

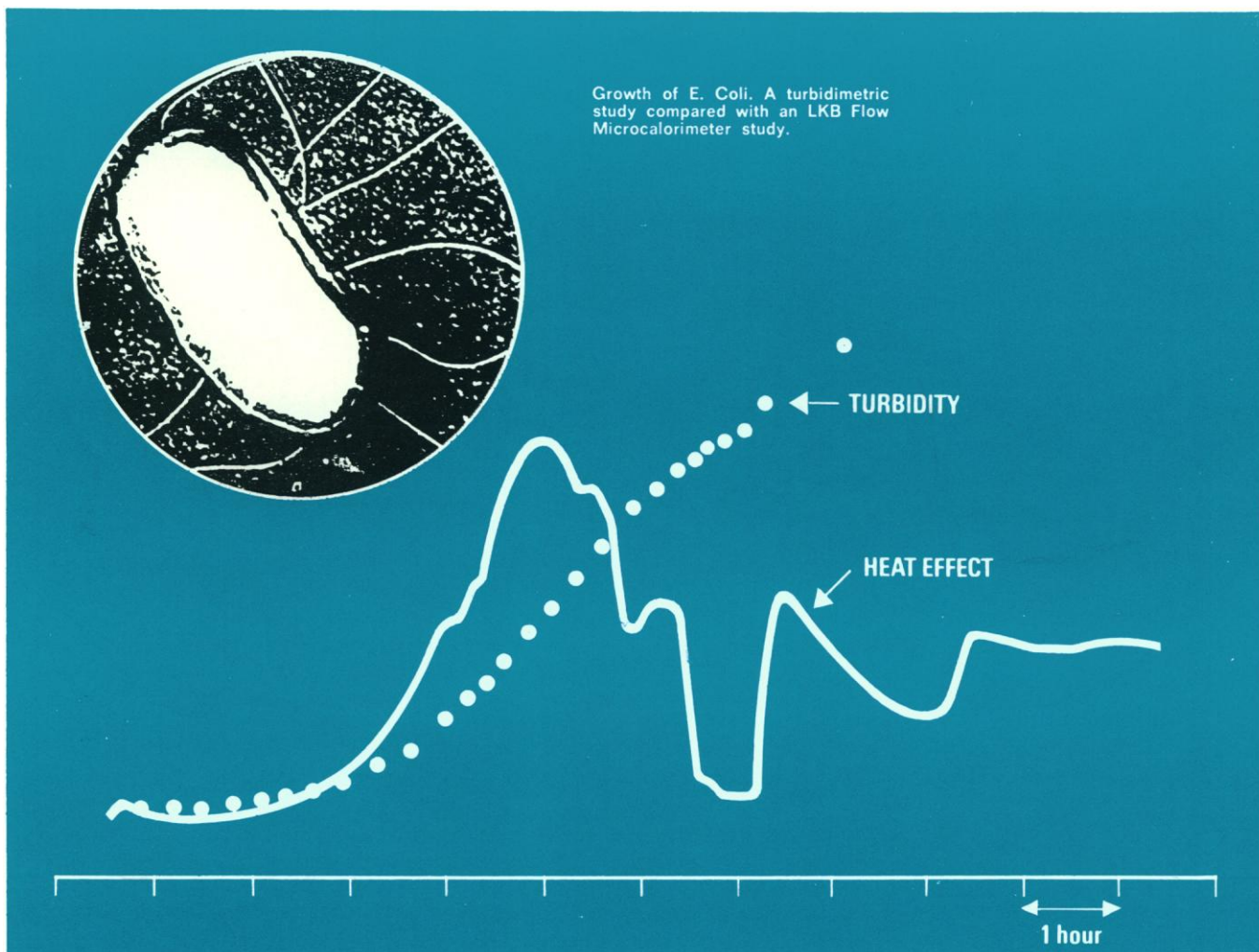
SCIENCE

19 March 1971

Vol. 171, No. 3976

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





A Matter of Life and Death

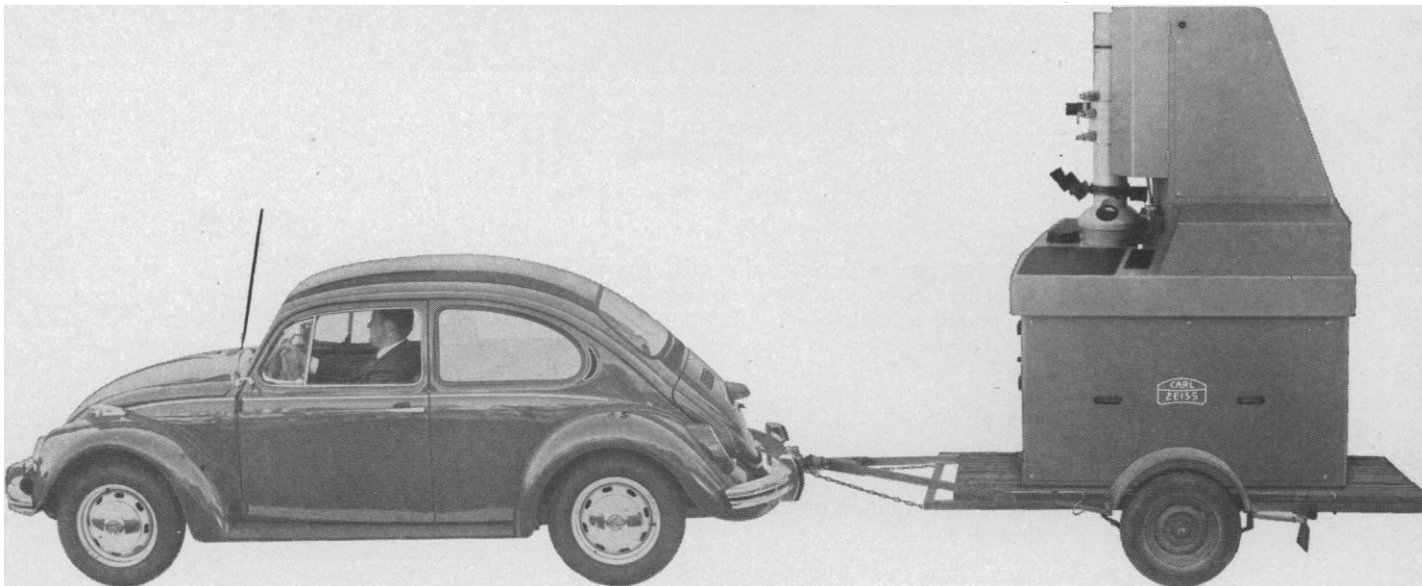
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COVER

