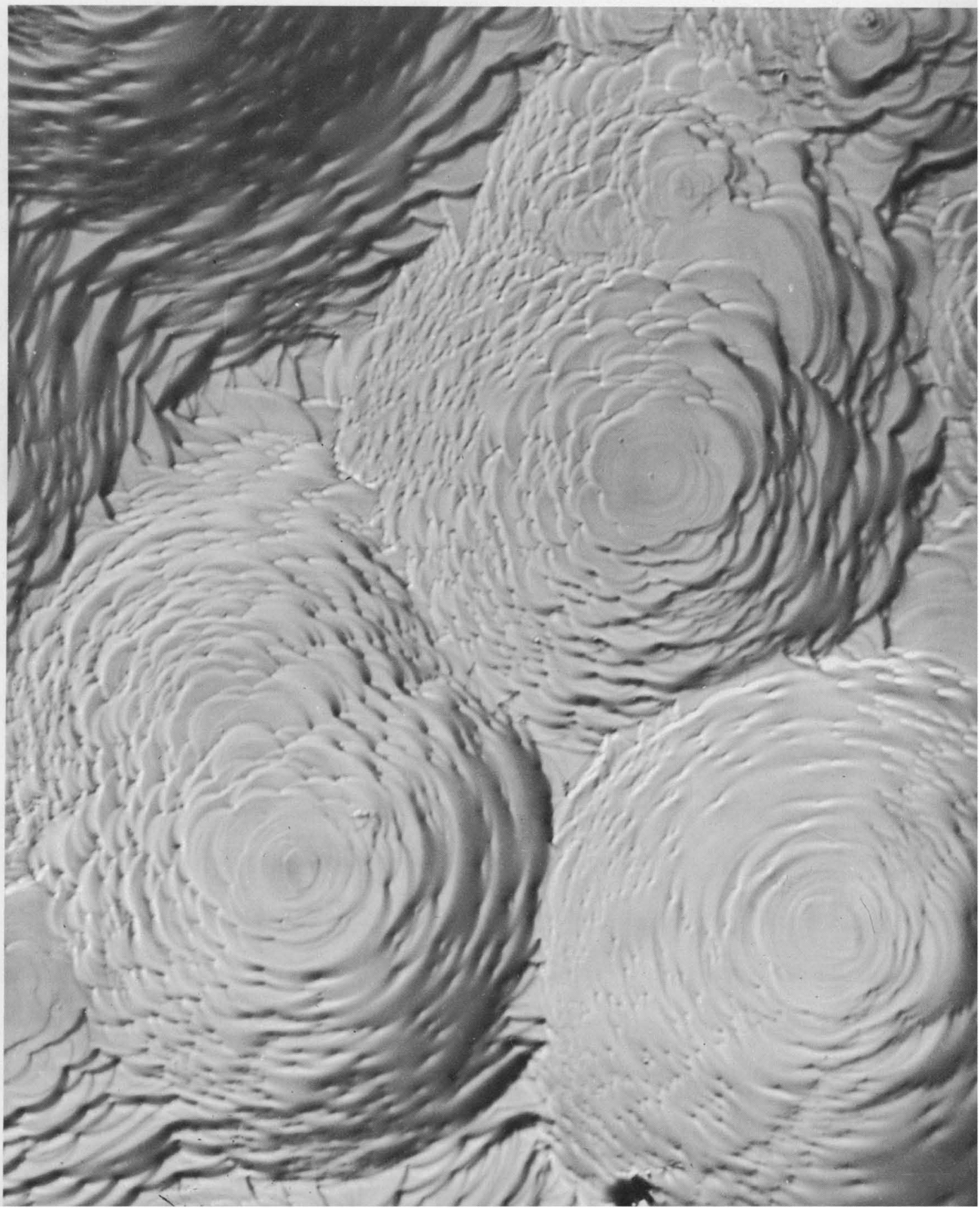
SCIENCE

3 August 1962

Vol. 137, No. 3527

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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IBM scientists know that one result will be smaller computers. But they have a more important reason for making computer parts smaller: *speed.*

Tomorrow's computers will be able to perform a mathematical operation in billionths of a second—less time than it takes light from this page to reach your eye. When this happens, the slowest thing about a computer will be the time it takes electricity to travel from one part of the computer to another. The more this distance can be shortened, the faster the computer will operate.

One recent advance in this area is IBM's development of a way to make computer memory components that contain 135 circuit elements on a piece of glass the size of a postage stamp.

Research and engineering advances like this make possible the faster computers man needs to solve problems now beyond his reach.

