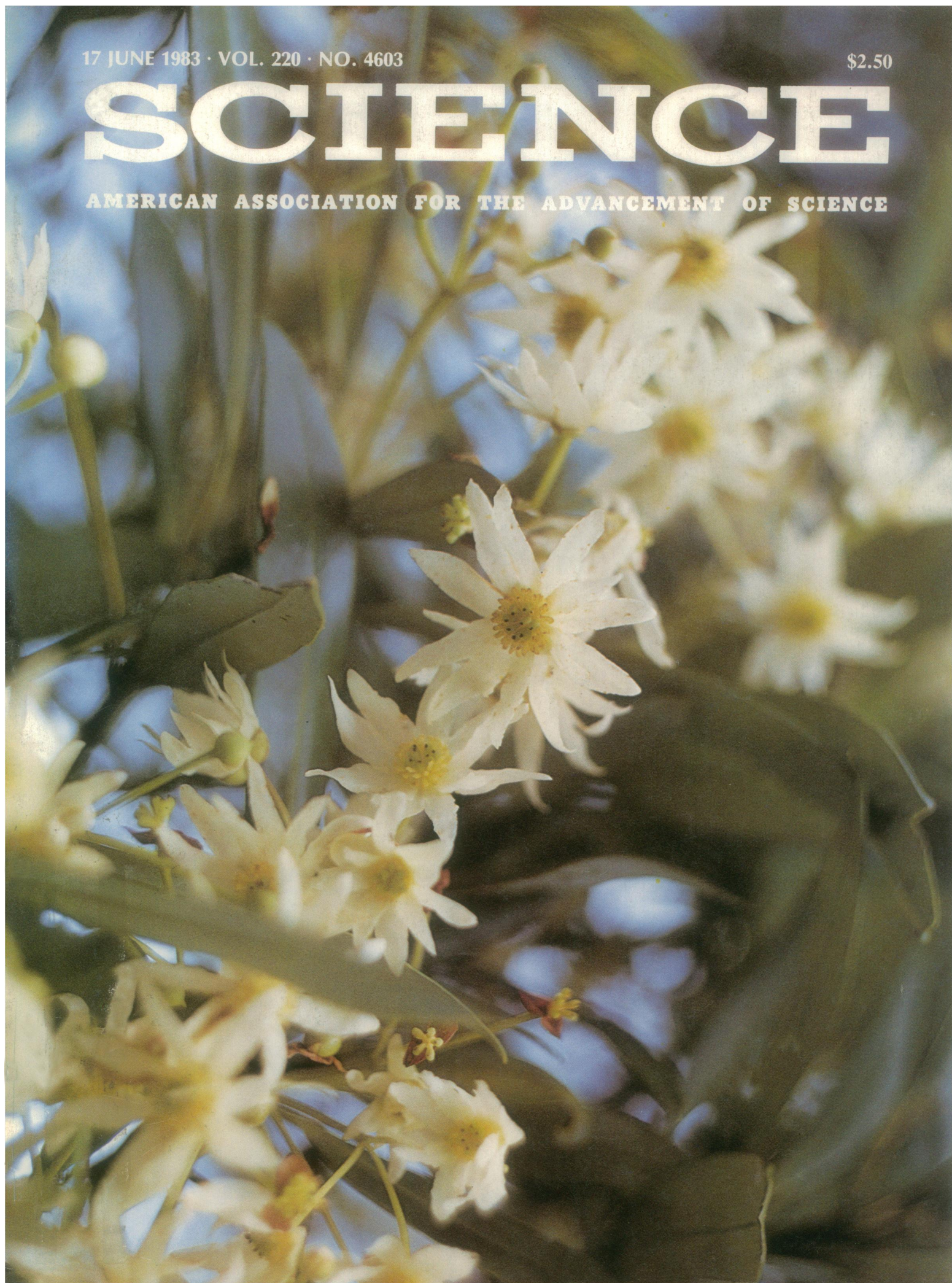


17 JUNE 1983 · VOL. 220 · NO. 4603

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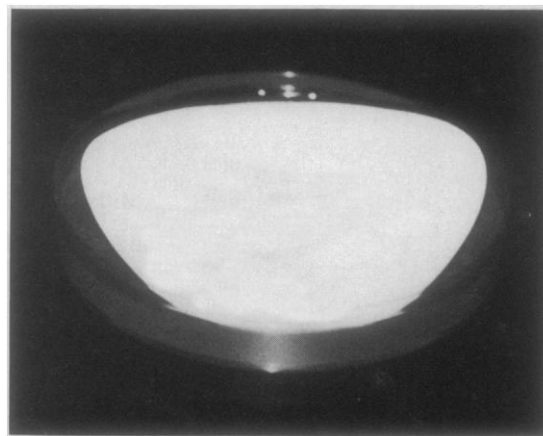
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COVER

Flowers of the primitive angiosperm family Winteraceae (*Drimys granadensis* L.f.) from Costa Rica. Pollen found in the Lower Cretaceous of Israel extends the fossil record of the Winteraceae back 40 million years and is strong evidence for the Early Cretaceous existence of an extant family of flowering plants. See page 1273. [James W. Walker, University of Massachusetts, Amherst 01003]

