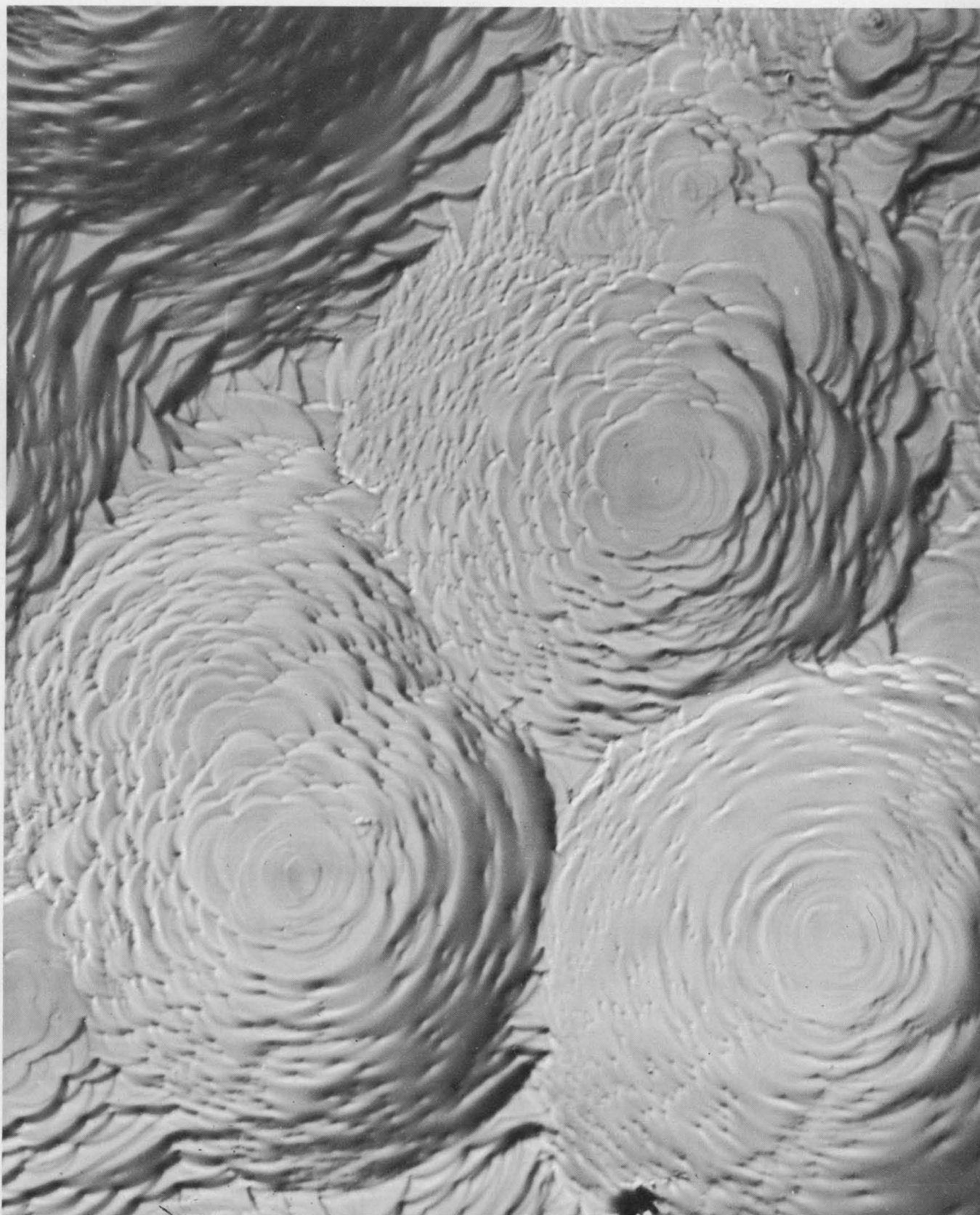


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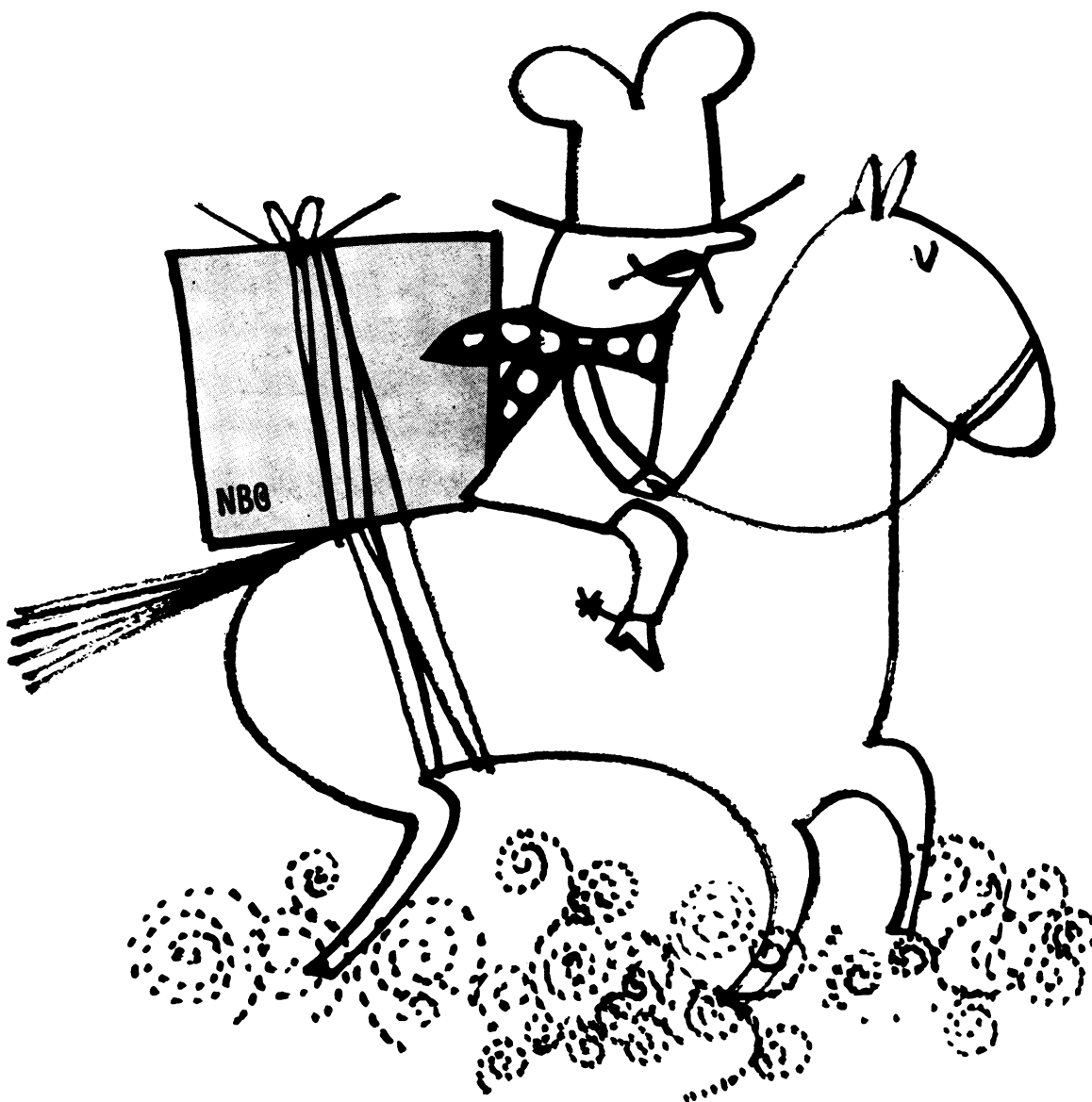
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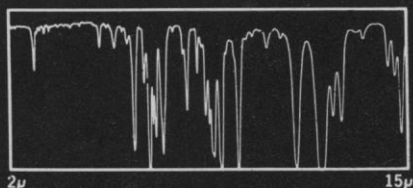
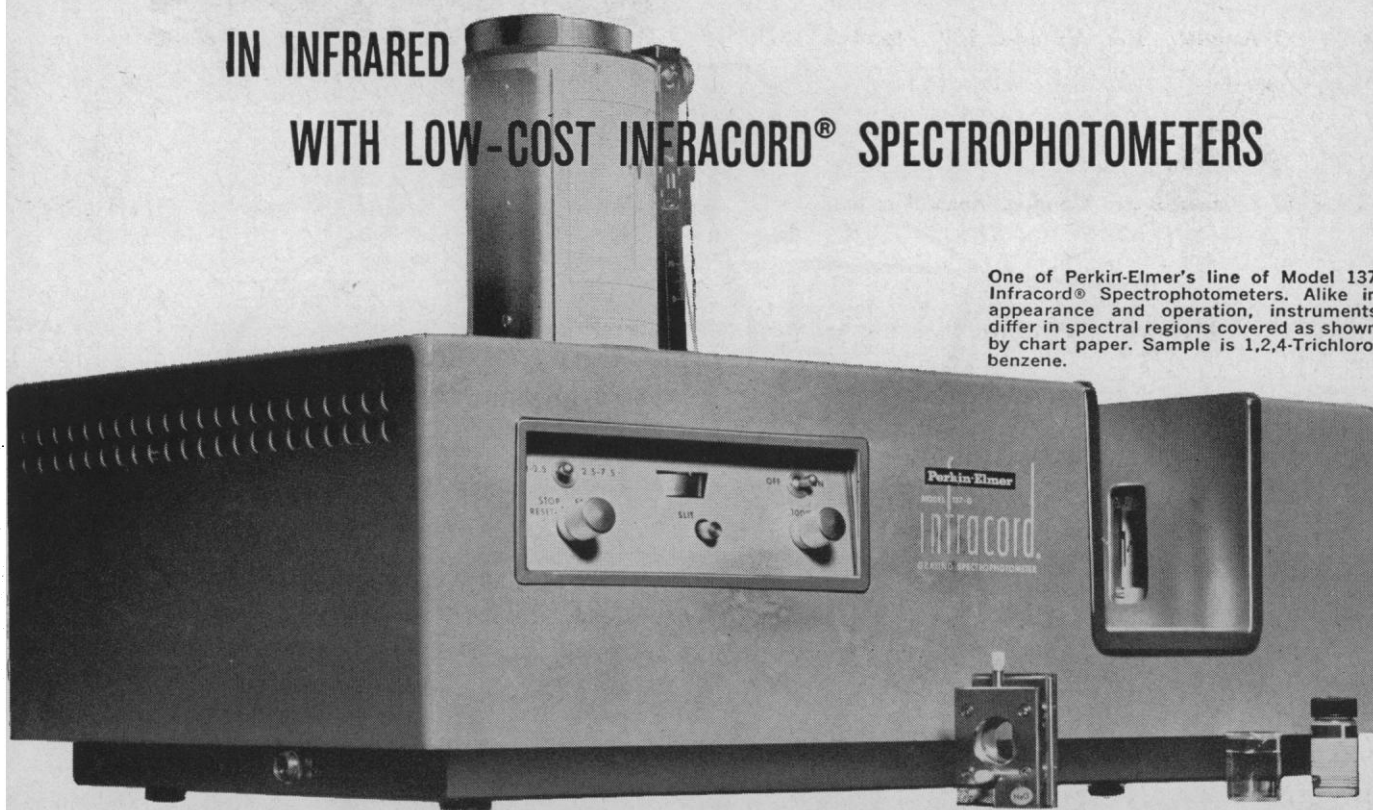
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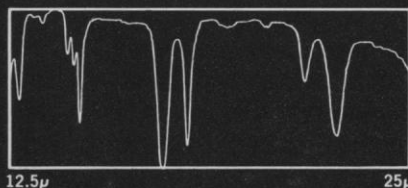
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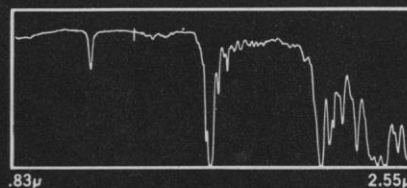
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| Cover | Microstructure of a {111} surface of a germanium single crystal thermally etched in an argon atmosphere (about $\times 850$). For a discussion of the properties of surfaces, see page 311. [H. C. Gatos and M. C. Lavine, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington] | |

SCIENCE TO PUBLISH GUIDE TO SCIENTIFIC INSTRUMENTS

In October of this year, **Science** will publish a Guide to the manufacturers of scientific instruments and equipment. The Guide will provide scientists with the names of manufacturers of products used for research in analytical chemistry, medical electronics, physics, nuclear and radiation sciences, biology, oceanography, and geology.

Approximately 80,000 copies of this

Guide will be sent to research scientists working in the fields mentioned above, to purchasing departments, and to libraries. It is the intention of the editors to make this directory of instrument manufacturers as complete as possible.

