

# SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

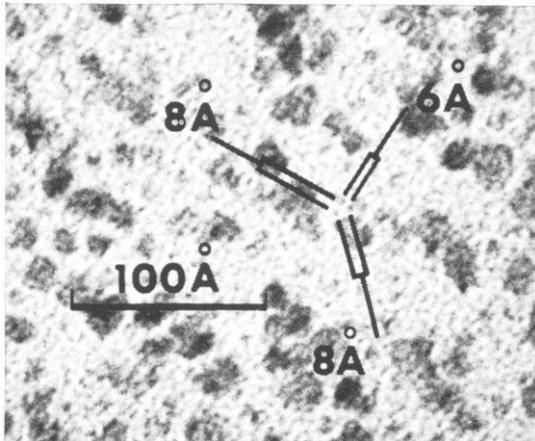


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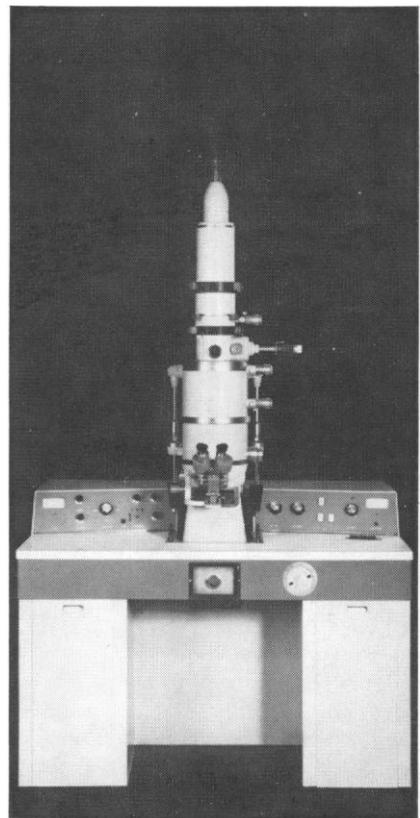
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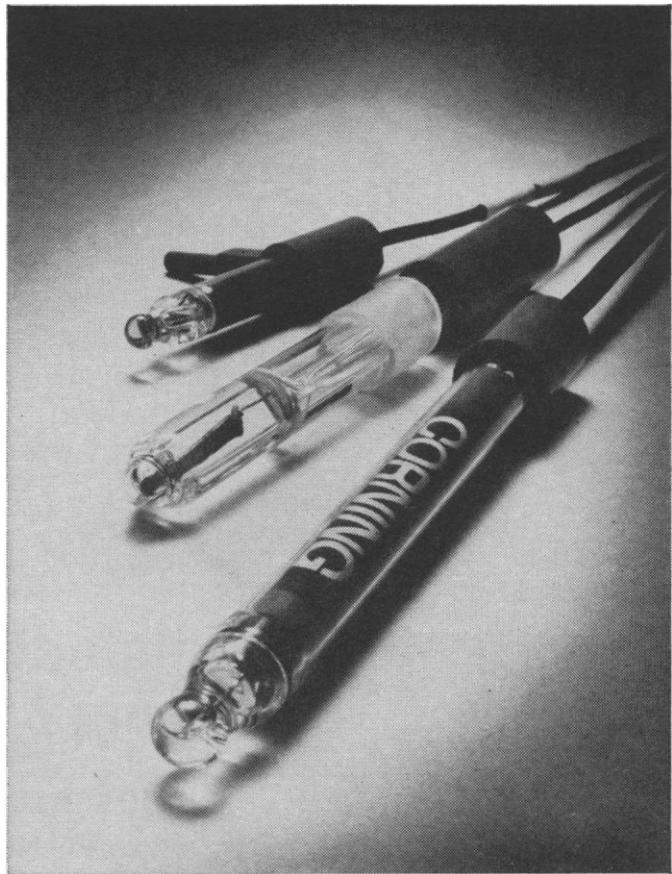
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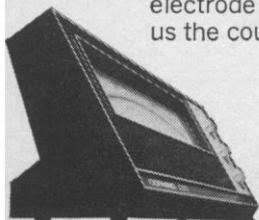
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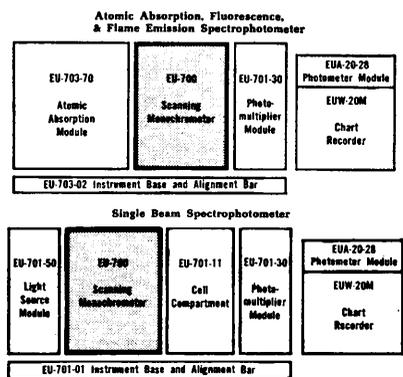
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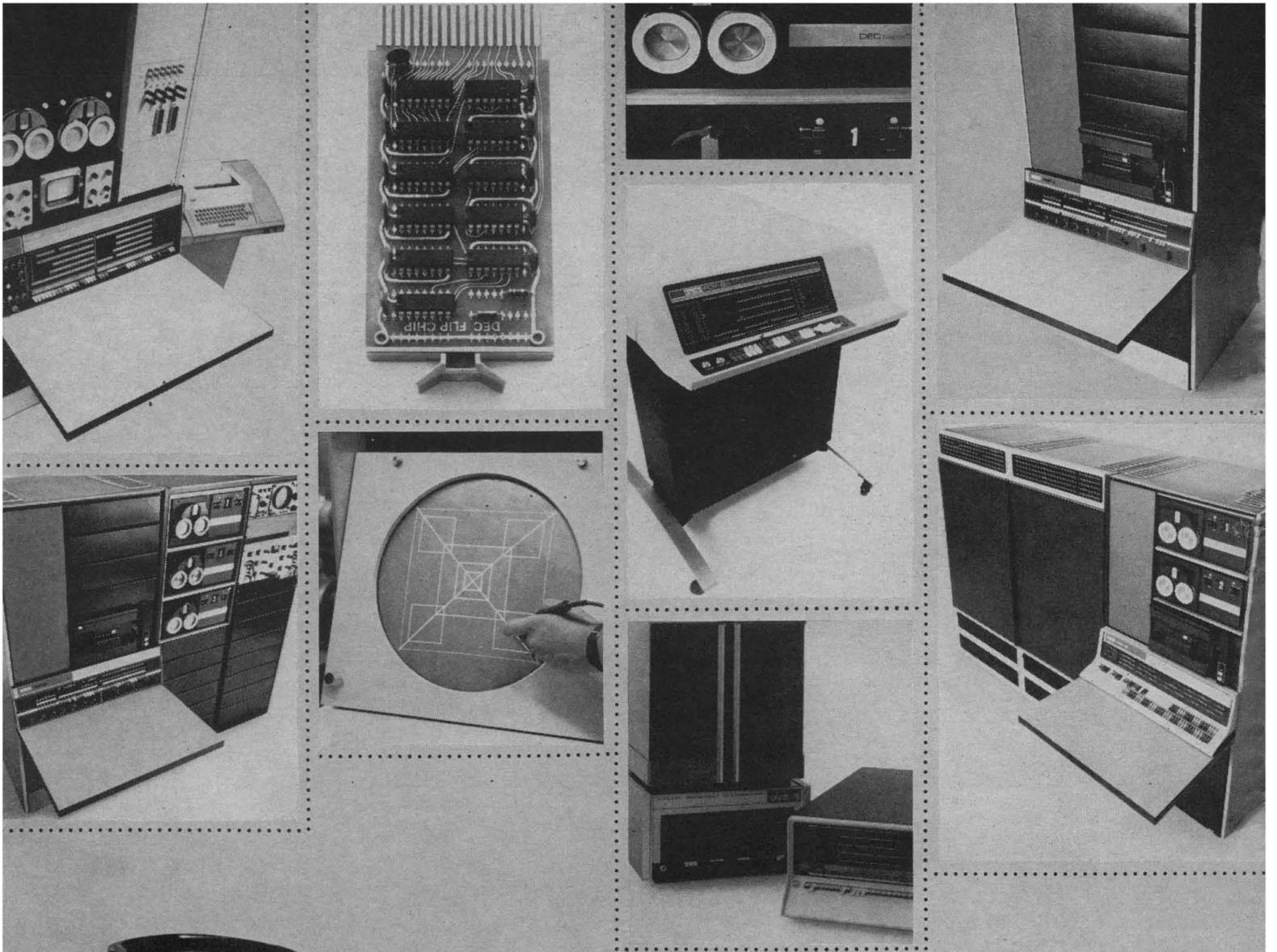
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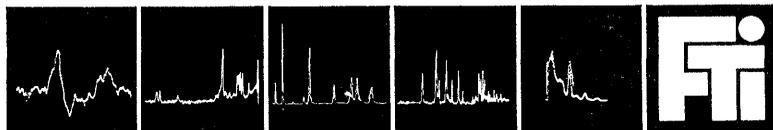
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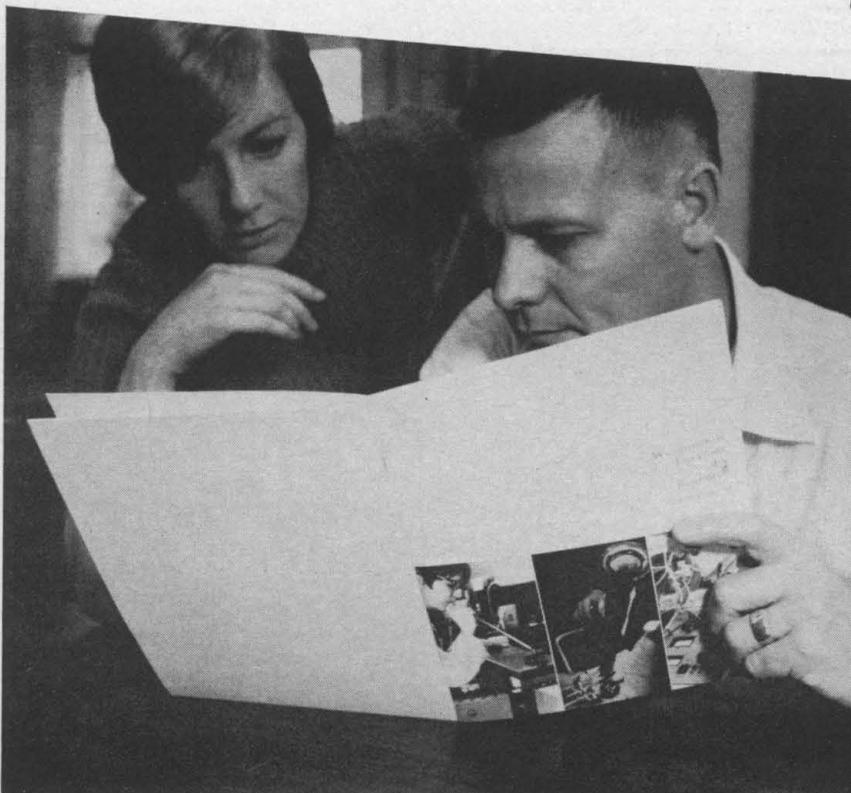
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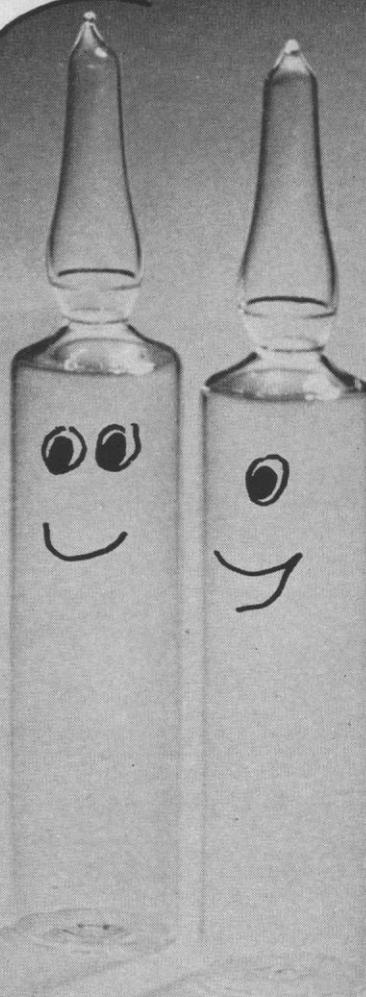
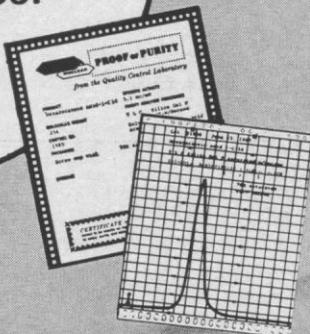
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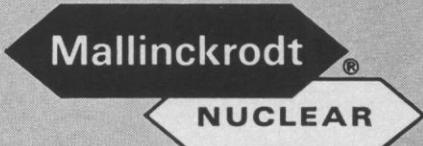


