

SCIENCE

20 September 1974

Vol. 185, No. 4156

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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and bottom-drive
magnetic stirrer

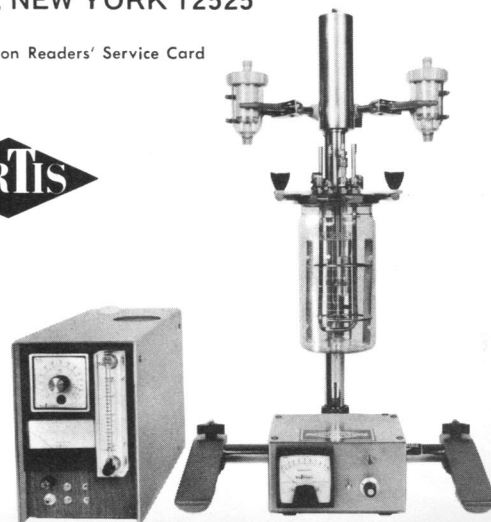
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Shown right: top-drive classical fermenter set up
with temperature and air control module



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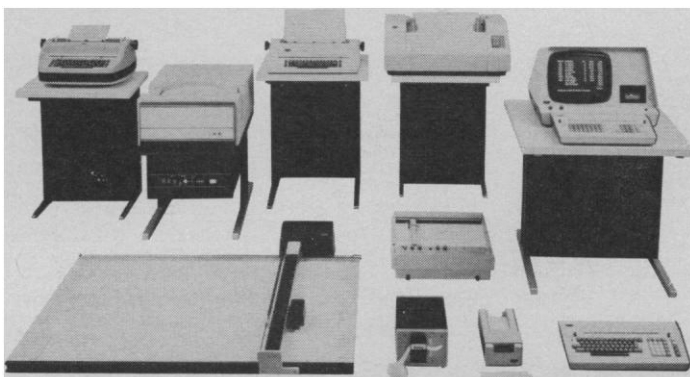
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COVER

Captive sea otter at Amchitka Island, Alaska. The reestablishment of sea otter populations in the western Aleutian Islands has produced remarkable changes in the structure of nearshore communities after near extinction from overhunting. See page 1058. [James A. Estes, University of Arizona, Tucson]

