

# SCIENCE

9 January 1976

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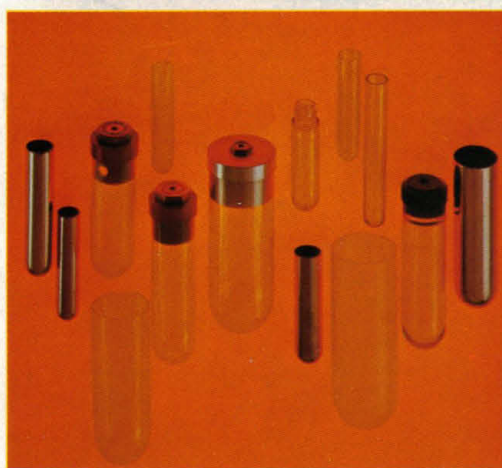
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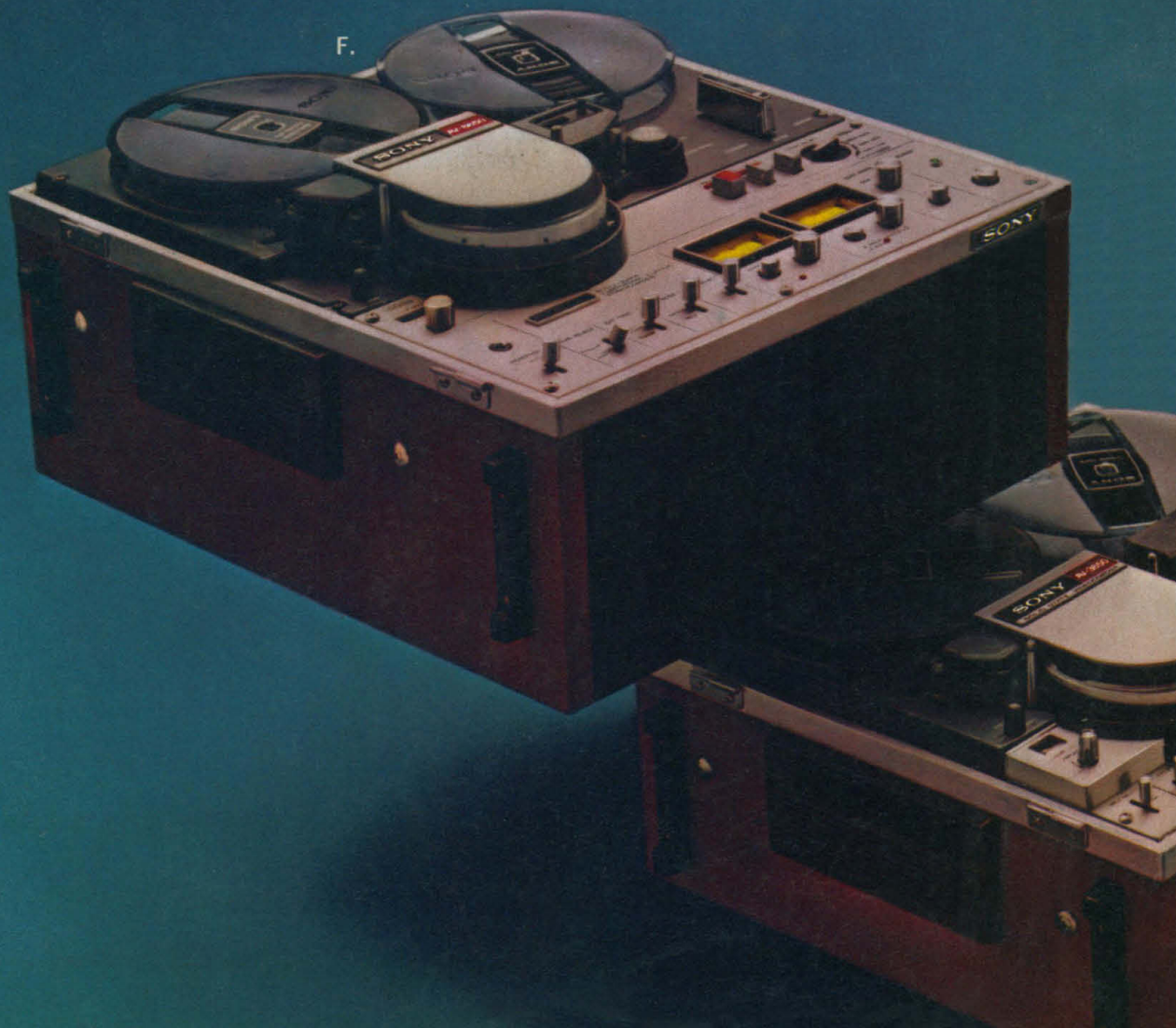
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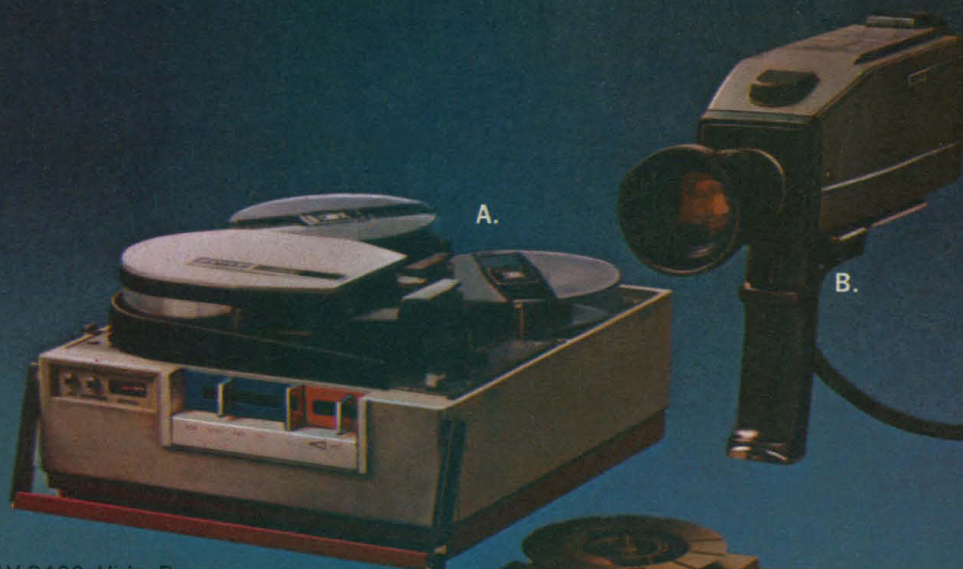
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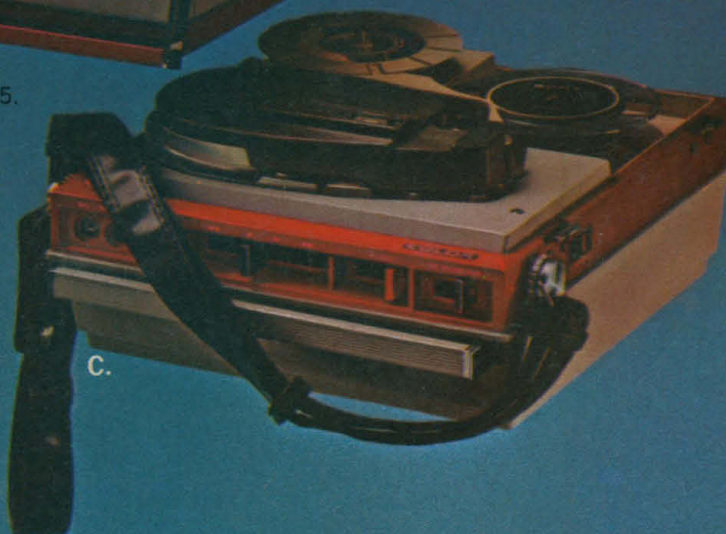






