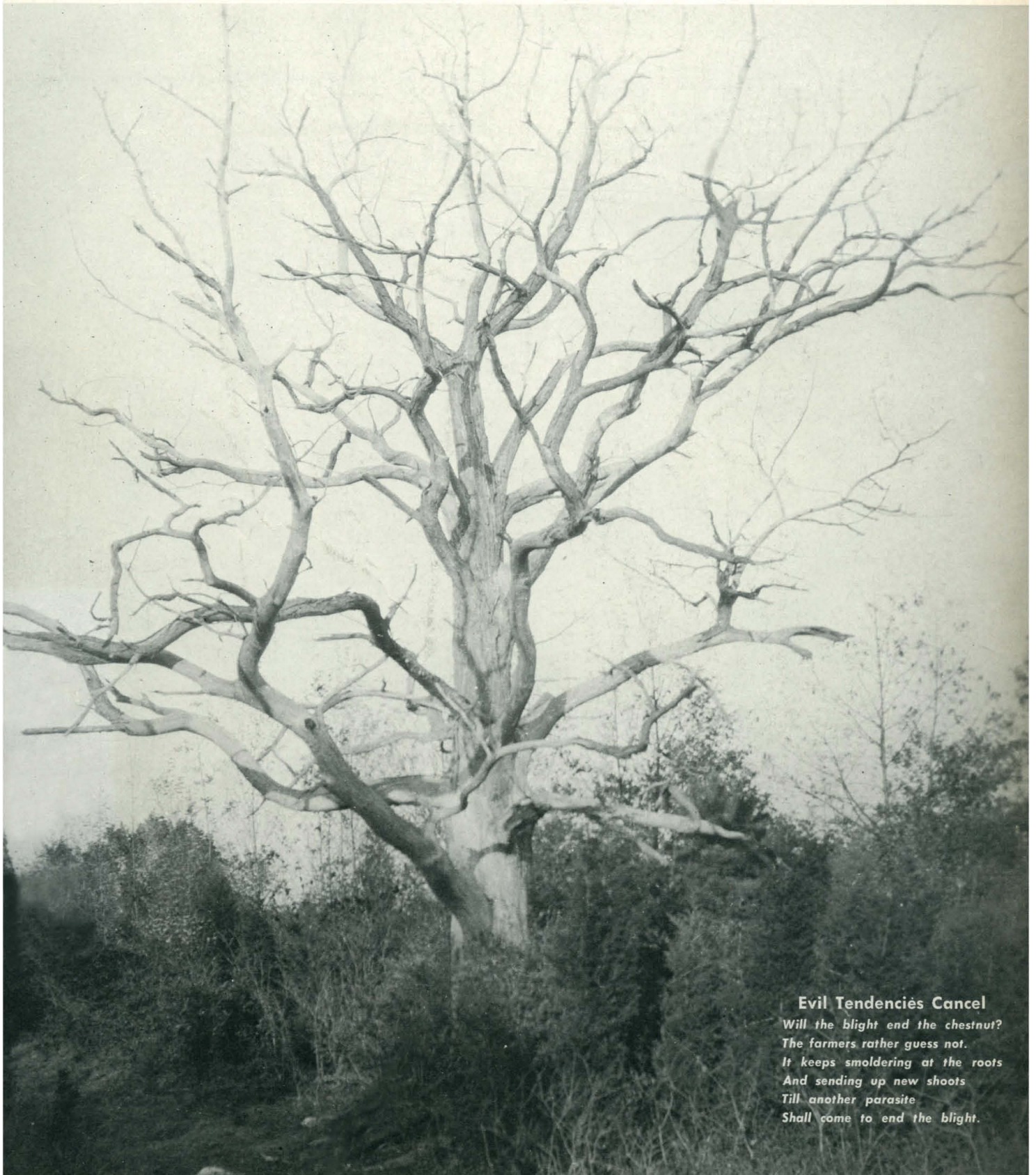


SCIENCE

12 September 1975

Volume 189, No. 4206

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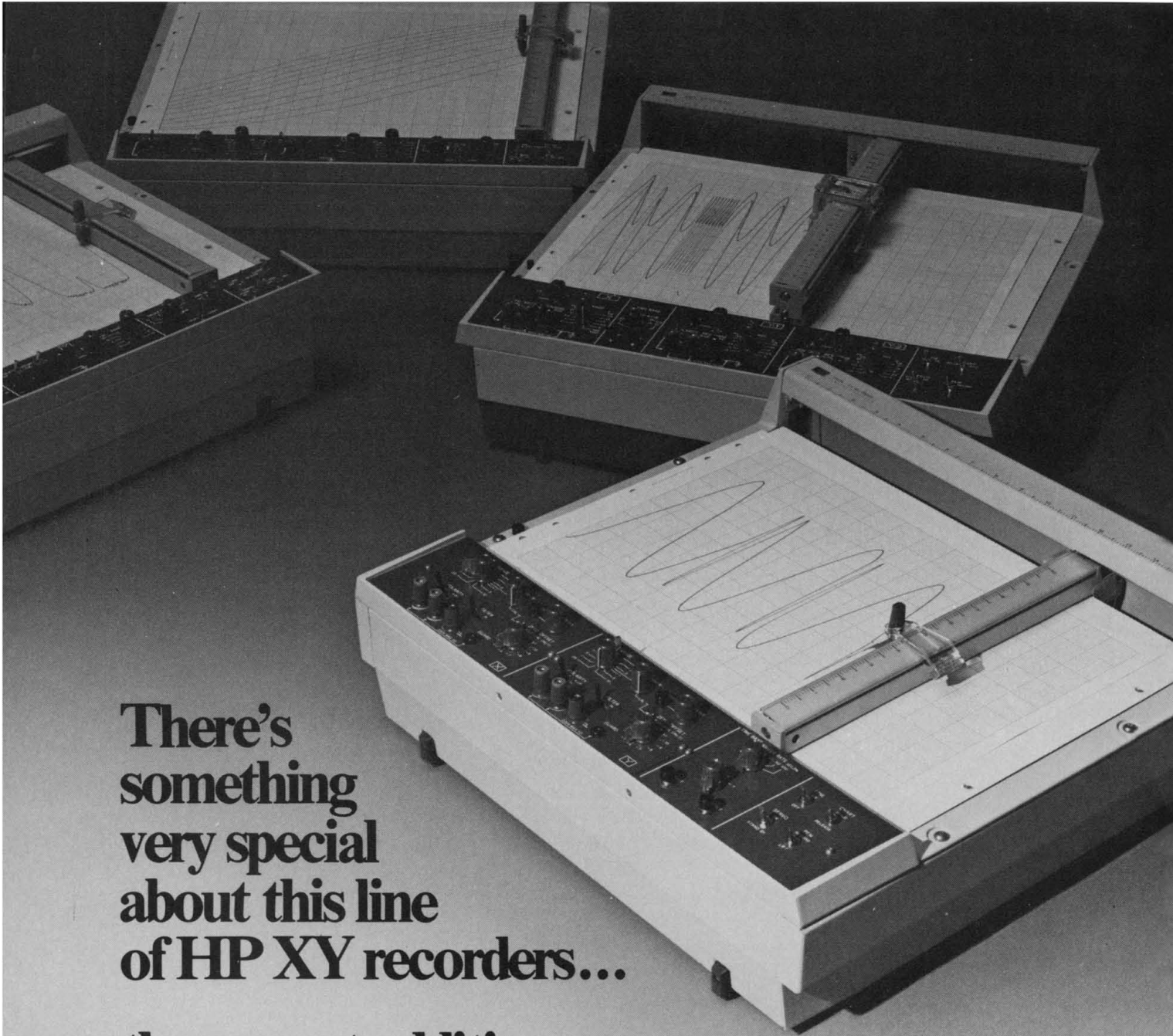
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Photograph, taken in 1922, of American chestnut tree (*Castanea dentata*) after being killed by the chestnut blight fungus (*Endothia parasitica*). This pathogen, introduced from Asia, destroyed a major U.S. forest tree species. See page 890. [Connecticut Agricultural Experiment Station, New Haven; poem from *Complete Poems of Robert Frost*, Holt, Rinehart and Winston, New York, 1949]

