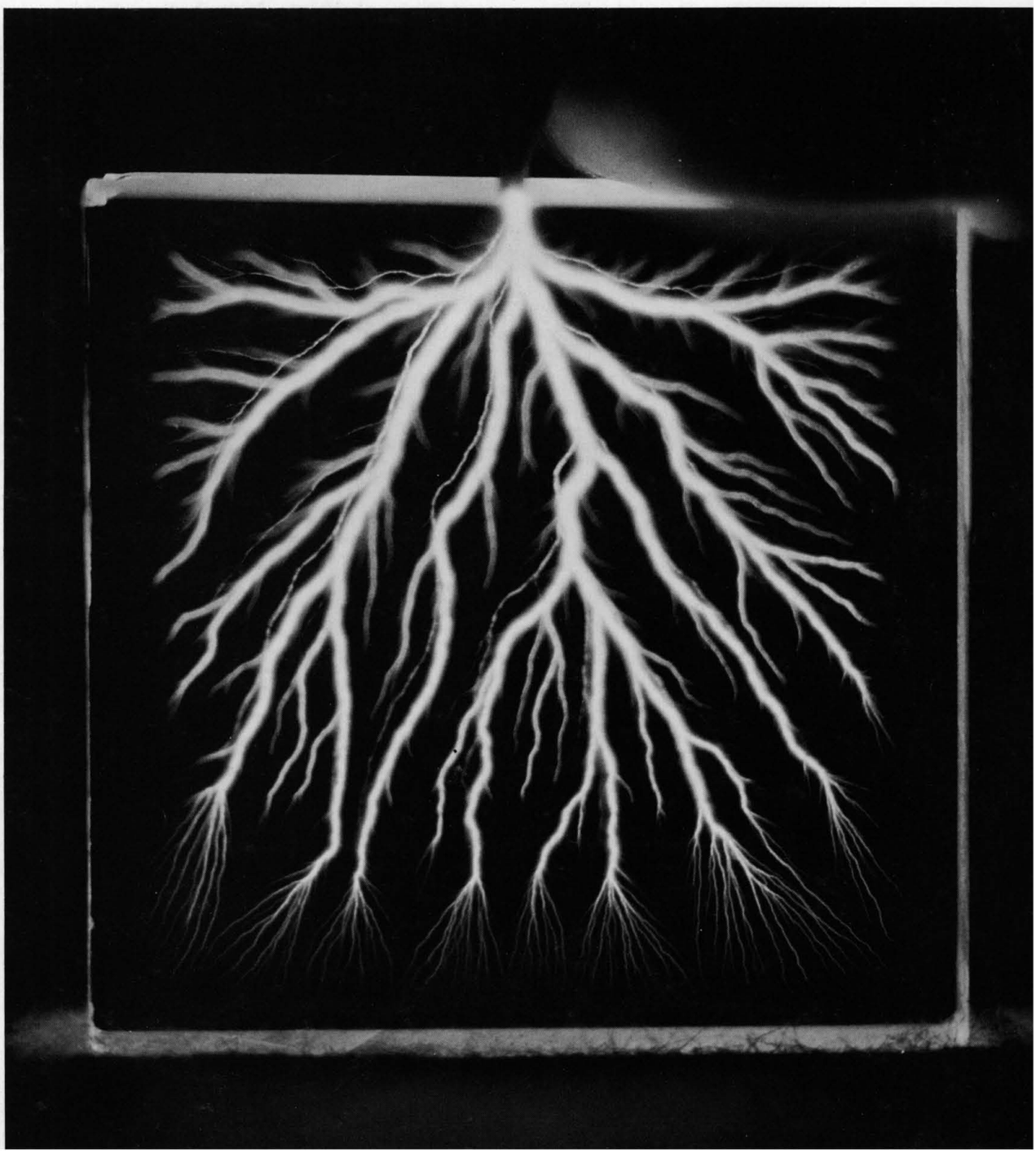
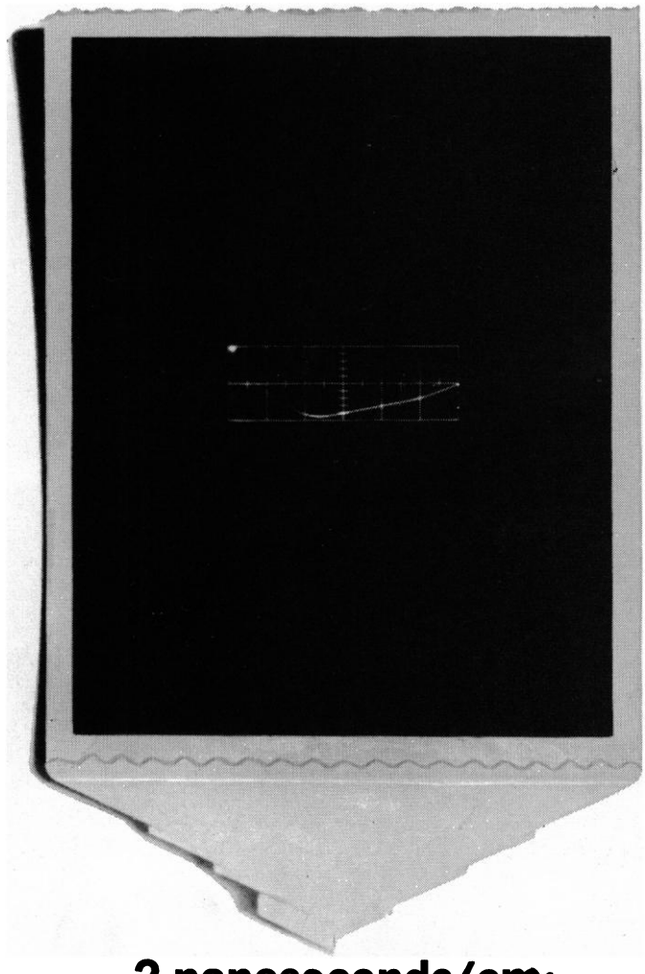
SCIENCE

