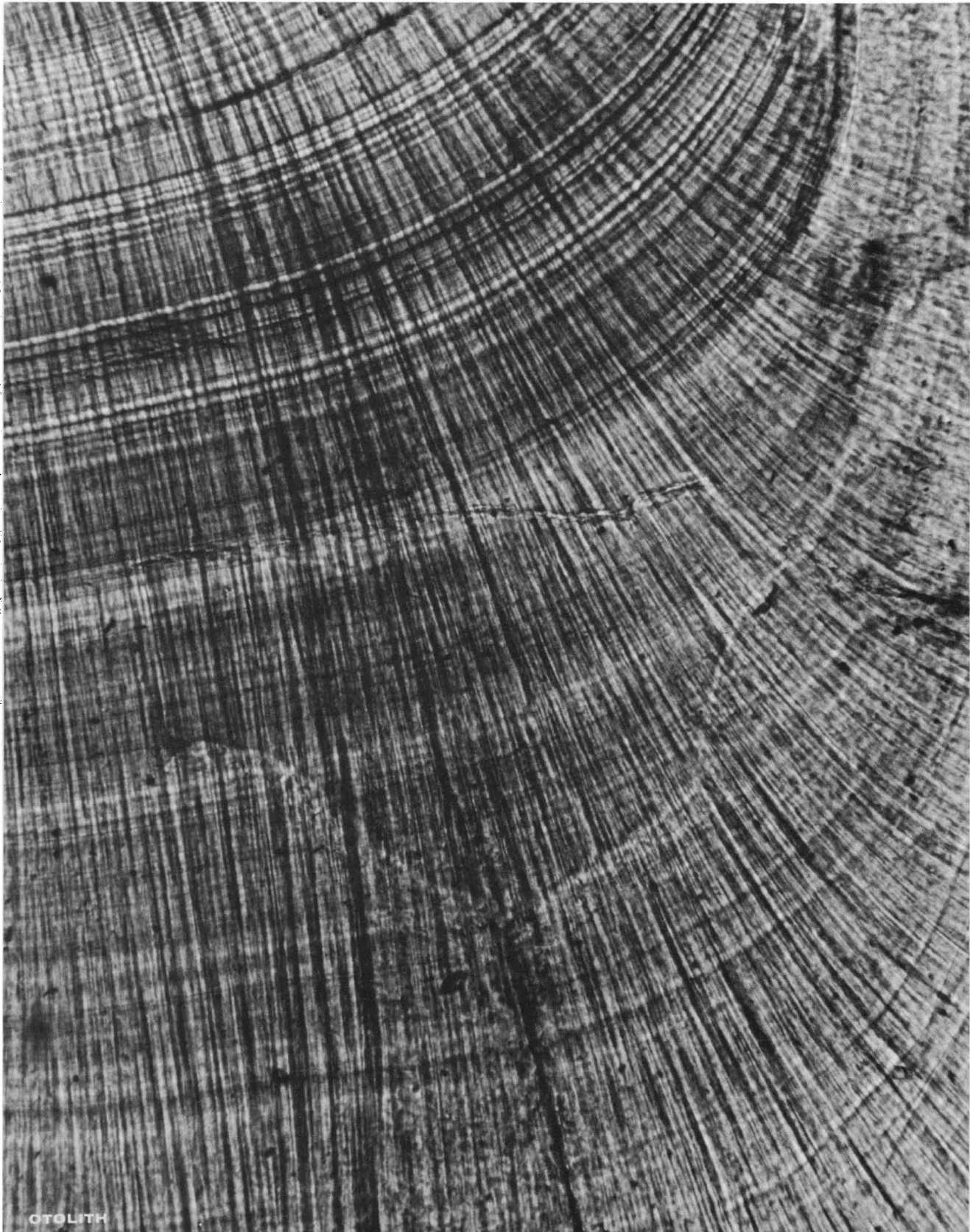


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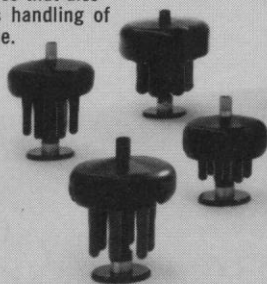
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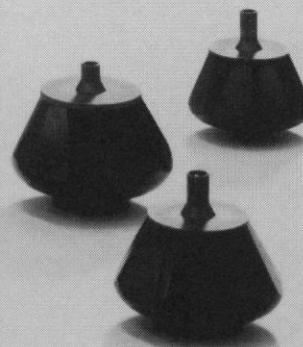
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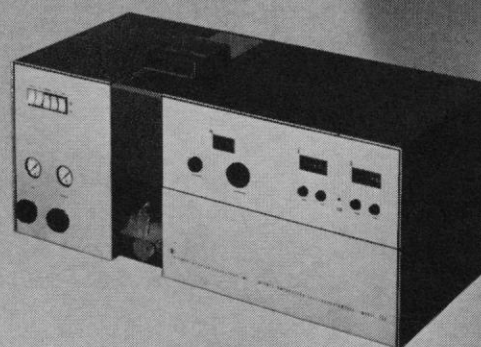
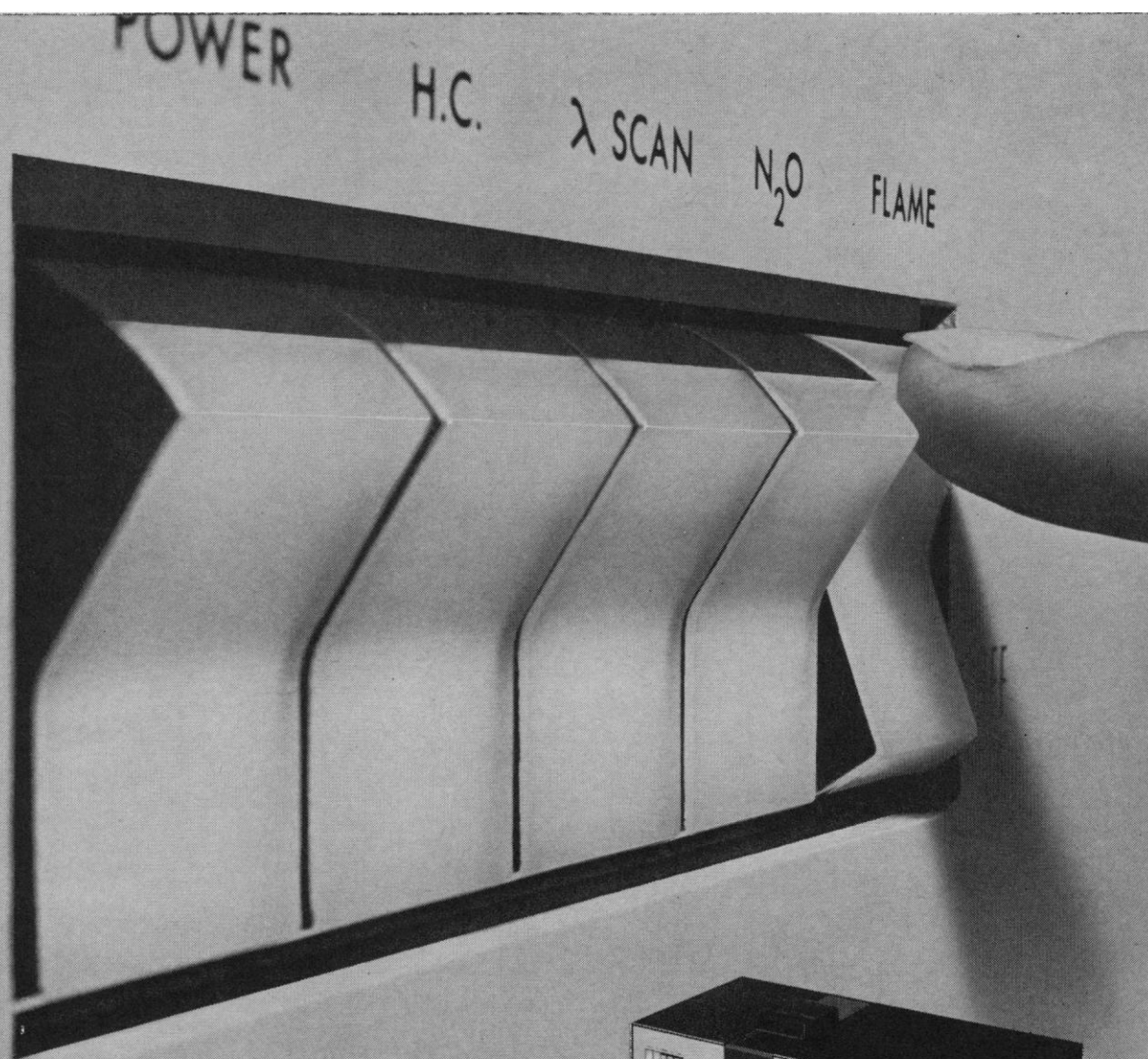
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Otolith of the nototheniid fish, *Trematomus bernacchii*. The thin section, about 50 microns thick, illustrates the complex but orderly structure of the otolith (about $\times 11$). See page 368. [L. R. Kittleman, University of Oregon]



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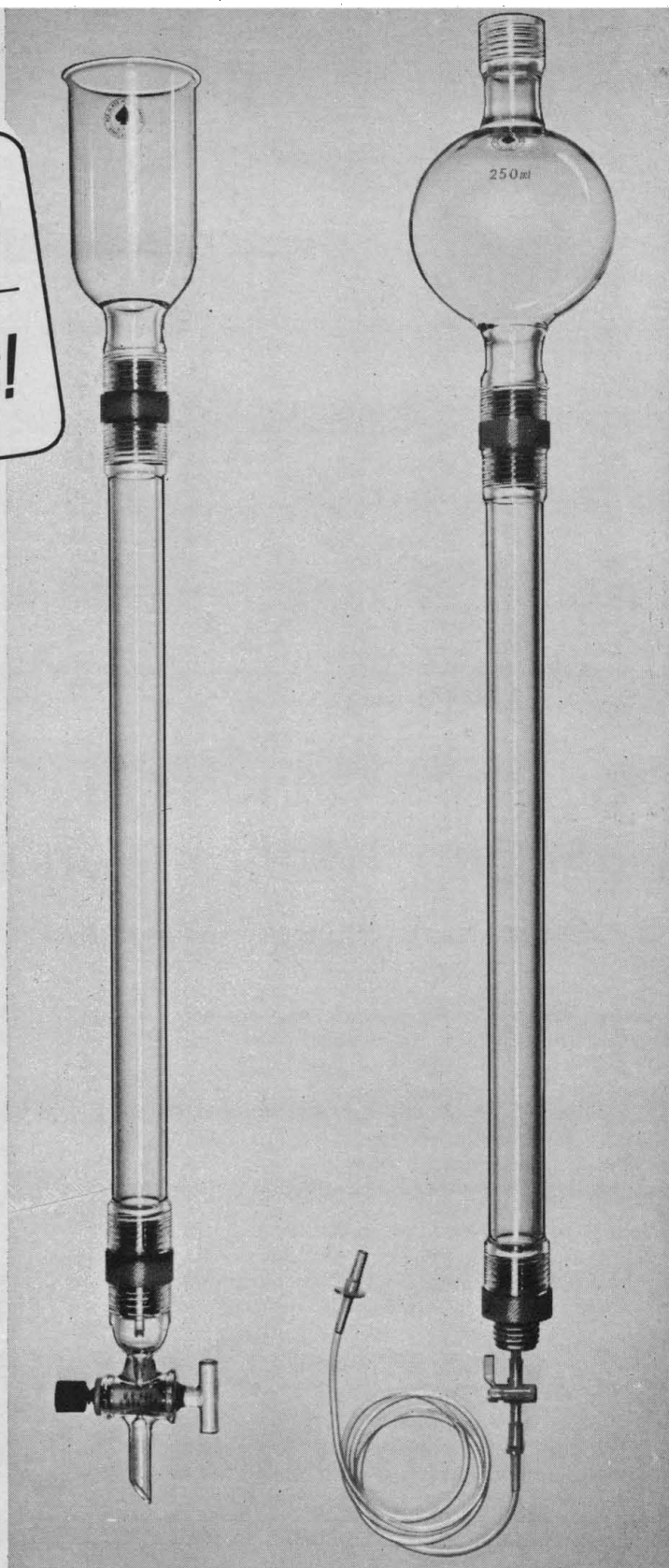
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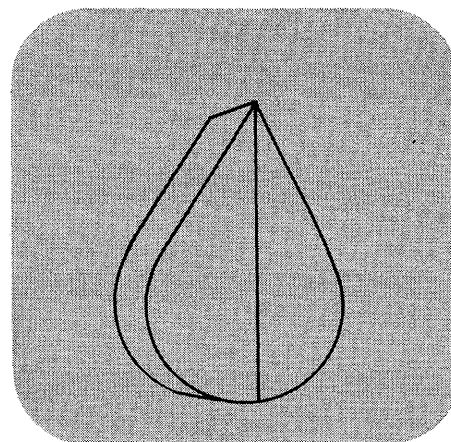
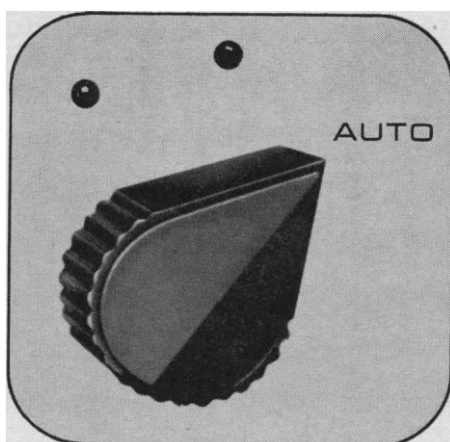
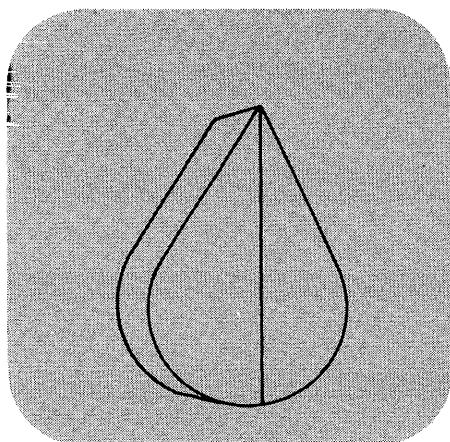


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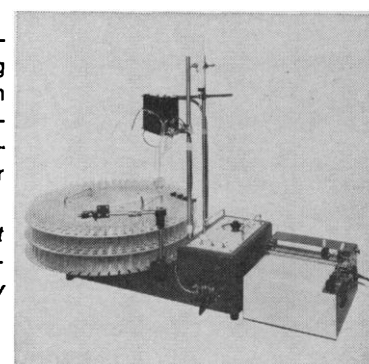
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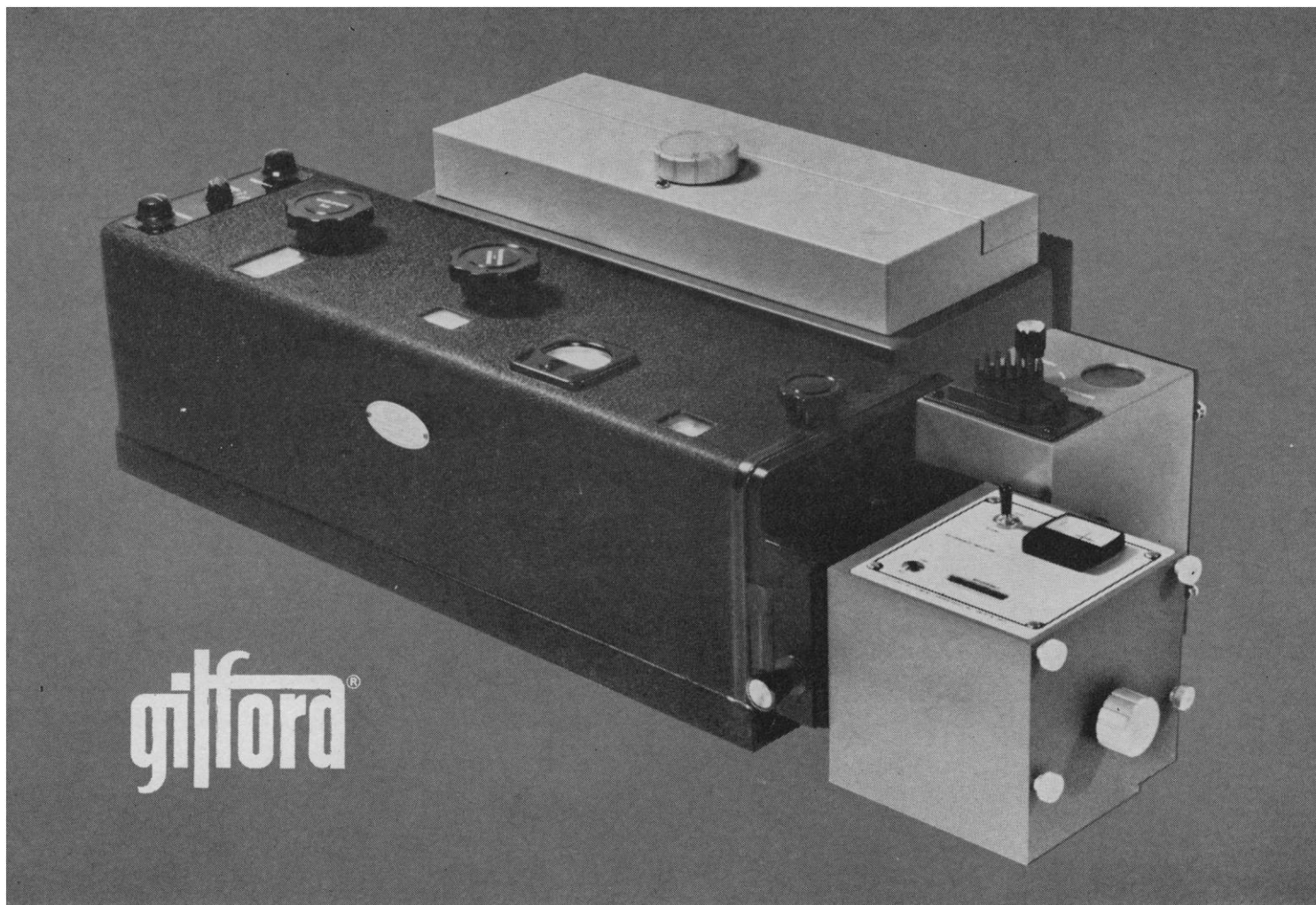


