

# Instructions for Contributors

The Editors of *Science*

Manuscripts submitted to *Science* for consideration for publication can be handled expeditiously if they are prepared in the form described in these instructions.

Submit an original and two duplicates of each manuscript. With the manuscript send a letter of transmittal giving (i) the name(s) of the author(s); (ii) the title of the paper and a one- or two-sentence statement of its main point; (iii) the name, address, and field of interest of four to six persons in North America but outside your institution who you think are qualified to act as referees for your paper; (iv) the names of colleagues who have reviewed your paper for you; (v) the field(s) of interest of readers who you anticipate will wish to read your paper.

## Editorial Policies

All papers submitted are considered for publication. The author's membership or lack of membership in the AAAS is not a factor in selection. Papers are accepted with the understanding that they have not been published, submitted, or accepted for publication elsewhere. Authors will usually be notified of acceptance, rejection, or need for revision in 4 to 6 weeks (Reports) or 6 to 10 weeks (Articles).

**Types of papers.** Five types of signed papers are published: Articles, Reports, Letters, Technical Comments, and Book Reviews. Familiarize yourself with the general form of the type of paper you wish to submit by looking over a recent issue of the journal, and then follow the instructions for that type of paper.

**Reviews.** Almost all Articles, Reports, and Technical Comments, whether solicited or not, are sent to two or more outside referees for evaluation of their significance and soundness. Forms showing some of the criteria reviewers are expected to consider are available on request.

**Editing.** Papers are edited to improve the effectiveness of communication between the author and his readers. The

most important goal is to eliminate ambiguities. In addition, improvement of sentence structure often permits readers to absorb salient ideas quickly. When editing is extensive, with consequent danger of altered meanings, papers are returned to the author for correction and approval before type is set. Authors are free to make additional changes at this stage.

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Organize your material carefully, putting the news of your finding or a statement of the problem first, supporting details and arguments second. Make sure that the significance of your work will be apparent to readers outside your field, even if you feel you are explaining too much to your colleagues. Present each step in terms of the purpose it serves in supporting your finding or solving the problem. Avoid chronological steps, for the purpose of the steps may not be clear to the reader until he finishes reading the paper.

Provide enough details of method and equipment so that another worker can repeat your work, but omit minute and comprehensive details which are generally known or which can be covered by citation of another paper. Use metric units of measure. If measurements were made in English units, give metric equivalents.

Avoid specialized laboratory jargon and abbreviations, but use technical terms as necessary, defining those likely to be known only in your field. Readers will skip a paper they do not understand. They should not be expected to consult a technical dictionary.

Choose the active voice more often

than you choose the passive, for the passive voice usually requires more words and often obscures the agent of action. Use first person, not third; do not use first person plural when singular is appropriate. Use a good general style manual, not a specialty style manual. The University of Chicago style manual, the style manual of the American Institute of Physics, and the *Style Manual for Biological Journals*, among others, are appropriate.

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Prepare your manuscript in the form used by *Science*. Use bond paper for the first copy. Submit two duplicates. Double-space title, abstracts, text, signature, address, references (including the lines of a single reference), figure legends, and tables (including titles, columns, headings, body, and footnotes). Do not use single spacing anywhere. Put the name of the first author and the page number in the upper right-hand corner of every page.

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Insert subheads at appropriate places in the text to mark your main ideas. The set of subheads should show that your ideas are presented in a logical order. Keep subheads short—up to 35 characters and spaces.

Provide a summary at the end.

Do not submit more than one illustration (table or figure) for each 4 manuscript pages unless you have planned carefully for grouping. With such planning many illustrations can be accommodated in the article. Consult the editorial office for help in planning.

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**Signature.** List the authors on the last page of the text and give a simple mailing address.

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## Letters

The Letters section provides a forum for discussion of matters of general interest to scientists. Letters are judged only on clarity of expression and interest. Keep them short and to the point; the preferred length is 250 words. The editors frequently shorten letters.

## Technical Comments

Letters concerning technical papers in *Science* are published as Technical Comments at the end of the Reports section. They may add information or point out deficiencies. Reviews are obtained before acceptance.

## Book Reviews

The selection of books to be reviewed is made by the editors with the help of advisers in the various specialties; arrangements are then made with reviewers. A sheet of instructions accompanies each book when it is sent to the reviewer.

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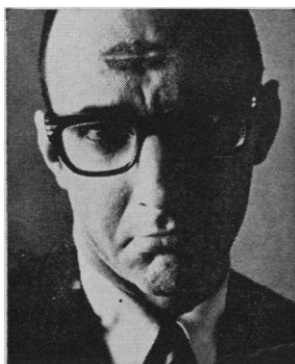
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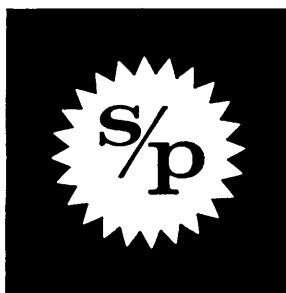


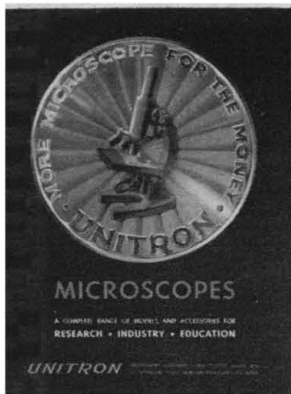
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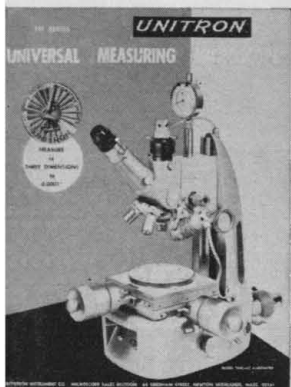
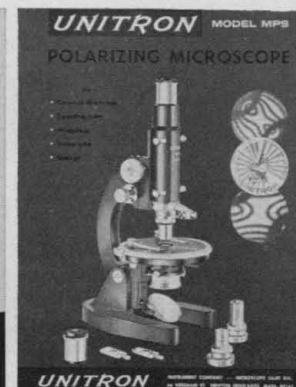
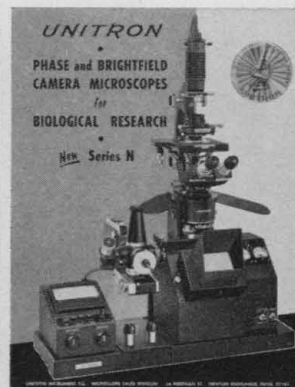
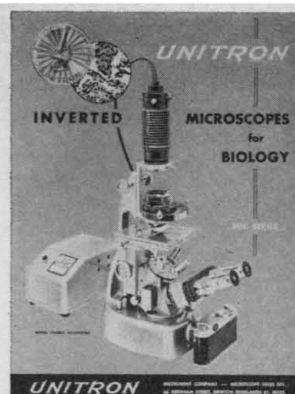




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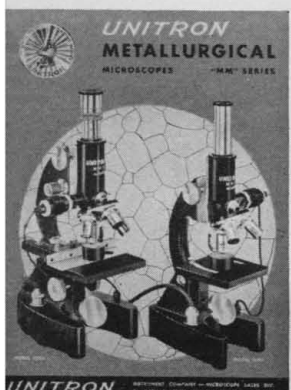
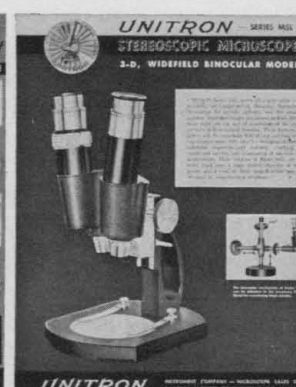
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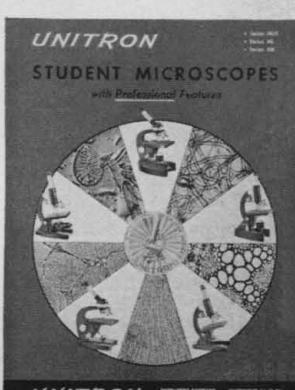
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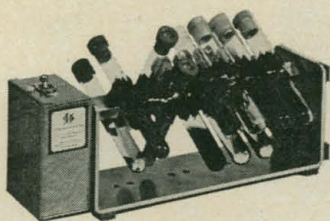
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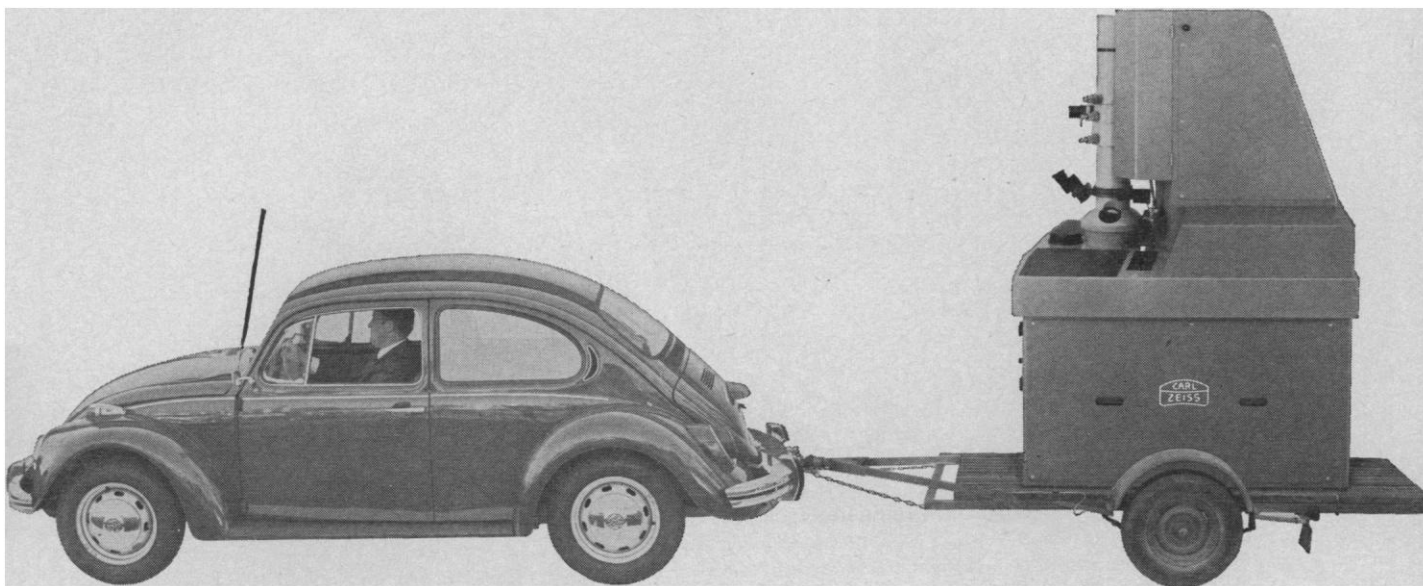
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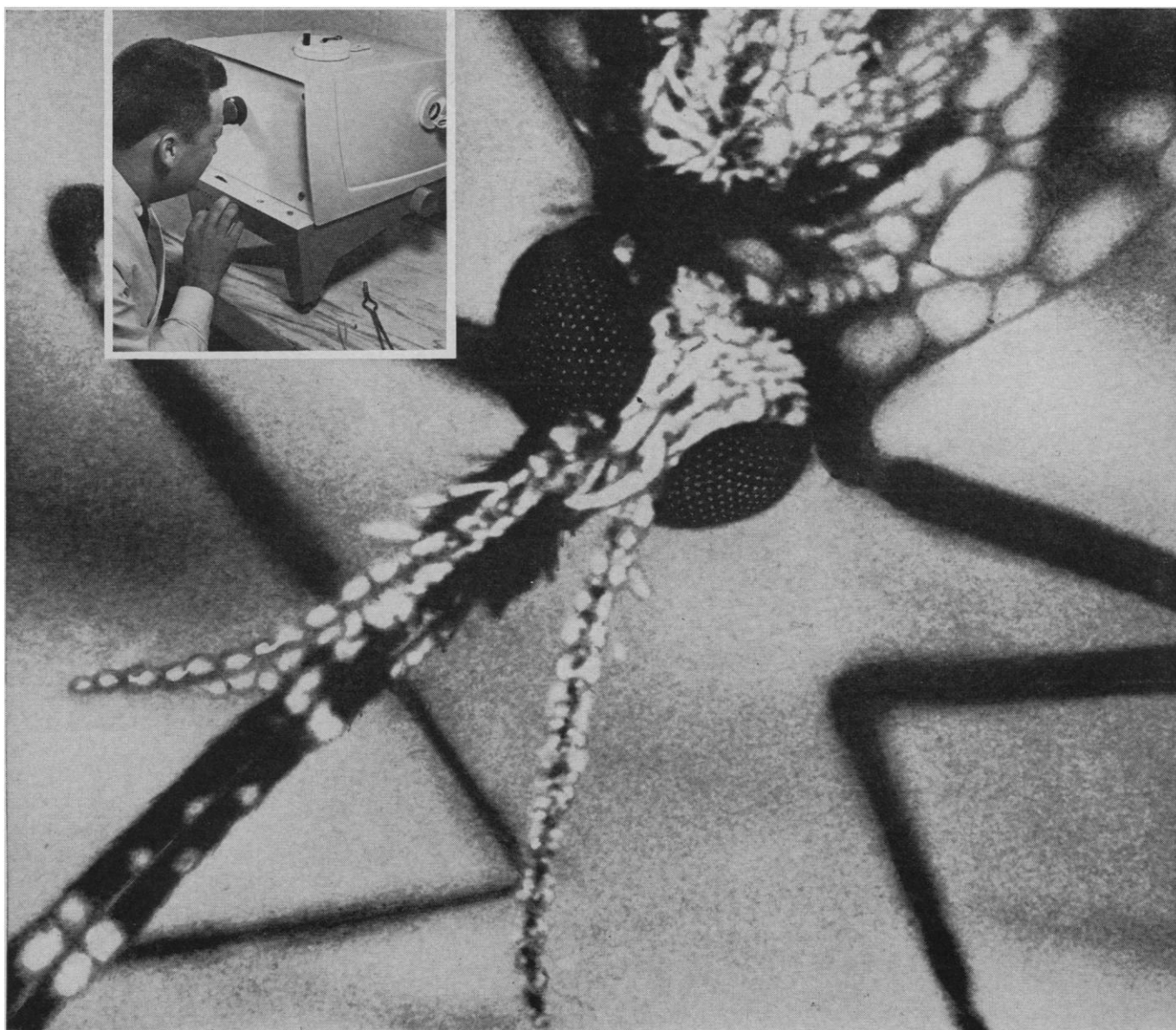
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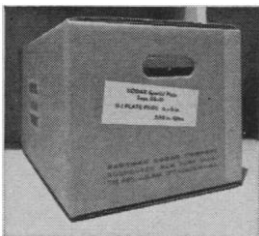
**Kodak**