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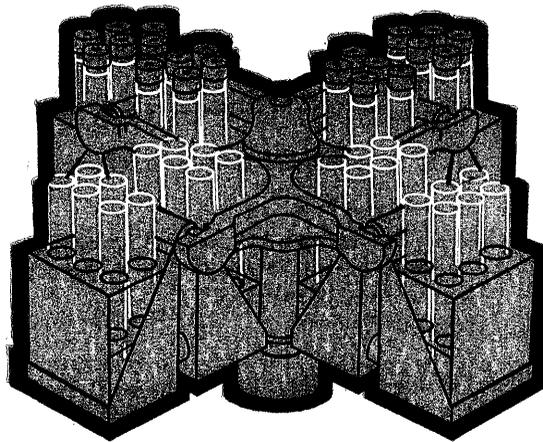
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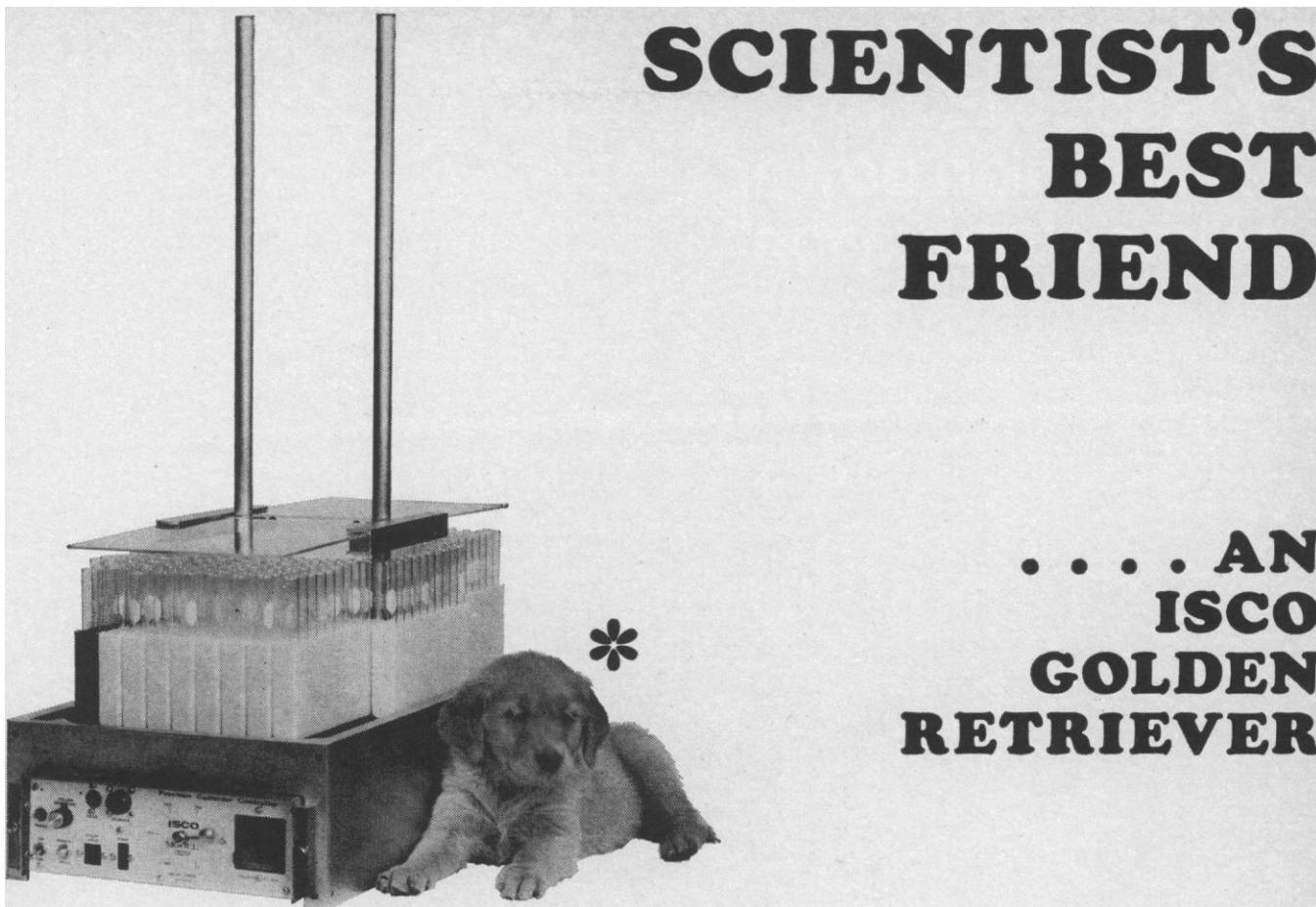