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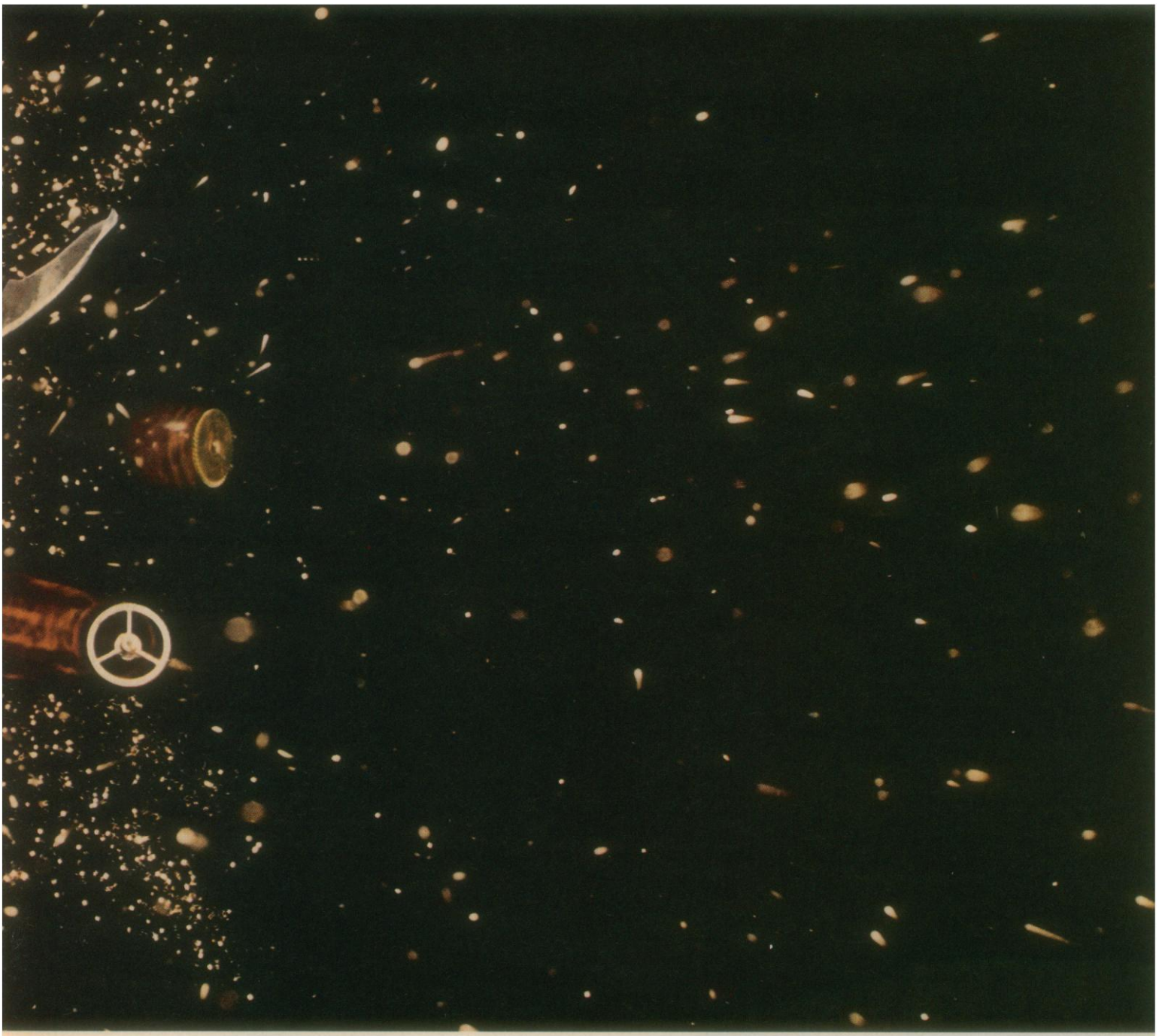
An IBM 3081: subatomic physics at Stanford

Finding the pieces in one billionth of a second.

Trying to see how a watch works by slamming two together and examining the pieces is a popular analogy with physicists. It explains how they examine the innermost secrets of subatomic particles.

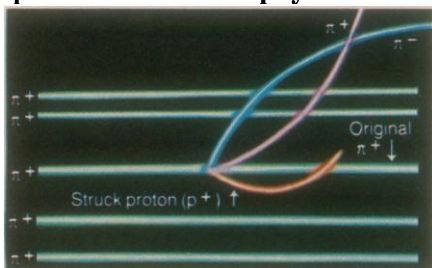
The watches represent matter and antimatter—electrons and positrons that whirl in opposite directions through a 1.3-mile ring at the Stanford Linear Accelerator Center (SLAC). Approaching the speed of light, they collide and generate bursts of subatomic shards that last for only a tiny sliver of time.

An IBM 3081 processor at SLAC has proved a smashing success in finding meaning in millions of bits



of data from these experiments, which may run for weeks or months.

As Charles Dickens, director of SLAC computing services, says, "Our 3081 moves data in and out of its central processor fast enough to provide the scores of physicists with



A significant event at SLAC. Positive pion (π^+) strikes proton (p^+) creating two new pions, one negative and one positive. Four other pions pass through with no contact.

immediate access to experimental results."

They can think about the problem, and not worry about the computer, with microcode-assisted VM/CMS. With this flexible IBM software and the 3081's reliability, physicists can, with confidence, steal a look for a significant event during the experiment.

Dickens explains, "Before, people might say, 'If I'd only known what was happening, I'd have done things differently.' Now they see the results as they happen."

