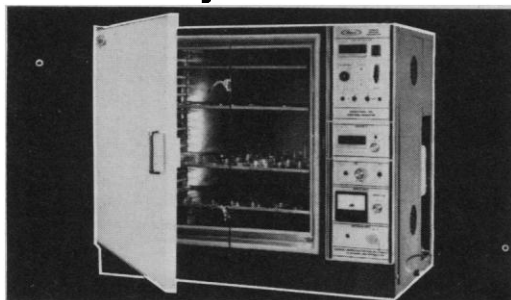
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pighi's correspondence was exchanged. The exchanges with Giovanni Borelli, Malpighi's mentor in Pisa, and with Lorenzo Bellini are capital documents for the history of anatomy, physiology, and institutional developments in science in Italy. Bellini, passionate and ironic and Malpighi's lifelong friend, was an early and unrelenting advocate of the mathematicomechanical interpretation of vital processes in the manner of the Galileans.

The subjects discussed in the correspondence are prodigiously varied. Murder and civil disorder in Bologna, plant anatomy, publication arrangements, the battle between ancients and moderns, numerous details of animal structure, curricular reform, medical advice (Malpighi was a much-consulted authority), the unwelcome demands of one's scientific patrons, exchange of books across Europe—all find a place in these five volumes.

This *Correspondence* thus constitutes an archival resource of the first order. Viewing this work together with his magnificent study of Malpighi's scientific endeavors (*Marcello Malpighi and the Evolution of Embryology*; 5 volumes, Cornell University Press, 1966), we easily discern the magnitude of Adelmann's contribution to our access to and understanding of medicine and, above all, anatomy during an epoch of revolutionary intellectual change, the later 17th century. It is a major scholarly achievement.

WILLIAM COLEMAN

*Department of History of Science,
Johns Hopkins University,
Baltimore, Maryland*

Struggles of Natural History

The Letters of Jan Swammerdam to Melchisedec Thévenot. With English translation and a biographical sketch by **G. A. LINDEBOOM.** Swets and Zeitlinger, Amsterdam, 1975. x, 190 pp. + plates. Dfl. 80.

Jan Swammerdam's correspondence with his French patron Melchisedec Thévenot was used by Boerhaave in his biographical introduction to the *Biblia Naturae* (1737-38); the letters then passed through the hands of Wouter van Doeveren to Göttingen University Library, where they remained unnoticed and forgotten for two centuries. For each of these letters G. A. Lindeboom has now provided a summary, a transcription of the Göttingen manuscript, and an English translation. Lindeboom has also written an introductory biographical



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sketch and a number of shorter notes on 17th-century figures. All the editorial material is in English. For those who do not read Dutch this book will (though the English is stilted) be a very welcome primary source for information about science and scientists in Holland's golden age. Certainly no student of the 17th century can read with indifference the names of patrons, acquaintances, and friends mentioned in this volume: Elzevier, de Graaf, Huyghens, Leeuwenhoek, Malebranche, Cosimo de Medici, Ruysch, Steno, and Tulp.

And, of course, Thévenot. Melchisedec Thévenot, a wealthy French diplomat with an interest in letters and science, received a circle of scholars and scientists at his home in Paris during the 1660's. Foreigners were welcome. Thévenot's Dutch visitors included Huyghens, de Graaf, and Swammerdam. Eventually the worldly Thévenot became the most reliable ally and patron of the shy and moody Swammerdam.

Young Swammerdam had trained as a doctor, but felt no inclination toward practice. He was drawn to anatomy, insects, and all curious experiments—commendable interests, but not, as his father reminded him, a profession at which one could make a living. The letters to Thévenot over a period of 15 years record Swammerdam's incredible efforts in the face of family and financial pressure: work on the spinal medulla, injections of human uterine vessels, a treatise on respiration, the famous history of insects, discovery of seeds in ferns, and so on and on, all first-rate work on the frontiers of natural history.

But the tale told in this book is only incidentally biographical. The real subject is a new science's search for institutional recognition and support. The study of nature as conceived by Swammerdam, Leeuwenhoek, and Boerhaave had asserted its independence from routine medical education, on the one hand and, on the other, from aimless speculation in natural curiosities. Unfortunately, to be outside the limits of science as perceived by contemporaries was to be outside the limits of support as well. "Ruysch," Swammerdam writes, "has founded an anatomy room and shows it for money." These letters are full of similarly grim financial details. Here is one of the neglected opening chapters in an almost unknown story, the professionalization of natural history.