2 March 1962
Vol. 135, No. 3505

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



POLAROID



2 nanoseconds/cm: impossible to photograph until now

Polaroid has a new film that is so fast, it will reproduce scope traces that are almost invisible to the naked eye. The one above, a scintillation pulse, has never been photographed until now. Pulse duration was ten nanoseconds. Scope sweep speed was 2 nanoseconds/cm. *The new 10,000-speed Polaroid PolaScope Land film produced a finished usable print ten seconds after exposure.*

The maximum writing speed of the 10,000-speed film is about twice that of the Polaroid Land 3000-speed film, which is currently the standard for high speed photography. The new film not only gets "impossible" pictures, it also produces far better shots of slower pulses and steady state waveforms. Because of its high speed, less light is required; camera aperture and scope intensity can be reduced considerably, producing sharper pictures.

And besides oscillography, the PolaScope film opens up new possibilities in applications where light is at a premium, such as photomicrography and metallography. It is not suited, however, for pictorial work due to its high contrast and relatively coarse grain.

PolaScope film (designated Type 410) is packed twelve rolls to a carton. The price is actually lower than the 3000-speed film.

The film can be obtained through industrial photographic dealers. For the name of the dealer nearest you, write to Technical Sales Department, Polaroid Corporation, Cambridge 39, Massachusetts.

New Polaroid Land 10,000-speed film for oscillography.

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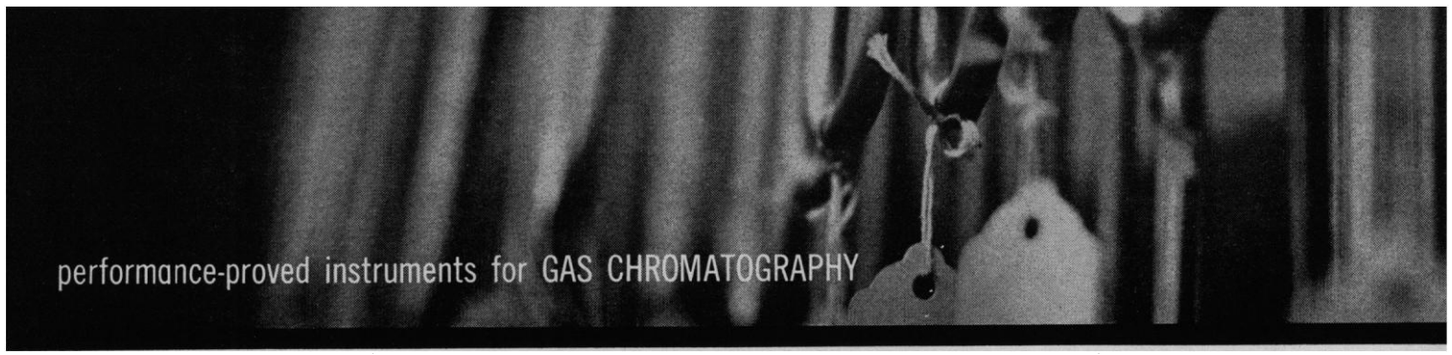
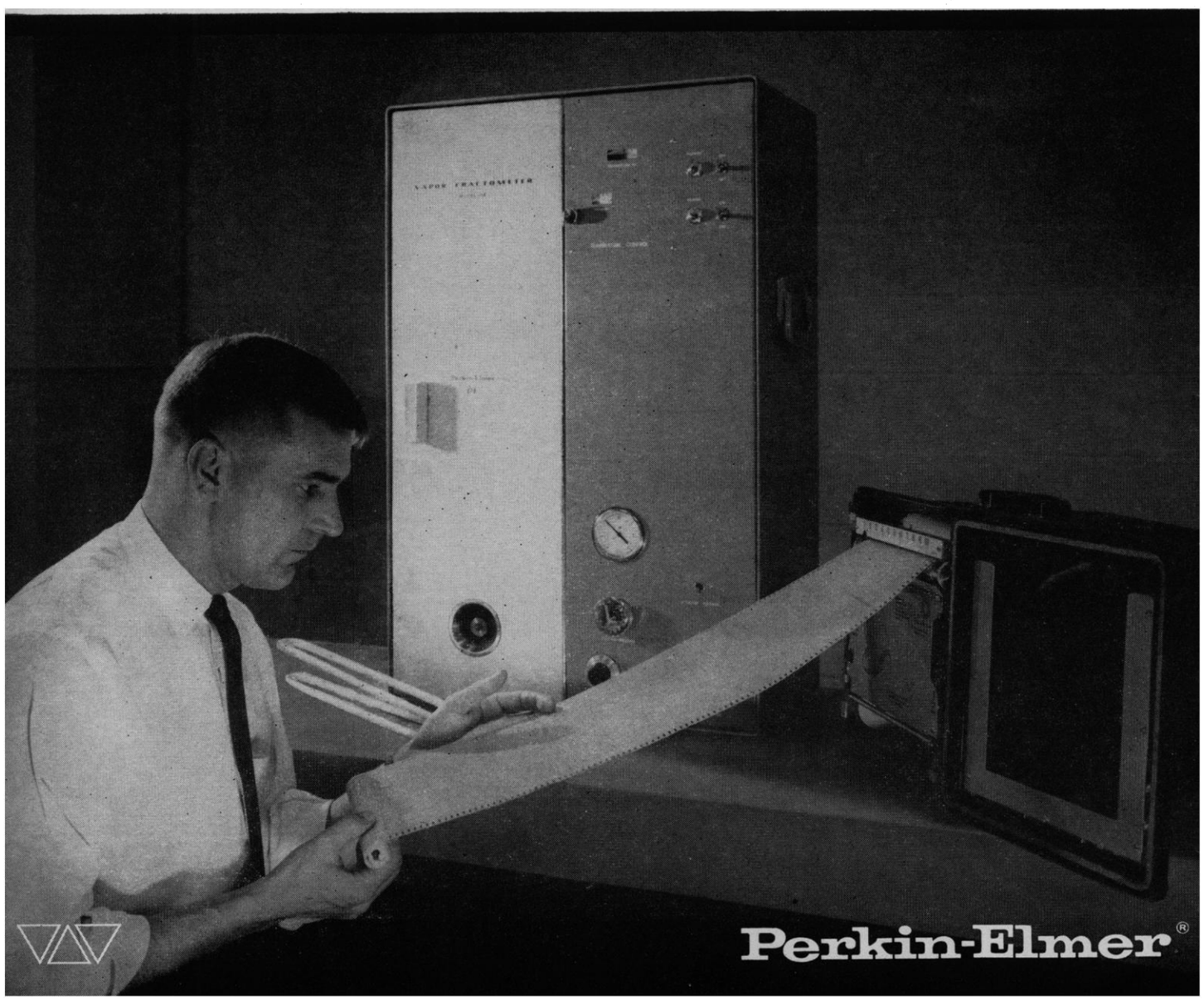