The 3081 supports 450 terminals for interactive computing under VM/CMS. It performs well in

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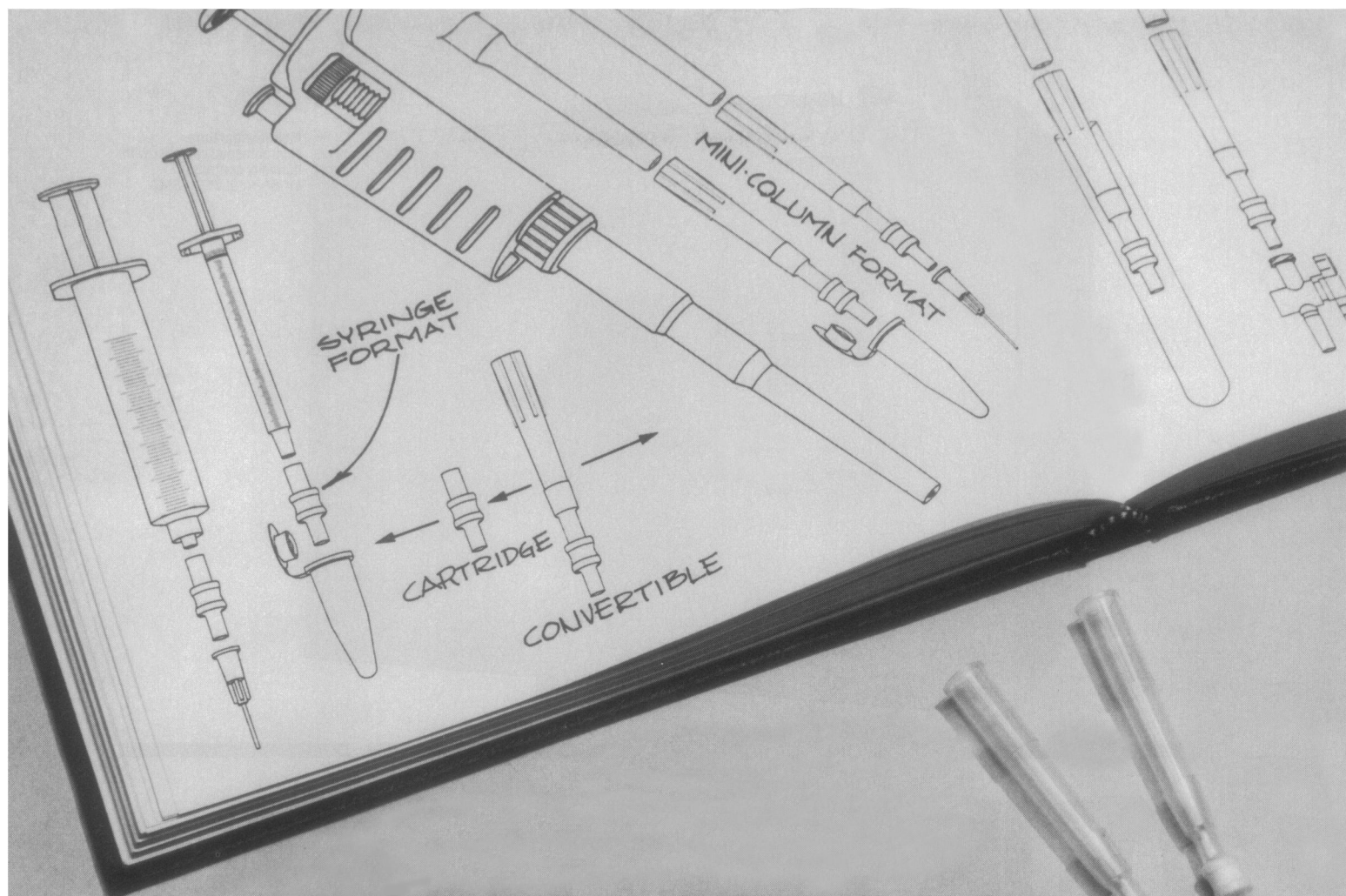
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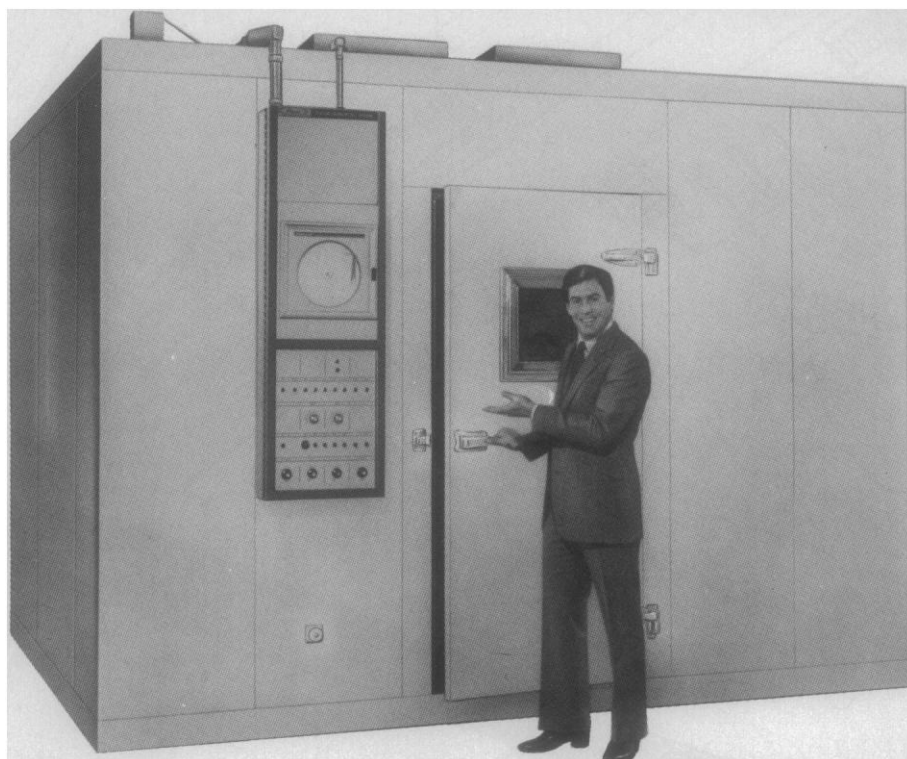
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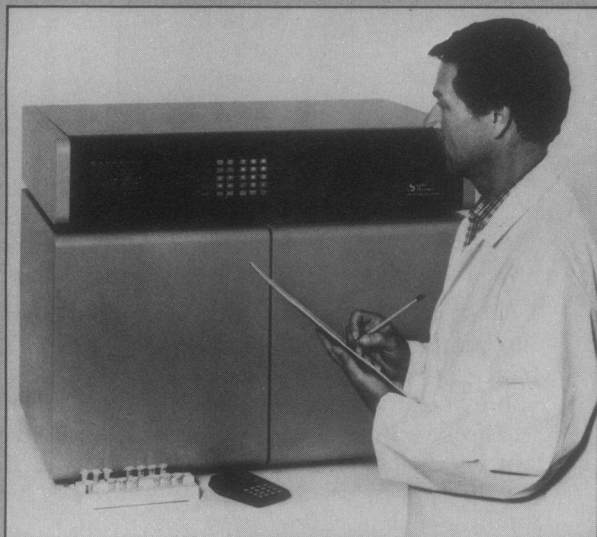
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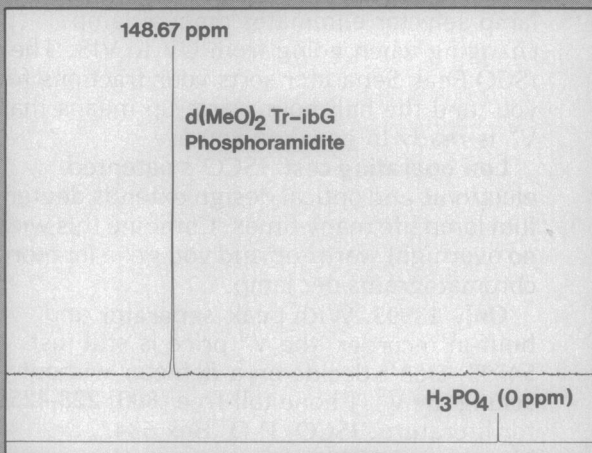
BIOSYSTEMS UPDATE

