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Batavia, Dutch East Indies, as it appeared around 1780. In April of 1815, Batavia was covered with half an inch of ash in the aftermath of Tambora's eruption more than 700 miles away. See page 1191. [Aquatint by Ivan C. Rynne, courtesy of E. T. Archive, London, England]

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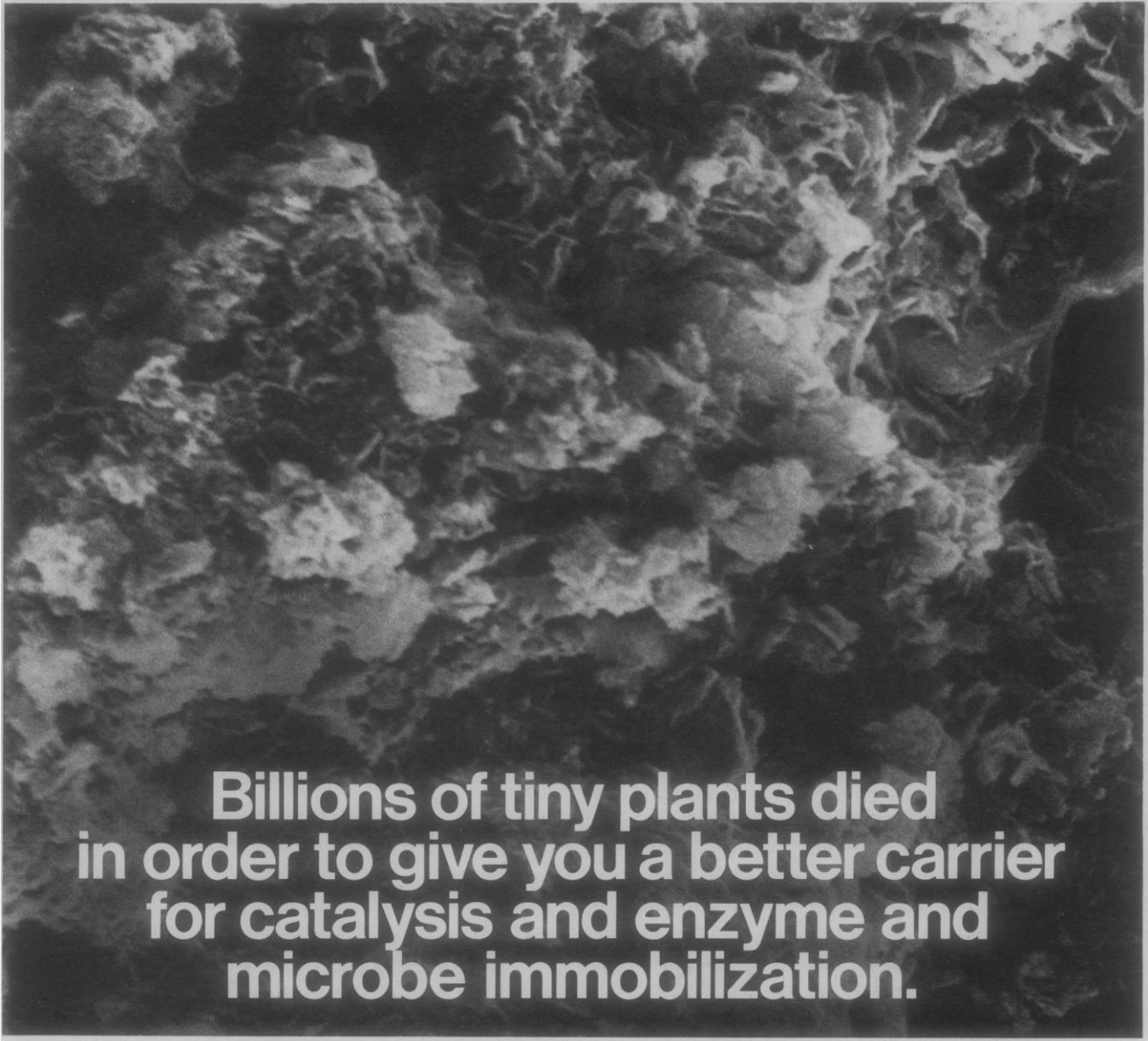
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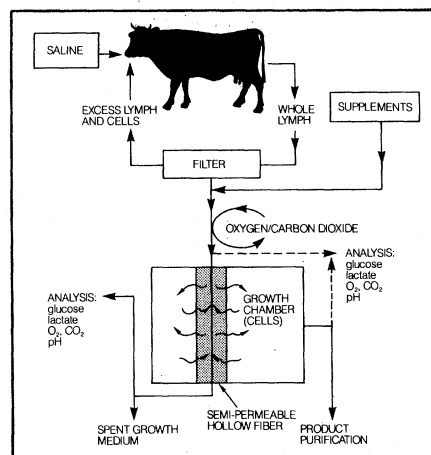