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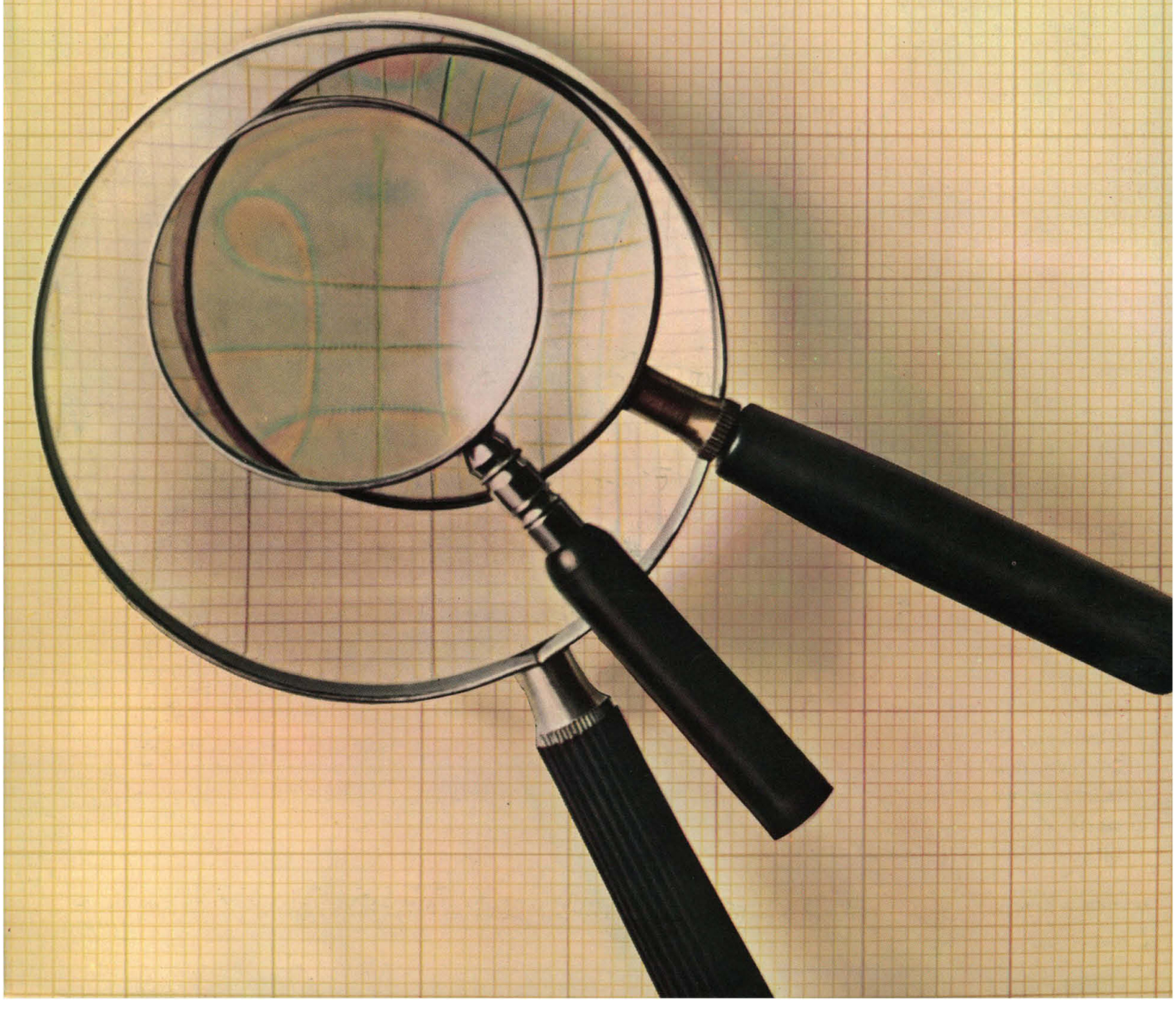
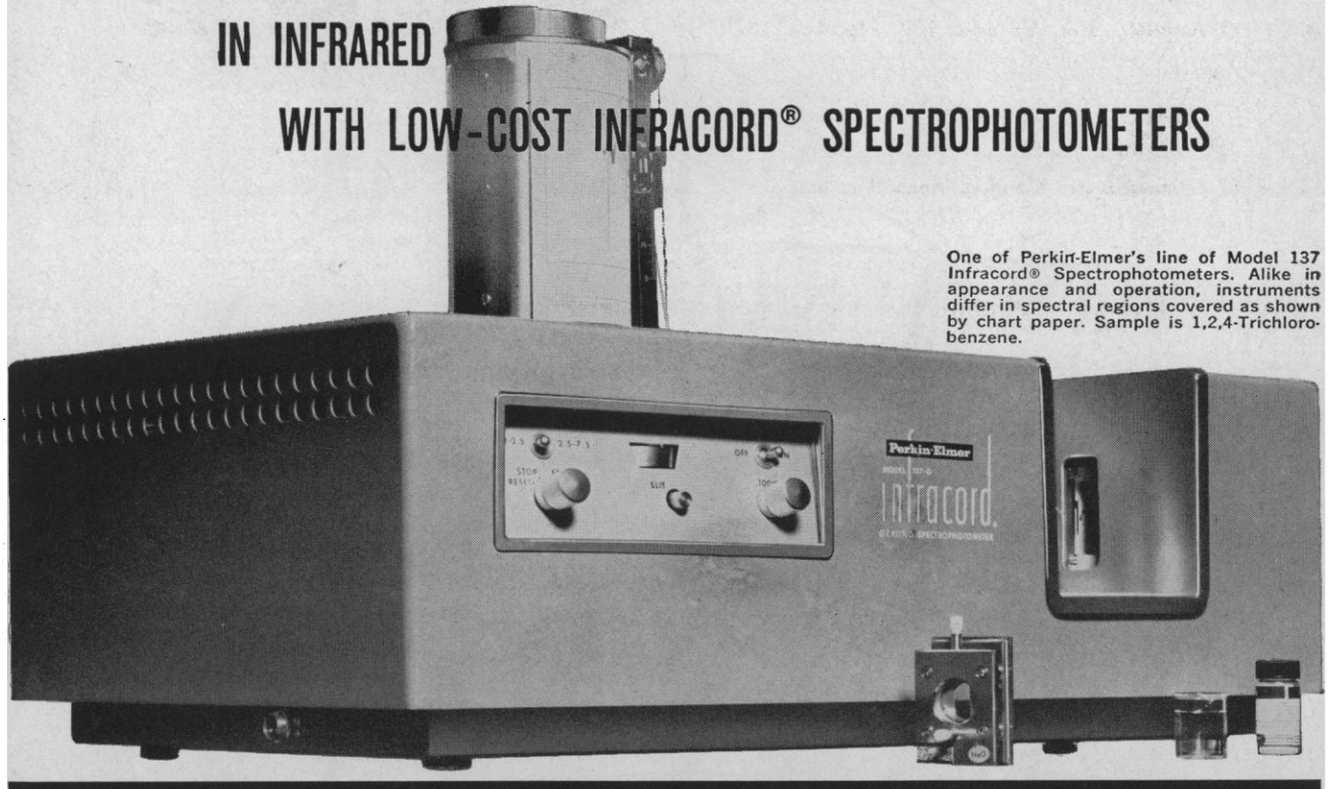
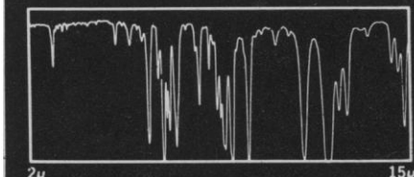