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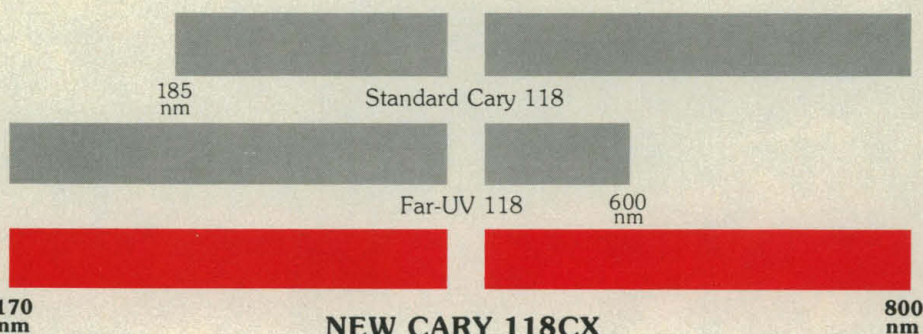


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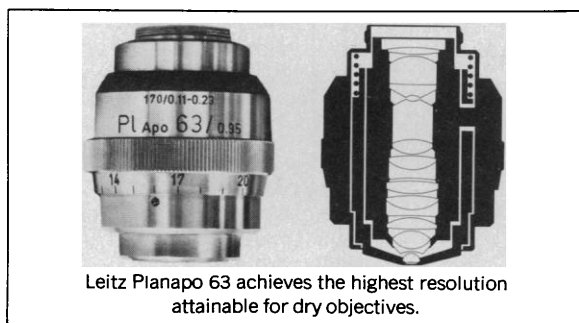




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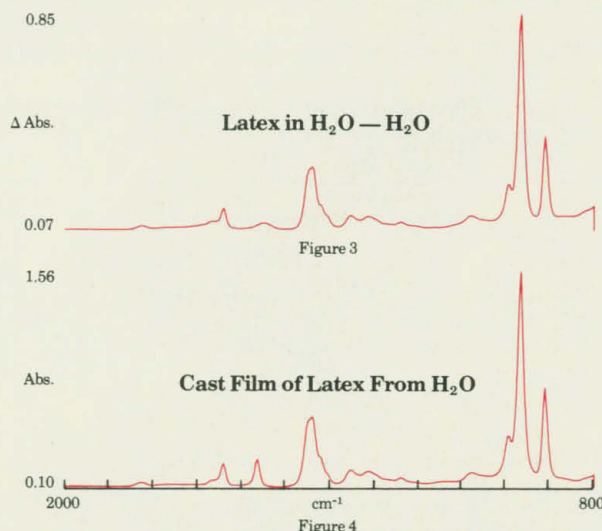
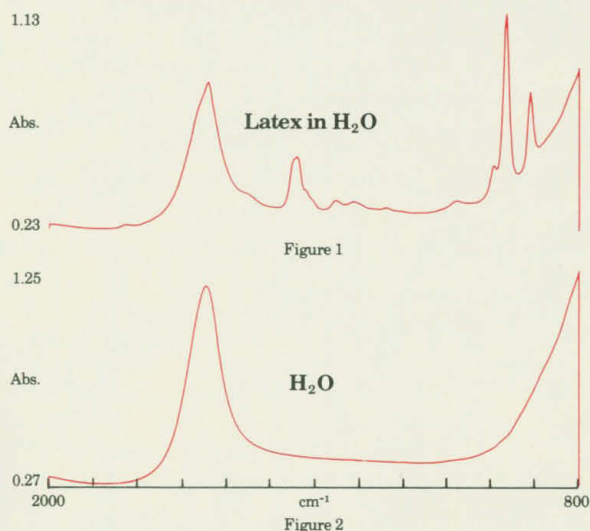
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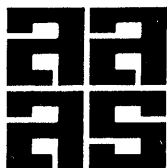
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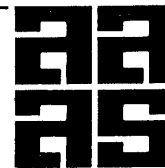
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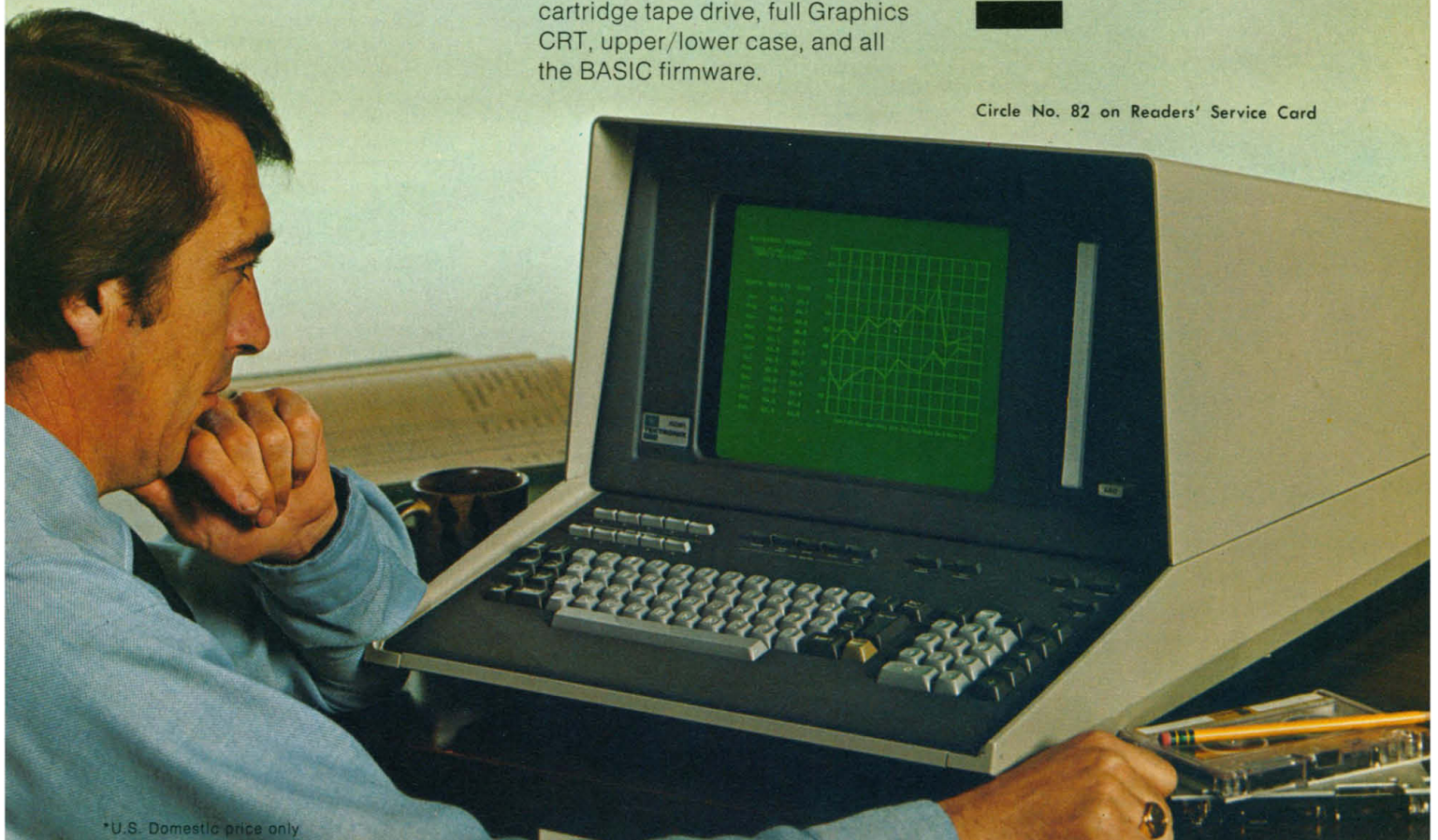
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On the news pages, *John Maddox* asks the question, biochemistry of Babel? And *H. Eisenberg* describes the emerging technique of laser light scattering.