There is no charge for listings. If your company manufactures products which are used in the fields mentioned above, and you have not as yet received an official listing form, you can obtain one by writing to:

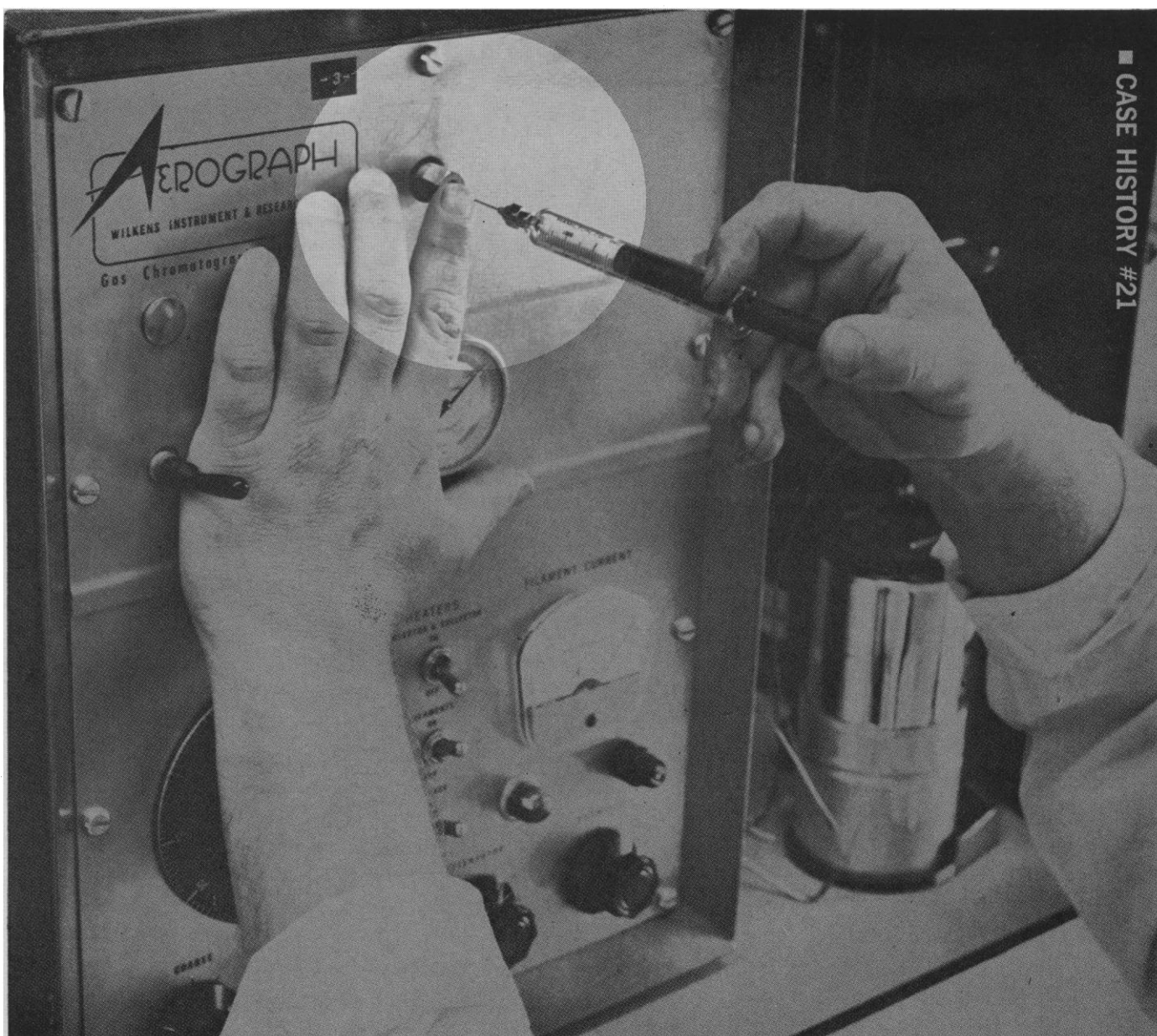
We will send you promptly a listing form and a complete list of the categories to be included.

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The rules for determining which manufacturers will be listed are given below.

RULES GOVERNING LISTINGS

1. Any manufacturer of a product used in research in the fields mentioned above is eligible for a listing.
2. Only products currently in production will be listed.
3. All requests for listings must be accompanied by descriptive literature.
4. All requests for listings must be made on the official listing form. (See instructions above if you have not received an official form.)
5. Special categories will be added when justification exists.
6. Dealers and distributors will be listed only under products which they themselves manufacture.
7. CLOSING DATE FOR ALL LISTINGS IS 14 AUGUST. All forms must be in our hands by that date.
8. The directory will appear in the annual Instrument Issue of **Science**.
9. Advertising will be accepted at regular rates. Closing date for advertising is 1 September.



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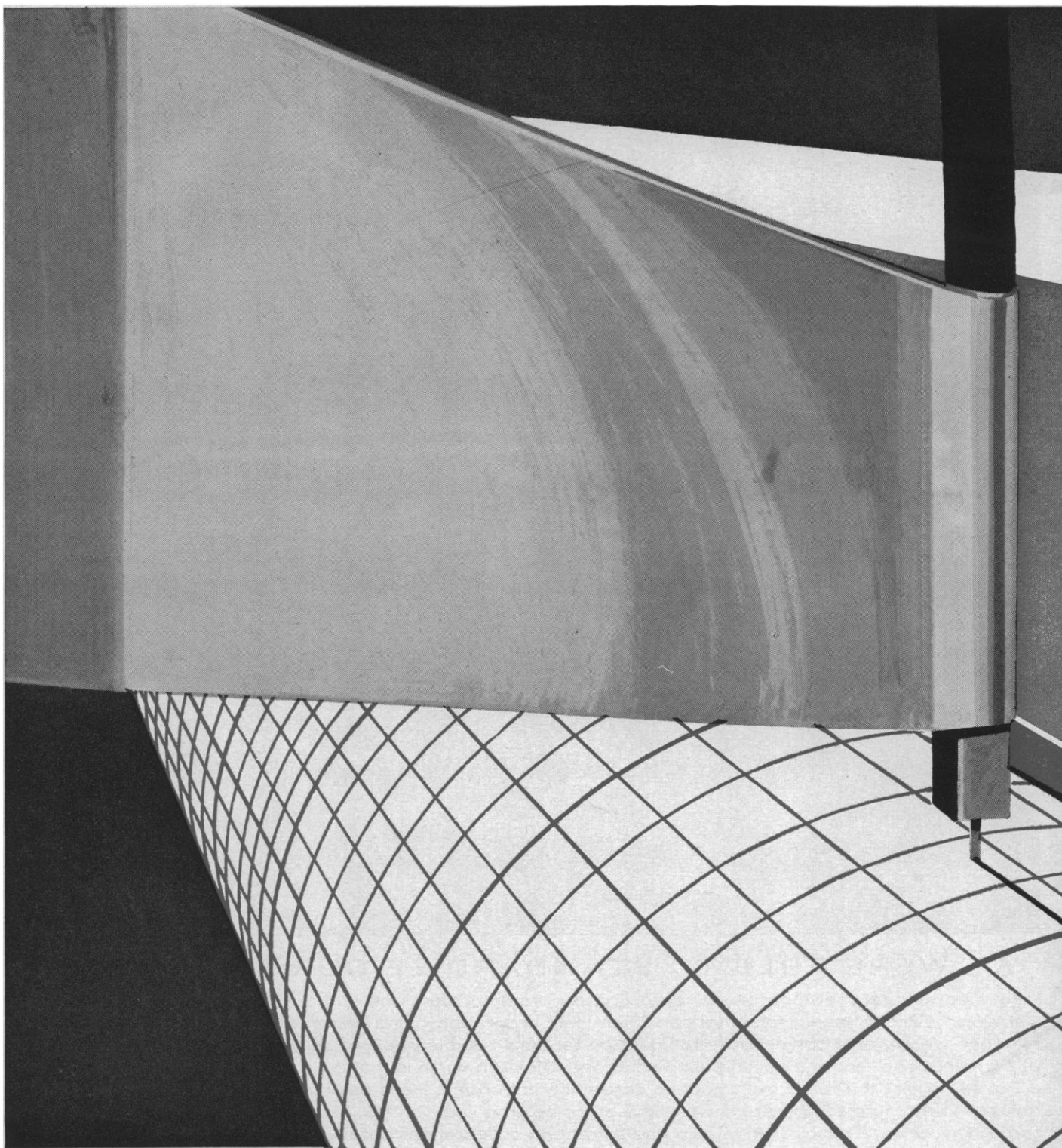


