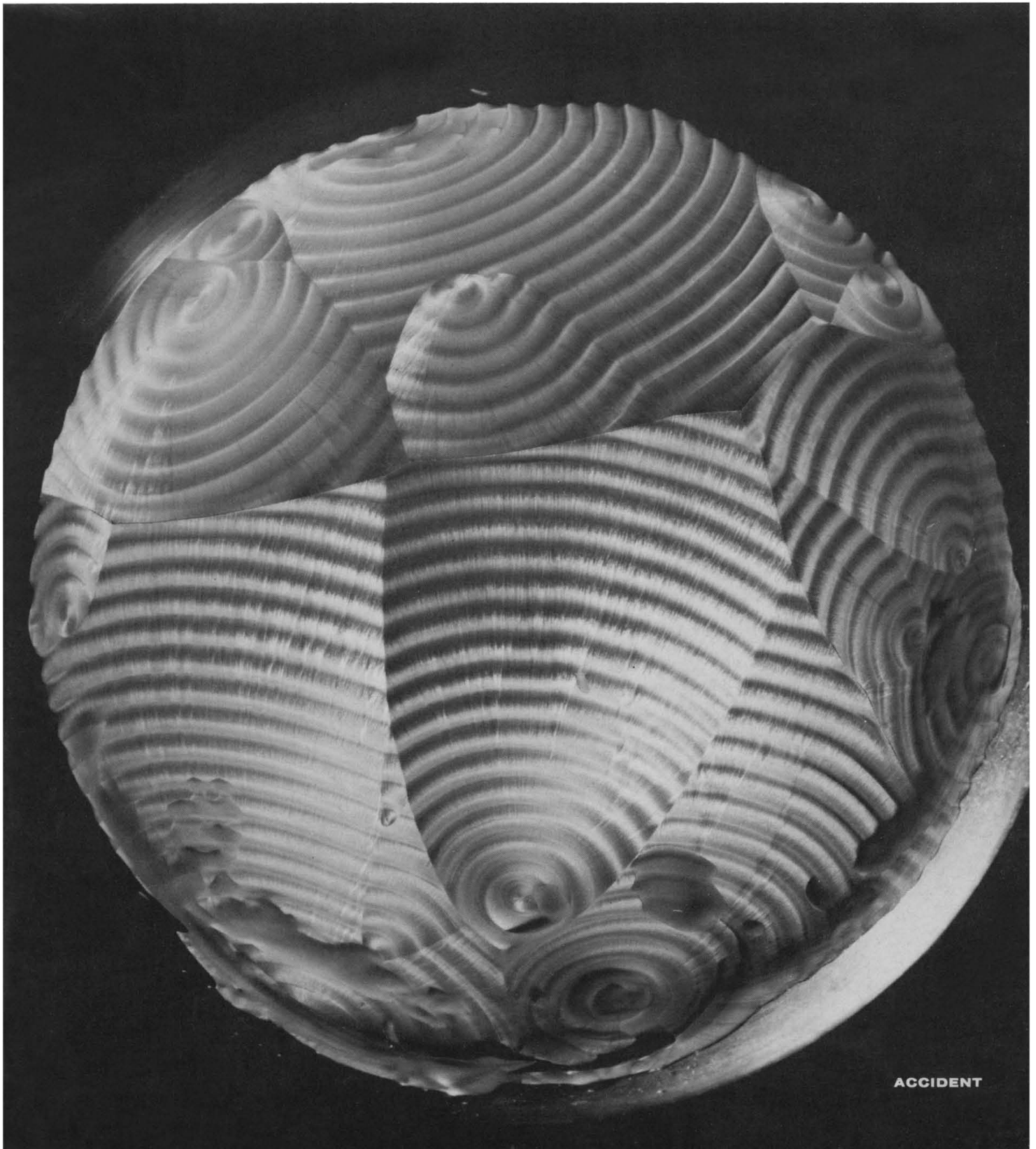


SCIENCE

15 January 1965
Vol. 147, No. 3655

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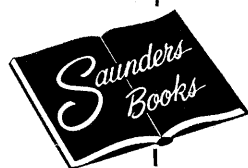
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COVER

Crystals of a salt, probably potassium acid acetate, in a 1-liter flask with a round bottom. The pattern was produced during the course of an experiment in which a solution of potassium acetate and acetic acid was being evaporated, under reduced pressure and with continuous rotation, for an entirely different purpose (about $\times 1.1$). [Waldo E. Cohn and Photographic Services Department of Oak Ridge National Laboratory]

Kodak reports on:

a virtuoso tracer . . . mapping today and tomorrow . . . printing today

Dyed chicken finds rabbit in rat

Read *Physical Techniques in Biological Research* (New York, Academic Press, 1956) III, p. 136. Learn of a piggyback operation where fluorescent chicken antiserum to rabbit globulin was made to seek out rabbit antiserum specifically localized in rat tissue to permit quantitative analysis by microdensitometry of the fluorescence photomicrographs. This is a virtuoso example of the fluorescent antibody tracer method.

Note remarks to the effect that along with the successes of this technique, there have also been disappointments due to organic synthesis difficulties, among others. Note statement that *Chemical and Engineering News* carries advertisements

of companies that undertake organic synthesis on order and could be approached to make fluorescein isocyanate as the fluorescent dye. This could mean us.

Not that Distillation Products Industries (Division of Eastman Kodak Company, Rochester, N. Y. 14603) wants to stanch the gratifying flow of inquiries for custom synthesis in quantity. Nevertheless it feels obligated to point out that 5-Dimethylamino-1-naphthalene-sulfonyl Chloride, which it can now furnish off the shelf as EASTMAN P9090, is favorably reported on as a fluorescent dye for the fluorescent antibody technique in Proc. Soc. Exptl. Biol. & Med. 98, 120 (1958). Always be sure you are up to date on what's available in EASTMAN Organic Chemicals. Latest catalog is No. 43. Watch above-named C. & E. News for additions.

Color saves shoe leather

TIROS or NIMBUS transmits a picture of the Florida peninsula and lo, Florida turns out to have exactly the same shape that the Spanish navigators of the 16th century said it had. That men could map as well as they did before they learned to fly grows in wonder. Mapping without aerial photography now seems like building the Pyramids by muscle.

Despite the reduction in map-making footwork from olden times, some observations still have to be made on the ground. With the Pharaohs' knack for low unit labor costs now a lost art, field-completion runs big on a mapping budget.

The higher information content of color photography should permit a thinner network of ground-control points.

Color in mapping has become practical. Shortly it will be necessary to judge where black-and-white remains economically defensible.

What has happened is that we have put on the market 1) an aerial color film on dimensionally stable ESTAR Base and of a speed that no longer restricts its use to an intolerably narrow range of solar altitudes but can be *adjusted* in processing to exposure conditions; and 2) glass plates that can carry the color image into the stereo plotting equipment.

For no better reason than to be well informed, you should know that this is happening. Maps are basic to civilization. The small coterie who need specific details about the film and the plates can get the information from Eastman Kodak Company, Special Sensitized Products Division, Rochester, N. Y. 14650.

Shallow relief

Another technology which a civilized party can consider worthy of his mild interest is printing. Here, with a new entity designated the KODAK Relief Plate, we have further complicated the complex interconnections among cost, speed, quality, and utility of printing.

We do not recommend our new product either for tomorrow morning's New York Times or for a \$250-per-copy edition of Rembrandt reproductions. Handbills announcing a postponement of the volunteer firemen's ball can deliver their message cheaper and just as effectively without it. For a journal of plant pathology which needs photomicrographs, gross photographs, and drawings to illustrate nearly every paper, "shallow relief" could mean the difference between life and death as a feasible publishing operation.

Huge rotary presses printed these words from cylindrical shells of great thickness compared to the depth of the areas where ink-covered metal was not to touch paper, as inside this "o." A rotary press is obviously more efficient than a flat-bed press, such as Gutenberg's. Even publications in far less demand than the one you are now reading need rotary presses for economy, but not huge ones. The modest-size rotaries

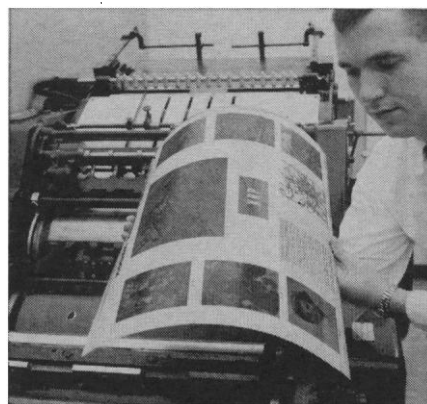
need to print from thin, easily made plates bent to the requisite radius. To retain the strength to keep the outer surface reasonably cylindrical instead of collapsing to an irregularly polygonal contour, and to minimize the need for certain mysterious and time-consuming adjustments called "make-ready" that the printer's customers do not understand but appreciate as the difference between pleasing appearance and mere legibility, the no-ink portions must remain shallow.

One type of such low relief plate uses as its printing surface a polymer which an ingenious chemical reaction sensitizes to light for a few minutes before exposure under the photographic negative that determines where the plastic will remain and where not. It is further demanded that when this miraculous polymer whirls on the press it retain its bond to its sheet metal substrate and never crumble off a comma or a few hundred minimum-size halftone dots.