New transit system in the San Francisco Bay Area. Interior of the tube under the bay. See page 1125 [Bay Area Rapid Transit District Photograph]

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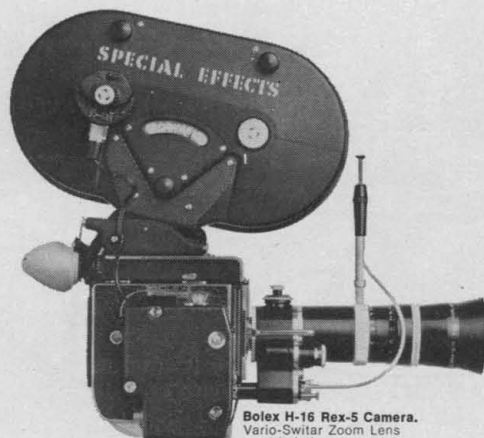
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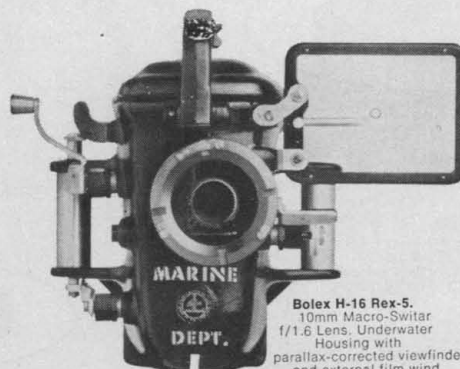
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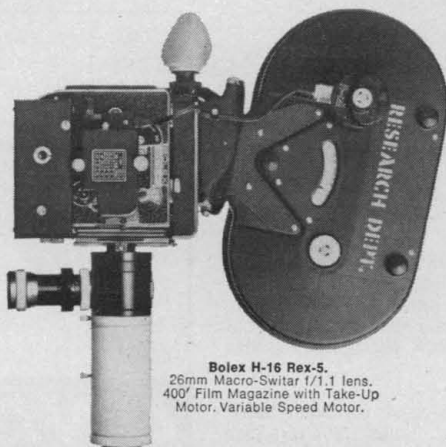
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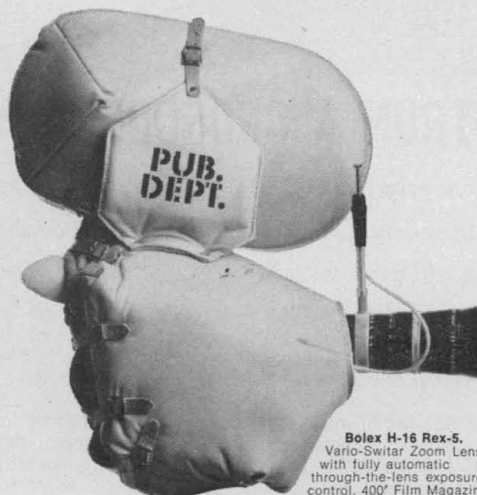
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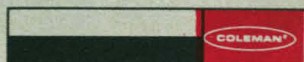


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zonal centrifugation...

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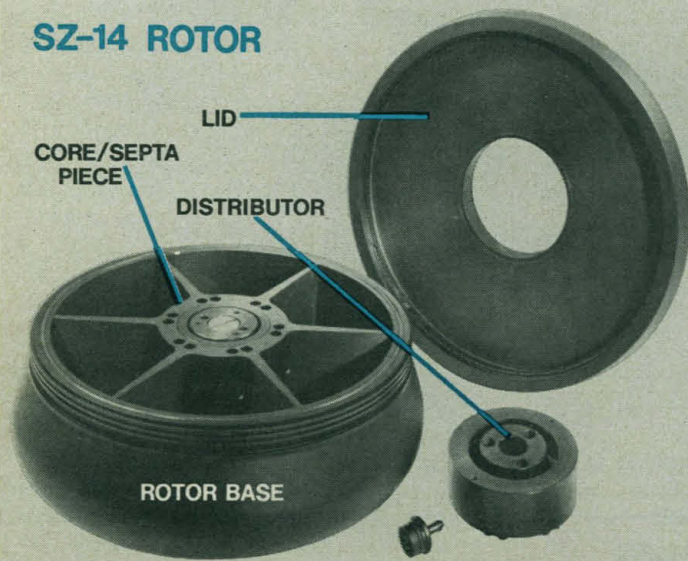
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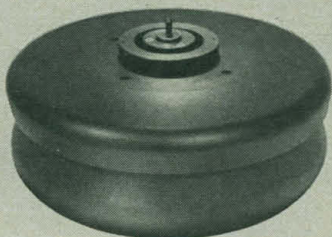
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SZ-14 ROTOR



SZ-14 density gradient reorientation is illustrated below.