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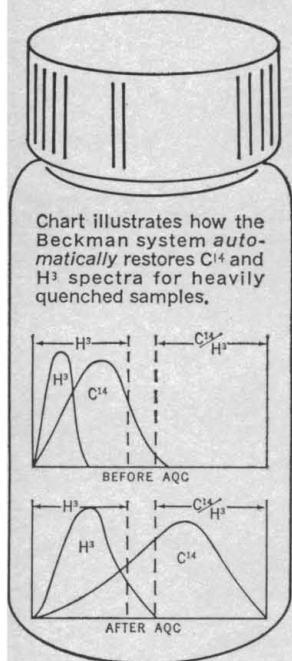
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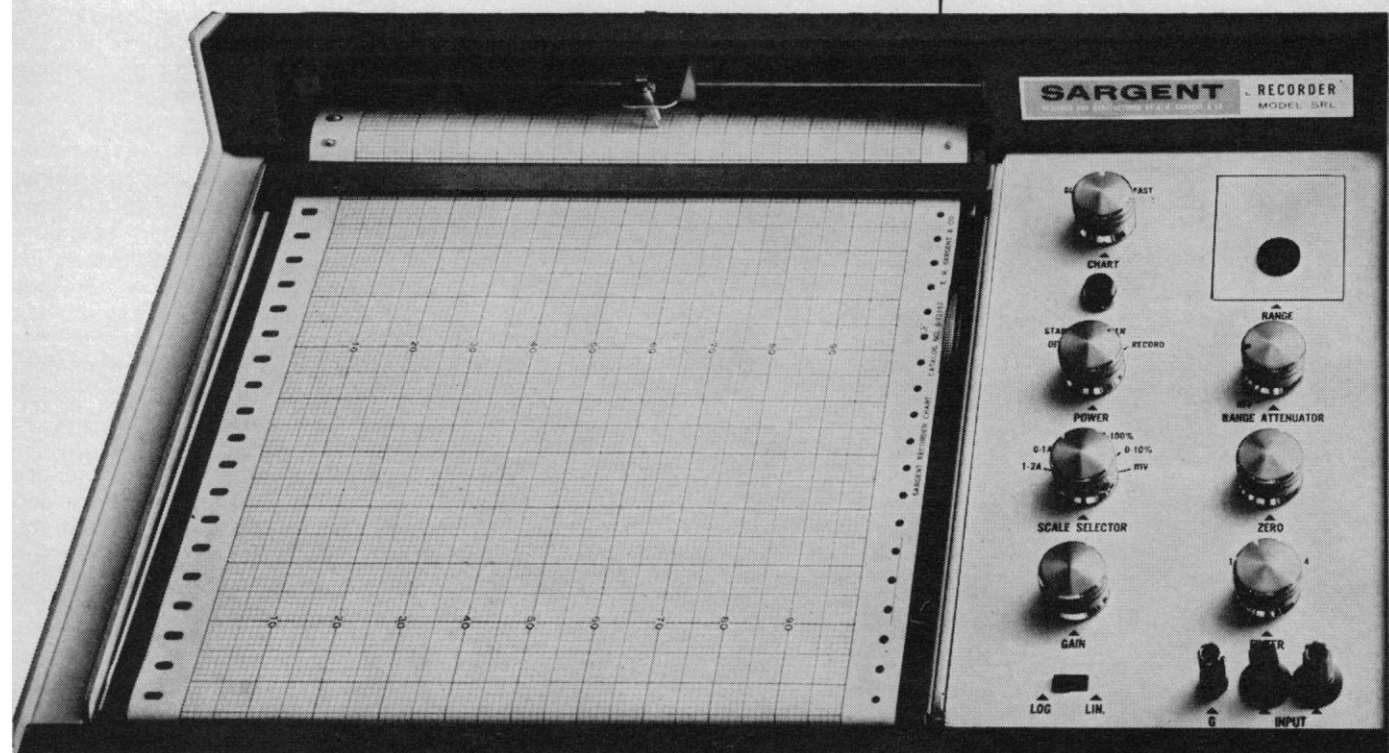
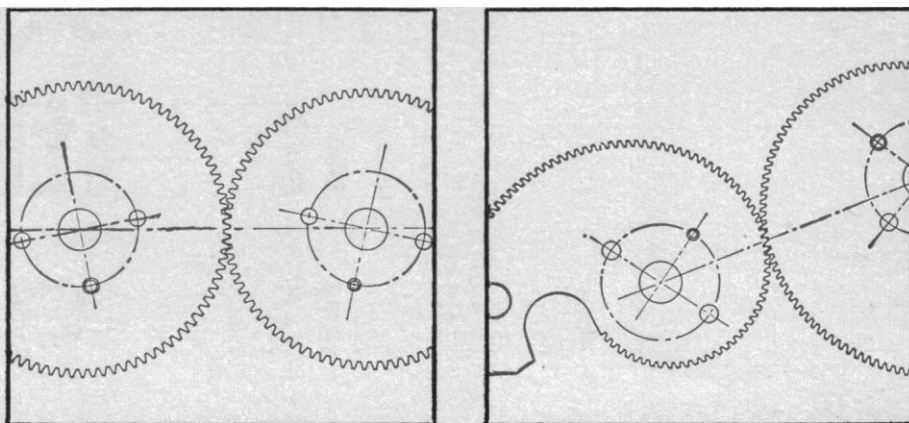
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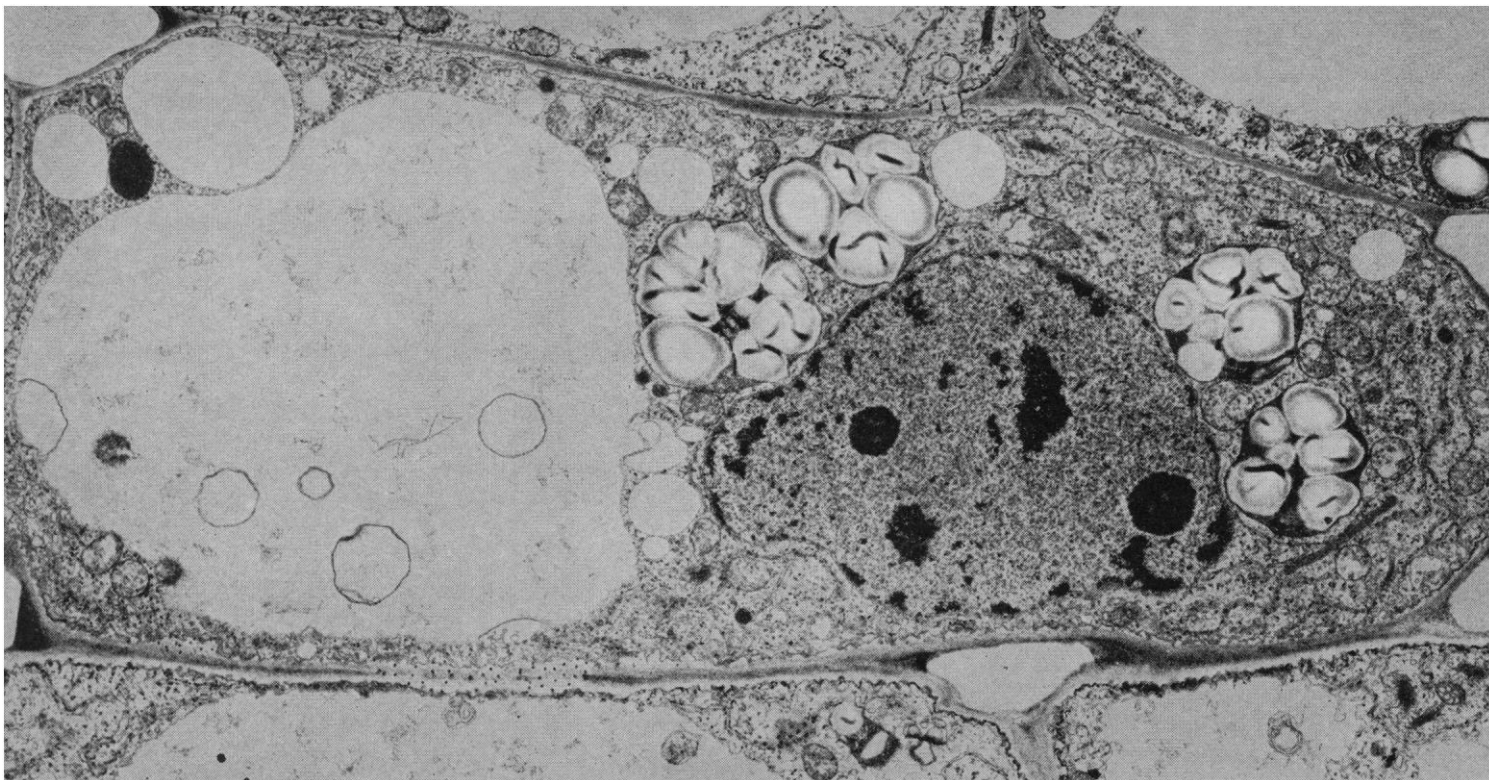
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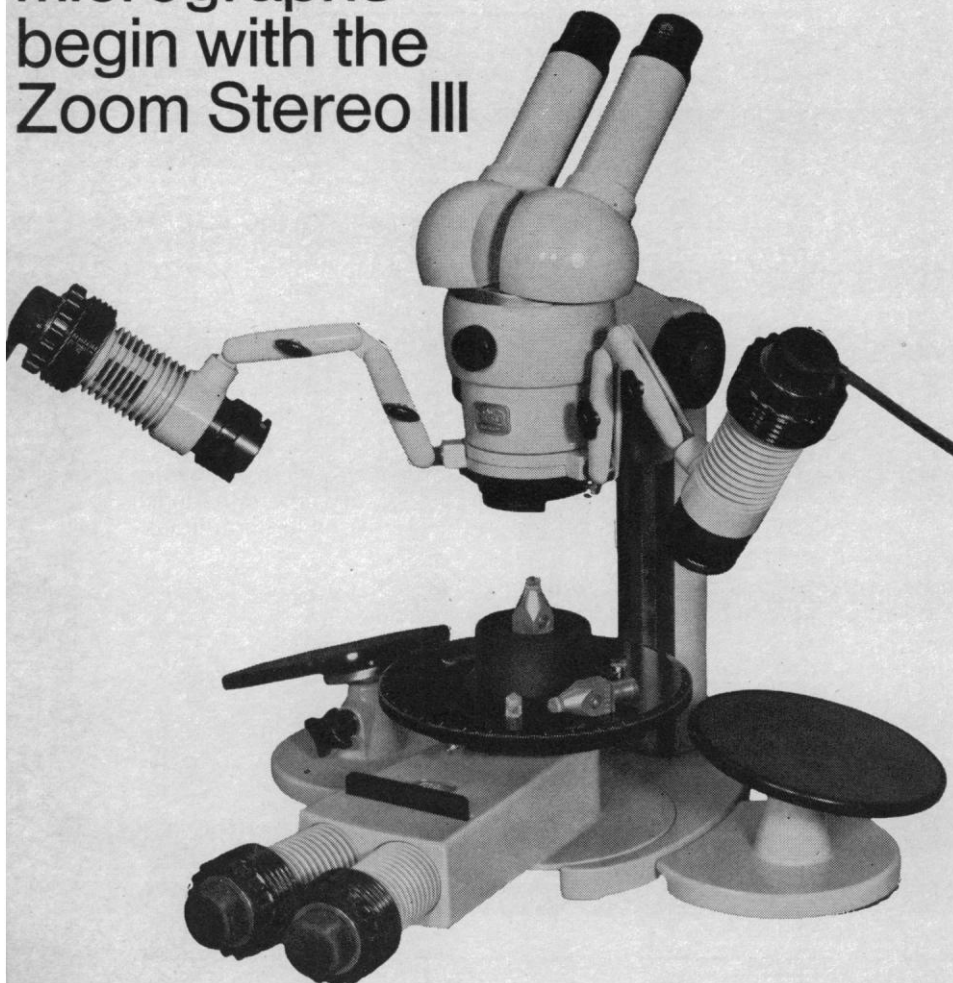
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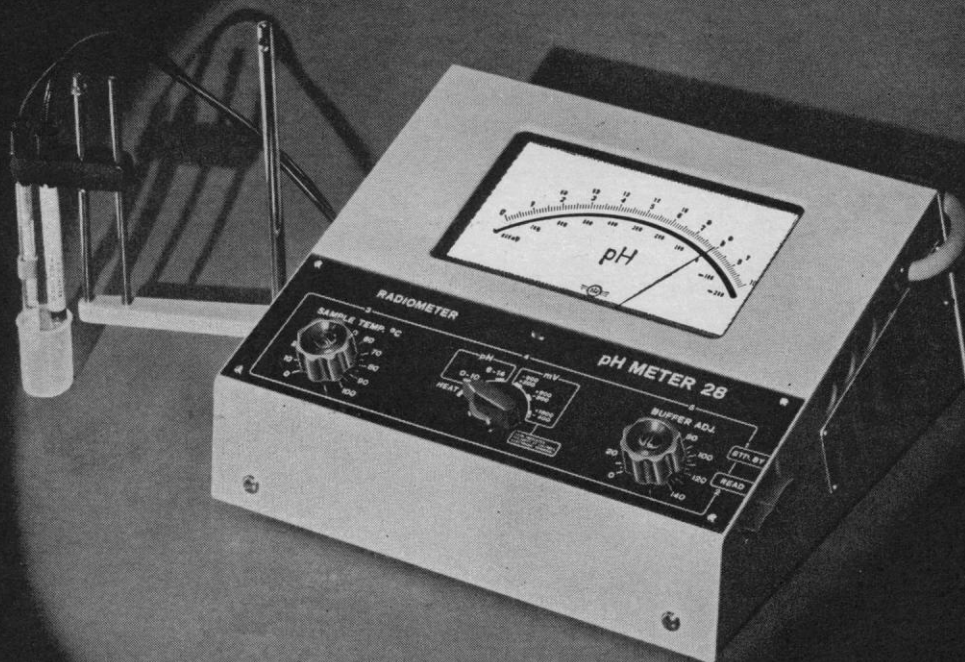
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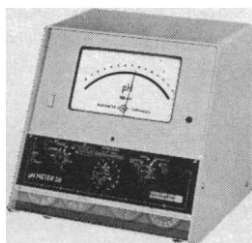
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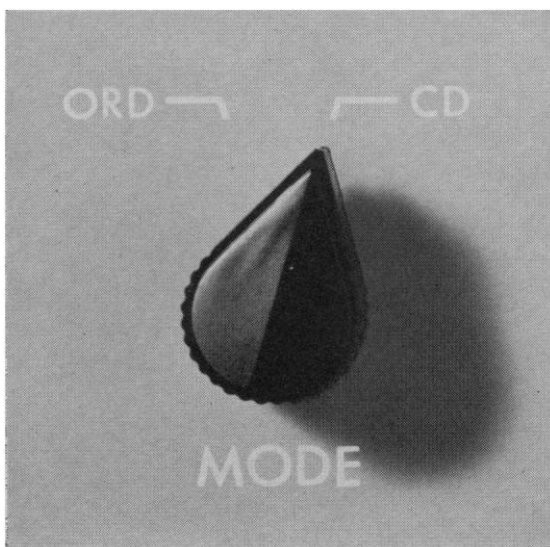
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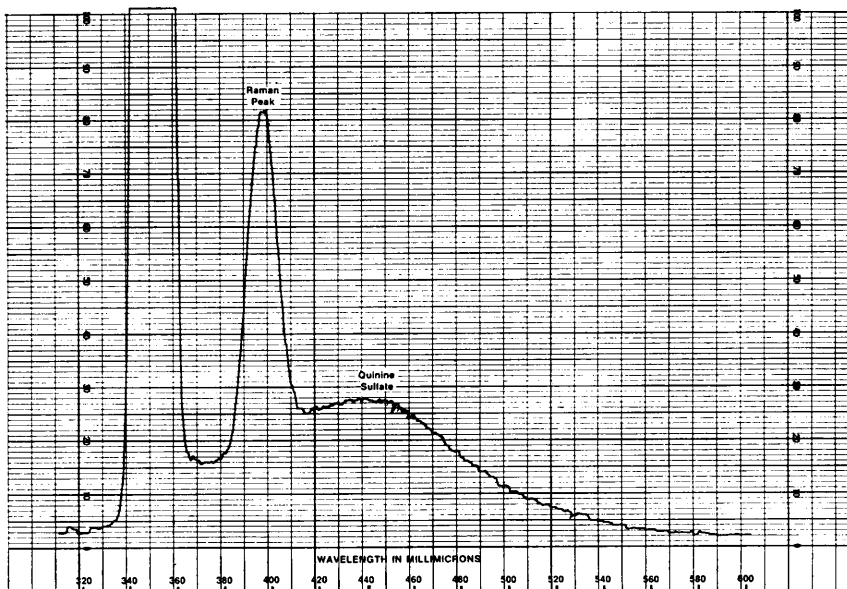
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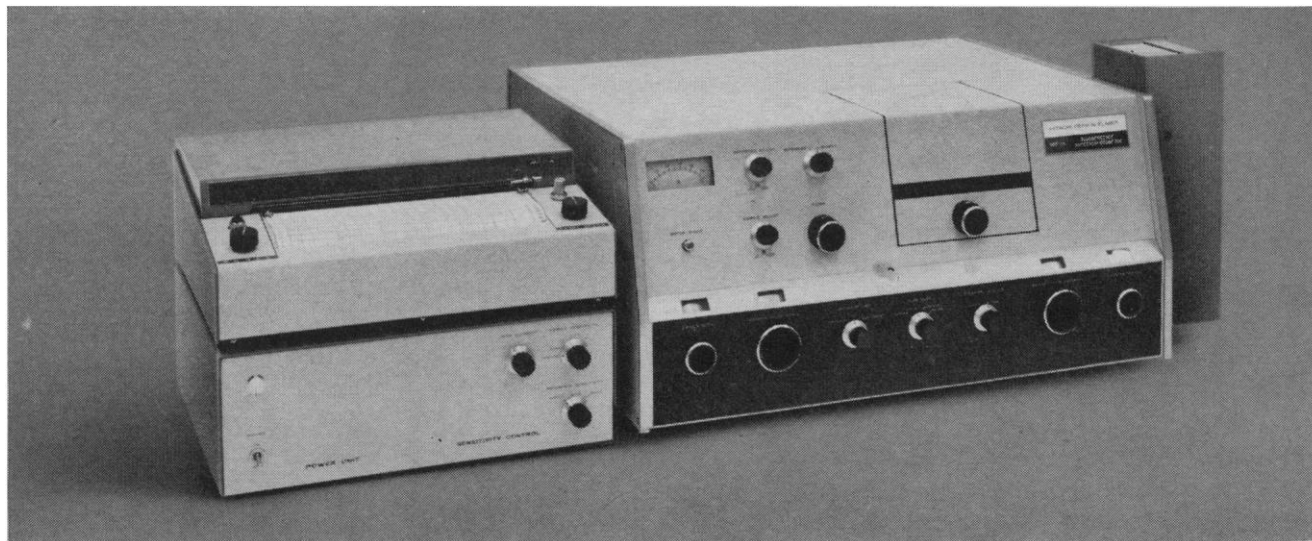
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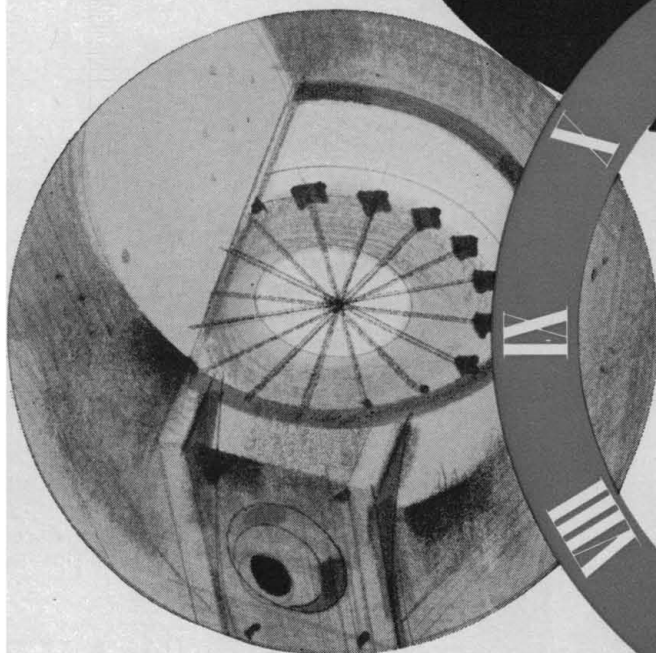
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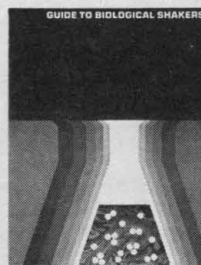
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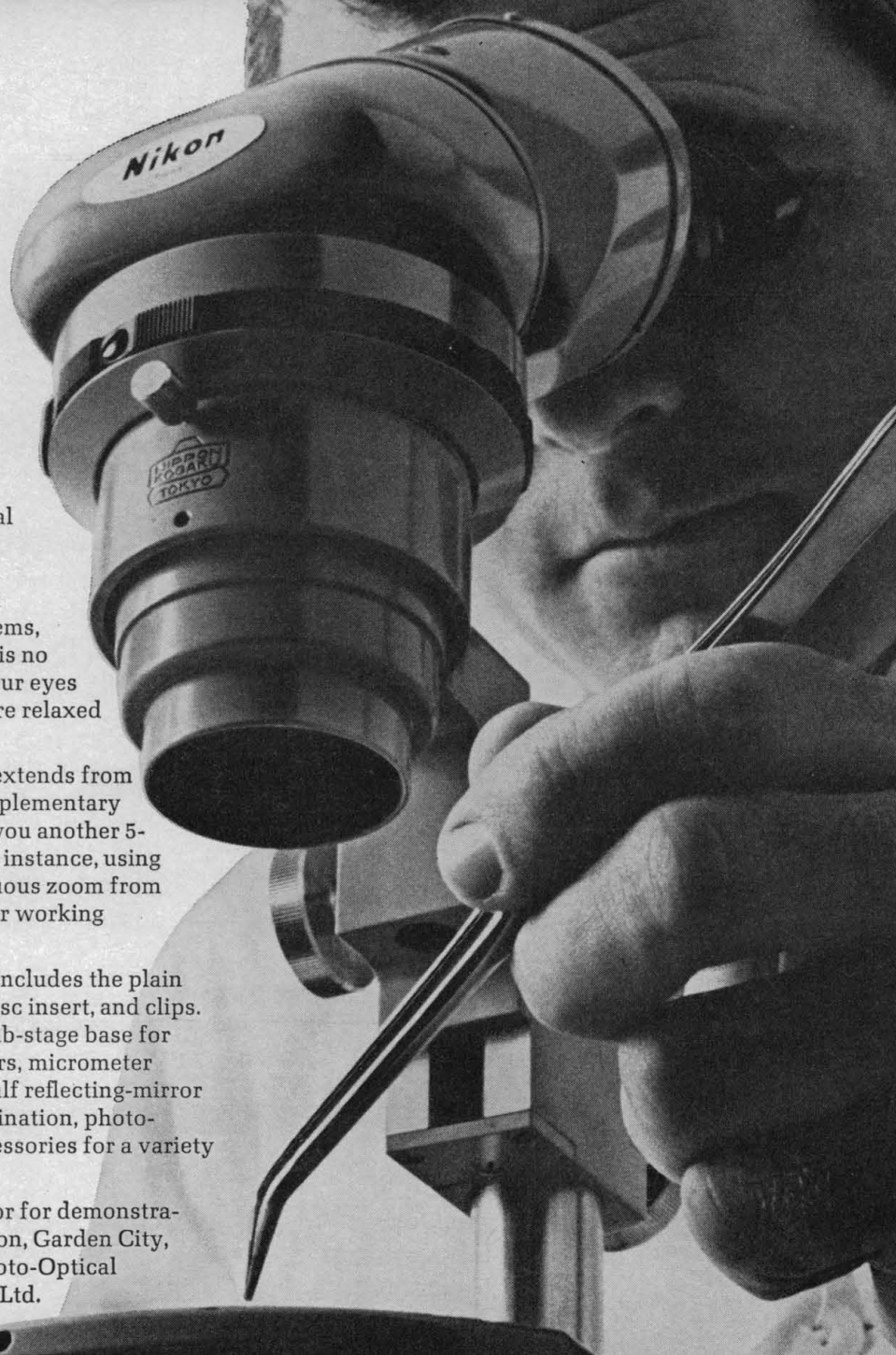
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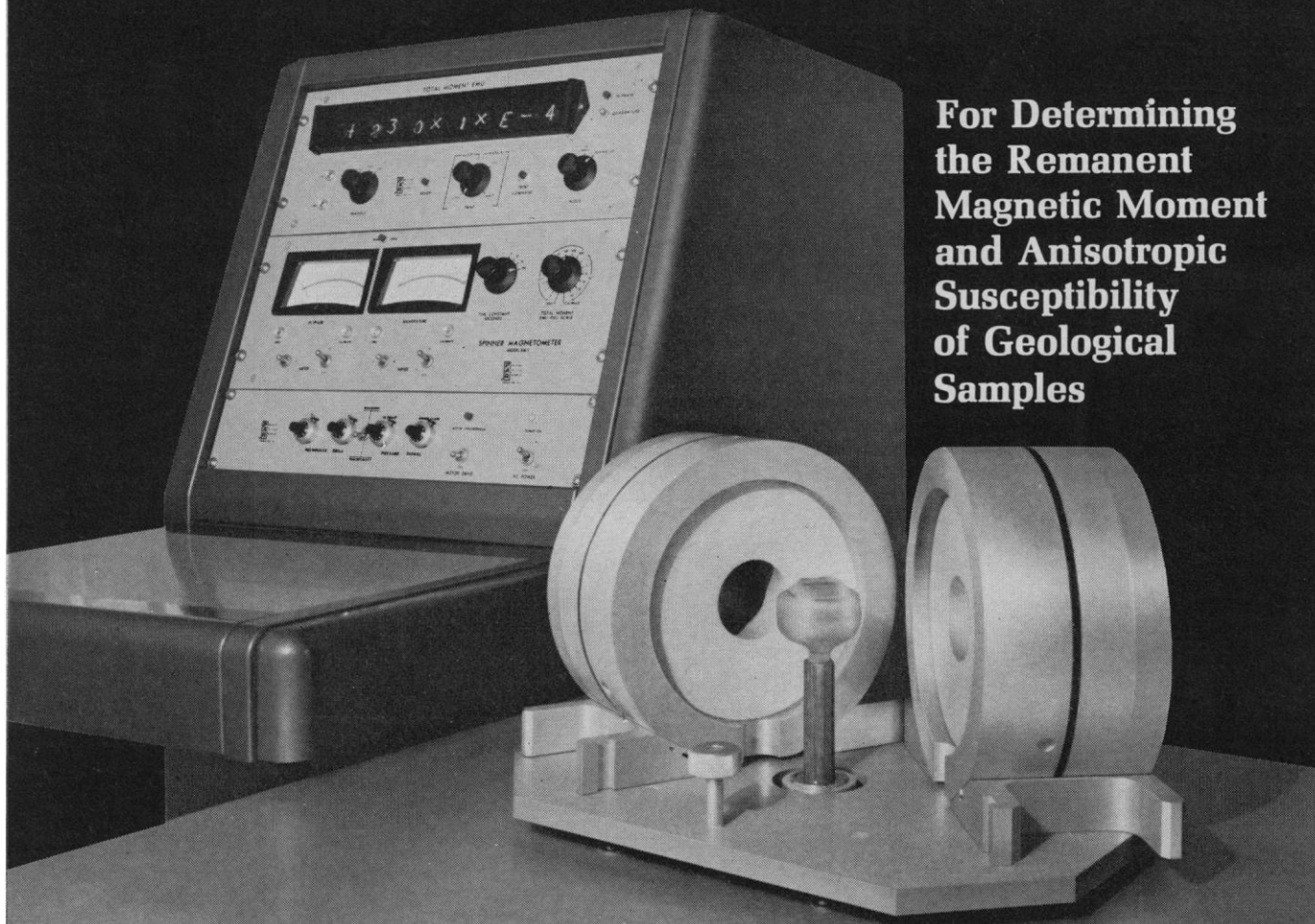
The full magnification range of the SMZ extends from 4x to 120x, using different ocular and supplementary objective lens combinations. Each gives you another 5-time zoom range. With 10x eyepieces, for instance, using no supplementary lenses, you get continuous zoom from 8x through 40x without change in focus or working distance.