JAMES L. LARSON

Department of Comparative Literature,
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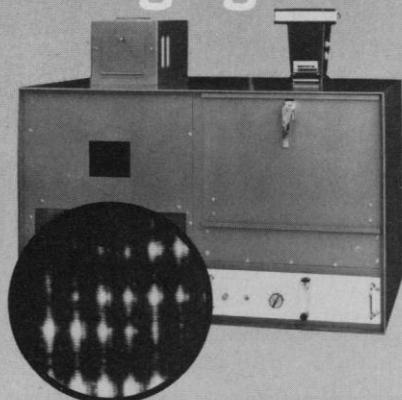
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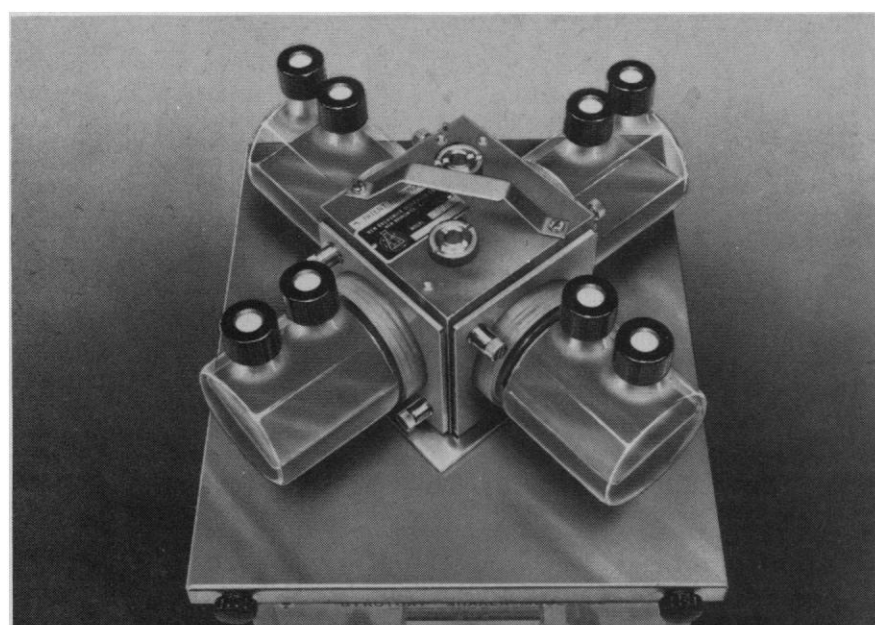


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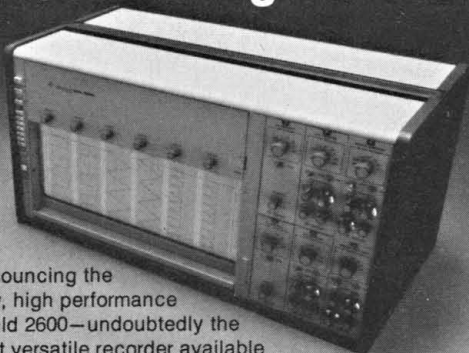
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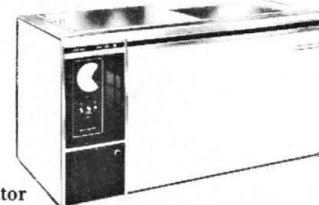
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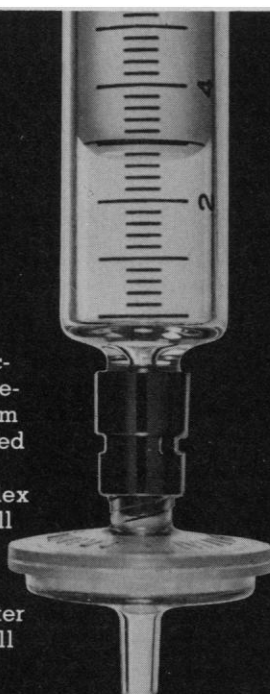
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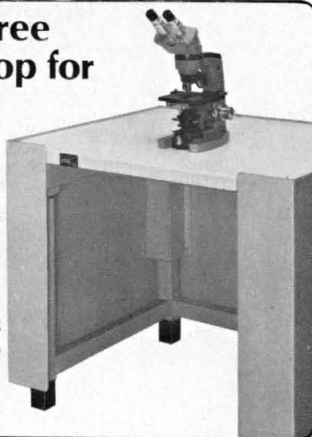


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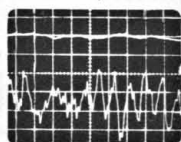
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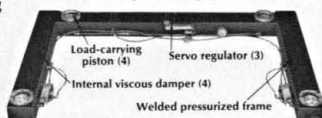
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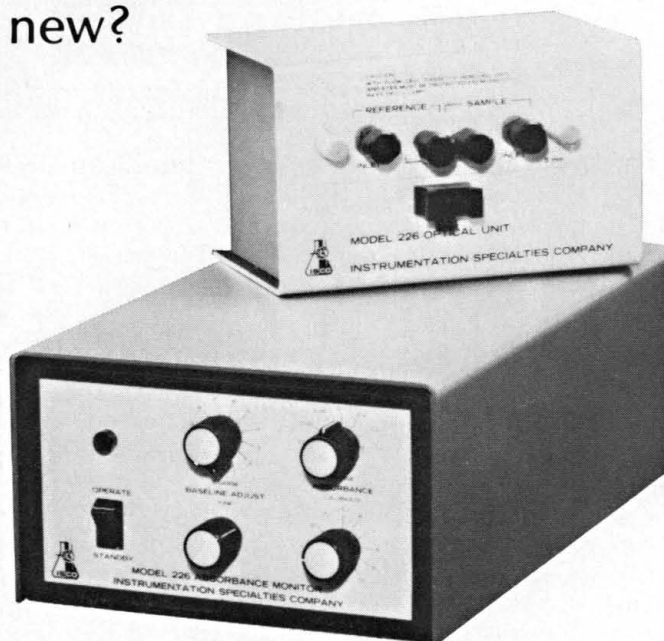
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