PERKIN-ELMER INTRODUCES A QUALITY-BUILT, LOW-PRICE VAPOR FRACTOMETER

For laboratories that must have a full-quality, thoroughly reliable gas chromatograph at an economical price, Perkin-Elmer now offers the Model 154-L Vapor Fractometer. This new instrument, suitable for routine and research uses, features high sensitivity and wide temperature range.

A broad selection of sample-handling and analytical accessories is available. Send for the illustrated brochure and complete information on the entire 154 product line. Write Instrument Division, Perkin-Elmer Corporation, 910 Main Ave., Norwalk, Conn.

$1150



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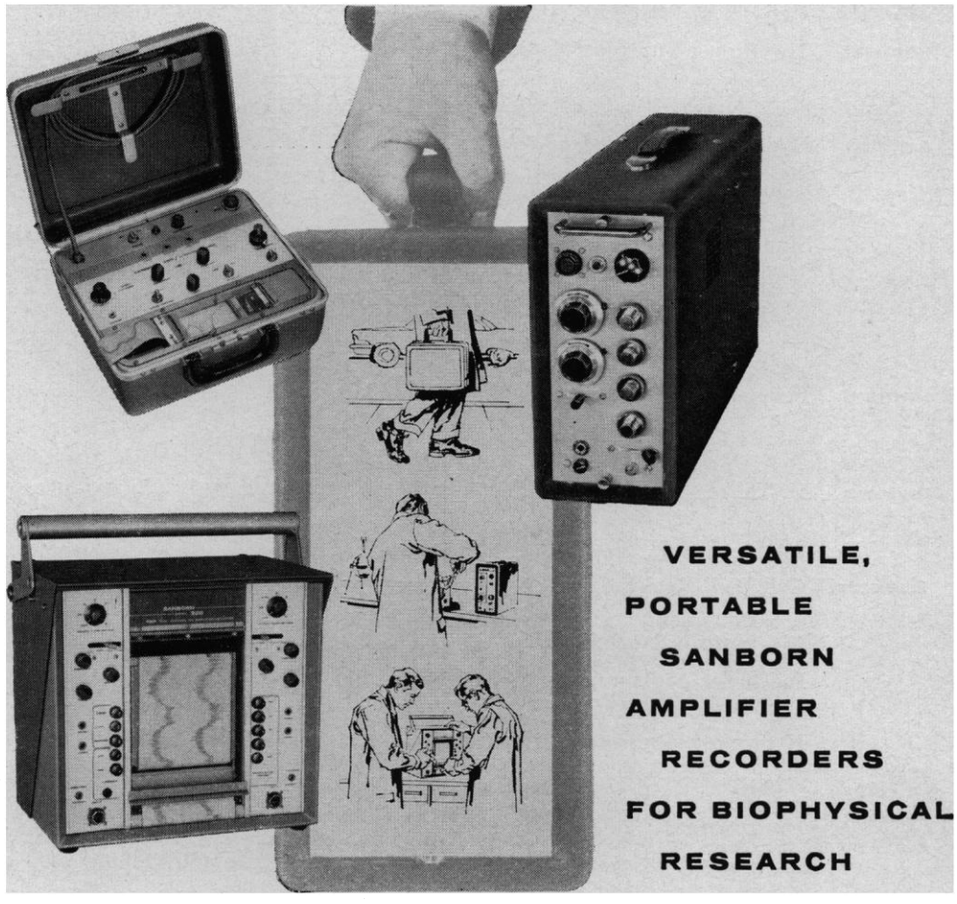
Cover