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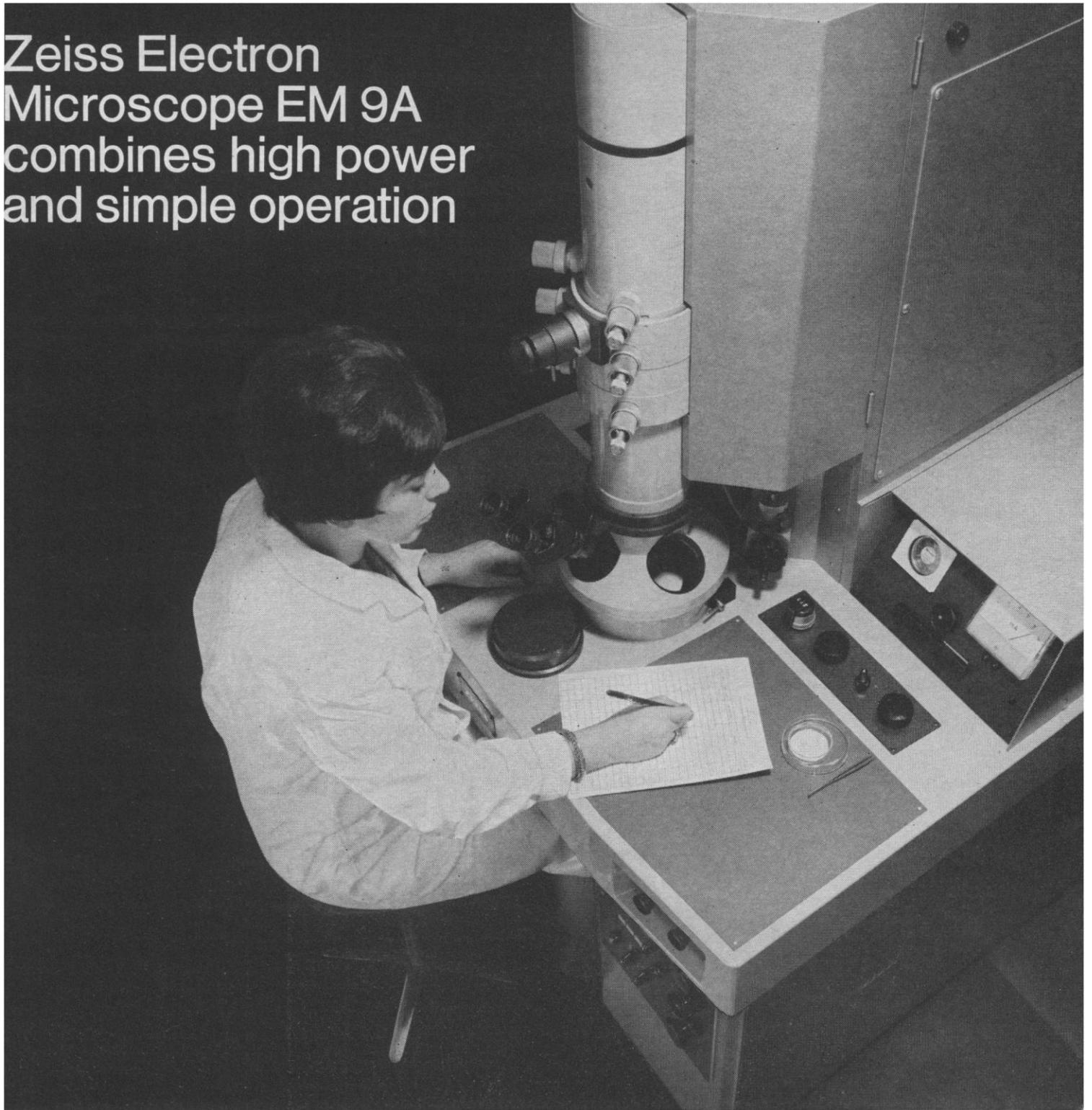
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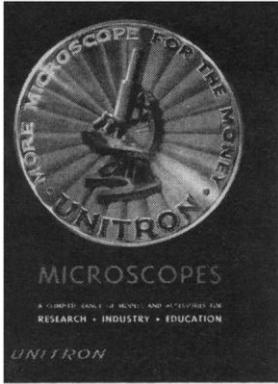
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Length, max. inches	4	2½	2½	5	2½
Height, max. inches	.81	.93	.80	1.62	1.05
Width, max. inches	1.32	1.29	.69	4⅞	.69
Weight, nom. oz.	4½	2	2½	.16	3

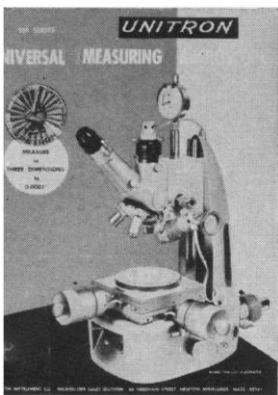
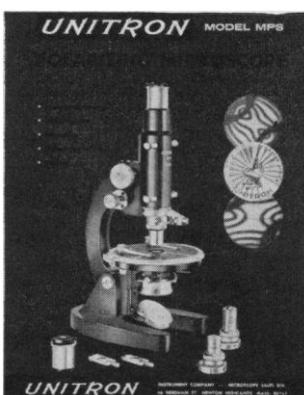
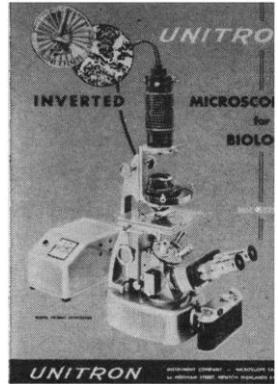