Standard equipment for the Nikon SMZ includes the plain stand, with reversible black-and-white disc insert, and clips. Optional equipment: universal stands, sub-stage base for transmitted light observation, illuminators, micrometer stages, reticles, polarizing attachment, half reflecting-mirror attachment for shadowless surface illumination, photo-micrographic attachments and other accessories for a variety of applications.

For complete stereo microscope catalog or for demonstration, write: Nikon Inc., Instrument Division, Garden City, N. Y. 11533. Subsidiary of Ehrenreich Photo-Optical Industries, Inc. (In Canada: Anglophoto, Ltd. Rexdale, Ontario)



Spinner Magnetometer



**For Determining
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Magnetic Moment
and Anisotropic
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of Geological
Samples**

Recent results in paleomagnetic research have pointed out the importance of remanent magnetic moment studies in dating events in the Earth's history. This new application of remanent moment measurement together with earlier uses in drilling core orientation and studies of continental drift, polar wandering and magnetic anomalies have greatly increased interest in this technique. To facilitate work in these fields, PARTM is making available its Model SM-1 Spinner Magnetometer. This instrument, which incorporates the results of PAR's wide experience in small-effect measurement and weak signal processing, has been designed to increase measurement sensitivity to the limits imposed by the thermal noise of the pick-up coils.

The Model SM-1 simultaneously measures and displays two orthog-

onal components of the magnetic moment in the spin-plane of the sample. Operation is simple and straightforward, and can be carried out by non-technical personnel. Low noise and freedom from drift and spurious pick-up allow quick and accurate measurement of samples having very weak moments. Earth field-canceling Helmholtz coils are included on two axes to eliminate problems associated with anisotropic susceptibility. These coils also allow the determination of the anisotropic susceptibility of the sample.

Brief Specifications:

Minimum Detectable Signal: Will detect changes in magnetic moments smaller than 7×10^{-9} EMU/cc.

Sensitivity Ranges: 21 full scale ranges calibrated in TOTAL MOMENT from 0.5×10^{-6} to 5 EMU in a 1, 2, 5 sequence.

Calibration Accuracy: The system is factory calibrated to within $\pm 0.5^\circ$ phase and within 1% magnitude.

Sample Size: Cylinder 2.54 cm diameter, 2.28 cm length. Slightly larger or smaller samples can be accommodated.

Sample Rotational Speed: 105 Hz (52.5 for anisotropic susceptibility measurements). 105/15 Hz unit available at additional cost.

Price: \$9,600 for complete system; with automatic digital readout (as shown in the photograph) to monitor the orthogonal components of the moment alternately, \$11,350. Export price approximately 5% higher, except Canada.

Write for Bulletin No. T-157 to Princeton Applied Research Corp., Dept. G, P.O. Box 565, Princeton, N. J. 08540. Telephone: (609) 924-6835.