## Avoid fog

When traveling by air in these uptight times, don't leave unprocessed film in your checked luggage. It may be fluoroscoped. Carry the film in your pocket or a flight bag. Magnetic flux won't fog it (but could affect a sound stripe or other magnetic recording). If you are carrying a quantity of film, it might be well to mention your concern to the gate agent and work out ways of proving your peaceful intentions.

## Flying your stack, instead of blowing it

To lead off a long parade of new Kodak products for 1971, here is KODAK Special Plate 114-01. Many of the products to follow will be much more widely appreciated, lower in price, and more attractively packaged. For the price of the short dozen of 6" x 4" plates in this package you could buy the same number of pleasant acres of real estate in many a U.S. county. Even so, the purchaser furnishes the glass himself, having first engraved fiducial marks on it. On both sides we proceed to coat 100 $\mu$ m of an emulsion that responds to "minimum ionization"\* but is not particularly sensitive to light.



One suggested use, as proposed by the customer who convinced us this product ought to be made and who has pre-tested it in Palestine, Tex. and Parana, Argentina:

Send a stack of these plates outside as much of the atmosphere as you can manage, accompanied by a magnetic field. A superconducting magnet is recommended unless you can think of a more convenient way to wrap the package in a dozen kilogauss or so. With the fine grain of our emulsion despite its high sensitivity, that much field should suffice to

\*This term pertains to the rate at which an electron, proton, meson, stripped nucleus, etc. gives up kinetic energy as ionization while slowing down in the emulsion. The rate passes through a minimum on a plot of  $dE/dx$  vs.  $E$

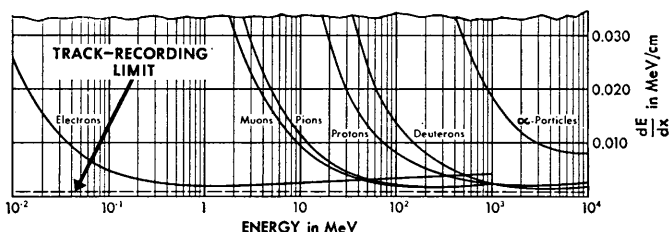
From the very slow ascent of these curves past their minima, it is apparent that only an emulsion capable of accepting an ionization trail as weak as 440 electron volts/ $\mu$ m can show tracks for charged particles of very high energy. Such an emulsion therefore records the path of *any* charged particle possessing enough energy to get through more than two or three grains.

put a measurable curvature in most tracks you will find upon recovering the plates and processing them. A couple of days at 130,000 feet should yield about 100,000 tracks. If you are pointing your stack right, the more interesting of these tracks will continue through several of the plates, perhaps all of them. Those will be from cosmic ray particles of the highest energy, galactic or extra-galactic in origin. They will be nuclei as heavy as iron, moving with energies as much as 200 Gev per nucleon. With the help of the fiducial marks and whatever other arrangements you have worked out to keep from getting mixed up by 100,000 tracks, pick out these interesting ones.

If you can raise your proportion of interesting tracks, you'll want to stay up longer before running out of room on the plates. Here's a helpful hint for that: fly your stack near the earth's magnetic equator. There you won't pick up so many particles of energy low enough to be following the earth's lines of force much.

Your vehicle may happen to be an orbital one rather than a balloon. Then, of course, you are rid of the clutter of cosmic ray cascades and can stay up for weeks instead of hours, unless you pick up too big a dose of Van Allen belt protons over the mid-South Atlantic. It is simply unfortunate that the earth's geomagnetic center is shifted some 436 km toward the Marianas to bring the Van Allen belt lower by the same amount on the opposite side of the globe.

Anyway, this sort of activity keeps your mind from dwelling continually on evils that stir your choler dangerously. We wish it would regain some of its lost appeal.



These are theoretical rates in air. They must be multiplied by the "stopping-power" factor for a photographic emulsion, which is about 1800. This high factor is one of the advantages of using photographic techniques.

## The power of used water

Permit us to brag a bit about the engineering behind this pipe.

We're looking up here from the Genesee River gorge in Rochester, some 150 feet below our largest plant and some three miles from the river's mouth on Lake Ontario. Some 36 million gallons of used water come down this pipe a day, bearing kinetic energy we paid for when we pumped it up from Lake Ontario. It is on its way to a primary settling tank and thence through trickling filters, where dwell organisms that break down waste compounds, to an activated sludge tank where other microorganisms continue the oxidation. The



activation could be accomplished by surface aeration. Instead, at the expense of doubling the electrical power requirement, we quietly inject the oxygen 20 feet beneath the surface. Surface aeration, we estimate, would bring forth a sound "about equivalent to a medium surf." Rochester is too far from the ocean for the neighbors to be fooled into accepting noise pollution as a tradeoff for water pollution.

So, instead of letting the kinetic energy generate a 6-inch froth on the primary tank, it's merely smart engineering to use it hydroelectrically in the interests of tranquillity for the neighborhood and the health of fish.

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a personal letter objecting to the statement that "it does not pay to recycle these minerals," pointing out that when the price of virgin metals rises, there is a well-known tendency for scrap to appear in abundant quantity at the furnaces. A doubling of the average cost of raw materials would make feasible forms of recycling that are now too expensive to consider; yet a doubled price of raw materials would not raise their share of the total cost of the national product to as much as 10 percent.

ANSLEY J. COALE

*Office of Population Research,  
Princeton University,  
Princeton, New Jersey 08540*

### Hydra-Headed Pesticides

In his presentation of the rationale for pest control by the Agricultural Research Service (19 June, p. 1419), George W. Irving, Jr., capsulizes the many alternatives or complements to the use of the synthetic organic pesticides. . . . [He] states that American agriculture has evolved a monoculture system and that the use of persistent pesticides has been an essential element in the successful production of the cheapest, highest quality food with only 5 percent of the labor force. One would infer that our monoculture system and its results are good and provide the only viable pattern for the world in the future. But the burgeoning degradation of our natural and social environment indicates that perhaps we are paying too little for food that is unnecessarily free of blemishes, that we have driven more people off the land than our cities can support, and that we have an unrealistic standard of living which the environment cannot sustain and the rest of the world can never achieve. Neither the world's fossil fuel and mineral reserves nor the capital resources of the developing nations can long support any major expansion of modern agriculture or U.S. life-styles. Serious doubt exists as to whether the quality and essential diversity of the environment can be maintained either.

The reasoning of the pest control specialist seems to be that man must "fight" so-called pests to survive and that the "balance of nature is not an achievable ideal, if it is an ideal at all." Man creates pests when he so simplifies an ecosystem that a particular insect group experiences a massive

population increase. His repeated retaliation with chemical pesticides further unbalances the ecology by stimulating the development of resistant pests and eliminating effective natural controls. Man must achieve a viable, dynamic balance within the global biosphere of which he is a part. The alternatives are frightening.

Alternatives do exist to the inexorable increase in use of pesticides, fertilizers, and machinery. Irving mentions several innovative plant protection systems being investigated by ARS. Unfortunately these techniques are not always economical in a monocultural system, particularly in the absence of long-term environmental cost accounting.

Extensive research, education, and incentives will be required to develop practical, ecologically sound systems of agriculture in which truly integrated insect control can function. Less conventional practices which tap the productivity of an agriculture modeled after natural ecosystems must replace the forcing of output through heavy energy and chemical subsidies. Such systems are particularly suited to the developing nations where capital inputs are scarce and conventional monoculture has had limited success.

We should question the assumption that agriculture has the responsibility to raise agricultural productivity to feed unlimited numbers of people. To irreparably damage the earth's life support system in an effort to extend conventional agriculture would be technologically difficult, economically unsound, and poor ecology.