A New DNA Synthesizer with Unique Capabilities

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deliveries have now begun. The Model 380A is the only instrument of its kind to address all the elements of automated syntheses:

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AND COMING SOON

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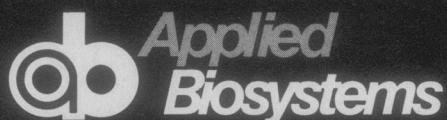
¹Test results available upon request.

²Patent pending.



Analytical autoradiogram of the crude isolates of three automated syntheses with their corresponding purified oligonucleotides.

For more information circle #25.



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| ☐ | (GRF I-44) (pfs) | 1.0 mg | 388.00 |

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Guillemin et al., report this peptide has growth hormone releasing activity.

Ref.: Guillemin, R., et al., Science, **218**, 585 (1982).

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|---------------|-------------------------|--------|--------|
| Ala- | GROWTH HORMONE | 0.1 mg | 58.20 |
| G 0263 | RELEASING FACTOR | 0.5 mg | 194.00 |
| ☐ | (GRF I-40) (pfs) | 1.0 mg | 339.50 |

Synthetic

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| | Hydrochloride Salt | 250 mg | 132.00 |

Substrate for dipeptidyl-aminopeptidase (DAP IV [E.C. 3.4.14.4.])

Ref.: Feller, A.C., et al., Br. J. Haem., **51**, 277 (1982).

