

# SCIENCE

24 September 1965

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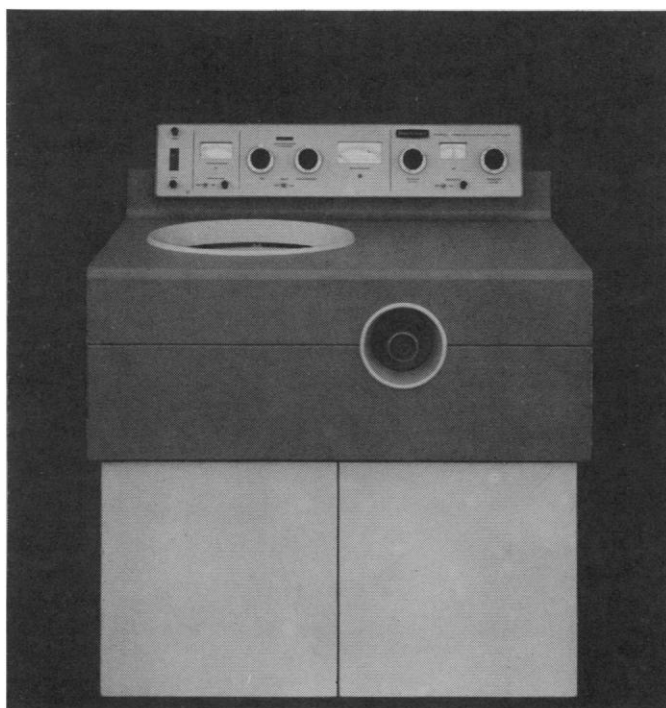
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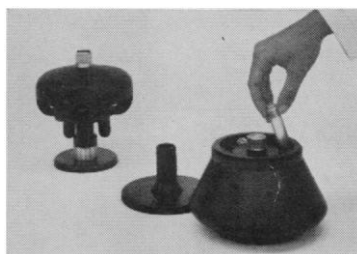
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Index Issue

# Two New Beckman Ultracentrifuges

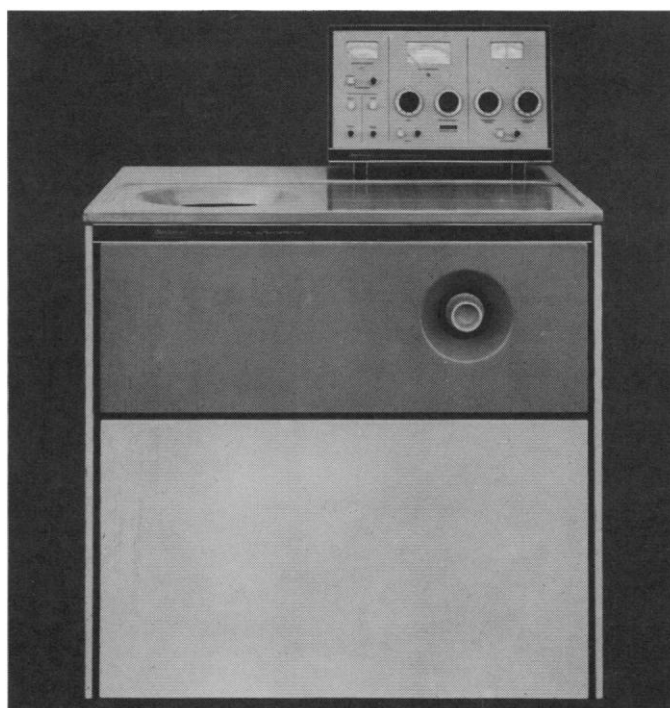


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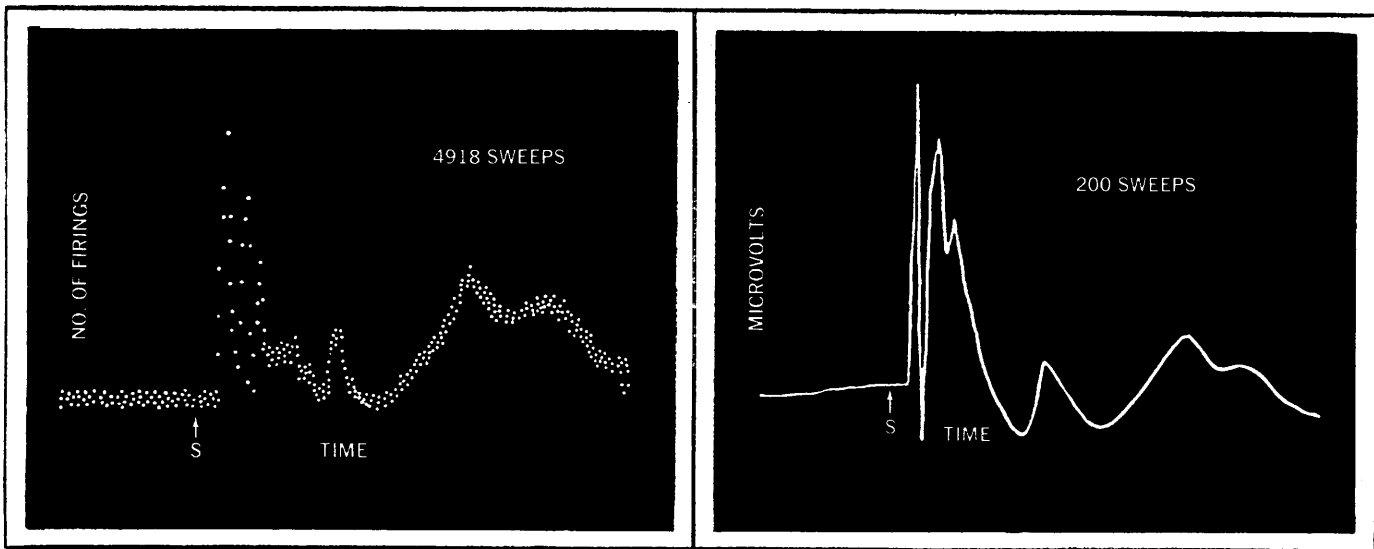
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Frequency distribution histogram of single-cell firings in response to 4918 stimuli, and averaged evoked potential to 200 stimuli (visual cortex of cat). Data courtesy of

S. S. Fox and J. H. O'Brien, see "Duplication of Evoked Potential Waveform by Curve of Probability of Firing of a Single Cell", *SCIENCE*, Vol. 147, 19 February, 1965.