SCIENCE is published weekly by the AAAS, 1515 Massachusetts Ave., NW, Washington 5, D.C. Second-class postage paid at Washington, D.C., and additional mailing office. Annual subscriptions: $8.50; foreign postage, $1.50; Canadian postage, 75¢.

KEEP YOUR LAB AHEAD IN INFRARED WITH LOW-COST INFRACORD® SPECTROPHOTOMETERS

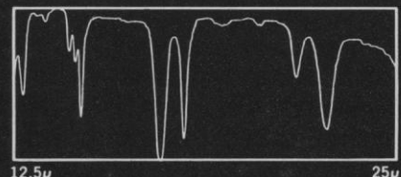


One of Perkin-Elmer's line of Model 137 Infracord® Spectrophotometers. Alike in appearance and operation, instruments differ in spectral regions covered as shown by chart paper. Sample is 1,2,4-Trichlorobenzene.



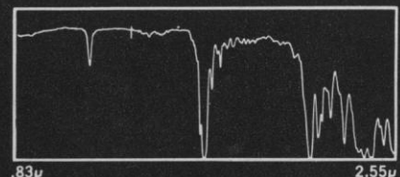
2μ 15μ

NaCl Model 137. Scans fundamental infrared range —2.5μ to 15μ. Offers 12-minute scan speed for precise determinations, or 4-minute run for survey spectra. Suitable for 70% of all analytical problems involving organic chemicals.



12.5μ 25μ

KBr Model 137. Scans from 12.5μ to 25μ in 6.5 minutes; provides data impossible or difficult to obtain at shorter wavelengths.



.83μ 2.55μ

Model 137-G. Newest Infracord, this grating instrument covers the highly significant .83μ to 7.5μ region with high resolution. Two-speed wavelength drive permits either 24-minute scan for quantitative analysis or 8-minute scan for survey work.

INSTRUMENTS COVER THREE IR RANGES. Three Infracord Spectrophotometers are available. All are double-beam instruments, similar in appearance, accuracy, reliability, simplicity, low cost and availability of accessories for sampling and special analyses. They differ only in the IR spectral region covered and in their optics.

Any laboratory can improve its analytical efficiency with one or more low-cost Perkin-Elmer Model 137 Infracord® Spectrophotometers.

The cost is one-half to one-third that of infrared instruments designed for more complex and demanding work. Despite this difference in price, P-E Infracords can handle most analytical problems a chemist in research and development, process or quality control, must perform. This means you don't pay for performance you don't need . . . nor for a high-salaried specialist, since a technician can operate the Infracord after a few minutes' instruction.

For laboratories with no IR instrument, an Infracord means cutting analytical time from hours to minutes . . . achieving accuracy and reliability unmatched by other techniques. Results are presented as standard spectra on notebook size paper for easy reference and filing as a **permanent record.**

For large laboratories, the use of a number of Infracords provides rapid, accurate analysis of the more routine samples . . . prevents delays at the spectroscopy lab . . . keeps more sophisticated IR equipment and skilled spectroscopists busy at problems only they can handle.