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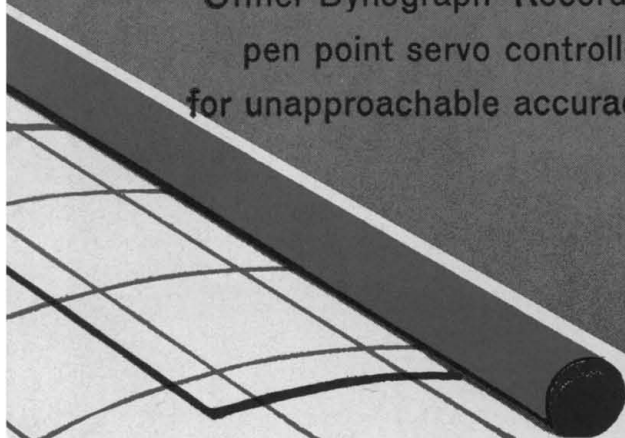
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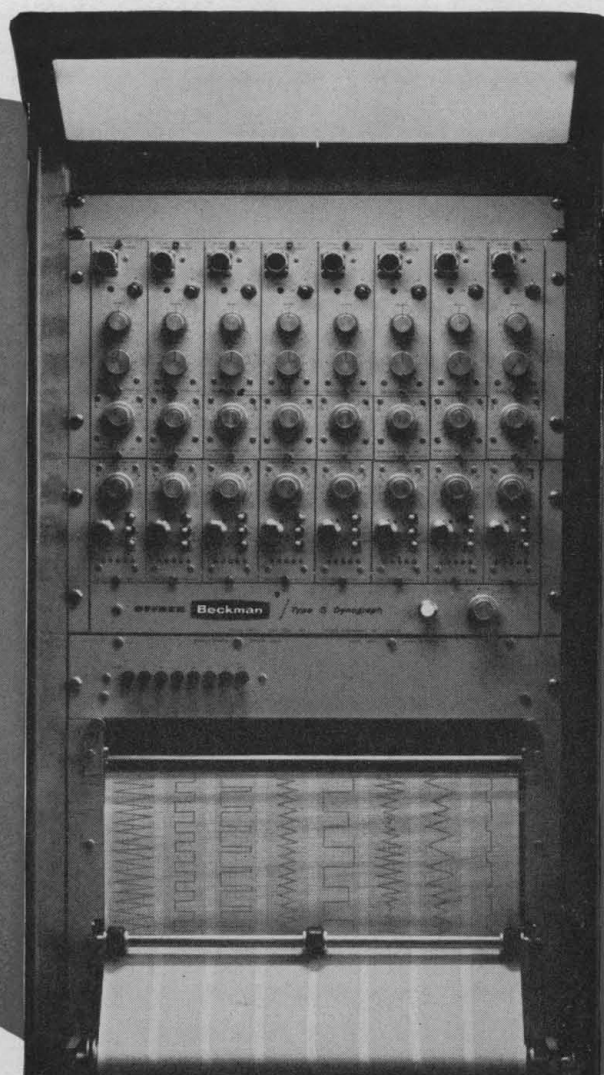


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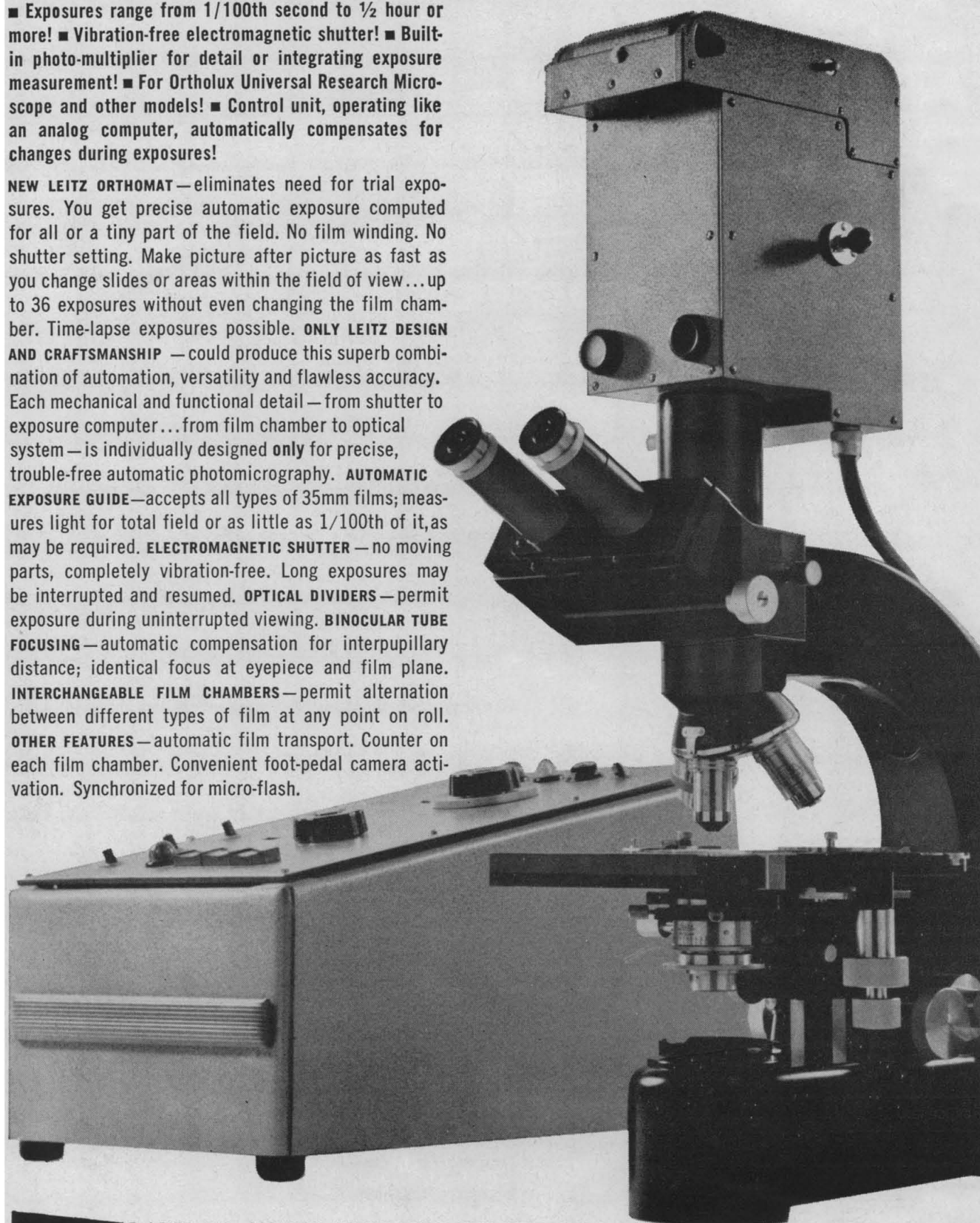
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Congressional Seminars