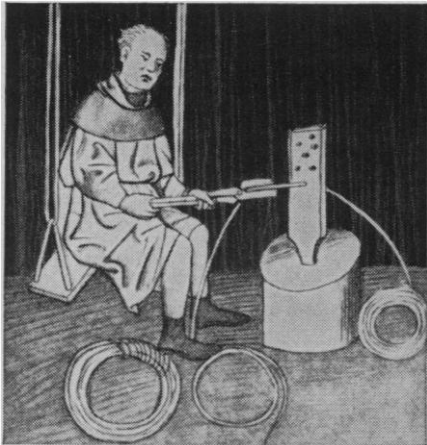
JOSHUA C. DICKINSON, III  
*Center for Tropical Agriculture,  
University of Florida,  
Gainesville 32601*

Rachel Carson (1) emphasized the importance of thoroughly testing all pesticides under controlled laboratory and field conditions before introduction of any chemical into the marketplace. The broadcast application of mirex is contrary to these scientific principles (2); for example, studies on mammalian systems are practically nonexistent (3).

Mirex, included with aldrin, dieldrin, and heptachlor in the same chemical family, may degrade into intermediates with a similar or higher level of general toxicity. I am not aware that such tests have been made or whether medical procedures exist to diagnose acute or chronic mirex poisoning. Human fetuses contain dieldrin and hepta-



## The big push to replace the long pull

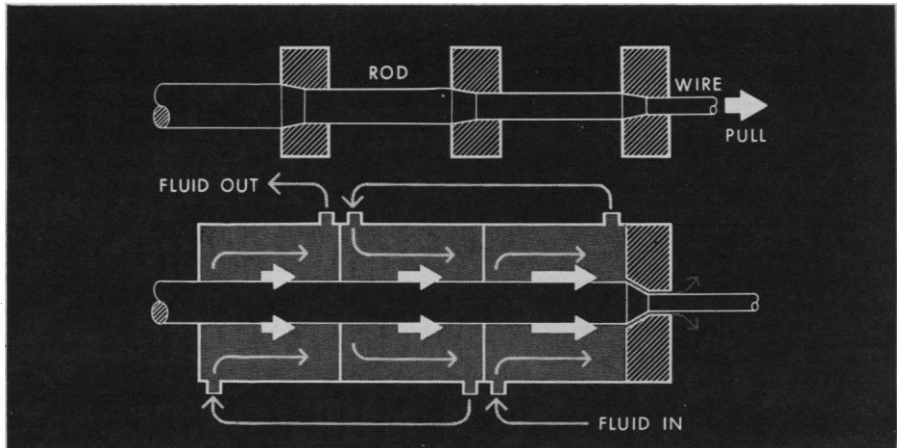


Medieval German "schockenzieher" (shock drawer) pulled wire through die by swinging back and forth.

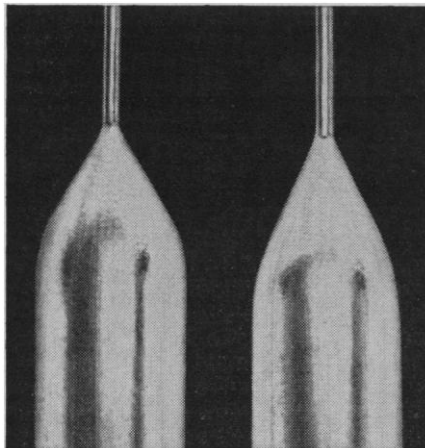
For at least 2000 years people have been making wire by pulling thin rods through small holes. The pulling force has been progressively human, animal, water, steam, and electricity, but the essentials remain.

But the process has limitations. You can get just so much reduction on one draw, so fine wire requires a series of draws. High speeds (modern wire drawing goes at speeds up to 12,000 feet per minute) wear out even diamond dies. And severe working and high tension drawing cause metal to become brittle, requiring annealing.

At Western Electric we probably make more wire than anyone else in the world. So we've been looking for a method that doesn't have these drawbacks, and a group at our Engineering Research Center in Princeton, N.J., has found one. This group has been working with metal under enormous hydraulic pressures—thousands of pounds per square inch—that enable it to flow like taffy into otherwise impossible shapes without getting brittle.



In conventional wire drawing (top), rod has to be pulled through series of dies for significant reduction. Hydro-dynamic extrusion (bottom) achieves the same reduction in one operation.



20 gage (.031" dia.) wire extruded from .364 dia. rod—a 99.2% reduction.

How could such enormous pressures be used to form wire? The simplest way would be to put a pointed rod in a chamber with a hole at one end that tapered down to a size just a shade larger than the wire you want; fill the chamber with liquid; raise the pressure. Two things would happen: pressure against the flat end of the rod would push the point against the hole; and pressure inside the hole would squeeze the rod as much as 24 successive draws did by the old method. Since it was the liquid that did the squeezing, rather than the material of the die, there would be virtually no wear on the die. And the wire would be soft and pliable, requiring no heat treatment.

So far so good. But the process

would not be continuous. The rod would have to fit inside the chamber.

However: suppose the liquid were forced into an opening at one end of the chamber, and out of an opening at the other. It would then be moving continuously through the chamber, and would push the rod along. The rod could be continuously fed into one end of the chamber; and wire would be extruded continuously from the other.

Actually our engineers found that three successive chambers, with liquid flowing into and out of each (as in the above diagram) helps the wire move along better. And incidentally, while they are still searching for the right liquid, they have found that beeswax is close to ideal.

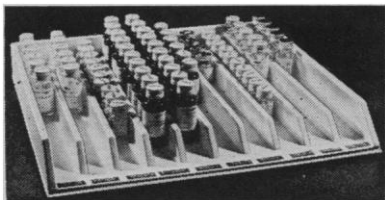
A prototype continuous hydrodynamic extrusion machine is now being built in Atlanta, Georgia. It is expected to produce aluminum wire, at a rate of 4000 feet per minute, at considerably less investment and operating costs than conventional wire-drawing machines.



**BEL-ART**

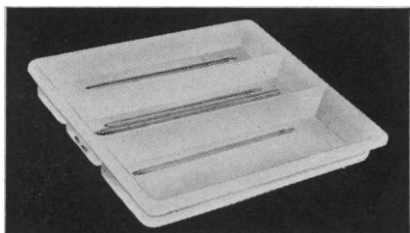
## ORGANIZE

### SMALL BOTTLES



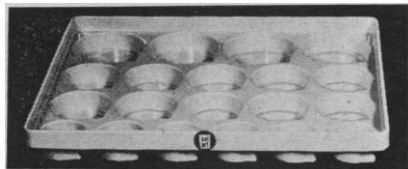
## ORGANIZE

### PIPETTES



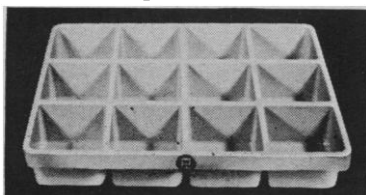
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chlor epoxide in their tissues; placental transfer studies using mirex would be of significant value. It is important to know if this chemical is incorporated into plant tissues or whether, by prolonged vaporization, mirex is released into the atmosphere (3).

... George Irving, responding to Ferguson's criticism of the Agricultural Research Service's fire ant eradication program (Letters, 14 Aug.), admitted that this insect predator is more significant as a "people pest." This statement can be applied to beneficial hymenopterans, spiders, or venomous reptiles. In these cases, however, action is restricted with the purpose of limiting the population to a reasonable level.

Ferguson objected with good reasons to the broadcast application of mirex for fire ant control. There are alternative procedures to combat *Solenopsis* which will eliminate the queen ant and reproductive capacity of the colony (2): place the mirex bait around the nest sites (close proximity of the fire ant may discourage consumption by nontarget animals); or burn the mounds during the seeding or harvesting seasons or in the winter when the fields lie barren and the colonies are inactivated by cold weather (avoid soil contamination due to leeching of mirex from the bait). These methods could be executed during low night temperatures and would present a minimal danger to farm workers and to the quality of the rural environment. The project would be under local or district control, the reaction to infestation would be precise and, most likely, less expensive than the \$200 million now allocated for control by the ARS.

JOHN W. PARKER

Department of Biology,  
Georgia State University,  
Atlanta 30303

#### References

1. R. Carson, *Silent Spring* (Houghton Mifflin, Boston, 1962).
2. D. Ferguson, *Environ. Action* 2, 11 (1970).
3. *Biological Effects of Pesticides in Mammalian Systems*, H. Kraybill, Ed. (New York Academy of Sciences, New York, 1969), vol. 160 of *Ann. N.Y. Acad. Sci.* 1 (1969).

#### Cancer Research: Once-Over-Lightly

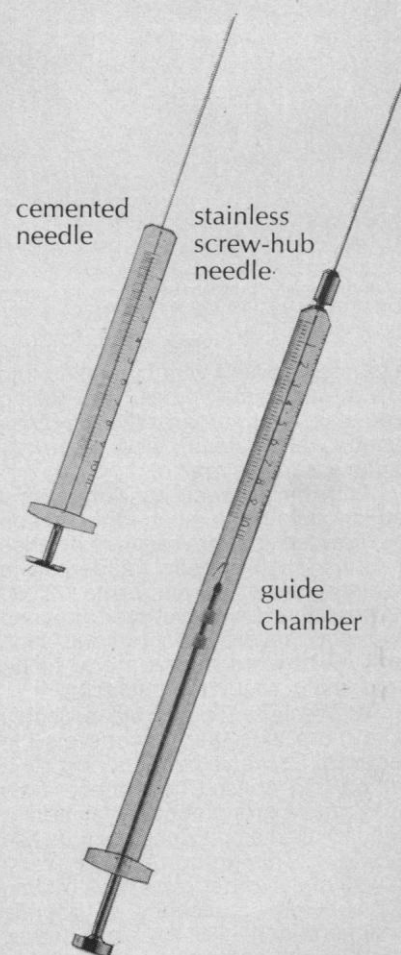
I believe Robert J. Bazell's commentary on "Cancer research" (16 Oct., p. 304) was based on several rather brief and superficial discussions with some of the people mentioned in his article, rather than on any real comprehension of the very exciting new discoveries

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which have provided the impetus for the new research programs now proposed in the cancer virus field. The \$5 million purported to be administered by me impressed Bazell, but as former chief of the Laboratory of Infectious Diseases of the National Institute of Allergy and Infectious Diseases for 13 years, I was responsible for influencing expenditures many times greater than this amount, expenditures that were regarded by many as well worth the effort; at least no one has questioned the value received.

Many new discoveries concerning the natural behavior of RNA and DNA tumor viruses in natural species and ecologies as well as in laboratory systems are entirely responsible for the new excitement that has been generated among virologists, cancerologists, immunologists, and molecular biologists in all parts of the world. Thus the recent breakthroughs on the cancer virus front are mainly responsible for the new research proposals and the additional appropriations for cancer research. . . .

It will come as no surprise to the numerous virus and cancer investigators serving as expert reviewers for the National Cancer Institute research contracts (research contracts, like grants, must go through a series of peer reviews) to learn that I am not the director of NCI's virus program but one of several branch chiefs in NCI's Special Virus Cancer Program, which is currently administered by Frank Rauscher and John Moloney. This error compounds some of Bazell's other conclusions concerning NCI's Special Virus Cancer Program (it is no longer the Special Virus Leukemia Program).