For our own offering in low relief we have been more conservative. By not asking so much of one substance, we ease the problems of bonding, fragility, conformity to the cylinder, exposure convenience, and many other factors that might bore you but not your printer. If your printer happens to print by off-set instead of the venerable letterpress

principle, his counterpart to the "make-ready" bit is striking a water: ink balance. A rotary press may have to reach full speed before a trial ratio can be judged. On a short run, involving large solidly inked areas, particularly with certain inks, for a fussy customer who has been taught strong feelings about printing esthetics, 20% of the paper consumed may leave the plant via the baler. It has to be paid for somehow. If the job runs on KODAK Relief Plates, no ratio judgement is required. The water is simply turned off.

In the unlikely event that your printer doesn't know all about this, tell him to get in touch with Eastman Kodak Company, Graphic Arts Sales Division, Rochester, N. Y. 14650.



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



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Report from
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HIGH-SPEED SWITCH FOR MODERN TELEPHONE SYSTEMS

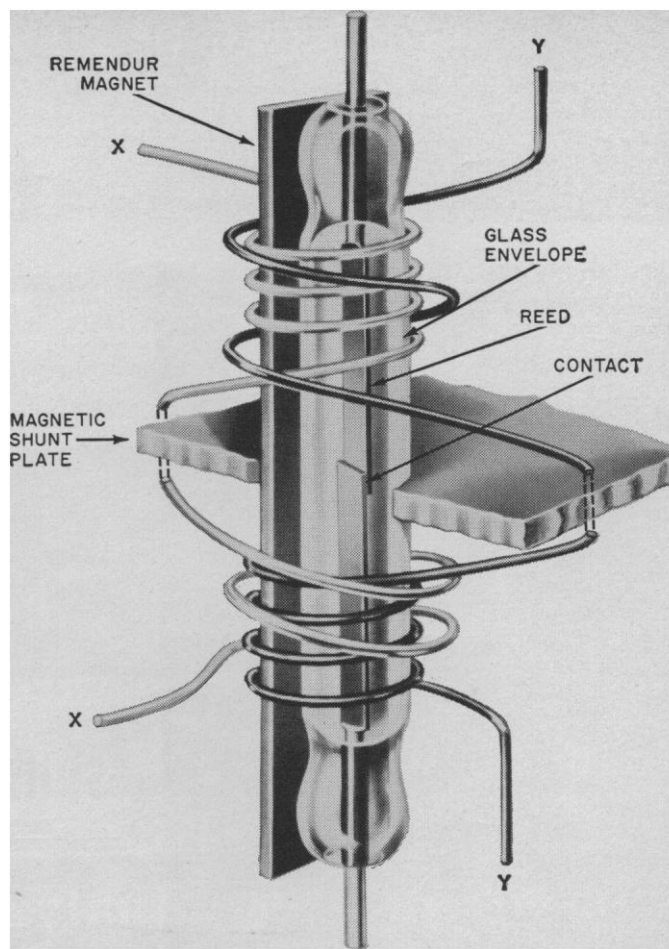
"Ferreed" switches are key elements in the talking paths for telephone conversations in the Bell System's new electronic central office. In setting up connections through the office, the appropriate ferreeds are closed under the direction of the system's central control unit.

As indicated in the drawing (top right), ferreed switches include glass-enclosed contacts operated by external magnets. Contacts close when central control causes short current pulses to energize the external magnets. A contact remains closed, without expenditure of additional power, until another pulse opens it.

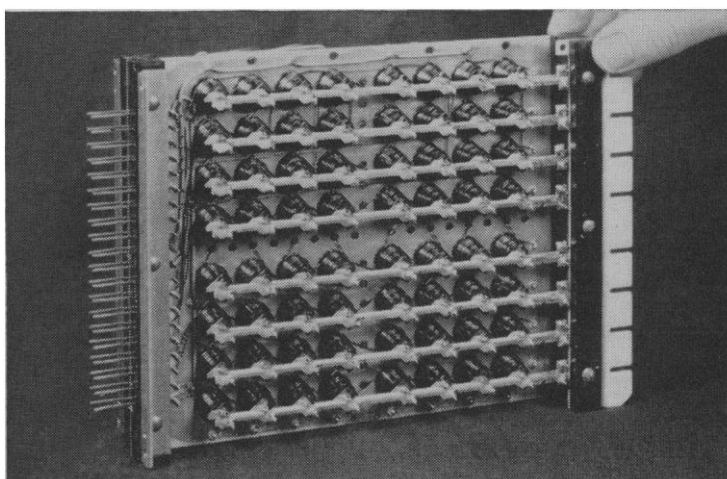
The name for the ferreed switch was coined from "ferrite," the material used in the external magnet when this device was first described by Bell Telephone Laboratories in 1960, and "reed," referring to the magnetic members inside the glass enclosure.

In its most recent form as developed at Bell Laboratories, Remendur is used in place of ferrite. Remendur, also a Bell Laboratories development, is a cobalt-iron-vanadium alloy with square hysteresis loop and values of coercive force intermediate between those of soft magnetic materials and permanent magnets. The device achieves fast contact closure (about a half millisecond) with even faster control pulses—characteristics that are compatible with the high-speed, versatile performance of modern telephone communication systems.

Bell Telephone Laboratories
Research and Development Unit of the Bell System



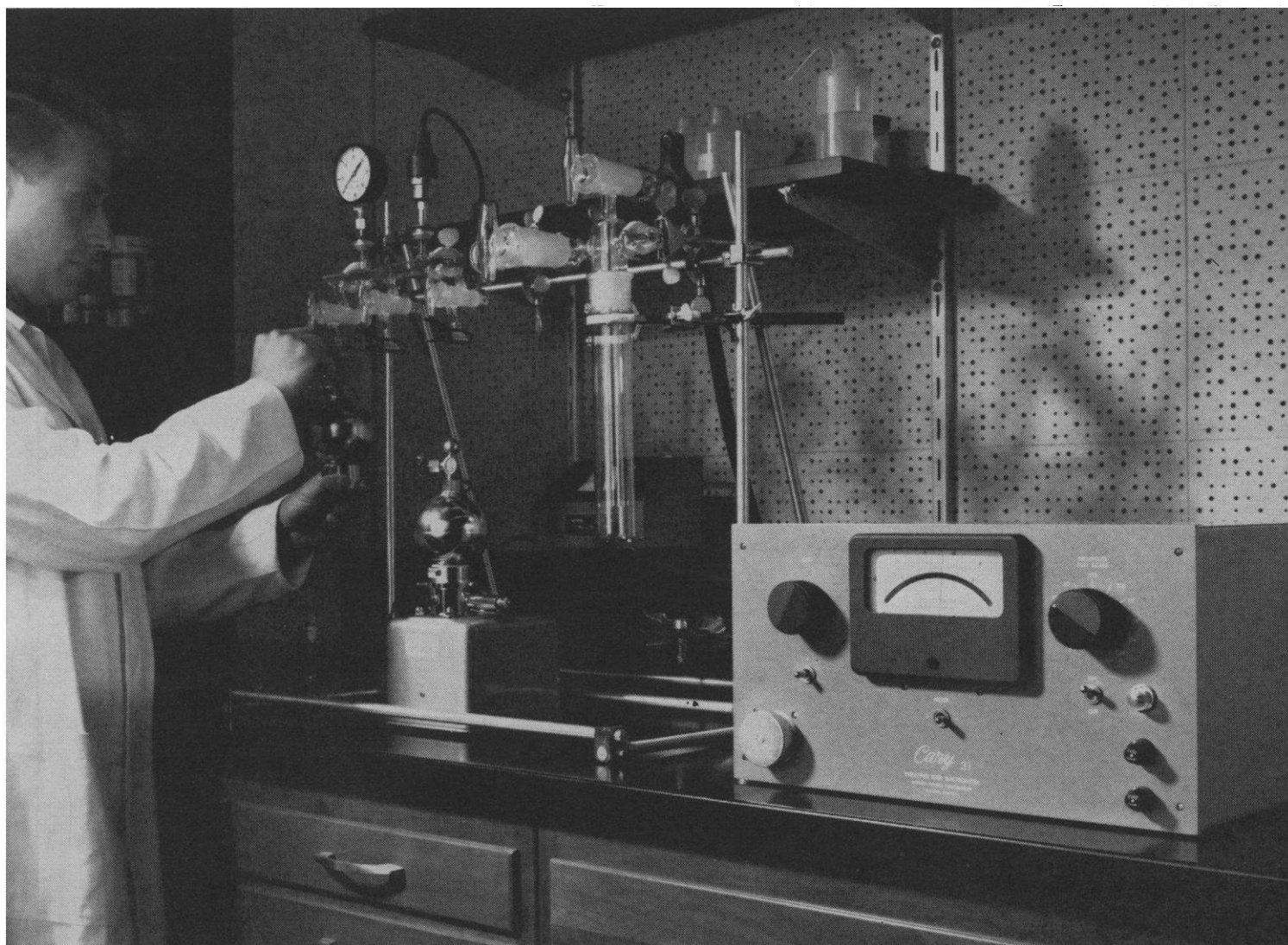
Concept of the ferreed in simplified form. Windings around magnet and glass-enclosed reeds are arranged in such a way that the contact is opened or closed in response to pulses of current on the x and y leads. For the closed state shown here, simultaneous pulses on both x and y leads effectively cause the Remendur to become one magnet. The two reeds are now magnetically attracted and the contact is closed. To open the contact, a pulse is applied to either the x or the y winding. This pulse effectively divides the Remendur into two magnets at the magnetic shunt plate. The ends of the Remendur then are both north (or both south) poles, and the contact is opened.



Typical array of 64 ferreed elements used as network crosspoints in electronic switching systems. Coincident current pulses on x and y leads (see drawing) permit operation of one ferreed crosspoint but not others in the same horizontal row and vertical column. Unit was carefully designed, in cooperation with the Western Electric Co., for efficiency of manufacture and economy.