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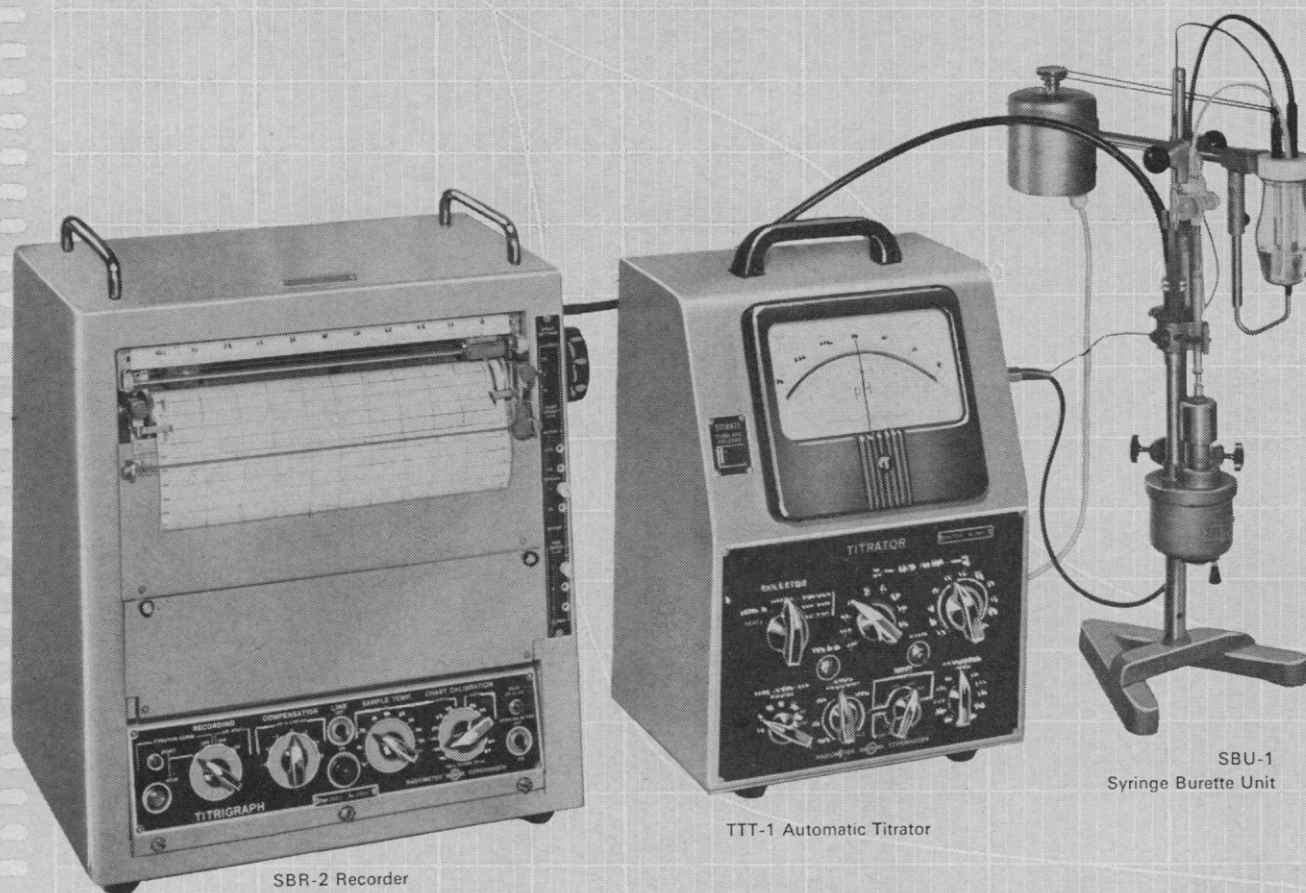
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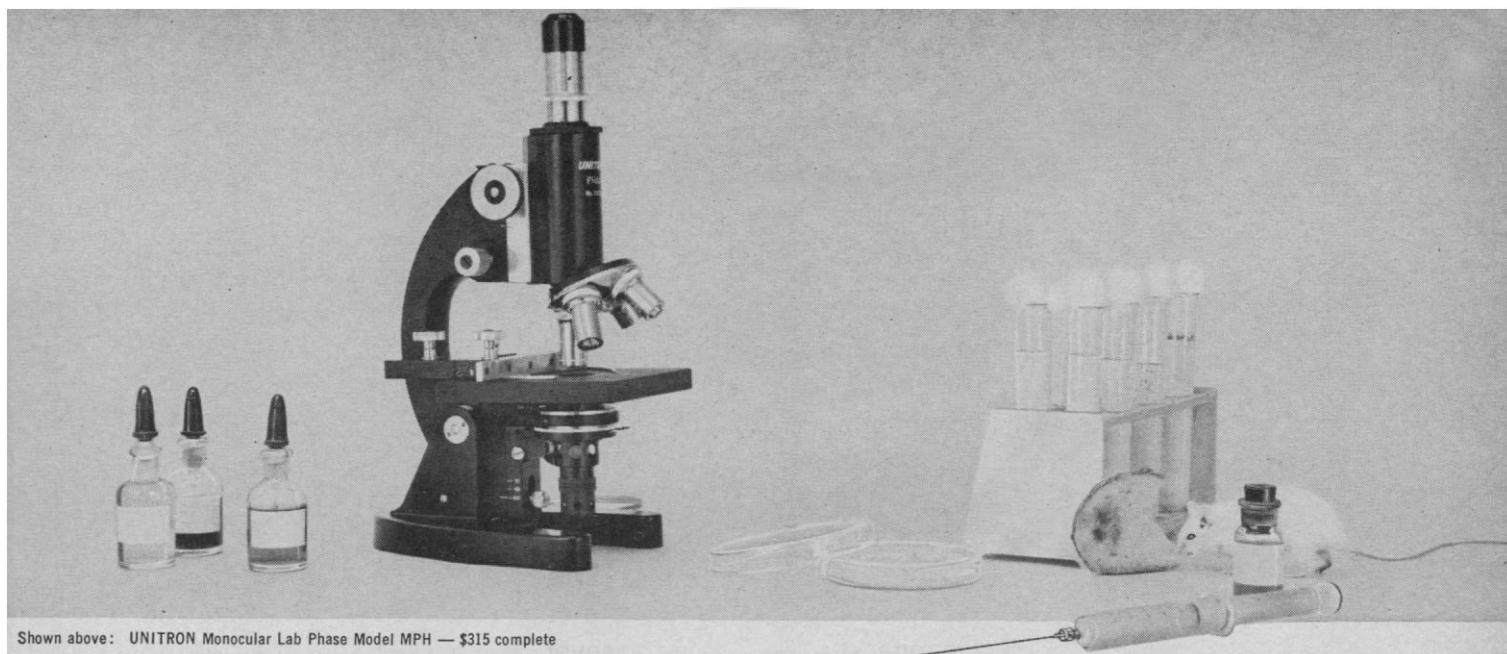