A special monthly feature is a discussion forum where leading protagonists debate current controversial topics. In this issue, *Garnet Davey* and *Brian Inglis* raise the question of how research in the pharmaceutical industry should be controlled.

In the first of a series in which a life scientist comments on an original paper whose 50th anniversary occurs this year, *John T. Edsall* assesses James B. Sumner's crystallization of urease.

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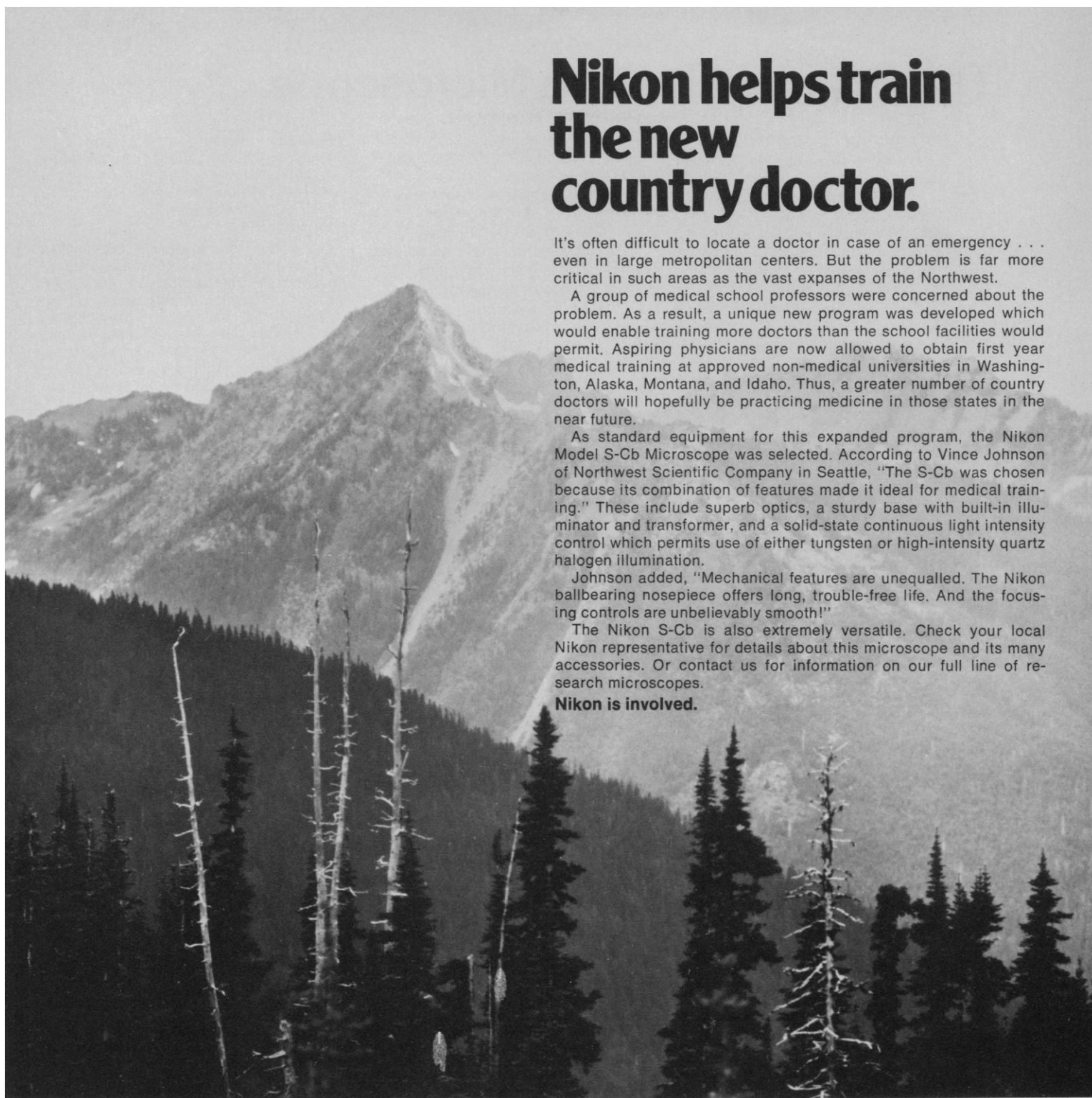
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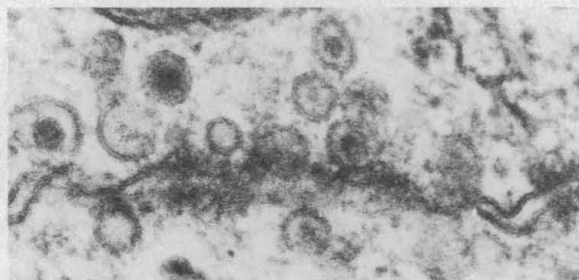
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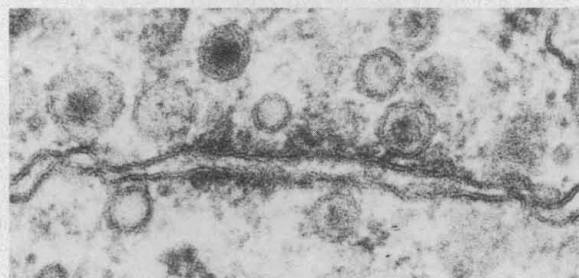
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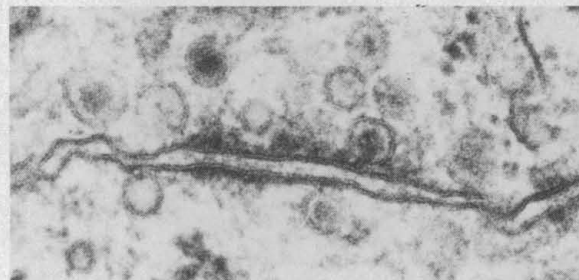
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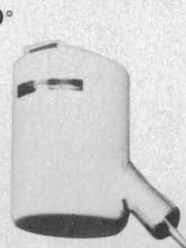