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| Ala- | SARCOSYL-L-PROLYL-L- | 1 mg | 9.00 |
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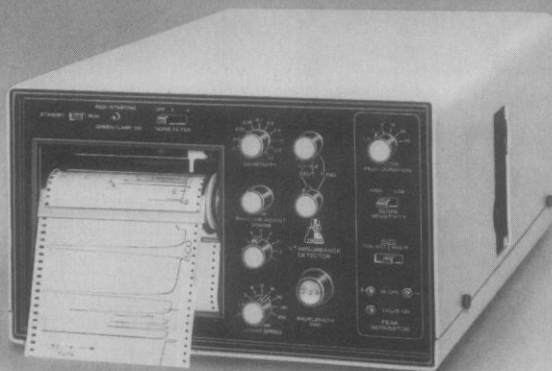
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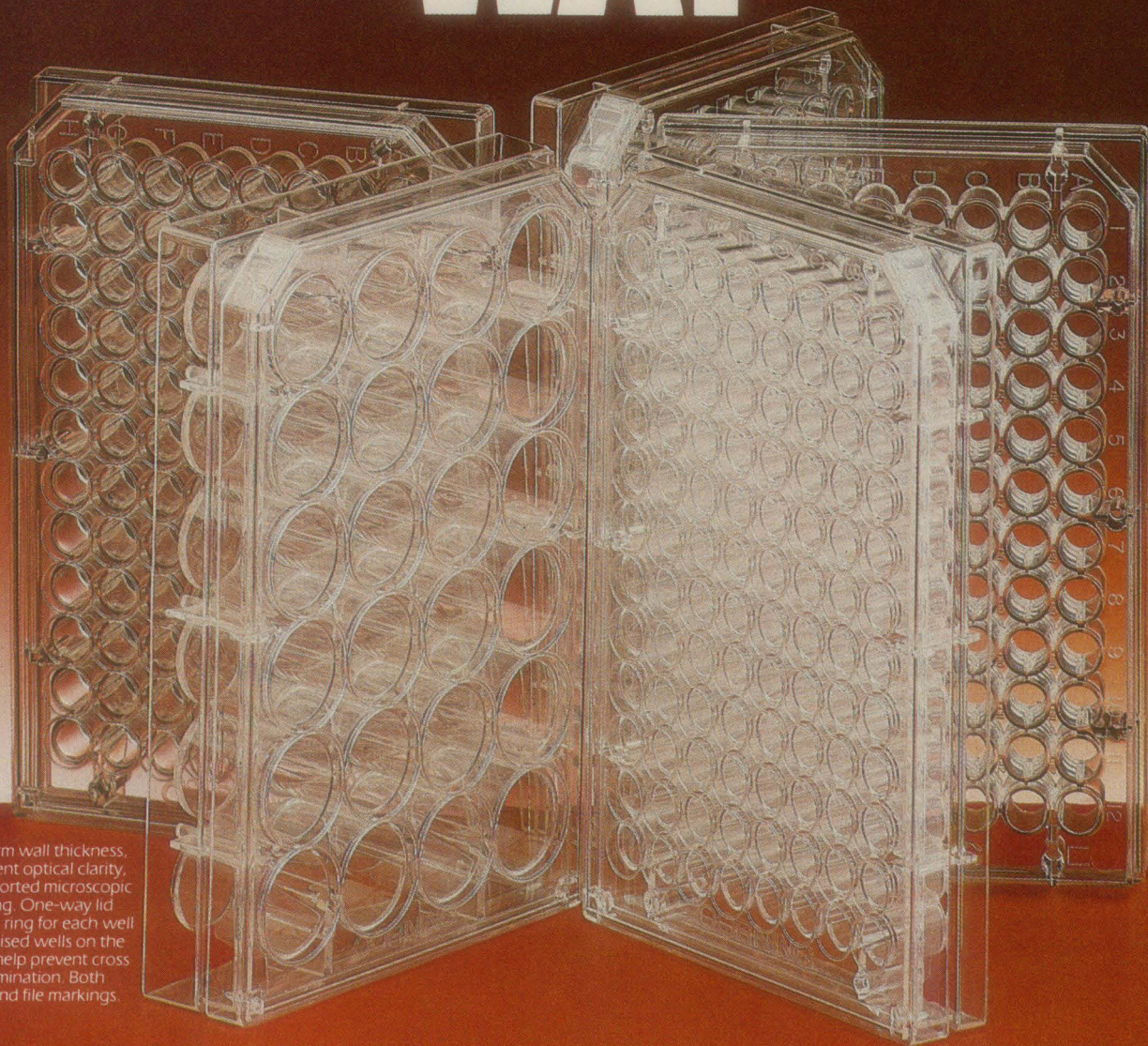
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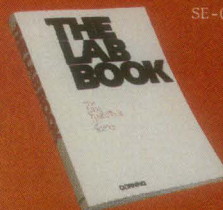
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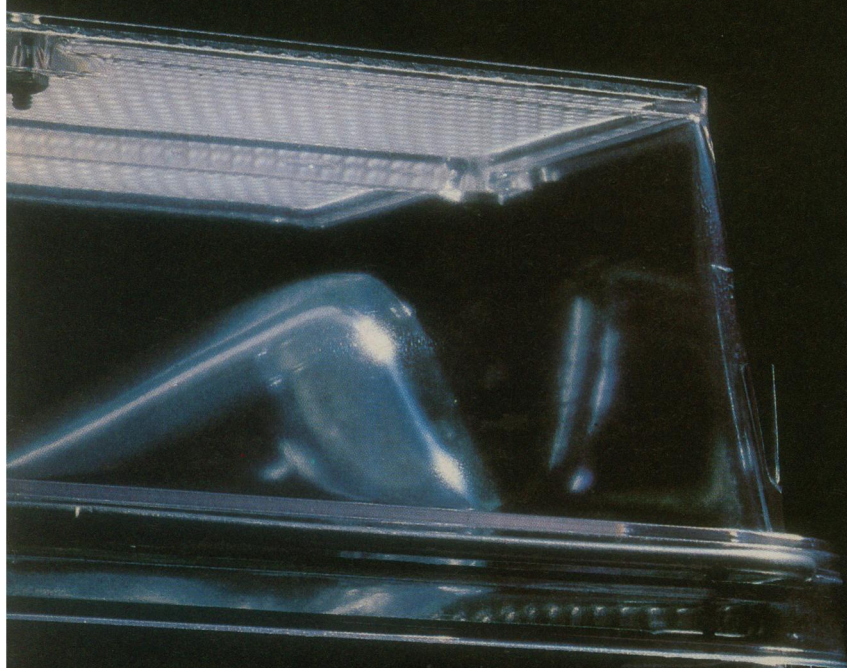


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References

R. S. Sedlacek, H. D. Suit, K. A. Mason, and E. R. Rose; 7th ICLAS Symp., Utrecht, 1979; Gustav Fischer Verlag, Stuttgart, Germany, 1980; New York, 1980.

See also: abstracts of papers Nos. 32 and 35 of papers presented by R. S. Sedlacek and R. P. Orcutt at 32nd Annual Session AALAS, Salt Lake City, Sept. 20-25, 1981.