ROBERT J. HUEBNER

*Viral Carcinogenesis Branch,  
National Cancer Institute,  
Bethesda, Maryland 20014*

### Walter Reed Papers

I am editing the works, papers, and letters of Walter Reed (1851-1902), known for his contributions to the suppression of yellow fever. I would appreciate learning of original documentary material, letters, papers, and other primary source material related to Dr. Reed.

WILLIAM B. BEAN

*Department of Internal Medicine,  
University of Iowa Hospital,  
Iowa City 52240*

8 JANUARY 1971

# Signal Averaging...

## Principles and Practices

### *Phase Correction in NMR*

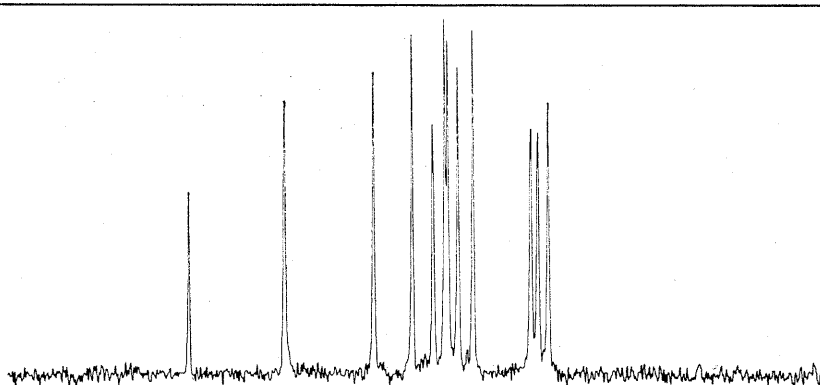
Number 12 of a Series

The objective of fast Fourier transform (FFT) techniques in NMR spectroscopy is to produce absorption spectra equal or superior to those obtained through CW methods, and in far less time. Unfortunately, rather than directly providing a true absorption spectrum, the FFT algorithm yields only two intermediate results called the real and imaginary components.

Ideally, the real component should be a good representation of the absorption spectrum. But some distortion due to the phase characteristics of the spectrometer/data handling system is unavoidable. Any time lag in recording data following onset of the exciting pulse, for example, will produce a linear frequency-dependent phase shift. (Often, such a delay must be deliberately introduced to avoid feedthrough of the pulse into the observed free induction decay signal.)

It is possible to eliminate phase distortion by calculating the magnitude spectrum, i.e., the square root of the sum of the squares of the real and imaginary components. The problem here is that spectral lines are broadened by the squaring operations; therefore, the resolution obtainable from a magnitude plot is necessarily inferior to that of a true absorption spectrum.

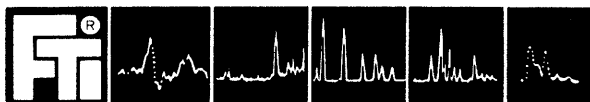
The Fabri-Tek solution, as used in our FFT data handling system, is to compensate the transformed spectra for frequency-dependent distortions. This is accomplished by rotating the axes of the complex plane until the real and imaginary components represent the true absorption and dispersion spectra.



Proton-decoupled, natural abundance  $^{13}\text{C}$  NMR absorption spectrum (after phase correction) of aqueous 1 M sucrose at  $38^\circ\text{C}$ . Shown is 100 ppm sweep starting at 66.8 ppm upfield from neat  $\text{CS}_2$  out of a total sweep width of 250 ppm at 15.08 MHz with a  $^{19}\text{F}$  lock. 128 scans were made in 5 minutes with 4K points in the time domain. Data courtesy of A. Allerhand, Department of Chemistry, Indiana University, Bloomington, Indiana.

If you are adding pulsed Fourier capabilities to your laboratory, why not call and discuss the data handling part of the system with us?

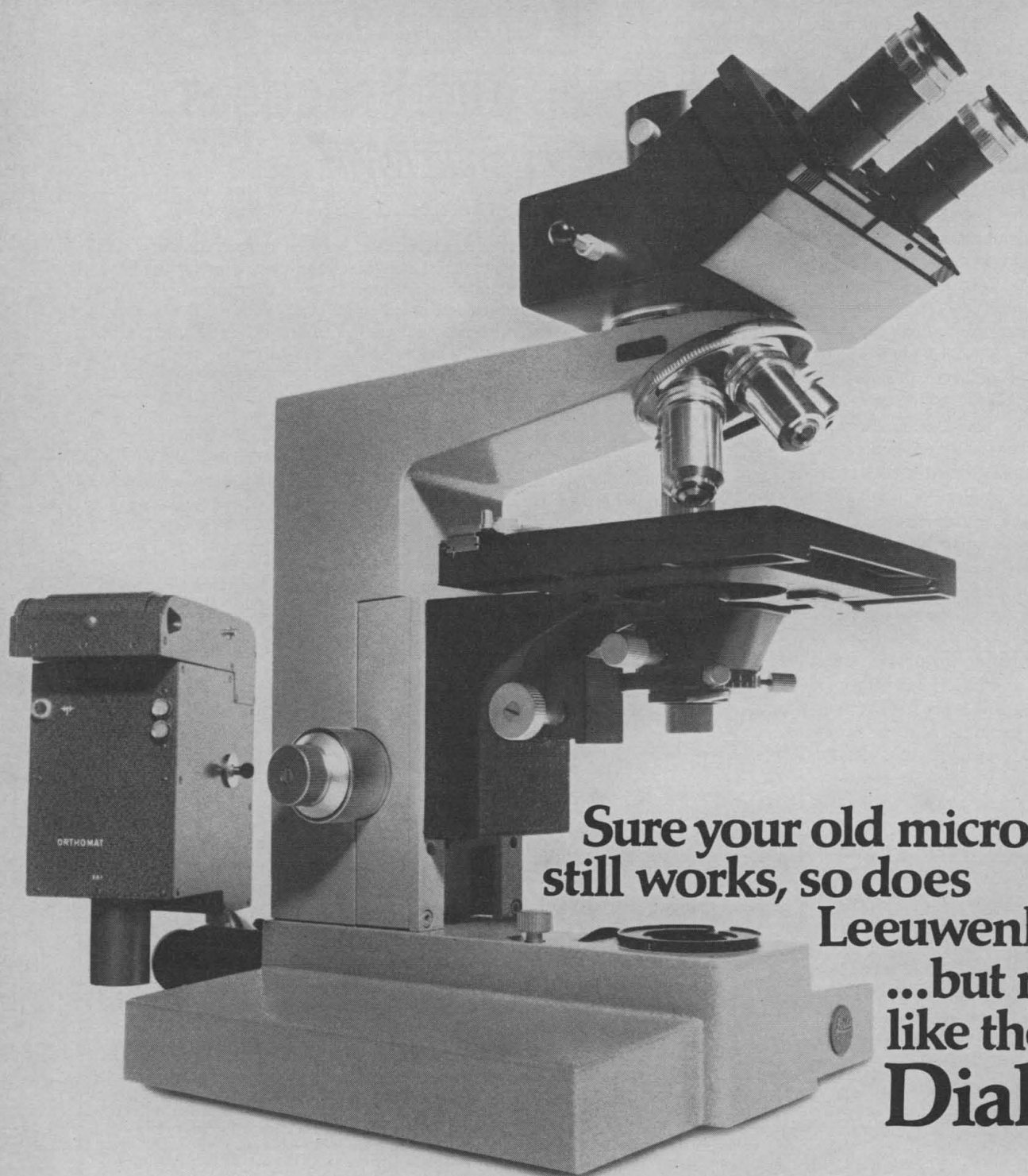
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## Marine Pollution

Until recently the oceans with their vast area and volume have seemed a safe site for the disposal of wastes. Recent events are causing second thoughts. Over half the population of this country is crowded close to the shores, partly because of recreational and esthetic considerations. Increasingly, however, the nearshore ocean is the receiver of a multitude of toxic or offensive materials. We must exercise better stewardship if we are to enjoy our heritage.

The oceans contain  $13 \times 10^{23}$  grams of water. They receive from natural processes each year about  $10^{16}$  grams of materials—mainly silicates but also substantial amounts of trace elements. In comparison to quantities of this size the contributions of man might seem small. However, mixing in the ocean is slow; surface waters are relatively isolated from the deeps. Man's wastes are dumped near shore and physical chemical and biological mechanisms act to produce substantial concentrating effects. Typical values of the concentration of mercury in the ocean range from 0.03 to 2.0 parts per billion. In contrast, the values found in tuna are in the neighborhood of  $0.5 \times 10^{-6}$  part per billion. The amounts of DDT found in commercial fishes testify even more convincingly to extremely effective concentrating processes. Similar processes are known to occur with other toxic heavy elements, but the extent of detrimental concentrations of organic substances in marine biota is less well established. We know that petroleum on the beach is offensive but have little information on the extent to which some of its constituents are concentrated in marine animals to their detriment.

Insufficiently treated human wastes are another source of damage to marine ecosystems. Lifeless zones have been created in the marine environment; there have been heavy kills of fish and other organisms. Shellfish have been found to contain hepatitis, polio virus, and other pathogens.

The coastlines of the United States with their associated estuaries and salt marshes are highly productive biologically. Many animals live their entire lives in that environment. Others must dwell there during crucial periods in their development. Marine pollution of various kinds has already seriously damaged the environment in some areas. The full extent of this damage is probably not known. Population studies are useful, but the population of a given species is influenced by many factors. Commercial fishes may be scarce because of disease, overfishing, or failure of a food supply. When it is discovered that a species is disappearing, the time is late.

Earlier warning could be provided by more intensive monitoring of chemical constituents of key members of the food chain, especially algae and fish. The items checked should include heavy metals, chlorinated organic compounds, and possible carcinogenic components of petroleum. Beyond monitoring we need far better knowledge of the extent to which potentially harmful molecules are concentrated or eliminated from various animals. In addition to chemical examination, searches for incipient pathological abnormalities should be conducted.

The recent measurements of mercury in tuna and of DDT in other fishes should warn us that we cannot count on the ocean as an almost infinite sink. We have awakened to the fact of very large concentrating effects, and we shall probably find more examples. Having been warned, we would be imprudent not to take action against heavy metal pollution. It would also be imprudent not to expand greatly a search for man-made and petroleum-derived chemicals in marine biota. At the same time, we should do whatever is necessary to decrease the amount of petroleum released to the environment and to regulate the discharge of raw sewage into the oceans.—PHILIP H. ABELSON

Sources used include *Ocean Dumping—A National Policy* (Government Printing Office, Washington, D.C., 1970) and *Waste Management Concepts for the Coastal Zone* (National Academy of Sciences and National Academy of Engineering, Washington, D.C., 1970).

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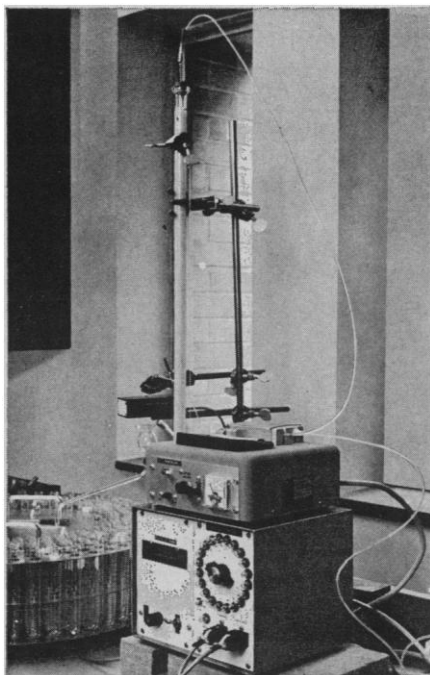
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that deposits of potential economic value be earmarked as such.