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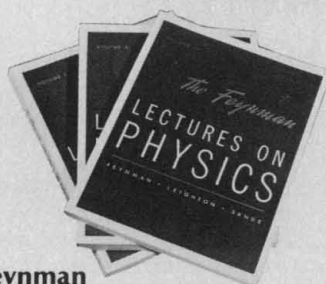
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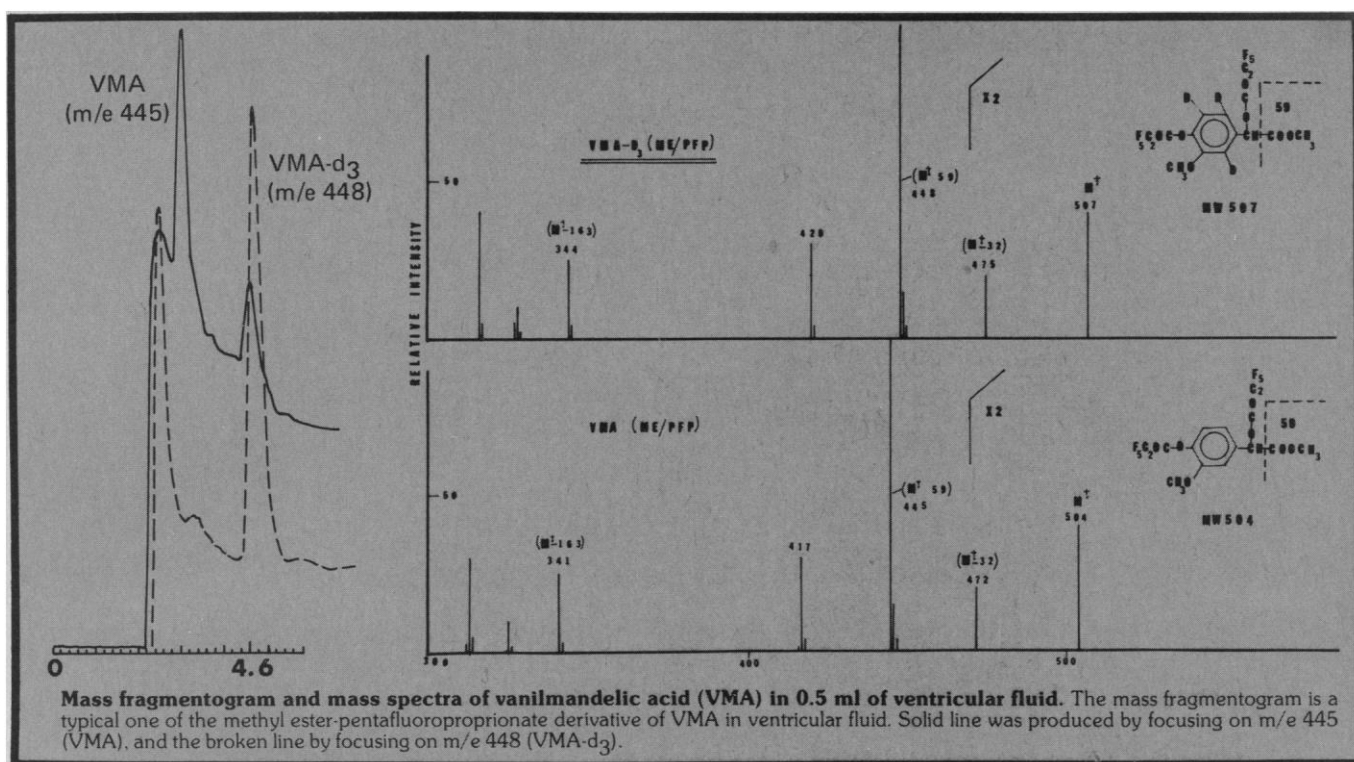
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The quantitation of these amines and their metabolites is important for understanding how the central nervous system works in health and disease. To this end, several scientists at the Division of Special Mental Health Research, NIMH are dedicated. At present, mass fragmentography is being used extensively to measure different biogenic amines and their metabolites in CSF (1) and brain tissue (2, 3).

Vanilmandelic Acid (VMA)

It has been assumed that VMA is a minor metabolite of central nervous system norepinephrine and of little importance. The results of recent work by NIMH scientists suggests, however, that VMA may be an important catecholamine metabolite in man. The mass spectra and mass fragmentogram above show typical results of assays of VMA in 0.5 ml of ventricular fluid obtained during neurosurgical procedures in nine patients (1). The mean (\pm SEM) content of VMA was 3.08 \pm 0.60 ng/ml.

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(1) F. Karoum, C. Gillin, R. J. Wyatt, Human cerebrospinal fluid (CSF) of biogenic amine metabolites. *Federation Proceedings* (1975) **34**, 146.

(2) F. Karoum, F. Cattabeni, E. Costa, C. R. Ruthven, and M. Sandler, Gas chromatographic assay of picomole concentrations of biogenic amines. *Analytical Biochemistry* (1972) **47**, 550.

(3) F. Cattabeni, S. H. Koslow, and E. Costa, Gas chromatographic-mass spectrometric assay of four indole alkylamines of rat pineal. *Science* (1972) **178**, 166.