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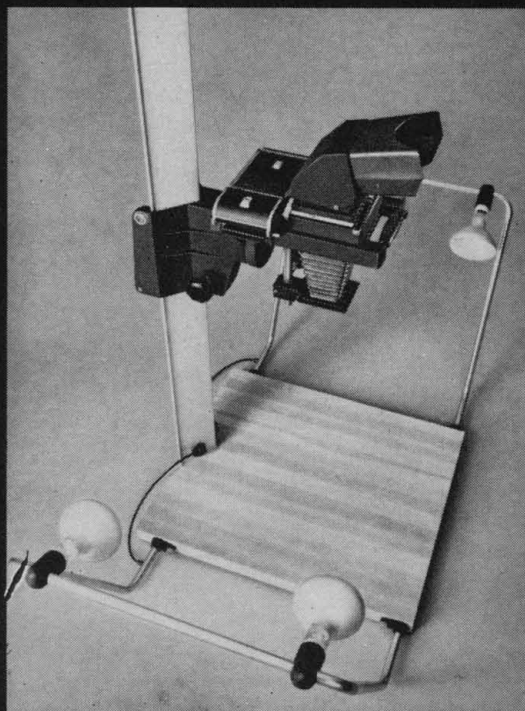
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jects believed the booms to be a needless and uncivilized outrage, if they had no place of refuge, and if the booming were to continue for the rest of their lives? And what about the musician making a valuable recording, or the surgeon performing a delicate operation?

WILLIAM A. SHURCLIFF
19 Appleton Street,
Cambridge, Massachusetts 02138

References

1. K. S. Pearsons and K. D. Kryter, *NASA (Nat. Aeron. Space Admin.) Rep. No. CR-187* (1965).
2. "Sonic Boom Experiments at Edwards Air Force Base by National Sonic Boom Evaluation Office," *Interim Rep. No. ETU-6065* (28 July 1967).

... What happens when an SST going at 1800 miles per hour passes a Concorde going at 1200 miles per hour in the opposite direction? Which cancels out: the superbooms or the superplanes?

ROBERT F. MARSCHNER
18427 Stewart Avenue,
Homewood, Illinois 60430

The Right to Breathe Pure Air

In a recent appearance I made on television to discuss the social and psychological effects of smoking, I mentioned that whenever a student came into my office with a lighted cigarette I asked him to put it out. A colleague asked me why. I responded that I found the odor of smoke distasteful and that I did not care to have the air in my office polluted. He said that I was interfering with student rights, and that in an office provided for by taxpayers, I had no cause to inject my personal biases. Our conversation became heated, but he did cause me to do some thinking.

Is smoking by students or anyone else a right? May they smoke on any public property except where smoking is expressly forbidden for reasons of fire safety? From a philosophical point of view, one person's rights end where another individual's rights begin. If students have a right to smoke, certainly I have a right to breathe pure air in my office. Since I have to spend the most hours at my desk, my right to pure air would surely outweigh anyone's questionable right to smoke at my place of public employment. When I have been breathing smoke-filled air, I acquire a headache, my eyes smart,

I cough, and my mental efficiency performance must decline. Thus a student smoking in my office would deprive other students of their right to expect a maximum performance from me.

Assuming that my office is a "public facility" and at the disposal and use of taxpayers, I wonder why the university issues me a key so that I am responsible for what takes place in it. Are all tax-supported facilities "public"? Could my colleague exercise his "right" to smoke in President Johnson's office at the White House? And I don't think that an executive of a private company necessarily has a greater right to privacy than a similarly situated individual at a state-supported institution. All necessary expenses of doing business at the private company are tax-deductible. This means that the rest of the public must then pay more taxes. For that reason, the public has a vested interest in the private sector of the economy as well as in the public part.

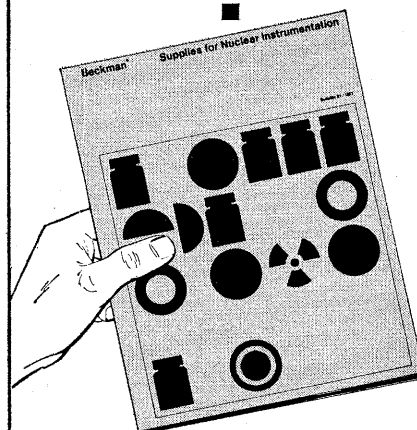
My own view is that the right to inhale pure air predominates over the right to pollute it. Every trip I take by air is marred by the smoke-filled air in the cabin of the plane. Couldn't the airlines, while passing out free cigarettes, also set up smoking compartments? Even an outdoor event, such as a football or baseball game, doesn't assure the spectator a supply of unpolluted oxygen. Aside from the ever-present industrial and domestic pollutants, a pall of tobacco smoke hangs over most of our occupied stadiums. Sometimes visibility is seriously impaired.

Columbia University recently announced its interest in a new cigarette filter. Aside from the obvious point that all filters are virtually useless in preventing the consumption of such substances as carbon monoxide, aldehydes and phenols, many of us non-smokers are wondering if the filter developers aren't barking up the wrong tree. What we really need is a filter to protect us from the smoker. With all our research into the causes of air pollution, haven't we overlooked smoking as one of the prime causes? We might make a start by restricting smoking to private homes and to public smoking lounges, but such a proposal is not within the bounds of reason at this time.

GUS TURBEVILLE
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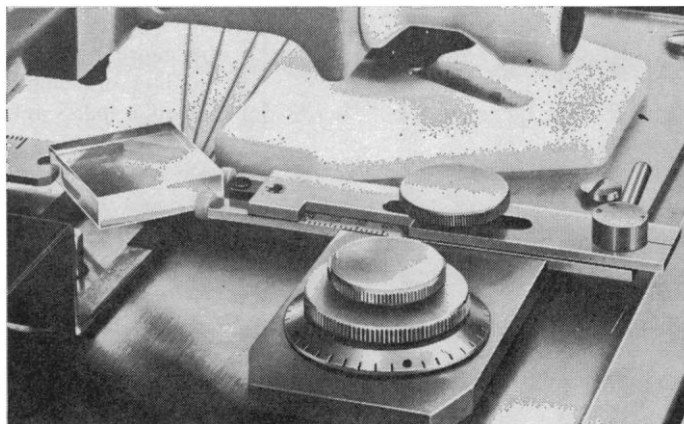
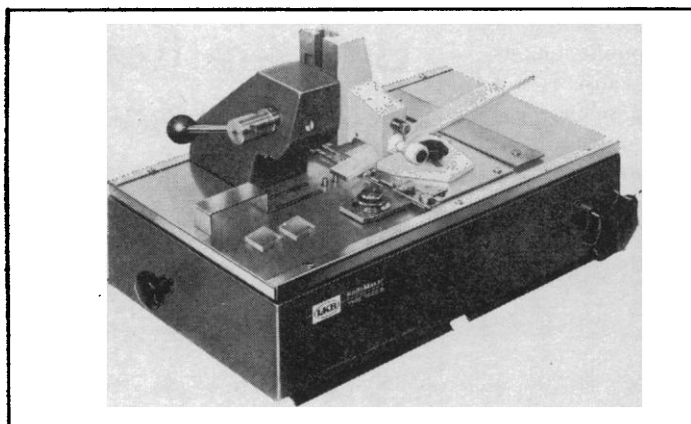
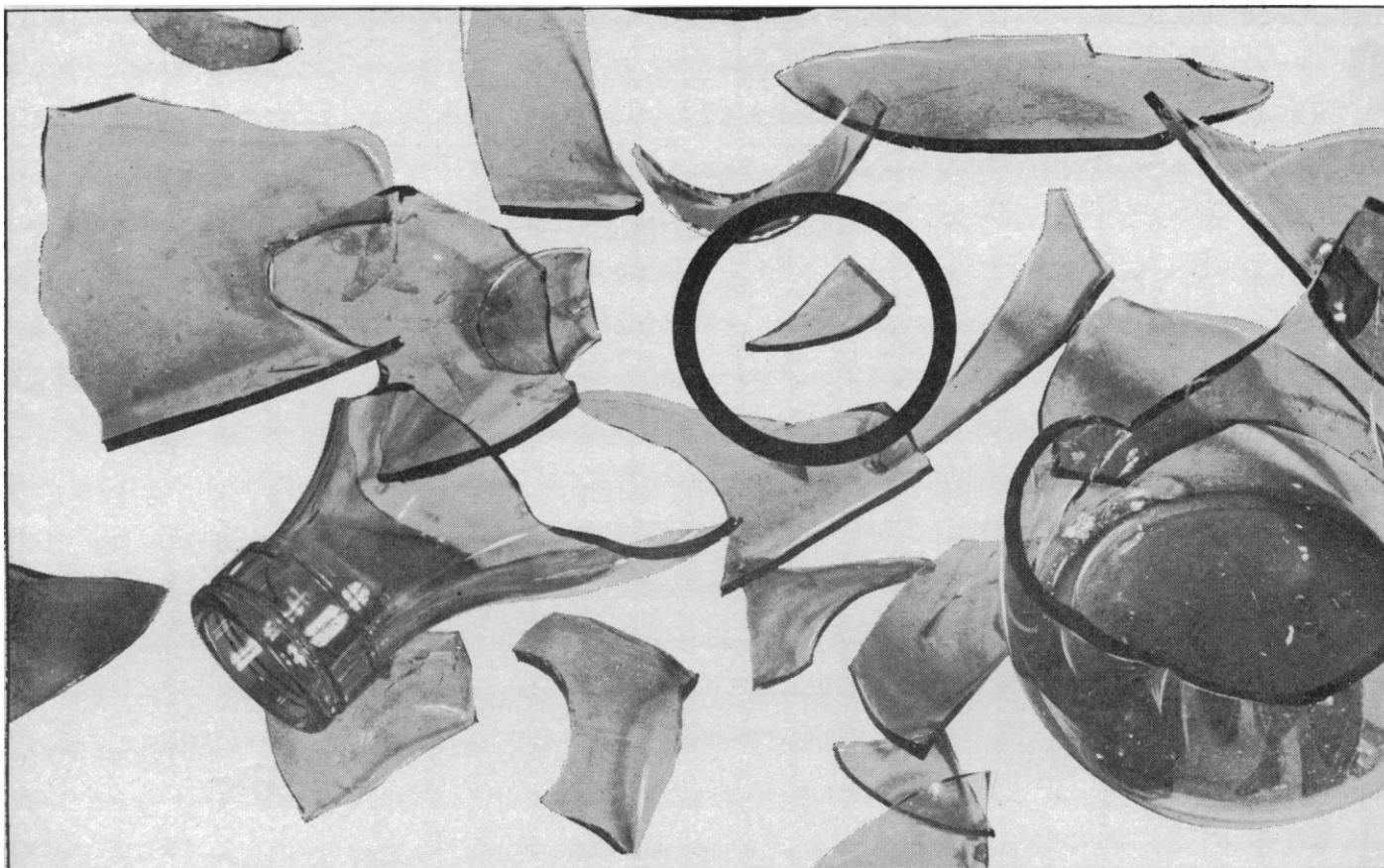
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Weightlessness in Space

Certainly astronauts, whether near or remote from the earth, appear weightless because they are in a free-fall condition. However, whether they really are weightless or not depends on one's definition of weight. Mueller's claim (Letters, 28 July), that the reason for weightlessness during an earth-moon trajectory has nothing to do with decreasing gravitation, is consistent with his definition of weight; however, this definition is not the only one given by dictionaries. For example, the fourth edition of the *Concise Oxford Dictionary* defines weight first as "Force with which body tends to centre of attraction," and, as an example of the word in context, gives the phrase: "the weights of the planets." Since the planets are not restrained from accelerating, they would be excluded from having weight by Mueller's definition. According to the *Concise Oxford Dictionary*, weight is reduced with decreasing gravitation, and very much so during a trip to the moon.

It is not important which definition, if either, is on higher authority. My earlier letter (9 June) was written in the cause of aiding the public understanding of science. This cause is not helped if press releases on science use a common word in an unusual sense without a note of explanation.

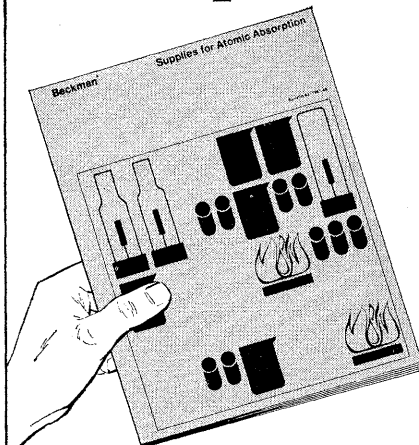
F. E. M. LILLEY

*Department of Geodesy and
Geophysics, Cambridge, England*

Prominent Noses

In his paper discussing variation in solar ultraviolet at different latitudes as a possible basis of racial differentiation in man (4 Aug., p. 501), Loomis limits himself to the question of skin pigment. It has occurred to me that his theory might be extended to another anatomical feature roughly associated with skin color and with latitude, namely, the prominence of the nose. As so many people on occasion are painfully aware, the nose is without question an outstanding receptor of solar rays. In fact, it is difficult to imagine what other evolutionary reason there could be for the sharply thrust-out nose in the latitudes of lesser solar intensity. . . . As Loomis suggests, the early hominids moving northward into Europe, particularly during warm interglacial periods, may have lost much

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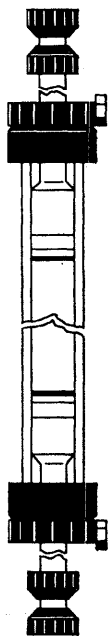
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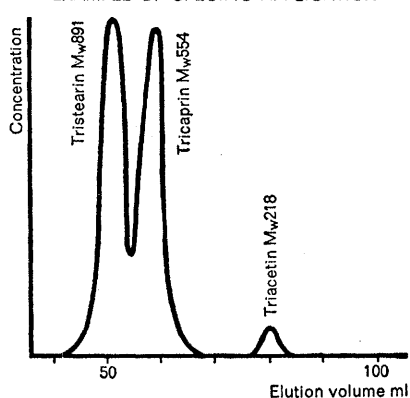
RANGE OF APPLICATION

Solvent	Approx. solvent regain ml solvent/g dry gel	Approx. bed volume ml/g dry gel
Dimethylformamide	2.2	4
Water	2.1	4
Methanol	1.9	3.5-4.0
Ethanol	1.8	3.0-3.5
Chloroform*	1.8	3.0-3.5
n-butanol	1.6	3
Dioxane	1.4	2.5-3.0
Tetrahydrofuran	1.4	2.5-3.0
Acetone	0.8	1.5

*Containing 1% ethanol.

Particle size: 25-100 μ

EXAMPLE OF SPECIFIC APPLICATION



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of their body hair and skin pigmentation half a million years ago. But when it got cold they had to cover most of their skin to keep warm (or else retreat), and it is perhaps at this time that the nose came into prominence.

DONALD V. MCGRANAHAN

47, chemin Moise Duboule,
Geneva, Switzerland

Writers: Fancies and Foibles

We have had considerable discussion of "freight trains" in scientific writing. Another trick of poor writing perhaps deserves christening. Since it encourages freight trains to emerge, it might be called "verb switching." The principle behind verb switching is very simple: whenever a verb with a reasonably definite meaning threatens to appear, the poor writer carefully converts it to a noun or gerund and inserts a weak, essentially vacuous verb to fill out the grammar. Thus, instead of saying that some step improves the accuracy of a measurement, the writer will say that it "makes an improvement in..." or "aids in improving..." In place of "isolate," he will write "produce isolation." And so on. Once the principle has been grasped, endless examples can be constructed.

Verb switching is often aggravated by gerund phobia. Presumably, the victim was once frightened by a dangling participle and now avoids words ending in -ing whenever he can. Thus, instead of writing about calibrating the equipment, he will write, "the calibration of the equipment." This habit might be called "tioning."

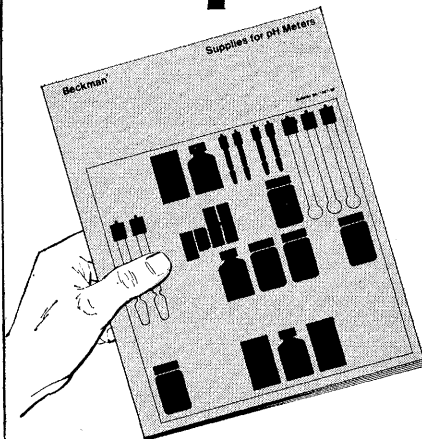
PAUL I. RICHARDS

*Technical Operations, Inc.,
Burlington, Massachusetts 01803*

Bad grammar is unfortunately not restricted to authors. It (and pedantry) are also to be found, although more rarely, among editors. In this latter case the problem is of course more serious. In addition to letting some of the bad grammar of their authors pass through, they sometimes make good grammar into bad or change correct but free sentences into stilted ones. It is disconcerting to have one's writing altered to a style one deliberately avoids using, or to have qualifiers such as "perhaps" omitted.