For multi-purpose organizations, an Infracord at each of a company's decentralized labs stems the flow of samples to the central research lab for IR analysis. It provides better analytical service in the field . . . leaves the central lab free for more basic work.

For complete information on all Infracords, write to the Perkin-Elmer Corporation, 910 Main Avenue, Norwalk, Conn.

INSTRUMENT DIVISION
Perkin-Elmer *Corporation*
NORWALK, CONNECTICUT

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SCIENCE

Cover Microstructure of a {111} surface of a germanium single crystal thermally etched in an argon atmosphere (about × 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:

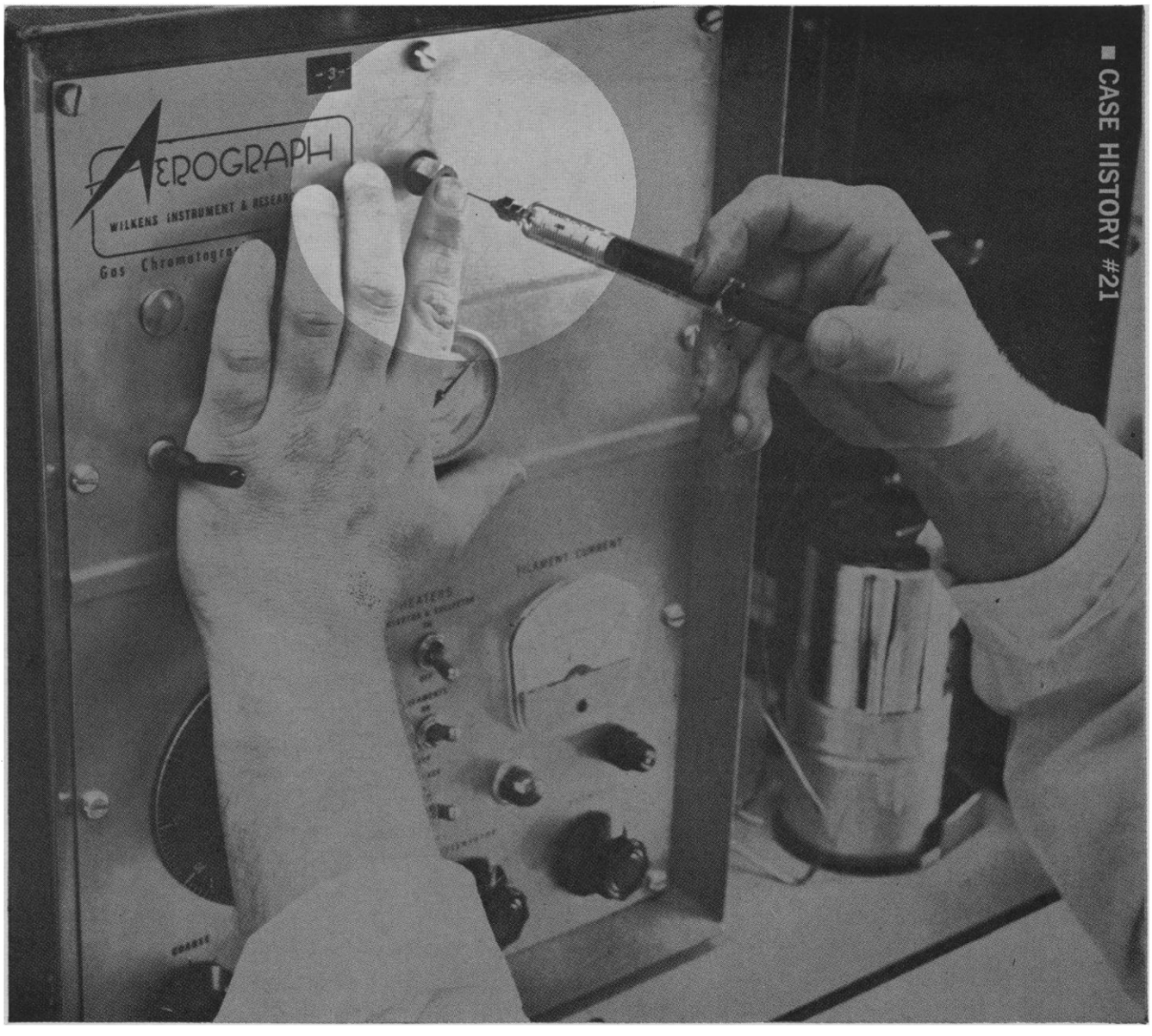
SCIENCE Magazine
Research Equipment Guide
11 West 42 Street
New York 36, N.Y.

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

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.