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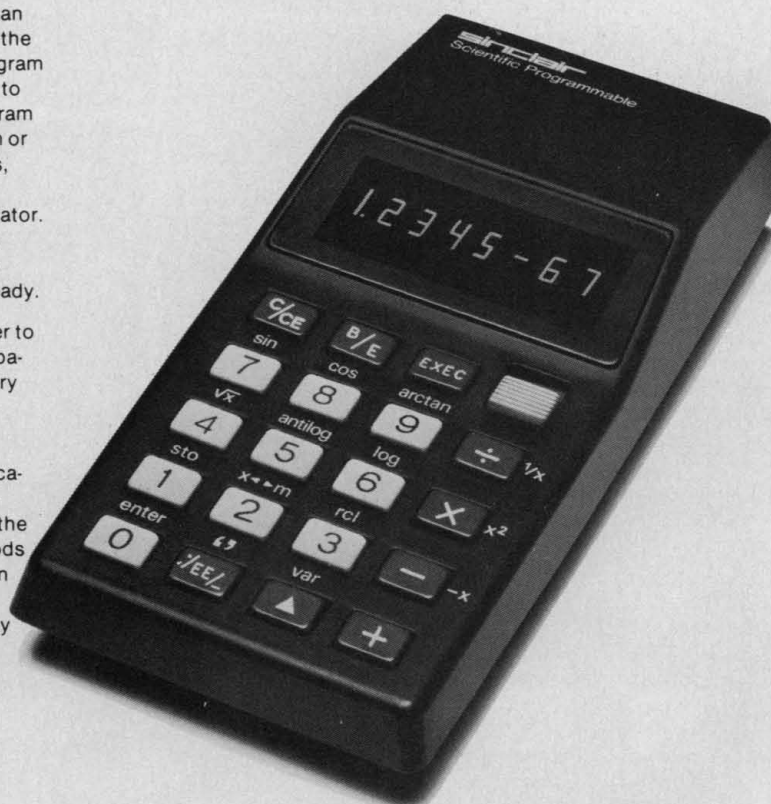
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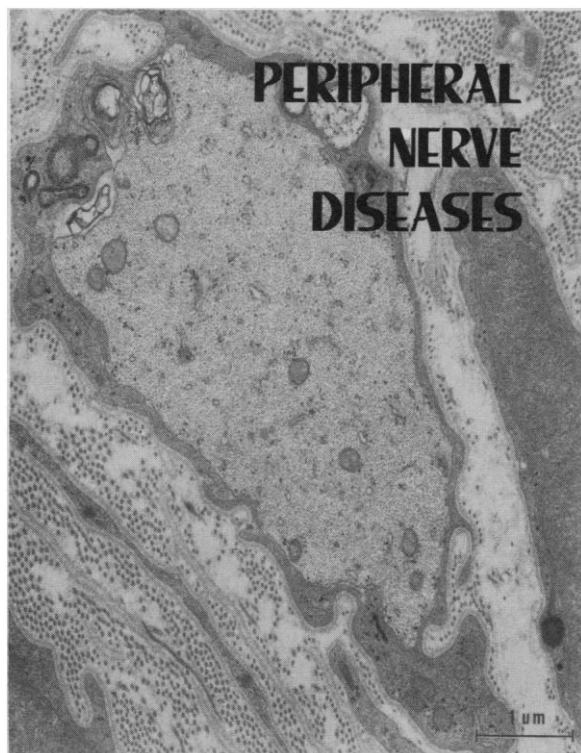
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P. K. Thomas, MD, DSc, FRCP, Royal Free Hospital, London

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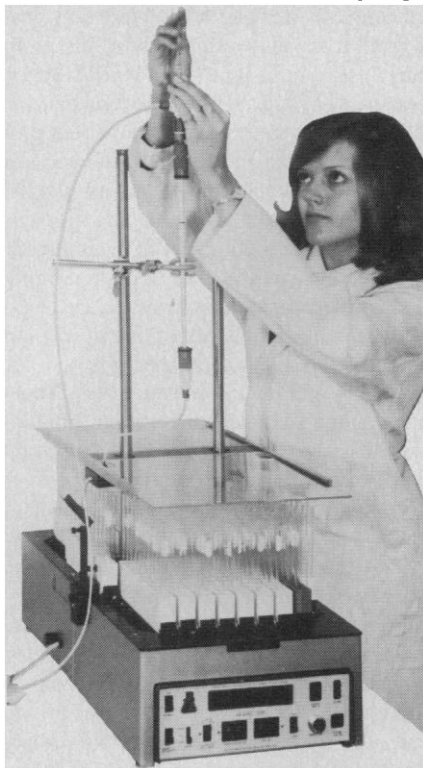
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to support the *belief that psychosis was increasing* [italics added] in modern society, and no systematic data have yet appeared to alter . . . [this] conclusion." The subtlety of this distinction could be missed by the casual reader. The italicizing of *Western* by Barocas so it "should not be taken lightly" adds nought to the original, since throughout the discussion, I repeatedly mentioned Western society to specifically indicate that no attempt was being made to discuss or imply the biology of the species. Barocas agrees that insufficient data exist to make such comparisons, and I fail to see how I can discuss or make comparisons to nonexistent data.

After readily accepting Torrey's very useful discussion of schizophrenia across races, cultures, and nations (factors which are literally unmanageable sources of unreliability), Barocas then raises the issue of the unreliability of psychiatric diagnoses—a notorious and tedious, but valid, issue that has plagued all of us doing research and study in this area these past 25 years. Yet these are the data we have, so either we cautiously use them or we accept the "no data" beliefs and conjectures of those who state that psychosis is on the increase.

Barocas's comments and additions regarding rates of armed forces psychosis deal with psychiatric discharges and psychiatric disturbances in general, not psychosis *rates*. We are well aware of the changes in practice in triage, treatment, and so forth, but I discussed *rates* of psychosis according to available data. Considering the extensive literature on psychiatric epidemiology, it is difficult to understand Barocas's utilization of summary reports and an introductory textbook on abnormal psychology for an evaluative reference base. While he mentions British versus American diagnostic differences, he glosses over the greater reliability of the British psychiatrists. The pioneering work of Zubin and others in the joint United States-United Kingdom project mentioned by Barocas demonstrated what can be accomplished in this regard with assiduous training and study and reflects a frustrating neglect to date by American psychiatrists.

As for the comments regarding factors influencing access to treatment, these were beyond the scope of the article. Even cursory familiarity, however, with the extensive psychiatric and sociologic literature on health-care utilization and delivery indicates acceptance of the role, not only of economic resources, but also of social class, geography, transportation, population density, religious beliefs, cultural values, tolerance of deviancy, and so forth, and so forth. But I was merely discussing hospitalization effects per se, not why and how they get there to begin with.

As for the observation that halfway houses and sheltered workshops are in the community, Barocas does not note my discussion of a continuum of treatment and the "indiscriminate" all-or-none utilization of community treatment—key points in the article—until his final paragraphs.