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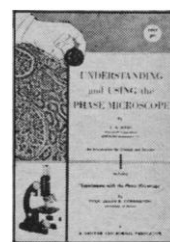
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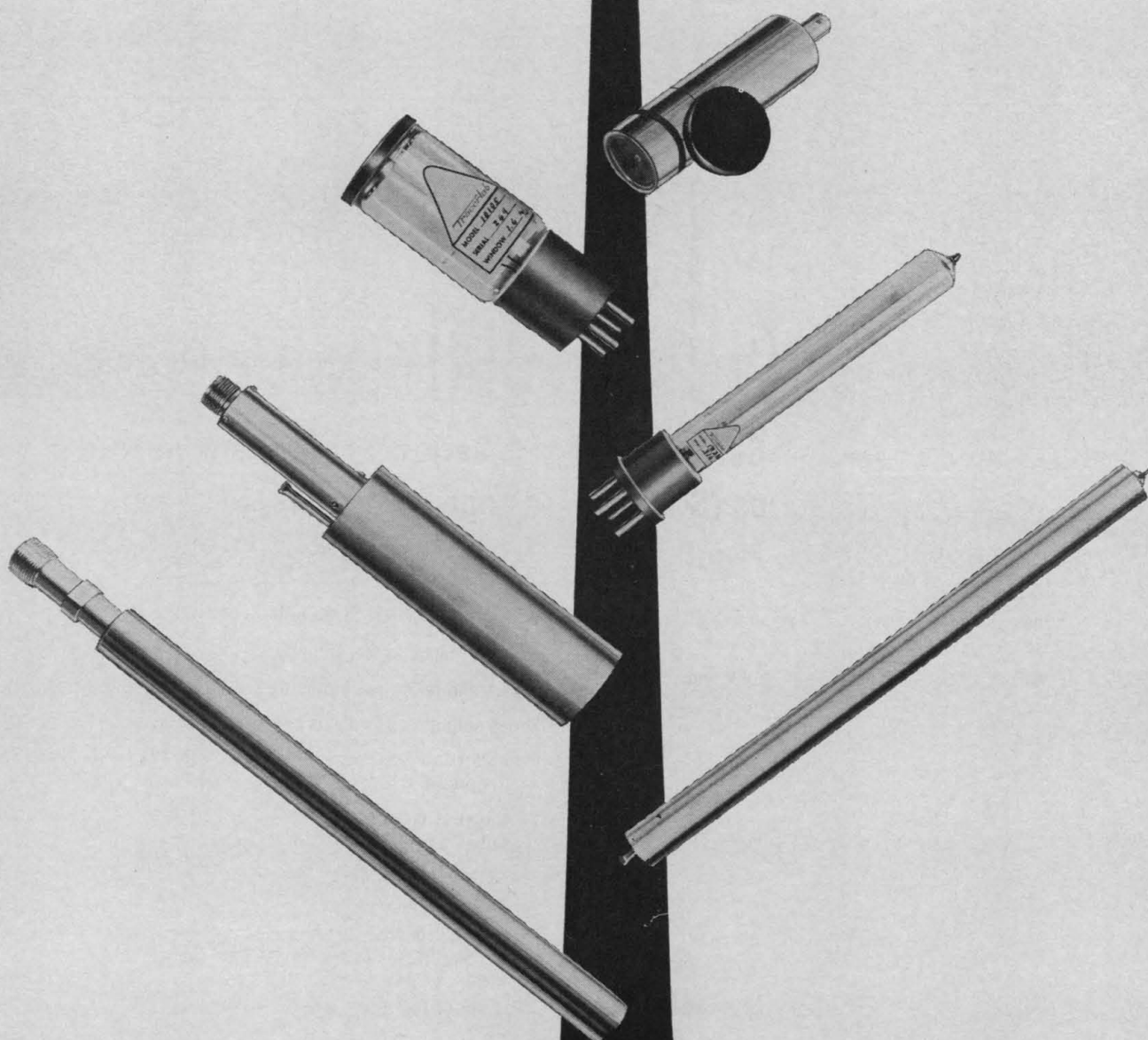
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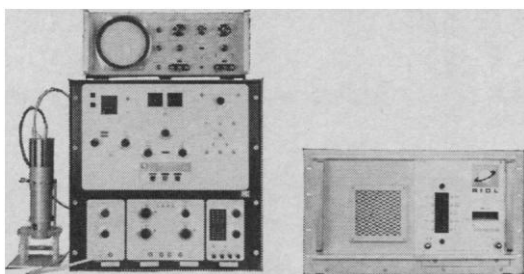
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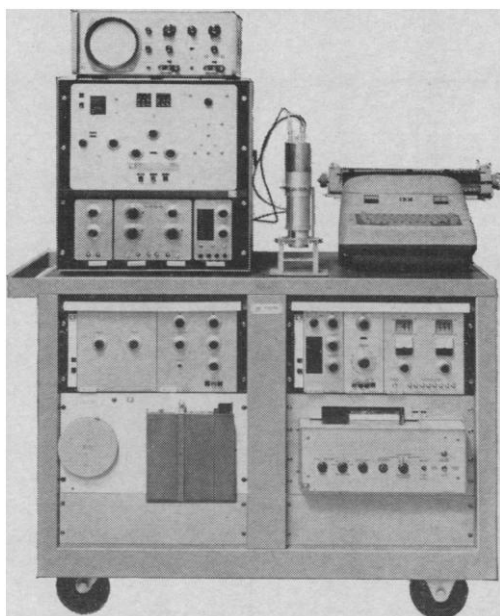
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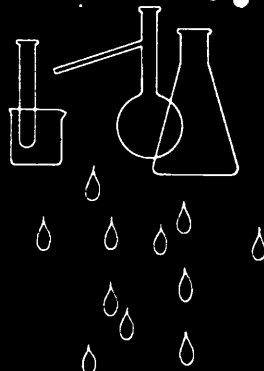
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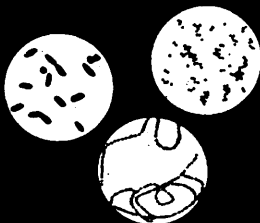