In the study of the mechanism and course of genetic and diagenetic changes, it was recommended that model reactions be studied in the laboratory; the investigator should start with pure, well-defined, simple systems and gradually increase the complexity of the system by adding more components. It was stressed that more laboratory work will be needed on synthesis at low temperatures and pressures.

### Soils

The presence of amorphous materials in soils creates several problems. Because of the high reactivity of these materials and their large specific surface area, the chemisorption of inorganic fertilizers often makes large fractions of the added fertilizers unavailable to the plants. Furthermore, the adsorption of pollutants from streams and from the atmosphere often causes considerable soil pollution. The large and strong adsorption capacity of the amorphous materials may well upset biological activity and balance in soils. It was emphasized that much fundamental and applied work would be needed in these highly important areas.

The permeability of volcanic soils is often high, thus causing excessive drainage which poses problems in rice growing. Measures to remedy this situation, such as the addition of bentonites, require more study of the factors governing colloidal stability to which the problem is directly related.

The colloidal properties of soils are also directly related to properties such as strength, swelling, and shrinking, which are of importance for foundation engineering and road building.

### Industrial Applications

Industrially, the use of the amorphous materials should be explored for those applications where small particle size and high adsorption capacity and large surface area are important. On the basis of knowledge of the structure and chemistry of the surface, it will be possible to chemically modify the surface to tailor the colloidal system to suit a particular application. Potential fields of application are in ceramics, paints, fillers, drilling fluids, lubricating greases, defoaming, ion exchange, heterogeneous catalysis, and adsorbents.

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## Forthcoming Events

### February

9–11. **Aerospace and Electronic Systems**, 12th annual winter conv., Los Angeles, Calif. (W. H. Herrman, Inst. of Electrical and Electronics Engineers, Inc., Los Angeles Council Office, 3600 Wilshire Blvd., Los Angeles 90005)

9–11. **Advanced Planning for Industry on Ships and Marine Systems**, Washington, D.C. (National Security Industrial Assoc., Dept. NM, Suite 700, Union Trust Bldg., 15th and H Sts., NW, Washington, D.C. 20005)

9–11. **Weed Science Soc. of America**, Dallas, Tex. (D. L. Klingman, Agricultural Research Service, U.S. Dept. of Agriculture, Beltsville, Md. 20705)

9–12. **Conference of the Reinforced Plastics/Composites Div.**, 26th, Washington, D.C. (C. Condit, Soc. of the Plastics Industry, Inc., 250 Park Ave., New York 10017)

10–11. **Vinyl Plastics II—Fundamentals of Processing Techniques**, Atlanta, Ga. (J. Seay, School of Architecture, Georgia Inst. of Technology, 225 North Ave., NW, Atlanta 30332)

11–13. **Society of University Surgeons**, New Haven, Conn. (T. Drapanas, Tulane Univ., New Orleans, La. 70112)

12. **Society of Teachers of Family Medicine**, Chicago, Ill. (Miss G. Gillespie, Div. of Family Medicine, Box 875, Biscayne Ave., Miami, Fla. 33152)

14–15. **American Medical Assoc., Medical Education**, 67th annual congr., Chicago, Ill. (C. H. W. Ruhe, AMA Council on Medical Education, 535 N. Dearborn St., Chicago 60610)

14–18. **American Soc. of Abdominal Surgeons**, New Orleans, La. (B. F. Alfano, ASAS, 675 Main St., Melrose, Mass. 02176)

14–18. **American Soc. of Range Management**, 24th annual, Reno, Nev. (F. T. Colbert, ASRM, 2120 S. Birch St., Denver, Colo. 80222)

15–16. **Virus and Water Quality: Occurrence and Control**, 13th annual, Urbana, Ill. (V. L. Snoeyink, Dept. of Civil Engineering, Univ. of Illinois, Urbana 61801)

17–18. **Conference on Integrated Information Systems**, Palo Alto, Calif. (R. W. Rector, Cognitive Systems, 319 S. Robertson Blvd., Beverly Hills, Calif. 90211)

17–19. **Solid State Circuits**, intern. conf., Philadelphia, Pa. (R. W. Webster, Texas Instruments, P.O. Box 5012, Dallas, Tex. 75222)

17–24. **Therapeutic Use of Dreams**, New York, N.Y. (H. Gersham, American Inst. for Psychoanalysis, 329 E. 62 St., New York 10021)

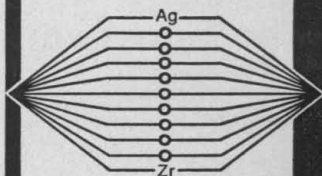
18–19. **Theoretical Chemistry and Sulfur Chemistry**, 3rd annual symp., New Orleans, La. (L. P. Gary, Jr., Loyola Univ., New Orleans 70118)

18–20. **Experimental Nuclear Magnetic Resonance**, 12th annual conf., Gainesville, Fla. (J. M. Anderson, Bryn Mawr College, Bryn Mawr, Pa. 19010)

18–21. **Western Electroencephalography Soc.**, Honolulu, Hawaii. (D. Crowell, Pacific Biochemical Research Center, Univ. of Hawaii, Honolulu 96822)

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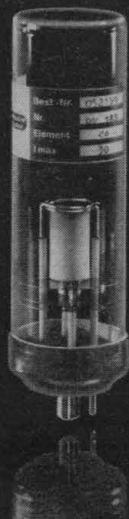


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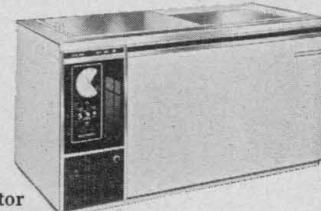
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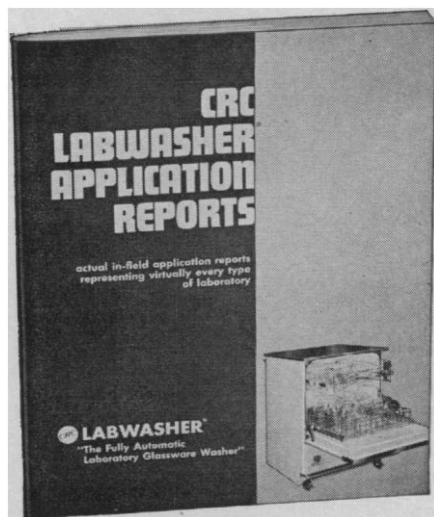
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19-20. **Immune Complexes and Disease**, 12th annual symp., New York, N.Y. (I. Saulpaugh, New York Heart Assoc., 2 E. 64 St., New York 10021)

20-24. **American Acad. of Allergy**, Chicago, Ill. (J. O. Kelley, 756 N. Milwaukee St., Milwaukee, Wis. 53202)

20-27. **American Soc. of Clinical Pathologists and College of American Pathologists**, Las Vegas, Nev. (A. G. Boeck, 710 S. Wolcott Ave., Chicago, Ill. 60612)

21-22. **National Assoc. of Medical Examiners**, Phoenix, Ariz. (A. Z. Hemeli, 3300 Kirkwood Hwy., Wilmington, Del. 19808)

21-26. **Engineering Foundation Research Conf. on Environmental Engineering in the Food Industry**, Pacific Grove, Calif. (R. Lachman, Environmental Resources Program, Cornell Univ., Ithaca, N.Y.)

21-26. **Stack Gas Emissions and Measurements**, Pacific Grove, Calif. (W. T. Ingram, New York Univ., New York)

22. **Efferent Organization and Integrative Behavior**, New Orleans, La. (J. D. Maser, Dept. of Psychology, Tulane Univ., New Orleans 70118)

22-24. **National Federation of Science Abstracting and Indexing Services**, Washington, D.C. (NFSAIS, 2102 Arch St., Philadelphia, Pa. 19103)

23. **Source Sampling of Atmospheric Contaminants**, Toronto, Ont., Canada. (H. G. McAdie, Chemical Inst. of Canada, c/o Ontario Research Foundation, Sheridan Park, Ont.)

22-26. **Plastic and Reconstructive Surgery**, 5th annual intern. congr., Melbourne, Australia. (J. Snell, Royal Australian College of Surgeons, Spring St., Melbourne 3000)

23-24. **Scope of Thermosets**, Chicago, Ill. (P. E. Fina, Box P, Riverdale, Ill.)

23-25. **Chemical Marketing Research Assoc.**, Chicago, Ill. (C. W. Slade, Jr., CMRA, 100 Church St., New York 10007)

24-27. **American Acad. of Forensic Sciences**, Phoenix, Ariz. (A. H. Schatz, 750 Main St., Hartford, Conn. 06103)

24-27. **Society of Professors of Education**, Chicago, Ill. (R. Reilly, Shippensburg State College, Shippensburg, Pa. 17257)

24-28. **American College of Angiology**, 17th annual, New Orleans, La. (A. Halpern, 381 Park Ave., S., New York 10016)

26-5. **International Acad. of Proctology**, Mexico City, Mexico. (A. J. Cantor, 147-41 Sanford Ave., Flushing, N.Y. 11355)

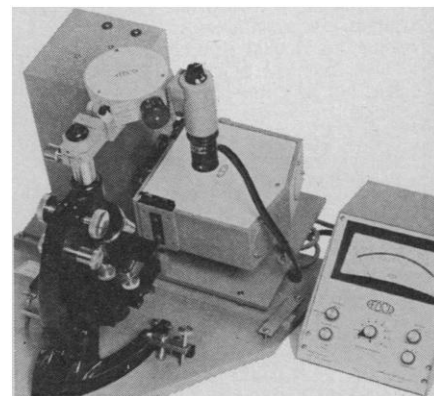
27. **Oregon Acad. of Science**, Monmouth. (C. L. Smith, Dept. of Anthropology, Oregon State Univ., Corvallis, 97331)

28-4. **Symposium of the Pan-American Assoc. of Biochemical Societies**, Banff, Alberta, Canada. (W. J. Whelan, Dept. of Biochemistry, Univ. of Miami School of Medicine, P.O. Box 875, Biscayne Ave., Miami, Fla. 33152)

28-4. **American Inst. of Chemical Engineers**, 6th annual, Houston, Tex. (E. L. Ekholm, Bechtel Corp., P.O. Box 2166, Houston 77001)

28-5. **Analytical Chemistry and Applied Spectroscopy**, 22nd annual, Cleveland, Ohio. (W. G. Fateley, Carnegie-Mellon Univ., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

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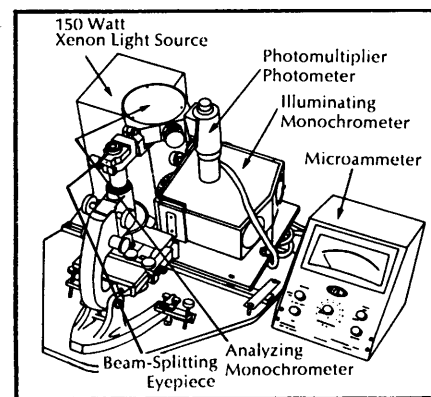
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28-5. American Assoc. of **Junior Colleges**, 51st annual, Washington, D.C. (W. A. Harper, AAJC, 1 Dupont Circle, NW, Washington, D.C. 20036)