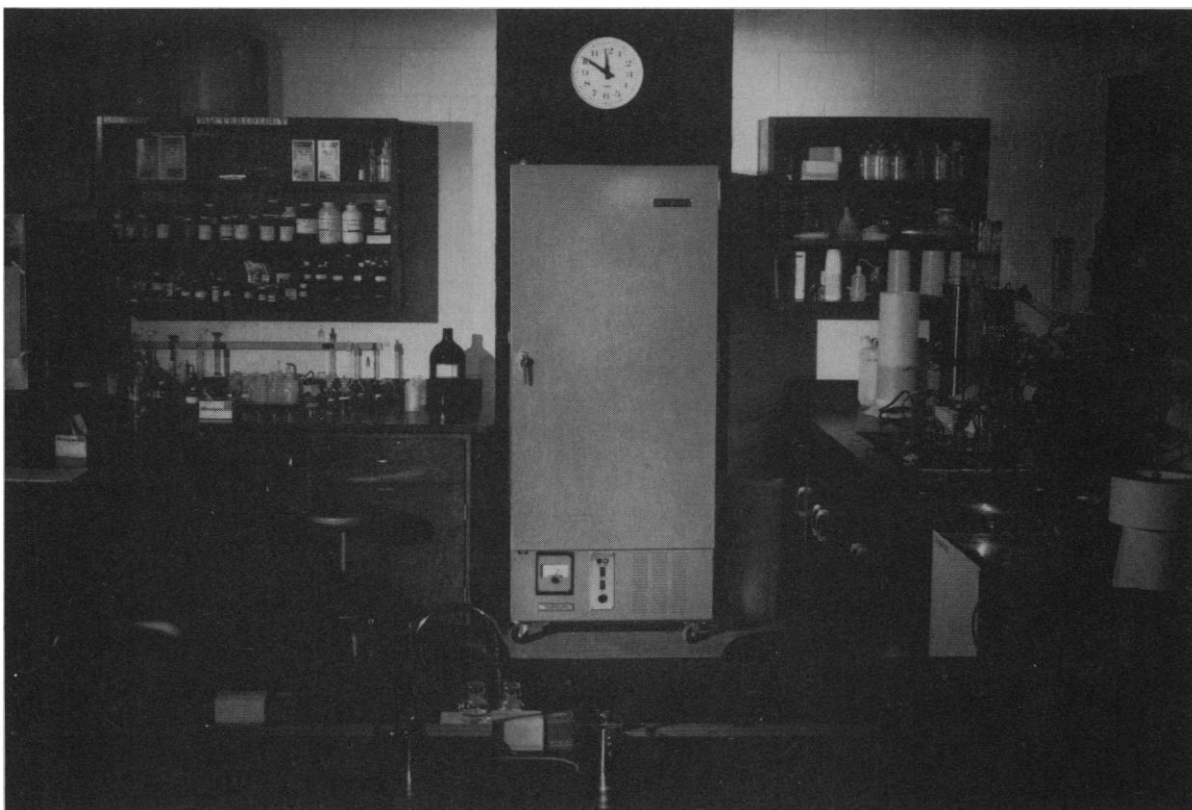
Regarding early intervention programs that support "healthy behavior," this value-laden concept, along with "positive mental health," suffice it to say, has not produced definitions which are even reasonably reliable, valid, or measurably precise. No systematic data have appeared to support claims of primary prevention, and precious little controlled data have been found to show prevention of much of anything. Yet, such program developments and acceptance are precisely the sort of value-laden, politically initiated, global efforts the article deals with and which continue to divert resources, funds, and manpower from the care and treatment of major mental illness. As to my dismissal of "mental health" as a euphemism, again, this nowhere occurs in the article. Let reader Barocas consult my article and the cited references to understand the historical context in which the term arose, and whence its usage spread, as it was stated by me.

As for an "implicit leap to the speculation of eugenic solutions . . .," I neither inferred nor suggested all the evils that seem to disturb Barocas. A careful reading of my article would show that my interest lies in *less* rather than *more* ill-conceived social meddling. A paragraph, however, which might have been more helpful to Barocas, regarding the need for birth control advice, counseling, and so forth for young psychotics, was deleted in the editing process.

The recent Supreme Court decisions mentioned by Barocas are laudatory for their protection of civil liberties, but have absolutely no relevance to what I stated, again unless Barocas believes not discussing these decisions implies advocacy of involuntary commitment, indentured servitude, and so forth. His point does reinforce the article's theme of the shabby treatment, or nontreatment, in the publicly supported hospitals.

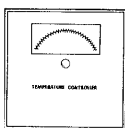
Essentially, my article detailed what might be facetiously titled: "There's no such thing as a free lunch"—an idea which to many is abhorrent, since it directs thought to unpleasanties which ultimately are paid for. While conclusions other than those the writer intended may always be drawn, an author always hopes that the reader is able to keep clear what is author-stated and reader-interpreted.

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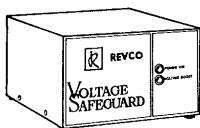
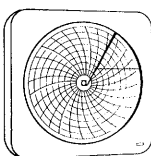
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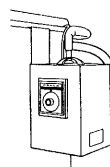
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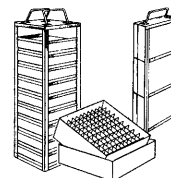
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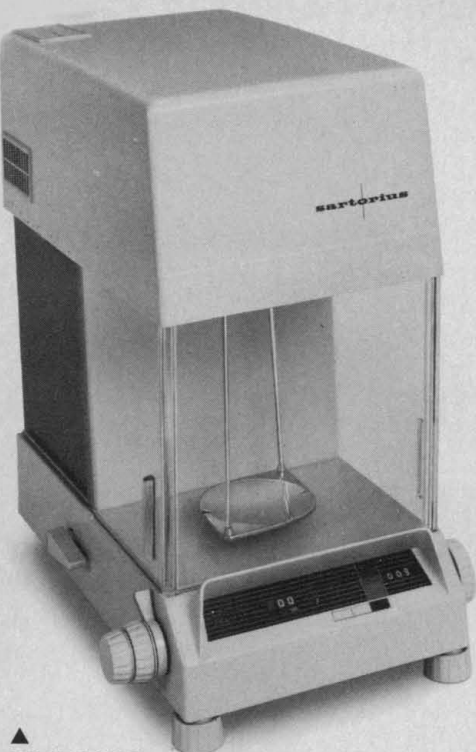
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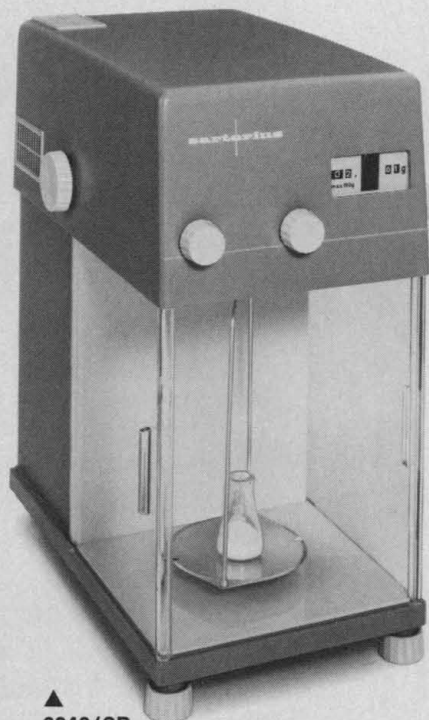
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The Centenary of Forestry in America

A century ago, on 10 September 1875, the American Forestry Association (AFA) was formed in Chicago. This was the first organized effort to protect the forests of the United States from wasteful cutting and fire and to promote the propagation and planning of forest trees.

The founder-president of the AFA was John Aston Warder of Ohio, a physician, author of several medical treatises, but chiefly remembered as a prolific writer on forestry, horticulture, and landscaping. Midway in his medical career, he gave up his practice to become a professional horticulturist. He was the founder and editor of *Western Horticultural Review* and the author of a manual on evergreens and a monograph on pomology. He became a member of the American Association for the Advancement of Science in 1851. Although long interested in tree culture, he first came in contact with professional forestry when he was appointed a U.S. commissioner to the International Exhibition in Vienna in 1873. For the U.S. government he wrote an extensive report on forests and forestry in Europe.