Induced discharge in a piece of lead-cerium glass. The glass was irradiated for 20 seconds with 1.5-Mev electrons at 10 microamperes, 18 centimeters from the window of a Van de Graaff accelerator. The discharge was produced by a sharp tap with a pointed tool (the tip is just visible on top center of glass). The discharge produced all the light. The specimen was about 1 inch square and 3/8 inch thick. The fine lines parallel to the heavier lines are reflections off the rear face of the glass. [P. S. Rudolph, Chemistry Division, Oak Ridge National Laboratory]



Any one of these portable amplifier recorders will provide your laboratory with greater recording flexibility and operating economy. Select either a one or two channel model with electronics for either DC or carrier amplification, for such applications as routine recording from transducers . . . monitoring output of laboratory instruments such as Sanborn "450" portable amplifiers (self-contained units with built-in power supplies, available in DC Coupling, Carrier, ECG/General Purpose, Low Level and other types), vital capacity spirometers, pH meters, etc. . . . or for direct-writing recording of one or two channels of a photographic recording system (e.g., Sanborn 564 and 558M) or a visual monitoring system (e.g., Sanborn 760 and 762).

FOR GENERAL PURPOSE DC RECORDING

The Model 299—21 lb., brief case, 1-channel recorder . . . 5 and 50 mm/sec or 2.5 and 25 mm/sec chart speeds . . . sensitivities from 10 volts to 10 mv/div . . . frequency response 0 to 100 cps, down 3 db at 10 div peak-to-peak . . . inkless recording.

Model 320—2 complete channels in a one-cubic-foot package — separate, current-feedback amplifiers with floating and guarded inputs . . . sensitivities from 2 volts to 0.5 mv/mm . . . full 50 mm for each channel . . . frequency response 0-125 cps, down 3 db at 10 mm peak-to-peak . . . choice of speed ranges—50, 25, 5, 2.5 mm/sec or 100, 20, 5, 1 mm/sec . . . inkless records. Model 322 also available, for low gain 2-channel recording.

FOR AC CARRIER AMPLIFIER RECORDING

Model 301 — single-channel portable — same construction, physical specifications and chart speed options as Model 299. Self-contained AC carrier amplifier recorder . . . sensitivities to 10 microvolts rms/div . . . frequency response 0-100 cps, down 3 db, 10 div peak-to-peak . . . internal 2400 cps carrier frequency . . . uncalibrated zero suppression. For similar applications but in *two channels*, Model 321 is available as a carrier amplifier version of the Model 320 system.

Contact your nearest Sanborn Branch Office or Service Agency for complete details, or write Research Instrument Sales Manager:

MEDICAL DIVISION

SANBORN COMPANY

175 Wyman St., Waltham 54, Massachusetts

2 March 1962, Volume 135, Number 3505 **SCIENCE**

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The Proper Study of Mankind

That basic research is important and that free-wheeling investigation of whatever interests the researcher is the only way to conduct basic research are concepts difficult to convey to nonscientists. Ten or 20 years ago what congressman would not have been critical of the use of public funds for research on the genetics of bacteria and viruses? One can imagine the headlines: "Microbe Sex-life Research Grant Irks Senator Fish." Of course no one could have told the senator with absolute assurance that investigations of this kind would lead to the grand generalization about the universal similarity in hereditary mechanisms (DNA and RNA) that we have now attained. Researchers know that all living things are related and that what is true of one form may be true of another, but that if it is not, *"Vive la différence!"* Comparative study teaches us much that we can learn in no other way.

A case in point is the recent attack by Representative Harsha and Senator Byrd on the research grant of $1.2 million to Dr. Harry Harlow of the University of Wisconsin for a 6-year program of primate research. Subhuman primates, as the congressmen should know, offer unusual advantages for research. Interesting in their own right and fully worthy of scientific investigation, they occupy the unique position of being the animals most similar to man in physiology and in mental capacity. Their bodies and brains are far more like ours than are those of any other animals. Hence, they react to physical stresses, to disease, to psychic disturbances, in much the same way that we do. It was not caprice that led us to use a chimpanzee for our first suborbital test shots. The brilliant achievement of Colonel Glenn last week owes something to what was learned from Ham's flight. Nor was it an indifferent choice that led to the use of monkey kidney for the cultivation of the polio virus: The virus will grow in monkey kidney. Of course, it will also grow in human kidney, but that is a tissue hard to come by. Prior to the work of Professor Harlow and others hunger, thirst, pain, and so on were thought to be the primary motivations of behavior. Harlow has shown experimentally that monkeys have—as had long been suspected for man—motivations not reducible to these primary ones: drives to explore, to manipulate, to see, to hear, and to experience affection. Furthermore, his work has had an effect on learning theory: monkeys learn how to learn; they have an accretion of learning.