For example, in a paper of mine published in another journal in the past year the editor changed "The insecti-

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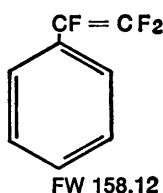
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vore *Protentomon ursivalis* is . . ." so that the species was set off by commas, as if it were the only known insectivore. In a more recent paper "now" was changed to "presently," which is not of Anglo-Saxon origin and so more "scientific," but which usually means "in the near future." Neither editor would reverse himself.

The main function of grammar is, after all, to reduce ambiguity. Wider use of such a criterion might help in communication.

LEIGH VAN VALEN
 Department of Anatomy, University of Chicago, 1025 East 57 Street, Chicago, Illinois 60637

Information Distribution:

A Plea for Efficiency

Harvey Brooks's comments ("Applied science and technological progress," 30 June, p. 1706) focus on many of the ramifications of basic-versus-applied science emphasis. In speaking of the transfer of federally-supported technology to private industry, he cites the encouragement provided by the Atomic Energy Act, and the desirability in government of a more hospitable attitude generally toward this objective.

It must also be remembered that the entire initial product of any research is information, and the dissemination of information generated at public expense has been of concern in many quarters. Often vast amounts of money and expertise have been expended in that research, but its product will not be utilized if there is no effort to make it available. The generating effort of the research is to a great extent wasted if the concluding step of efficient dissemination—good reporting and accessibility to the reports—is omitted.

Aside from some agencies (notably AEC and NASA), there has been lagging interest in such dissemination. Except for holders of defense contracts, it is a difficult and slow process for the general public to (i) learn what usable technology results from Department of Defense-sponsored research, and (ii) to examine or obtain copies of potentially interesting reports. Despite efforts to produce better announcement and indexing media, the jumbled jargon of identifying report numbers, the uncertainty of subject indication and long delays in obtaining copies are enough to discourage the belief that the govern-

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ment is much interested in information transfer.

About 5 years ago, 12 organizations were asked to set up regional technical report centers, with some federal support. Located at eight universities and four public scientific library collections, these centers received from NASA, AEC, and DOD (through the Clearing House for Federal Scientific and Technical Information) copies of all unclassified reports resulting from government research. These reports were available for consultation, copies could be made on demand, and assistance given in unraveling the knots of literature and report citation. Despite withdrawal of support funds later, the host institutions felt sufficiently concerned with the basic need so as to continue these services at their own expense, while still receiving the reports (in microform).

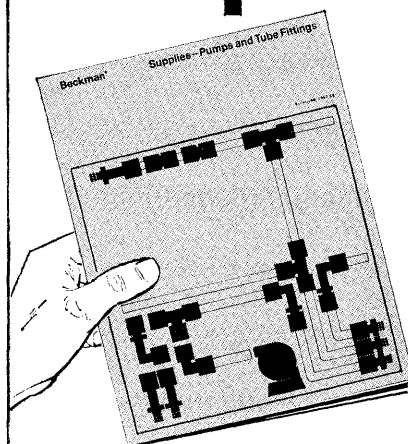
Last fall, distribution of the DOD reports ceased (although AEC and NASA have continued). Now the public finds that cited reports are no longer to be had through local channels. One center alone has been handling over 2800 requests per year, at no cost to the government except the few cents per copy for microforms sent to the centers. In all centers, reference service comes to a standstill; reports are no longer available for consultation or loan; copies can no longer be had on a day-or-two notice. All in all, this modest program was a bargain to the government and especially to the taxpayer.

The State Technical Services Act of 1965 has as its goal "programs to place the findings of science usefully in the hands of American enterprise." Yet its benefits may be seriously undermined by discontinuance of the resources of the regional report centers. It is hoped that the Jennings Randolph Subcommittee on Science and Technology of the Senate Small Business Committee will note this gap in the transfer machinery, and that, as a result of its forthcoming hearings, will recommend restoration of this national network of information centers. To promote this service to public research interests, there has been formed a Council of Regional Technical Report Centers. Information users, too, of both basic and applied persuasions, can helpfully add their voices.

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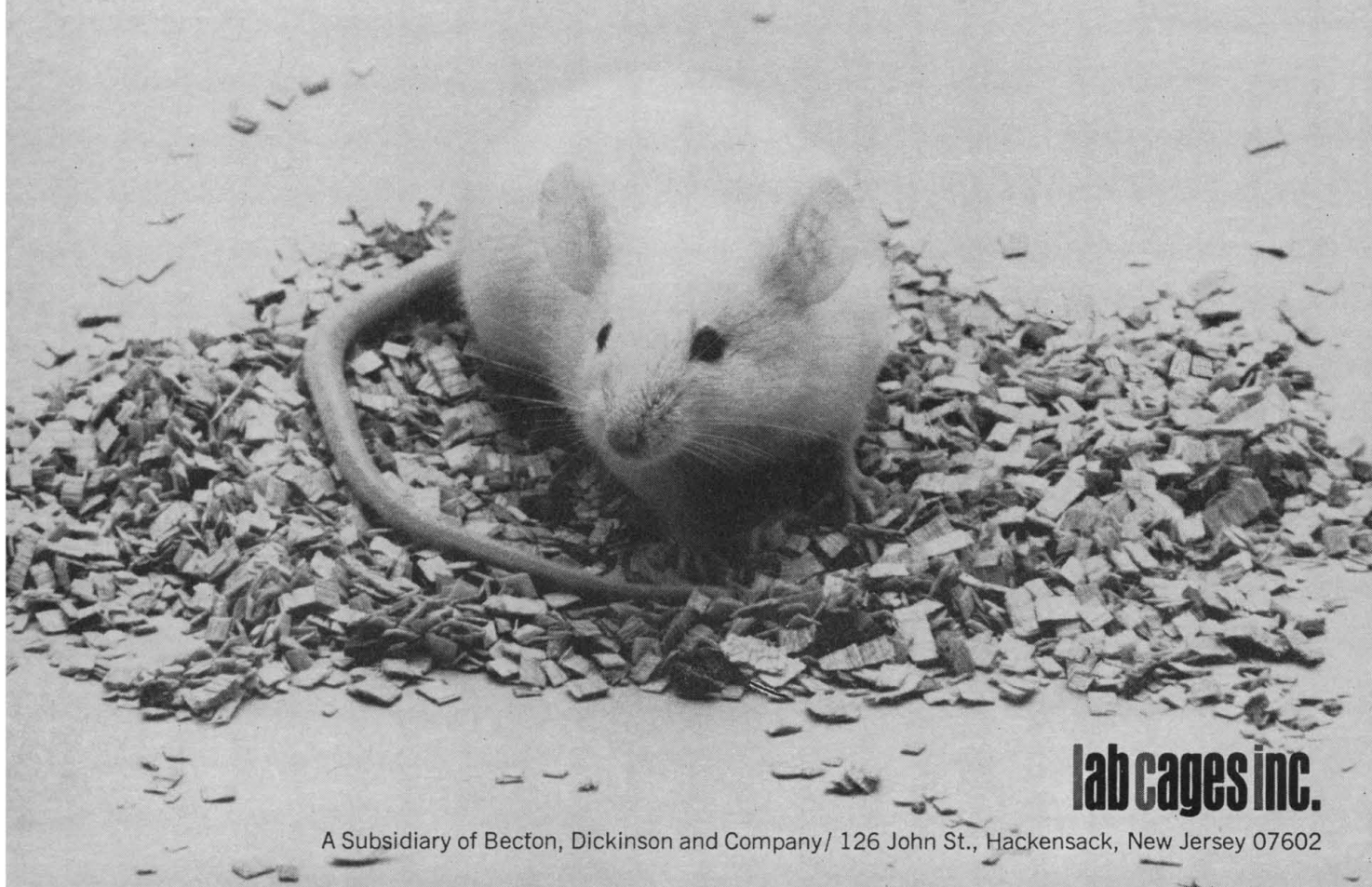
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Privacy

Science and technology have given man vastly enhanced powers to achieve socially desirable purposes, but the exercise of some options opens the way to dangerous abuses. A particularly worrisome development is the increasing use of science and technology in the invasion of privacy. The magnitude of the present problem and its future scope have been surveyed in a thoughtful volume* by Alan F. Westin, professor of public law and government at Columbia University.

The author begins by discussing the individual's basic need for a minimum of privacy. He links the human requirement to the well-known territorial behavior of many animals. He acknowledges the need for society to exert controls on individuals and groups. However, he points out that occasional privacy is essential to the health of individuals as well as to that of most organizations.

Many means for invading privacy are now available. These include new devices and techniques for physical surveillance, psychological surveillance, and data surveillance. These developments provide sophisticated help for the merely curious. They furnish technological assistance to modern peeping Toms. They can make life easier for a growing army of private detectives. The devices find wide application in business, both for legitimate surveillance and for industrial espionage. They are employed by many branches of government, sometimes in questionable ways. They provide governments with tools that one day may be used to bring about George Orwell's 1984.

Some of the techniques are old and familiar. They include wire-tapping and use of hidden microphones and cameras. These methods have been improved, however, as technology has advanced. Thus, solid-state electronics permits miniaturization. Microphones the size of a sugar cube (\$10) or the size of a pea (\$100) are available.

Photographic techniques also have been improved. Special screens can be installed in walls, which seem opaque to persons inside a room but permit an observer outside the room to see and photograph events within it. A more advanced method is to employ infrared light, in conjunction with appropriate panels and cameras. This permits photography in what appears to be total darkness. A possible future development is the use of computers to analyze telephone conversations. In principle, all such conversations could be monitored and recorded. Computers might be used to identify characteristics of a person's voice. Then the computer could search out all phone conversations in which that individual took part, even when the call originated from a pay station. In a day when so much of society's business is transacted by phone, a powerful tool for the invasion of privacy would be available.

The computer is a key to a related kind of invasion of privacy, in that it quickly makes available detailed information about a large number of individuals. All of us have filled out dozens of forms. What is new is the ability of a centralized bank of computers to store the massive amounts of data and quickly retrieve them.

The ultimate extent and consequences of erosion of privacy can be only dimly perceived. However, it is clearly desirable to seek technical and legal means of curtailing the use of what might otherwise become instruments for the destruction of our freedom.—PHILIP H. ABELSON

*A. F. Westin, *Privacy and Freedom* (Atheneum, New York, 1967).

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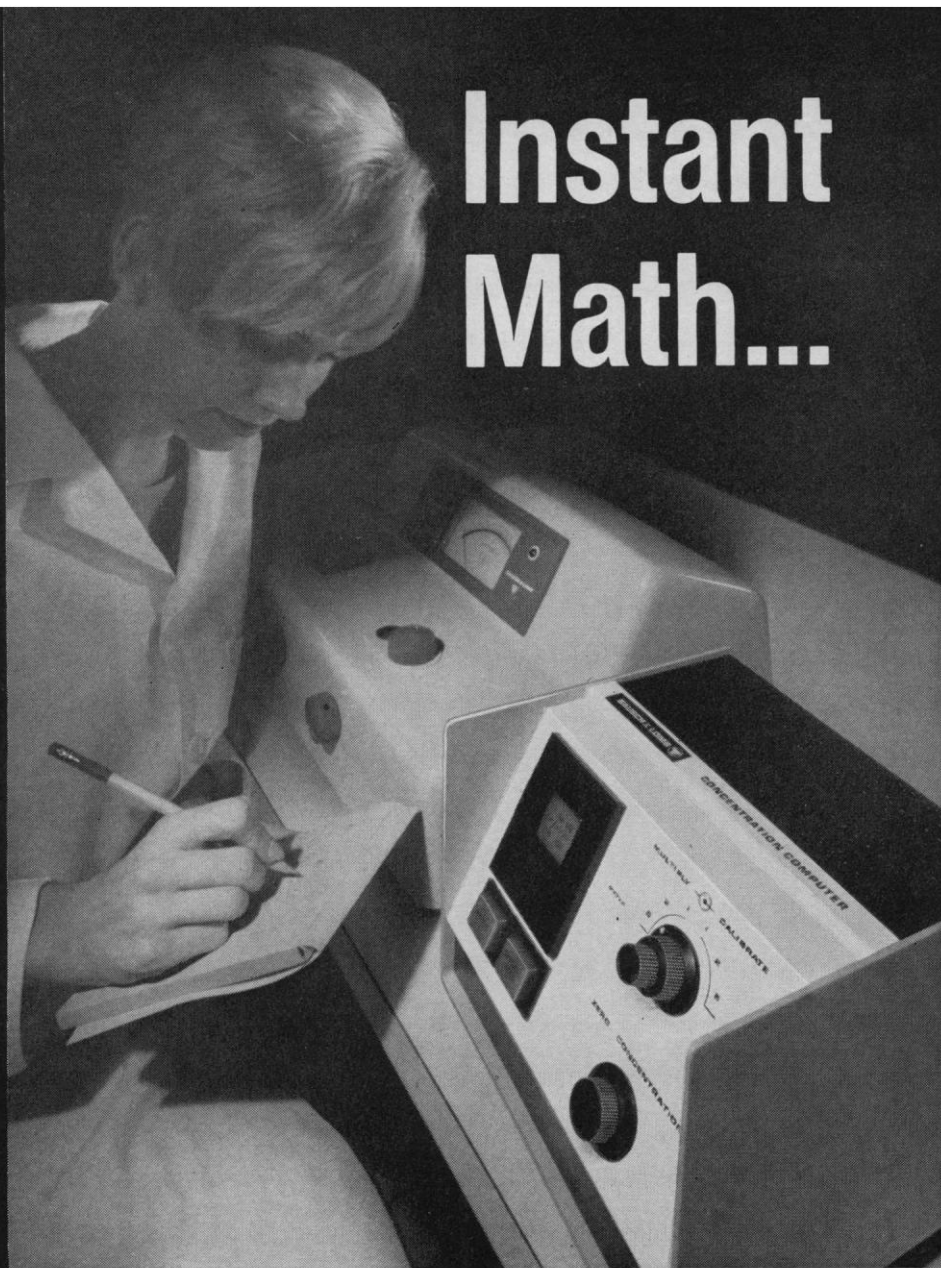
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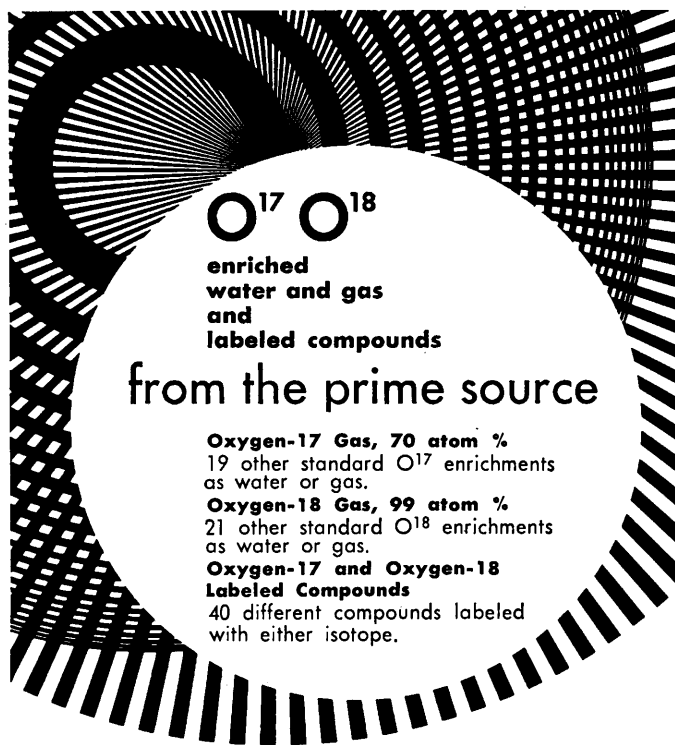
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Hering, thus resolving a controversy nearing its centennial. At the same time a dozen or so minor contending theories have been eliminated from competition.

The organization of excitatory and inhibitory input from retina to lateral geniculate neurons was scrutinized by G. F. Poggio. It was his conclusion that excitatory and inhibitory functional systems are operationally co-extensive at least over the center region of the receptive fields, and that the two mechanisms have similar characteristics with respect to time course of action. During the discussion of this paper De Valois pointed out that, in his view, excitatory and inhibitory influences of opponent colors also extend over the entire receptive field of individual neurons.

In a general discussion of the method of coding of sensory quality in different afferent modalities, R. P. Erickson pointed out the similarities in the translation of colors and of tastes into neural signals. In both cases a limited number of parallel channels coming from a small area of the tongue, or retina, has to perform the discrimination of finely shaded qualitative stimulus differences. If individual color receptors were tuned to a narrow band of wavelengths, the number of available nerve fibers would be insufficient to distinguish all the shades of the visible spectrum (T. Young); hence the broad, overlapping sensitivities of the visual pigments and visual afferents. Similarly, broad tuning occurs in other sensory modalities in which quality is not represented topographically in the nervous system (taste, temperature, and vestibular sensitivity). Topographically organized modalities have sufficient numbers of neurons for each to be narrowly tuned (audition, visual, and somesthetic position).