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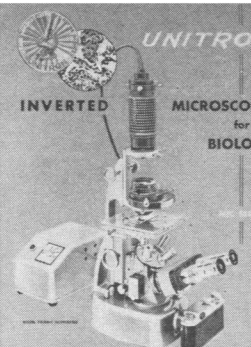
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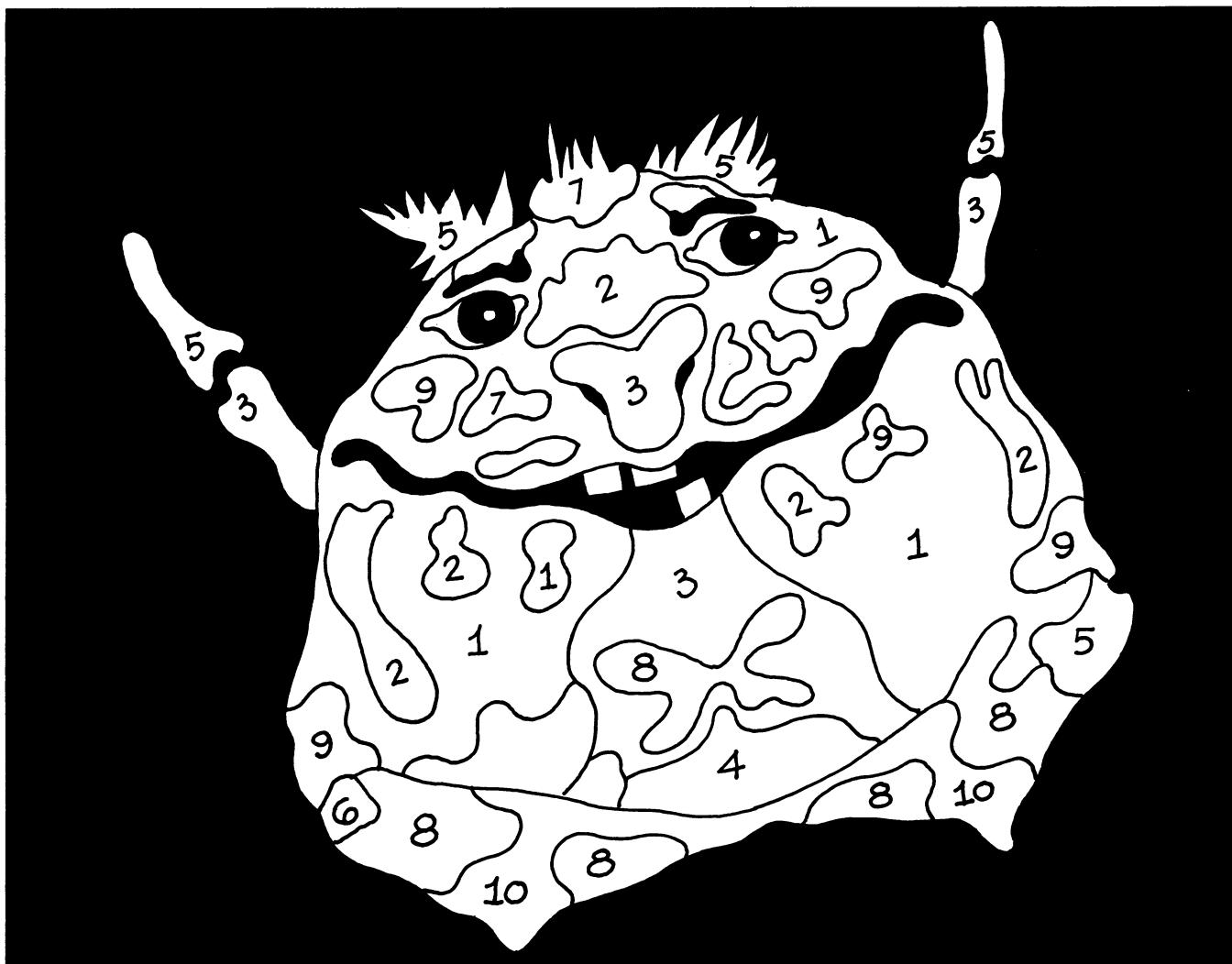
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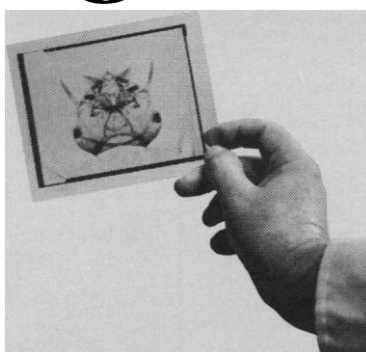
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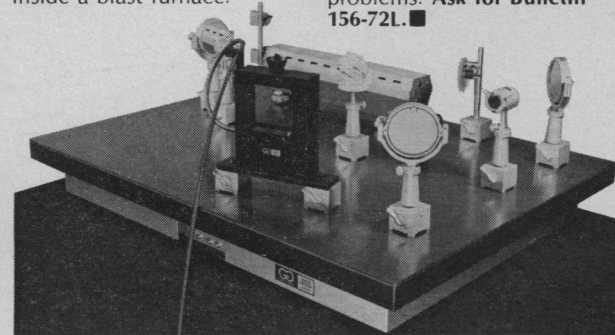
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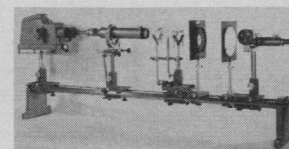
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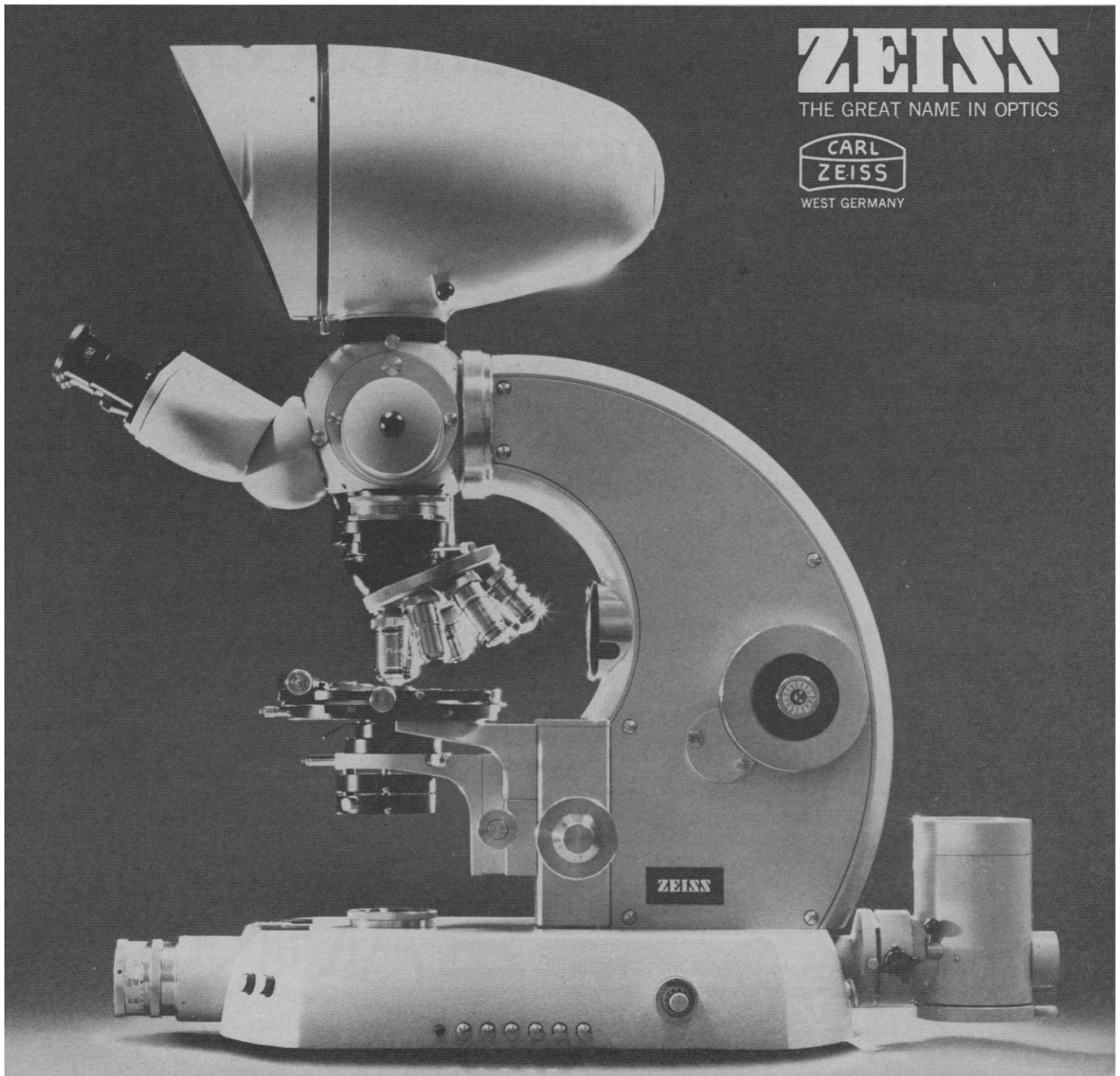
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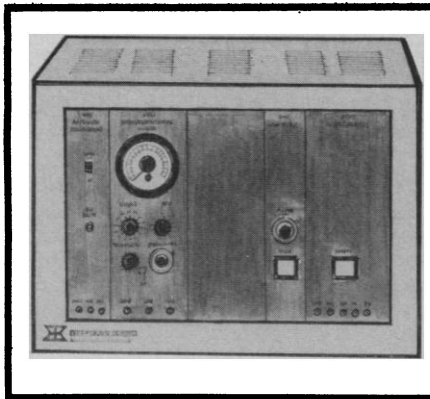
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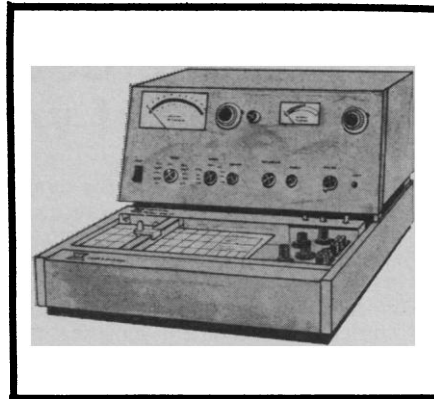




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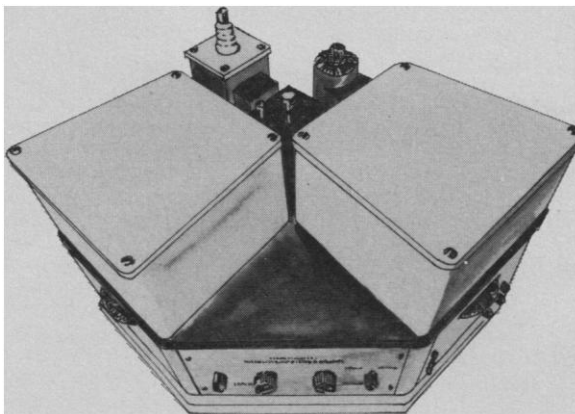