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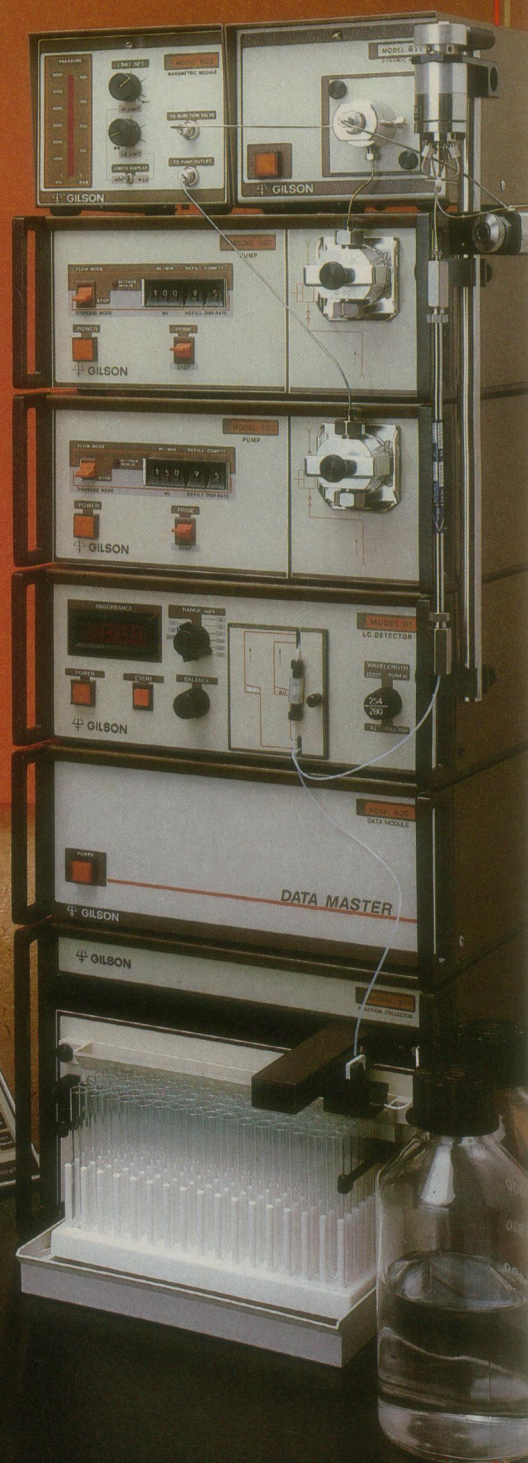
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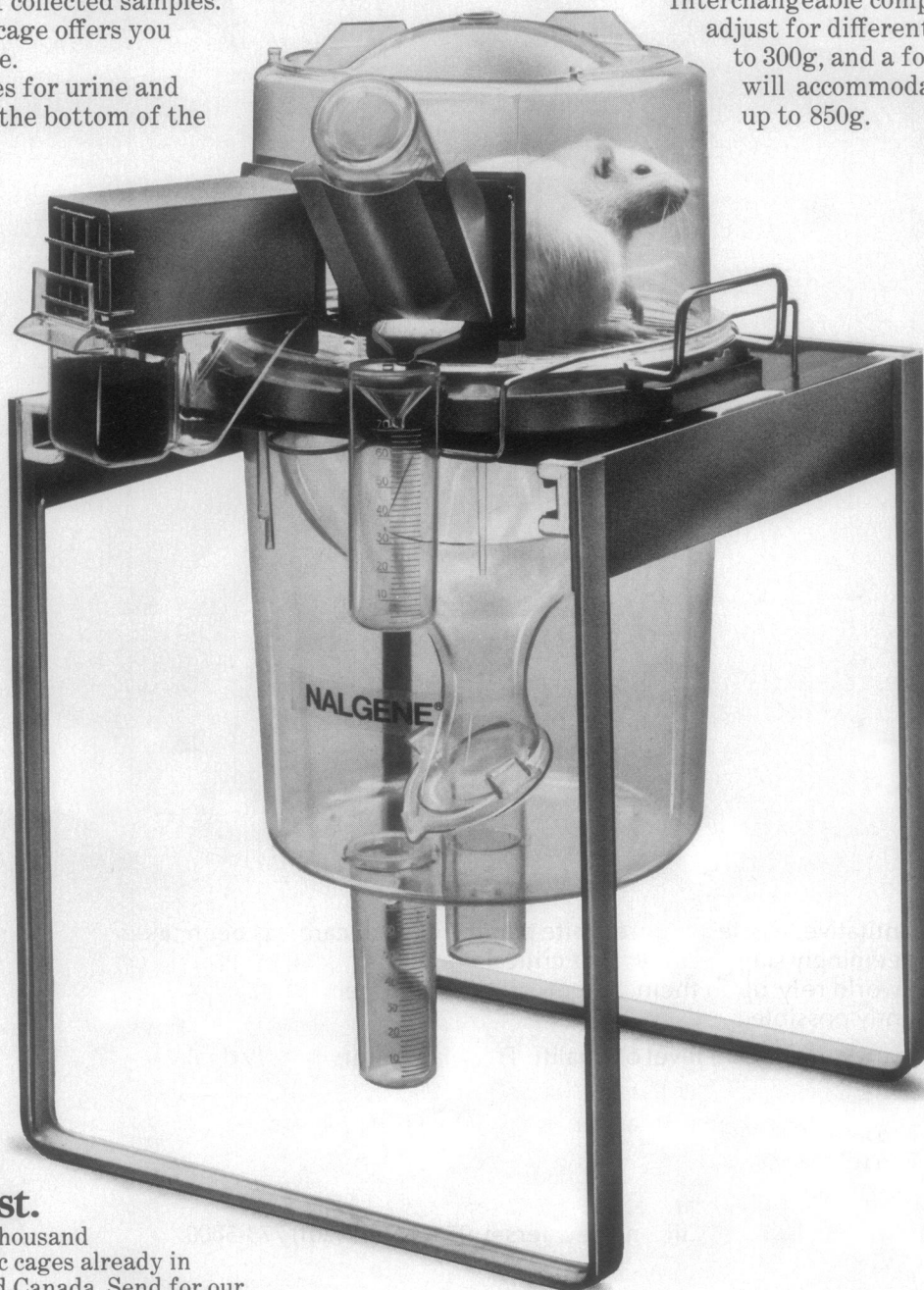
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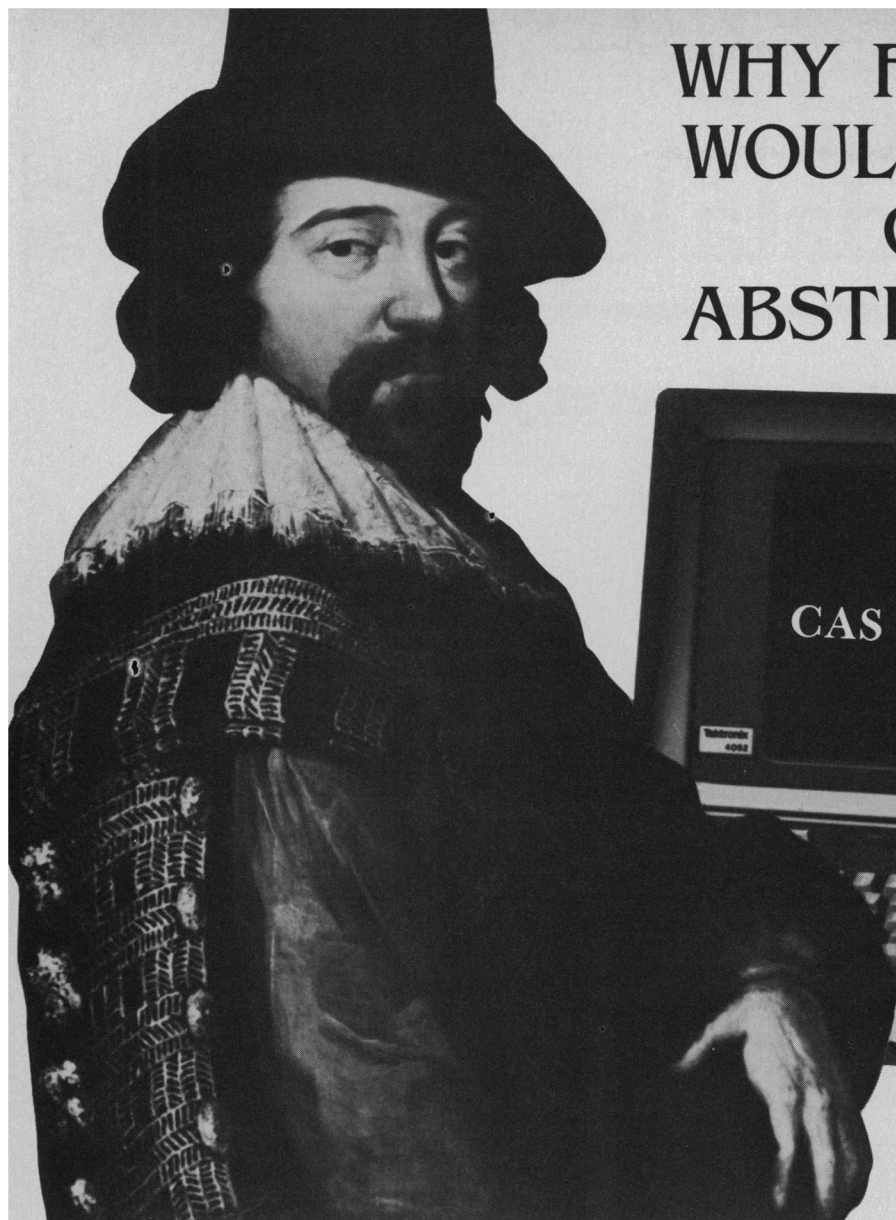