The leading theme of a paper by I. C. Whitfield was that discrimination of pitch is dependent on the statistical distribution of excitation over a geometrically arranged array of first-order auditory nerve fibers. He pointed out that this is the most feasible system of detection of complex waveforms, such as occur in human speech. Speech sounds are recognized by the relative position of "formants," or dominating frequency bands. Several such bands are presented simultaneously, and recognition is independent of the particular pitch of the speaker's voice. On the basis of observations on the auditory cortex of waking, free moving ani-



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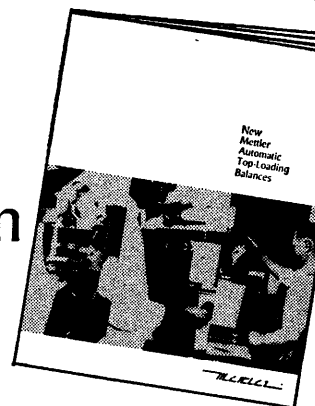
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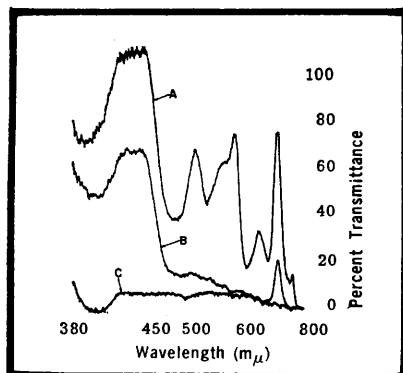
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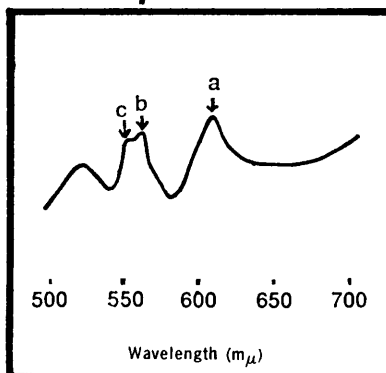
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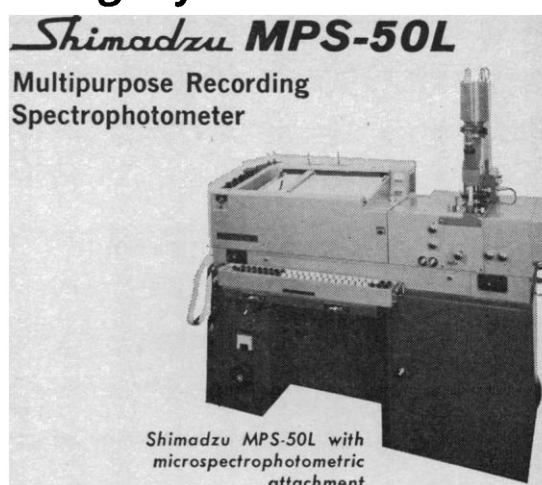
DIFFERENCE SPECTRA BETWEEN OXIDIZED AND REDUCED FORMS OF MITOCHONDRIA IN SUSPENSION. Recorded in the scale of $-0.1 \sim +0.1$. Small letters show absorption bands of cytochromes a, b and c.

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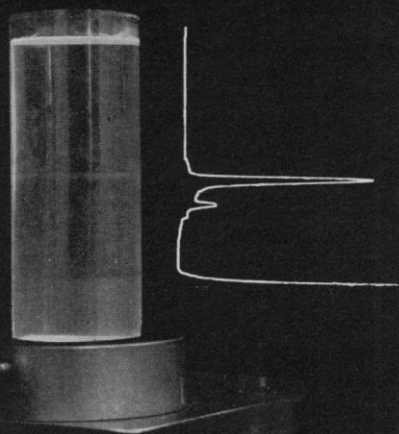
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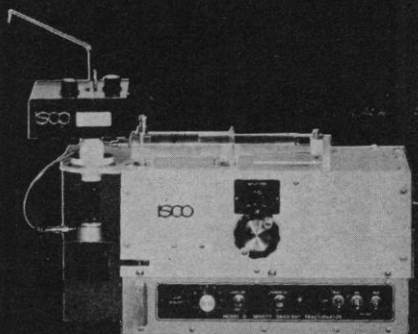
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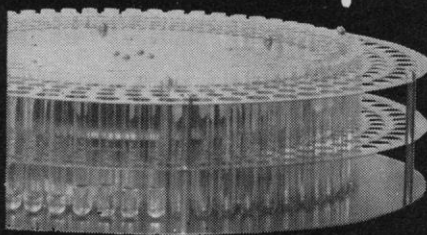
mals, it was argued that this level is concerned with temporal patterns of stimuli and that responsiveness to a particular frequency is, if anything, more widespread than at lower levels. He claimed that there is no evidence in the normal intact auditory system for the view that specific stimuli eventually activate some unique area or group of cells, but rather that a many-many relationship probably exists between detectors and effectors at several neural levels.

The precise relation between sound waves and discharges of auditory nerve fibers was described by J. E. Hind. For frequencies lower than about 4000 hertz nerve impulses are phase-locked to the stimulating sound waves. Phase-locking occurs in spite of the fact that nerve fibers do not follow vibrations in a one-to-one relationship, even in the lowest audible frequencies. Phase-locking was also seen in Mountcastle's experiments with somatic vibration receptors. Hind also described experiments in which two tones of different frequency and intensity were presented simultaneously. In these cases, phase-locking followed rules reminiscent of psychophysical tonal masking. Hind noted that other studies have shown that the pulse-time coding in the auditory nerve is preserved at least in part at higher levels of the nervous system. The notion that such coding could provide a basis for pitch perception is at variance with that proposed by Whitfield.

The emphasis of the discussion shifted to the anatomical organization of sensory systems. The multiplicity of the sensory receiving areas of the cerebral cortex was discussed by C. N. Woolsey, who reviewed the discoveries of the Wisconsin school over the past two decades. He also presented a new and precise map of the topographical projection of the retina to the first and second visual areas. The question of the source of inputs to visual area I was raised during the discussion. It was the opinion of those speaking that this input originates from subcortical nuclei as well as from visual area II. The need for further study was stressed.

That multiplicity of representation is not synonymous with redundancy of function was emphasized by the presentation of W. D. Neff. He and his collaborators are continuing their effort to define precisely the defects resulting from removal of various parts of the auditory cortex, and sur-

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rounding areas. For example, bilateral removal of auditory area I causes a deficiency in ability to locate a source of sound in space without loss of other auditory functions which were tested. Of special interest is the finding that removal of the insulo-temporal areas of cats, sparing auditory areas I and II, caused a permanent loss of the ability to recognize sequential and tonal patterns without a deficit in discrimination of changes in frequency, and also some increase of spontaneous activity in the test situation. To your reporter, this syndrome was reminiscent of the apparent visual agnosia and compulsive exploratory behavior, described by Klüver and Bucy, after temporal lobe ablations in monkeys.

In hedgehogs the total removal of cortical visual area I was followed by severe visual deficit, but only moderate retrograde degeneration in the dorsal lateral geniculate nucleus. By contrast, tree shrews are apparently able to see quite well after complete bilateral removal of their very large striate cortex, even though severe degeneration was found in the "lateral geniculate of the operated animals. These findings can be explained, according to I. T. Diamond, by assuming that during the evolution of mammals the ancient tectocortical visual projection was at first invaded by a new geniculo-cortical projection. Later the two systems become progressively separated. The more recent geniculostriate system is organized in a compactly point-to-point pattern of projection. The older connections from midbrain to cortex are diffuse, but not random or haphazard.

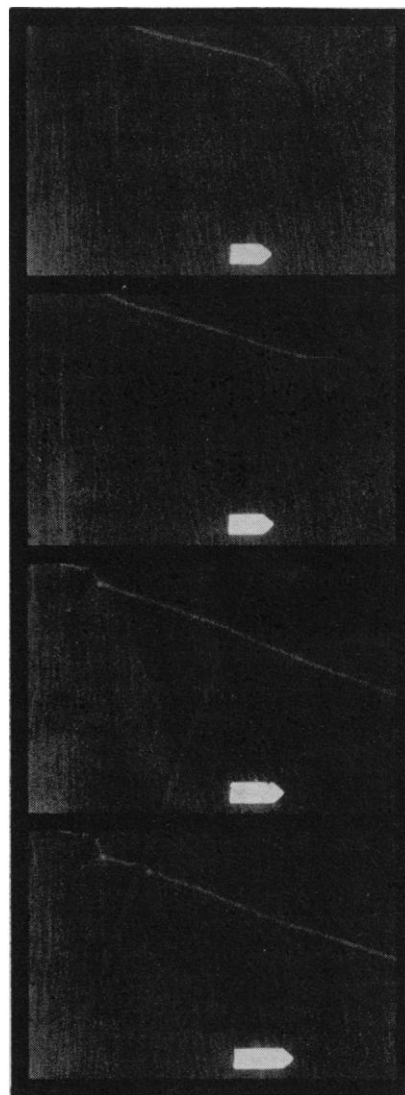
R. E. Myers presented anatomical evidence that the monkey's visual cortical mechanism consists of six distinct cortical areas. The striate area, striate-receptive area 19, and area 19 are free of commissural fibers; juxta-striate area 18, area 18 and areas 20 and 21 combined receive commissural fibers throughout. Only the striate area receives heavy projection from the thalamus, primarily from the lateral geniculate, but also from a portion of the pulvinar. Myers described experiments indicating that, in the cat, direct visual sensory input over the primary optic pathways is greatly more potent in memory induction than information indirectly received from the opposite hemisphere through the corpus callosum. Conflicting information fed into a hemisphere through



Magnetic domains made visible by the electron microscope

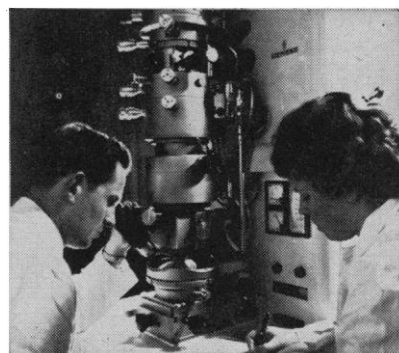
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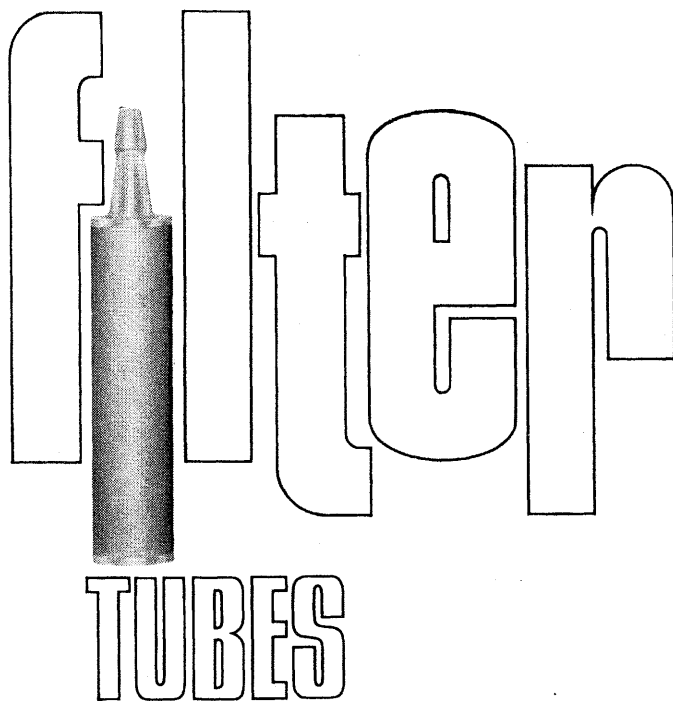


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the corpus callosum is incapable of reversing the effects of direct sensory experience.

To sum up, the participants were largely in agreement concerning the nature of coding in receptor organs and the signaling of peripheral sensory nerves. Perhaps a critical voice would have been heard, had we been successful in securing the presence of G. Weddell. Debate was lively with occasional sparks, when the topic shifted to the mechanism of central information processing. Mountcastle stressed the need for adequate identification of the cells that are being observed in experiments using the essentially blind method of probing by microelectrodes. He also pointed out the difficulty of controlling stimulus parameters in free-moving animals. Whitfield reminded us that the dangers of drawing conclusions from the behavior of paralyzed animals may be quite as great as those from anesthetized animals, and that, from higher neural levels, any such results must be viewed with extreme caution.

The meeting was the third annual symposium sponsored by the Research Training Program in Sciences Related to the Nervous System of Duke University.

G. G. SOMJEN

Department of Physiology and Pharmacology, Duke University, Durham, North Carolina

Calendar of Events

Awards

The **Lalor Foundation** program of awards for 1968 emphasizes research in the field of reproductive physiology. The principal present aim of the foundation is to assist qualified investigators working on applied scientific and medical research directed to the study of uterine phenomena relevant to implantation and post-implantation birth control and to better and safer means of female sterilization.

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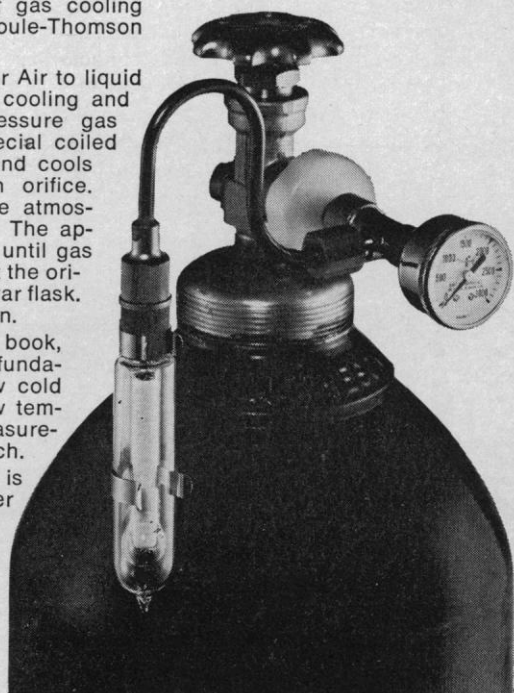
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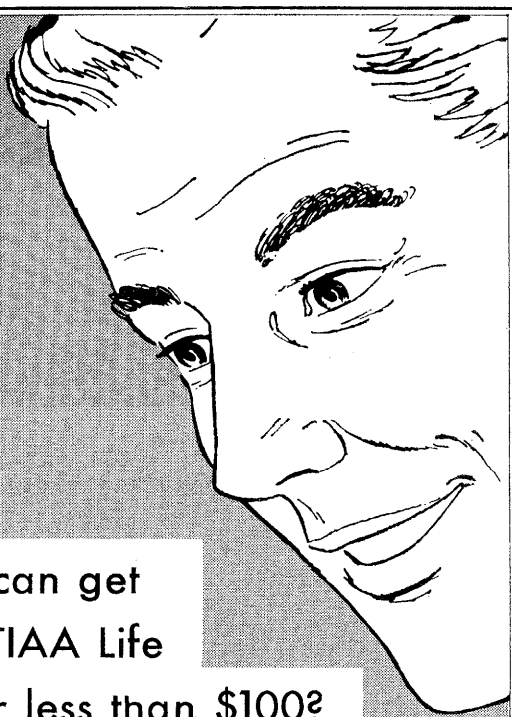
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National Meetings

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28-29. American College of **Dentists**, Washington, D.C. (O. W. Brandhorst, American College of Dentists, 4326 Lindell Blvd., St. Louis, Mo. 63108)

28-2. American **Fracture Assoc.**, annual mtg., Chicago, Ill. (H. W. Wellmerling, 610 Griesheim Bldg., Bloomington, Ill. 61701)

29-1. Association for **Research in Ophthalmology**, annual mtg., Chicago, Ill. (Secretary-Treasurer, Univ. of Florida, College of Medicine, Gainesville 32603)

29-4. American College of **Gastroenterology**, 32nd annual conv., Los Angeles, Calif. (D. Weiss, 33 W. 60 St., New York 10023)

30-2. American **Dental Assoc.**, 108th annual mtg., Washington, D.C. (H. Hillenbrand, 211 E. Chicago Ave., Chicago, Ill.)

30-2. **Nuclear Science**, 14th symp., Los Angeles, Calif. (R. E. Emberson, 345 E. 47 St., New York 10017)

31-2. **Numerical Prediction**, conf., Monterey, Calif. (K. C. Spengler, 45 Beacon St., Boston, Mass. 02108)

31-3. Society for **Experimental Stress Analysis**, annual mtg., Chicago, Ill. (B. E. Rossi, 21 Bridge Sq., Westport, Conn.)