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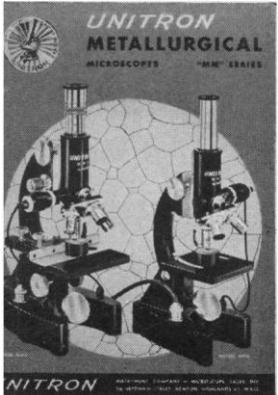
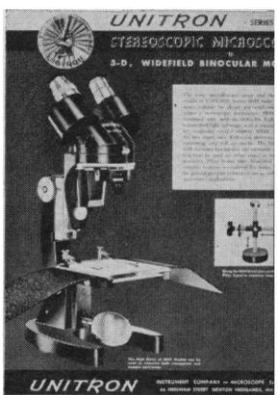
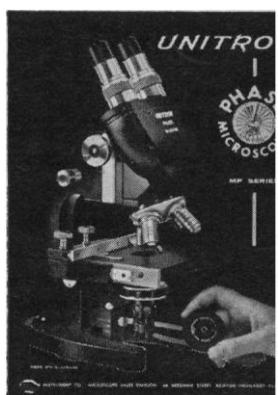
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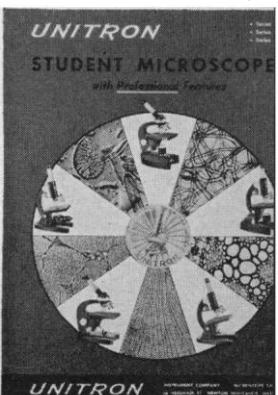
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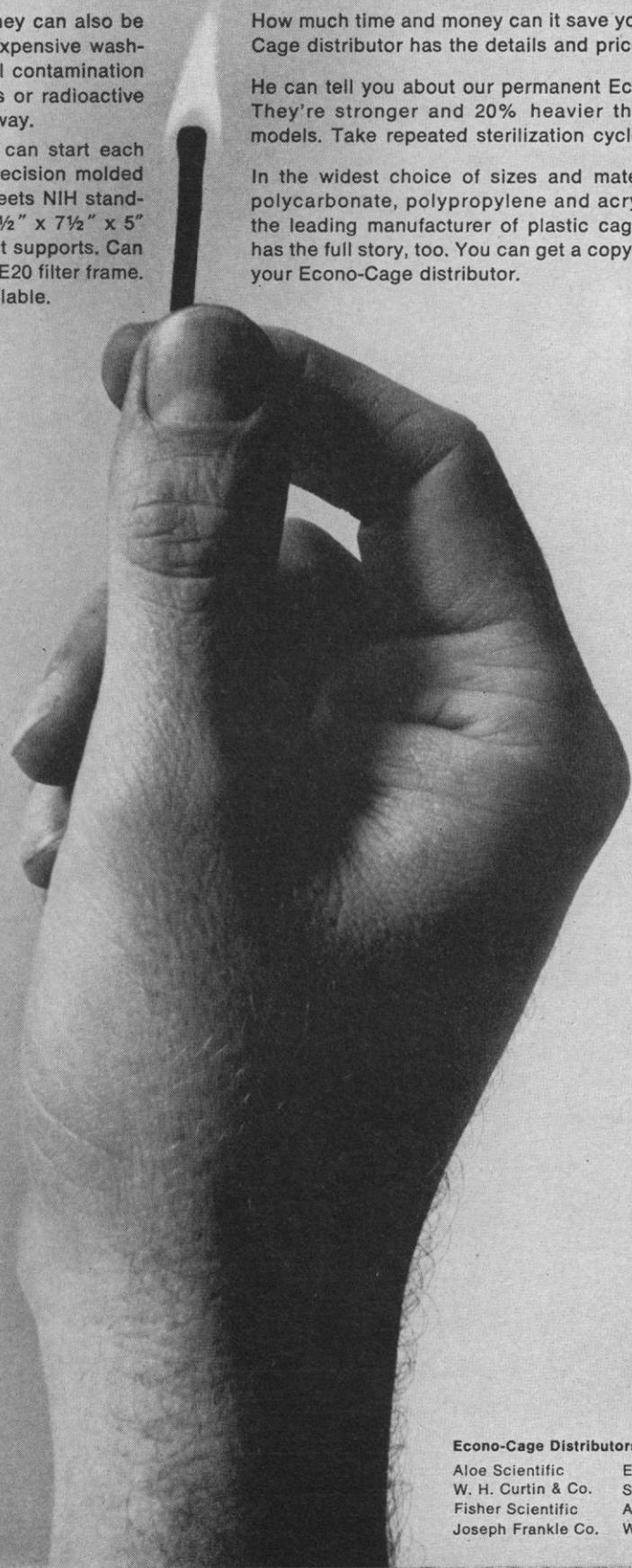
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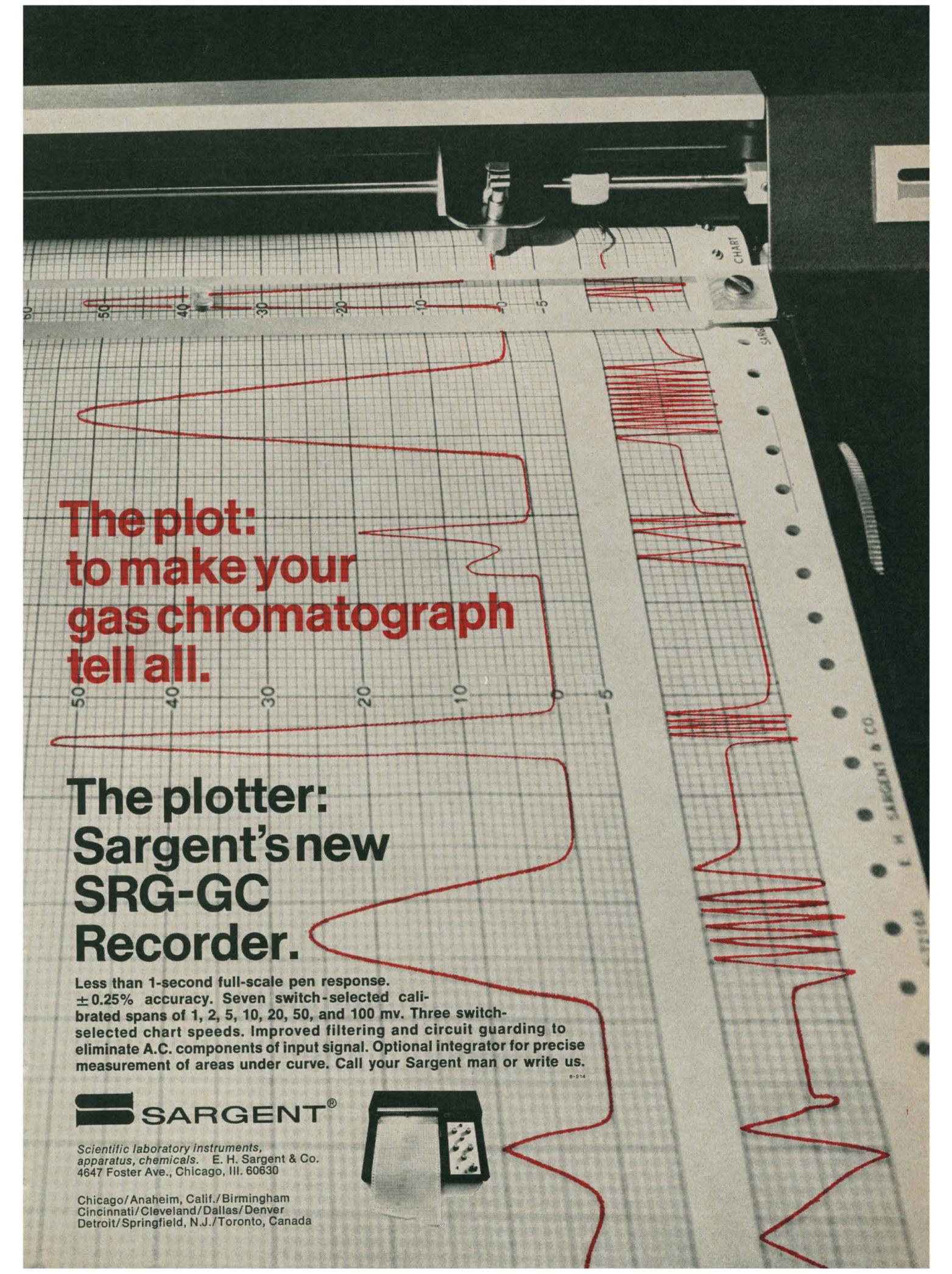
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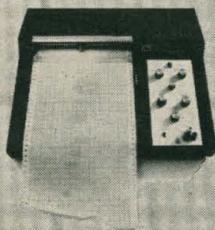
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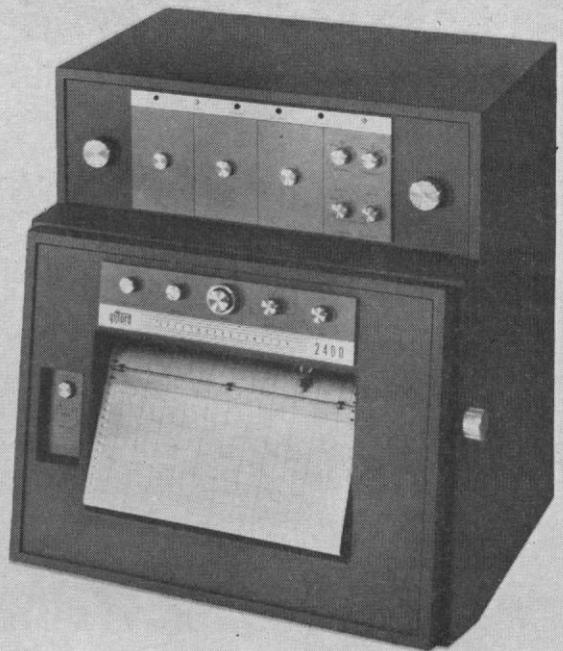
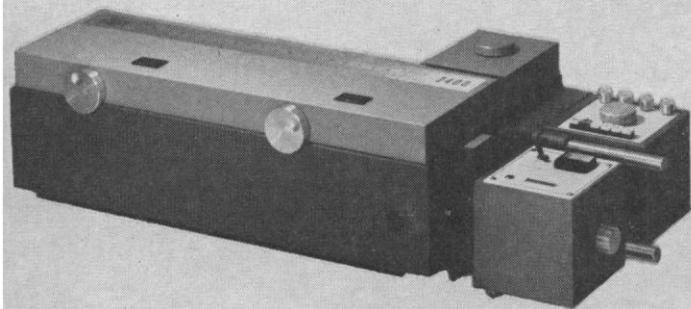