During static loading, the density gradient is pumped into the rotor (light end first) through the stem of the distributor (Fig. 1A). Channels in the distributor and core/septa piece conduct the gradient into the rotor chamber. This produces a vertical density gradient upon acceleration of the rotor (Fig. 1B). During dynamic loading, however, the empty rotor is first accelerated to about 2,000 RPM (Fig. 1G), whereupon the gradient is introduced (dense end first) into the rotating distributor. Centrifugal force carries the gradient stream into the rotor compartments through other channels in the distributor and core/septa piece directly producing a horizontal gradient without reorientation (Fig. 1H).



with SORVALL

Both static and dynamic loading procedures culminate in a horizontal density gradient within the spinning rotor. The sample is introduced into the annular chamber of the distributor and is rapidly deposited on the density gradient (Fig. 1C). After the sample particles have been separated (Fig. 1D), the rotor is decelerated with subsequent reorientation of the gradient (Fig. 1E).

Static Loading

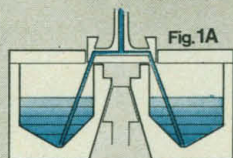


Fig. 1A
Gradient Loaded at Rest
(Light End First)

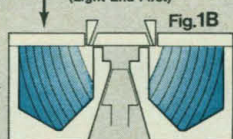


Fig. 1B
Reorientation During
Acceleration

FIGURE 1

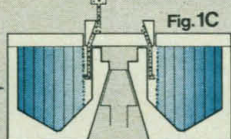


Fig. 1C
Loading Sample

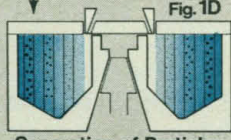


Fig. 1D
Separation of Particles

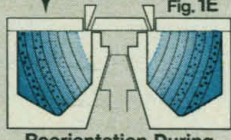


Fig. 1E
Reorientation During
Deceleration

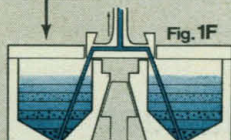


Fig. 1F
Unloading

Dynamic Loading

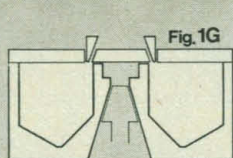


Fig. 1G
Empty Rotor Accelerated

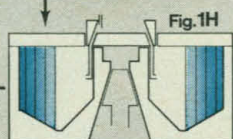


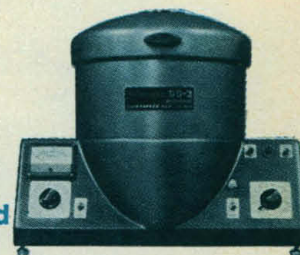
Fig. 1H
Gradient Loaded
(Dense End First)