November

1-3. Northeast **Electronics Research and Engineering**, Boston, Mass. (E. Witschi, IEEE, 31 Channing St., Newton, Mass. 02158)

1-3. **Industrial Engineering and Management Clinic**, 31st annual, Chicago, Ill. (R. J. Mayer, 330 S. Wells St., Chicago, Ill.)

1-3. **Operations Research Soc. of America**, 32nd natl., Chicago, Ill. (T. E. Caywood, % Caywood, Schiller Assocs., 401 N. Michigan Ave., Chicago 60611)

1-3. American Soc. of **Tropical Medicine and Hygiene**, Philadelphia, Pa. (G. M. Jeffrey, P.O. Box 295, Kensington, Md. 02795)

1-4. **Irrigation and Drainage**, conf., Sacramento, Calif. (C. E. Lent, Jr., American Soc. of Chemical Engineers, 345 E. 47 St., New York 10017)

2-3. **Product Assurance Conf.**, New York, N.Y. (J. Rayfield, EDO Corp., College Point, N.Y. 11356)

2-5. Association of **Clinical Scientists**, annual mtg. (R. P. Mac Fate, ACS, 300 N. State St., No. 5322, Chicago, Ill. 60610)

5-8. National **Agricultural Chemicals Assoc.**, 34th annual mtg., Palm Springs, Calif. (National Agricultural Chemicals Assoc., 1145 19th St., NW, Washington, D.C. 20006)

5-8. American Society of **Plastic and Reconstructive Surgeons**, annual mtg., New York, N.Y. (P. Randall, ASPRS, 2850 Sixth Ave., Suite B, San Diego, Calif.)

5-9. American **Nuclear Soc.**, Chicago, Ill. (O. J. Du Temple, Executive Secretary, American Nuclear Soc., 244 E. Ogden Ave., Hinsdale, Ill. 60521)

5-10. American Soc. of **Agronomy**, Washington, D.C. (Executive Secretary, 677 S. Segoe Rd., Madison, Wis. 53711)

5-10. **Crop Science Soc. of America**, Washington, D.C. (Executive Secretary,

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TOBACCO AND TOBACCO SMOKE: Studies in Experimental Carcinogenesis by E. L. Wynder and D. Hoffman. Thoroughly discusses the biological and chemical aspects of tobacco and tobacco smoke carcinogenesis and related fields. A description of some of the laboratory methods in carcinogenesis and a selective summary of experiments in tabular form are given. Complete references to the literature, including major recent studies, are made. December 1967, about 700 pp., \$29.00

IMMUNITY, CANCER AND CHEMOTHERAPY: Basic Relationships on the Cellular Level by Enrico Mihich. Presents the proceedings of a Symposium on Molecular Pharmacology, organized to consider recent advances in immunology from the biological, biochemical and pharmacological points of view. 1967, 390 pp., \$18.00

INSECT VIROLOGY by Kenneth M. Smith. The first English language publication to provide a concise account of insect viruses and virus diseases. It is fully illustrated and includes numerous electron micrographs. 1967, 256 pp., \$11.50

SEX CHROMOSOMES by Ursula Mittwoch. Deals with the recent discoveries and hypotheses concerning the behavior and function of normal and abnormal sex chromosomes in representative plants, insects and animals, including man. 1967, 306 pp., \$14.00

RADIATION AND SHIELDING IN SPACE by J. W. Hafner. The first book to combine, in a structured manner, a review of nuclear radiation in space, a discussion of the effects of nuclear radiation and an analysis of radiation doses in space missions. Volume 4 in the series of "Nuclear Science and Technology." 1967, 347 pp., \$17.50

VARIABLE PHASE APPROACH TO POTENTIAL SCATTERING by F. Calogero. Includes the quantum-mechanical theory of potential scattering and a powerful, systematic method for the study of scattering phase shifts and bound states. Volume 35 in the series of "Mathematics in Science and Engineering." 1967, 244 pp., \$11.50

PHOTOIONIZATION PROCESSES IN GASES by G. V. Marr. Contains the collected experimental and theoretical data on the ionizing interaction of energetic protons with atoms and molecules and applications of this data to the fields of plasma physics, aeronomy, and astrophysics. Volume 28 in the series of "Pure and Applied Physics." 1967, 282 pp., \$12.50

THE THEORY OF SPLINES AND THEIR APPLICATIONS by J. H. Ahlberg, E. N. Nilson, and J. L. Walsh. Comprehensively treats the spline theory based on the authors' own applied research. Volume 38 in the series of "Mathematics in Science and Engineering." 1967, 284 pp., \$13.50

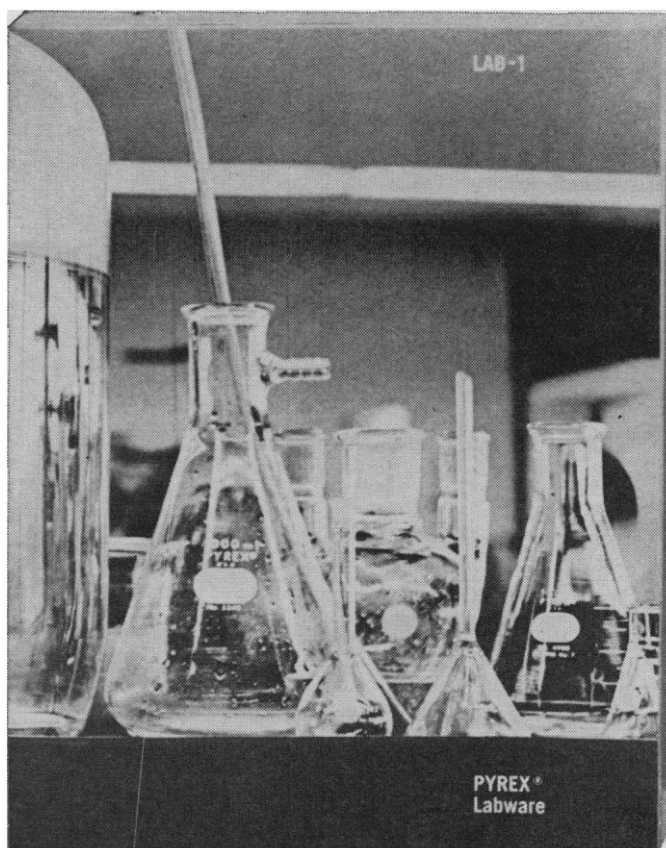
ATLAS OF ESR SPECTRA by B. H. J. Bielski and J. M. Gebicki. This important reference collection for experimental electron spin resonance spectroscopists contains some 1200 published and unpublished electron spin resonance spectra. 1967, 665 pp., \$27.50

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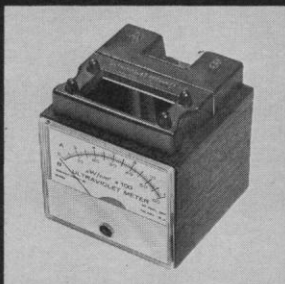
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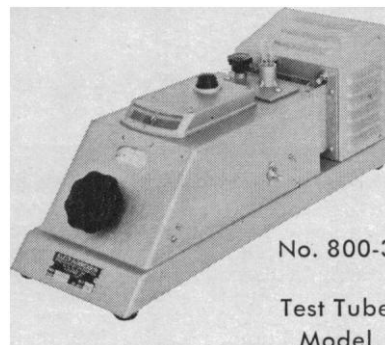
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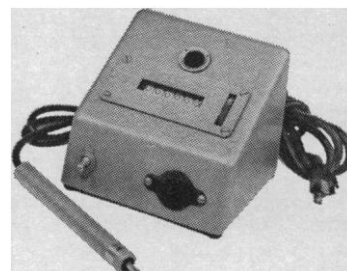


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Volume 40

Chronic Infectious Neuropathic Agents (CHINA) and Other Slow Virus Infections

Edited by Jacob A. Brody, Werner Henle, and Hilary Koprowski
With 22 figures. VIII, 74 pages 8vo. 1967. Cloth DM 32,—; US \$8.00

Contents: Hilary Koprowski: Prelude.—Richard T. Johnson: Chronic Infectious Neuropathic Agents; Possible Mechanisms of Pathogenesis.—Lars Karstad: Aleutian Disease. A Slowly Progressive Viral Infection of Mink.—Halldór Thormar: Cell-Virus Interactions in Tissue Cultures Infected with Visna and Maedi Viruses.—John Hotchin: Immune and Autoimmune Reactions in the Pathogenesis of Slow

Virus Disease.—Clarence J. Gibbs, Jr.: Search for Infectious Etiology in Chronic and Subacute Degenerative Diseases of the Central Nervous System.—Carleton Gajdusek: Discussion on Kuru, Scrapie and the Experimental Kuru-Like Syndrome in Chimpanzees.—Jacob A. Brody: Symposium on CHINA Viruses.

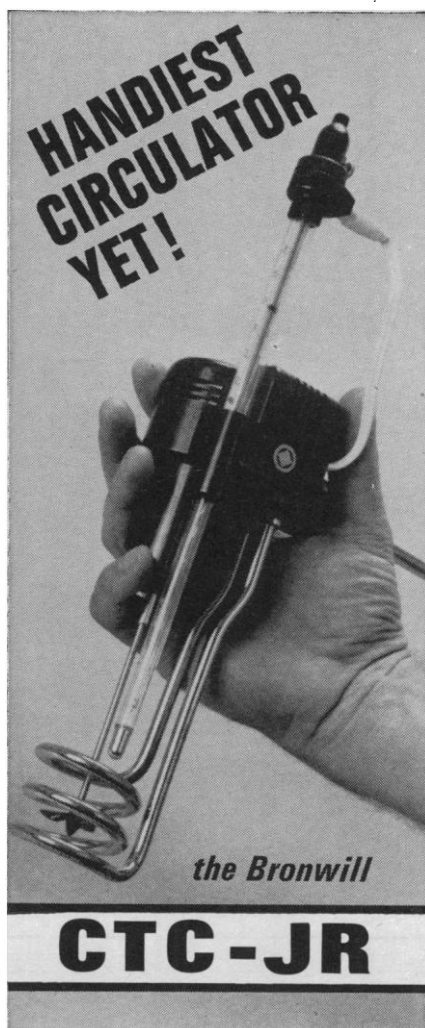
Volume 41

With 31 figures. IV, 183 pages 8vo. 1967. Cloth DM 46,—; US \$11.50

Contents: M. R. Hilleman: Present Knowledge of the Rhinovirus Group of Viruses.—R. V. Walker: Plague Toxins—A Critical Review.—M. Plempel/A. M. Walter: Biochemische Wirkungsmechanismen

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6-8. **Applied Superconductivity**, conf. and exhibition, Austin, Tex. (G. D. Cody, Publicity Chairman, RCA Laboratories, Princeton, N.J. 08540)
6-8. **Ground-Water Hydrology**, natl. symp., San Francisco, Calif. (M. A. Marino, % AERA Hq., 1201 16th St., NW, Washington, D.C. 20006)
6-8. **Speech Communication and Processing**, annual conf., Cambridge, Mass. (G. Cushman, 555 Huntington Ave., Boston, Mass.)
6-8. **Weather Forecasting**, conf., Fort Worth, Tex. (K. C. Spengler, American Meteorological Soc., 45 Beacon St., Boston, Mass.)
6-9. **Interstate Postgraduate Medical Assoc. of North America**, annual mtg., Chicago, Ill. (R. T. Ragatz, Box 1109, Madison, Wis.)
7-9. **Automatic Support Systems for Advanced Maintainability**, 1967 symp., Clayton, Mo. (D. L. Reed, Box 4124, Jennings Station, St. Louis, Mo. 63136)
7-9. **Reliability Physics**, 6th symp., Los Angeles, Calif. [A. Coppola, Publicity Chairman, RADC (EMERS), Griffis AFB, New York 13440]
8-10. **Eastern Analytical Symp.**, New York, N.Y. (E. G. Brame, Jr., Elastomer Chemistry Dept., duPont Experiment Sta., Wilmington, Del. 19898)
8-10. **American Water Resources Assoc.**, 3rd annual conf., San Francisco, Calif. (A. A. Stone, International Engineering Co., 74 New Montgomery St., San Francisco 94105)
8-11. **Respiratory Therapy**, 4th annual conf., Boston, Mass. (M. J. Nicholson, 6 Beacon St., Suite 620, Boston 02108)
9-11. **Gerontological Soc., Inc.**, 20th annual mtg., St. Petersburg, Fla. (Mrs. M. Adler, 660 S. Euclid St., St. Louis, Mo.)
10. **Laboratory Animal in Gerontologic Research**, symp., St. Petersburg, Fla. (R. H. Yager, Natl. Acad. of Sciences-Natl. Research Council, 2101 Constitution Ave., NW, Washington, D.C.)
11-12. **American Acad. of Psychotherapists**, annual conf., Warrenton, Va. (H. Rockberger, Conference Chairman, 44 South Munn Ave., East Orange, N.J. 07017)
11-15. **American Soc. for Cell Biology**, 7th annual mtg., Denver, Colo. (M. J. Moses, Box 2982, Duke Univ. Medical Center, Durham, N.C. 27706)
12-17. **American Soc. of Mechanical Engineers**, winter annual mtg., Pittsburgh, Pa. (A. B. Conlin, Jr., 345 E. 47 St., New York 10017)
13-15. **Industrial Diamond Revolution**, technical conf., Columbus, Ohio (Conference Hq., 330 S. Wells St., Chicago, Ill. 60606)
13-15. **American Petroleum Inst.**, 47th annual mtg., Chicago, Ill. (American Petroleum Inst., 1271 Ave. of the Americas, New York 10020)
13-16. **Engineering in Medicine and Biology**, 20th annual conf., Boston, Mass. (Professional Assocs., 6520 Clayton Rd., St. Louis, Mo. 63117)
14-16. **American Federation of Infor-**

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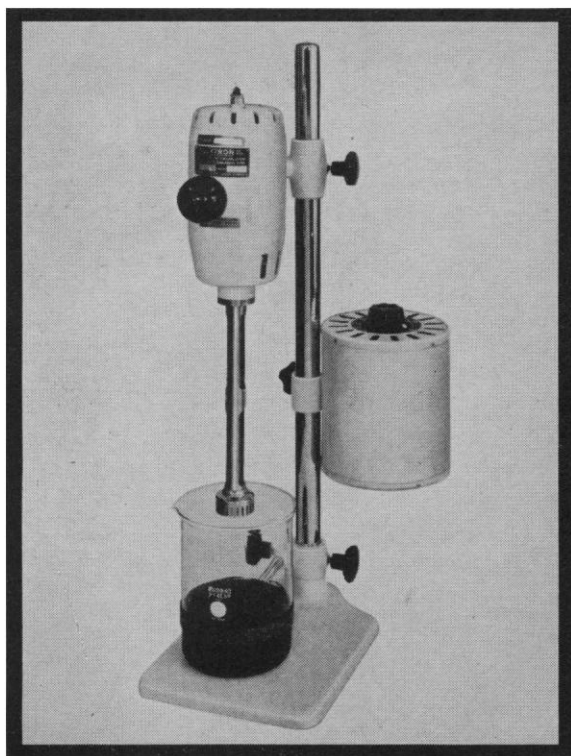
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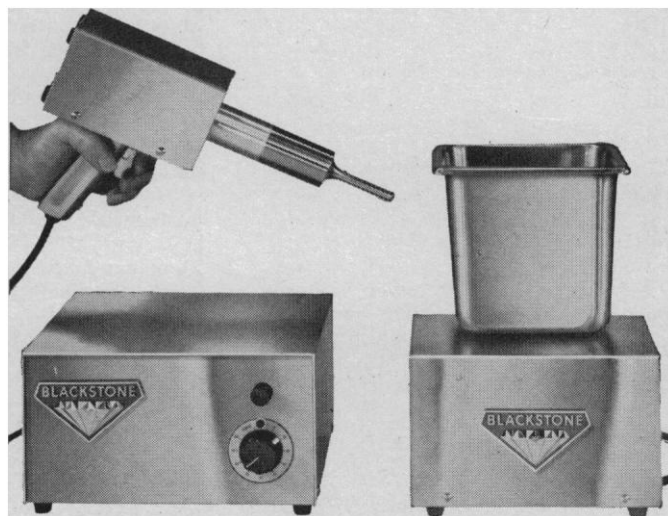


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14-17. American Acoustical Soc., fall mtg., Miami Beach, Fla. (J. Steinberg, Inst. of Marine Science, Univ. of Miami, Miami 33149)

14-18. Air-Conditioning and Refrigeration Inst., annual mtg., Miami, Fla. (1815 N. Fort Myer Dr., Arlington, Va. 22209)

15-18. American Society of Tool and Manufacturing Engineers, semi-annual conv., Dearborn, Mich. (The Society, 20501 Ford Rd., Dearborn 48128)

16-18. American Physical Soc., New York, N.Y. (W. W. Havens, 538 W. 120 St., New York 10027)

16-19. National Soc. for Crippled Children and Adults, annual mtg., Los Angeles, Calif. (K. Bauer, Director of Public Relations, 2023 W. Ogden Ave., Chicago, Ill.)