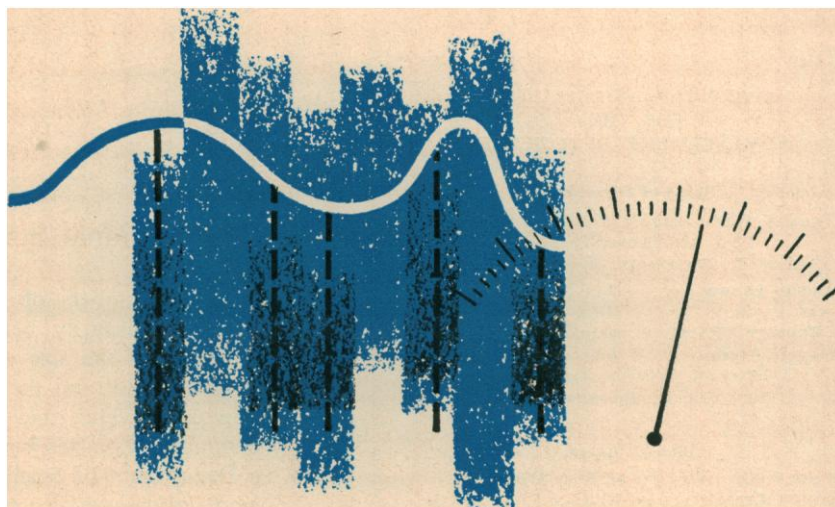
Some members of Congress have become increasingly concerned over the disparity between the meagerness of their knowledge of science and the size of the research and development budgets they must consider and the number of scientific issues involved in legislation upon which they must take action. Indeed, the wish for better communication has persuaded some congressmen that we should have a Department of Science and Technology headed by a cabinet officer who could serve as a major source of information about many of the government's scientific activities. The fact that the head of the new Office of Science and Technology will be available for testimony before congressional committees was one of the features that commended the establishment of this office to Congress.

But there are other, less formal, ways of finding out what is going on in science. Several committees have invited a scientist or a panel of scientists to come and talk with them, not about pending appropriations or specific legislation, and not in the formal and sometimes forbidding atmosphere of a "hearing," but informally, about the speaker's area of research, where it is heading, what has been accomplished, and what problems are being encountered.

Notable among these seminars was one arranged last spring by the National Science Foundation at the request of the Subcommittee on Independent Offices of the House of Representatives Committee on Appropriations. For several days, a series of speakers talked with the subcommittee about research in physics, astrophysics, biochemistry, genetics, and psychology, and about science education, the economics of research and education, and the problems of planning future scientific resources.

Even less formal, and carried out around a dinner table instead of in a Capitol Hill committee room, have been two series of seminars arranged by the Brookings Institution and the AAAS for a group of 25 to 30 members of the House of Representatives. At each session a speaker has described and answered questions about his own research area: astronomy, genetics, meteorology, operations research, virology, learning, cryogenics, or something else. A third series of these informal meetings will be given next winter.

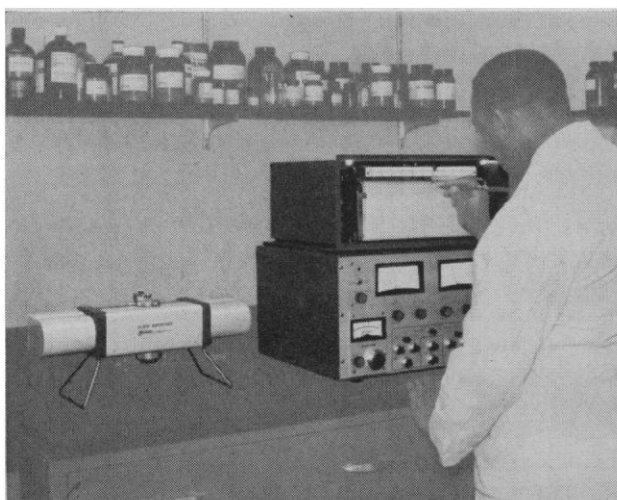
Sitting in on these discussions—for there is always lively discussion—gives an impression of greater and better informed interest in scientific topics than one could have expected a decade ago. Members of the congressional audience may not know the details of a research area, but they ask searching questions, questions that usually center on the applications and the public policy implications of whatever topic the speaker has chosen. Thus the congressmen increase their knowledge of science and of how scientists think and work, and the scientists gain a greater appreciation of congressional concern with the work in which they are engaged. Both benefit, and the seminar is proving to be a useful channel of communication between the scientist and the legislator.—D.W.



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The growth of this branch of photography proves it was just what the space age was waiting for; the reduction in weight of the age's playthings without sacrifice of strength is but one aspect of photography's importance as the newer kind of fabrication. The changes it has wrought in the whole art of electronics are now recognized in financial circles as profound. If it has gone that far, readers here addressed will have doubtless passed some time ago the stage of wonderment at it all. Nevertheless, guidance on technique may still be badly needed.

The new book doesn't so much guide as inform. (Let your conscience be your guide, assisted by a lawyer who closely follows the patent situation proliferating as a result of industry's heavy investment of brainpower in the field. Most important firms are reasonable about licenses.) The book brings together a lot of hot tips on preparing the many kinds of substrate, applying our various resists, preparing the coatings for exposure, determining correct exposure, developing, choosing the proper etchants or electroforming solutions for use with stainless steel, glass, gold, germanium, etc.

If you happen to know a Kodak Graphic Arts Dealer, call up and ask for the \$1 data book, "Kodak Photosensitive Resists for Industry." We would appreciate your kindness in ordering it that way because we have just about all we can do answering specific questions. If you don't even know what a Kodak Graphic Arts Dealer is, send the dollar to Eastman Kodak Company, Graphic Arts Division, Rochester 4, N. Y. At least this will give us an opportunity to introduce you to the dealer.