"WE WERE ABLE TO STANDARDIZE OUR SAMPLE SIZE"

"We tried several methods of standardizing our sample injections without success," states Mr. Sam Ashworth, Chief Chemist for American Chemical Corporation, Long Beach, California, "But with Hamilton syringes we are able consistently to inject a standard liquid sample of 1 ul and gas sample of 2 ml on all of our injections." In the operation shown above, Mr. Ashworth is making an analysis with an injection of a 1 ul sample of the reactor product to determine impurities. He is using a dual column system with one column at ambient temperature while the other column is at 200°C. The columns are connected with a three-way valve. This operation also has a fraction collector for obtaining fractions for identification by infrared analysis. **Hamilton manufactures a complete line of precision syringes from a capacity of 0.5 ul to 500 ul and other related chromatograph equipment.**

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Send me a catalog on your complete line of syringes and related equipment

Name_____ Title_____

3 August 1962, Volume 137, Number 3527

SCIENCE

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Advertising correspondence should be addressed to SCIENCE, Room 1740, 11 West 42 St., New York 36, N.Y.

Change of address notification should be sent to 1515 Massachusetts Ave., NW, Washington 5, D.C., 4 weeks in advance. Furnish an address label from a recent issue. Give both old and new addresses, including zone numbers.

Annual subscriptions: $8.50; foreign postage, $1.50; Canadian postage, 75¢. Single copies, 35¢. School year subscriptions: 9 months, $7.00; 10 months, $7.50. Cable address: Advancesci, Washington.

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.

Kodak reports on:

what finance expects of electronics . . . Michaelis to Arbuzov to Eastman . . . microfilm to paper in 30 seconds

How to fabricate photographically

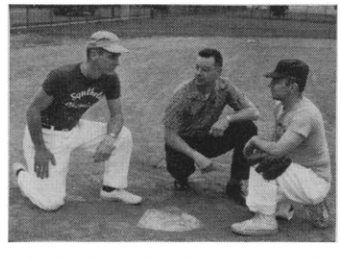
"Photography provides a quick, easy, and reproducible system of weight control," says a new data book of ours, illustrating the perils in out-of-context quotations. The weight control it talks about has nothing to do with embonpoint, and the photography isn't even based on silver halide. It is based on the photosensitivity of certain monomers and on the chemical resistance that the resulting polymers have toward reagents as mighty as hydrofluoric acid and aqua regia.

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



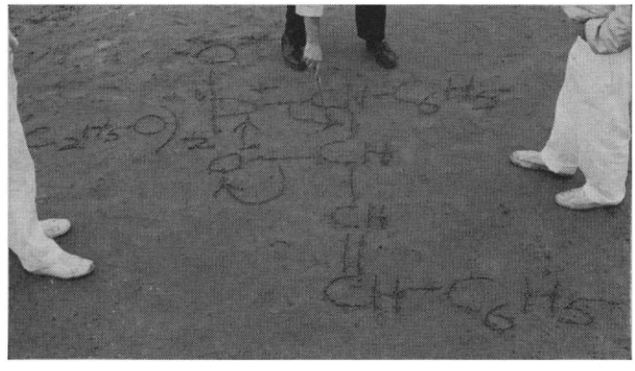
The man on the left joined our Synthetic Chemicals Division softball team last season as an outfielder. The one in the middle plays very little softball. He plays center on the Synthetic Chemicals Division basketball team. The man on the right is well acquainted with both of the other boys, since he 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.*

Retriever for sale

So you think information-retrieval schemes have been over-automated to the point of silliness, do you? You may be right.

Let us assume no army of wise (but personally unambitious) scholars has been raised to encode all knowledge that has been accumulated through all past time in a given field. Let us merely assume that you have a collection of microfilm and a rough idea of how its content is organized. Let us assume that you have a new machine known as a RECORDAK LODESTAR Reader-Printer, Model PES. You want to retrieve.