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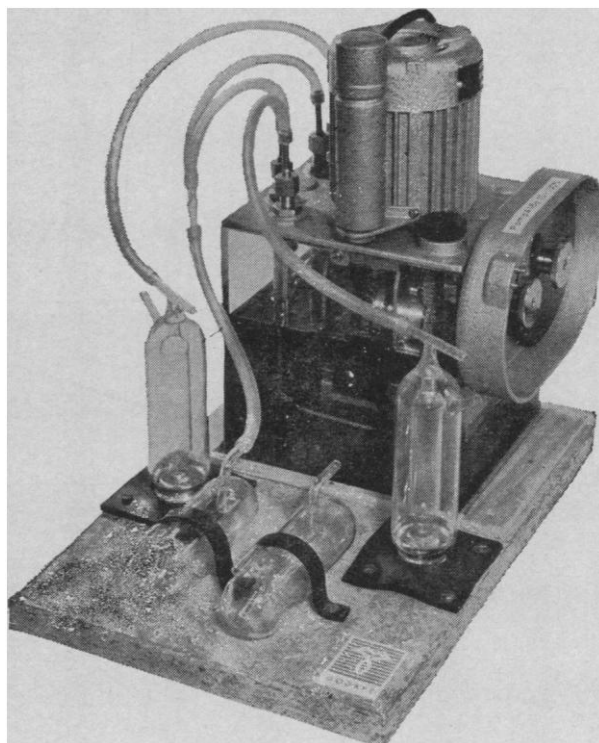
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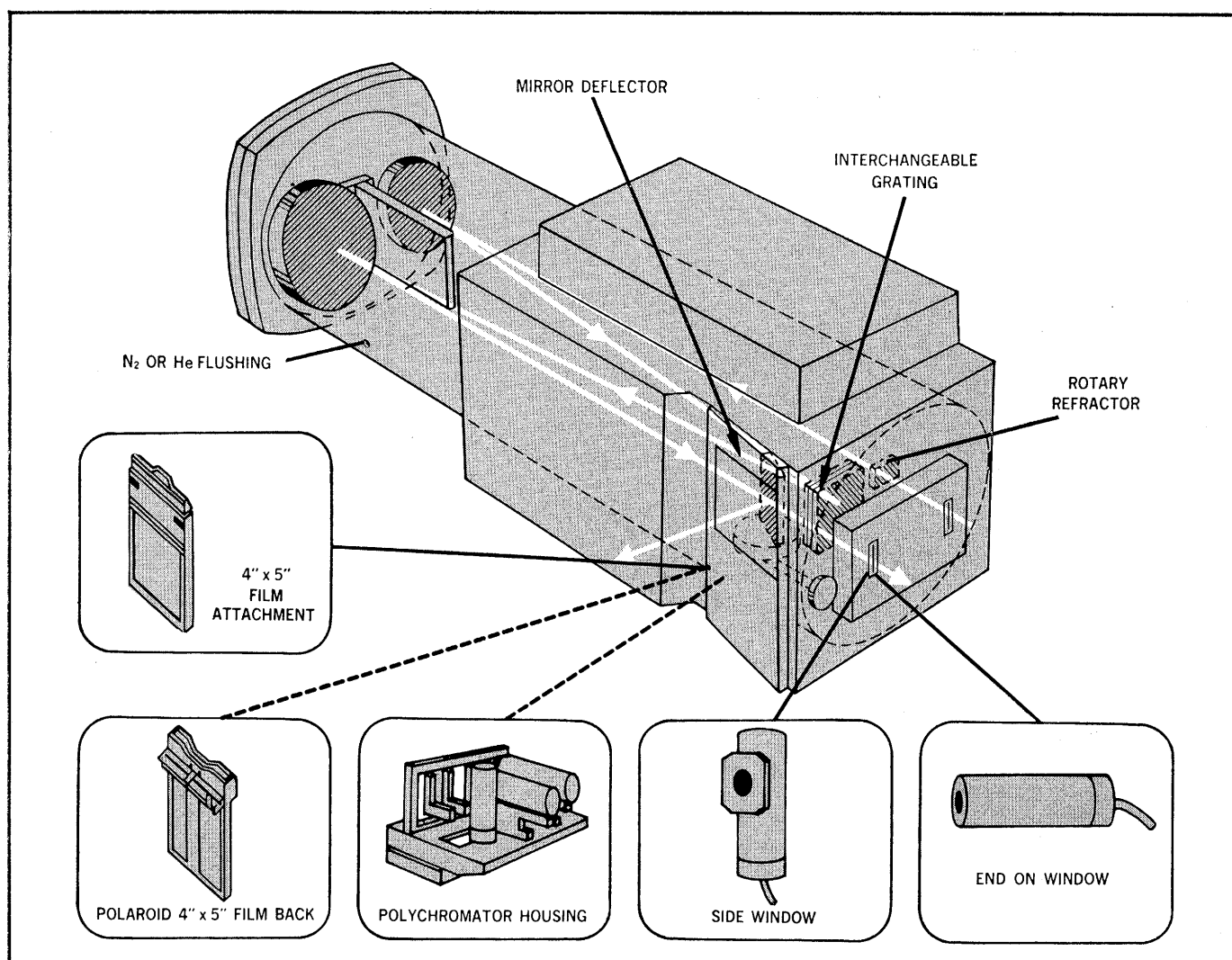
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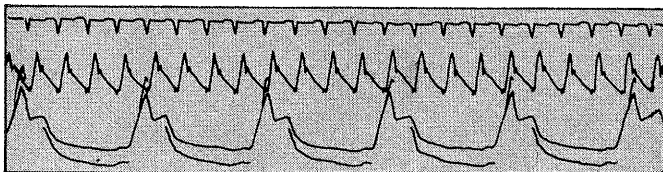
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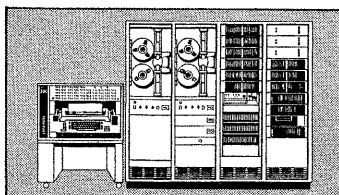
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$$A(n,w) = \int_0^T W(t)F(n,t) \cos(wt)dt$$
$$B(n,w) = \int_0^T W(t)F(n,t) \sin(wt)dt$$