How to make a double bond

The man on the left joined our Synthetic Chemicals Division softball team last season as an outfielder. The one in the middle plays very little softball. He plays center on the Synthetic Chemicals Division basketball team. The man on the right is well acquainted with both of the other boys, since he manages both the softball team and the basketball team. In addition, he had been asked to make 1,4-diphenyl-1,3-butadiene.



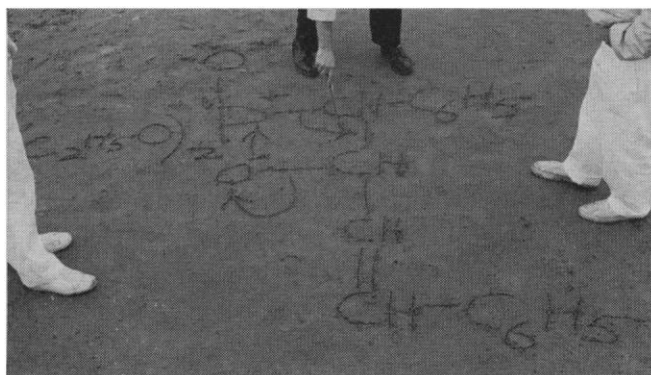
The outfielder and the basketball center mentioned that they had developed a new synthesis for olefins via a phosphonate intermediate. Well, not exactly new but much faster, easier to work, and better-yielding than the prior art had afforded.

"Give," said the manager.

"Run the Michaelis-Arbuzov reaction and make some diethyl benzylphosphonate," said the outfielder. "That's $(C_2H_5O)_2P(O)CH_2C_6H_5$. The benzyl group on it will hook on exothermically to almost any aldehyde. The carbonyl oxygen from the aldehyde and a proton from the benzyl come off, and a double bond is formed. You have to run the reaction in a strongly basic medium. The new wrinkle is to achieve the

alkalinity you need by previously prepared sodium methoxide, with dimethylformamide as your solvent."

"What happens," added the kibitzer, "is the phosphonate reacts with the $NaOCH_3$ in an equilibrium reaction to form phosphonate carbanion, which then performs a nucleophilic attack on the aldehyde carbon. For what you want to do, your aldehyde would be $C_6H_5CH=CHCHO$. So you get a situation like this:



"The redistribution of electrons leads to formation of the new double bond and leaves sodium diethyl phosphate."

This colloquy has resulted not only in the availability of 1,4-Diphenyl-1,3-butadiene as EASTMAN 8543 but also of the exceedingly helpful Diethyl Benzylphosphonate as EASTMAN 8559 at \$5 for 25 grams and of a reprint of a short paper on the method for free. N,N-Dimethylformamide is EASTMAN 5870. And there are some 3900 other EASTMAN numbers—organic chemicals we sell from Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company). We forget who won the ball game.

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AAAS Committees Sessions of the Cooperative Committee on the Teaching of Science and Mathematics, the Committee on Science in the Promotion of Human Welfare, and others.

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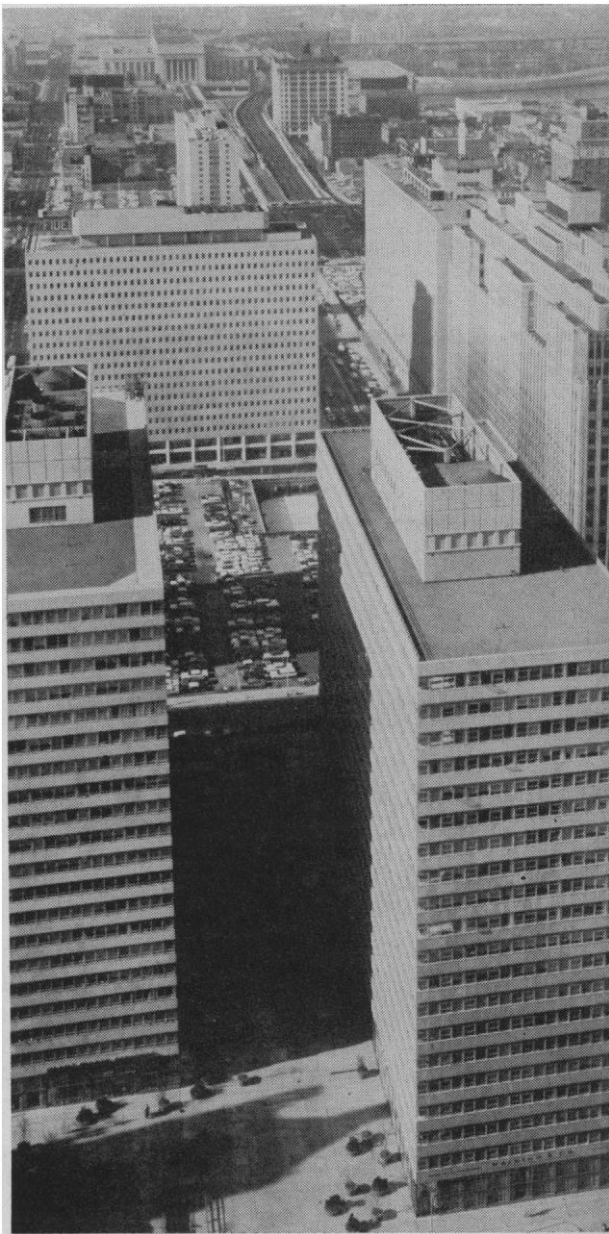
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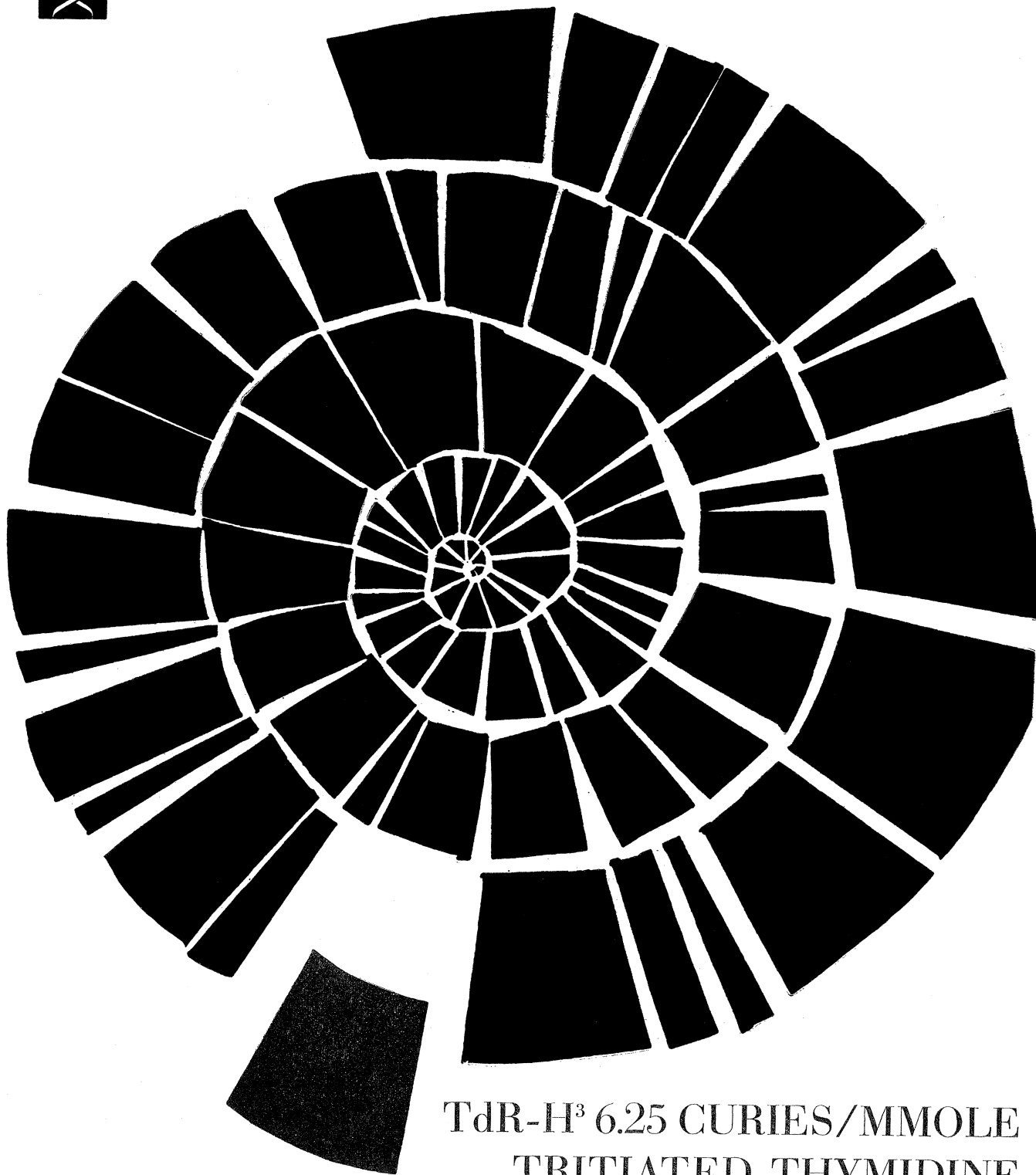
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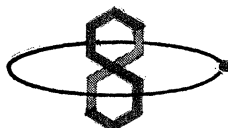
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The material in this section is prepared by the following contributing writers:

Robert L. Bowman (R.L.B.), Laboratory of Technical Development, National Heart Institute, Bethesda 14, Md. (medical electronics and biomedical laboratory equipment).

Joshua Stern (J.S.), Basic Instrumentation Section, National Bureau of Standards, Washington 25, D.C. (physics, computing, electronics, and nuclear equipment).

The information reported is obtained from manufacturers and other sources considered reliable. Neither *Science* nor any of the writers assumes responsibility for the accuracy of the information.

Address inquiries to the manufacturer, mentioning *Science* and the department number.

Double-beam recording spectrophotometer measures, simultaneously, small optical density changes occurring at two wavelengths. The apparatus is used to time and record absorption spectrum changes in suspensions which scatter light. The use of two beams at specific wavelengths provides specificity for reference and analyzing beams to follow the difference in spectra of reactant and product, and reduce errors due to light scattering. The system is particularly applicable to studies of enzymatic reactions in the presence of cells or cellular fractions where reaction kinetics and spectra of intermediate compounds are followed. A grating monochromator with the grating divided in two so that each half can be separately adjusted to select a suitable wavelength emits both beams from the same slit. The beams are separated by means of a rotating shutter system and measured by a single photomultiplier for differential or individual absorbance recording. A tungsten lamp is ordinarily supplied, but hydrogen arc illumination and ultraviolet-sensitive photo tubes are available.—R.L.B. (American Instrument Co., Dept. S286, Silver Spring, Md.)

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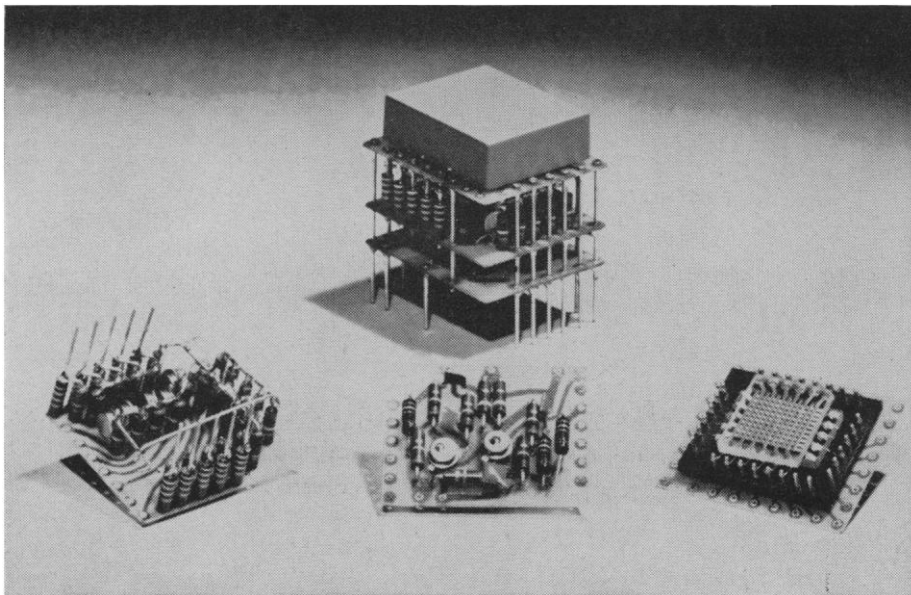


Fig. 1. Decimal decade counter.