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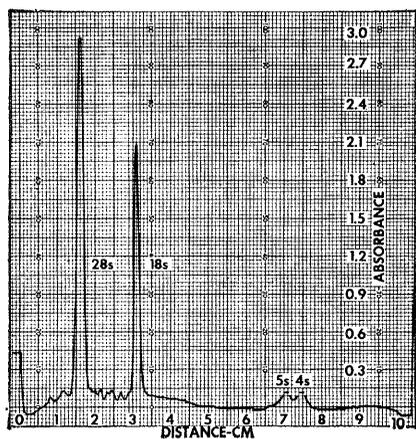
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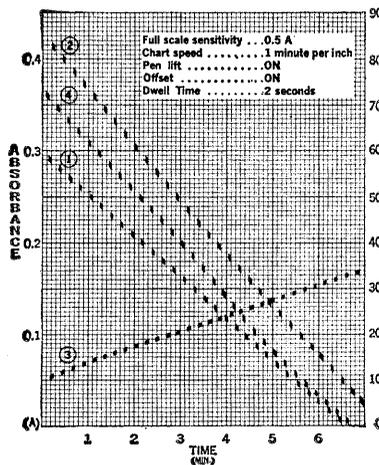
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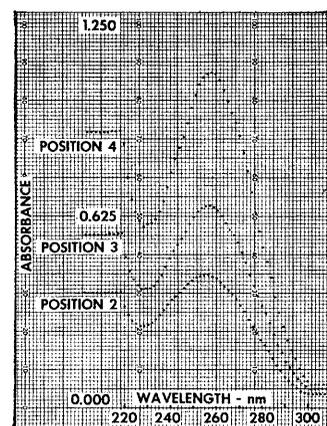
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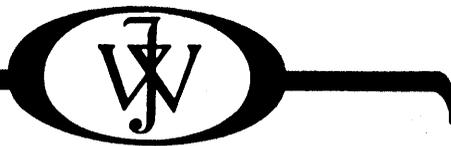
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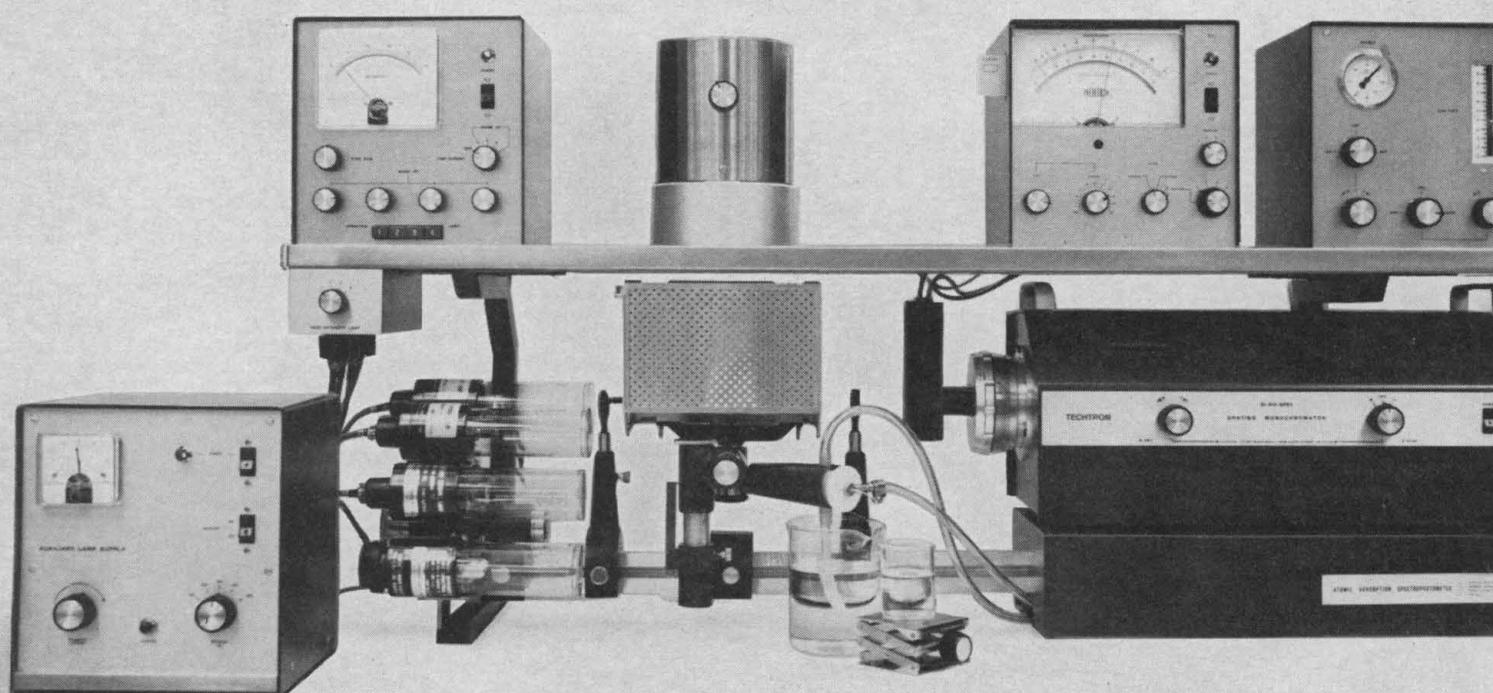
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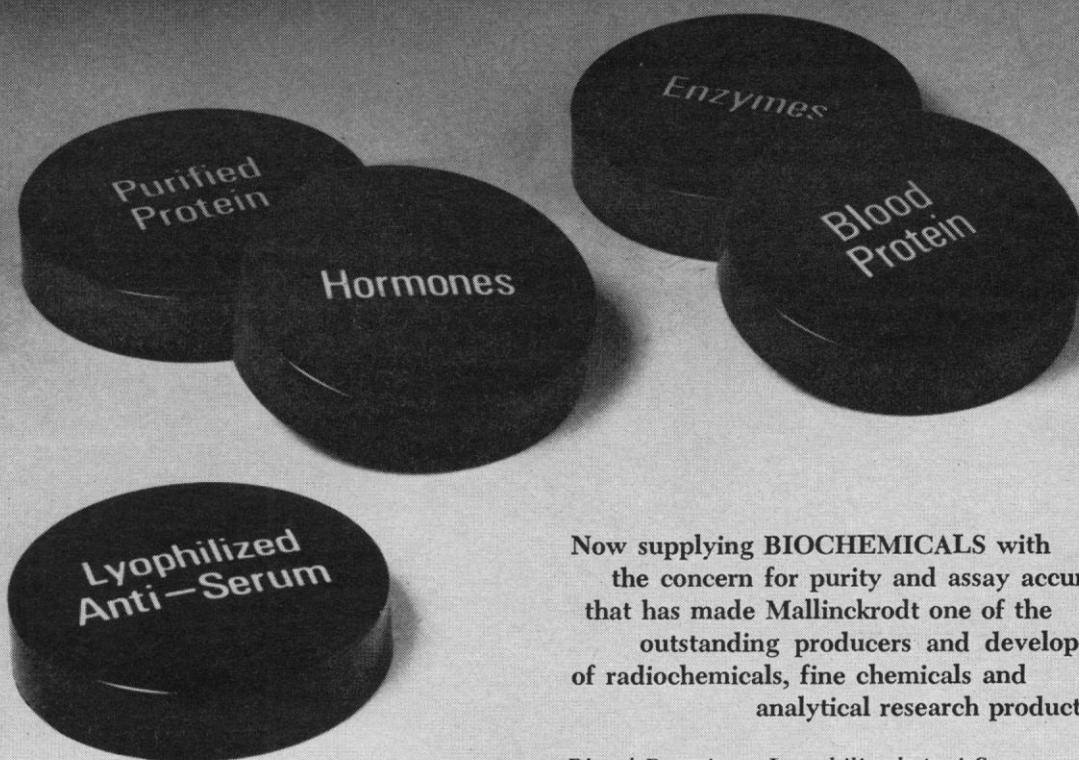
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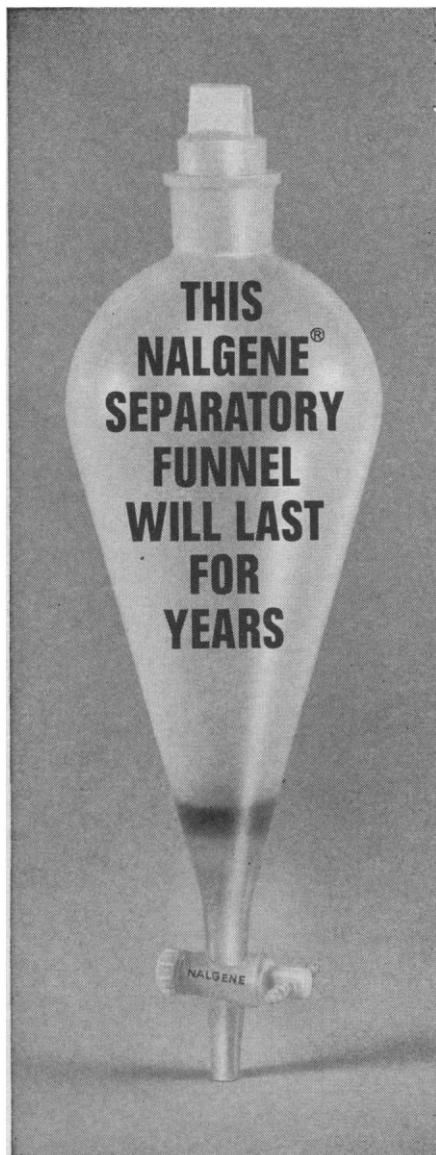
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### Burke on Civil Liberty