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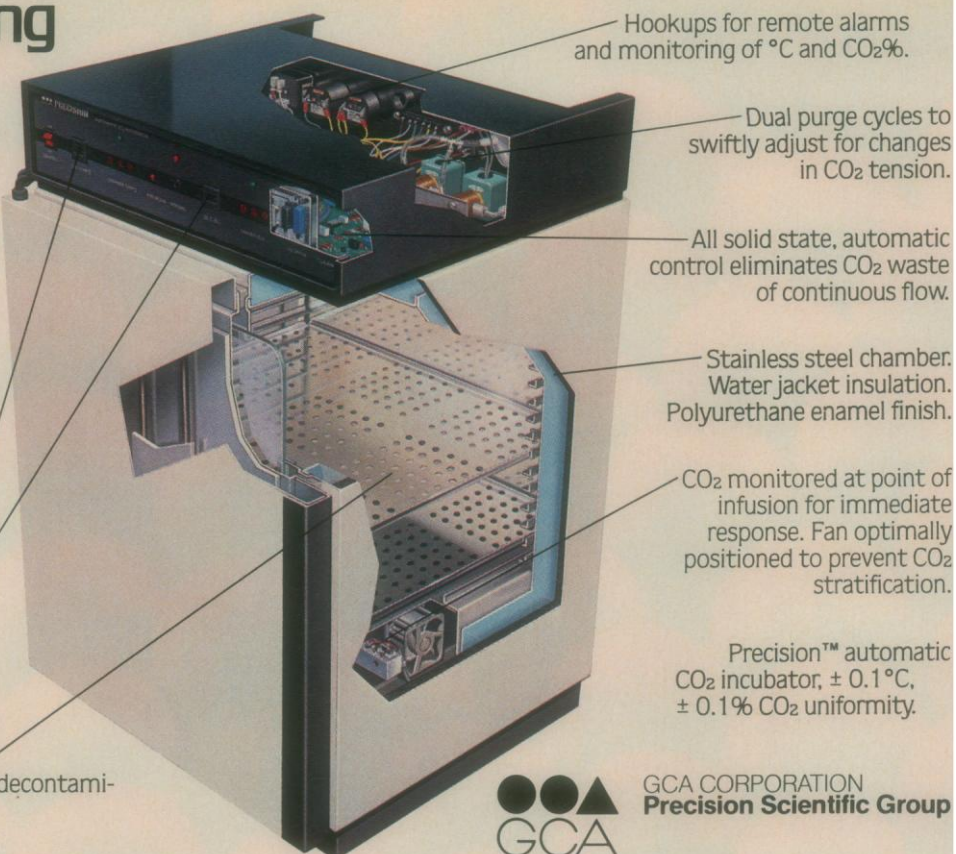
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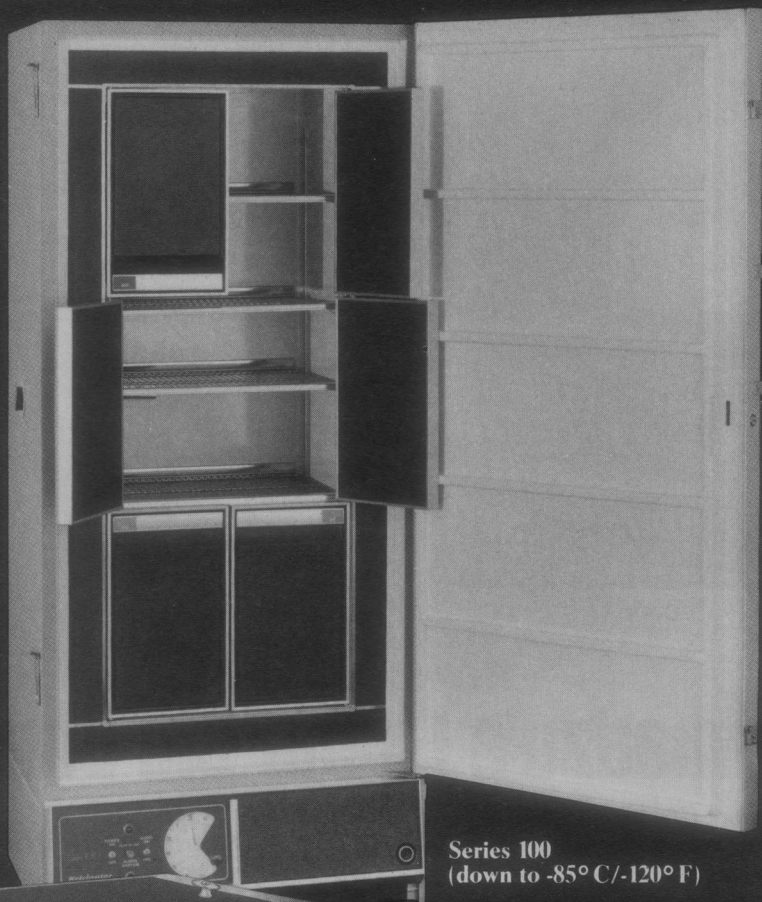
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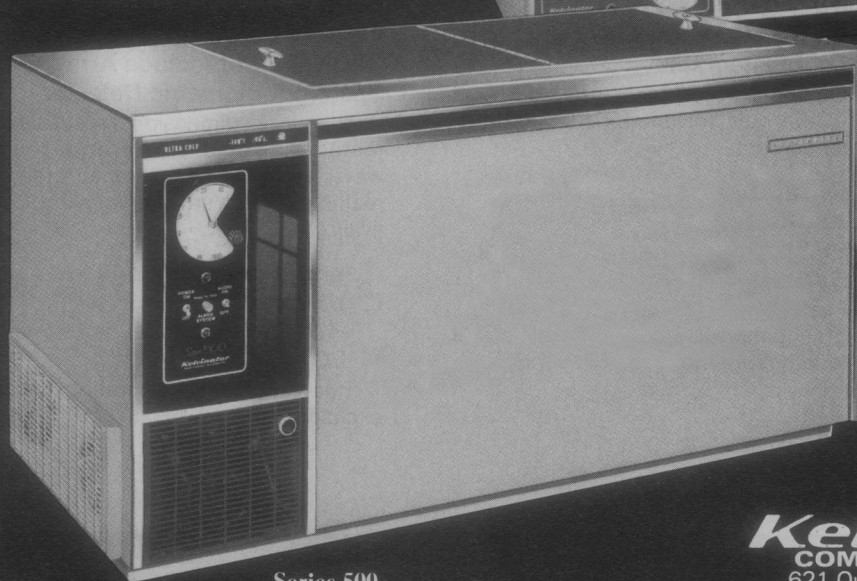
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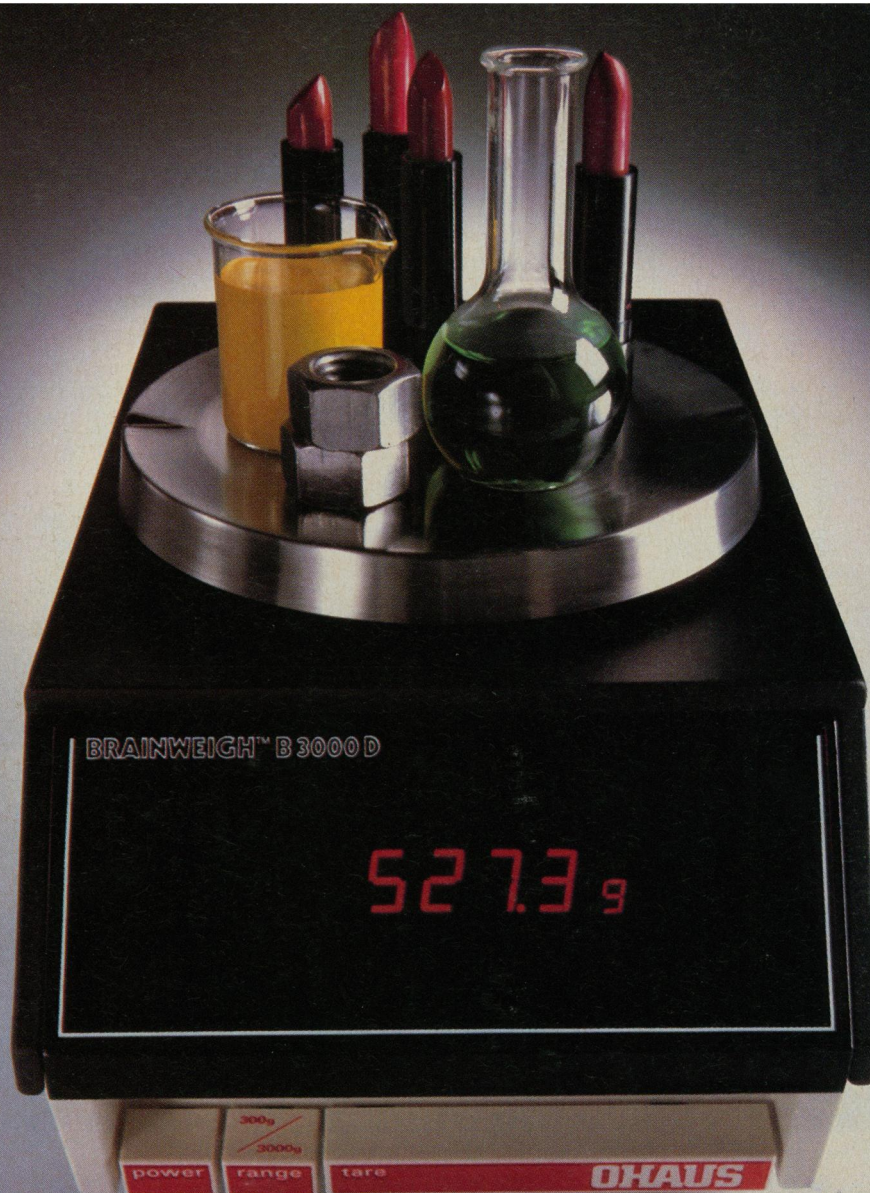
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The new MICRO-ISOLATOR™ System:

A remarkably simple caging system that has the microbiological integrity of a complex isolator... without its high cost or the awkward limitations on the movement of people and animals.

What's different about the MICRO-ISOLATOR System?

At first glance, it looks as though we've just put a polycarbonate cage on top of a standard mouse cage with the "roof" of the top cage vented. Right . . . but there's more. The recessed roof functions as a static filter by virtue of a special filter material that's protected by a perforated aluminum sheet. And, most importantly, the top cage overlaps the bottom cage and effectively forms a giant Petri dish-like structure. Result: There is a substantial interchange of gases *and* an effective microbiological barrier.

How effective is all this?

This system, when incorporated into most existing facilities (with only minor facility modification), can maintain axenic mice in the gnotobiotic state. The static filter and the cage overlapping effectively keep dust particles—which are the "microbiological taxis"—out of the system. Accordingly, this is really a miniature isolator, an "island," a protected microenvironment within any macroenvironment.

Does it really work? Even immune-suppressed mice have been successfully maintained in this system *adjacent* to mice contaminated with *Pseudomonas*, *Pasteurella*, *Citrobacter*, *Aerobacter*, *Klebsiella*, and *Staphylococcus aureus* without any transfer of organisms.

What are the applications of the MICRO-ISOLATOR System?

It's ideal for the maintenance of a stable limited defined-flora mouse colony . . . for either animal production or research. It is also a first-rate quarantine housing system because animals from different sources with differing microbiological profiles can be quarantined in the same room without cross-contamination. (The barrier works in both directions: keeps contaminants in or out.)

What are the other advantages?

This caging system is rigid, durable, easy to handle, uses minimal rack space, is easy to sterilize, and because the top fits snugly on a standard 29.2 x 19 x 12.7 cm mouse cage, it doesn't dislodge when cages are pushed together (the way other filter caps sometimes do).

The system eliminates the expense and inconvenience of starting or maintaining a complex SPF barrier type facility. Simple, inexpensive, and no time-consuming "entry" procedures.

Finally, the colony odor is significantly minimized; allergic responses are substantially reduced through containment of animal dander.