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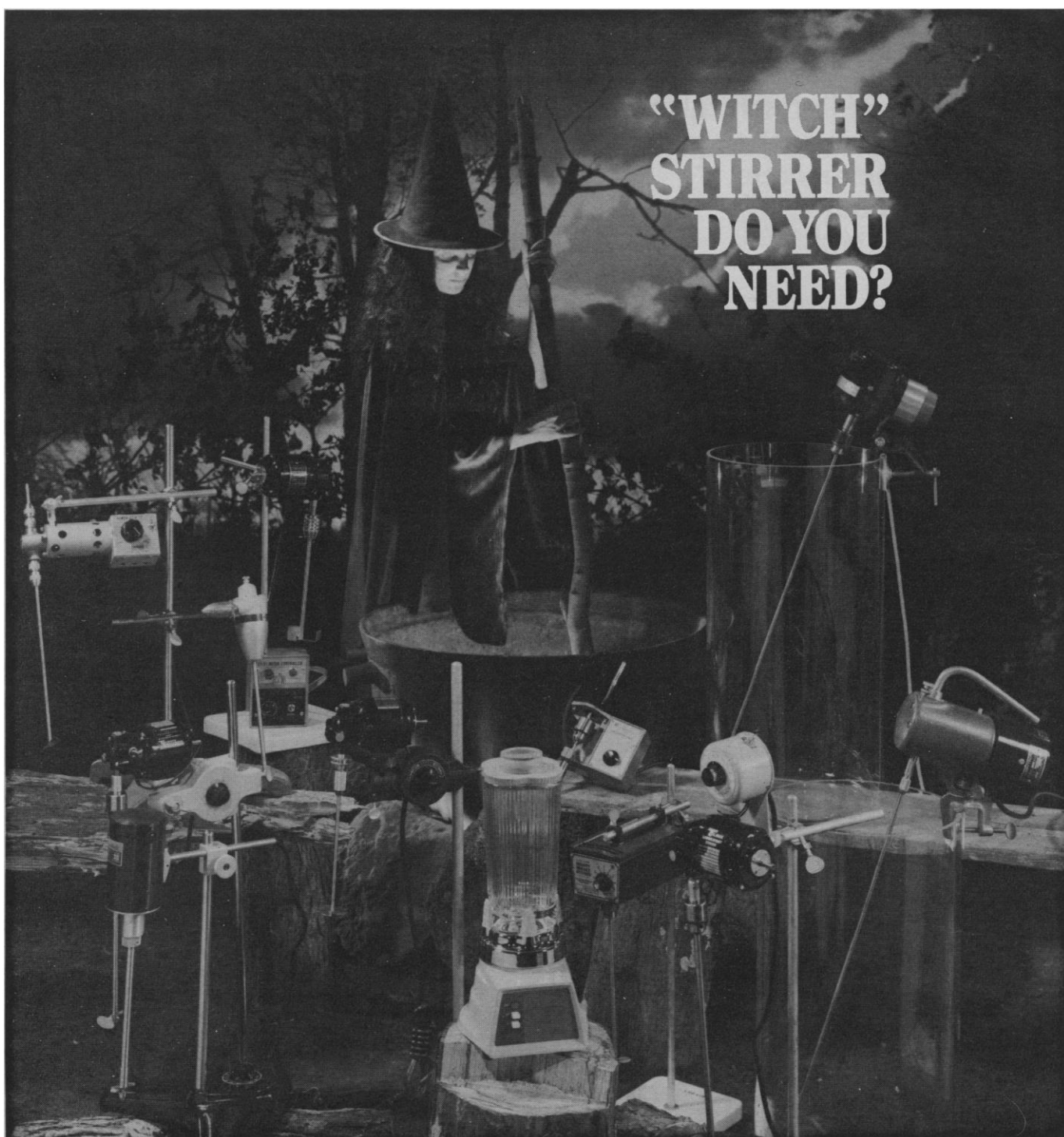
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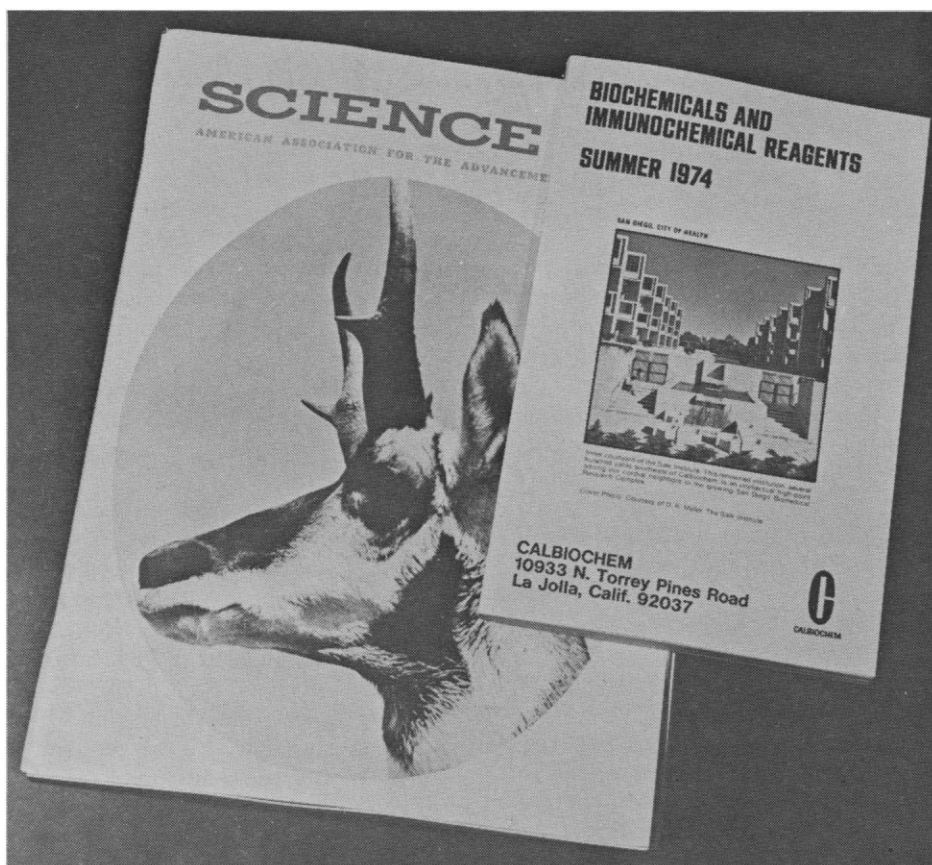
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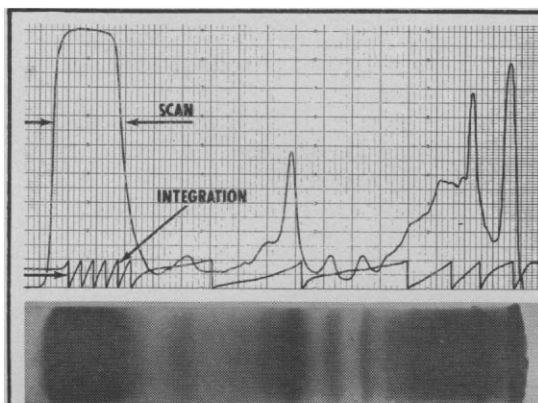
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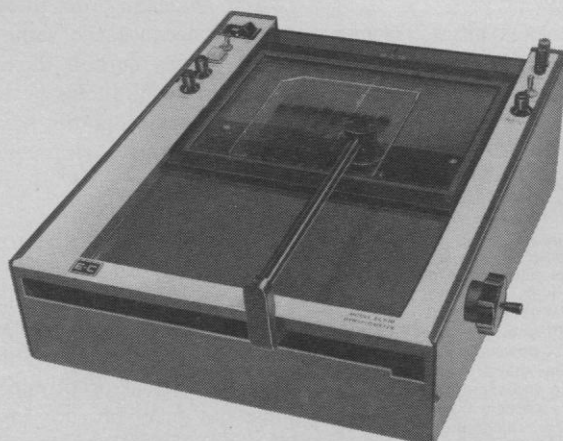
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meable material seems to exist. I have tested many plastics and several other materials, but have found nothing that is significantly more permeable to carbon dioxide than to water at normal plant growth temperatures.