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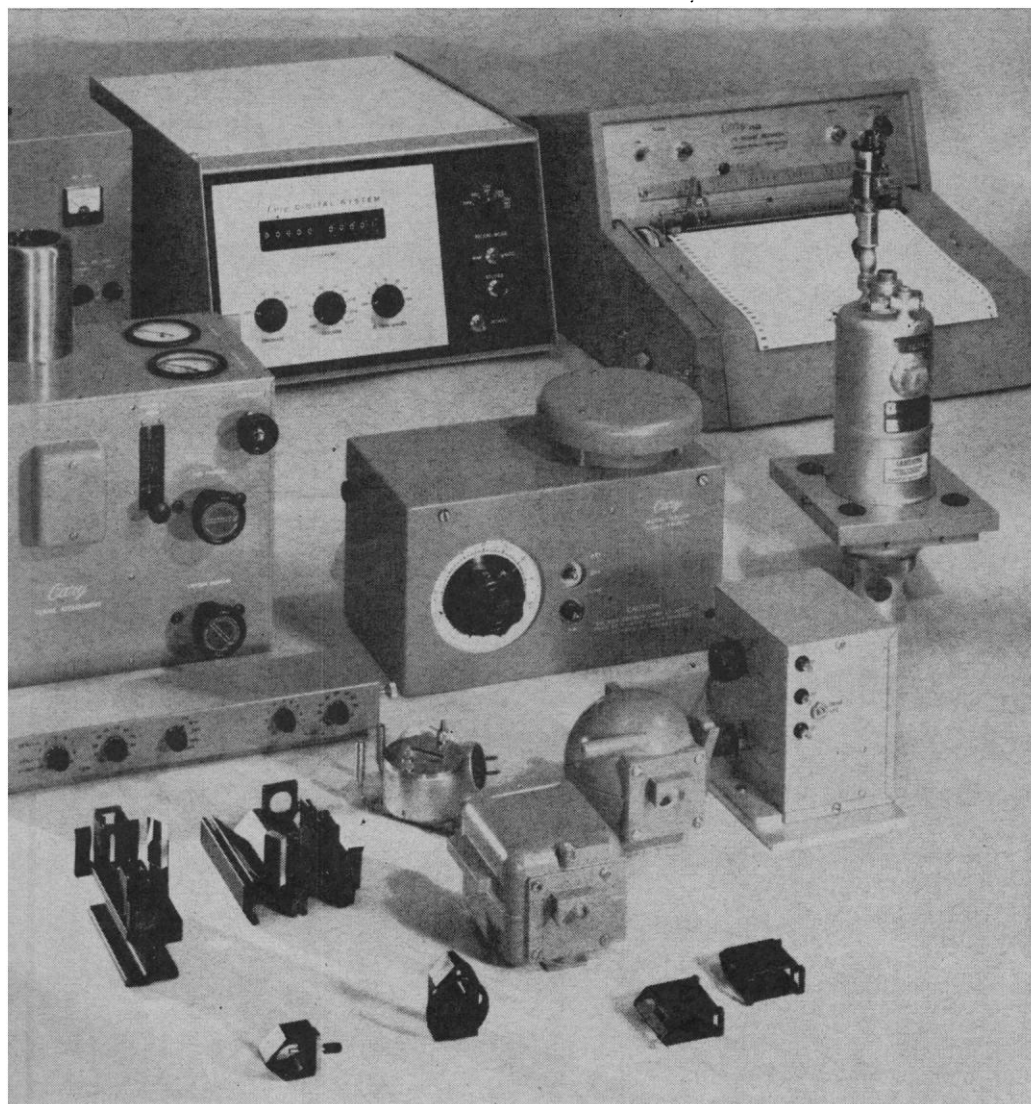
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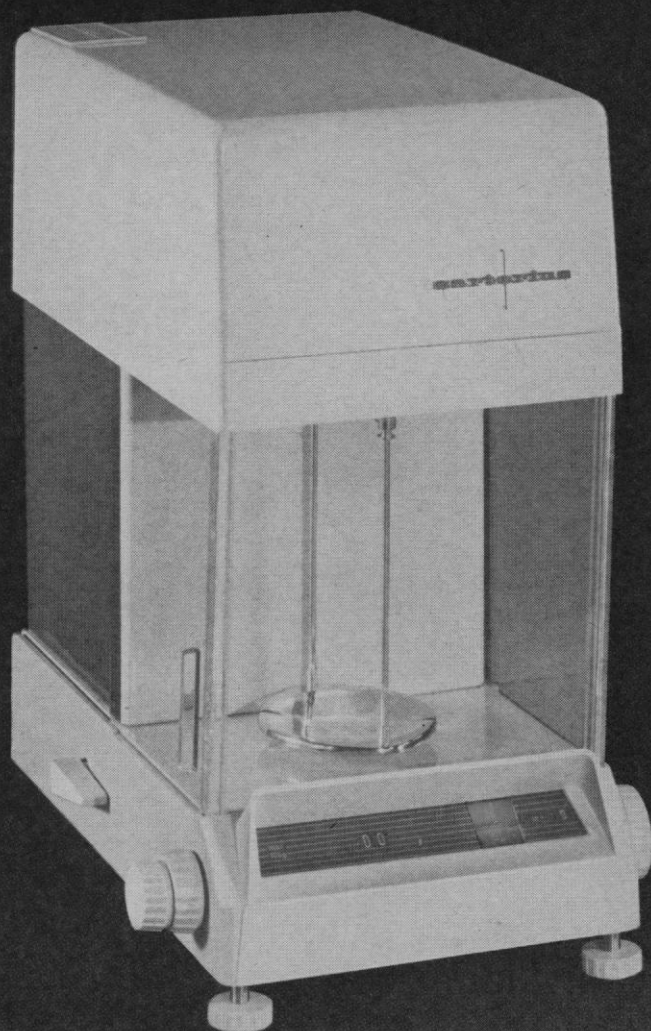
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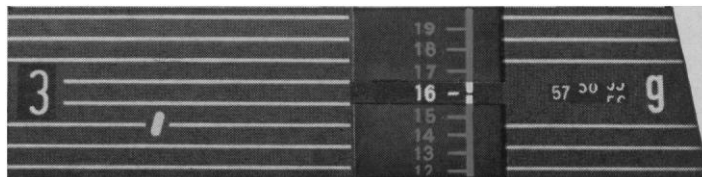
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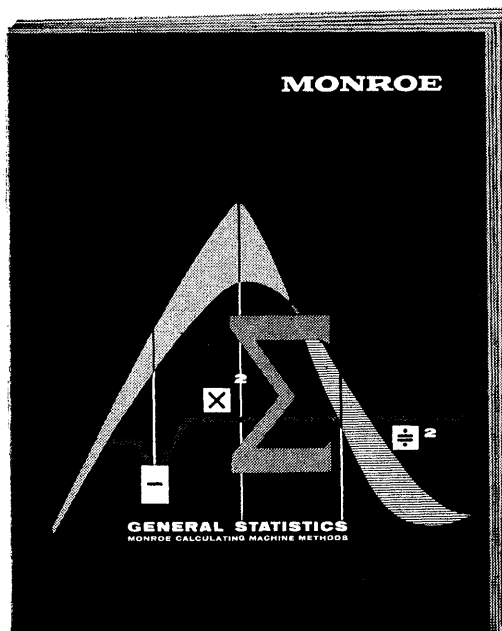
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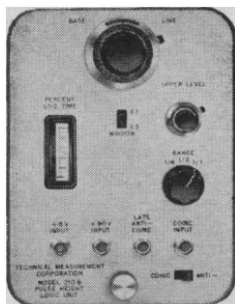
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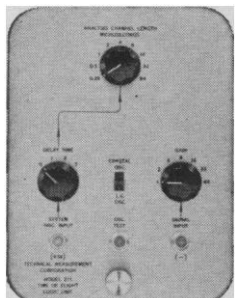
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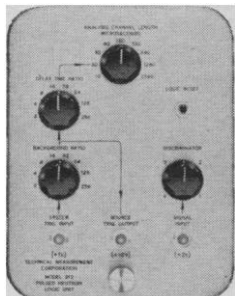
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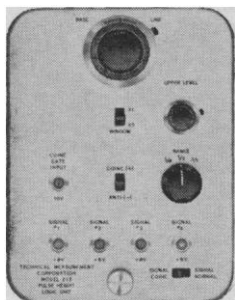
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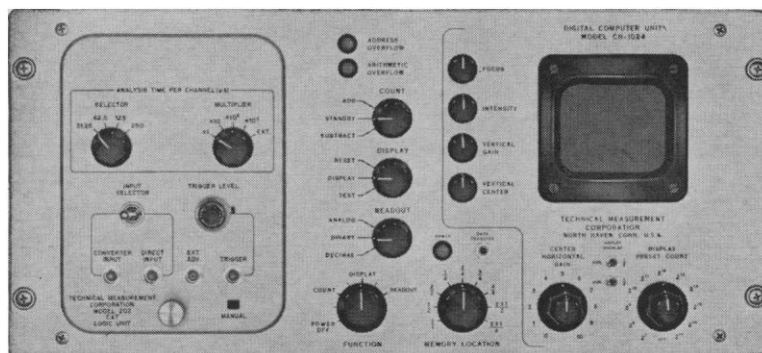
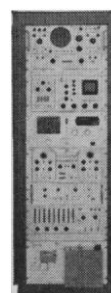
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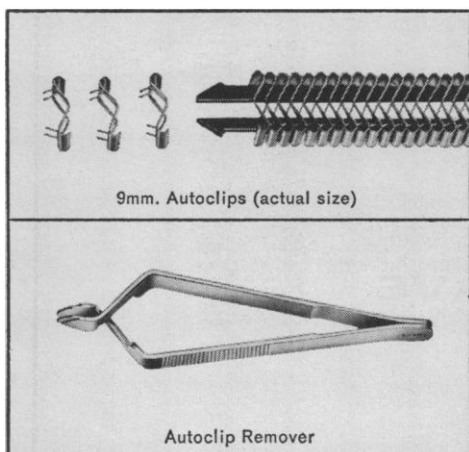
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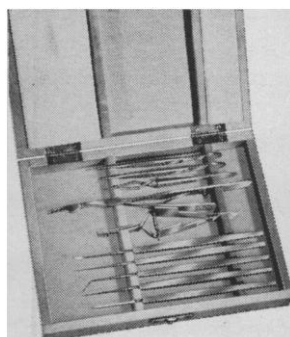
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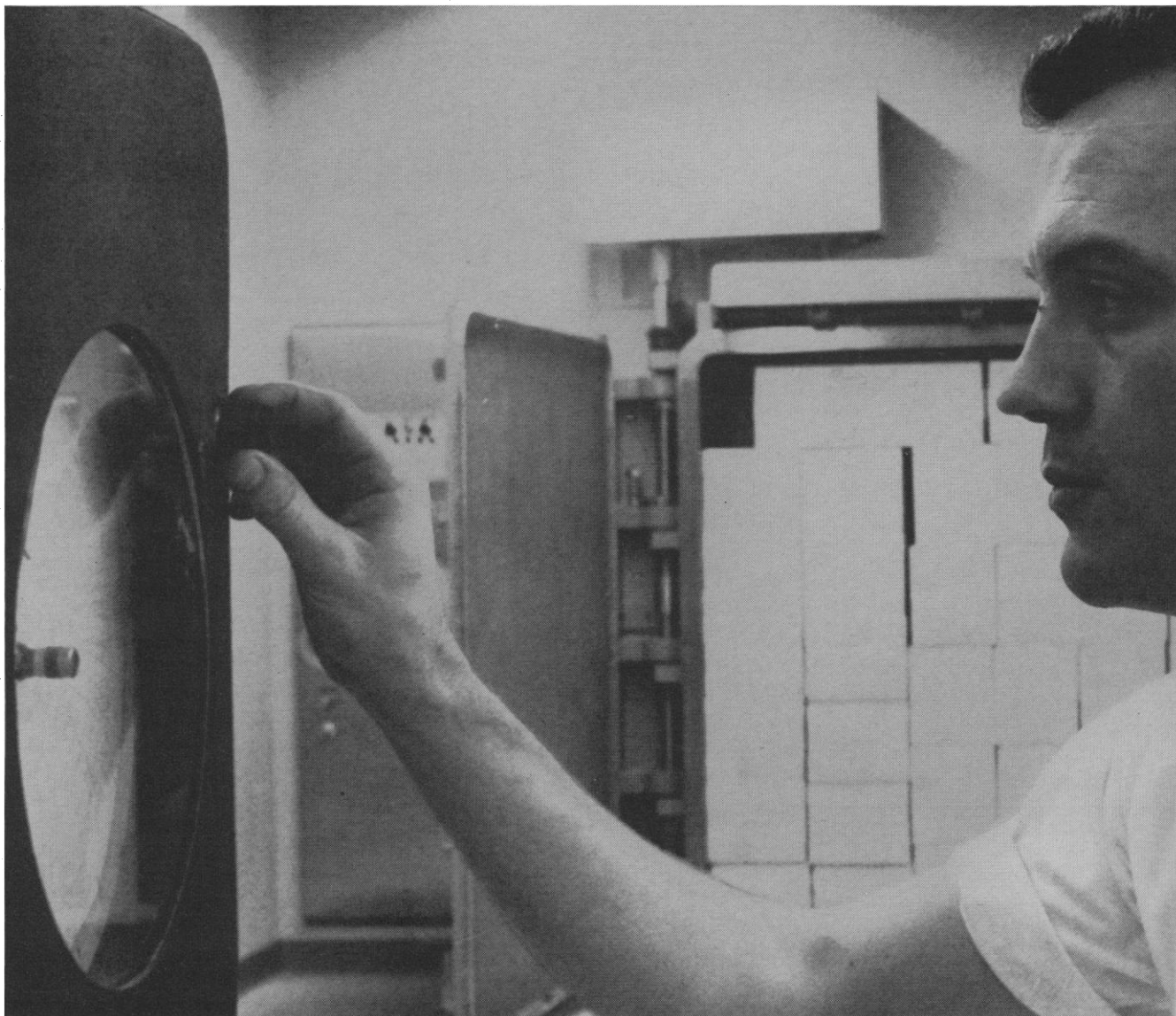
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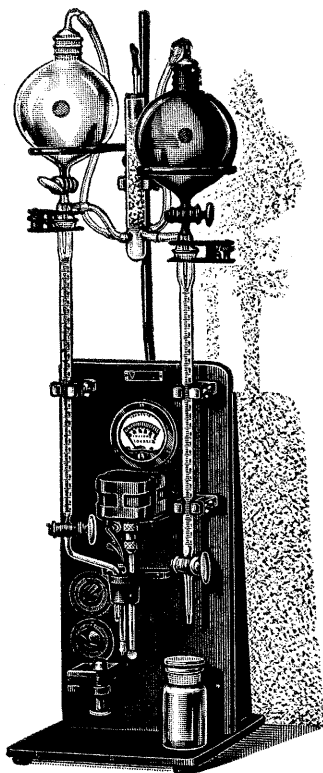
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addresses itself to a challenging and fascinating problem. The problem is frequently a timely one in that techniques have become available which offer a new leverage with which to pry answers from nature. These factors apply to the "fashionableness" of elementary-particle physics today. This field has very little trouble in attracting bright, imaginative, and creative people. The limitation at present lies not in the technology and not in the availability of interested scientists, but only in the availability of support for an expanding program. The planning of a reasonable level at which such support should be provided requires much careful thought and review. In indulging in this planning scientists must be careful not to cut off capriciously and completely any other promising field of study.