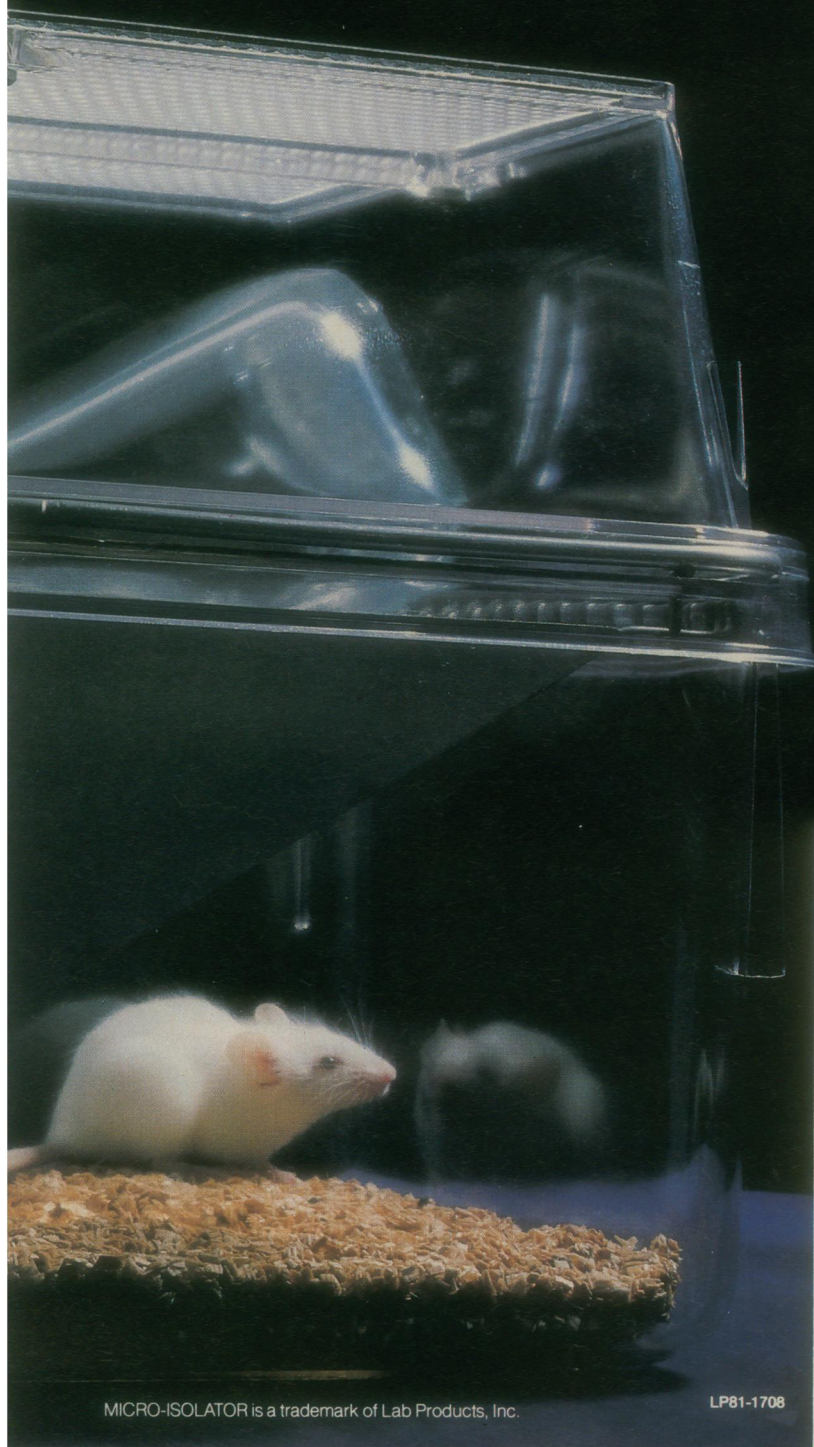


But is the air interchange really adequate?

Institutions now using this system report that hypoxia is not a problem. Additionally, ammonia level is not a problem if the population density per cage is kept at three to four mice and bedding changed every three or four days... especially when relative humidity can not be well controlled. (Ammonia can be totally eliminated from the colony if defined-flora mice without urease-positive aerobic bacteria are used.)

What else do I need to make the MICRO-ISOLATOR System work?

To effectively maintain the isolation of the animals at all times, cages must be opened and serviced within a Class II Biohazard Hood and aseptically supplied with sterile feed, bedding, and water. (For additional guidance on the use of this system, please consult the references below.)



MICRO-ISOLATOR is a trademark of Lab Products, Inc.

LP81-1708

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To order the new MICRO-ISOLATOR System, please refer to the following catalog number:

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 - 10227—Stainless steel wire bar cover
 - 10204—Polycarbonate MICRO-ISOLATOR filter bonnet
- Above items may be ordered individually.