Wolfe is to be commended for commenting on campus problems ("Beleaguered presidents," 22 Mar., p. 1309). To be sure, if we continue to experience strife on our campuses, the long-term result will be the imposition of undesirable restrictions on our educational institutions. The effect on the progress of our society could be tragic. I am reminded of a letter written by Edmund Burke in 1791 to a member of the French National Assembly. He said:

Men are qualified for civil liberty in exact proportion to their disposition to put moral chains upon their own appetites; in proportion as their love of justice is above their rapacity; in proportion as their soundness and sobriety of understanding is above their vanity and presumption; in proportion as they are more disposed to listen to the counsels of the wise and good in preference to the flattery of knaves. Society cannot exist unless a controlling power upon the will and appetite be placed somewhere, and the less of it there is within, the more there must be without. It is ordained in the eternal constitution of things that men of intemperate minds cannot be free; their passions forge their fetters.

A. W. SALAY

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### A Sport Worth Watching

In his acerbic review (29 Mar., p. 1448) of James Watson's *The Double Helix*, Erwin Chargaff speaks of "the degradation of present-day science to a spectator sport." Even if we accept Chargaff's conclusion that science has turned into a spectator sport, couldn't this simply mean that it's become worth watching again? . . . A more pertinent complaint about modern science was issued some years ago (in 1878, actually) by Jacob van't Hoff (1):

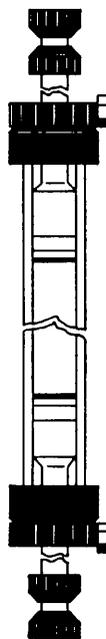
The number of those who are engaged in scientific research increases; previously, only irrepressible drive and extraordinary talents were able to overcome all difficulties which stood in the way of a scientific career. Today this road is open and the path well-trodden.

But the consequence of just this is that with the increasing number the mean value of the contributions is lowered; the rare gifts, among these, imagination, fall into an unfavorable relationship with those gifts which are more commonly distributed. This has changed the ways and means by which the scientific mechanism operates. . . .

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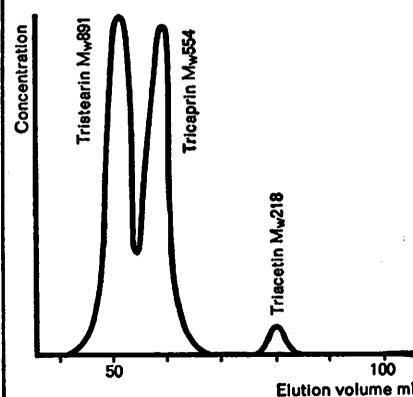
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Tetrahydrofuran	1.4	2.5-3.0
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\*Containing 1% ethanol. Particle size: 25-100 μ

### EXAMPLE OF SPECIFIC APPLICATION



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something different from what it was: It *resembles* the shooting down of a fortress from different sides, the cautious scaling of the ruins, and the battle to raise the flag on top after the arrival of all forces. Before, it *resembled* the simple advancement of a single battery like the one which NAPOLEON used to subdue the British navy at TOULON. Even though it is now possible to compensate for imagination with a great effort of work, imagination has not been excluded. The role which it plays is a different one, but not the role which it is capable of playing.

Now Chargaff tells us that quite a bit was known about DNA back in 1952, that "the discovery of the base-pairing regularities pointed to a dual structure." Well, we all know that now, but back then the signpost was not exactly etched out in neon lights. . . . We ought to appreciate Watson's account of Watson and Crick's achievement, if only because it gives us a glimpse of what imagination can do when disciplined by fact but freed from the rut that most of us force our imaginations into.

G. ALAN ROBISON

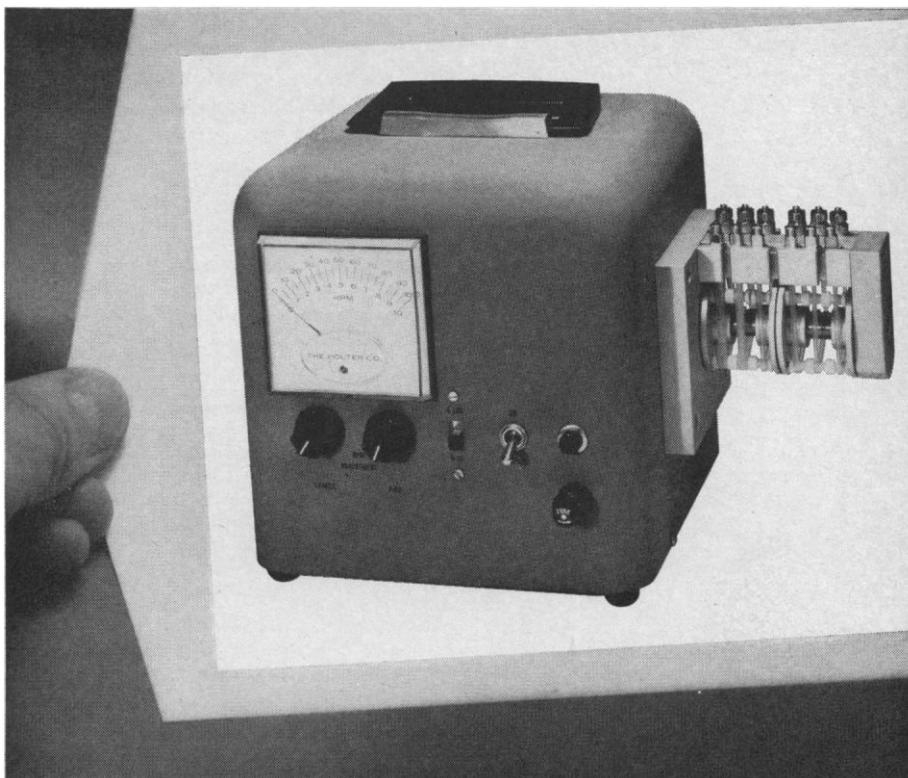
Department of Pharmacology,  
Vanderbilt University,  
Nashville, Tennessee 37203

Reference

1. J. H. van't Hoff, *Imagination in Science*, G. F. Springer, Trans. (Springer-Verlag, New York, 1967).

In reviewing *The Double Helix*, my friend Chargaff bewails the supposedly recent emergence within science of two phenomena—charismatic personalities and races for discovery. I believe he has missed the very point that makes Watson's book a welcome, refreshing novelty. For in science, as in any other human activity, personality and competitiveness are ever-present, even determining, elements. That they have traditionally been hidden by biographers and historians of science is due to the unusually protracted survival, in this field of scholarship, of Dickensian stereotypes. Scientists themselves have long been steeped in the illusion that science, by forcing on its practitioners the habit of intellectual integrity, also purifies them of human frailties like aggressiveness and hero worship.