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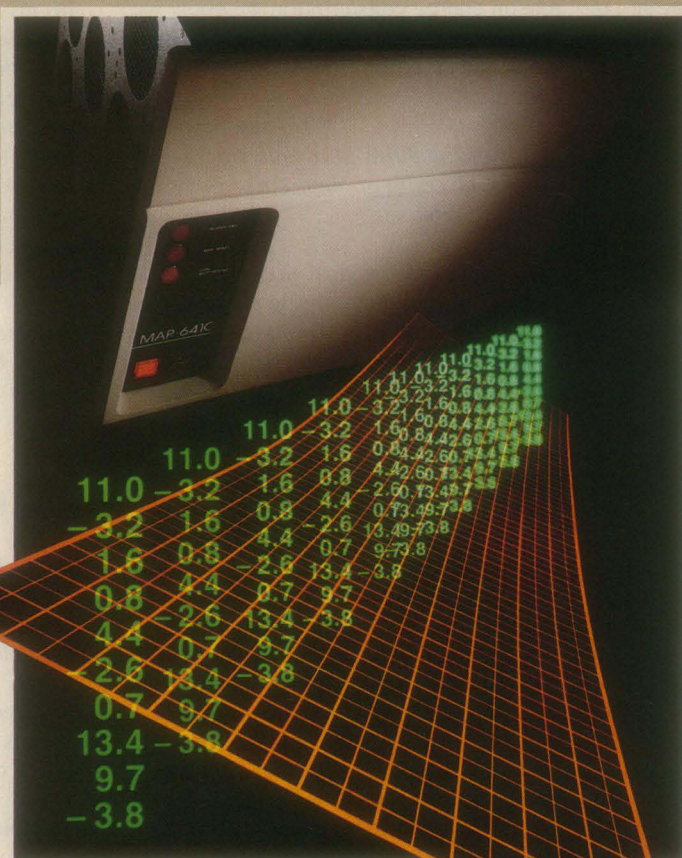
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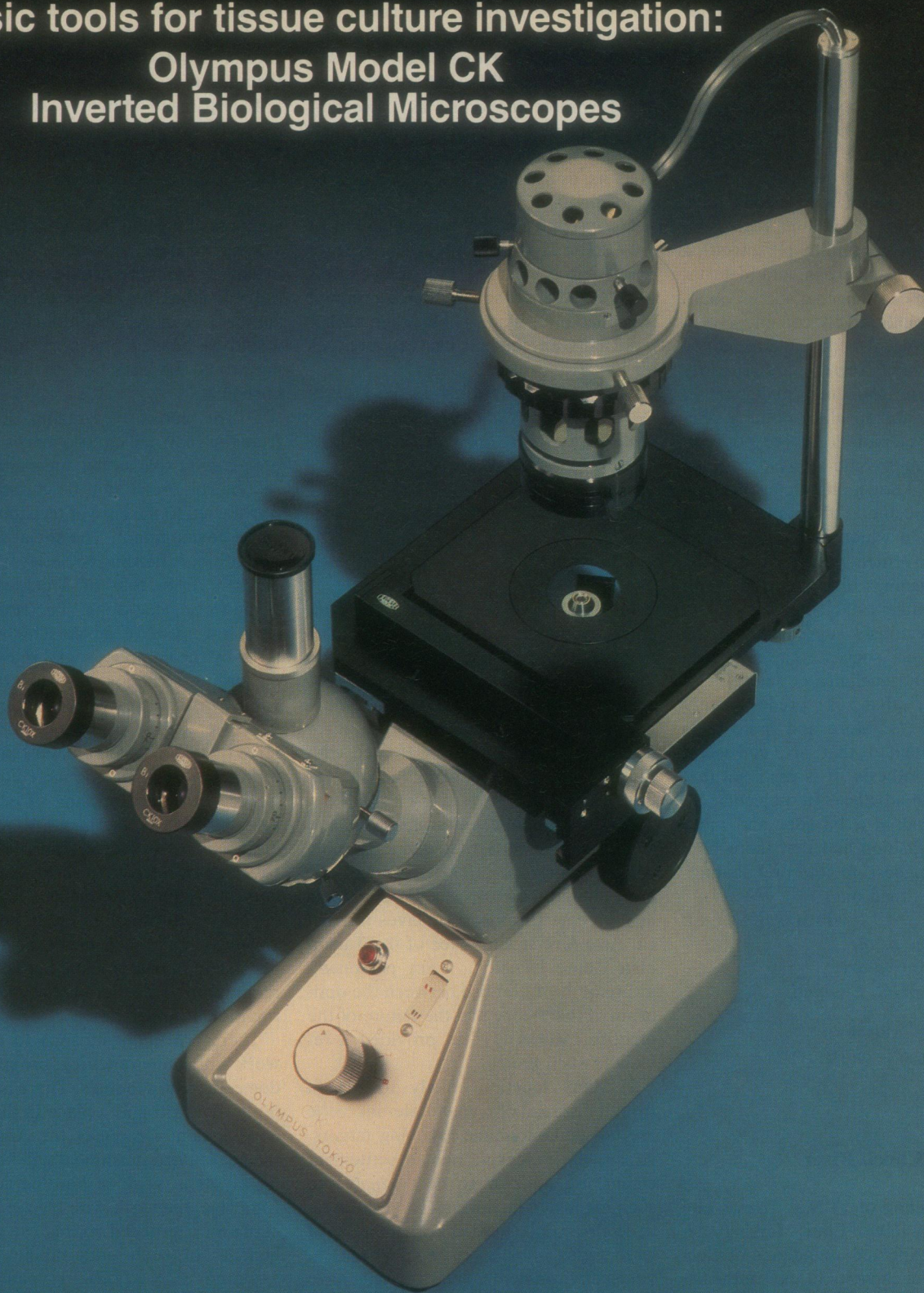
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Science and Science Education Are In