McVittie appears to resent the participation of scientists in the mass communication media of radio, TV, and the press. In view of the fact that large amounts of public funds are being spent for research programs in cosmology as well as in elementary-particle physics, it is not unreasonable or even undesirable that scientists should be eager to have their results quoted in the *New York Times* or to lecture on the BBC. If the public is not involved at some level in these programs, why should public funds be used for them? Scientists should be much more aware than they have been in the past of their responsibilities to the public. Scientific research in all fields is becoming more and more costly, and the motivation for carrying on this research must be very carefully examined and interpreted to the public if a stable program is to be achieved.

In one paragraph McVittie expounds the dangers to branches of science "where quick results are expected." In another he asks whether the total flux of energy from an extended source of radiation can be determined "satisfactorily and relatively quickly from the earth's surface" or whether it may "require an orbiting astronomical observatory." Why should anyone be motivated to get this information relatively quickly? I can answer for McVittie that all of us would like to see the questions that perplex us answered within our lifetimes. I can also answer that creative people will be attracted to a field of research only so long as there is some hope for their creativity to bear fruit within a time that will provide for them a satisfying professional career. As

the scale of apparatus that is required in various fields of research becomes ever larger, the time scale for accomplishing anything grows commensurately. It would be my guess that for the health of our science and probably for the health of our entire culture it is important that cosmologists should get their orbiting astronomical observatory, if it is feasible to launch and profitable to use, and that elementary-particle physicists should get their accelerators if these are feasible to construct and useful to have.

No one could take exception to McVittie's plea for careful planning. The costs for all these programs are large. Competition is not the end toward which we strive, but the human being is a competitive animal and as long as there are interesting things to do, more than one man of talent will be engaged in the doing. All would like the satisfaction of success. In a large sense, each scientist gets satisfaction from the success of another, but we all get special satisfaction, as well as recognition, from our own successes. We cannot abolish competition, but we should certainly not support hasty and slipshod work. Elementary-particle physicists are investing enormous time and effort in trying to establish a responsibly scaled program in their field. They need help from other scientists.