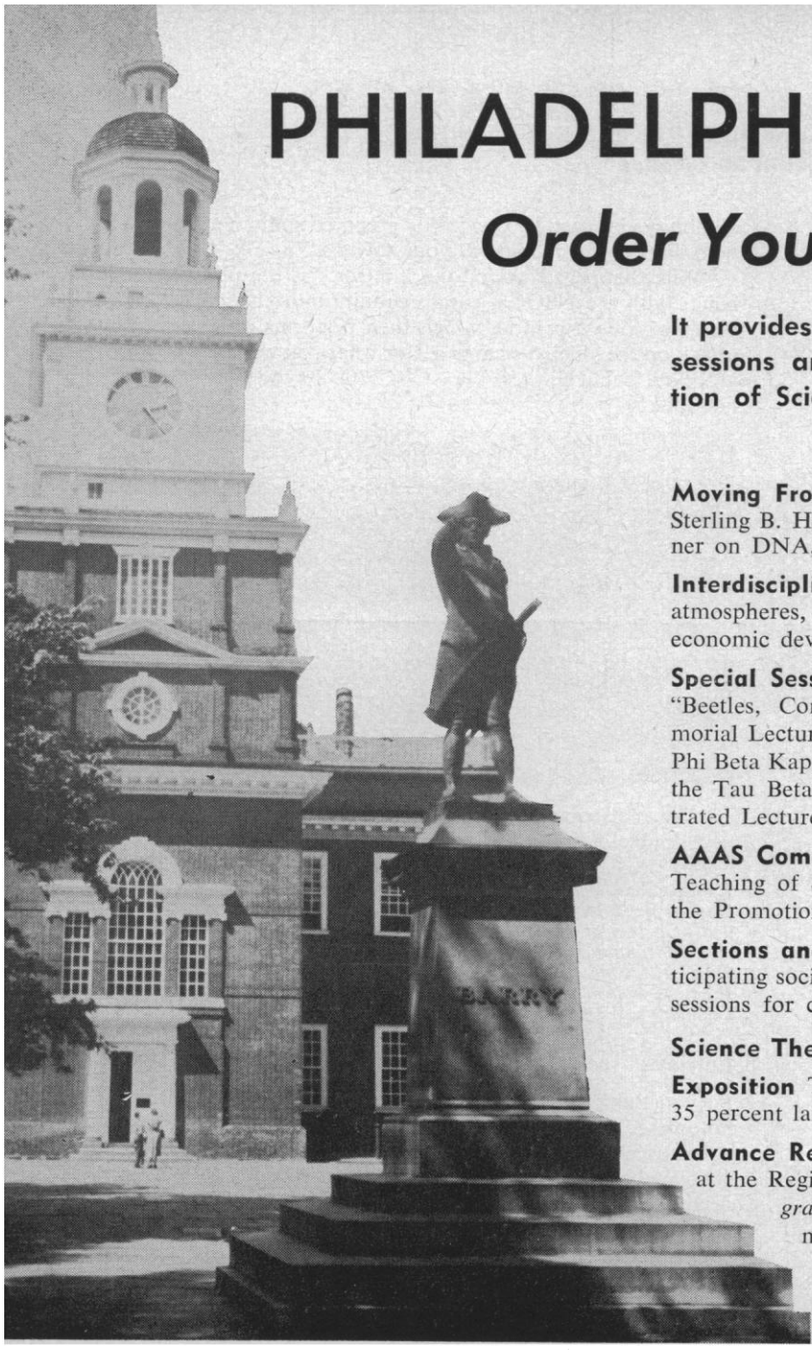
Select a likely cartridge of your microfilm and insert it into the reader. A flick of a lever threads the film into the machine and regulates the speed of film advance or rewind up to 600 feet per minute. Such high searching speed is made possible by a miraculous sensing device, the human eye, assisted by a scale on the side of the screen and a touch of foresight in having done the microfilming with a camera that exposes index marks alongside the document images.

With the desired image centered on the screen, press the "PRINT" button. Thirty seconds later there emerges before you a neatly cut 8½" x 11½" positive copy of the retrieved microfilm document, truly photographic in quality, dry in seconds. Each additional print of the same image takes 17 seconds to deliver. Search can be resumed 17 seconds after the "PRINT" button is pressed. No darkroom facilities are required.

The machine stands 31" high, 16" wide, and 28½" deep; weighs 143 lbs.; is sold for $2650 by Recordak Corp., 770 Broadway, New York 3, N. Y. (Subsidiary of Eastman Kodak Company).

Prices subject to change without notice.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science



PHILADELPHIA • 129th AAAS

Order Your General Program

It provides complete, detailed information about all the sessions and symposia scheduled, the Annual Exposition of Science and Industry, and the Science Theatre.

Program Highlights

Moving Frontiers of Science Homer E. Newell on space science, Sterling B. Hendricks on biological timing mechanisms, Sydney Brenner on DNA, William O. Baker on industrial research.

Interdisciplinary Symposia AAAS day: Dynamics of planetary atmospheres, the spread of technical knowledge as an instrument of economic development, the DNA story.

Special Sessions AAAS Presidential Address by Thomas Park on "Beetles, Competition, and Population"; the George Sarton Memorial Lecture by Gerald Holton; the Joint Address of Sigma Xi and Phi Beta Kappa by Loren C. Eiseley; the AAAS Distinguished Lecture, the Tau Beta Pi address; and the National Geographic Society Illustrated Lecture.

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.

Sections and Societies The 20 AAAS Sections and some 50 participating societies are scheduling specialized symposia, and many have sessions for contributed papers.

Science Theatre The latest foreign and domestic films.

Exposition The Annual Exposition of Science and Industry will be 35 percent larger than it was last year.

Advance Registration By registering in advance, you avoid delay at the Registration Center on arrival, you receive the *General Program* in time to plan your days at the meeting, and you permit your name to be posted in the Visible Directory of Registrants when the meeting opens.

Use the coupon below for advance registration or to order your advance copy of the *General Program.*

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(Check 1a or 1b)

1a. ☐ Enclosed is $3.50 Advance Registration Fee. This brings me the **General Program** and Convention Badge.

1b. ☐ Enclosed is $2.50 for the **General Program.** (if I attend the meeting, the badge, which I need to obtain the privileges of the meeting, will cost me $1.00 more.)

2. FULL NAME (Dr., Miss, etc.) .....
(Please print or typewrite) (Last) (First) (Initial)

3. OFFICE ☐ OR HOME ☐ ADDRESS .....
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CITY .....ZONE ..... STATE .....