Science and science education are again in the political limelight. Viewed as the precursor of technology, science, particularly physical science, has become the means to secure the free world from exploitation through military intimidation, to ensure U.S. economic superiority in an increasingly competitive world of technology, and to alleviate unemployment.

Much of the political rhetoric indicates that favorite status for physical and biological R & D and favorite status for mathematics, science, and engineering education may be in part the windfall of a search for a quick fix for complex issues. Be that as it may, mathematics, science, and engineering have essential contributions to make, and the interest in science and science education is there. This interest gives the scientific community an exceptional opportunity to develop a realistic environment for science, engineering, technology, and education—an environment that is stable and minimally responsive to the changing winds of political fortune.

The legacy of scientific investigation is knowledge: knowledge that extends our awareness, understanding, and appreciation of the universe, the planets, our immediate environment, ourselves, and our relations with others; knowledge that extends our capability to develop and deliver goods and services and to develop and modify social, economic, and political systems.

Without denying in any way the tremendous benefits derived by society from the products of technology, as a nation we must be ever mindful of the negative impacts of technology on society, diligent in our endeavors to minimize these burdens, and forthright in our endeavors to attain a balance in the distribution of the benefits and the burdens of technology. Knowledge and understanding of both the benefits and the burdens inherent in technology are essential to the attainment of a realistic environment for science and technology.

Without denying in any way the essential role of the scientific and technological community, a subset of the public, in the extension of scientific knowledge, the development of technology, the assessment of the impact of technology on society, and the communication of these developments to the public, as a nation we must be ever mindful that value decisions related to the quality of life, and hence the quality of the environment, are the prerogative of the total public and are often made by surrogates for the public. Meaningful educational experiences in the sciences and the humanities in schools and colleges, both for those who become scientists and engineers and for those who do not, are essential for responsible participation in value decisions concerning science and technology.

Appropriate educational opportunities in mathematics, science, and engineering can be attained and long sustained only in an environment that also provides appropriate educational opportunities in the languages and the humanities, and vice versa. Favorite status for mathematics, science, and engineering education will disrupt the institutions we seek to strengthen.

Without denying in any way the need for industry and the mission agencies to carry on scientific investigations to acquire knowledge essential for ongoing developments of specific goods and services, as a nation we must be ever mindful that many of the most significant breakthroughs in technology have been based upon knowledge derived from investigations that were not, and probably could not have been, identified initially as areas for targeted research. The continuous augmentation of shared scientific knowledge is an essential investment in research potential and sustained technological growth.

We have a choice to make: either exploit the current interest in science and science education to obtain short-term gains for a subset of society, or utilize the current interest to foster a realistic environment for science, engineering, technology, and education and, in so doing, foster their sustained growth and thus enhance their contribution to society.—ANNA J. HARRISON, *Mount Holyoke College, South Hadley, Massachusetts 01075*

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