If anyone has reason to believe that some material (plastic, metal, liquid, or interface) is significantly more permeable to carbon dioxide than to water vapor, I would appreciate being told of it.

JOSEPH T. WOOLLEY
Agricultural Research Service,
Department of Agriculture,
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References and Unreferences

In a graduate seminar in atmospheric science, I require that my students write a research paper. Having found that these student papers can stand improvement, I hand out, at the beginning of the semester, a list of "do's and don't's" for paper writing. One of the "don't's" is, "Don't use a reference unless you've seen the original paper. Are you going to swallow whole what Mason, or Blanchard, or Vonnegut said about Sigurdur Schlockinghausen's memorable 1932 paper that appeared in the *Journal of Irreproducible Results*? Better not, unless you wish to view the world through the particular brand of colored glasses each of them unknowingly wears. Try your own brand; you might find other colors more to your choosing."

Alas, I forgot to tell my students the most important "don't" of all—"Even if you've seen the original paper, don't copy the reference to it from somebody else's paper. It's probably wrong." For years I've been aware of this, but sometimes under the pressure of compiling a small mountain of references, I'd sneak into my reference list one or two I had read but for which I had forgotten to jot down the title, journal, page spread, and so forth. In an attempt to save time, I copied the references from someone else's list. When will I ever learn that this usually ends in disaster? Let me illustrate. A while ago I had occasion to reference a paper which I had read in 1970 in the Swedish geophysical journal *Tellus*. I couldn't find the reference in my card index, but I knew it was cited by the authors of six or seven papers in the 21

September 1972 issue of the *Journal of Geophysical Research*, which I just happened to have on my desk. Quickly I flipped the pages and found an author who cited the *Tellus* paper. He said it had appeared in volume 21, 1970, pages 451-461. I had no reason to doubt the accuracy of this citation, but just to be on the safe side I decided to check this against the reference list of another author who cited the paper. After all, there's safety in numbers. To my surprise the second author said the paper appeared, not in volume 21, but in volume 22. Otherwise he agreed with the first author. So who was correct? Obviously I needed a third author and a third reference list. In a few minutes I found him. He said the second author was correct regarding the volume number, but that both were wrong about the page spread. The paper actually ends on page 462.

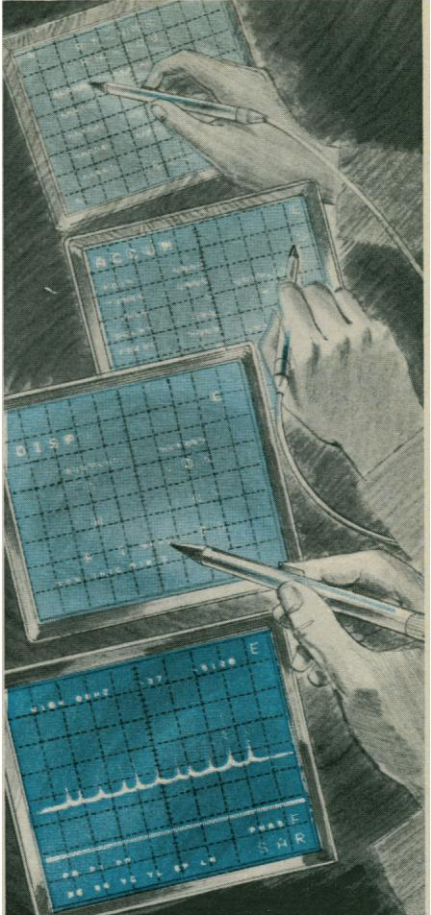
Fast losing faith, I turned to a fourth author, and this time, I thought I had hit the jackpot. The fourth author was none other than the author of the *Tellus* paper in question, and, since authors are very careful when citing their own papers, I assumed that he would cite his own paper in impeccable form. He said everyone was wrong—the paper starts on page 541, not page 451. But he said nothing about the page spread. So on I went through the 21 September issue of the *Journal of Geophysical Research*. I found a fifth author who said the proper *Tellus* volume was neither 21 nor 22 but 12. With five authors behind me who could not agree on the citation, I went to the last remaining author who used the reference, expecting by this time a sixth version. But no, he agreed with the second author. The proper volume is 22, and the page spread is 451-461. Authors 2 and 6 are right. I confirmed this at the library.

Do you think I've made this all up? Check the aforementioned journal. But please, no secretaries, no Xerox copies. Go to the library yourself and see what I saw. As for me, I am now a firm believer in the moral of one of Thurber's stories (1), "There is no safety in numbers, or in anything else."

DUNCAN C. BLANCHARD
Atmospheric Sciences Research Center,
State University of New York,
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References

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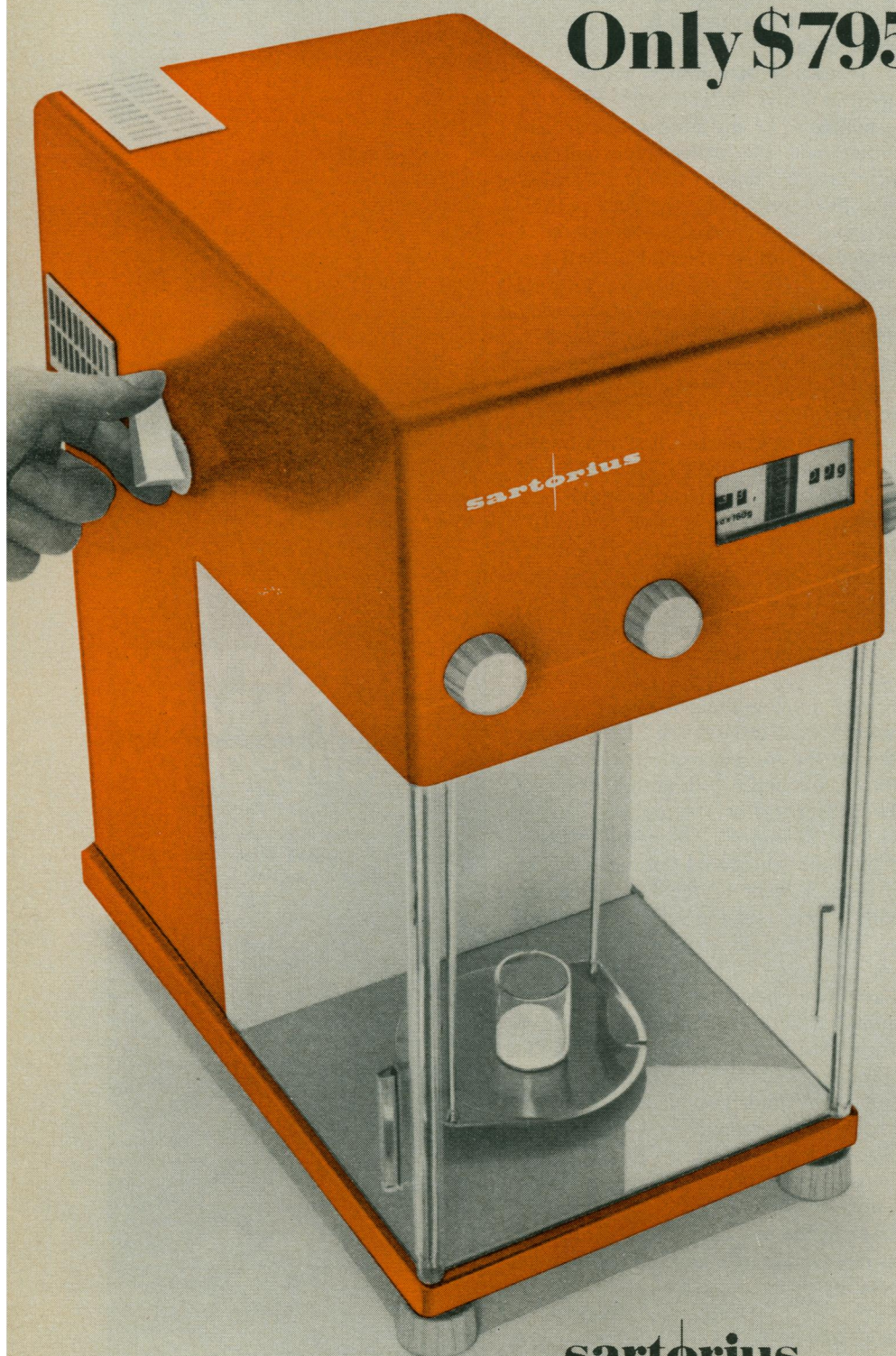
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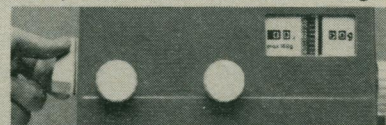