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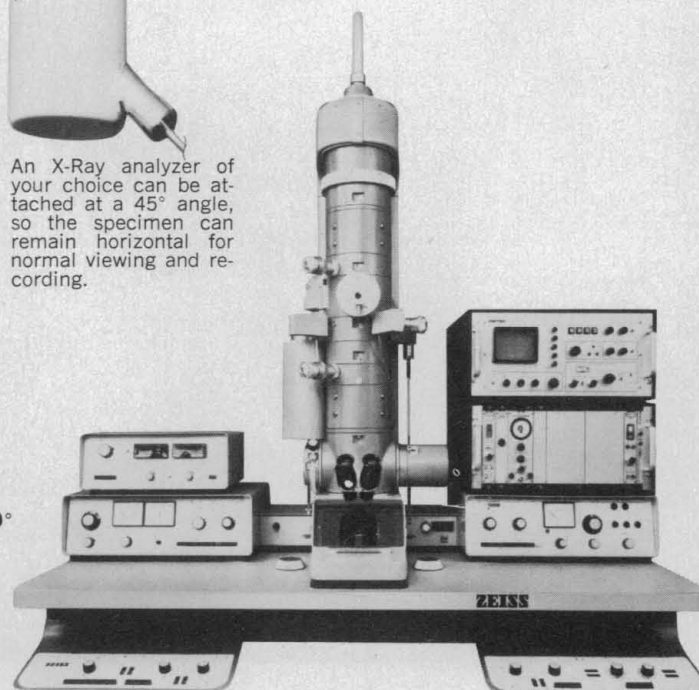
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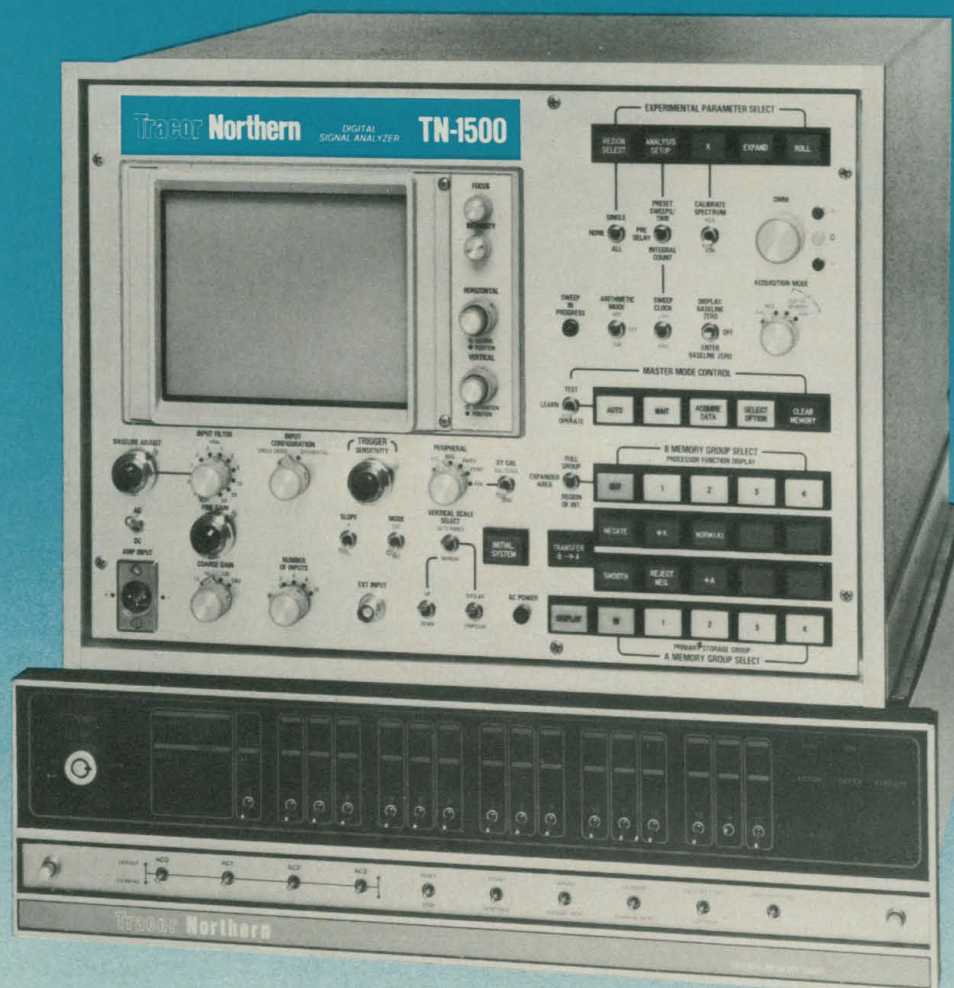
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# Nicolet News

Published by Nicolet Instrument Corporation

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## Nicolet Announces A New, *Complete System* For Fourier Transform Infrared Spectroscopy

MADISON, Wis.—Nicolet Instrument Corporation (a leader in Fourier Transform NMR Spectroscopy) has acquired the Infrared Interferometer product line of EOCOM Corporation.

This means that, for the first time, one company manufactures both the interferometer *and* the data system. This combination of capabilities has produced a complete Fourier Transform Infrared Spectrophotometer instrumentation system for basic analytical or routine laboratory work.

The system contains automatic ratio recording with better than  $0.07\text{ cm}^{-1}$  resolution throughout the spectral range of 4000 to  $400\text{ cm}^{-1}$ . It includes a Michelson interferometer with germanium on KBr beam splitter, laser reference and white light reference system, and variable mirror drive rates of  $0.05\text{ cm/sec}$  to  $4\text{ cm/sec}$ . It has a total optical retardation length of 16 cm and a nominal aperture of 2" diameter. Options are available for operation in the visible, near and far infrared regions, and for operations with a cooled detector.

Information is collected, processed and displayed from a Nicolet 1180 data system having 40K words of solid state, 20-bit memory storage, dual 4.8 megaword disk memory, a high speed digital plotter and CRT display.

Some major features of this data system are its 15-bit analog-to-digital converter (ADC) with automatic gain ranging, the ability to plot while processing and/or acquiring, the ability to collect and transform up to 512K data points, an optimized instruc-

tion set for fast Fourier transformations, and a very complete software package. An option is available to replace the data system with an ADC interfaced to a 9-track magnetic tape system and a complete Fortran software package for an IBM 360 system.

---

## Nicolet Technology Announces Fourier Transform Mass Spectrometer

MOUNTAIN VIEW, Calif. — Nicolet Technology Corporation, which previously specialized in interfacing data systems to nmr spectrometers, has announced plans for a new, high resolution Fourier Ion Resonance Mass Spectrometer called FIRMS. Capable of working with samples of lower volatility than usable in conventional mass spectrometers this new spectrometer offers greatly improved resolution and sensitivity along with the ability to examine higher molecular weight compounds. Since Fourier transform ion resonance spectroscopy detects the entire spectrum at once, rather than one element at a time as in the conventional scanning spectrometer, a given

spectrum may be obtained 100 to 1000 times faster. Because of this speed the chemist can observe ion-molecule reactions.

---

## More Details Offered

MADISON, Wis.—For complete details on either of the products described please write or phone Nicolet Instrument Corporation, 5225 Verona Road, Madison, Wisconsin 53711, Telephone: 608 / 271-3333.

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might also be concerned about the possible creation of aerosols by the evaporating liquid nitrogen. We are unaware of the stability of other infectious agents in liquid nitrogen, but appropriate safety precautions appear to be indicated if glass vials are used for their storage. Possibly, plastic vials (which are commercially available) could be investigated as an alternative storage container.

In the past 75 years, some 3500 cases of laboratory-acquired infections have resulted in more than 150 deaths (2). The sources of such infections were frequently difficult, if not impossible, to trace. These statistics, and the recent discussions of laboratory biohazards and potential biohazards (2, 3) underscore the need for constant vigilance in the microbiology laboratory.

THOMAS W. SCHAFER, JEFFREY EVERETT  
GERALD H. SILVER, PAUL E. CAME  
*Schering Corporation,  
Bloomfield, New Jersey 07003*

#### References

1. H. T. Meryman and E. Kafig, *Proc. Soc. Exp. Biol. Med.* **90**, 587 (1955).
2. N. Wade, *Science* **182**, 566 (1973).
3. C. Norman, *Nature (London)* **254**, 6 (1975); R. Weiss, *ibid.* **255**, 445 (1975).

### "Affinity" Chromatography

The terms "affinity chromatography column" and "affinity purification" are used inaccurately and often indiscriminately in many publications (1). For the last two decades it has generally been believed that the attachment of an appropriate substrate or inhibitor to a support matrix can produce a highly specific chromatographic column which can be designed to isolate a particular protein or enzyme. Recently, however, it has become evident that in many cases the column specificity is less than adequate. There are three major causes which may interfere with the specificity.

1) The matrix offered by the major commercial manufacturers of the activated gel used for the attachment of the ligand is Sepharose 4B, and this matrix retains its molecular sieving properties and will selectively retard proteins of low molecular weight.

2) In cases where the manufacturer offers a spacer attached to the matrix, the spacer contains a charged moiety to which the ligand is to be bound, and this can act as an ion exchanger if not properly blocked. Ion exchanging properties can also result from charged groups on the ligand itself.