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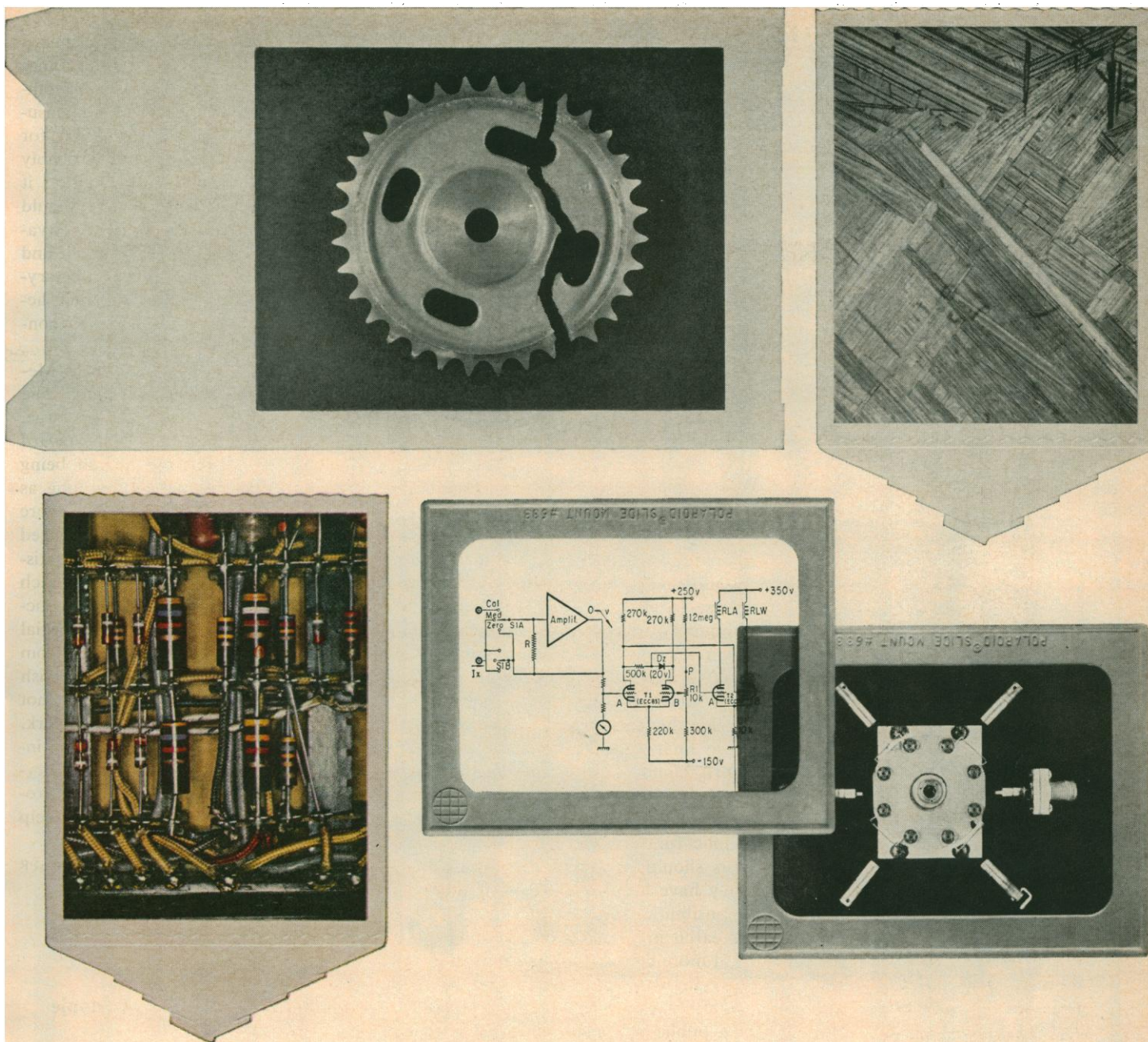
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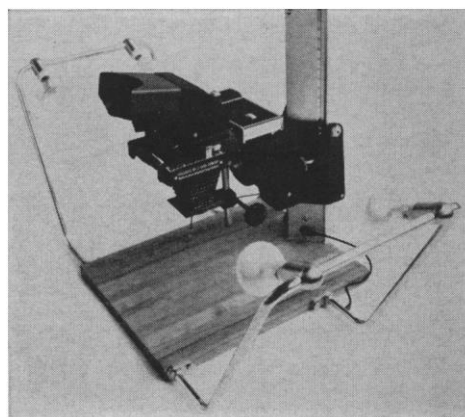
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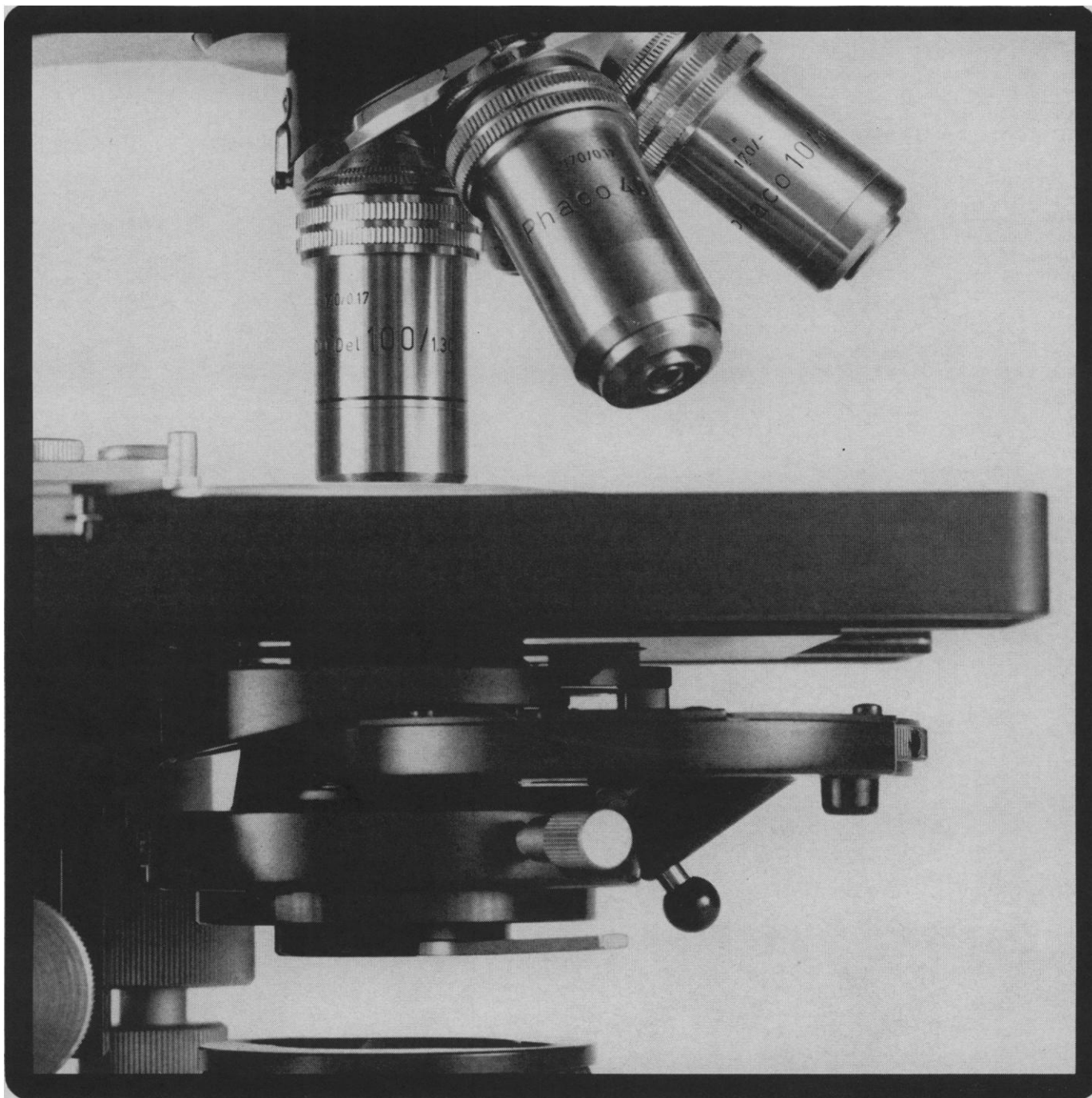
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A Pacific Tropical Botanical Garden

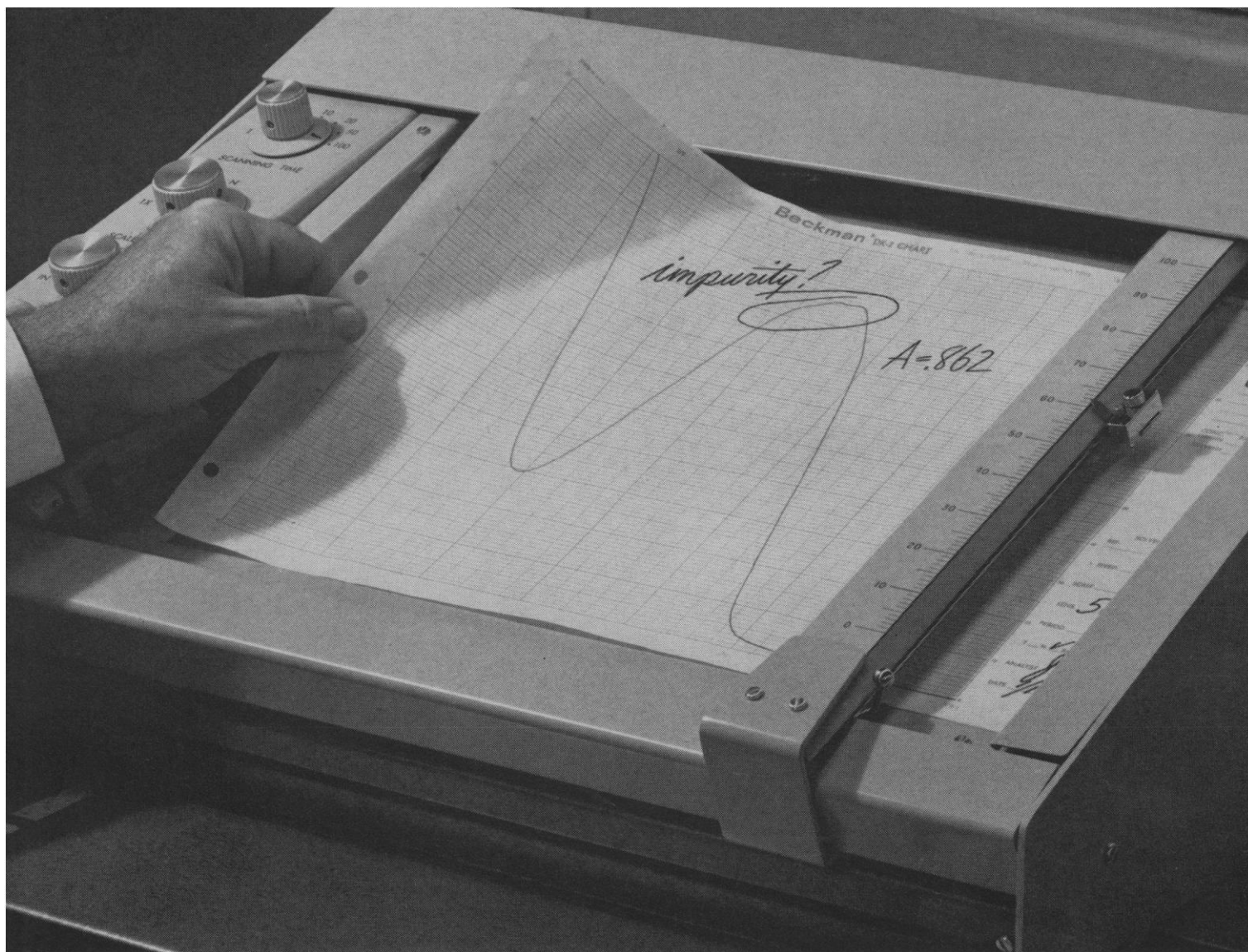
Public Law 88-449, signed by President Johnson on 14 August 1964, incorporating the Pacific Tropical Botanical Garden, sets in motion a proposal dating back to the mid-19th century. At that time William Hillebrand urged the importance of such a garden. The Foster Botanical Garden in Honolulu, a beautiful but small park, contains many of the exotics which he brought in. Since his day the need for an adequate collection of tropical plants and for facilities for their study has been urged by individuals and groups, both in the Islands and on the mainland.