But reality cannot easily be bent to fit Victorian ideals of good behavior, as psychologists well know. What has suffered has been not only the credibility of science history but also its usefulness as a document of human endeavor. How long will students who read of the wonderful epic of the "fruitfly room" at Columbia not be told of the jealousies



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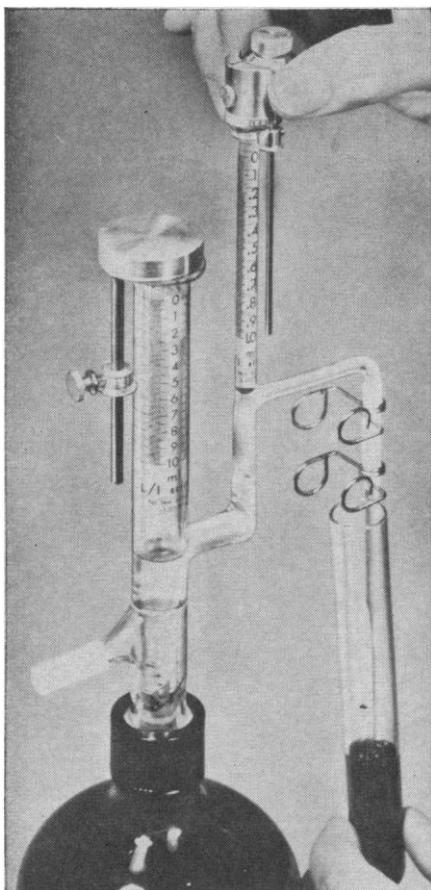
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and tensions that were part and parcel of its scientific history? Will the stories of photosynthesis and of oxidative phosphorylation, when written, be properly recorded if they hide the fact that some of their protagonists were often at bitter odds, for scientific as well as personal reasons?

Science is a human enterprise, one of the greatest, in fact, because in its course it embodies better than any other intellectual pursuit the productive outcome of human cooperation. Why should the vital interplay between competition and mutuality in the scientific enterprise be kept hidden?

Indeed, if science is really important, why should the brilliant, sarcastic wit of such as Erwin Chargaff be less a part of history than that of a Talleyrand or a Disraeli?

S. E. LURIA

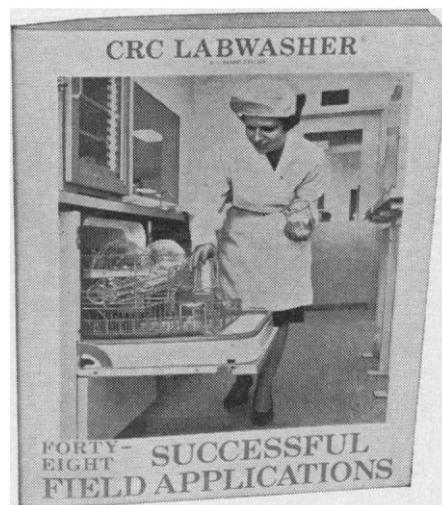
*Department of Biology,  
Massachusetts Institute of Technology,  
Cambridge 02139*

## One Wrong To Justify Another

Greenberg's excellent article on the marijuana raid at Stony Brook (9 Feb., p. 607) is a perfect exposition of the older generation's apparent helplessness when confronted with adolescent stupidity. The misguided young pot smokers attempt to justify their behavior on the grounds that other things (tobacco and alcohol, used to excess) are known to be bad but are not prohibited; therefore marijuana (the extent of whose deleterious effects are not known with scientific precision) must also be permitted. To generalize, we must not proscribe any evil as long as we allow some other evils to exist.

It seems to me that this rationalization is being used in all kinds of situations by those who would defy any form of authority. In matters of religion we are told that because there are some hypocrites in the congregation (which is true) all pronouncements of churchmen are without standing. In matters of morals, the fact that certain deviations are tolerated or poorly enforced is held to negate all moral authority. The fact that some adults are Babbitts or "squares" is considered ample justification for spurning the advice of all adults. The fact that we don't allow the police to break people's doors down to check up on what they are reading in bed is supposed to make it all right to

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peddle semipornographic trash in bookstores and theaters. The fact that some white people are prejudiced is given as reason enough to "burn Whitey," and because some Negroes riot there are those who would put "the Negro" back in his place. In every instance, one wrong is being used to justify another.

There is no reason to be surprised that such childish reasoning is used by immature people—this has been going on since time immemorial. What is so discouraging is that supposedly intelligent people, including a fairly strong and vociferous segment of our educators and scientists, are not only unable to cope with such arguments on the part of adolescent students, but actually side with the students in their blind rebellion against any standards of conduct.

JOHN D. ALDEN

98 Sunnyside Avenue,  
Pleasantville, New York 10570

### Research on Aging: A Proposal

In my letter (15 Dec.) essentially supporting Strehler's view on aging research, I suggested the "creation of a Research Commission of Aging which would be directly responsible to the President and Congress and the transfer to this Commission of authority for all basic biological research on aging—in effect, formation of an AEC of biological aging." Unfortunately Strehler interpreted my statement to mean creation of an organization of the *financial* size and complexity of the AEC, while I intended it to refer only to an organization with centralized responsibility and authority similar to the AEC. I had in mind an organization of perhaps 100 people whose primary purpose would be to monitor contracts with universities, hospitals, and independent research groups. A secondary purpose would be to carry on in-house research, both to verify contract results and to explore concepts which were not under contract. A third purpose would be to stimulate private research interest in the biological mechanisms of aging. These three aims could be accomplished on an annual budget of between \$5 million and \$50 million, progressing from the smaller to the larger value as the commission became established.

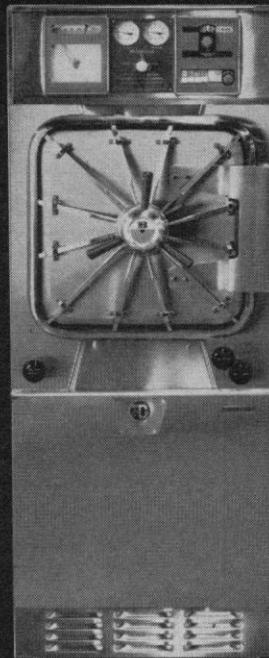
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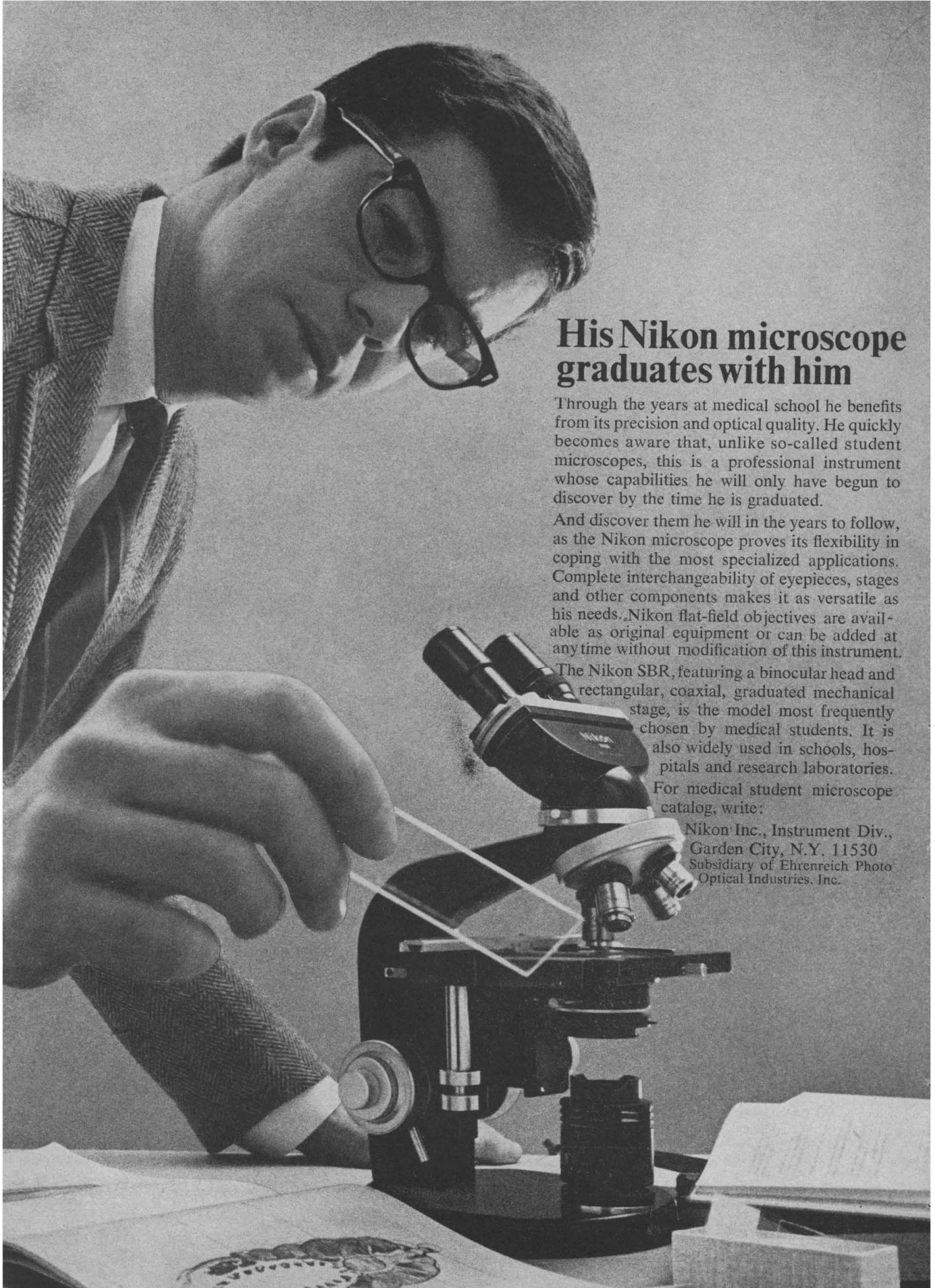
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**Science Advice for State Governments**