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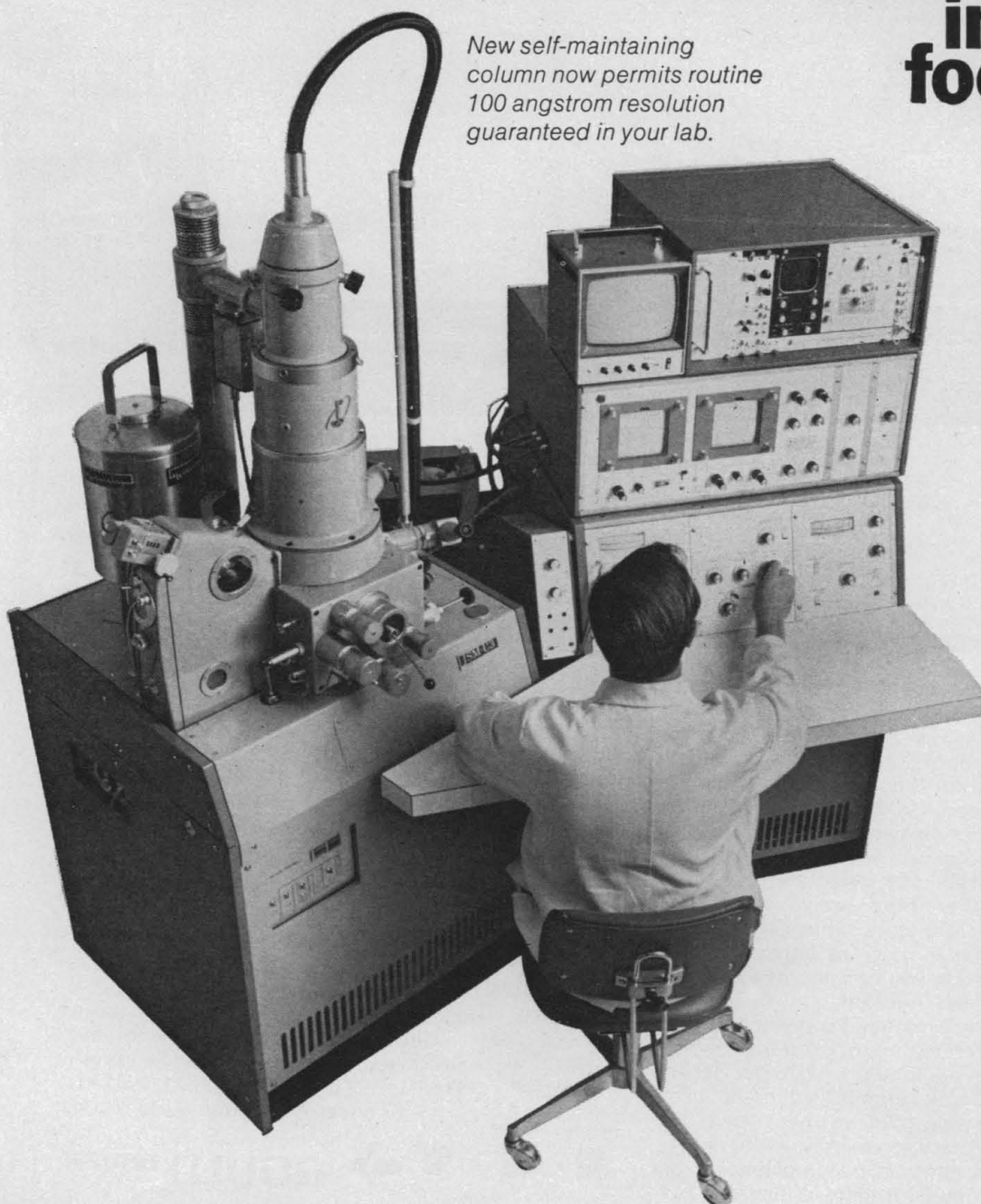
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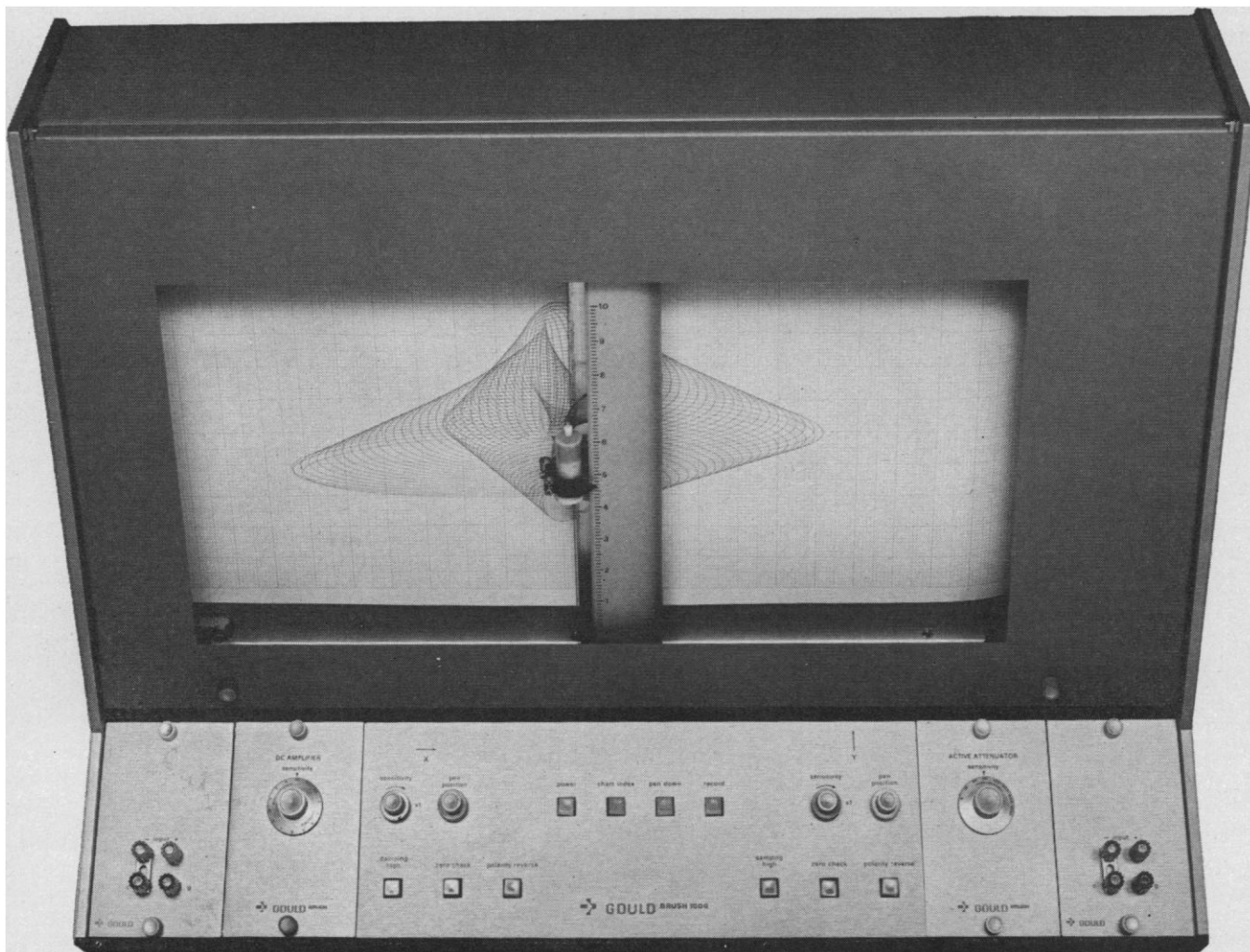
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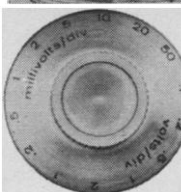
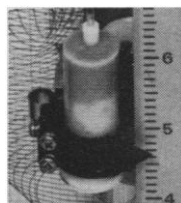
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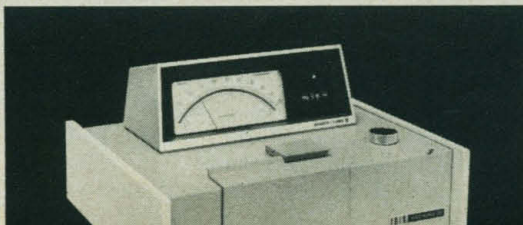
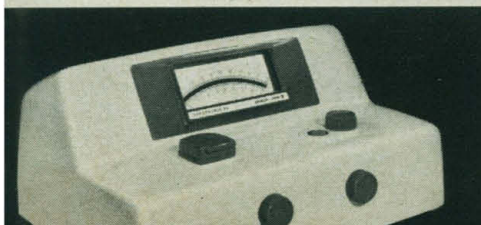
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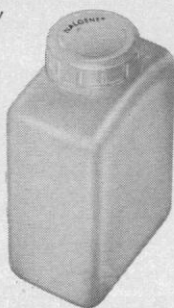
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leukemia mortality rate was significantly higher, and higher by a factor of 1.5, than the leukemia mortality rate in the general population. This, as yet, inconclusive study by no means excluded radiation as the cause of an observed higher leukemia mortality in the patients treated with radioiodine.