3) In many instances, the strong adsorption of an enzyme on an affinity column has been shown to be a result of hydrophobic interactions between the spacer at-

tached to the matrix, or the matrix itself, and certain regions of the enzyme.

Although a good resolution of proteins is obtained by "affinity" chromatography, ascribing the results to a real affinity binding process is often more speculative than proven, and the actual cause of the resolution is disregarded. We suggest that, unless affinity binding is specifically demonstrated, terminology such as "activated gel column" or "modified gel column" is preferable.

AMIRAM D. LANDMAN  
E. THACKERAY PRITCHARD  
*Department of Oral Biology, Faculty of  
Dentistry, University of Manitoba,  
Winnipeg, Canada R3E 0W3*

#### Notes

1. See, for example, P. O'Carra, *Methods Enzymol.* **34**, 108 (1974).

### Cross-Cultural Health Assessment

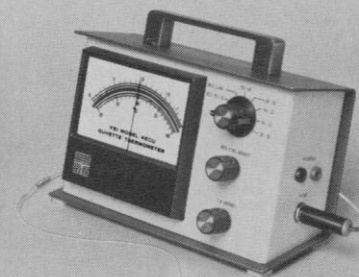
It may interest those who read Horatio Fabrega's article "The need for an ethnomedical science" (19 Sept., p. 969) to know that an interdisciplinary group at the University of Washington is developing the Sickness Impact Profile (SIP), by which self-perceived changes in usual daily activities related to health can be measured (1). The rationale for developing the SIP closely parallels Fabrega's concern: the need for a culture-free measure that would permit evaluation of treatment and assessment of need both within and across socio-cultural groups. The developmental study design includes examination of the relationship between the SIP and clinician measures of disease and dysfunction, between the SIP and a subject's self-assessment of sickness and dysfunction, and between the SIP and diagnostic measures (2).

The SIP is being used in England and in Alabama, and a translation into a Chicano dialect of Spanish has just been completed. Such efforts should permit study of the cross-cultural issues Fabrega mentions.

MARILYN BERGNER  
BETTY S. GILSON, RUTH A. BOBBITT  
DIANE K. MARTIN, WILLIAM CARTER  
*Sickness Impact Profile Project,  
Department of Health Services, School of  
Public Health and Community Medicine,  
University of Washington, Seattle 98195*

#### References and Notes

1. This research has been supported by the Bureau of Community Health Services and the Bureau of Health Services Research, Health Resources Administration, Department of Health, Education, and Welfare.
2. B. S. Gilson, J. S. Gilson, M. Bergner, R. A. Bobbitt, S. Kressel, W. E. Pollard, M. Vesselago, *Am. J. Public Health* **65**, 1304 (1975); M. Bergner, R. A. Bobbitt, W. E. Pollard, D. K. Martin, B. S. Gilson, *Med. Care* **14**, 57 (1976); W. E. Pollard, R. A. Bobbitt, M. Bergner, D. K. Martin, B. S. Gilson, *ibid.*, in press.



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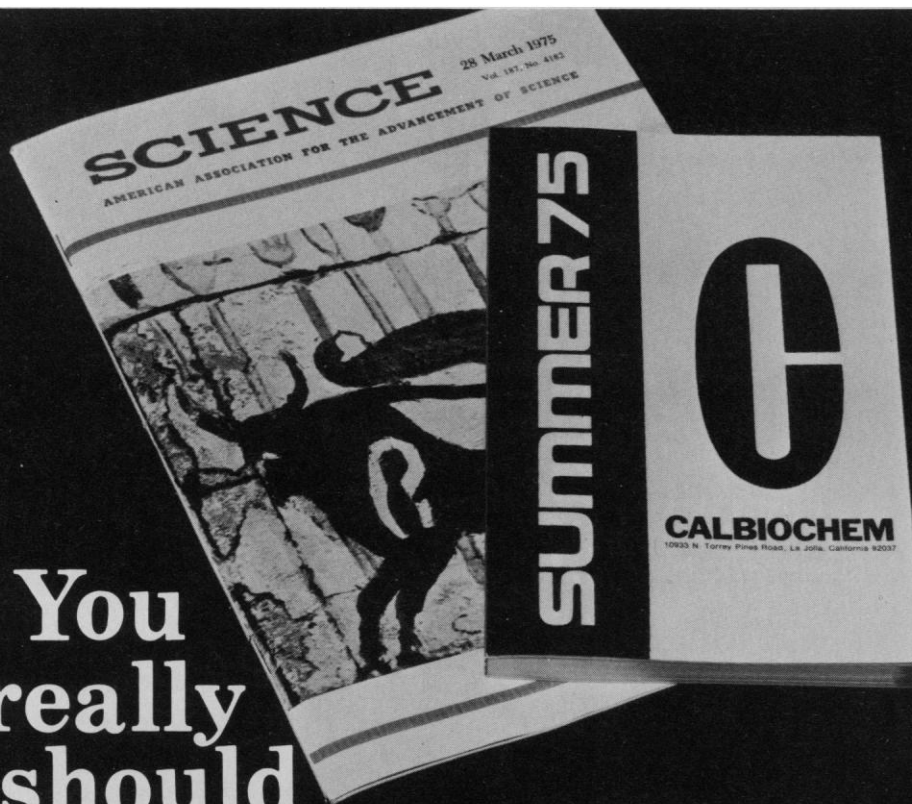
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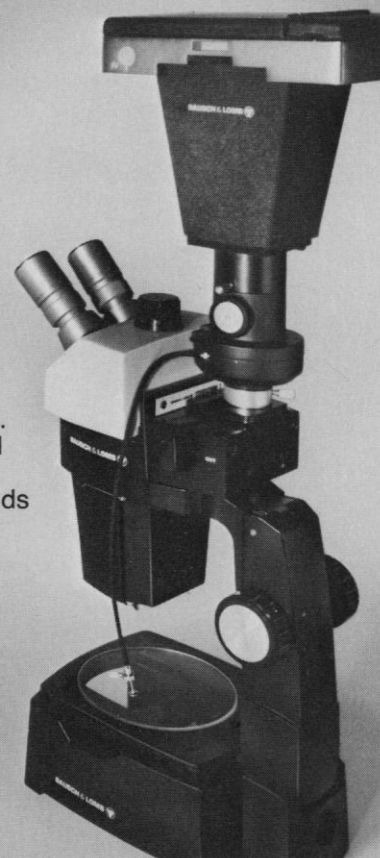
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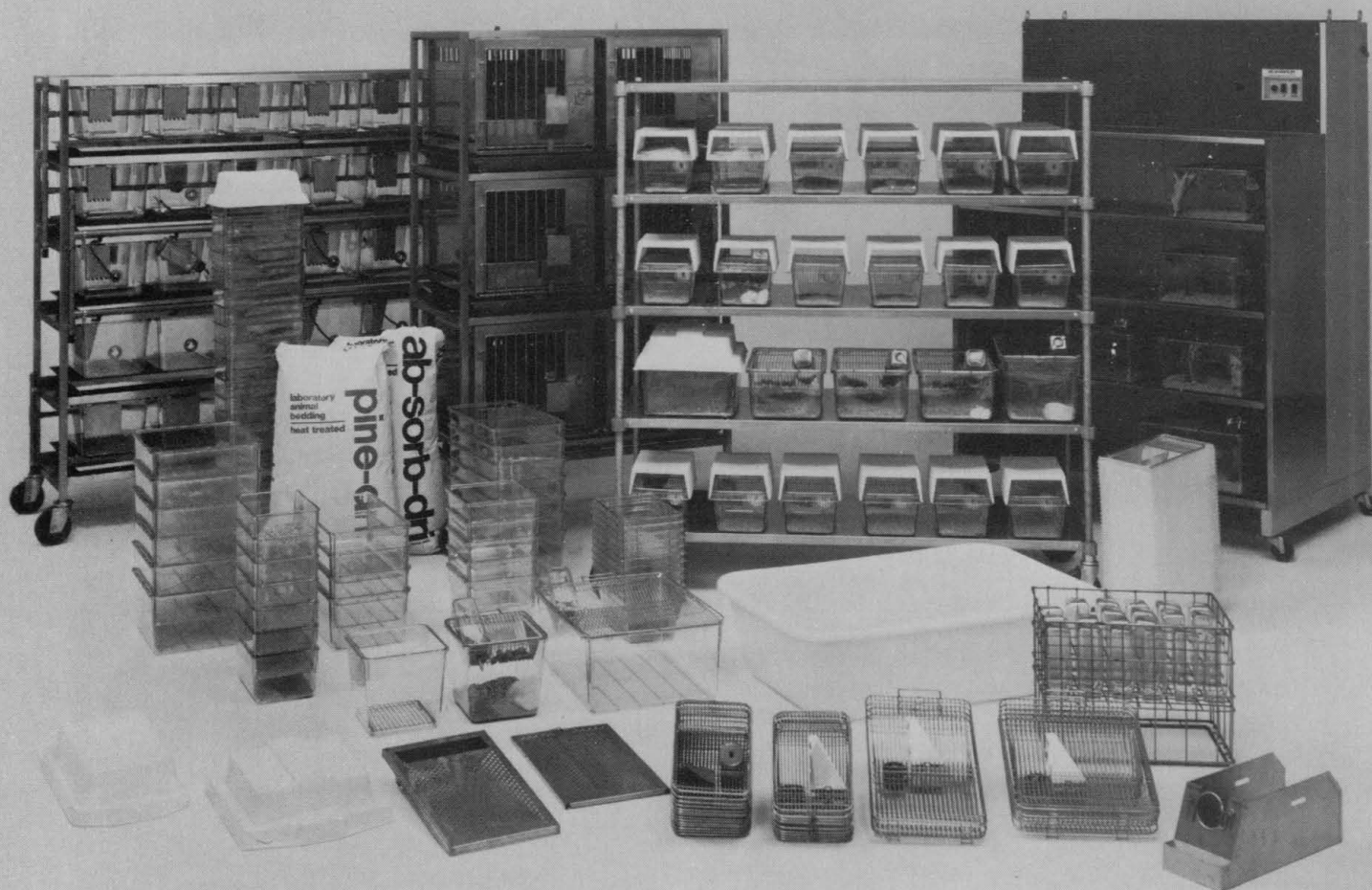
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## Enough of Pessimism