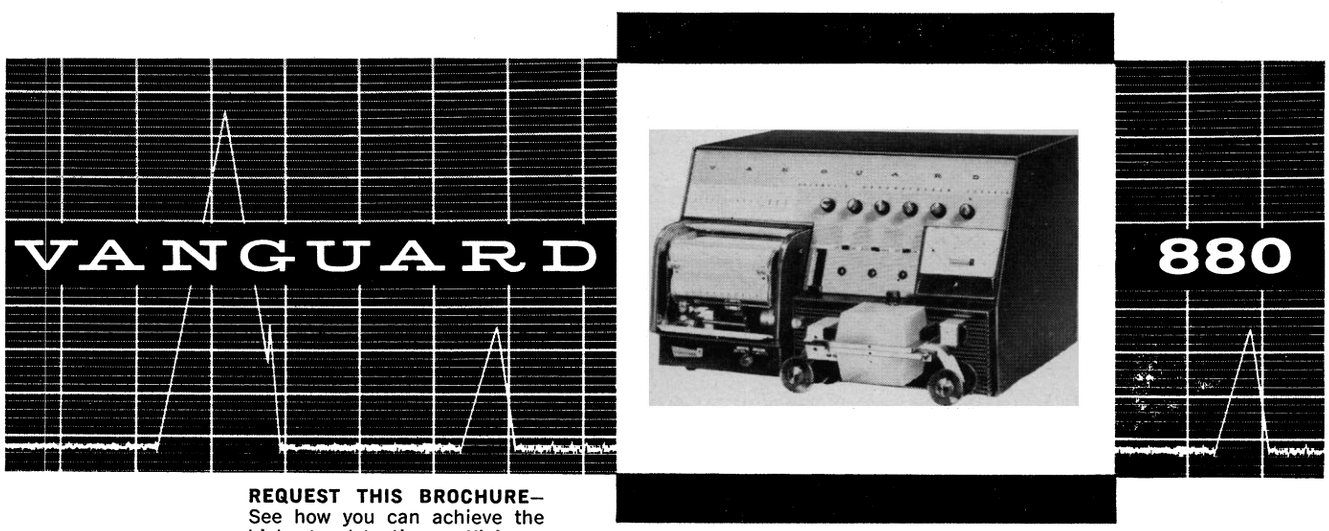
To give another example, monkeys reared in isolation are emotionally crippled; those brought up by artificial "substitute mothers" seem for a time to be normal, but when adult they are unable to act like mothers toward their offspring. Monkeys have still another advantage as research subjects. They can be studied throughout their lives—they grow up in 2 to 3 years—and can be kept in a controlled environment and subjected to planned experiments. Studies of this kind provide new insights into human behavior that could be attained in no other way. Would the congressmen suggest that we carry out such studies on human beings? Or do they perhaps think it unimportant to try to understand behavior? dangerous to study motivation?—G.DuS.

NEW SENSITIVITY
IN CHROMATOGRAM SCANNING....

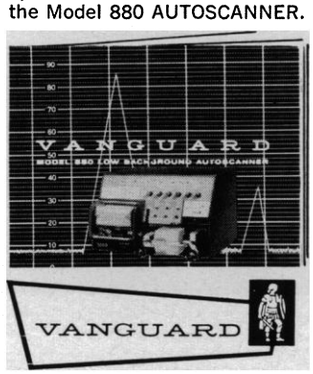
Vanguard 4 pi AUTOSCANNER reduces background to less than 10 c pm., revolutionizes counting of H^3, C^{14}, and S^{35}

Vanguard's new, completely transistorized Model 880 Low Background AUTOSCANNER revolutionizes chromatogram scanning of low-energy, beta-emitting radioisotopes. Specially designed to meet the exacting requirements of medical, agricultural and pharmaceutical research, the AUTOSCANNER utilizes the most advanced electronic and mechanical design, integrated into a compact, one-piece console. With the Model 880, analyses can be performed with the highest possible degree of sensitivity—even when counting tritium, carbon-14 and sulphur-35.

NEW STANDARD ACCESSORY, TOO! Also available is the new, exclusive Vanguard Model 880ADS, a completely automatic system for quantitative integration and digital presentation of radioactive zones. For complete details concerning either the Model 880 or Model 880ADS, please write or call.



REQUEST THIS BROCHURE— See how you can achieve the highest detection efficiency available for chromatogram scanning. Booklet outlines distinctive features and lists all operational characteristics of the Model 880 AUTOSCANNER.



- Features 4 pi scanning—counts radiation on both sides of strip simultaneously
- Reduces background to less than 10 cpm.
- Completely transistorized for longer, more reliable performance
- Handles chromatograms 1½ to 4 cm. wide in lengths to 100 ft.
- Gas and power shut off automatically at end of scanning period
- 10 scanning speeds, 5 rate meter time constants, 7 count rate ranges, 3 individual slit width collimations
- Automatically marks solvent fronts, leading and trailing edges of strips
- Windowless gas-flow, geiger detection
- Accuracy of better than 2% of count rate on all ranges
- Compact, completely integrated, one piece unit

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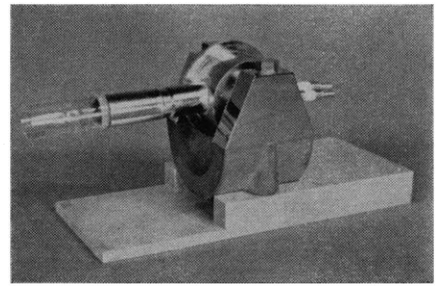
New Products

Flame photometer (model H) for clinical determinations of sodium and potassium concentration utilizes lithium as an internal standard and gives direct readings on a calibrated dial. In operation the conventional null balance system is used to measure the unknown emission in terms of proportional output from the internal standard. The internal-standard system eliminates effects of viscosity and surface tension on the rate of atomizing the sample into the flame. An adjustable, resettable stainless-steel atomizer, also a feature of the manufacturer's older research model 1B, eliminates clogging and facilitates rinsing and cleaning.