If one reads our study carefully one can realize that when one compares a group of hyperthyroid patients treated with iodine-131 to a similar group treated with surgery, no difference in rates of subsequent leukemia is found. If Lewis believes that an excess of leukemia is attributable to the radiation of iodine-131, he would also have to attribute a similar excess of leukemia in the surgical group to some factor associated with the procedure of thyroidectomy. In our experience, the circumstances surrounding subtotal thyroidectomy or many other surgical procedures have not hitherto been associated with a postulated increase in leukemia. In analyzing the results of the Cooperative Thyrotoxicosis Study it does seem difficult to reach the conclusion that radiation can by no means be excluded as the cause of an observed higher incidence of leukemia without being logically directed to the same conclusion in regard to the patients treated surgically.

It is always difficult to determine when a study becomes conclusive. Three years after our initial report (1) there have been no changes in leukemia rates in any of the treatment groups. Furthermore, this study is unique in having a well-defined population of 36,050 persons with a follow-up rate of 98.8 percent yielding 35,613 studied patients and with reasonably well-calculated radiation doses. The sensitivity of detecting a doubling of leukemia with $P = .9$ is more clearly stated than for some other studies where diagnoses, numerator, and denominator values seem somewhat less precise.

The fact that this properly designed study of the largest number of patients yet reported exposed to low-dose radiations with careful follow-up and relatively precise dosimetry fails to fit certain carefully nurtured concepts may relegate it to a permanently inconclusive state in the minds of some. To date prospective studies of radiation at low doses in human beings have failed to show association between such doses and somatic effects. For example, Lewis might want to review the statements in his letter (4) concerning the 1.4-fold increase in children exposed prenatally to doses of not more than

a few rads in light of the report of Jablon and Kato (5) wherein they have been unable to confirm this relationship in children exposed during atomic bombing in Japan.

We agree enthusiastically with Lewis that these investigations should continue but would hope that one's conclusions would be reached with appropriate consideration of the many factors concerned.

EUGENE L. SAENGER

College of Medicine, University of Cincinnati, Cincinnati, Ohio 45229

EDYTHALENA TOMPKINS

Bureau of Radiological Health, Environmental Health Service, Department of Health, Education, and Welfare, Rockville, Maryland 20852

GEORGE E. THOMA

St. Louis University School of Medicine, St. Louis, Missouri 63104

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2. E. L. Saenger, R. A. Seltzer, T. D. Sterling, J. G. Kereiakes, *Health Phys.* **9**, 1371 (1963).
3. R. W. Holcomb, *Science* **167**, 853 (1970).
4. E. B. Lewis, *ibid.* **168**, 315 (1970).
5. S. Jablon and H. Kato, *Lancet* **1970-II**, 1000 (1970).

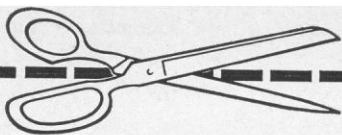
Anointed but Not Appointed

Some response must be made to the recent report in "Harvard: New president's task to unify, preside over change" (22 Jan., p. 264) of a statement by Francis Burr bearing on the appointment of William H. Danforth as chancellor of Washington University. The implication that the immediate occasion for Danforth's appointment (if not the sole reason) was the appearance of his name in the widely advertised list of those being considered for the presidency of Harvard is as presumptuous as it is arrogant and untrue. The truth is that Danforth's accomplishments as a member of the faculty since 1957, and as vice-chancellor for medical affairs for the past 6 years, made him the unanimous choice of the selection committee. To suggest that this committee was precipitated into a decision by a rumor from the Charles River Basin is as offensive to all concerned as if we were to point out that Derek Bok failed to make the list at Washington University.