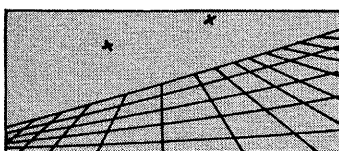
## Spectrum Analysis

Parallel hybrid multiplication and summing, 2 microsecond 30-bit digital storage, and a flexible instruction format providing efficient list processing combine to make the AMBILOG 200 powerful in statistical signal analysis techniques such as Fourier transformation, auto and cross correlation, power spectrum density analysis, and generation of histograms of amplitude spectra.



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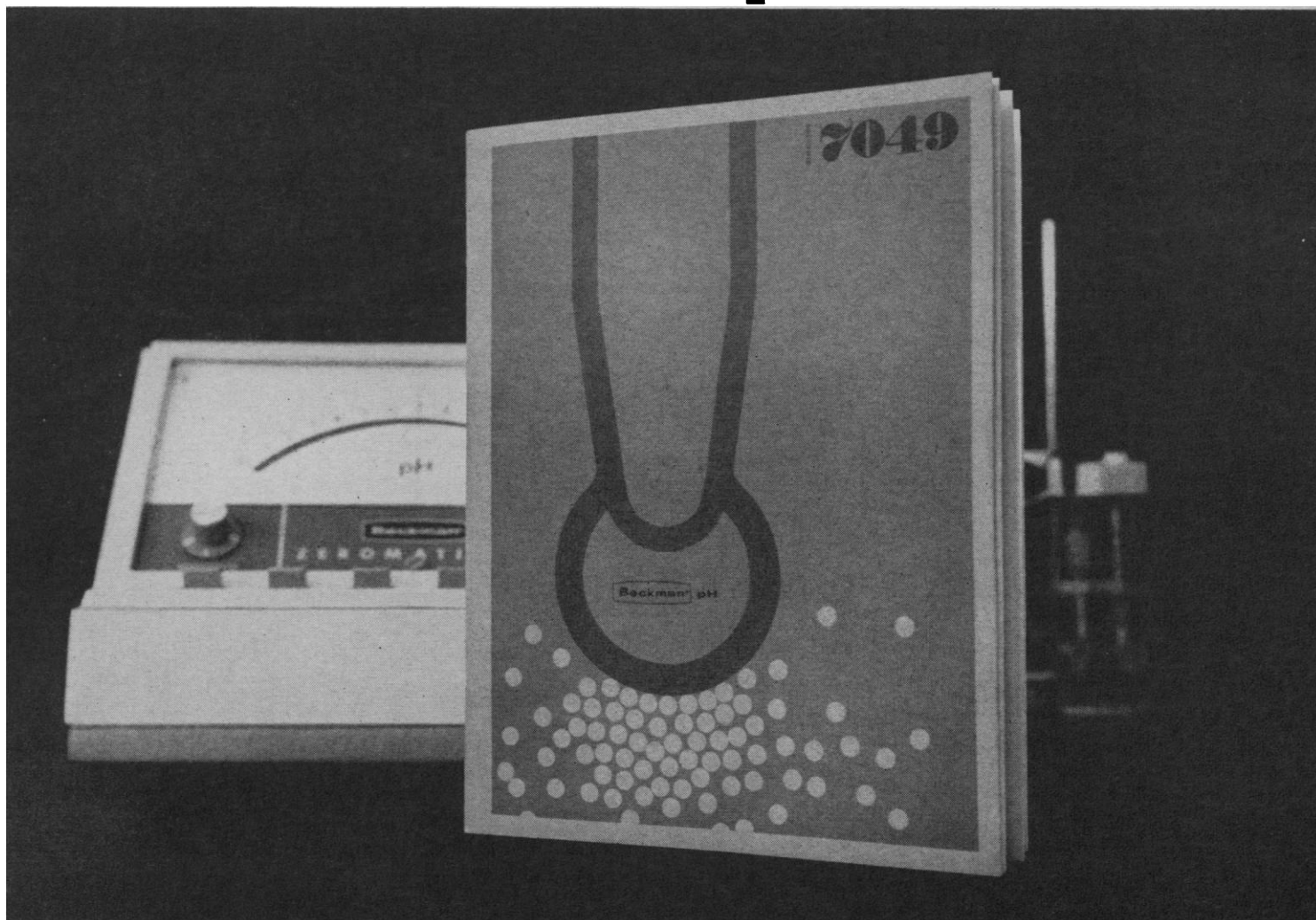
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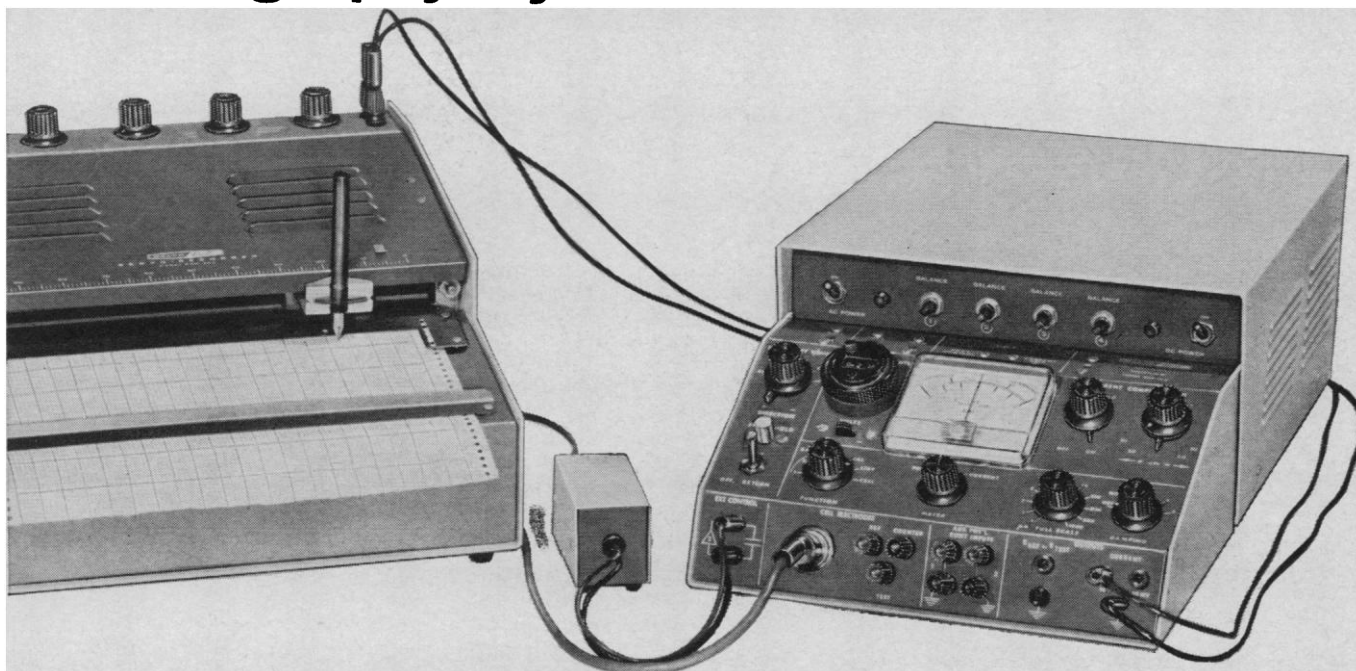
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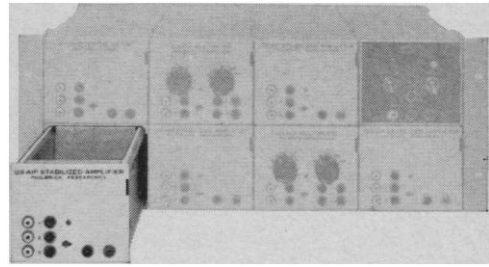