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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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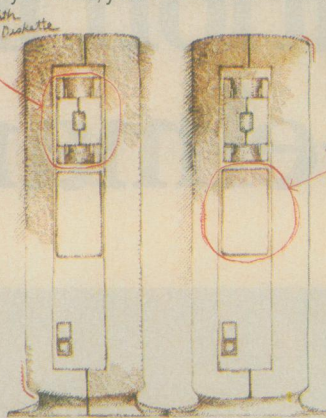
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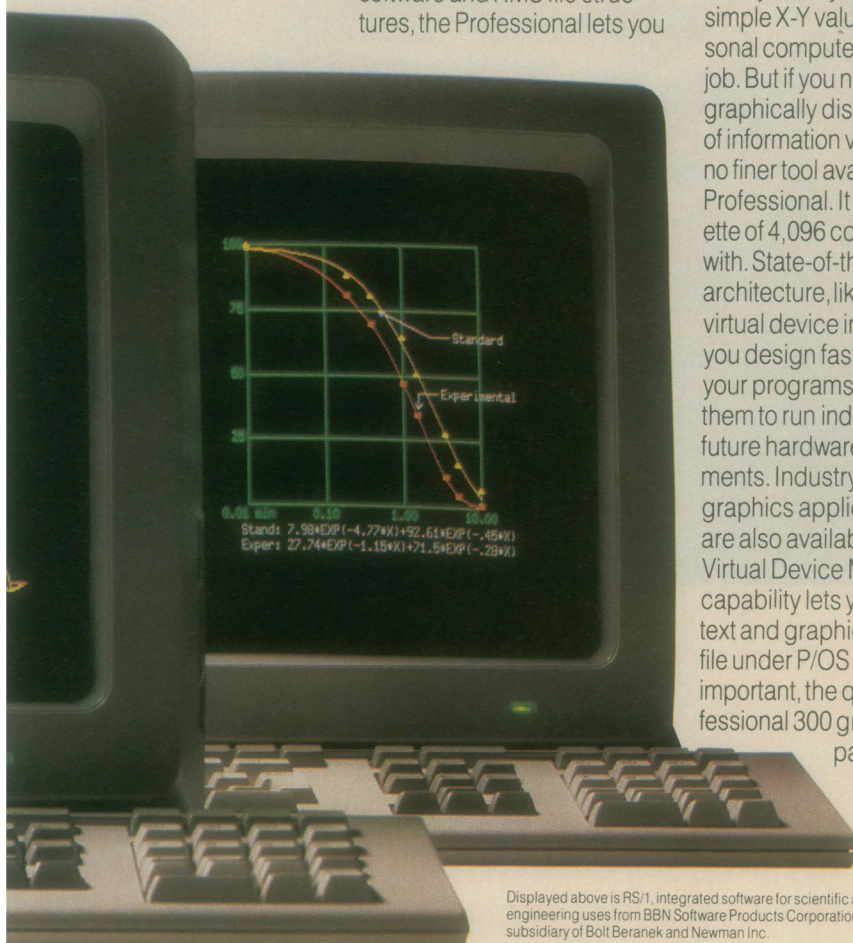
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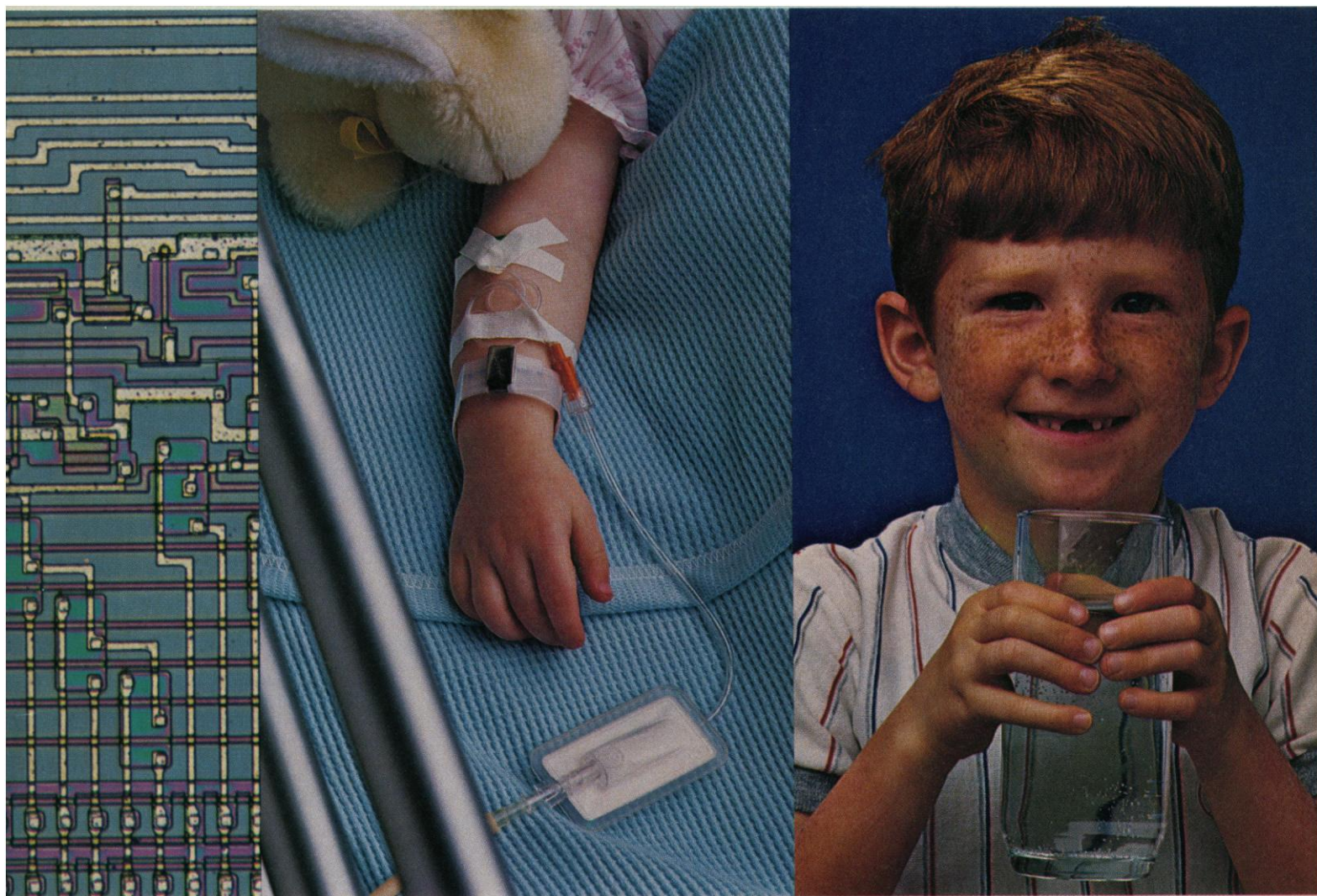


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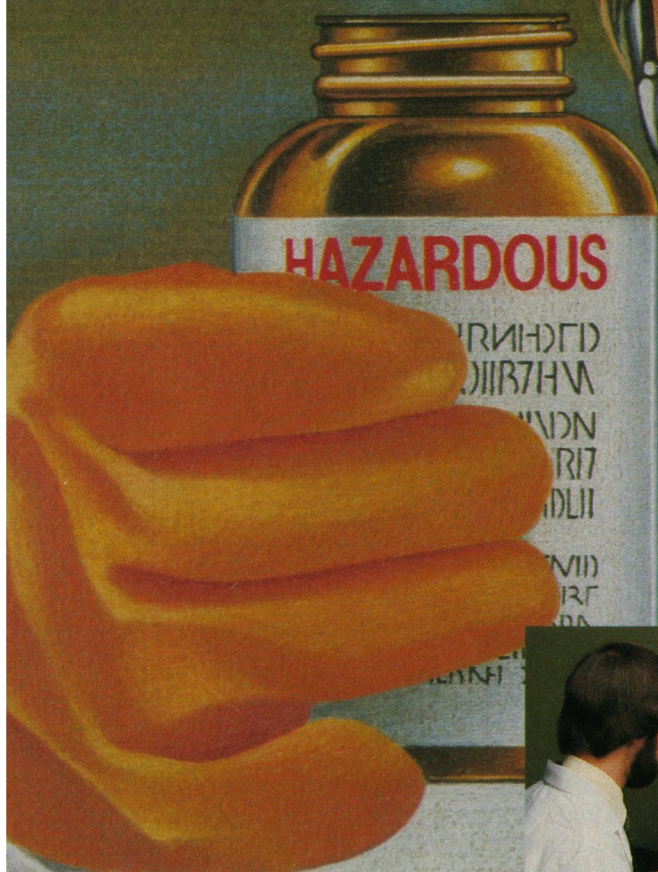