17-18. Computer Applications in Clinical Electrocardiography, postgraduate program, Washington, D.C. (J. S. France, Assistant Director, American College of Cardiology, Bethesda, Md. 20014)

19-21. International College of Surgeons, 5th Western regional mtg., Las Vegas, Nev. (F. M. Turnbull, Jr., 1127 Wilshire Blvd., Los Angeles, Calif. 90017)

19-22. Association of Military Surgeons of the U.S., annual mtg., Washington, D.C. (Brig. Gen. F. E. Wilson, AMSUS, 1500 Massachusetts Ave., NW, Suite 132, Washington, D.C. 20005)

20-22. Society of Economic Geologists, New Orleans, La. (J. O. Kalliokoski, Dept. of Geology, Princeton Univ., Princeton, N.J. 08540)

20-22. American Physics Soc., annual Fluid Dynamics mtg., Bethlehem, Pa. (P. S. Klebanoff, Natl. Bureau of Standards, Connecticut Ave. at Van Ness St., NW, Washington, D.C. 20234)

20-22. Geological Soc. of America, annual mtg., New Orleans, La. (G. E. Murray, Texas Technical College, Box 4680, Technical Station, Lubbock, Tex., or Miss D. Curtis, Shell Oil Co., Box 60193, New Orleans 70160)

20-22. Geochemical Soc., annual mtg., New Orleans, La. (E. C. T. Chao, % U.S. Geological Survey, Washington, D.C.)

20-22. Mineralogical Soc. of America, New Orleans, La. (G. Switzer, % U.S. National Museum, Washington, D.C. 10025)

20-22. Paleontological Soc. of America, New Orleans, La. (R. L. Langenheim, Dept. of Geology, Univ. of Illinois, Urbana)

26-29. American Medical Assoc., clinical conv., Houston, Tex. (W. E. Burmeister, Director, Convention Services Dept., AMA, 535 N. Dearborn St., Chicago, Ill.)

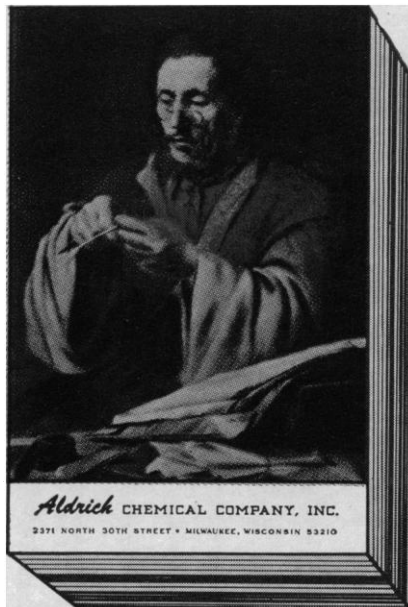
26-30. American Inst. of Chemical Engineers, 60th annual mtg., New York, N.Y. (H. I. Wolff, Shell Chemical Co., 50 W. 50 St., New York 10020)

26-1. Radiological Soc. of North America, 53rd annual mtg., Chicago, Ill. (M. D. Frazer, RSNA, 713 East Genesee St., Syracuse, N.Y.)

27-29. American Astronautical Soc., natl. mtg., New York, N.Y. (N. Levin, Guidance and Control, Plt. 35, Grumman Engineering Corp., Bethpage, N.Y. 11714)

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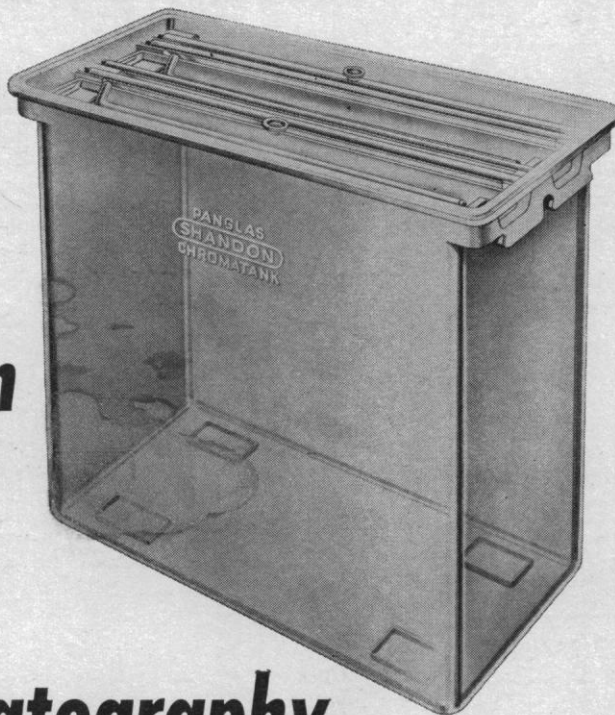
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27-30. **Entomological Soc. of America**, annual mtg., New York, N.Y. (R. H. Nelson, ESA, 4603 Calvert Rd., College Park, Md.)

27-1. **Chemical Industries**, New York, N.Y. (International Exposition Co., 200 Park Ave., New York 10017)

28. **American Soc. of Therapeutic Radiologists**, Chicago, Ill. (J. A. Del Regato, Penrose Cancer Hospital, Colorado Springs, Colo. 80907)

29-30. **Society for Industrial and Applied Mathematics**, fall mtg., Santa Barbara, Calif. (H. B. Hair, 33 S. 17 St., Philadelphia, Pa. 19103)

29-1. **Wire and Cable Symp.**, Atlantic City, N.J. (J. Spengel, USAEC, Fort Monmouth, N.J. 07703, attn: AMSEL-KL-EE)

30-3. **American Anthropological Assoc.**, annual mtg., Washington, D.C. (C. Frantz, 1530 P St., NW, Washington, D.C. 20005)

International and Foreign Meetings

November

1-3. **Northern Development Conf.**, 4th, Edmonton, Alberta, Canada. (Alberta and Northwest Chamber of Mines and Resources, Edmonton)

5-11. **Allergology**, 6th intern. congr., Montreal, Canada. (S. O. Freedman, 1390 Sherbrooke St., W., Montreal 25)

5-11. **Pharmaceutical Federation**, 4th Central American, San Salvador, El Salvador. (% International Pharmaceutical Federation, 11 Alexanderstraat, The Hague, Netherlands)

6-10. **Microbiological Standards and Testing Methods for Irradiated Food**, Vienna, Austria. (International Agency Liaison Branch, Office of the Director General, Food and Agriculture Organization, Via delle Terme di Caracalla, Rome, Italy)

6-11. **Global Impacts of Applied Microbiology**, 2nd intern. conf., Addis Ababa, Ethiopia. (A. Lemma, Faculty of Science, Haile Sellassie I Univ., Addis Ababa)

6-14. **Dentistry**, intern. symp., Quito, Ecuador. (O. C. Jaramillo, Decano, Facultad de Odontologia, Universidad Central, Quito)

6-24. **Meteorological Instructors**, regional seminar, Santiago, Chile. (World Meteorological Organization, 41, Av. Giuseppe Motta, Geneva, Switzerland)

7-10. **Methods in Soil Ecology**, symp., Paris, France (UNESCO, Pl. de Fontenoy, Paris 7)

8-10. **Electroplating**, intern. conf., Erfurt, Germany. (Dr. Burkhardt, PV Elektrotechnik, Pa 16, Galvanotechnik, Kammer der Technik, Torgauer Str. 76, 705 Leipzig 5, Germany)

9-10. **American Anthropological Assoc.**, annual mtg., Toronto, Ontario, Canada. (Executive Secretary, 1530 P St., NW, Washington, D.C. 20005)

9-11. **Hematology**, 2nd natl. conf., Bucharest, Rumania. (I. Caloescu, Union of Medical Science Societies of the Socialist Republic of Rumania, 8 rue Progresul, Bucharest)

10-11. **Psychosomatic Disorders**, 11th annual conf., London, England. (A. H. Crisp, % Academic Psychiatric Unit, Middlesex Hospital, London, W.1)

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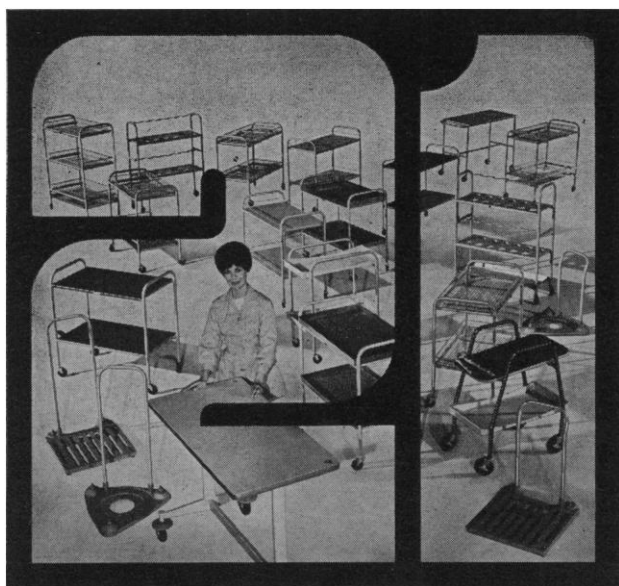
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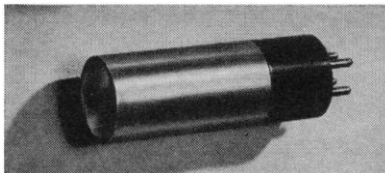
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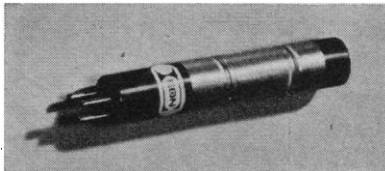


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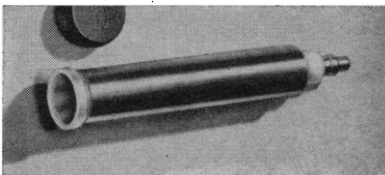
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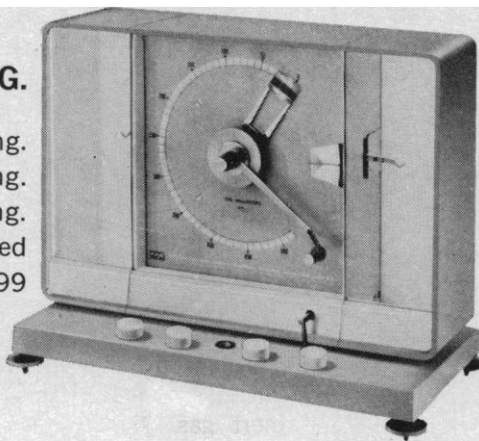


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The Bering Land Bridge. Based on a symposium given at the 7th Congress of the International Association for Quaternary Research (Boulder, Colo.), August–September 1965. David M. Hopkins, Ed. Stanford Univ. Press, Stanford, Calif., 1967. 511 pp. Illus. \$18.50. Twenty-four papers.

Calcium in Reproductive Physiology: A Comparative Study of Vertebrates. K. Simkiss. Chapman and Hall, London; Reinhold, New York, 1967. 278 pp. Illus. \$11.

Comprehensive Biochemistry. vol. 28. *Morphogenesis, Differentiation, and Development.* Marcel Florkin and Elmer H. Stotz, Eds. Elsevier, New York, 1967. 288 pp. Illus. \$15. Six papers.

Computers and Management: The 1967 Leatherbee Lectures. Hershner Cross, Donald I. Lowry, A. R. Zipf, George Kozmetsky, and Robert N. Anthony. Harvard Univ. Graduate School of Business Administration, Boston, 1967. 129 pp. Illus. Paper, \$3.50.

Conformation of Biopolymers. vol. 1. Papers read at an international symposium (Madras, India), January 1967. G. N. Ramachandran, Ed. Academic Press, New York, 1967. 439 pp. Illus. \$19.25. Forty-seven papers.

Contemporary Change in Traditional Societies. vol. 2, *Asian Rural Societies.* Julian H. Steward, Ed. Univ. of Illinois Press, Urbana, 1967. 362 pp. Illus. \$10. Five papers.

Countercurrent Separation Processes. H. R. C. Pratt. Elsevier, New York, 1967. 559 pp. Illus. \$34.

Cyclobutadiene and Related Compounds. M. P. Cava and M. J. Mitchell. Academic Press, New York, 1967. 517 pp. Illus. \$22.

Detection and Determination of Trace Elements. Maurice Pinta. Israel Program for Scientific Translations, Jerusalem. 1966; Davey, New York, 1967. 622 pp. Illus. \$29.50.

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Diesel Fuel Oil. A symposium (Atlantic City, N.J.), June–July 1966. American Soc. for Testing and Materials, Philadelphia, 1967. 120 pp. Illus. Paper, \$7.50. Seven papers.

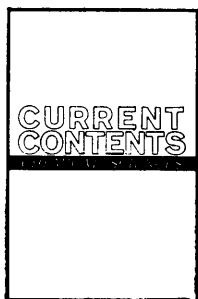
Electrical Characteristics of Transistors. R. L. Pritchard. McGraw-Hill, New York, 1967. 731 pp. Illus. \$19.50. McGraw-Hill Electronic Science Series.

Electrical Properties of Semiconductor Surfaces. Daniel R. Frankl. Pergamon. New York, 1967. 326 pp. Illus. \$13.50. International Series of Monographs on Semiconductors, vol. 7.

Electrodynamics of Moving Media. Paul Penfield, Jr. and Hermann A. Haus. M.I.T. Press, Cambridge, Mass., 1967. 288 pp. Illus. \$12.50.

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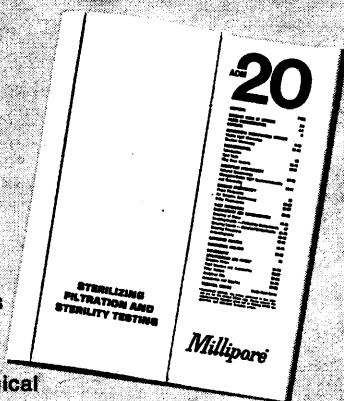
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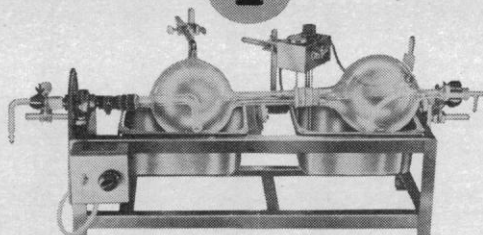
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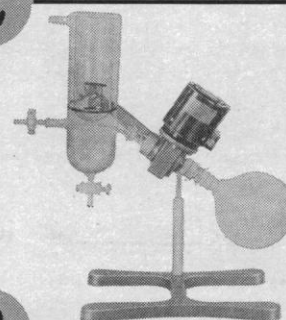
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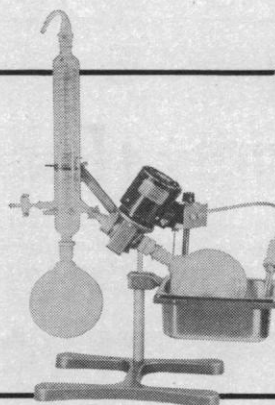
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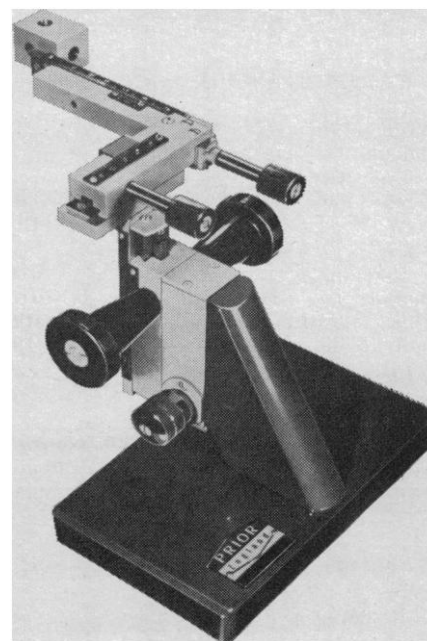
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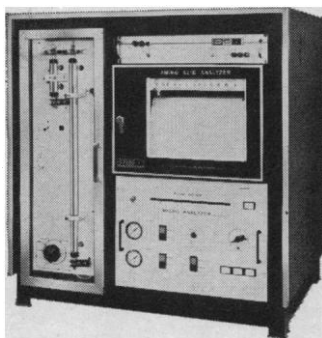
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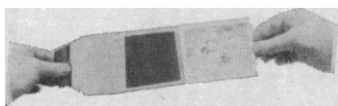
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