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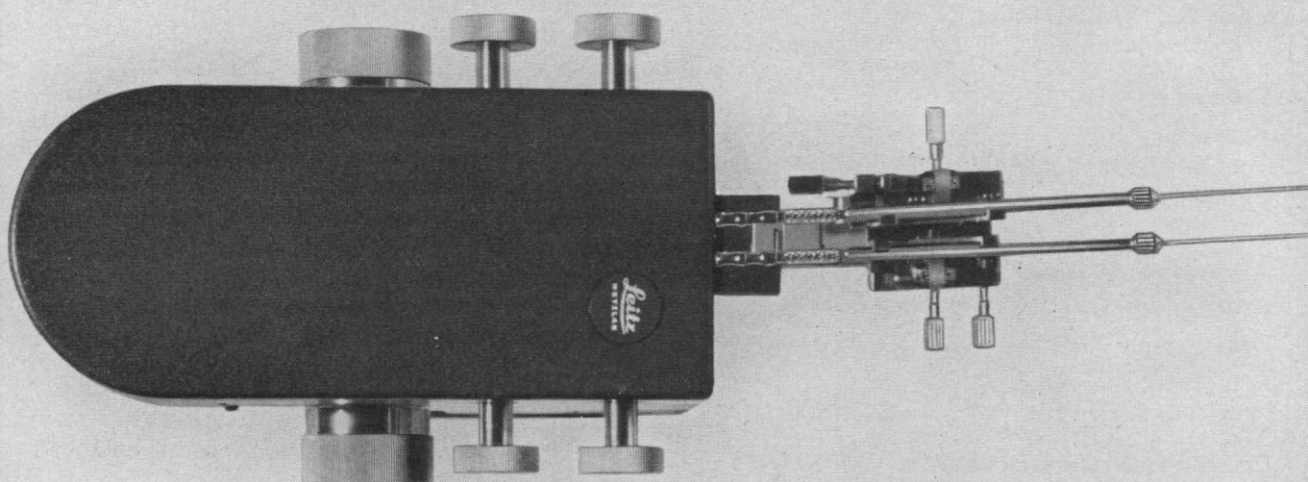
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The Editing of Science

Each week *Science* prints about the same amount of material as do leading newsweeklies. We strive for and usually maintain standards of accuracy that compare favorably with the best of them. Yet we must achieve this with a fraction of the staff engaged by other weekly magazines. We could not accomplish our tasks and maintain standards were it not for the generous cooperation of many scientists. They provide letters, articles, book reviews, scientific reports, technical comments, and meetings reports. More than 6000 reviewers help us in the selection of these materials. This cooperation arises naturally from members of a community who are accustomed to working unselfishly toward constructive ends. Final decisions must be made in our editorial offices, but, in terms of creating material for *Science* and judging it, the community-at-large is a considerably greater factor than is the staff.

Because *Science* is published by AAAS, members rightly consider that the content of the magazine is a matter about which they are entitled to form and to advocate opinions. In consequence, there is rarely a time when the editors are not under various kinds of pressure to publish or not to publish this or that.

The members of AAAS include a heterogeneous group of scientists, engineers, physicians, and others. They represent many disciplines and specialties. They are drawn from academia, government, industry, and private practice. Broad spectrums of ages and political attitudes are also represented. When permutations and combinations of background and interest are taken into account, few readers can be expected to have identical needs or views as to what should be published in *Science*.

One issue is the balance between material that is strictly scientific and material that is concerned with interactions of science and technology with society. Surveys indicate that the majority of our readers are working scientists, often with teaching responsibilities, who are more interested in new developments in science and in review articles than in public affairs. These scientists are often critical of our policy-oriented material. Those who have administrative responsibilities follow such material closely and value it, while paying less attention to the more technical content.

Tensions and emotions are aroused over scientific material, but they are minor in comparison with those arising when political issues are involved. Policy matters can be discussed with good humor and objectivity—as long as they are not in the middle of an active political arena. So strong are the emotions of the political process that the question can be raised as to whether a scientific organization can survive if more than a modest fraction of its activities are oriented to the political issues of the moment.

But the future of civilization is dependent on the wise use of science and technology, and members of AAAS cannot responsibly avoid participation in some of the opinion-making and decision-making processes. *Science's* policy in this matter is to attempt to give fair representation to the broad spectrum of views. On many occasions the Board of Directors of AAAS have considered the role of *Science*, and they have reiterated that it should function as a forum rather than as an official spokesman.

Audience participation in the editing of *Science* produces an unending series of problems major and minor. Without that participation, however, life would be dull and the magazine would be neither interesting nor consequential.—PHILIP H. ABELSON