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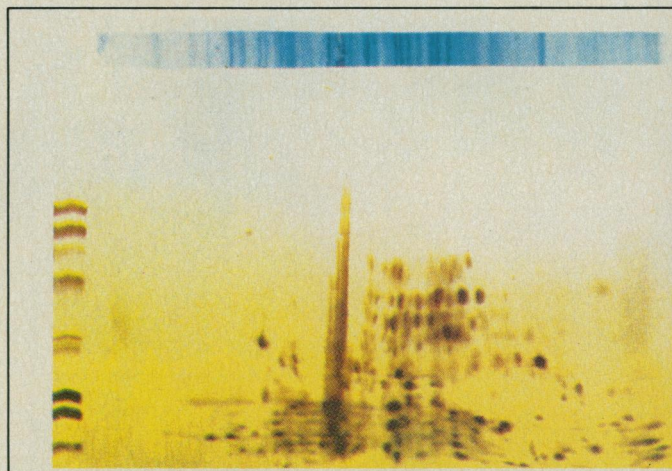
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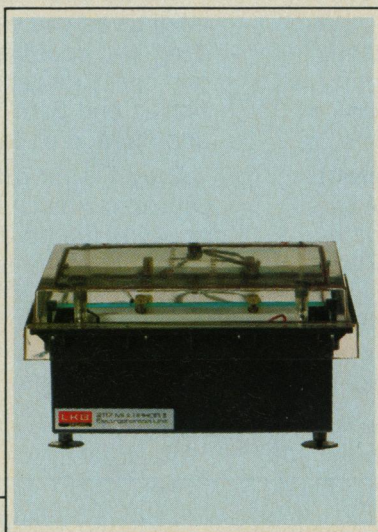
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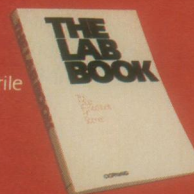
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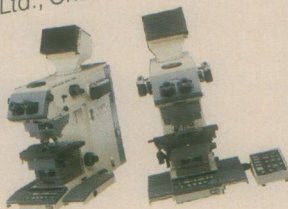
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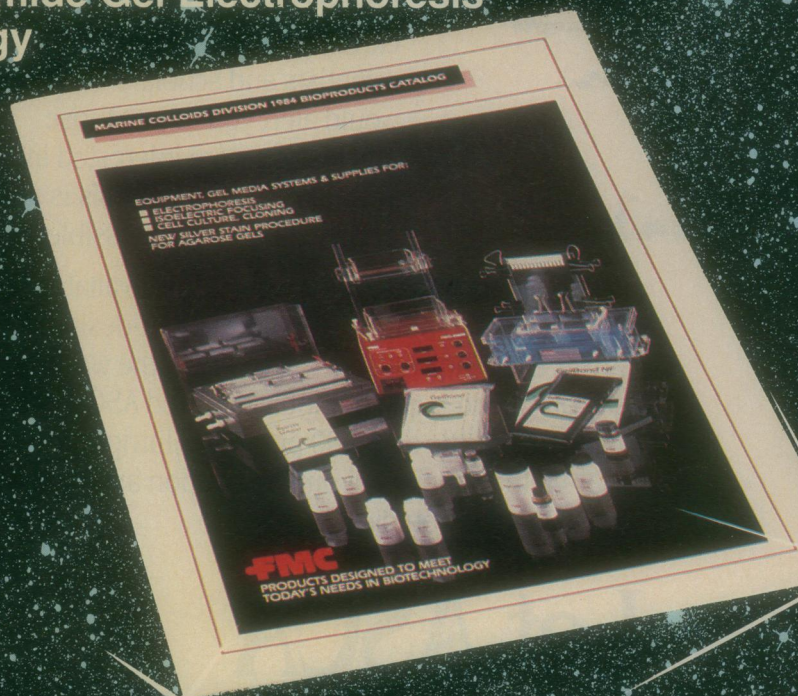
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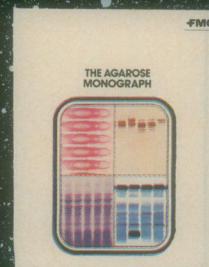