As AFA president until 1882 (he died a year later), Dr. Warder was indisputably the planner and leader of the conservation movement in America. The exact number of founding members present at AFA's organizing meeting is unknown, but there were probably not more than 35. Most were horticulturists, but the group also included botanists, a clergyman, a lawyer, and physicians.

Without public support, a body so small could hardly exert much influence to halt the spread of forest destruction. But the general public were largely indifferent to timber cutting and fire, unless their own lives or property were endangered. Some states had laws for the protection of forests from fire, but for the most part they were either weak or seldom enforced.

The third quarter of the 19th century was an era of profligate exploitation of the nation's forests, unchecked burning of cutover lands, and extensive land clearing for agriculture. Concerned citizens foresaw the possibility of timber famine and advanced this threat to alert the public to the crisis. With several notable exceptions—for example, Carl Schurz, Secretary of the Interior from 1877 to 1881—they were unable to enlist the support of federal executives and members of Congress. Indeed, Congress would not even provide protection from fire and theft for the timber resources on millions of acres of public land.

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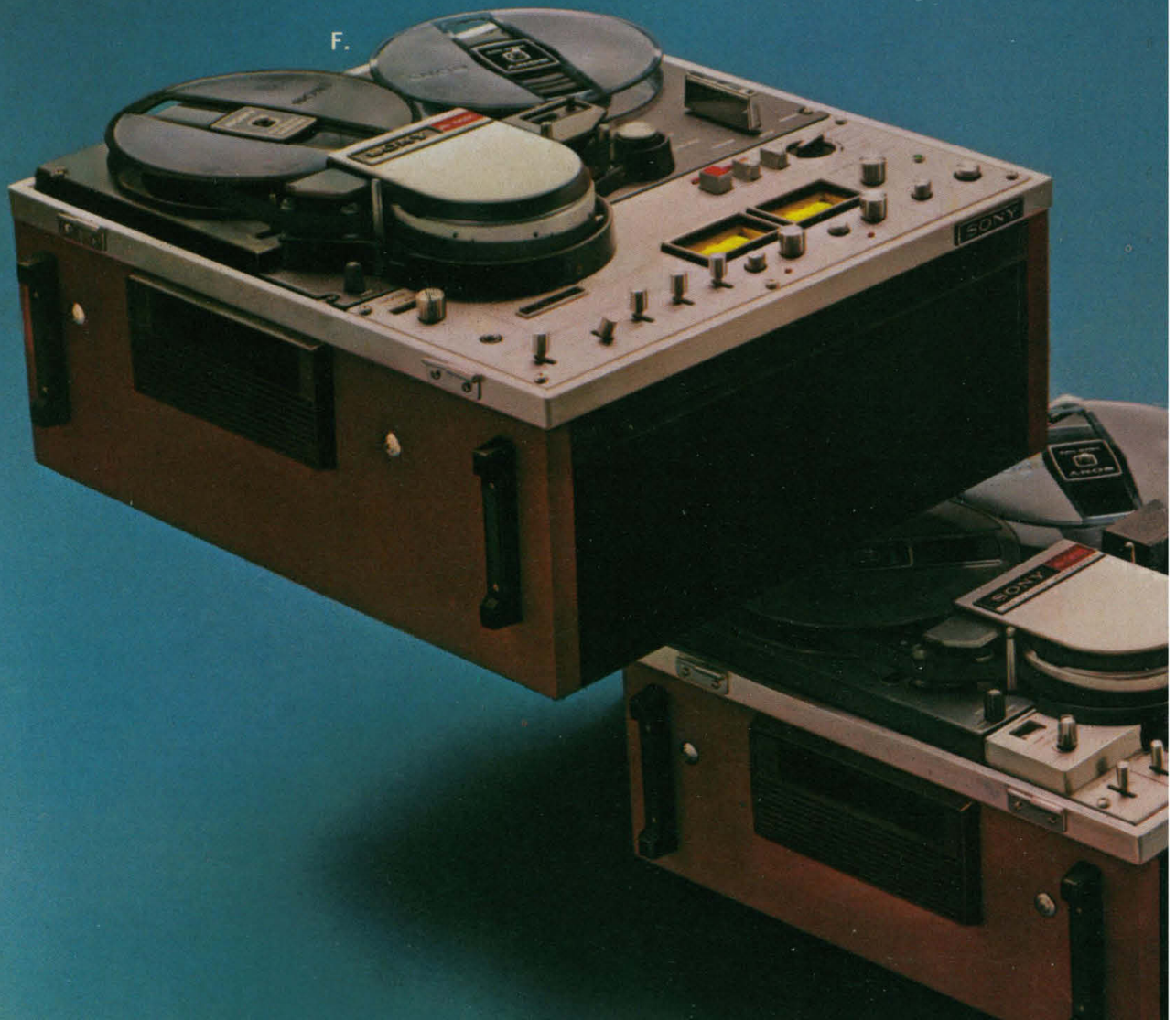
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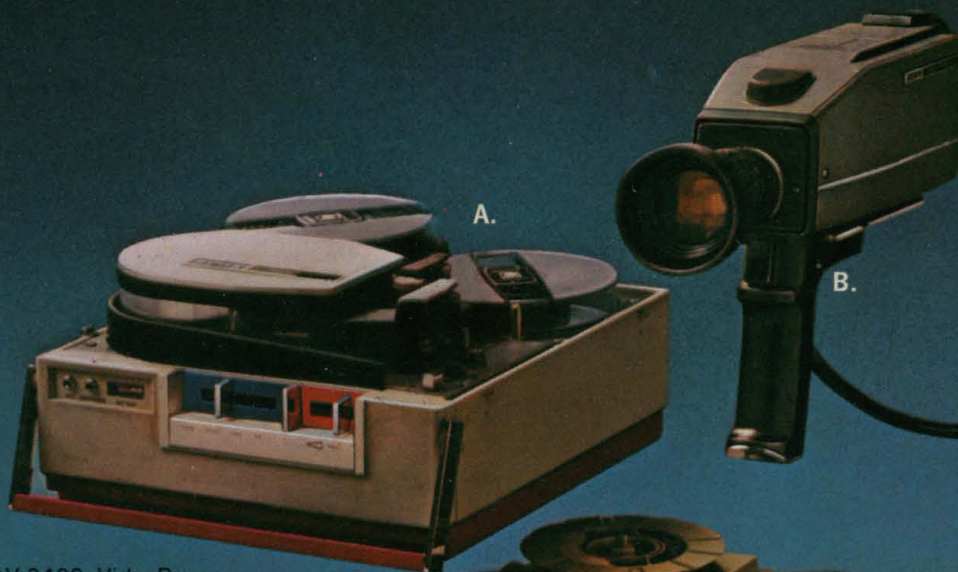
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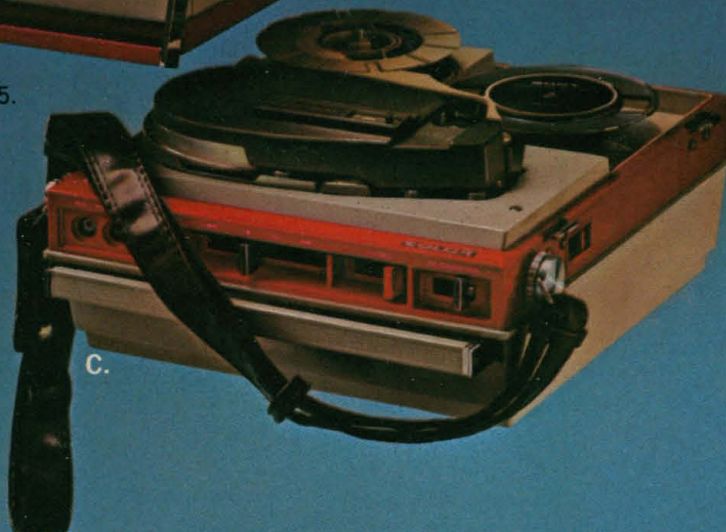