The Bicentennial year is an appropriate time for comparisons between earlier times and now. In terms of knowledge, education, affluence, and health the contrast is great; there has been substantial progress. However, in terms of leadership and morale, the opposite is true. The people of those times were rich but we are poor. They had leaders of stature, breadth, and vision, who in keeping with the spirit of the times, faced the future with faith and optimism. In comparison to a Franklin or a Jefferson, our leaders and would-be leaders seem only ordinary. Caught up in the excitement of the present, they rarely look beyond the next election.

Who among the present-day politicians can come close to matching Franklin's enthusiasm, foresight, and knowledge of the world around him? These qualities were exemplified when he wrote in 1780: "It is impossible to imagine the height to which may be carried, in a thousand years, the power of man over matter. We may perhaps learn to deprive large masses of their gravity, and give them absolute levity, for the sake of easy transport. Agriculture may diminish its labour and double its produce; all diseases may by sure means be prevented or cured. . . ."

And who among our politicians comes close to the breadth of a Jefferson who, though a successful lawyer, was an avid student of nature, a talented botanist and paleontologist with a deep interest in all the other sciences. What politician today would have either the imagination or the convinced insight to make a statement matching Jefferson's, "knowledge is power, knowledge is safety, knowledge is happiness."

Our poverty goes beyond a lack of leadership. It extends to a malaise of the spirit of our people. Indeed such is the pathology that, even if the Messiah should appear, he or she would either go unrecognized or, if recognized, would soon be chopped down to size. At the same time this country has turned its back on optimism and is becoming a nation of pessimists.

During most of the country's history, perhaps its greatest assets were its faith in progress, its can-do spirit. Sometimes exuberance was overdone but better than the opposite, as any experienced scientist can testify. The research worker who is convinced ahead of time that experiments will be fruitless seldom is proved wrong in that judgment. It is the optimists who achieve.

In this country optimism was at its peak early during times of great poverty, hardship, and amid unmerciful ravages of disease. But Franklin's optimism was justified by events. Great increases in knowledge and enormous improvements in agriculture, medicine, and technology liberated many humans from much of the drudgery and pain that had previously been their lot. But the behavior of humans is weird and wonderful. Far from feeling gratitude toward benefactors or admiring the great edifice of knowledge that makes their comforts possible, they have now turned sour and their attitudes are reflected by their chosen representatives.

Part of their feeling toward science may be due to another factor. Shortly after World War II, public opinion accorded science a high place in the scheme of things. For nearly 20 years science was exalted in the press, by the public, and by politicians. Expectations were aroused that could not be fulfilled. A swing of the pendulum was inevitable and it has been going on for about 10 years. The public has the impression that scientists, engineers, and physicians are not delivering the perfect performance that should be expected of them. At the same time relatively small side effects of new technology and medicine have appeared. In view of the insatiable need of the mass media for stories, the seriousness of these effects has been greatly exaggerated. The backward swing of the pendulum has also been abetted by some scientists who have been leaders in creating more problems and more pessimism than the facts justified.

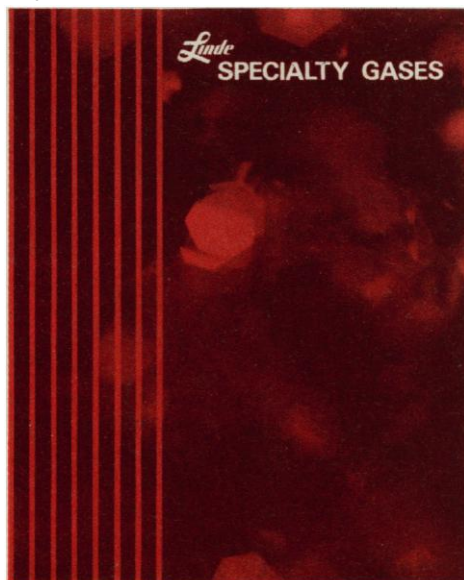
Pessimism is a kind of sickness that debilitates the individual and the country. One would not advocate that we become a nation of Panglosses. However, enough of pessimism. It leads nowhere but to paralysis and decay.