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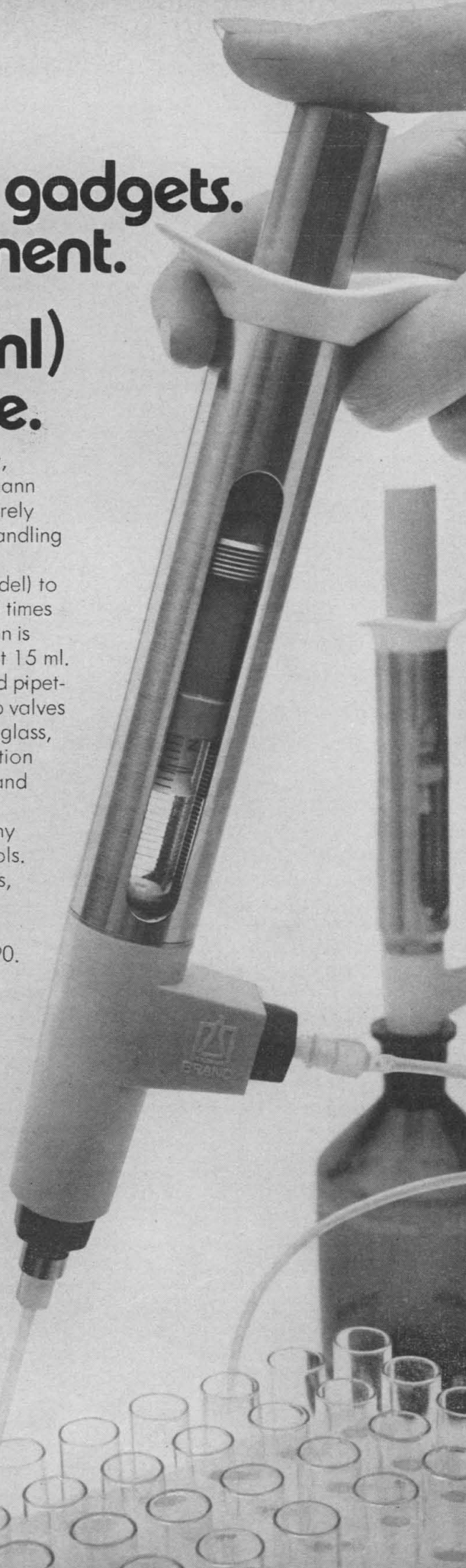
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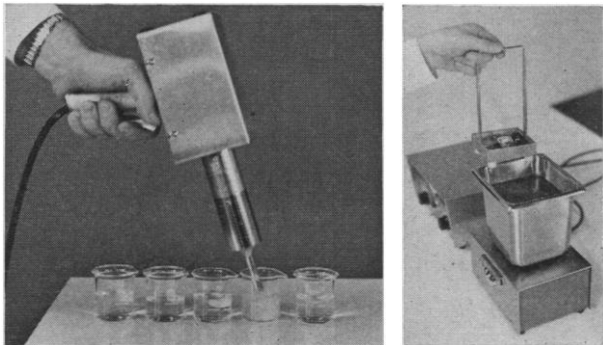
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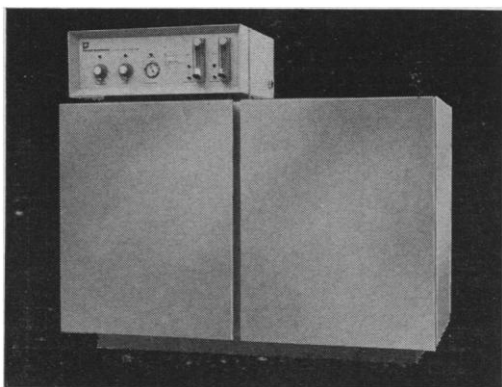
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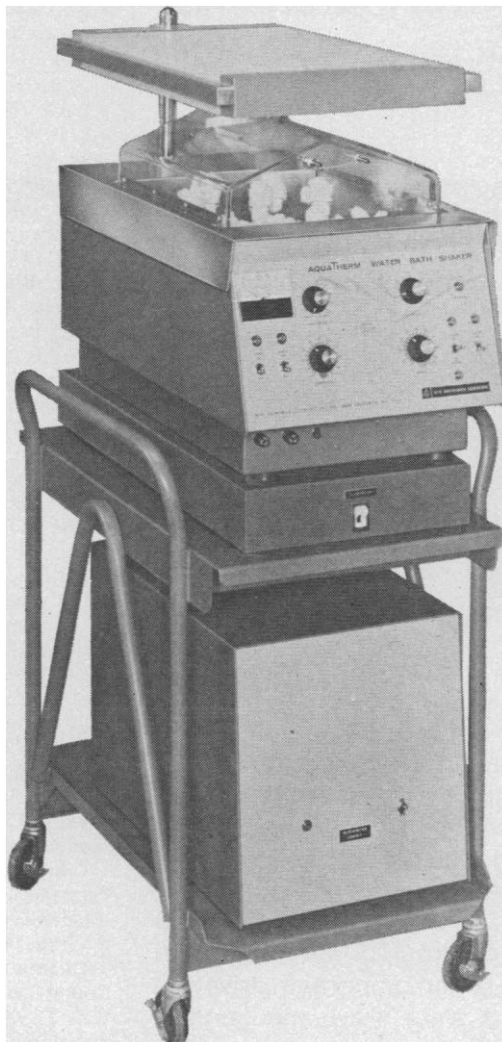