The intrinsic attraction of tropical plants is obvious to any visitor to the Fairchild Gardens in Florida, or to the less accessible but superb horticultural garden at Lancetilla in Honduras. Not so widely understood is the scientific and economic importance of tropical plant life. During the vicissitudes of climate in cooler latitudes, the tropics have stood as a continuous reservoir of evolutionary process, producing a flora of incomparable richness, still imperfectly known. Our concepts of plant biology have been, and still are, largely based on experience in more impoverished regions. In that respect they are provincial and should be revised continually through the establishment of proper scientific facilities in the tropics and subtropics.

The enormous economic importance of plant life is often forgotten. The economy of our 50th state rests upon members of the plant kingdom—sugar cane and pineapple, not to mention beautiful cabinet woods and the lush green that delights thousands of visitors from the mainland. In future, it may become vital for Hawaii to diversify her production by developing resources other than cane and pineapple. Much of the superb and valuable indigenous growth of Hawaii was destroyed by livestock which Cook and Vancouver introduced before 1800. To protect her soils and water supply she has improvised a quick forest cover of eucalypts and other foreign trees whose dry, undecomposed litter does little to promote infiltration and storage of vital ground water. The economic potentials of her native species have been neglected and require investigation, as do those of a wide variety of non-native plants which could be grown in her soil. A proper botanical garden should be an asset not only to science but to the state and national economies.

A difficult but highly desirable aspect of the proposal is that the garden must be established and maintained by private gift. Through the generosity of Robert Allerton of Kauai and Chicago, a substantial sum has been made available to initiate study and work. The small group of incorporating trustees includes representatives from the Islands and the mainland, who use the offices of Oscar Chapman in Washington as their present clearinghouse. Active endorsement by individuals and groups from the several islands of Hawaii augers well for future voluntary support of the project.

It is perhaps in order to note that if a reasonable share of the wealth extracted and exported from Appalachia had been reinvested in the science, economy, and esthetics of that region, it would not be the distressed area that it now is. Hopefully, there are enough public-spirited citizens of Hawaii, and friends of the Islands on the mainland, to forestall so needless a deterioration in our new and beautiful Pacific state.—PAUL B. SEARS, *Department of Biology, Yale University*



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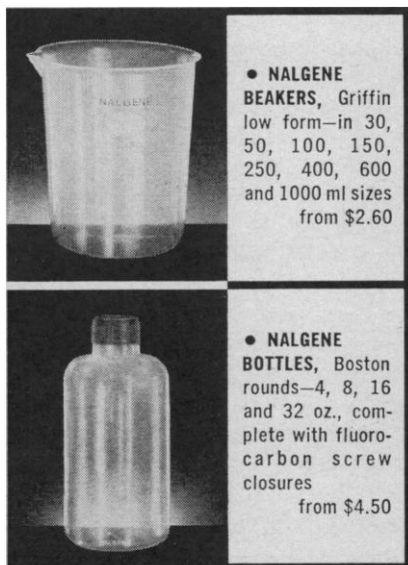
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nificance of propanediol and the isomers of lactaldehyde in intermediary metabolism.

The next session was concerned with relations between NAD-linked dehydrogenases in mammalian cells and the validity of the concept that the ratio of L-lactate to pyruvate (L/P) in the blood represents the state of reduction of the NAD systems within the cell. H. J. Hohorst (Marburg, Germany) presented detailed data supporting the concept that the NAD systems in the cytoplasmic compartment of the hepatic cells of the rat are in a steady state; the extracellular L/P was in good agreement with intracellular L/P for the liver cells. Endocrine effects on the ratios of reduced to oxidized forms of the substrates in the liver cells were profound, but the intersubstrate relations were maintained. Hoberman (Albert Einstein College of Medicine), using preparations of lactate labeled with H^3 and C^{14} in perfused rat liver, showed that the tritium equilibrated between lactate and malate within 10 minutes but that isotopic equilibration between the H^3 of lactate and glycerol-1-phosphate was much slower. The first observation supported Hohorst's hypothesis, while the second implied that glycerol-1-phosphate and dihydroxyacetone phosphate as a pair are not major contributors to the transfer of hydrogen across the mitochondrial membrane. H. Schimassek (Marburg) reported on extensive studies on relative substrate levels in perfused rat liver and the perfusion medium; hormonal influences on this preparation were of particular interest. Glucagon and epinephrine corrected the changes in glucose-6-phosphate and fructose-1,6-diphosphate that occurred on removal of the liver and increased uptake of L-lactate, while prednisolone decreased lactate uptake and increased L/P.

N. R. Alpert (University of Illinois), using normal and hepatectomized dogs, attempted to correlate the excess oxygen consumption of the recovery period with the removal of excess lactate. Although correlation was fairly good in normal dogs, the hepatectomized group had similar oxygen consumption in the presence of a greatly reduced rate of removal of excess lactate. Alpert's conclusion was that the two events were not causally related.

In the final session, devoted to clinical problems, R. H. Dunlop (Cornell) reported on the implication of D-lactic acid in the pathogenesis of a disease in ruminants that follows excessive con-

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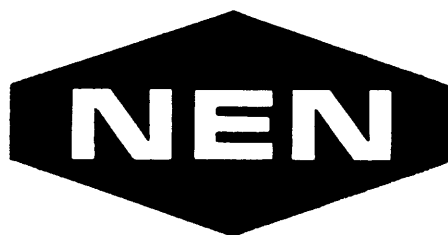
Co⁵⁷ (Fe⁵⁷) in Cu, Pd, Pt, Fe, and others.
Sn^{119m} (Sn¹¹⁹) in Sn, SnO₂, SnMg₂, and others.
I¹²⁵ (Te¹²⁵), Au¹⁹⁵ (Pt¹⁹⁵),
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SCIENCE, VOL. 147

sumption of feeds rich in starch or sugars. Bacterial fermentation in the rumen yields large amounts of L- and D-lactic acid in a hypertonic solution; D-lactate accumulates in the blood, leading to acidosis. D. I. Peretz (Vancouver General Hospital) correlated the severity of lactic acidosis with the irreversibility of shock in humans; isopropylnorepinephrine appears to be beneficial in some cases. J. B. Dossetor (Royal Victoria Hospital, Montreal) reported two cases in which the hyperlactatemia of pathological hyperventilation was alleviated by inhalation of 5 percent CO₂. L. S. James (Columbia University College of Physicians and Surgeons) discussed lactic acidosis in prenatal and newborn infants.

The conference was sponsored by the New York Academy of Sciences.

ROBERT H. DUNLOP

*New York State Veterinary
College, Ithaca*

Forthcoming Events

January

25-26. **Fundamental Phenomena in the Material Sciences**, 3rd annual symp., Boston, Mass. (D. B. Fay, Ilikon Corp., Natick Industrial Centre, Natick, Mass.)

25-26. **Viruses of Laboratory Rodents**, symp., Atlanta, Ga. (R. Holdenried, Natl. Cancer Inst., Natl. Institutes of Health, Bethesda, Md. 20014)

25-27. **American Inst. of Aeronautics and Astronautics**, New York, N.Y. (J. Bidwell, AIAA, 1290 Avenue of the Americas, New York 10019)

25-28. **American Meteorological Soc.**, annual, New York, N.Y. (K. Spengler, AMS, 45 Beacon St., Boston 8, Mass.)

25-28. **American Society of Heating, Refrigerating and Air-Conditioning Engineers**, Chicago, Ill. (R. C. Cross, 345 E. 47 St., New York 10017)

25-28. **Modern Methods of Analytical Chemistry**, 18th annual intern. symp., Baton Rouge, La. (P. W. West, Dept. of Chemistry, Louisiana State Univ., Baton Rouge)

25-28. **Cardiovascular Diseases**, 2nd natl. conf., Washington, D.C. (C. H. Maxwell, 9650 Wisconsin Ave., NW, Washington, D.C. 20014)

25-29. **American Mathematical Soc.**, Denver, Colo. (G. L. Walker, AMS, 190 Hope St., Providence, R.I.)