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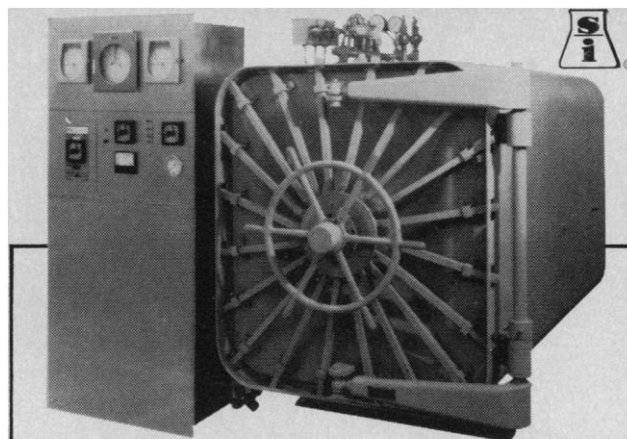
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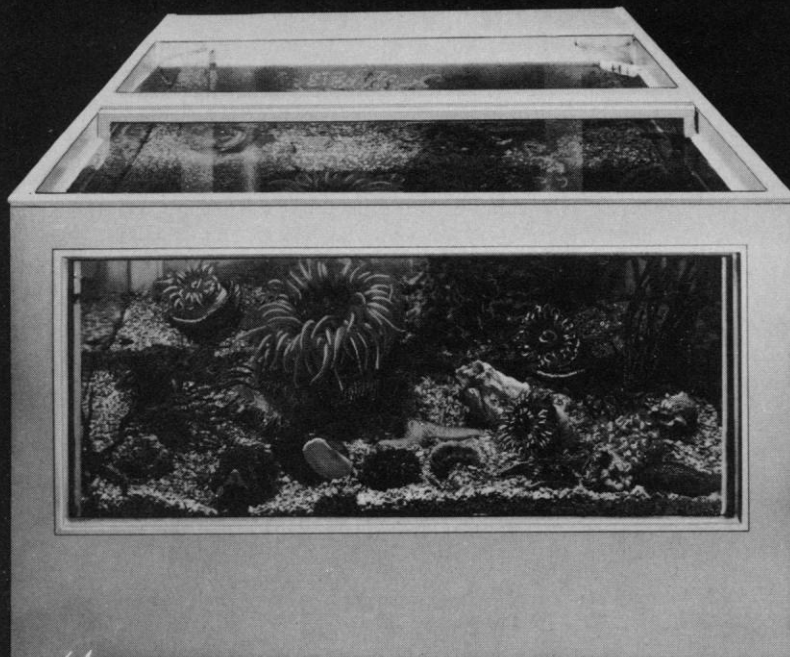
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The Dynafilmer CT-380 blood filmer utilizes a pad to hold the slide while it is spun. The design (patent pending) features an absorbent liner to collect excess blood and to prevent the aerosol effect. The pads each absorb up to 10 milliliters of blood. With 0.2-milliliter samples, up to 50 slides may be centrifuged before the pad requires changing. Variable speed and spin time controls render the device suitable for preparing films of fluid specimens other than blood. Dynatech Cryomedical. Circle 680.

pH Meter

Model PHM61 registers from 0 to 14 pH units. Buffer, sensitivity, and temperature controls are provided for calibration, matching electrode sensitivities, and compensation for reaction temperatures. Potential is measured from 0 to ± 1400 millivolts to within 3 millivolts. Adjustable displacement voltages up to ± 600 millivolts are also provided. The instrument is intended for pH, potentiometric, and ion-activity analyses. London. Circle 675.

Programmable Gradient Elution Accessory

Model 838 (Fig. 1) allows selection of gradient forms. In use with liquid chromatography this increases flexibility and facilitates reestablishing initial solvent conditions for repetitive analyses. The chemist scribes the form of a desired gradient on a chart which is inserted in the programming module. The chart then drives valves to proportion the amounts of solvents to achieve the desired gradient. The single-pump system uses an internal reservoir

and time-proportioned solenoid valves to control the ratio of primary and secondary solvents. DuPont Instruments. Circle 677.

Film for Transmission Electron Micrography

A film, designated SO-163, is similar in physical construction to the currently available film 4489. It incorporates a 0.007-inch Estar base to retain high dimensional stability and also to minimize pumpdown time, a dyed gelatin backing to facilitate identification of the emulsion side, and a thin layer of hardened gelatin over the emulsion layer to reduce its susceptibility to abrasion. The emulsion is more sensitive to electrons and it has an extended exposure and development latitude equivalent to Kodak electron image plate film. Eastman Kodak. Circle 676.

Graphics Display System

The Megraphic 6000 contains a graphics processor, an 8K Nova 2/4 minicomputer, a 19-inch display screen, and an ASCII keyboard. Options include a hardware character generator, an interactive data tablet, and a real-time clock as well as interfacing with a full line of peripherals.



Fig. 1. Model 838 gradient elution accessory is programmed to provide the chromatographer with desired solvent ratios.

The processor displays 6000 flicker-free points and/or vectors with a full-screen resolution of ± 0.05 percent. It operates from a core-based display list which accepts either two-word absolute or single-word relative vector elements. Megatek. Circle 679.

Sample Changer for Liquid Densitometry

The SP2 in conjunction with a density meter measures up to 20 samples continuously. Measuring time varies from 2 to 10 minutes per sample depending upon the properties of the sample and rinsing time requirements. The sample changer draws the sample into the cell, allows the temperature to equilibrate and the measurement to be taken, and then is rinsed in two steps. The cell is then dried with air, equilibrated again, and a calibrating measurement is made. Mettler Instrument. Circle 678.

Literature

Trade-up Program for Vacuum Pumps offers allowance for pumps of any manufacturer toward new pumps. Alcatel Vacuum Products. Circle 687.

Balances, 1975 Catalog describes a full line of laboratory instruments including the new series 3500 top-loading electronic balances. Brinkmann Instruments. Circle 681.

Agarose: Purification, Properties and Biomedical Applications is a monograph with an extensive bibliography that describes agarose and gel products not limited to those available from this manufacturer. Marine Colloids. Circle 682.

Incubators, Ovens, Autoclaves, Water Baths and Walk-in Environmental Rooms are featured in a 28-page catalog. National Appliance. Circle 683.

TN-11 Data Acquisition and Analysis System describes components, design specifications, and applications. Tracor Northern. Circle 684.