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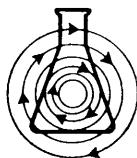
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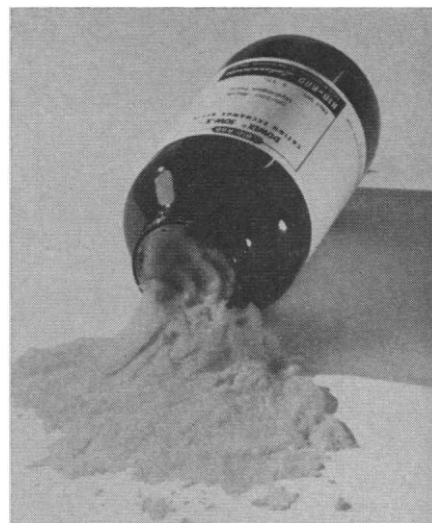
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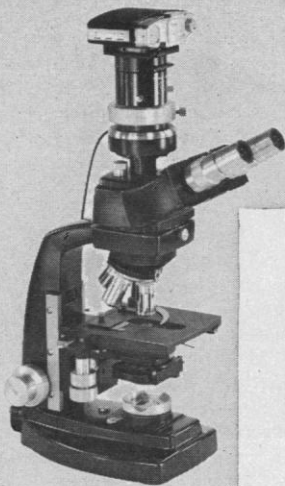
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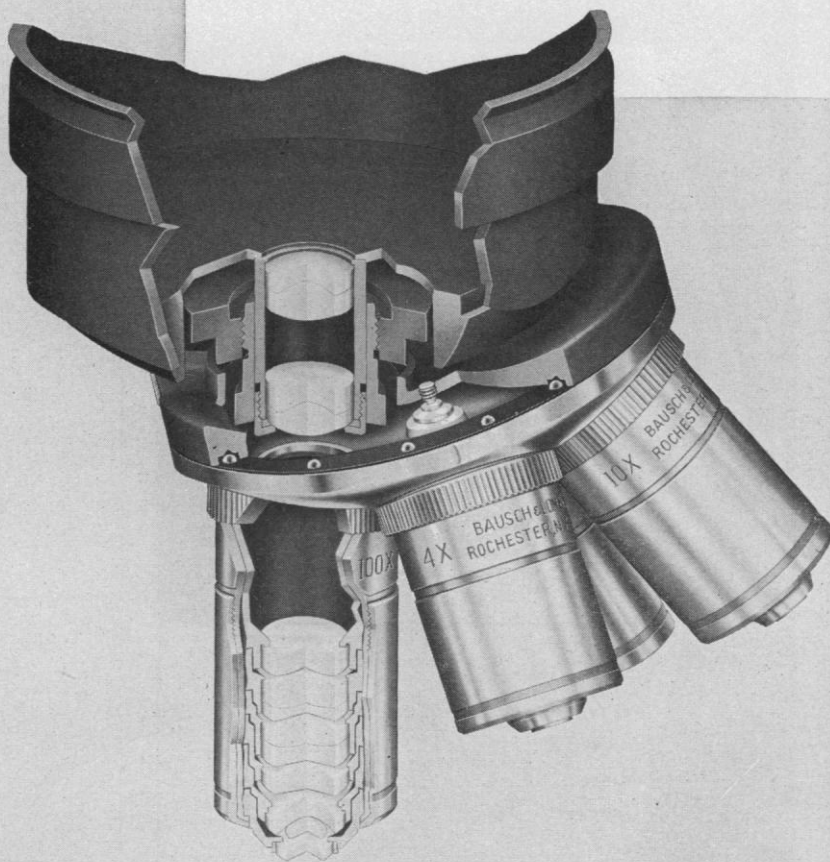
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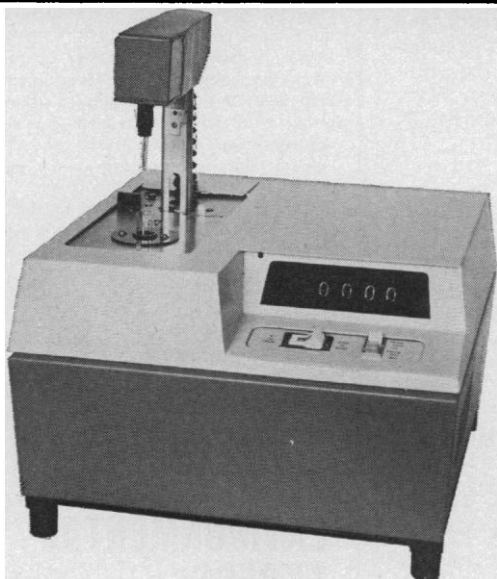
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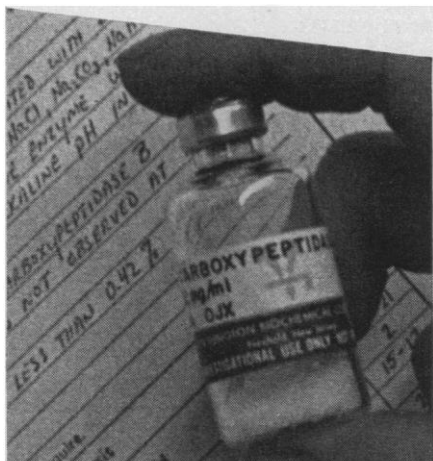
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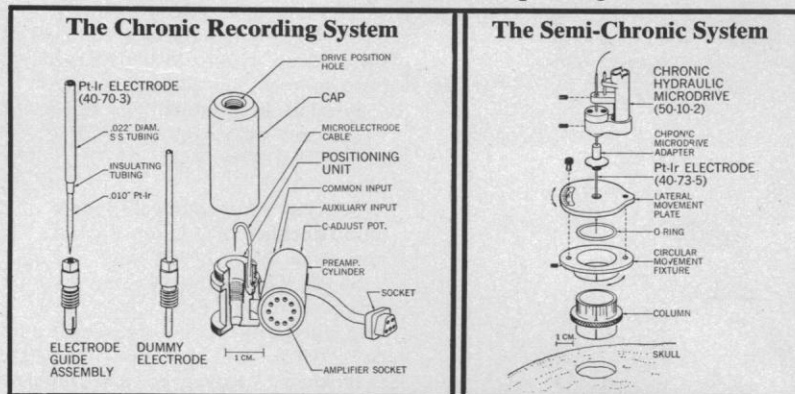
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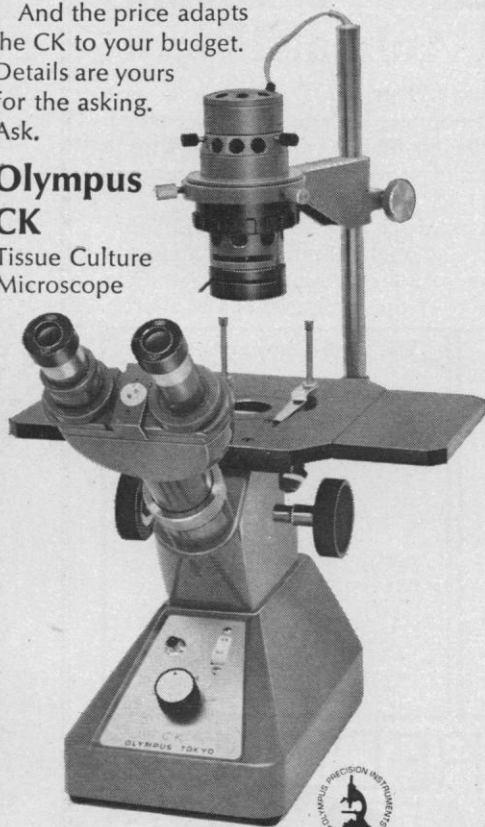
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