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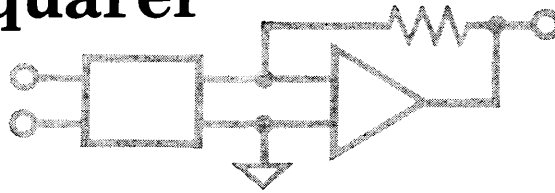
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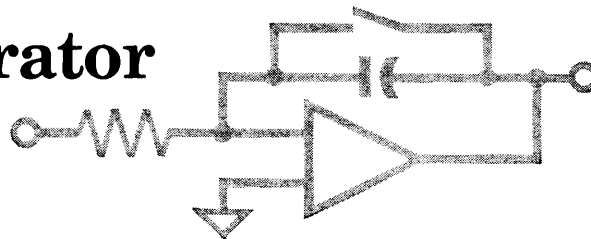
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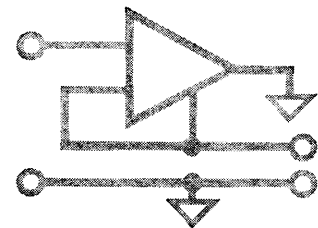
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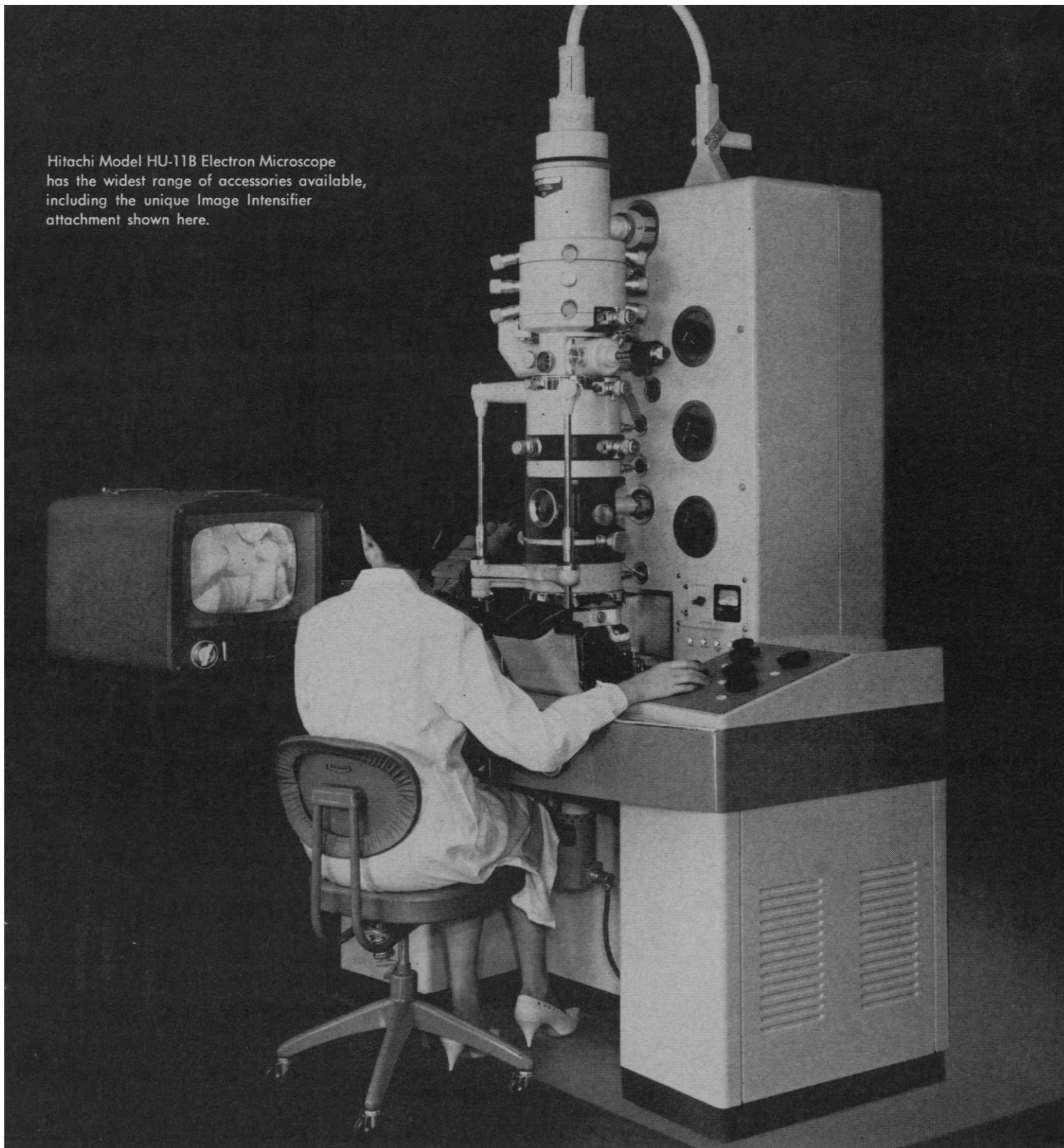
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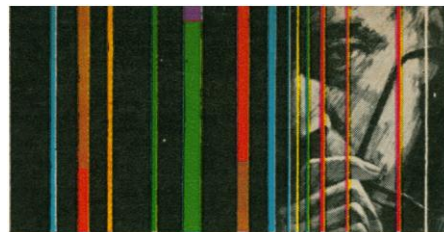
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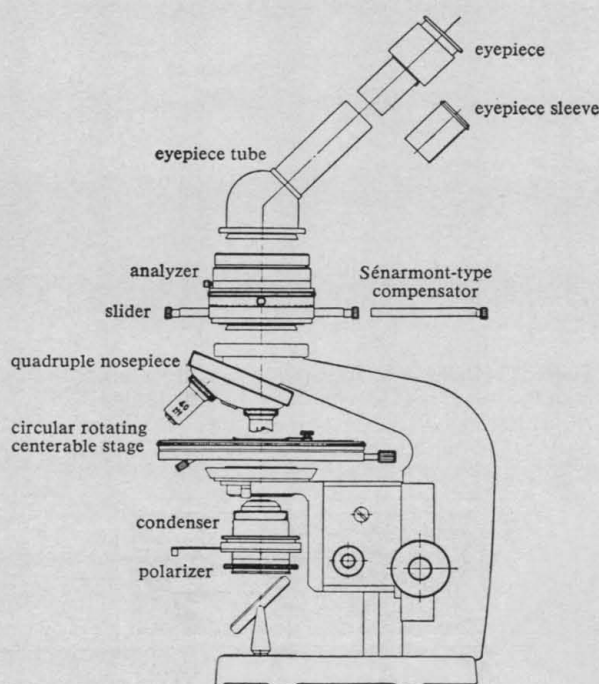
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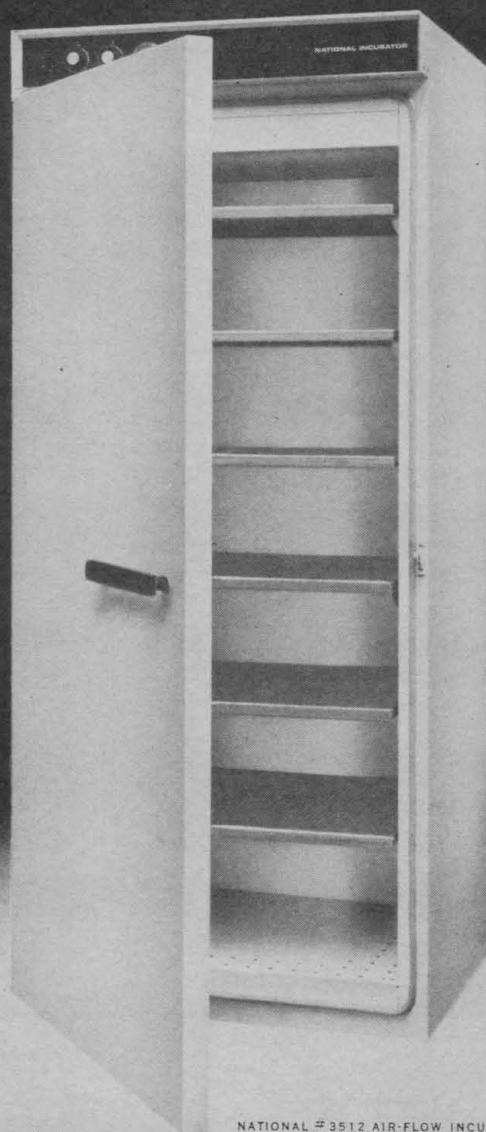