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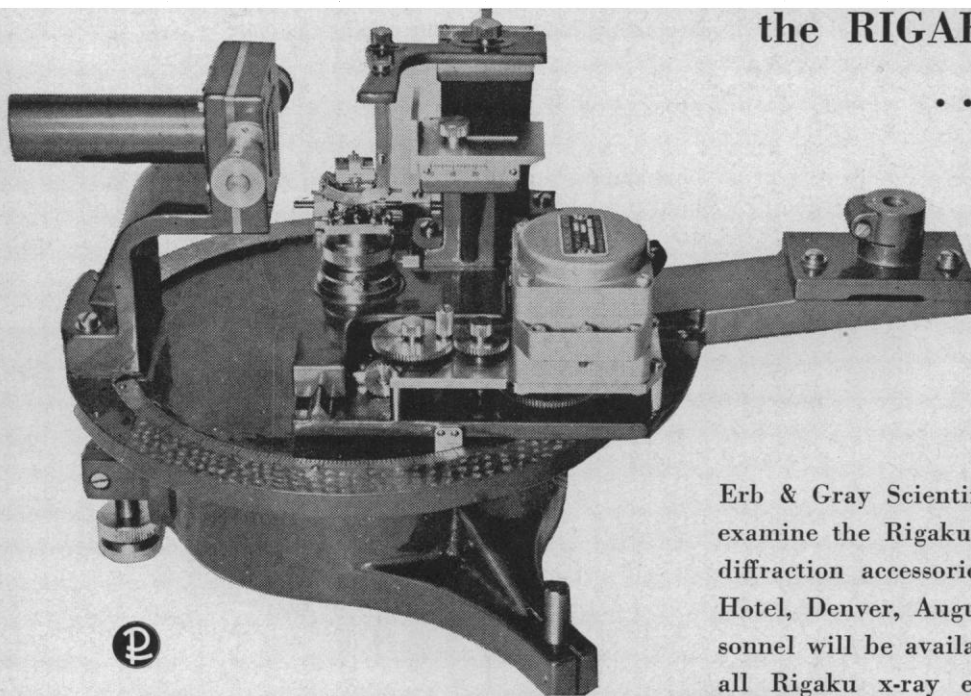
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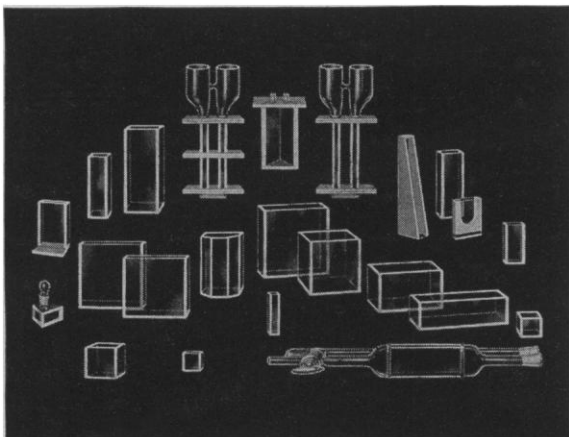
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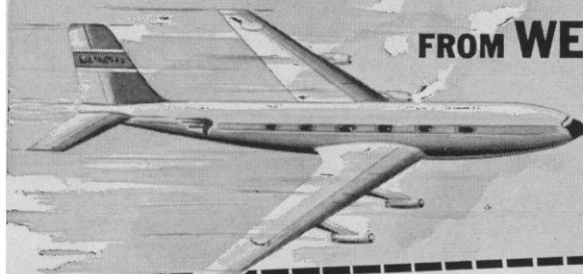
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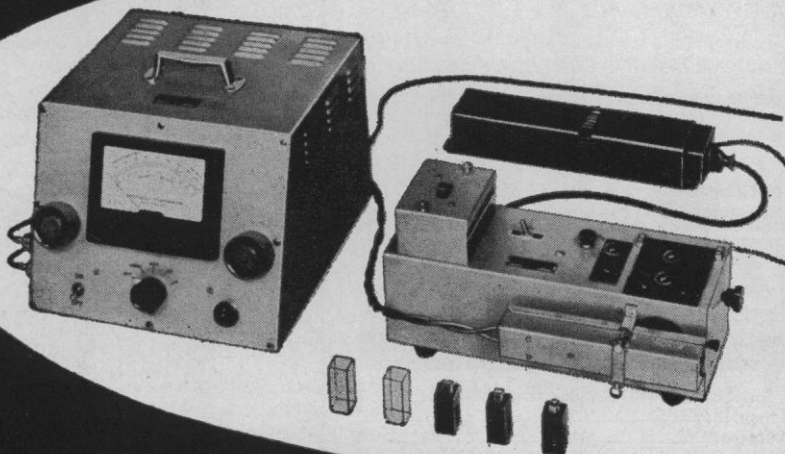
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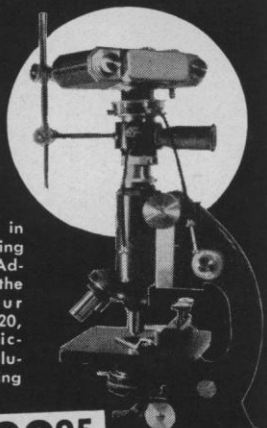


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17-21. Malacological Congr., London, England. (H. E. J. Biggs, 19 Siward Rd., Bromley, Kent, England)

17-21. Vector Control, symp., Geneva, Switzerland. (World Health Organization, Palais des Nations, Geneva)

17-22. High-Speed Photography, intern. congr., The Hague, Netherlands. (Congress Secretariat, 14 Burgemeester de Monchylein, The Hague)

17-22. International Brain Research Organization, central committee meeting, Paris, France. (H. H. Jasper, U.N. Educational, Scientific and Cultural Organization, Place de Fontenoy, Paris 7°)

17-22. International Union Against Tuberculosis, annual, Paris, France. (IUAT, 15 rue Pomereau, Paris 16°)

17-24. History of Medicine, intern. congr., Warsaw and Krakow, Poland. (Organizing Committee, Chocimska 22, Warsaw)

17-29. Chromatographic Methods for Lipid Research, intern. congr., Milan, Italy. (R. Paoletti, Congrès International, V. del Sarto 21, Milan)

18-21. Food Science and Technology, intern. congr., London, England. (F. J. Griffin, 14 Belgrave Square, London, S.W.1)

18-22. Agricultural Aviation, intern. conf., Grignon, France. (P. Journet, Service de la protection des végétaux, Ministère de l'Agriculture, 78 rue de Varenne, Paris 7°, France)

18-23. International Assoc. of Geodesy, Munich, Germany. (J. J. Levallois, IAG, 19 rue Auber, Paris 8°)

18-24. Effects of Use and Disuse of Neuromuscular Functions, Prague-Liblice, Czechoslovakia (by invitation). (Czechoslovak Acad. of Sciences, Narodny Tr. 5, Prague I)

18-26. Equatorial Aeronomy, intern. symp., Huaychulo, Peru. (A. A. Giesecke, Scientific Program Committee, Apartado 3747, Lima, Peru)

18-28. International Atomic Energy Agency, general conf., Vienna, Austria. (IAEA, 11 Kärntner Ring, Vienna I)

19-20. Industrial Electronics, annual symp., Chicago, Ill. (E. A. Roberts, Compotometer Corp., 5600 Jarvis Ave., Chicago 48)

19-21. Rocky Mountain Minerals Conf., Butte, Mont. (Metallurgical Soc. of AIME, 345 E. 47 St., New York 17)

19-22. Information Retrieval, seminar, Minneapolis, Minn. (Director, Center for Continuation Study, Univ. of Minnesota, Minneapolis 14)

19-23. Air Force Assoc., convention and aerospace panorama-weapons meet, intern., Las Vegas, Nev. (Air Force Assoc., 1901 Pennsylvania Ave., NW, Washington 6)

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20-22. Sulphur Therapy, intern. symp., Innsbruck, Austria. (K. Weithaler, c/o Medizinische Universitäts Klinik, Innsbruck)

(See issue of 13 July for comprehensive list)