5. FIELD OF INTEREST .....

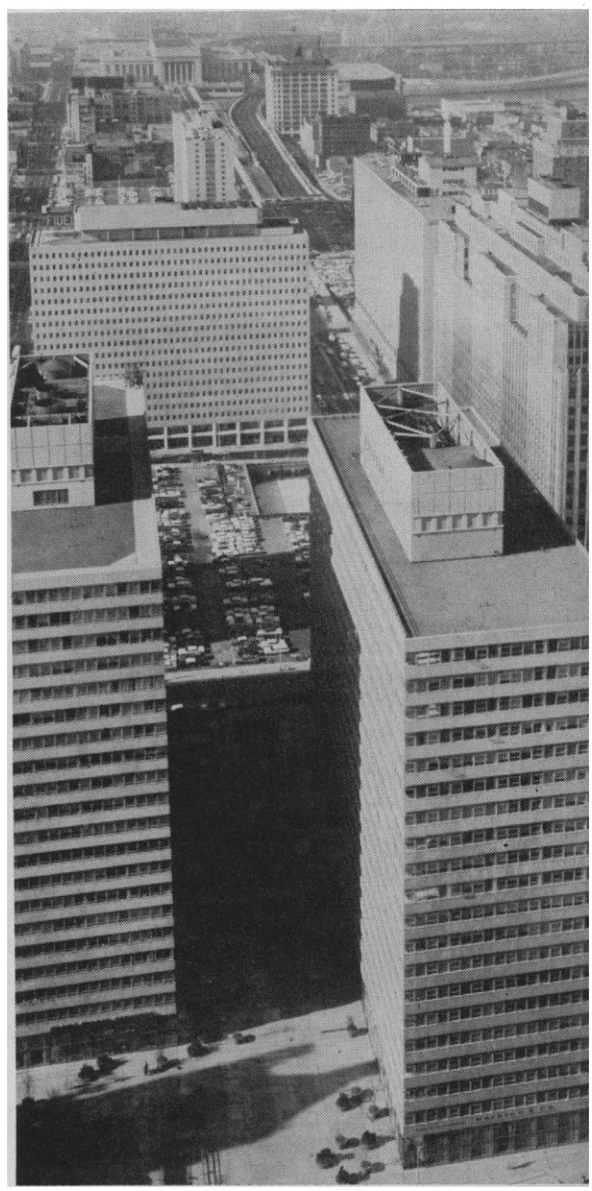
6. CONVENTION ADDRESS .....
(May be added later, after arrival)

Please mail this coupon and your check or money order for the total amount to the AAAS.

MEETING • 26-30 DECEMBER

Reserve Your Hotel Room

Make sure you have the accommodations you prefer. A list of headquarters hotels of participating societies appears on page 235, SCIENCE, 20 July. The AAAS headquarters is the Sheraton.



The hotels for the AAAS Philadelphia meeting have established special, low flat rates and have reserved large blocks of rooms for the meeting.

Use the coupon below to make your hotel reservation in Philadelphia. Send your application to the AAAS Housing Bureau in Philadelphia, not to any hotel. Give a definite date and estimated hour of arrival, and also probable date of departure. The Housing Bureau will make the assignment and send you a confirmation in two weeks or less.

A rollaway bed can be added to any room at $3.00 per night. Mail your application now to secure your first choice of accommodations.

HOTEL RATES*
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

For a list of the headquarters of each participating society and section, see page 235, *Science*, 20 July.

Hotel	Single Bed	Double Bed	Twin Beds	Suites
Sheraton**	$8.50		$14.00	$35.00—$45.00
Bellevue Stratford**	8.50		14.00	32.00— 60.00
Warwick**	8.50		14.00	30.00— 65.00
Franklin Motor Inn	8.50		14.00	
Robert Morris	5.50—7.50	$9.00—$11.00	10.00—11.00	
Sylvania	7.50	11.00	12.00	
Adelphia	7.50	11.00	12.00	
Benjamin Franklin	8.50	12.00	14.00	32.00— 60.00

* All rooms are subject to a 4% Pennsylvania state sales tax.
** Hotels with sessions.

AAAS Housing Bureau, Hospitality Center.
16th Street and Pennsylvania Boulevard
Philadelphia 2, Pa.

Date of Application .....

Please reserve the following accommodations for the 129th Meeting of the AAAS in Philadelphia, 26—30 December, 1962

First Choice Hotel ..... **Second Choice Hotel** ..... **Third Choice Hotel** .....

Type of room: Single ☐ Double ☐ Double, twin beds ☐ Suite ☐ Rates: Desired ..... Maximum .....

Number in party..... Sharing this room will be: .....

(List name and address of each person, including yourself. Attach list if space is insufficient.)

.....

.....

DATES: ARRIVAL ..... A.M. .....P.M.....DEPARTURE .....
(These must be indicated—add approximate hour, A.M. or P.M.)

NAME .....
(Individual requesting reservation) (Please print or type)

ADDRESS .....
(Street) (City and Zone) (State)

Mail this coupon now to the Housing Bureau. Rooms will be assigned and confirmed in order of receipt of reservation.