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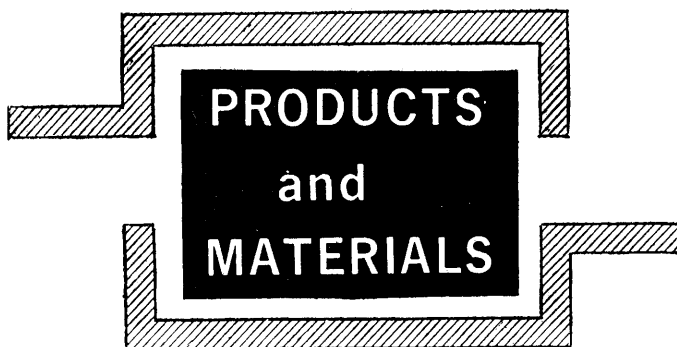
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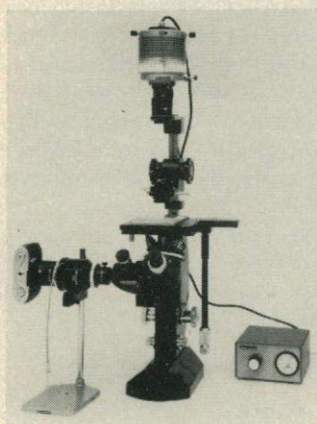
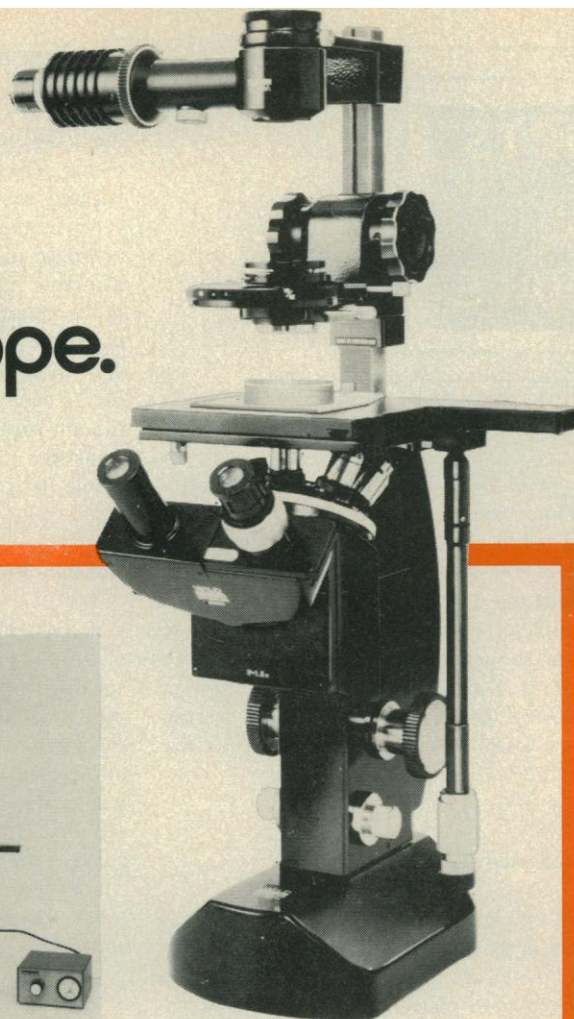
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### Microcomputer Timesharing System

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## Literature

*Eastman Organic Chemical Bulletin* features physical properties of nearly 1000 organic solvents. Eastman Kodak. Circle 689.

*Environmental Test Equipment* is listed in a short-form catalog. Bench top and walk-in chambers are included. Tenney Engineering. Circle 703.

*Uni-Pore* is a 24-page bulletin devoted to a polycarbonate membrane for filtration and recovery of cells, viruses, and other particles. Bio-Rad Laboratories. Circle 690.

*Model 3810A Total Station* describes a distance and angle measuring instrument for surveying. Hewlett Packard. Circle 691.

*Sephacrose CL* is a medium for gel filtration and affinity chromatography. Its properties and experimental methods are described in a pamphlet. Pharmacia Fine Chemicals. Circle 692.

*Aminco Laboratory News* for fall 1975 features a study of fluorescent tissue pigments and aging and news of instrument developments. American Instrument. Circle 693.

*Centrifuge Applications Bulletins* are devoted to various aspects of centrifugation and its uses in the laboratory. DuPont Instruments. Circle 694.

*Amino Acid Analyzer Kit* is a set of instructions for the assembly of a single-column amino acid, peptide or polyamine analyzer. Durrum Chemical. Circle 695.

*Know More about Your Polymer* describes the importance of molecular weight distribution as a fundamental polymer property. Waters Associates. Circle 696.

*Sputtering Modules* are listed and their specifications and uses are explained in detail. Denton Vacuum. Circle 697.

*Supergrators* are programmable computing integrators. They are described in a 12-page color brochure. Columbia Scientific Industries. Circle 698.

*Precision Optical Components* is a catalog that includes lenses, mirrors, prisms, beam splitters, polarizers, retarders, and custom design capabilities. Optics for Research. Circle 699.

*Power Supply* is devoted to the LO series of open frame power supplies for electronic instrumentation. Lambda Electronics. Circle 700.

*Instrument Catalog* lists waveform analyzers, computers, digital counters and meters, microwave components, power supplies, printers, timers, signal sources, testers, and voltage standards. Synstron Donner. Circle 701.

*Densitometers* describes a newly acquired instrument line. Corning Glass Works. Circle 704.

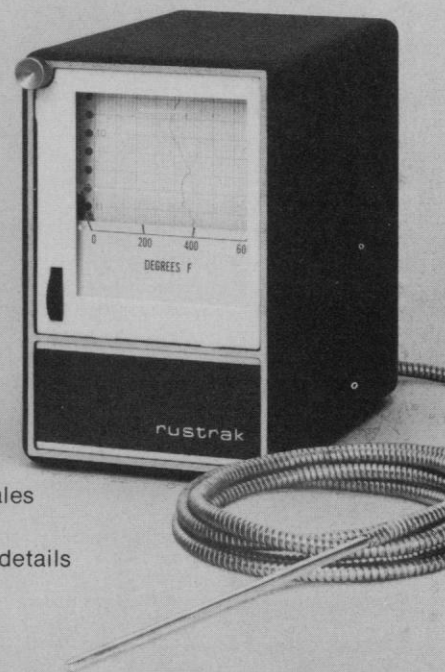
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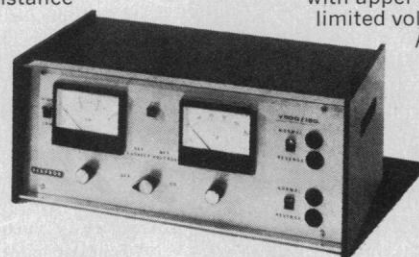
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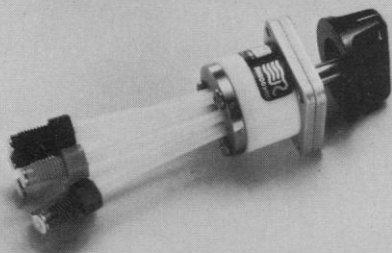
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(Continued from page 76)

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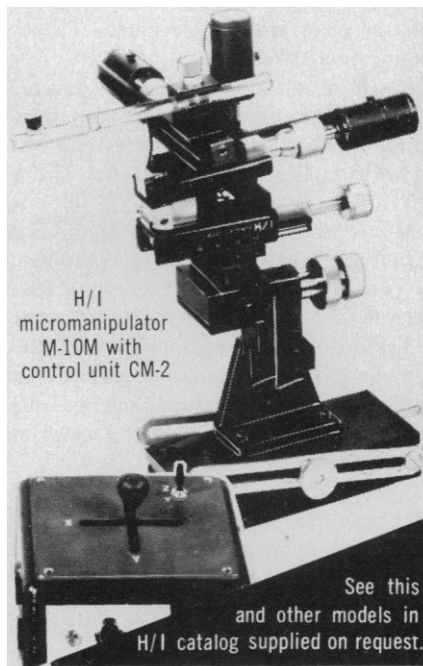
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management of marine fish stocks over  
the last half century is offered as a  
background to an understanding of  
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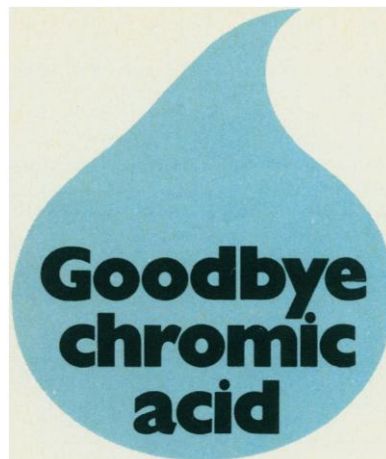
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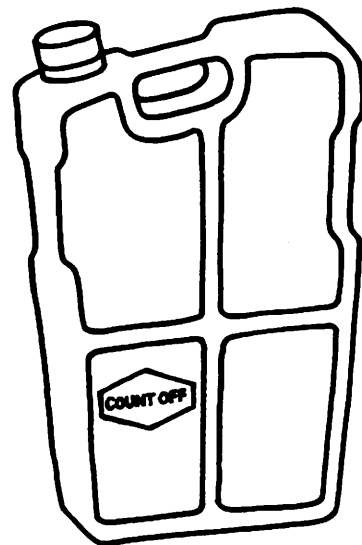
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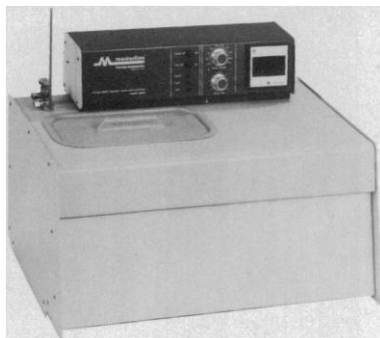