25-29. **American Soc. for Testing and Materials**, steel meeting, Mexico City, Mexico. (H. H. Hamilton, Public Relations, ASTM, 1916 Race St., Philadelphia, Pa. 19103)

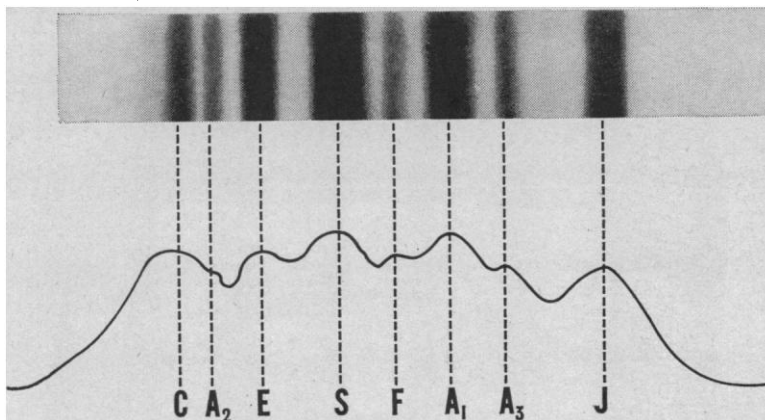
25-30. **American Library Assoc.**, Washington, D.C. (D. H. Clift, ALA, 50, E. Huron St., Chicago, Ill.)

26. **Quasi Stellar Radio Sources**, American Inst. of Physics, New York, N.Y. (E. H. Kone, AIP, 335 E. 45 St., New York)

15 JANUARY 1965

NEW FROM CANALCO

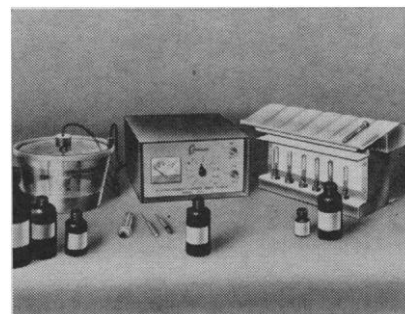
HEMOGLOBIN ANALYSIS



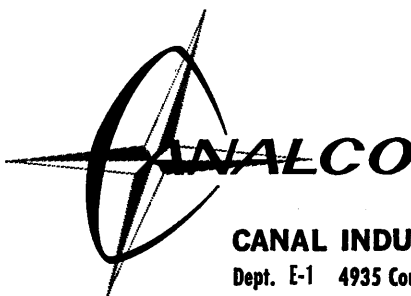
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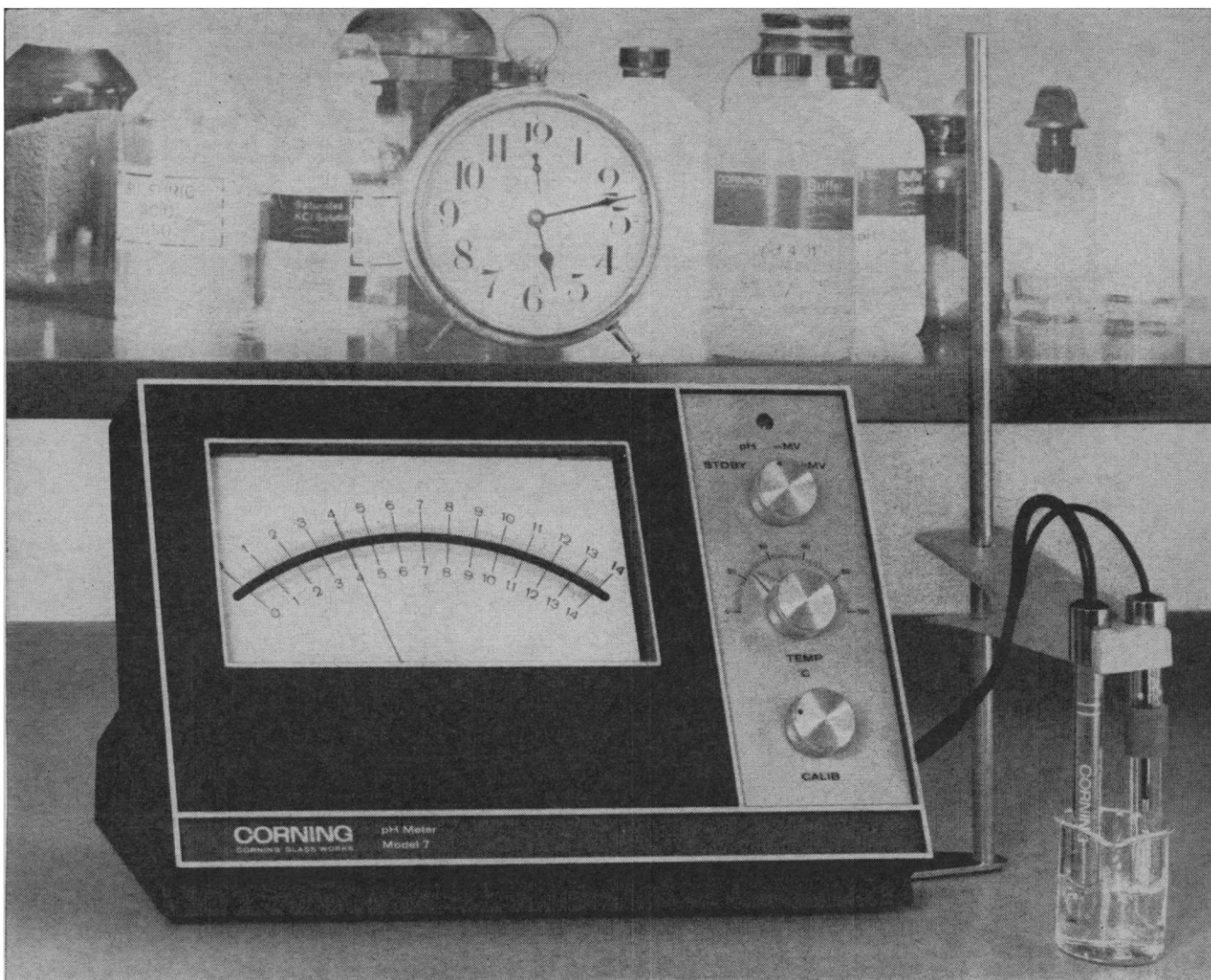


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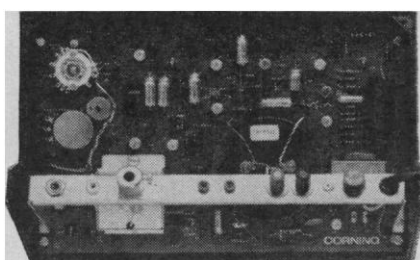
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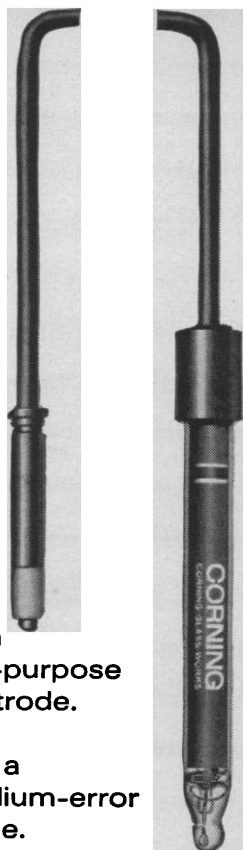
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15 JANUARY 1965

26. **Mossbauer Effect Methodology**, symp., New York, N.Y. (M. Ress, New England Nuclear Corp., 575 Albany St., Boston, Mass.)

26-29. **Canadian Pulp and Paper Assoc.**, technical, annual, Montreal. (Miss J. M. McKenzie, CPPA, Technical Section, 2280 Sun Life Bldg., Montreal 2)

27-30. **American Group Psychotherapy Assoc.**, annual, San Francisco, Calif. (AGPA, Inc., 1790 Broadway, Room 516, New York, N.Y. 10019)

27-30. **American Physical Soc.**, New York, N.Y. (K. K. Darrow, Pupin Physics Laboratory, Columbia Univ., New York 10027)

27-30. **Electrochemistry**, 5th seminar, Karaikudi-3, South India. (M. A. V. Devanathan, Central Electrochemical Research Institute, Karaikudi-3)

27-30. **Geological Soc.**, Southwestern Federation, Austin, Tex. (S. P. Ellison, Jr., Department of Geology, Univ. of Texas, Austin)

27-31. **Neurosurgical Soc. of America**, San Juan, Puerto Rico. (C. H. Davis, Jr., Bowman Gray School of Medicine, Winston-Salem, N.C.)

28-29. **Interactions of Man and His Environment**, symp., Chicago, Ill. (W. K. Stuckey, Dept. of Public Relations, 1802 Chicago Ave., Northwestern Univ., Evanston, Ill. 60201)

28-29. **Rheology Soc.**, winter meeting, Santa Barbara, Calif. (R. S. Porter, California Research Corp., Richmond Laboratory, 576 Standard Ave., Richmond, Calif. 94802)

28-30. **American Geophysical Union**, southwest regional, Socorro, N.M. (J. B. Franzini, Civil Engineering Dept., Stanford Univ., Stanford, Calif.)