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Two Digit Inflation

For many years, we lived with increasing affluence and a low rate of inflation. Suddenly there have been disagreeable changes. The rate of inflation has jumped to about 12 percent. Those who are retired and dependent on savings have been hard hit. Others whose pay is adjusted slowly have lost purchasing power. The beneficiaries have been the greedy who can demand and get disproportionately increased wages or prices. These effects have emotional overtones: the United States has had little recent experience with rapid inflation; to many people it is a scary thing. They see inflation accelerating and wonder why it is happening, how far it will go, and whether it can be stopped. The phenomenon is bigger than the individual, and government is expected to do something about it.

Indications are that Mr. Ford and the rest of the Administration are uncertain what to do. And they are not alone. Quite a few other people, including Congress and the economists assembled for the summit meeting, also seem divided and uncertain. The Administration probably would prefer to do nothing, but the impending election and the emotional state of the electorate leave no alternative but to do something, if only to call conferences.

A first step in dealing with inflation is to identify causes. Once a phenomenon is understood, it is usually less frightening, and a basis for action may be established. Perhaps we will not discover all the causes, but three have interacted to make a formidable combination—food, environmental improvements, and energy. World demand for food, coupled with a desire to use it for political purposes, led to higher prices. To pay for oil imports, it is necessary to export large quantities of food at high prices. Environmental concerns have led to higher food prices, for example, through banning of pesticides. Higher prices for goods have resulted as manufacturers passed on abatement costs. Environmental factors have been a major cause of higher costs for energy.

Increasing prices for energy are the major factor in creating our present situation. Energy enters repeatedly into virtually every product and activity. There is a close correlation in time between high inflation rates here and in the advanced countries and increased prices of oil. The end is not in sight. Less than two years ago, coal sold for \$8 a ton. In anticipation of a coal strike, spot prices have gone as high as \$50 a ton. A huge wage settlement for the miners will guarantee further increases in the cost of electricity.

The relationships of the price of oil to demand and supply are almost weird. A 400 percent increase in the price of oil abroad led to an overall shrinkage of only about 15 percent in demand. Imports into the United States have been running 15 percent above a year ago. In spite of reduced demand, the producing countries are holding the price line by cutting production. In a few months, the producers could be demanding and getting even higher prices. Why trade oil for paper? In the United States, a doubling of the price of domestic oil has been accompanied by a 5 percent drop in production.

This country will not be free of inflation until it solves the energy problem. The quickest path is conservation. But the public will not conserve or endure enforced scarcity until it understands the problem. The Administration should put less emphasis on conferences and on tinkering with interest rates and more emphasis on fundamental issues.