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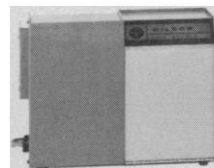
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## Gilson Spectra/Glo Fluorometer

—for liquid chromatography column monitoring of Fluorescamine-labeled compounds

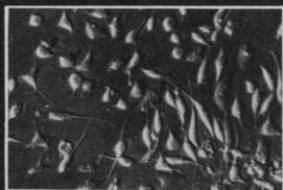
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Photomicrograph of an L 292 Fibroblast taken with the Hoffman Modulation Contrast System; Achromat 10X Objective. Photomicrograph Courtesy: Dr.M.Padnos

Here it is, the basic tool for live-culture investigators. The Olympus CK. We designed and priced it for Tissue Culture Observation. Nothing less.

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depth-of-field requirements of live-culture investigation in mind. Focusing is accurate and backlash-free, with tension instantly adjustable.

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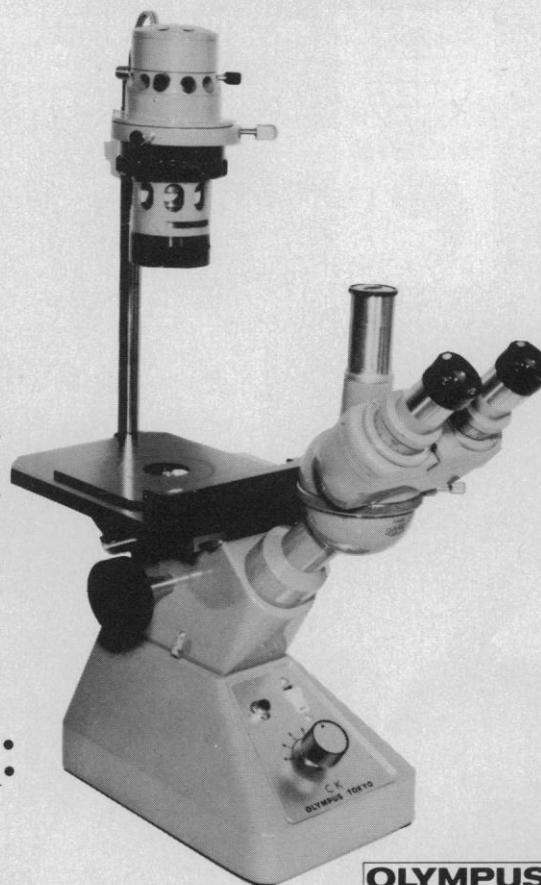
Accessories adapt the CK for phase contrast or polarizing microscopy. For photomicrography, the binocular tube may be replaced with a trinocular tube, which will accept most 35mm, Polaroid or sheet-film automatic or manual photomicrographic bodies.

A transformer in the CK's base powers its variable low-voltage, high-intensity light source. The lamphouse incorporates a built-in condenser with iris diaphragm and filter holder. The light support may be moved to accommodate any type of culture vessel.

If you want to know more about the CK, just ask us. We'll be glad to tell you. After all, it's basic to us.

Write: Olympus Corporation of America, 2 Nevada Dr., New Hyde Park, N.Y. 11040.

In Canada: W. Carson Co., Ltd., 321 Don Park Rd., Markham, Ontario, L3R, 1C2, Canada.

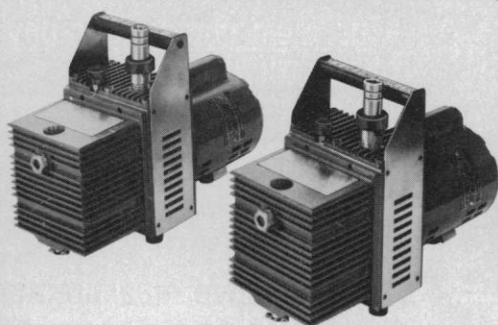


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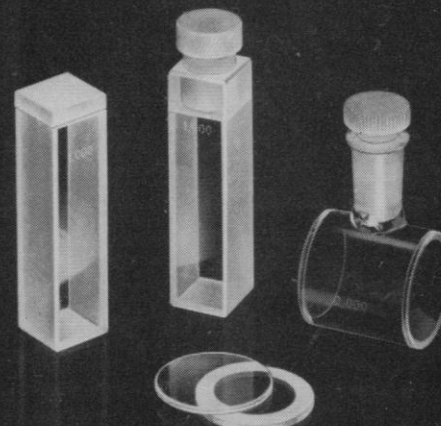
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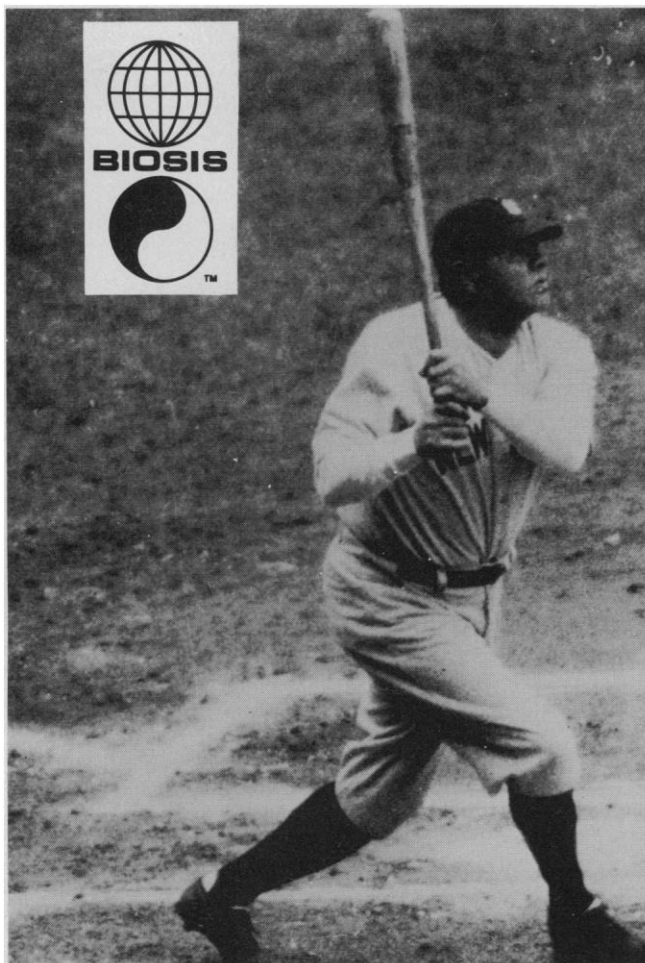
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