New Products

Petri dishes of clear disposable plastic have an extended rim that overlaps the dish below, eliminates the tendency for stacked dishes to slip aside, and eliminates the need for separate covers. The dish above is the cover for the one below to facilitate handling of large numbers of dishes. These dishes are available sterile and ready to use—R.L.B. (Lab-Tek Plastics Co., Dept. S290, 39 East Burlington, Westmont, Ill.)

Nuclear time-of-flight analyzer (model CN-440) is a 4096-channel analyzer with provision for 16 inputs and with switch-selected channel durations from 0.5 to 64 μsec. The channels are arranged in groups of 256 channels each. Each group is provided with an individual amplifier, integral discriminator, and detector. The discriminator accepts or rejects detected pulses produced by nuclear particles in flight. The channels of information in which pulses are stored open and close in sequence for a preselected length of time and can be programmed to accept information only after a controlled delay time. Pulses arriving through the 16 inputs are stored in the corresponding memory group on a first-come first-served basis. Memory cycles are fixed at 16 μsec. Other features of the instrument are live display on a 5-inch cathode-ray tube and static display through a fast scanning mode, and choice of paper-tape punch or typewriter output.—J.S. (Technical Measurements Corp., Dept. S267, 441 Washington Ave., North Haven, Conn.)

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.)

Miniaturized electrophoresis system, designed for radioactive and nonradioactive studies on the college and high school level features plastic construction, built-in voltage safety interlocks, a 0- to 10-ma current indicator, and platinum electrodes. The buffer chamber minimizes electrode contamination. Paper strips may be suspended or sandwiched. The unit is easily cleaned or decontaminated. Model EL-901 measures only 5½ inches high by 11 inches wide by 4½ inches deep. It will operate from any standard 67½-v battery or from optional model PS-901A power supply.—R.L.B. (Atomic Accessories, Inc., Dept. S288, 811 West Merrick Rd., Valley Stream, N.Y.)

Solid-state **decimal decade counter** (Fig. 1) can count at a 110 kcy/sec rate. The unit utilizes 90 built-in-place silicon diodes, 12 miniature transistors, and associated components. The entire diode matrix is fabricated simultaneously from a single piece of silicon with diodes positioned to perform the counting function. The diodes are automatically connected to two circuit plates to form a complete diode matrix. Input to the matrix consists of a conventional transistor flip-flop circuit. The outputs of the matrix connect to ten transistor amplifiers. These are sequentially activated and the output from the tenth transistor amplifier is used to drive the succeeding decade in a multi-decade counter chain. Outputs can operate numeral indicator tubes, printers, or other devices. The unit measures 1.2 by 1.2 by 1.4 inches.—J.S. (Burroughs Corp., Dept. S266, Plainfield, N.J.)

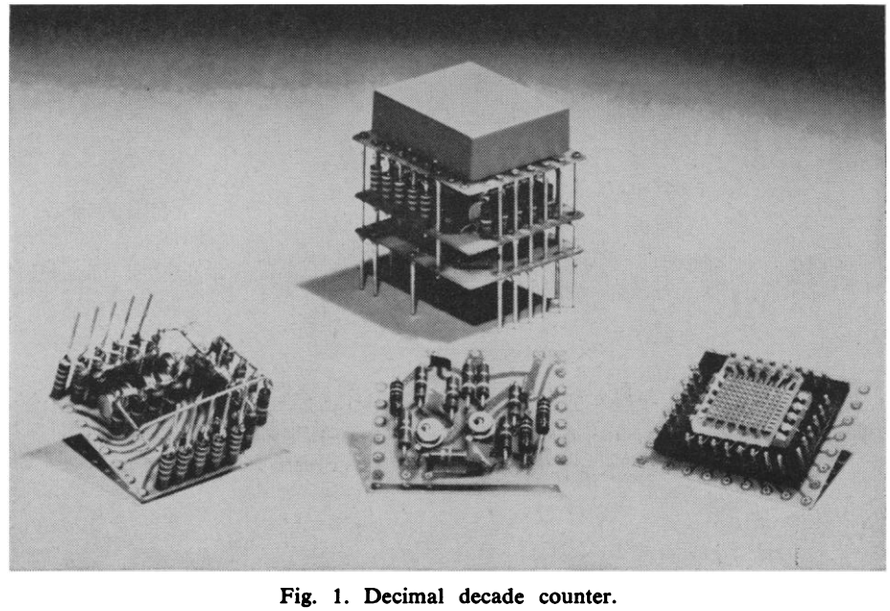


Fig. 1. Decimal decade counter.

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.

17–21. Hormones and the Kidney, colloquium, London, England. (P. C. Williams, c/o Imperial Cancer Research Fund, Burtonhole Lane, London, N.W.7)

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 Monchyplein, 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, Comptometer 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)

20. Surgery of the Hand, intern. conf., Paris, France. (L. Gosse, c/o Hôpital de Nanterre, 3 Av. de la République, Nanterre (Seine), France)

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

(See issue of 13 July for comprehensive list)