—PHILIP H. ABELSON



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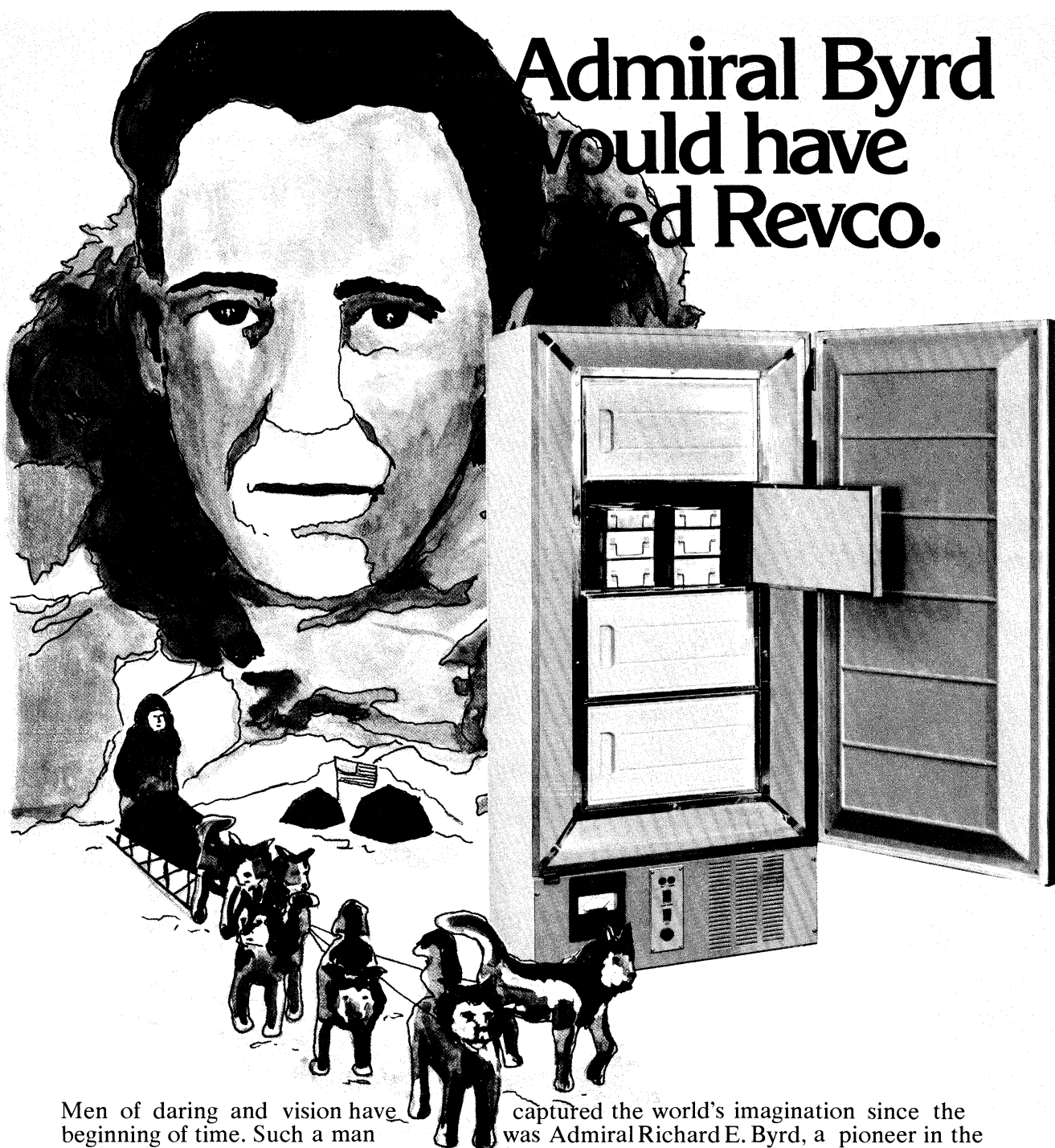
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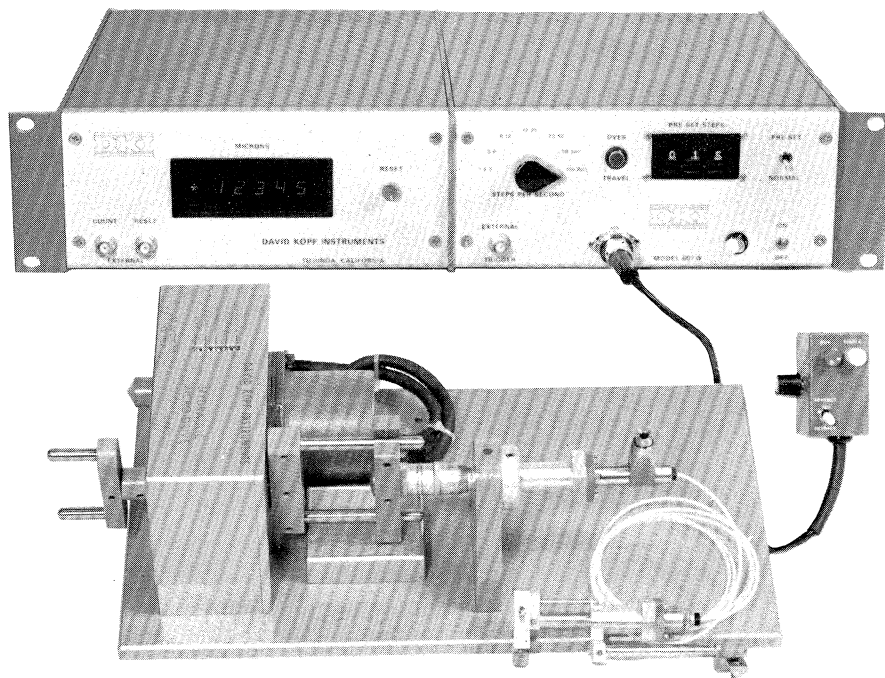
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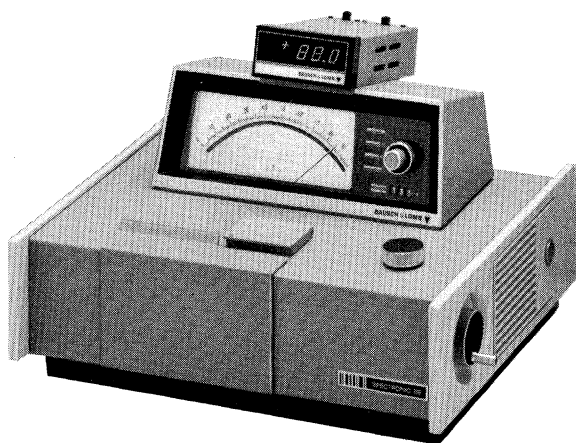


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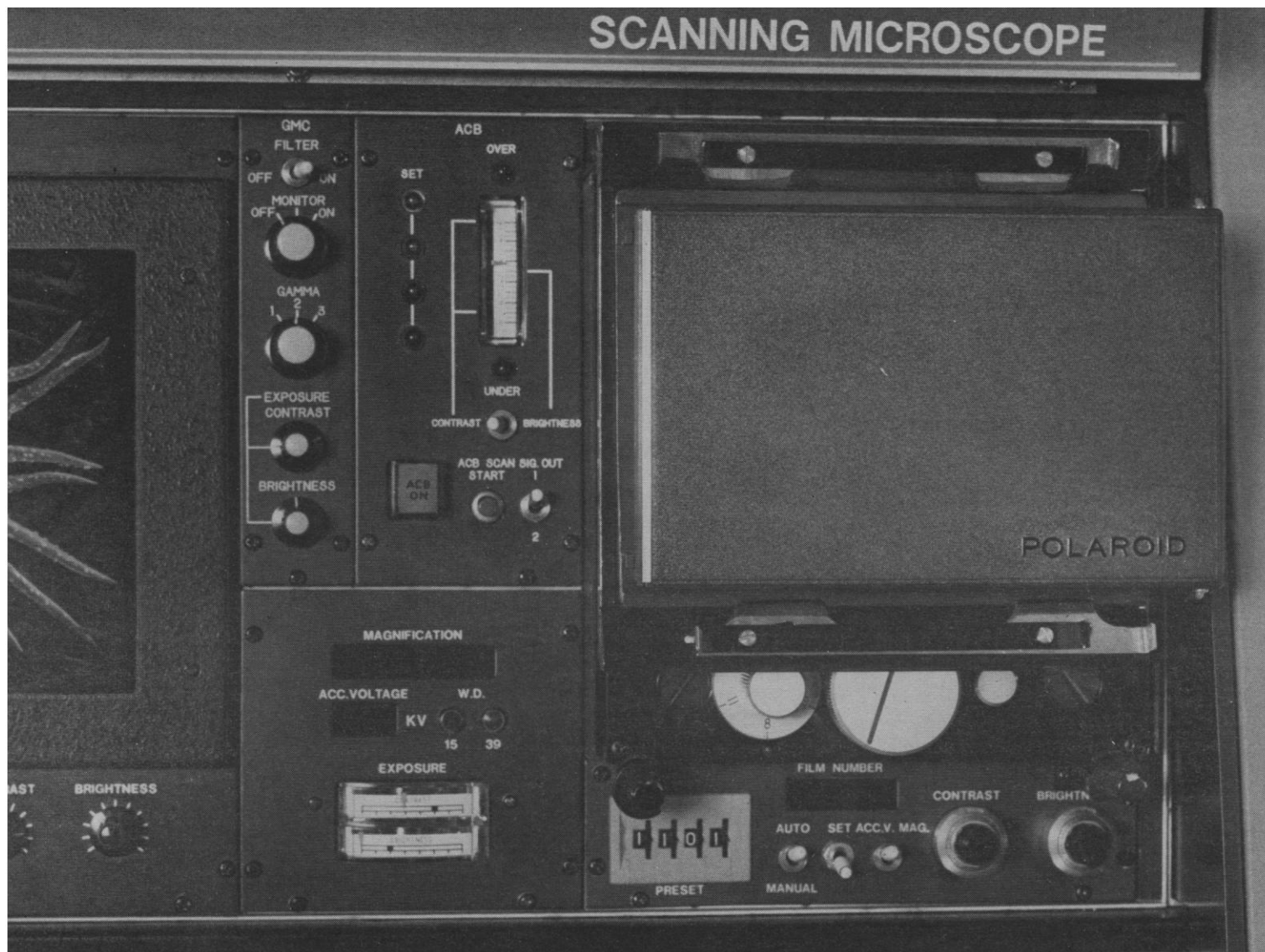
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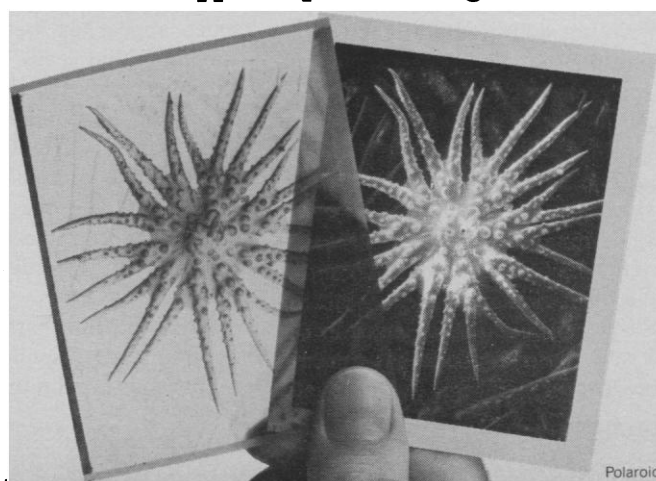
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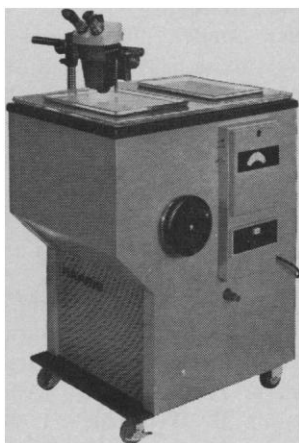
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RESEARCH NEWS