Direct-reading ranges, in milliequivalents per liter, of 0 to 10 (for potassium) and 0 to 200 (for sodium) simplify clinical determinations; readings are reproducible to ±¼ percent of full scale. Solid-state photocells, glass filter systems, rugged null detection meter, and sealed burner provide for a rugged instrument free from effects of vibration and the well-known errors due to air contaminated with smoke or soap powder.—R.L.B. (Process & Instruments Co., Dept. S29, 17 Stone Ave., Brooklyn 33, N.Y.)

Pulse generator (model 213A) forms a pulse having a rise time of approximately 0.2 nanosecond and a width of approximately 2 μsec. Either positive or negative 0.5-volt (peak) pulses trigger the generator at rates up to 100 kcy/sec. Jitter is less than 20 picoseconds when the generator is triggered by the manufacturer's model 185 sampling oscilloscope. When excited at a rate greater than 100 kcy/sec, the instrument runs free.—J.S. (Hewlett Packard Co., Dept. S1, 1501 Page Mill Rd., Palo Alto, Calif.)

Cold-cathode ionization gage of the magnetron type provides a range of sensitivity from 10^{-4} to 10^{-11} mm of mercury. All elements of the gage are supported within a cylindrical metal envelope by ceramic balls. Operation



and control of the unit is accomplished by an electron flow through crossed magnetic and electric fields. The cold cathode, which serves as both an electron emitter and ion collector, is typically operated at ground potential with the anode operated at +4000 volts. Current at low pressures is less than 1 μa.—J.S. (Geophysics Corporation of America, Dept. S22, Bedford, Mass.)

Radiation monitoring film badges are provided with circular metal filters in front and square filters in back to indicate whether radiation reaching the badge came from the front or through the wearer. The shaped cadmium and copper filters allow densitometer readings of the badges to be made, thus determining the exposure. Individual film packets are removed and mailed by the user, so that the badge itself does not have to be returned for reading.—R.L.B. (Nuclear-Chicago Corp., Dept. S34, 333 E. Howard Ave., Des Plaines, Ill.)

Random-access memory of the ferrite-core type features a cycle time of 1.5 μsec for a complete read-restore or write-clear cycle. Storing binary information, the model 2048, 4096, and 8192 memory modules use a linear or word-select drive system. Word lengths are up to 56 bits. Operation may be conducted on full words or on partial words. Larger capacities can be obtained by combining standard modules. The memory is a free-standing module with a self-contained frame that holds the ferrite core stacks, the associated logic circuits, and the power supplies. Controls for starting, stopping, and resetting may be installed at the computer. All logic and voltage-regulation circuits are on plug-in cards. Dimensions are 72 (h) by 48 (w) by 28 (d) inches.—J.S. (Ampex Computer Products Co., Dept. S38, P.O. Box 329, Culver City, Calif.)

Digital data reader consists of an *x-y* reading head, 16-inch paper or film transport, and keyboard. The reading head may be used separately in conjunction with a 35-mm film projector. Output is to a typewriter, IBM keypunch, or punched paper tape. Multiple channels can be handled, each with a different scale factor and zero reference. Zero references can also be located at any point on the graph. Patch-board programming permits any desired output format of fixed digits, channel count, signs, coordinate values, and time index count. Channel count, coordinate values, and time index count are displayed by a bank of numeral tubes.—J.S. (Gerber Scientific Instrument Co., Dept. S19, P.O. Box 305, Hartford, Conn.)

Vacuum system (model SEL 823) is designed for routine operation at 10^{-9} and 10^{-10} mm-Hg. The system is of double-wall design. The vacuum chamber is of stainless-steel construction with a large dynamic vacuum pumping throat. The ionization gage is mounted within the chamber to minimize errors due to gage pumping. Window ports, provided on all sides, can be removed; they are sealed with metal-gaskets. A disposable glass shield is provided as a vapor-plating barrier for the windows. Other ports as well as multiple-pin feed-through headers are supplied for mounting optional accessory equipment.—J.S. (Scientific Engineering Laboratories, Inc., Dept. S25, P.O. Box 607, Woodland, Calif.)

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).

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

benefaction of mankind to withhold its judgment in matters relating to its field of competence might serve as well to undermine the very prestige it guards so jealously and might inject a note of "commercial aspirations" into the activities of the organization and its members.

Admittedly, it is unfortunate that such recommendations must be made without control over their application in the "marketplace," but this does not relieve the medical or dental researcher or practitioner of his basic responsibility to alleviate human ills and suffering to the best of his ability, with every means at his disposal, and without regard to economic advantage (except from the standpoint of his patient).