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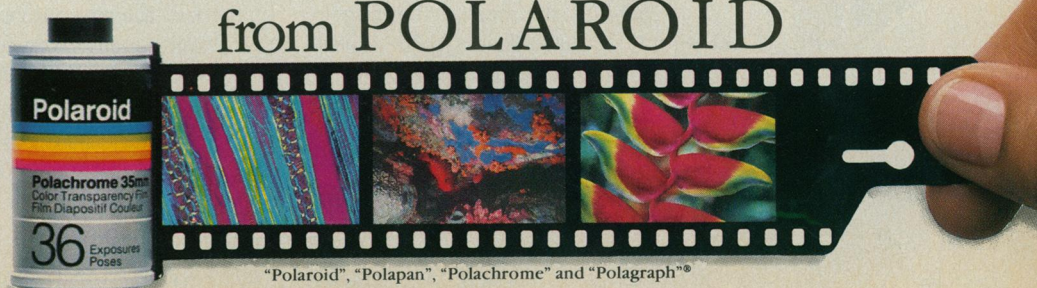
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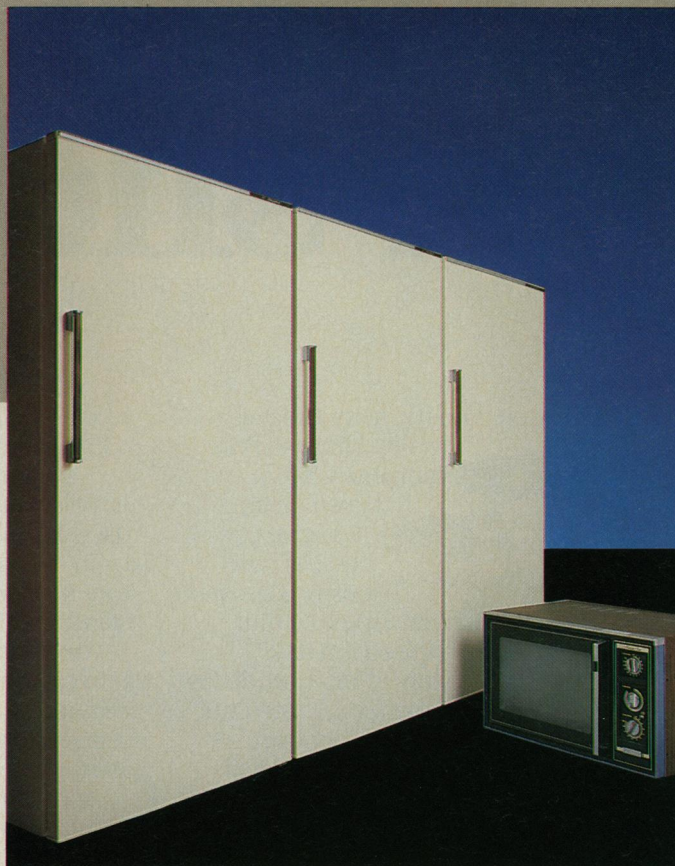
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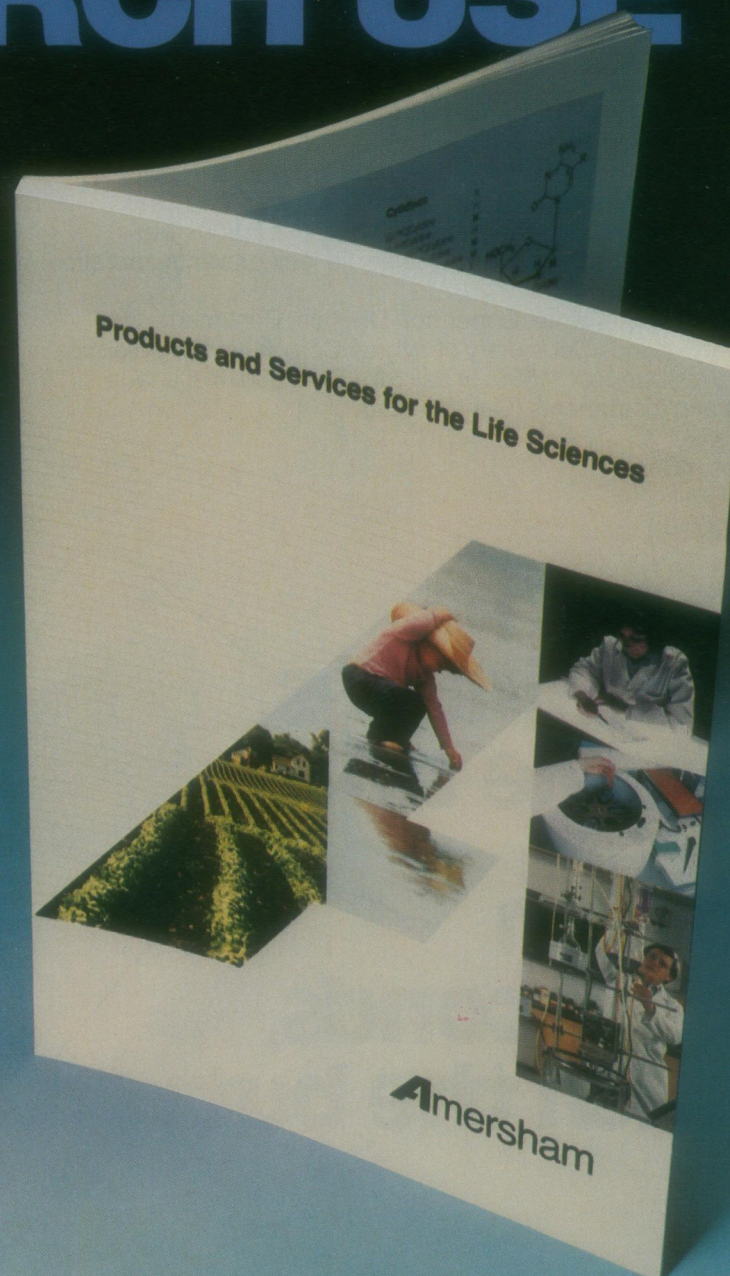
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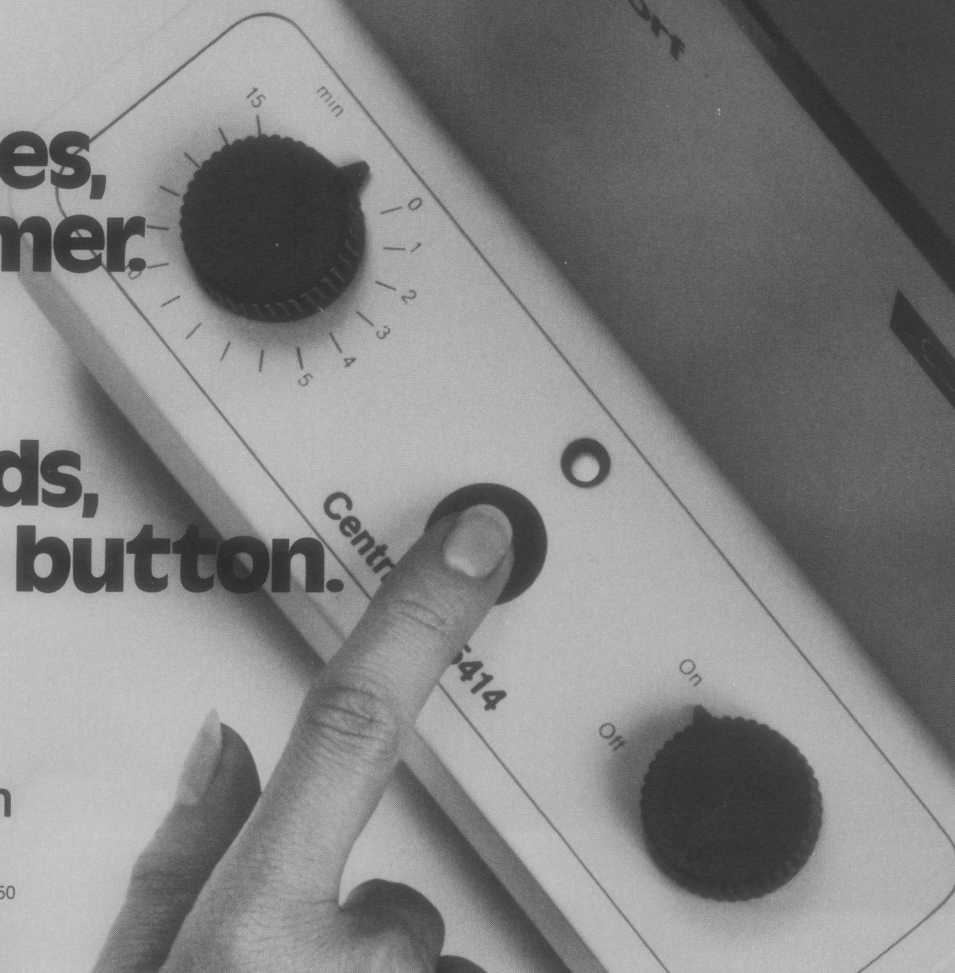
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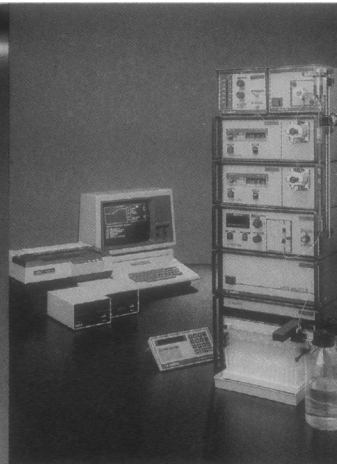
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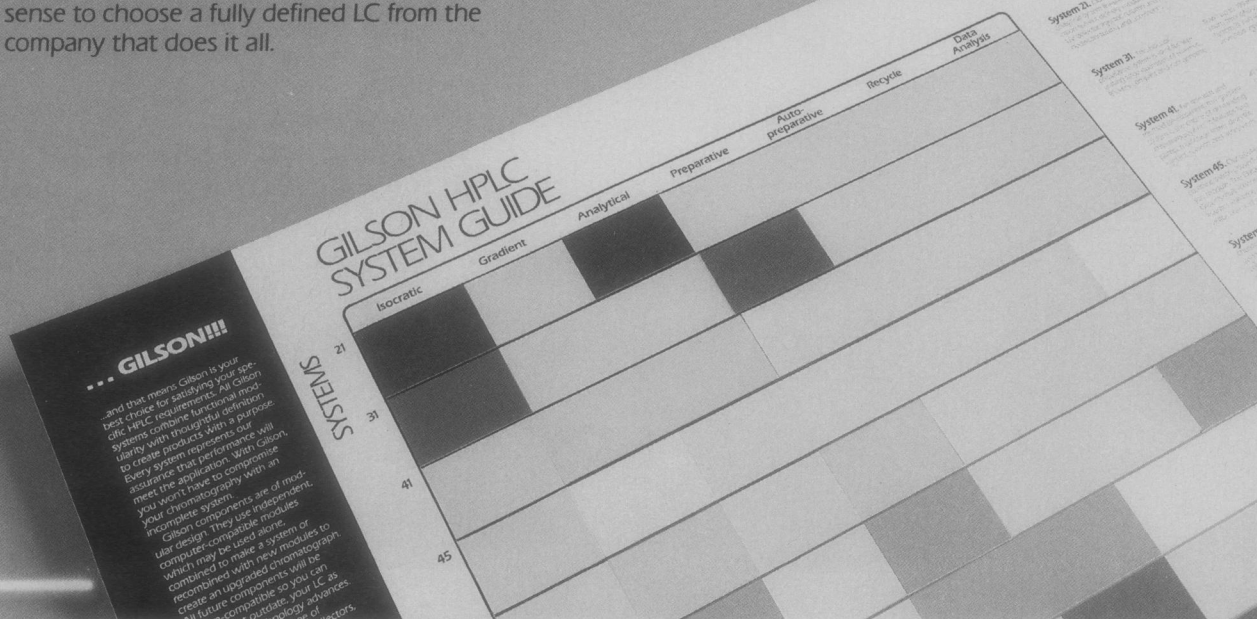
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Renewing U.S. Mathematics