28-6. Florida Midwinter Seminar in **Ophthalmology and Otolaryngology**, Miami Beach, Fla. (K. S. Whitmer, 550 Brickell Ave., Miami, Fla. 33131)

#### March

1-3. Symposium on **Antibiotics**, Ste. Marguerite, P.Q., Canada. (S. Rakhit, Ayerst Laboratories, P.O. Box 6115, Montreal, P.Q., Canada)

1-3. **Particle Accelerator Conf.**, Chicago, Ill. (D. A. Carlson, Argonne National Lab., Argonne, Ill. 60439)

1-3. American College of **Surgeons**, Phoenix, Ariz. (Communications Div., ACS, 55 E. Erie St., Chicago, Ill. 60611)

1-6. Society for **Cryosurgery**, Hollywood, Fla. (M. Trueblood, SC, 30 N. Michigan Ave., Chicago, Ill. 60602)

3-5. **Fundamental Cancer Research**, 25th annual symp., Houston, Tex. (F. Goff, Anderson Hospital and Tumor Institute, Univ. of Texas, Houston 77025)

3-6. **Midwest Clinical Conf.**, Chicago, Ill. (G. F. Lull, 310 S. Michigan Ave., Chicago 60604)

3-6. American **Educational Research Assoc.**, New York, N.Y. (R. A. Dershimer, AERA, 1126 16th St., NW, Washington, D.C. 20036)

3-10. Clinical Conf. on the **Treatment of Emotional Problems in Medical Practice, Case Studies in Child Therapy**, New York, N.Y. (H. Gershman, American Inst. for Psychoanalysis, 329 E. 62 St., New York 10021)

4-6. Southern Society of **Anesthesiologists**, Houston, Tex. (R. G. Zepernick, Mercy Hospital, New Orleans, La. 70119)

4-6. Society for **Contemporary Ophthalmology**, Hollywood, Fla. (SCO, Room 1629, 30 N. Michigan Ave., Chicago, Ill. 60602)

4-6. German **Endocrinological Soc.** 17th annual, Hamburg. (J. Kracht, Pathologisches Institut der Universitat Klinikstrasse 32g, 6300 GieBen, Germany)

4-6. Central **Surgical Assoc.**, Minneapolis, Minn. (W. J. Fry, Univ. of Michigan Medical School, Ann Arbor 48104)

5-6. American Soc. for **Surgery of the Hand**, Los Angeles, Calif. (L. Milford, ASSH, 869 Madison Ave., Memphis, Tenn. 08104)

5-7. National **Wildlife Federation**, Portland, Ore. (T. L. Kimball, NWF, 1412 16th St., NW, Washington, D.C. 20036)

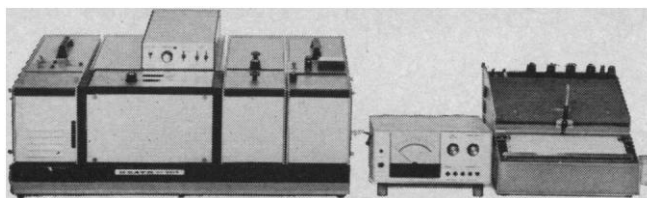
6-11. American Acad. of **Orthopedic Surgeons**, San Francisco, Calif. (C. V. Heck, AAOS, 430 N. Michigan Ave., Chicago, Ill. 60611)

6-12. American **Concrete Inst.**, 67th annual, Denver, Colo. (Secretary, Box 4754, Redford Sta., 22400 West Seven Mile Rd., Detroit, Mich. 48219)

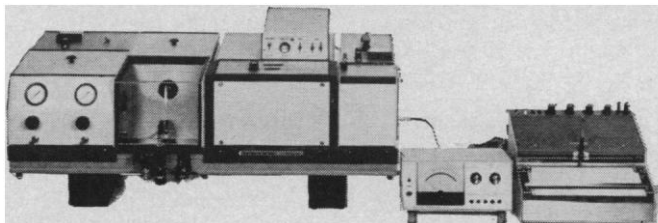
7-9. American Assoc. of **Pathologists and Bacteriologists**, Montreal, Canada. (K. M. Brinkhous, Dept. of Pathology, Univ. of North Carolina, Chapel Hill)

7-11. Society of **Toxicology**, Washington, D.C. (J. F. Borzelleca, Dept. of Pharmacology, Medical College of Virginia, Richmond 23219)

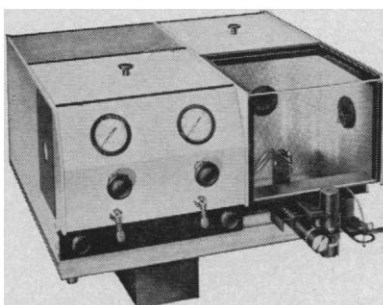
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7-12. American Soc. of **Photogrammetry**, Washington, D.C. (L. P. Jacobs, 105 N. Virginia Ave., Falls Church, Va. 22046)

8-10. **Aerodynamic Testing**, 6th annual conf., Albuquerque, N.M. [J. L. Jones, Aeronautics Div. (227-4), NASA Ames Research Center, Moffett Field, Calif. 94035]

8-10. The How-to-Year—The Year for **Continued Professional Development**, New York, N.Y. (R. E. Eddy, Commercial Development Dept., Nalco Chemical Co., 180 N. Michigan Ave., Chicago, Ill. 60601)

8-12. Symposium on **Biophysical Aspects of Radiation Quality**, Lucas Heights, N.S.W., Australia. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

8-12. **Western Metal and Tool Exposition Conf.**, Design and Scientific/Precision Instruments Exhibit (WESTEC), Los Angeles, Calif. (American Soc. for Metals, Metals Park, Ohio)

8-12. American Soc. for **Nondestructive Testing**, spring conf., Los Angeles, Calif. (R. E. Turner, Eastman Kodak Co., Rochester, N.Y.)

9-12. International Colloquium on the **Exploitation of the Oceans**, Bordeaux, France. (M. M. Vigneaux, c/o CNEXO, Boite Postale 107, Paris 16<sup>e</sup>, France)

9-13. International Exhibitions and Technical Meetings for **Medical Electronics and Bio-Engineering**, Basel, Switzerland. (Sekretariat, MEDEX 72, CH-4000 Basel 21, Schweiz Bankverein, Basel)

9-13. International Acad. of **Pathology**, Montreal, Canada. (L. D. Stoddard, Dept. of Pathology, Medical College of Georgia, Augusta 30902)

10-12. Society of **Photographic Scientists and Engineers**, Toronto, Ont., Canada. (H. J. Hall, 10 Maguire Rd., Lexington, Mass. 02173)

10-13. Latin American Congr. of **Neurosurgery**, 14th annual, Punta del Este, Uruguay. (Secretary, Instituto de Neurologia, Hospital de Clinicas, Montevideo, Uruguay)

10-13. **Quality Engineering**, Pacific Grove, Calif. (H. D. Greiner, Engineering Foundation, United Engineering Center, 345 E. 47 St., New York 10017)

12-19. **Marquette Medical Alumni Assoc.**, clinical conf., Maui, Hawaii. (R. H. Herzog, MMAA, 561 N. 15 St., Milwaukee, Wis. 53233)

13-17. California **Medical Assoc.**, Anaheim, Calif. (R. L. Thomas, CMA, 693 Sutter St., San Francisco, Calif. 94102)

14-17. International **Anesthesia Research Soc.**, 45th, Bal Harbour, Fla. (B. B. Sankey, 3645 Warrenville Center Rd., Cleveland, Ohio 44122)

14-17. American Assoc. of **Dental Schools**, Chicago, Ill. (B. F. Miller, III, AADS, Room 1610, 211 E. Chicago Ave., Chicago 60611)

14-17. National Conf. on **Higher Education**, 26th annual, Chicago, Ill. (K. Smith, American Assoc. for Higher Education, 1 Dupont Circle, NW, Washington, D.C. 20036)

15-16. **Aerospace Electronics Symp.**, Canadian Aeronautics and Space Inst.,

Toronto, Ont. (The Secretary, CASI, 77 Metcalfe St. Ottawa 4, Ont.)

15-17. **Neutron Cross Sections and Technology**, 3rd annual, Knoxville, Tenn. (J. A. Harvey, Oak Ridge National Lab., P.O. Box X, Oak Ridge, Tenn. 37830)

15-17. American College of **Surgeons** (sectional) joint mtg. for doctors and nurses, New Orleans, La. (Communications Div., ACS, 55 E. Erie St., Chicago, Ill. 60611)

15-18. American **Radium Soc.**, Mexico City, Mexico. (J. M. Vaeth, 1600 Divisadero St., San Francisco, Calif. 94115)

15-19. **Reprography**, 3rd annual intern. congr., London, England. (T. Hampshire, Inst. of Reprographic Technology, c/o IEL, Argyl St., London, W.1)

16-17. Conference on the **Effectiveness of On-Line Biomedical Computing**, Los Angeles, Calif. (M. J. Miller, Assoc. for the Advancement of Medical Instrumentation, 9650 Rockville Pike, Bethesda, Md. 20014)

16-17. **Plastics in Appliances**, Louisville, Ky. (J. L. Isaacs, Plastics Lab., General Electric Co., Appliance Park, 5-249, Louisville 40225)

17-24. Clinical Conf. on the **Treatment of Emotional Problems in Medical Practice, Family Therapy**, New York, N.Y. (H. Gershman, American Inst. for Psychoanalysis, 329 E. 62 St., New York 10021)

18-20. National Council of **Teachers of Mathematics**, Wichita, Kan. (NCTM, 1201 16th St., NW, Washington, D.C. 20036)

18-21. **Clinical Pharmacology**, 2nd annual intern. symp., Regensburg, Germany. (U. Smahel, P.O. Box 345, D-84 Regensburg 1)

18-21. International Assoc. for **Dental Research**, 49th annual, Chicago, Ill. (A. R. Frechette, 211 E. Chicago Ave., Chicago 60611)

18-21. Association for the Advancement of **Medical Instrumentation**, 6th annual, Los Angeles, Calif. (M. J. Miller, AAMI, 9650 Rockville Pike, Bethesda, Md. 20014)

19-20. **Brief Psychotherapy, "Behavior Therapy"**, 3rd annual, Chicago, Ill. (J. Cowen, Dept. of Psychiatry and Behavioral Sciences, Chicago Medical School, 2020 W. Ogden Ave., Chicago 60612)

19-22. Association of University of **Anesthetists**, Miami, Fla. (R. M. Epstein, 622 W. 168 St., New York 10021)

21-24. American **Orthopsychiatric Assoc.**, 48th annual, Washington, D.C. (M. F. Langer, AOA, 1790 Broadway, New York 10019)

21-26. National Assoc. of **Corrosion Engineers**, Chicago, Ill. (D. Miller, 2400 W. Loop South, Houston, Tex. 77027)

22-24. Institute of **Management Sciences**, Washington, D.C. (S. W. Hess, Wharton School, Univ. of Pennsylvania, Philadelphia 19104)

22-25. Institute of **Electrical and Electronics Engineers**, Inc., New York, N.Y. (J. M. Kinn, IEEE, 345 E. 47 St., New York 10017)

22-26. Australian Institution of **Engineers**, Adelaide. (Secretary, Institution of Engineers, Australia Science House, Gloucester and Essex Sts., Sydney, NSW 2000)

23-24. **Combustion** Inst. Central States section, Ann Arbor, Mich. (D. J. Patterson, Automotive Engineering Lab. 309, Dept.