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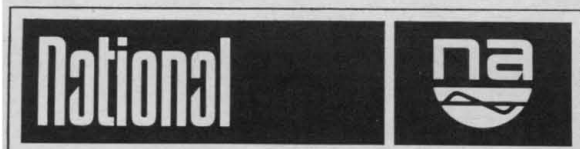
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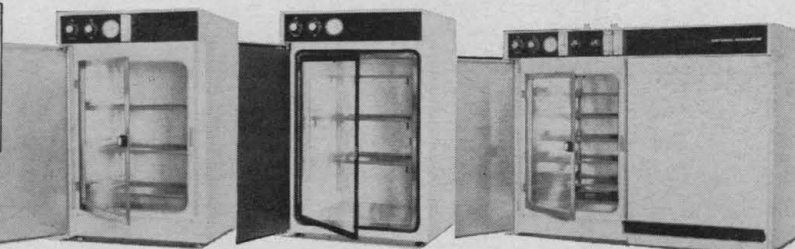
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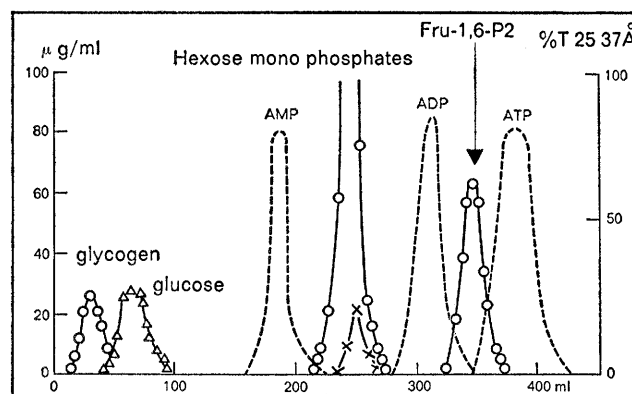
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Model experiment with glycogen, glucose, sugar phosphates and adenosine phosphates on a column of DEAE-Sephadex A-25. Reproduced from *Biochim. Biophys. Acta* 74 (1963) 588, by permission of the author.