In *Science* for 19 April, Harvey M. Sapolsky discussed the science advisory agencies that have been established by 22 state and territorial governments and five cities. Many of them have not worked well, and about half have lapsed. Inexperience and insufficient support have hampered some. State governments usually have few scientifically and technically competent members of the state bureaucracy who can understand, interpret, and implement the recommendations of an advisory body. Moreover, scientists would rather work on national than on local problems.

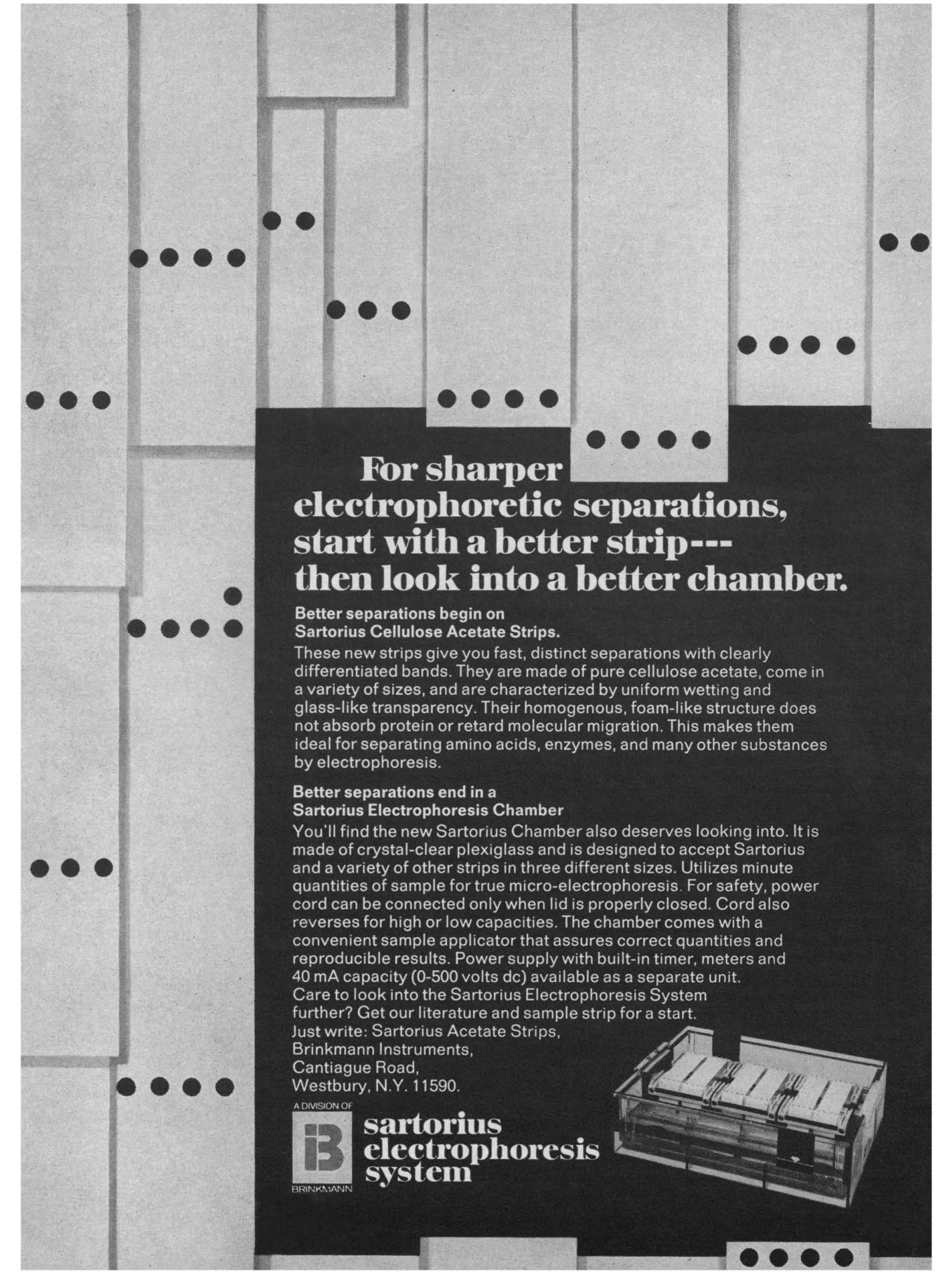
Underlying such specific reasons for the difficulties encountered by state advisory bodies is a major difference between state governments and the federal government. At the national level it has been necessary to deal with technical problems of military equipment, atomic energy, and space exploration. At the national level the scale is larger—in cost, in information-handling requirements, and in power. The federal government therefore earlier found it necessary to establish a variety of scientific advisory bodies.

The need at the state level came later, but will undoubtedly increase. State governments will require an understanding of scientific and technical matters in order to deal effectively with a variety of concerns: pollution problems; educational improvements; crime prevention; and the effort to preserve enough of the natural environment to provide protection against irreversible damage while also balancing the needs of economic development with the amenities of open space, the preservation of natural areas, and the provision of recreational facilities.

State and federal governments already share costs and responsibilities on some of these matters—for example, highway construction, education, and industrial innovation. In some areas of pollution control, states may establish their own standards, but the federal government retains authority to impose its standards if those of the states are not deemed adequate.

Governmental trends, increasing reliance on large-scale technology, increasing pressure to keep technology under social control, and the practical desire to be able to negotiate on reasonable parity with the federal agencies all make it seem highly likely that state science advisory bodies will increase in number and in responsibilities within a few years. (The oldest existing one dates only from 1959.) Political leaders will have to take the initiative in their development, but scientists and scientific organizations can sometimes help them see the need.

If this forecast is reasonable, there will be need—or opportunity—for a number of scientists to serve on state advisory bodies, and also need for more full-time employees who are knowledgeable about technical matters. There will also be a special opportunity for one or more universities. There are now more than a score of university departments or programs for teaching and research on science and government, or science and public policy. Most have concentrated on the political science of our constitutional government and the ways in which it has adapted to the burgeoning of science and technology. A university that chose to specialize in the study of the relations between state (and perhaps large city) governments and science and technology would pioneer a different area of specialization, and could begin its studies practically at the beginning of the development of formal means of providing science advice to state governments.—DAEL WOLFE



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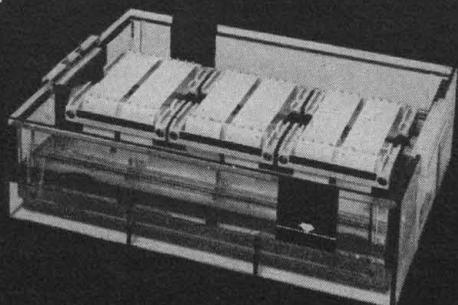
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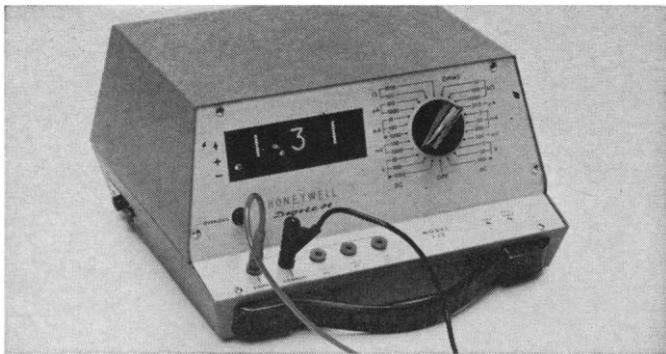
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