Any professional organization should be as quick to recommend as to condemn in matters which rightly belong in the field of its activities. The lay public is dependent upon the judgment of the professional man (best expressed through a collective organization), and should that judgment be withheld or qualified to the point of ambiguity, the "borderline quackery" which every professional man abhors will move in to fill the void thus created.

WALTER FOWKES
Grand Forks, North Dakota

Visiting Asian Students

Balaji Mundkur's generalization [*Science* **134**, 1942 (1961)] regarding the problems of visiting Asian students is true. The migrant students certainly are presented "problems of adjustment." But their supposed failure to adjust to new and strange cultural and academic patterns is not due to inadequately informed advisers or faculty members who have failed to notice discrepancies in academic preparation or in scholastic and social adaptabilities among visiting students. The students themselves, very often, do not take any initiative to face boldly a new environment, academic and cultural. It is doubtful that they were not aware of these challenging situations before they arrived in this country.

Many of these students live with their own countrymen, eat the same kind of food, confine themselves to their own clannish circles for discussions and exchange of ideas. I have seen this happen on one of the largest university campuses in California; these students live in large apartment houses

where their neighbors are their own countrymen, invariably; they are afraid or at least hesitant to live in strange localities among foreigners; they do not want to accept change. As long as this state of affairs prevails, I do not think counseling and orientation alone would help them adjust to new cultural and academic patterns. The visiting student should make every endeavor to be adventurous, be willing to accept change, and above all, try to realize his own potentiality for social, cultural, and academic adjustments.

S. K. KRISHNASWAMI
Department of Biology,
Rice University, Houston, Texas

Crimes, Science Fellowships, and the Disclaimer Affidavit

It has been called to our attention that our recent letter concerning National Science Foundation fellowships [*Science* **134**, 2007 (22 Dec. 1961)] could be misunderstood to imply opposition to the whole of the new bill HR 8556. Our objection is specifically to section (*d*) (1) (*B*) of this bill, requiring applicants for a fellowship from the National Science Foundation to list previous criminal convictions or pending charges. Our reasons for objecting were stated in the previous letter. The bill as a whole, however, would be beneficial, since it repeals the present ineffective and offensive requirement that each applicant submit a sworn affidavit concerning his political *beliefs*. This and closely similar provisions of the National Defense Education Act have caused grave and widespread concern, and they are clearly more objectionable than the proposed requirement of a statement of objective fact. We therefore believe that the terms of HR 8556 represent an improvement over the existing regulations. Hence, we favor passage of the bill, but preferably without section (*d*) (1) (*B*).

BERNARD D. DAVIS
JOHN T. EDSALL
DONALD R. GRIFFIN
Harvard University,
Cambridge, Massachusetts
CYRUS LEVINTHAL
S. E. LURIA
Massachusetts Institute of Technology,
Cambridge
BENTLEY GLASS
Johns Hopkins University,
Baltimore, Maryland

Meetings

Oceanography in Latin America

Four important meetings concerning oceanography and its research development in Latin America were recently held in Chile. They were the Latin-American Seminar of Oceanographic Studies; the 2nd Latin-American Symposium on Plankton; the Meeting of Directors of Latin-American Laboratories; and a Regional Training Course on Marine Biology. The meetings were organized by the UNESCO Science Co-operation Office for Latin America, jointly with the University of Concepción in the case of the first two meetings and with the University of Chile in the case of the latter two, and held, respectively, in the General Biology Laboratory, Concepción, and the Marine Biology Station, Montemar.

Thirty-seven distinguished Latin-American scientists participated, from Mexico, Colombia, Venezuela, Brazil, Uruguay, Argentina, Chile, Peru, and Ecuador. Present as observers were Dixie Lee Ray from the National Science Foundation (United States); Peter Dohrn, from the Stazione Zoologica di Napoli (Italy); Wilhelm Branhorst, chief of the Federal Republic of Germany's Technical Assistance Program to Chile; and François Ottmann, at present at the Institute of Marine Biology in Recife, Brazil. Ramón Margaleff (Spain) attended the symposium on plankton by special invitation.

At the first meeting, Pedro Roa Morales (Venezuela) was elected chairman of the "abiotic" section and Fernando de Buen (Chile), chairman of the "biological" sections. De Buen was also chairman of the Meeting of Directors. Margaleff was invited to act as chairman of the symposium on plankton. For the Regional Training Course, de Buen and Enrique Rioja (Mexico) acted as codirectors; the professors were scientists from Mexico, Chile, Uruguay, Argentina, and Brazil, and the students were from Latin-American countries. For all these meetings, Hugo Ferrando (Uruguay) acted as secretary.

The main purpose of the meetings was to make an evaluation of the present status of research in marine sciences in Latin America in the light of what has been accomplished. Accordingly, a series of reports covering the different disciplines of marine science were requested from, and submitted by, leading scientists of Latin America. It was also felt that some decision should be taken so as to increase existing knowledge through research and training, primarily on a cooperative regional basis.

Among the most outstanding resolutions and recommendations adopted were the following.

1) Creation of a Latin-American Council on Oceanography, with an elected steering committee composed of leading marine scientists from Mexico, Venezuela, Uruguay, Argentina, Chile, and Brazil, under the chairmanship of Fernando de Buen. This council should become a permanent Latin-American Council once the necessary official steps are taken throughout all the Latin-American countries; the secretariat will be located at the UNESCO Science Co-operation Office for Latin America, Bulevar Artigas 1320, Montevideo, Uruguay.