(Continued from page 1038)

such as the speed of light, the electronic charge, Avogadro's number, and others, metrologists do not rely only on direct measurements. Rather the "best" value of each of the constants is tied to measurements of other fundamental constants via a statistical procedure called a least squares adjustment. To see the effect that a more accurate value of Avogadro's number might have on the values assigned to the other constants was a major motivation for undertaking the project at NBS. However, each of the phases of the project has also yielded important results apart from the improvement in the knowledge of fundamental constants.

For example, the SRM 990 will be the publically available (for about \$50 a wafer, according to Barnes) silicon standard with a known atomic weight. In addition, techniques akin to those used in the silicon studies are being used both for the determination of the atomic weights of other elements with several naturally occurring isotopes, and in isotopic dilution methods for the quantitative determination of trace impurities in various substances. Similarly, an immediate outcome of the density studies is that the intermediate silicon blocks are now serving as "working" standards for density measurements throughout the United States. And, in a separate experiment, Deslattes and Henins were able to accurately determine the correction factor for converting kxu units to angstroms, by (in effect) reversing the usual x-ray diffraction procedure. Thus, by using silicon crystals of known lattice spacing as the diffraction medium, they measured x-ray wavelengths.

As for the possibility of redefining the kilogram, Deslattes pointed to several possible improvements (such as the use of isotopically pure silicon crystals) in the procedures necessary for finding Avogadro's number, which together hold the possibility of reducing the overall uncertainty by another factor of 100. However, because of the magnitude of the effort that would be required, such an "esthetic problem" likely would have a lower priority than other more pressing and practical problems.—ARTHUR L. ROBINSON

Additional Reading

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(Continued from page 1042)