Drug and Chemical Blood Level Chart lists almost 180 substances and their therapeutic or normal, toxic, and lethal levels in the blood. Fisher Scientific. Circle 685.

RIA Screening for Testosterone is the subject of a technical methods data sheet. New England Nuclear. Circle 686.

Gas Mixers is a 12-page pamphlet devoted to gas analysis instrumentation. Thermco Instrument. Circle 688.

Plastics and Polymers Newsletter is a quarterly publication. Waters Associates. Circle 689.

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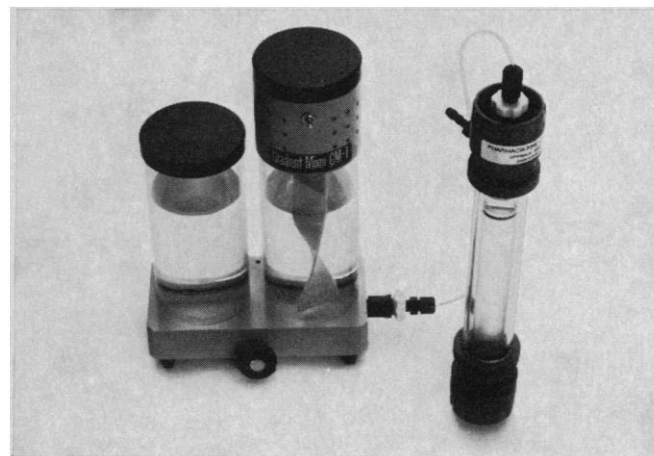


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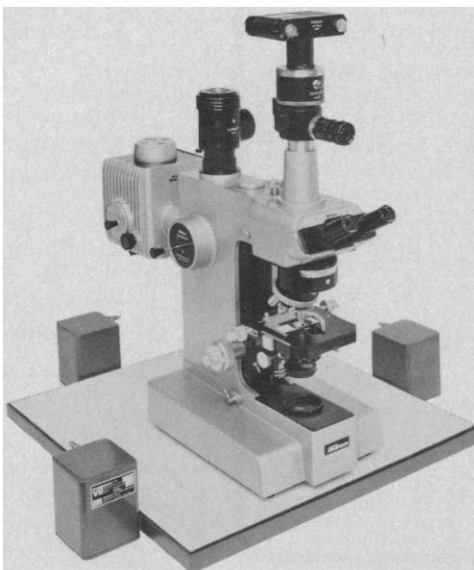
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(Continued from page 873)

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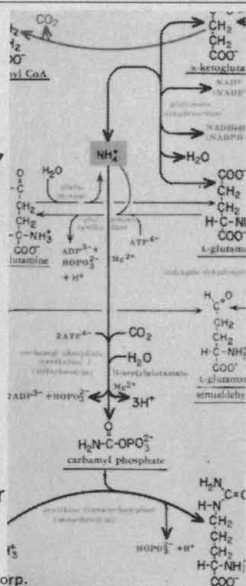
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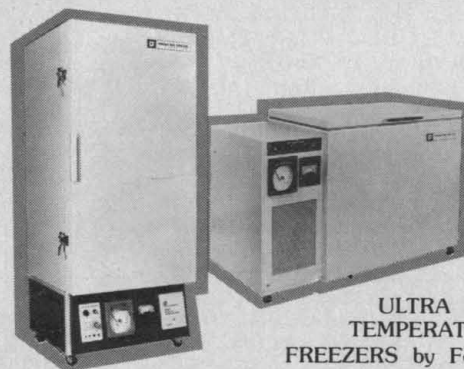