2) Establishment of research programs on a regional, coordinated basis. Seven projects were presented, and necessary measures are now being taken for the coordination of some of these by the existing marine biology laboratories and oceanographic institutes, with the help of the hydrographic naval services.

3) Publication of a "Lain-American Directory of Oceanographic Institutions and Scientists" so as to implement the exchange of scientists, students, information, and material, with the UNESCO Science Co-operation Office acting as a clearinghouse.

4) The unification and standardization of methods and equipment in marine research.

5) Organization by UNESCO, in 1962, of a 2 months' training course in physical oceanography. The Oceanographic Institute of the University of Orente (Venezuela) offered to act as host, and the Brazilian Navy offered its oceanographic vessel, the *Almirante Saldanha*, for a training cruise to complement the course.

6) Organization by UNESCO, in 1962, of a regional symposium on the biogeography of marine organisms for the purpose of studying the geographical distribution of such organisms and the effects upon them of the physicochemical condition and dynamics of water masses. The National Museum of Natural History "Bernardino Riva-

davia" of Argentina officially offered to act as host upon the occasion of its 160th anniversary.

7) Organization by UNESCO, in 1962, of a meeting of deans of science faculties of Latin-American universities for the purpose of raising scholastic standards for the education of marine scientists through the reorganization and modification of curricula and plans of study.

UNESCO's Science Co-operation Office is preparing to implement recommendations 5, 6, and 7 by building up the bibliographic reference library on marine sciences in Latin America which it has already started, with profitable results. For this purpose, each scientist present at the meeting planned to send in a contribution in his specific field. To further this program, it is requested that all scientists and institutions send two reprints of any of their publications that deal with any aspect of marine sciences in Latin America to the UNESCO Science Co-operation Office for Latin America, Casilla de Correo 859, Montevideo, Uruguay.

A. ESTABLIER

UNESCO Centro de Cooperación Científica para América Latina, Montevideo, Uruguay

Forthcoming Events

March

12–16. Society of Automotive Engineers Detroit, Mich. (R. W. Crory, SAE, 485 Lexington Ave., New York 17)

12–23. International Radio Consultative Committee, Study Group on Space Systems, Washington, D.C. (Palais Wilson, Geneva, Switzerland)

13–14. Packaging of Chemical Products, symp., annual, St. Louis, Mo. (Manufacturing Chemists' Assoc., 1825 Connecticut Ave., NW, Washington 9)

13–15. Application of Statistics and Computers to Fuels and Lubricants Research Programs, symp., San Antonio, Tex. (R. Quillian, Southwest Research Inst., 8500 Culebra Rd., San Antonio 6)

13–15. Electronic Industries Assoc., Washington, D.C. (Chief of Information, Dept. of the Army, Washington 25)

14–16. National Missiles and Space Conf., Washington, D.C. (Chief of Information, Dept. of the Army, Washington 25)

15–16. Textile Research Inst., annual, New York, N.Y. (P. C. Alford, TRI, Princeton, N.J.)

15–16. Western Industrial Writing Inst., 7th, Los Angeles, Calif. (R. M. Winters, American Industrial Writing Inst., P.O. Box 5453, Pasadena, Calif.)

15–17. Optical Soc. of America, Washington, D.C. (M. E. Warga, OSA, 1166 16 St., NW, Washington 6)

15–18. International Assoc. for Dental Research, St. Louis, Mo. (J. C. Muhler, Indiana Univ. Medical Center, 1120 W. Michigan St., Indianapolis 7)

15–23. American Soc. of Tool Engineers, annual, Detroit, Mich. (H. E. Conrad, ASTE, 10700 Puritan Ave., Detroit 38)

17–18. Etiology of the Neuroses, symp., Soc. of Medical Psychoanalysts, New York, N.Y. (D. B. Friedman, SMP, Fifth Ave. and 106 St., New York 29)

18–21. American Assoc. of Dental Schools, St. Louis, Mo. (R. Sullens, AADS, 840 N. Lake Shore Dr., Chicago 11, Ill.)

18–22. Bilharziasis, symp., Cairo, Egypt. (A. H. Mousa, Ciba Foundation, 41 Portland Pl., London, W.1, England)

18–22. International Anesthesia Research Soc., Bal Harbour, Fla. (Scientific Liaison Office, Natl. Research Council, Sussex Dr., Ottawa, Ont., Canada)

19–23. International Conf. on Equatorial Geophysics, Lima, Peru. (J. A. Broggi, Instituto Geofisico de Huancayo, Apdo. 46, Huancayo, Peru)

19–23. National Assoc. of Corrosion Engineers, Kansas City, Mo. (T. J. Hull, NACE, 1061 M&M Building, Houston, Tex.)

20–21. Hypervelocity Techniques, symp., Denver, Colo. (A. M. Krill, Mechanics Div., Univ. of Denver Research Inst., Denver 10)

20–23. American Assoc. of Anatomists, annual, Minneapolis, Minn. (C. B. Heggestad, Dept. of Anatomy, Univ. of Minnesota, Minneapolis 14)

20–23. High-Temperature Solution Chemistry, symp., Washington, D.C. (J. W. Cobble, Purdue Univ., Lafayette, Ind.)

20–23. Institute of Metals, London,