28-30. **International Medical Assembly** of Southwest Texas, San Antonio. (S. E. Cockrell, Jr., 202 W. French Pl., San Antonio 12)

28-30. **Large-Scale Air-Sea Interaction**, symp., Bombay, India. (UNESCO, Office of Oceanography, Pl. de Fontenoy, Paris 7^e, France)

28-30. **Mathematical Assoc. of America** and **American Mathematics Soc.**, Denver, Colo. (H. M. Gehman, MAA, Univ. of Buffalo, Buffalo 14, N.Y.)

28-30. **Selected Topics in Cardiology**, conf., American College of Cardiology, Gainesville, Fla. (G. L. Scheibler, ACC, 350 Fifth Ave., New York, N.Y. 10001)

29-31. **Southern Radiological Conf.**, Point Clear, Ala. (M. Eskridge, P.O. Box 4097, Mobile, Ala.)

31-2. **Institute of Electrical and Electronics Engineers**, New York, N.Y. (C. A. Woodrow, c/o General Electric Co., 1 River Rd., Schenectady 5, N.Y.)

31-5. **Institute of Electrical and Electronics Engineers**, New York, N.Y. (E. C. Day, IEEE, Box A, Lenox Hill Station, New York 10021)

31-6. **International Festival of the Scientific Film**, Brussels, Belgium. (Cercle des Sciences. Université Libre de Bruxelles, 22 avenue Paul Heger, Brussels 5)

February

1-2. **Protein Conf.**, 19th annual, Rutgers Bureau of Biological Research, New Brunswick, N.J. (J. H. Leatham, Rutgers Univ., New Brunswick)

1-3. **Solid Propellant Rocket Conf.**, American Inst. of Aeronautics and Astronautics, Washington, D.C. (D. L. Raymond, AIAA, 1290 Avenue of the Americas, New York 10019)

1-3. **Myasthenia Gravis**, conf., New York Acad. of Sciences, New York. (NYAS, 2 E. 63 St., New York, N.Y. 10021)

1-4. **Information Storage and Retrieval**, American Univ., Washington, D.C. (American Univ. Center for Technology and Administration, 2000 G St., NW, Washington 20006)

1-5. **Gas Chromatography**, conf., Los Angeles, Calif. (H. L. Tallman, Physical Sciences Extension, Room 6532, Engineering Bldg., Univ. of California, Los Angeles 90024)

2-3. **American Soc. Tool and Manufacturing Engineers**, Die Design and Press Tooling, seminar, Detroit, Mich. (L. S. Fletcher, ASTME, 10700 Puritan St., Detroit 38)

2-4. **On-Line Computing**, Symp., Los Angeles, Calif. (T. Kramer, Engineering Extension, Univ. of California, Los Angeles 90024)

2-4. **Society of the Plastics Industry**, Reinforced Plastics Div. conf., Chicago, Ill. (C. L. Condit, SPI, 250 Park Ave., New York 10017)

3-5. **Southwest Chemical Assoc./Chemical Market Research Assoc.**, joint meeting, Houston, Tex. (H. F. Pfann, Enjay Chemical Co., 60 W. 49 St., New York 10020)

3-5. **Military Electronics**, Inst. of Electrical and Electronics Engineers, Los Angeles, Calif. (IEEE, 3600 Wilshire Blvd., Los Angeles 90005)

3-5. **Institute of Management Science**, annual, San Francisco, Calif. (F. L. Weldon, Matson Navigation Co., 215 Market St., San Francisco 5)

3-6. **Fatty Acids Seminar**, Council of Scientific and Industrial Research, Hyderabad-9, India. (G. Satyanarayana Rao, Council of Scientific and Industrial Research, Regional Research Laboratory, Hyderabad-9)

4-5. **American Soc. for Engineering Education**, college-industry conf., Pittsburgh, Pa. (L. N. Canjar, Carnegie Inst. of Technology, Pittsburgh)

5. **Parenteral Drug Assoc.**, New York, N.Y. (Parenteral Drug Assoc., Inc., Western Saving Fund Bldg., Broad and Chestnut Sts., Philadelphia, Pa. 19107)

6-9. **Medical Education**, annual, Chicago, Ill. (W. S. Wiggins, Council on Medical Education, American Medical Assoc., 535 N. Dearborn St., Chicago 60610)

7-11. **American Inst. of Chemical Engineers**, 55th national, Houston, Tex. (AIChE, 345 E. 47 St., New York, N.Y. 10017)

8-10. **American Astronautical Soc.**, annual, Denver, Colo. (Miss G. W. Heath, Flight Safety Foundation, 468 Park Ave. S., New York 10016)

8-11. **Managerial Implications of the Emerging Technology**, Washington, D.C. (P. W. Howerton Center for Technology and Administration, American University, 2000 G St., NW, Washington 20006)

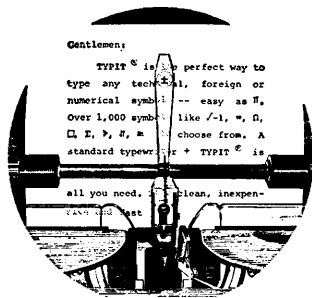
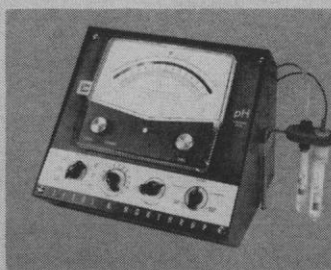
8-12. **American Soc. for Testing and Materials**, spring meeting, Cleveland, Ohio. (ASTM, 1916 Race St., Philadelphia, Pa.)

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Jerome Lejeune, Institut de Progenèse, Faculté de Médecine, Paris, France

"Summary of Technical Problems"

Harry S. Eagle, Albert Einstein College of Medicine, New York City, N.Y.

"Introduction to the Study of Markers in Cell Culture"

Stanley M. Gartler, University of Washington School of Medicine, Seattle, Wash.

"Study of the H-2 Locus in Murine Cell Culture"

Leonard A. Herzenberg, Stanford University School of Medicine, Palo Alto, Calif.

"Study of Galactosemia, Acatasemia, and Other Human Metabolic Mutants in Cell Culture"

Robert S. Krooth, University of Michigan Medical School, Ann Arbor, Mich.

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"Polyoma Virus," Klaus E. Bayreuther, California Institute of Technology, Pasadena, Calif.

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Ann Arbor

10-11. Corrosion of Water Supply Systems, 7th sanitary engineering conf., Urbana, Ill. (B. B. Ewing, Univ. of Illinois, Urbana)

10-12. American Educational Research Assoc., annual, Chicago, Ill. (R. A. Dershemmer, 1201 16th St., NW, Washington, D.C.)

10-12. National Assoc. Corrosion Engineers, conf., Calgary, Canada. (T. J. Hull, NACE, 980 M&M Bldg., Houston, Tex. 77002)

10-13. National Soc. of College Teachers of Education, annual, Chicago, Ill. (E. J. Clark, Indiana State College, Terre Haute)

10-13. American College of Radiology, annual, Philadelphia, Pa. (F. H. Squire, Presbyterian-St. Luke's Hospital, 1753 West Congress St., Chicago, Ill. 60606)

11-13. Biology of Human Variation, conf., New York Acad. of Sciences, New York, N.Y. (NYAS, 2 E. 63 St., New York 10021)

12. Science Programs for General Education and the Preparation of Elementary Teachers, conf., Long Beach, Calif. (A. F. Eiss, National Science Teachers Assoc., 1201 16th St., NW, Washington, D.C. 20036)

13-15. National Assoc. for Research in Science Teaching, annual, Chicago, Ill. (J. D. Novak, Bio-Science Dept., Purdue Univ., Lafayette, Indiana)

14. Scientific Conference on Psychoanalysis, 3rd annual, Council of Psychoanalytic Psychotherapists, Inc., New York, N.Y. (Miss M. Nelson, 1965 Conference Program, Box 255, East Setauket, Long Island, N.Y.)

14-18. American Inst. Mining, Metallurgical and Petroleum Engineers, annual, Chicago, Ill. (R. W. Taylor, AIME, 345 E. 47 St., New York, N.Y. 10017)

14-17. German Foundation for the Developing Countries, Public Health Training Problems in Asia, intern. seminar, Berlin, Germany. (GFDC, Tagungsreferat, Agrippinenstrasse 10, 53 Bonn, Germany)

14-18. Society of Economic Geologists, annual, Chicago, Ill. (E. N. Cameron, Room 30, Science Hall, Univ. of Wisconsin, Madison)

15-17. Flight Testing Conf., American Inst. of Aeronautics and Astronautics, Huntsville, Ala. (D. L. Raymond, AIAA, 1290 Avenue of the Americas, New York, N.Y. 10019)

15-17. American Standards Assoc., Inc., Chicago, Ill. (ASA, Inc., 10 E. 40 St., New York, N.Y. 10016)

15-20. Impact of Mendelism on Agriculture, Biology, and Medicine, intern. symp., New Delhi, India. (A. T. Nataraajan, Secretary, Indian Soc. of Genetics and Plant Breeding, Division of Botany, Indian Agricultural Research Inst., New Delhi 12)

17. Use of Enzymes in the Food Industry, seminar, New York Inst. of Food Technologists, Inc., New York, N.Y. (A. Bolaffi, Jell-O Division Laboratories, General Foods Technical Center, Tarrytown, N.Y.)

17. Colors in Food, seminar, New York Inst. of Food Technologists, Inc., New York, N.Y. (A. Bolaffi, Jell-O Division Laboratories, General Foods Technical Center, Tarrytown, N.Y.)