Mathematics research has been seriously underfunded despite the fact that research opportunities are at an all-time high. At present funding levels the mathematics community is losing its ability to renew itself, let alone maintain its essential contributions to the nation's technical activities. The situation has been obscured because in most published figures funds for mathematics research are merged with those for computer science.

Moreover, this underfunding has been happening at a time when advanced mathematics has never been more important to the nation's scientific and technological enterprise. In the span of just the last two years, advanced mathematics figured critically in no less than four Nobel Prizes awarded to U.S. scientists. The high technology era is the mathematical technology era. The fuel-conserving airfoils for the Boeing 767 and the European Airbus were designed almost entirely through mathematical techniques. The communications and computing revolution proceeds in large part on the basis of mathematical theory created by Wiener, Shannon, von Neumann, Bode, and their successors.

How have we reached this state, and what is to be done about it? These were the issues that quickly crystallized for the National Research Council's Ad Hoc Committee on Resources for the Mathematical Sciences.*

In its two-and-a-half years of study, the committee found enormous distortions and omissions in mathematics support. For example, in 1983 there were as many mathematicians as physicists or chemists in American universities, but only some 60 postdoctoral students in mathematics were receiving federal support compared with about 1200 in physics and 2500 in chemistry. Today, despite an important upturn in 1982 and 1983, federal support for mathematics research is still about two-thirds its 1968 level, in constant dollars, even though the number of researchers in the mathematical sciences has doubled. In mathematics, the country is still reaping the harvest of investments in human resources made in the middle to late 1960's. This is not obvious because increased funding for computer science masks the insufficient investment in mathematics.

The NRC committee concluded that mathematics research is badly out of balance with the rest of the research enterprise in this country. It is all the more out of balance given the increasing inability of the financially pressed universities to support mathematics. Industry support for university research is increasing, but it is likely to remain centered on engineering, computer science, and fields other than mathematics. The mathematics community must look to the federal government.

To rejuvenate mathematics research, the committee proposes a National Plan for Graduate and Postdoctoral Education in the Mathematical Sciences. The plan would bring annual support to the following levels: (i) grants to 1000 graduate students supporting 15 months of research on doctoral dissertations and two preceding summers of preparatory research; (ii) two-year postdoctoral positions or their equivalent for some 200 of the 800 Ph.D.'s earned annually in the mathematical sciences; (iii) 400 postdoctoral research grants for young investigators; and (iv) grants for 2600 established mathematical scientists, both to conduct their own research and to provide training for Ph.D.'s and postdoctoral students.

There has already been progress, primarily in National Science Foundation support. But to ensure that renewal becomes reality, the mathematicians are taking their case to the mathematics constituencies in the sciences, engineering, industry, and government. For the sake of their own enterprise and of the nation, the members of those constituencies should heed their call and help ensure that mathematics regains its essential place in the nation's research priorities.—EDWARD E. DAVID, JR., *president, Exxon Research and Engineering Company, Clinton Township, New Jersey 08801, and chairman of the Ad Hoc Committee*

*National Research Council, *Renewing U.S. Mathematics: Critical Resources for the Future* (Washington, D.C., 1984).



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