SCIENCE, VOL. 171





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<sup>1</sup> Benesch, R. and Benesch, R. E., Nature, 618, 221 (1969).

<sup>2</sup> Krinsky, I. in H. U. Bergmeyer, Methods of Enzymatic Analysis, p. 238, Academic Press, N.Y. (1965).

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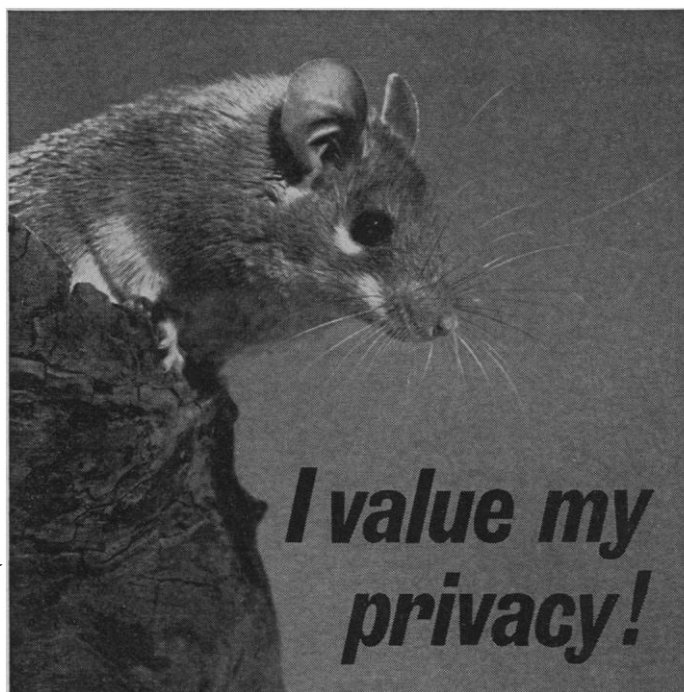
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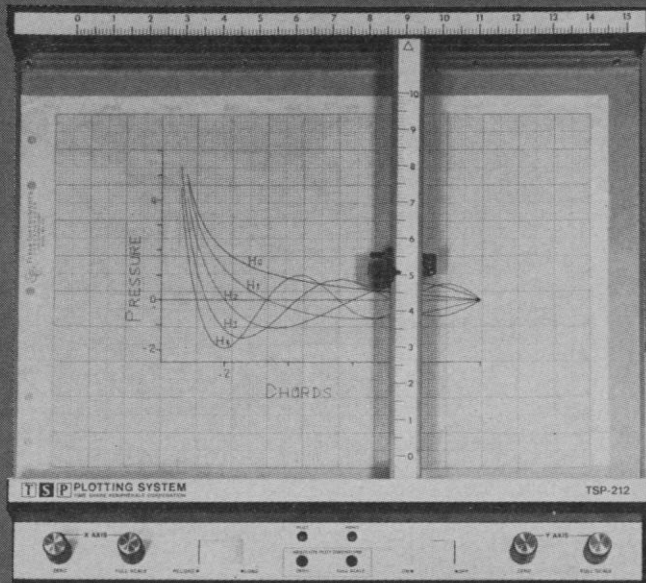


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of Mechanical Engineering, Univ. of Michigan, North Campus, Ann Arbor 48104)

23-25. **Symbolic and Algebraic Manipulation**, 2nd annual symp., Los Angeles, Calif. (J. Moses, Project MAC, Massachusetts Inst. of Technology, 545 Technology Sq., Cambridge 02139)

23-26. **Information Industry Assoc.**, 3rd annual, Lancaster, Pa. (P. G. Zurkowski, IIA Washington, 1025 15th St., NW, Washington, D.C. 20005)

23-26. **Negative Ions**, Liverpool, England. (Meetings Officer, Inst. of Physics and the Physical Society, 47 Belgrave Sq., London, S.W.1, England)

24. Association for the Advancement of **Psychoanalysis**, New York, N.Y. (A. Apolito, 80 Undercliff Rd., Montclair, N.J. 07042)

24-26. **American Surgical Assoc.**, Boca Raton, Fla. (G. T. Shires, ASA, 5323 Harry Hines Blvd., Dallas, Tex. 75235)

24-26. **Midwest Benthological Soc.**, 19th annual, Notre Dame, Ind. (C. I. Weber, FWQA, 1014 Broadway, Cincinnati, Ohio 45202)

24-27. **American Fertility Soc.**, New Orleans, La. (H. H. Thomas, 944 S. 18 St., Birmingham, Ala. 35205)

25-26. **National Conf. on Rural Health**, 24th, Atlanta, Ga. (B. L. Bible, American Medical Assoc., 535 N. Dearborn St., Chicago, Ill. 60610)

25-27. **American Soc. for Engineering Education**, Gulf Southwest section, Ruston, La. (Mrs. L. Hitch, ASEE, Suite 400, 1 Dupont Circle, Washington, D.C. 20036)

25-27. **American Assoc. of Colleges of Pharmacy**, San Francisco, Calif. (C. W. Bliven, AACP, 850 Sligo Ave., Silver Spring, Md. 20910)

25-27. **Seismological Soc. of America**, Riverside, Calif. (D. Tocher, P.O. Box 826, Berkeley, Calif. 94701)

26-27. **South Carolina Acad. of Science**, Charleston. (L. H. Stevenson, Univ. of South Carolina, Columbia, S.C.)

26-28. **American Soc. of Internal Medicine**, Denver, Colo. (W. R. Ramsey, Third at Market, San Francisco, Calif. 94103)

26-29. **National Assoc. of Boards of Pharmacy**, San Francisco, Calif. (F. T. Mahaffey, NABP, 77 W. Washington, Chicago, Ill. 60602)

26-30. **National Science Teachers Assoc.**, Washington, D.C. (R. H. Carleton, NSTA, 1201 16th St., NW, Washington, D.C. 20036)

27-1. **American College of Allergists**, San Francisco, Calif. (E. Bauers, 2100 Dain Tower, Minneapolis, Minn. 35402)

27-2. **American Pharmaceutical Assoc.**, San Francisco, Calif. (W. S. Apple, APA, 2215 Constitution Ave., NW, Washington, D.C. 20037)

28. **American Soc. of Hospital Pharmacists**, San Francisco, Calif. (J. A. Oddis, ASHP, 4630 Montgomery Ave., Bethesda, Md. 20014)

28-1. **American Soc. of Maxillofacial Surgeons**, Miami Beach, Fla. (D. Goulian, Jr., 116 E. 68 St., New York 10021)

28-1. **American Soc. of Mechanical Engineers**, Gas Turbine Conf. and Products Show, Houston, Tex. (A. B. Conlin, 345 E. 47 St., New York 10017)

28-2. **Engineering Foundation Conf. on Building Systems**, Pacific Grove, Calif. (H.



D. Greiner, Engineering Foundation, United Engineering Center, 345 E. 47 St., New York 10017)

28-2. American Chemical Soc., Los Angeles, Calif. (F. T. Wall, ACS, 1155 16th St., NW, Washington, D.C. 20036)

28-2. American College of Physicians, Denver, Colo. (E. C. Rosenow, ACP, 4200 Pine St., Philadelphia, Pa. 19104)

29-31. Society of Economic Paleontologists and Mineralogists, Houston, Tex. (Mrs. R. Tener, Box 979, Tulsa, Okla. 74101)

29-31. International Conf. on Non-Ionizing Radiation Safety, Cincinnati, Ohio. (P. Dehner, Children's Hospital Research Foundation, Elland and Bethesda, Cincinnati 45229)

29-31. American Assoc. of Petroleum Geologists and Soc. of Economic Paleontologists and Mineralogists, Houston, Tex. (E. W. Ellsworth, AAPG, Box 979, 144 S. Boulder, Tulsa, Okla. 74101)

29-31. New Development in Reactor Mathematics and Applications, Idaho Falls, Idaho. (J. C. Haire, Idaho Nuclear Corp. P.O. Box 1845, Idaho Falls 83401)

29-2. Psychosomatic Medicine in Obstetrics and Gynecology, 3rd annual intern. congr., London, England. (Intern. Congr. Coordinator Center, Travel Dept., 9 E. 38 St., New York 10016)

29-2. Symposium on the Use of Radiation and Radioisotopes for Genetic Improvement of Industrial Microorganisms, Vienna, Austria. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

29-2. International Conf. on Space and Communications, Paris, France. (M. Bignier, 16, rue de Presles, Paris, France)

29-2. International Union of Pure and Applied Physics, Conf. on Statistical Mechanics, Chicago, Ill. (S. A. Rice, James Franck Inst., Univ. of Chicago, 5640 Ellis Ave., Chicago 60637)

29-3. American College of Radiology, St. Louis, Mo. (W. C. Stronach, ACR, 20 N. Wacker Dr., Chicago, Ill. 60606)

30. External Non-Prescription Products, San Francisco, Calif. (D. E. Prescott, American Pharmaceutical Assoc., 2215 Constitution Ave., NW, Washington, D.C. 20037)

31-2. Reliability Physics Symp., Las Vegas, Nev. (O. D. Trapp, Fairchild Semiconductor, 313 Fairchild Dr., Mountain View, Calif. 94040)

#### April

1-2. American Soc. for Engineering Education, Midwest section, Rolla, Mo. (Mrs. L. Hitch, ASEE, Suite 400, 1 Dupont Circle, NW, Washington, D.C. 20036)

1-2. Southern Water Resources and Pollution Control Conf., 20th annual, Chapel Hill, N.C. (C. M. Weiss, Dept. of Environmental Sciences and Engineering, Univ. of North Carolina, Chapel Hill 27514)

1-3. Alabama Acad. of Science, University. (T. Denton, Samford Univ., Birmingham, Ala.)