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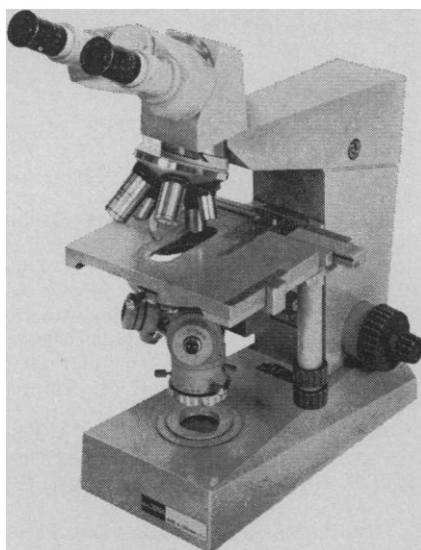
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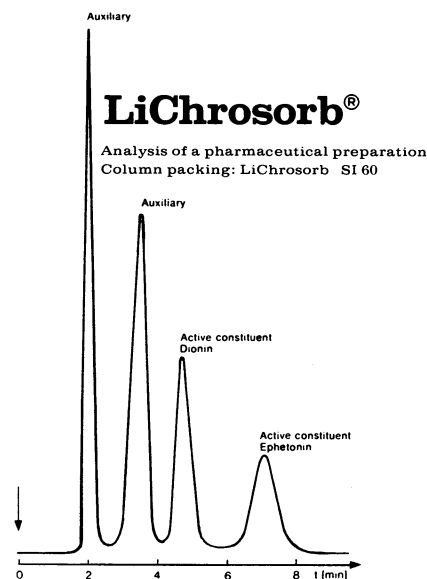
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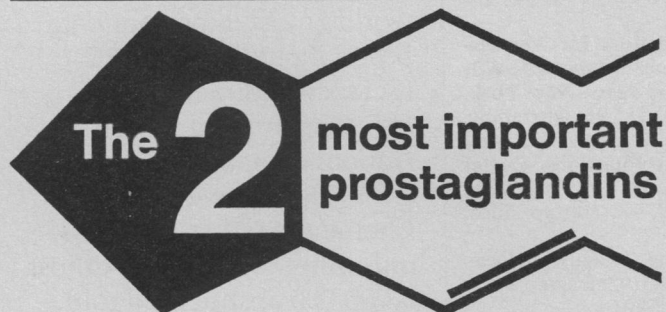
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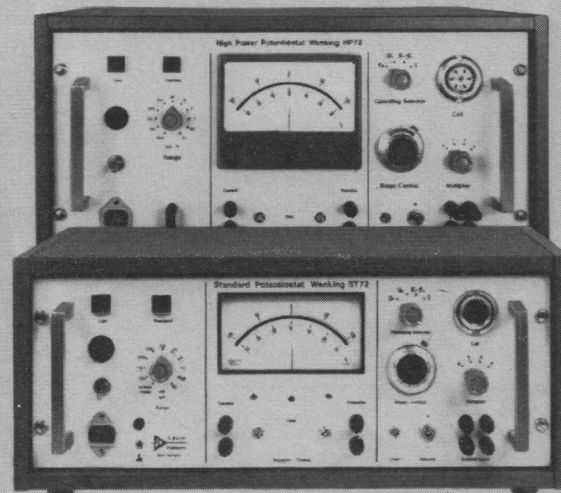
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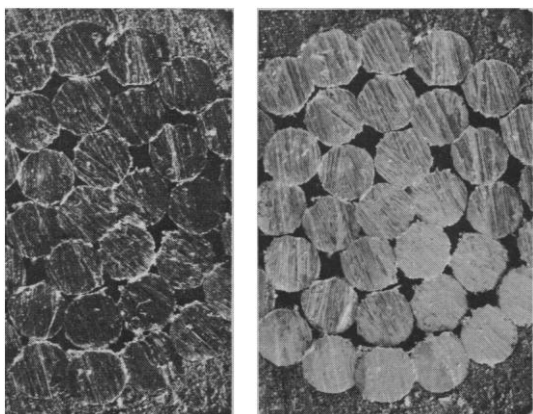
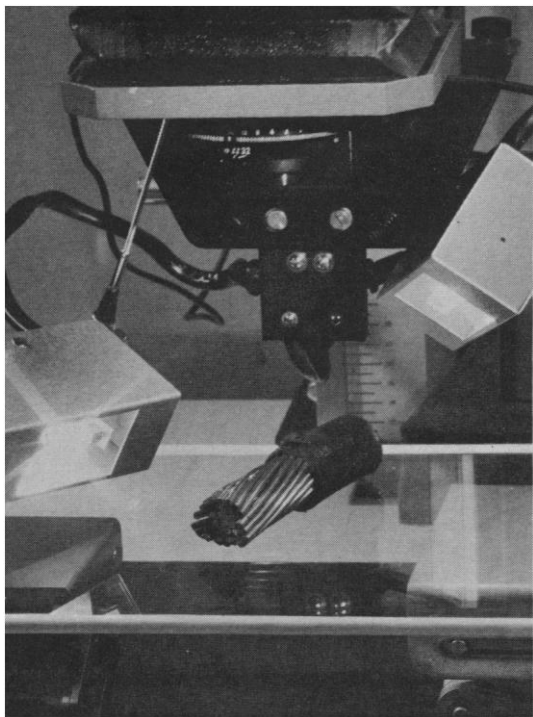
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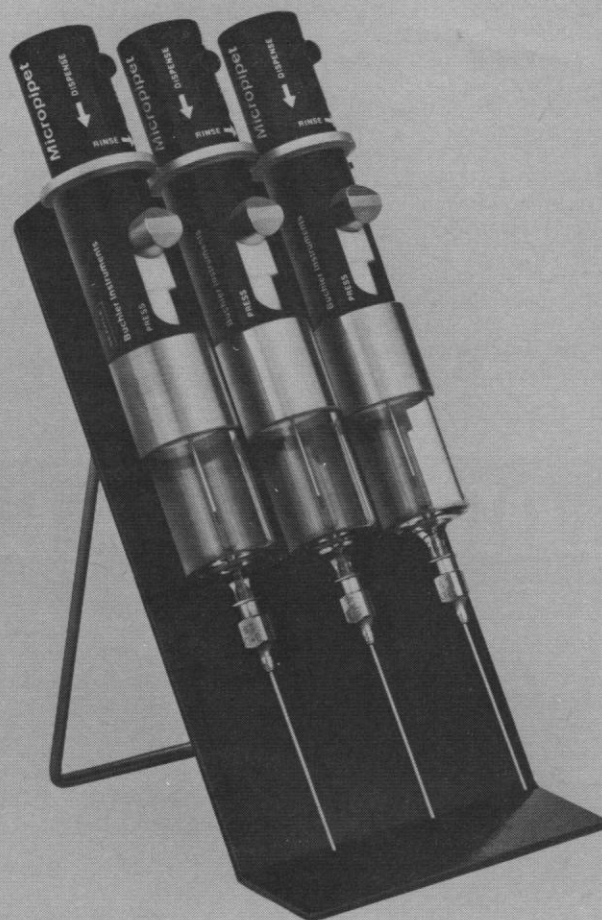
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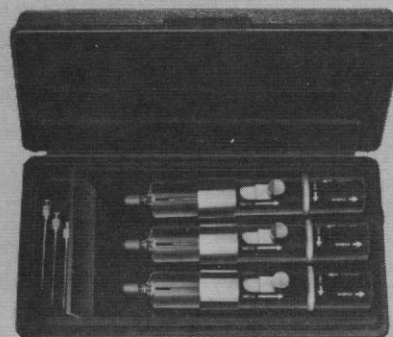
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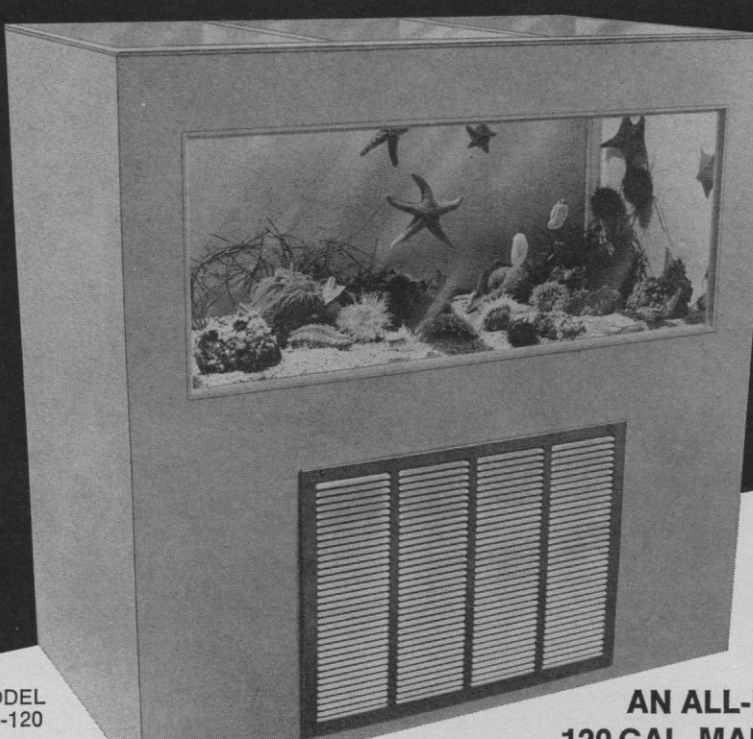
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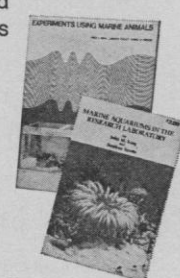
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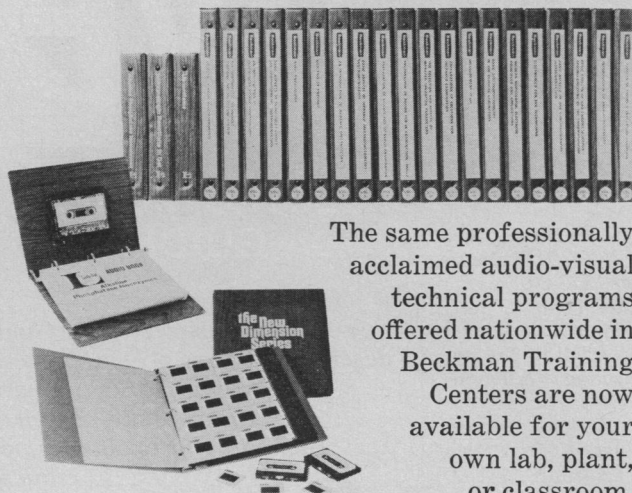


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