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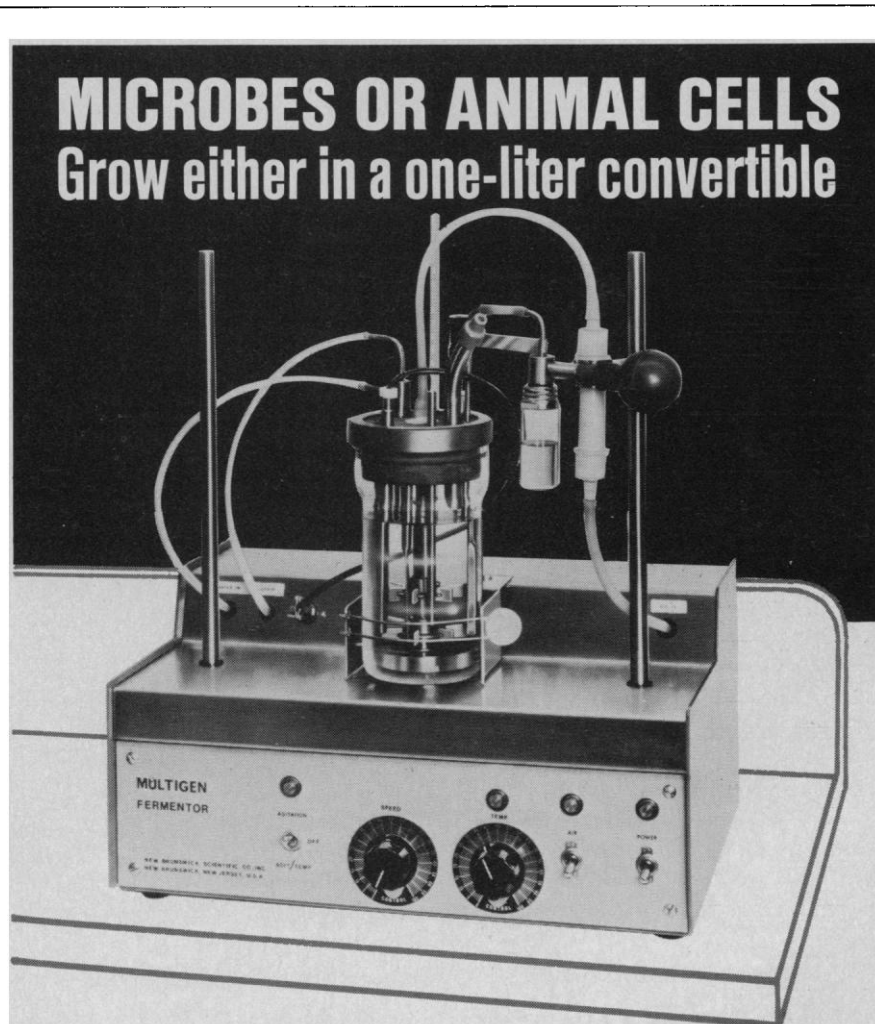
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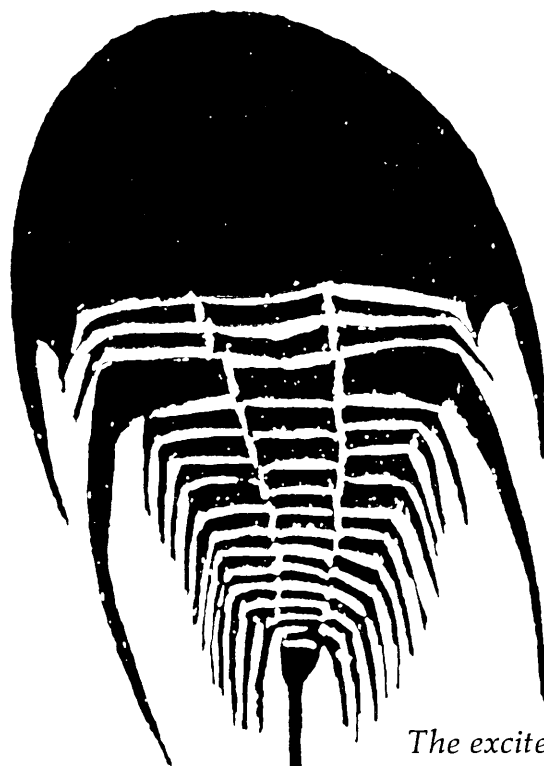
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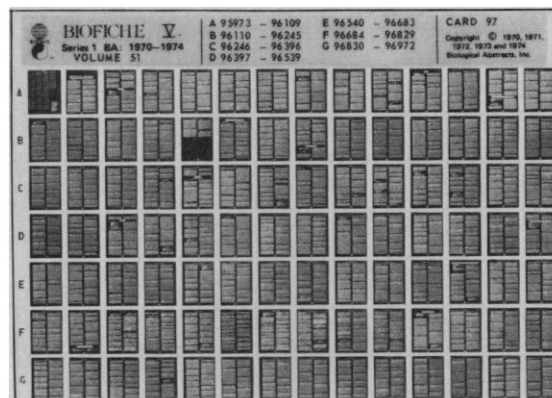
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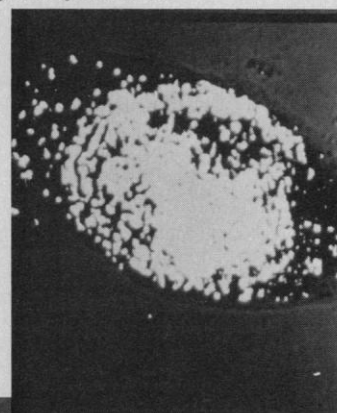
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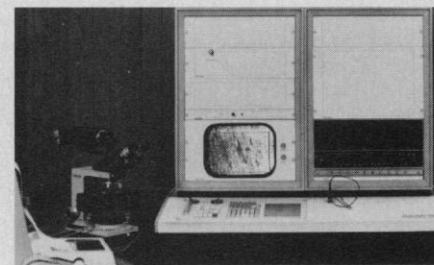
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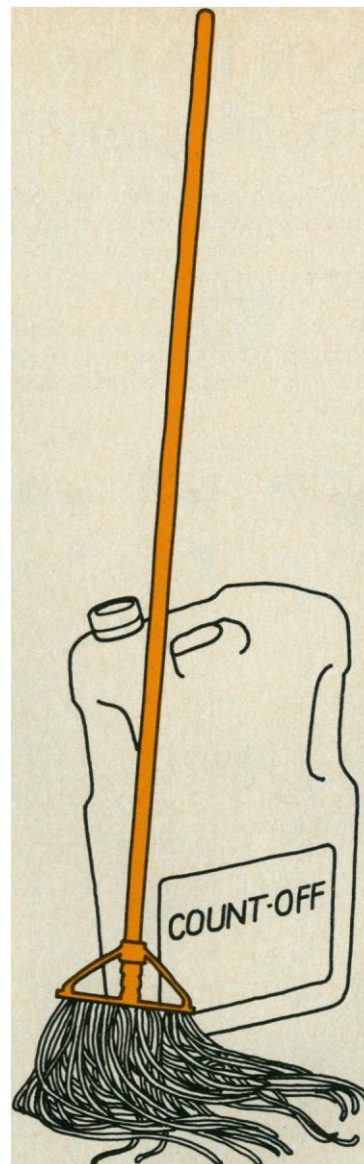
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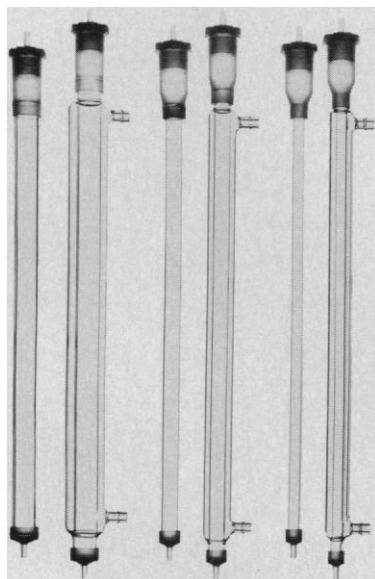
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Light-Emitting Diodes

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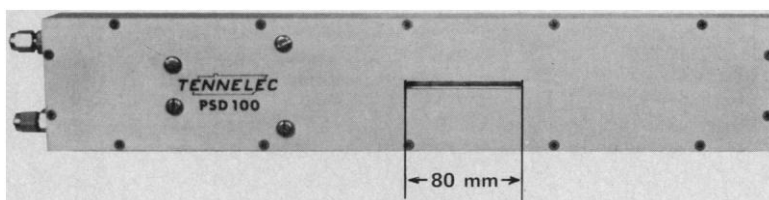
RESEARCH NEWS

(Continued from page 869)

ographic Institution, brines as hot as 60°C were sampled near the sea floor. The circulation pattern seems to be downflow on the flanks, which are marked by thick salt deposits, and upflow near the center of the rift zone. The sediments on the sea floor, especially in one of several closed basins that are thought to promote precipitation, were enriched in copper, lead, and zinc to depths of 50 meters. The amount of metals present testifies to the effectiveness of the leaching process—on the 50-square-mile floor of the Atlantis II deep, for example, lie an estimated 3 million tons of zinc, 1 million tons of copper, nearly that much lead, and perhaps 5000 tons of silver, worth in all about \$2 billion. Saudi Arabia and the Sudan, which border the Red Sea, have signed an agreement to share the sea floor resources, and an investigation of ways to process the ore is reported to be under way.

The closed basins and extremely high salinity of the Red Sea hydrothermal circulation make it something of a unique resource. The salinity in the open ocean, for example, could not build up as it has in the Red Sea basins; metal-bearing brines would also tend to be diluted and dispersed more once they reach the ocean. But investigators believe that similar processes do occur on the sea floor. French scientists last summer observed what they believe was a temporarily inactive hydrothermal system in dives along the Mid-Atlantic Ridge, and several research vessels have recently reported evidence of an active hydrothermal system in the Galápagos rift, a sea floor spreading center in the Pacific. Plans are under way to investigate the Galápagos site more carefully, including descending to the rift zone in submersibles to sample the fluids emerging from the sea floor and analyze their mineral content.

Other evidence of past hydrothermal systems comes from the polymetallic, massive sulfide ore deposits in ancient volcanic belts in Canada. According to R. H. Ridler of the Geological Survey of Canada, it is possible to distinguish a class of brine sediments, which he calls exhalites, associated with these ore deposits. These sediments form a distinctive pattern, with ore-bearing sulfides in the center of a belt, then carbonates on either side, and finally oxides on either edge. Ridler believes that the sedimentary pattern arises from variations in acidity, oxidation potential, and temperature in the area surrounding the vent of a submarine hydrothermal circulation. The less soluble species (which include the metal sulfides) precipitate nearest the vent,



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