1-4. British Medical Assoc., clinical mtg., Aberystwyth, England. (BMA, BMA

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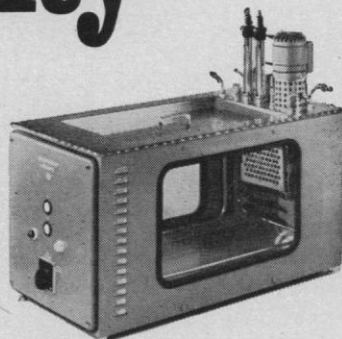
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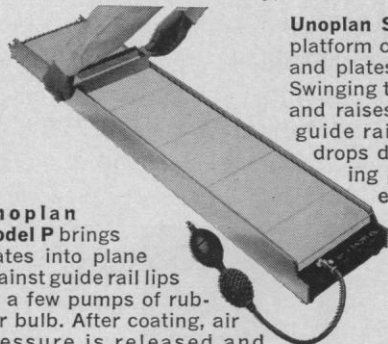
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1-4. American Soc. of Group Psychotherapy and Psychodrama, 29th annual, New York, N.Y. (R. W. Siroka, 215 Park Ave., South, New York 10003)

2-3. National Congr. on the Socio-Economics of Health Care, 5th annual, Las Vegas, Nev. (C. N. Theodore, Div. of Health Services, American Medical Assoc., 535 N. Dearborn St., Chicago, Ill. 60610)

2-4. American Psychosomatic Soc., 28th annual, Denver, Colo. (P. H. Knapp, APS, 265 Nassau Rd., Roosevelt, N.Y. 11575)

2-6. American Pharmaceutical Assoc., with the Hawaii Pharmaceutical Assoc., Honolulu. (D. E. Prescott, APA, 2215 Constitution Ave., NW, Washington, D.C. 20037)

3. New Jersey Acad. of Science, Princeton. (A. Hall, Princeton Univ., 70 Washington Rd., Princeton 18540)

3-5. National Assoc. of Blue Shield Plans, San Francisco, Calif. (J. W. Castellucci, 211 E. Chicago Ave., Chicago, Ill. 60611)

4-9. American Chemical Soc., 161st annual, Boston, Mass. (Meetings Manager, 1155 16th St., NW, Washington, D.C. 20036)

5-6. American Assoc. of Planned Parenthood Physicians, Kansas City, Mo. (W. C. Rogers, Planned Parenthood-World Population, 810 Seventh Ave., New York 10019)

5-6. System Theory, 3rd annual symp., Atlanta, Ga. (C. O. Alford, Inst. of Electrical and Electronics Engineers, Inc., 345 E. 47 St., New York 10017)

5-7. Conference on Developments in Electric and Magnetic Resonance, Keele, England. (Secretary, Institute of Physics and Physical Soc., 47 Belgrave Sq., London, S.W.1, England)

5-7. Conference on Elementary Particle Physics, Lancaster, England. (D. Newton, Dept. of Physics, Nuclear Physics Div., Univ. of Lancaster, Bailrigg, Lancaster)

5-7. Fabrication of Advanced Materials Symp., Milwaukee, Wis. (W.G. Gibbons, Sunstrand Aviation, 4747 Harrison Ave., Rockford, Ill. 61101)

5-7. American College of Surgeons, Montreal, Canada. (ACS, 55 E. Erie St., Chicago, Ill. 60611)

5-8. National Atomic and Molecular Physics Conf., 3rd annual, York, England. (Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London, S.W.1, England)

5-8. National Educational Technology Conf., New York, N.Y. (Conference Manager, Educational Technology, Englewood Cliffs, N.J. 07632)

6-7. Advanced Composites Symp., 5th annual, St. Louis, Mo. (E. V. N. Schuyler, Washington Univ. School of Continuing Education, Box 1048, St. Louis 63130)

6-8. Methods in Air Pollution and Industrial Hygiene Studies, 12th annual, Los Angeles, Calif. (E. Jeung, Air and Industrial Hygiene Lab., California State Dept. of Public Health, 2151 Berkeley Way, Berkeley 94704)

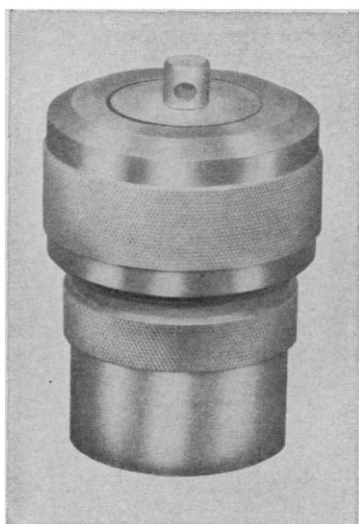
6-9. Optical Soc. of America, 55th, Tucson, Ariz. (M. E. Waga, OSA, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

7. American Soc. of Clinical Oncology,

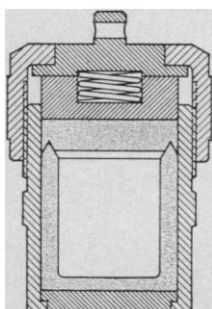
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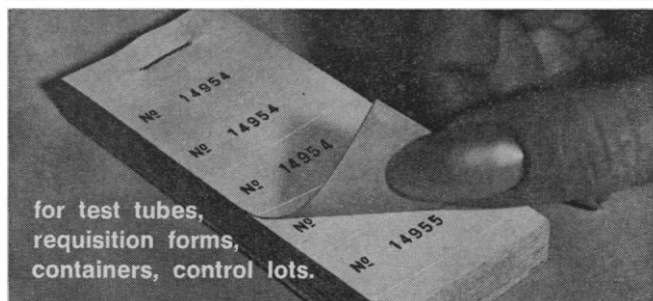
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Accessories available include: Rapid Mixing Chamber/Fluorescence Attachment/Oxygen Monitor/Anaerobic Cell/Rapid Stirrer/1 x 2 cm Cell Block and Chromatographic Scanner.

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A combination of the two methods offers the results shown in the curves at left.

This instrument can also be operated as either a dual-wavelength or a split-beam spectrophotometer by simple adjustment of three controls. In the dual-wavelength mode, it can detect small transmittance changes superimposed on a highly absorbing, turbid sample. In the split-beam mode, it is able to record the spectra of highly absorbing, turbid materials.

For complete technical details write for Bulletin 2383.



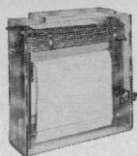
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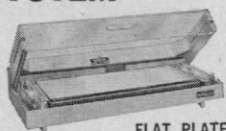
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Chicago, Ill. (R. R. Ellison, Roswell Park Memorial Inst., Buffalo, N.Y. 61420)

7-14. Management of **Acute Psychological Emergency**, New York, N.Y. (H. Gershman, American Inst. for Psychoanalysis, 329 E. 62 St., New York 10021)

8-10. American Assoc. for **Cancer Research**, Inc., 62nd annual, Chicago, Ill. (H. J. Creech, AACR, Inst. for Cancer Research, Fox Chase, Philadelphia, Pa. 19111)

8-10. Southern Soc. for **Philosophy and Psychology**, 63rd annual, Athens, Ga. (D. Browning, Dept. of Philosophy, University of Miami, Coral Gables, Fla.)

8-10. U.S. Natl. Committee/Intern. Union of **Radio Science** and Inst. of **Electric and Electronics Engineers**, spring mtg., Washington, D.C. (J. V. Evans, USNC/URSI, Lincoln Lab., Massachusetts Inst. of Technology, Lexington 02173)

12-14. Symposium on **Nonlinear Functional Analysis**, Chicago, Ill. (G. G. Moran, U.S. Army, Mathematics Research Center, Univ. of Wisconsin, Madison 53706)

12-15. **Air and Stream Improvement**, 6th annual conf., Quebec City, P.Q., Canada. (D. H. Paterson, Canadian Pulp and Paper Assoc., 2300 Sun Life Bldg., Montreal, 110, P.Q., Canada)

12-15. National **Telemetering** Conf. and Exposition, 21st annual, Washington, D.C. (H. B. Riblet, Johns Hopkins Univ., Applied Physics Lab., 8621 Georgia Ave., Silver Spring, Md. 20910)

12-16. Federation of the American Societies for **Experimental Biology**, Chicago, Ill. (J. F. A. McManus, 9650 Rockville Pike, Bethesda, Md. 20014)

12-16. American **Geophysical** Union, 52nd annual, Washington, D.C. (G. D. Mead, Lab. for Space Physics, NASA Goddard Space Flight Center, Greenbelt, Md. 20771)

12-16. American Assoc. of **Immunologists**, Chicago, Ill. (H. Metzger, AAI, 9650 Rockville Pike, Bethesda, Md. 20014)

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13-15. **Frontiers in Education**, Atlanta, Ga. (B. J. Dasher, College of Engineering, Georgia Inst. of Technology, Atlanta 30332)

13-15. **Microwave Research** Inst., 21st annual intern. symp., New York, N.Y. (J. Fox, Polytechnic Inst. of Brooklyn, 33 Jay St., Brooklyn, N.Y. 11201)

13-15. International **Magnetics** Conf., 9th annual, Denver, Colo. (G. Bate, IBM Corp., P.O. Box 1900, Boulder, Colo. 80302)

14-16. American Soc. for **Engineering Education**, Southeastern section, Clemson, S.C. (Mrs. L. Hitch, ASEE, Suite 400, 1 Dupont Circle, NW, Washington, D.C. 20036)

14-16. National **Pollution Control** Conf. and Exposition, 4th annual, Detroit, Mich. (B. Reeves, 1107 S. Loop West, Houston, Tex. 77021)

14-16. Symposium on **Prescribed Burning in Forests of the Southeastern Coastal Plain**, Charleston, S.C. (Director, Southeastern Forest Experiment Station, P.O. Box 2570, Asheville, N.C. 28802)

14-17. American **Gynecological** Soc., Phoenix, Ariz. (B. M. Peckham, University Hospital, 1300 University Ave., Madison, Wis. 53706)

15-17. Association of Southeastern **Biologists**, Richmond, Va. (D. C. Bliss, Box 278, Randolph-Macon Woman's College, Lynchburg, Va. 24504)

15-17. American Assoc. of **Physical Anthropologists**, Boston, Mass. (E. L. Fry, Dept. of Anthropology, Southern Methodist University, Dallas, Tex. 75222)

15-17. Eastern **Psychological** Assoc., New York, N.Y. (W. W. Cumming, 353 Schermerhorn Hall, Columbia Univ., New York 10027)

15-17. Joint meeting of Northwest **Scientific** Assoc., Idaho Acad. of Science, and Washington State **Entomological** Soc., Moscow, Idaho. (L. W. Roberts, Dept. of Biological Sciences, Univ. of Idaho, Moscow 83843)

15-21. American **Leprosy Missions**, 12th annual, Carville, La. (O. W. Haselblad, 297 Park Ave., South, New York 10010)

16-17. Idaho Acad. of **Science**, Moscow, Idaho. (M. A. Fisher, Dept. of Physics and Mathematics, College of Southern Idaho, Twin Falls)

16-17. American **Burn** Assoc., San Antonio, Tex. (J. A. Bostwick, Jr., 1825 W. Harrison St., Chicago, Ill. 60612)

16-17. American Soc. for **Engineering Education**, North Central section, Pittsburgh, Pa. (L. Hitch, ASEE, Suite 400, 1 Dupont Circle, NW, Washington, D.C. 20036)

16-17. Northwest **Scientific** Assoc., Moscow, Idaho. (G. H. Deitschman, U.S. Forest Service, P.O. Box 469, Moscow 83843)

16-17. American Assoc. of **University Professors**, Philadelphia, Pa. (B. H. Davis, AAUP, 1785 Massachusetts Ave., NW, Washington, D.C. 20036)

18-19. Montana Acad. of **Sciences**, Butte. (R. E. Juday, Univ. of Montana, Missoula 59801)

18-21. Association of American **Geographers**, Boston, Mass. (J. W. Nystrom, AAG, 1146 16th St., NW, Washington, D.C. 20036)

18-21. **Neutron Sources and Application**, Augusta, Ga. (C. Ice, Savannah River Lab., Aiken, S.C. 29801)

18-21. **Off-Shore Technology** Conf. Houston, Tex. (H. S. Field, Geophysical Research Corp., 136 Mohawk Blvd., Tulsa, Okla. 74106)

18-21. International **Systems** Meeting, Chicago, Ill. (R. L. Irwin, Systems and Procedures Assoc., 24587 Bagley Rd., Cleveland, Ohio 44138)

18-22. American Assoc. of **Cereal Chemists**, Dallas, Tex. (R. J. Tarleton, 1821 University Ave., St. Paul, Minn. 55104)

18-22. Illinois Acad. of **General Practice**, 23rd annual, Arlington Park. (H. M. Robinson, 14 E. Jackson Blvd., Chicago, Ill. 60604)