Type	Description	Ionic form	Capacity meq/g	Hemoglobin cap. g/g at pH	Particle size microns	Availability
DEAE-Sephadex A-25 A-50	Weakly basic anion exchanger Functional groups: diethylaminoethyl	Cl <sup>-</sup>	3.5 ± 0.5	0.5;8.8 1.4;8.8	40-120	100 g bottles 500 g bottles bulk quantities
CM-Sephadex C-25 C-50	Weakly acidic cation exchanger Functional groups: carboxymethyl	Na <sup>+</sup>	4.5 ± 0.5	0.7;6.5 4.7;6.5		
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Additional information on Sephadex Ion Exchangers is obtainable from:

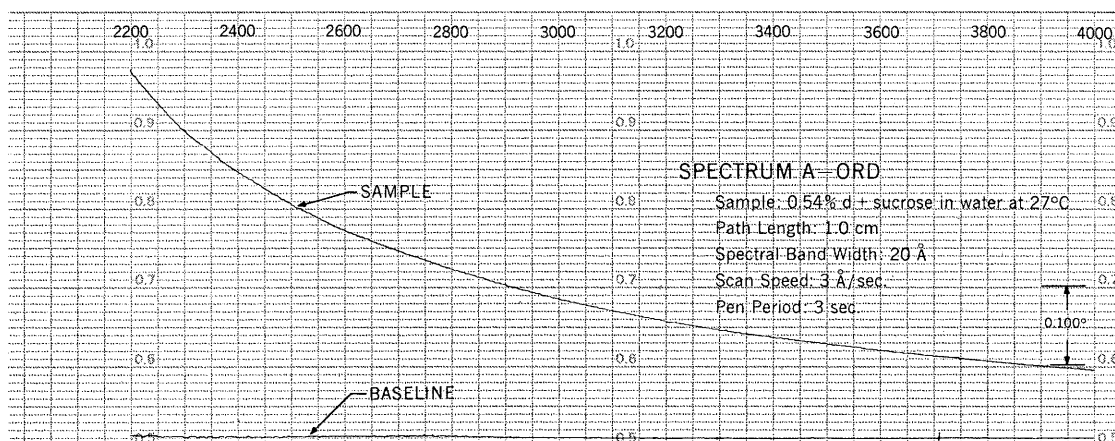


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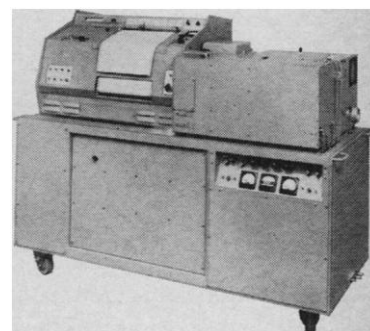
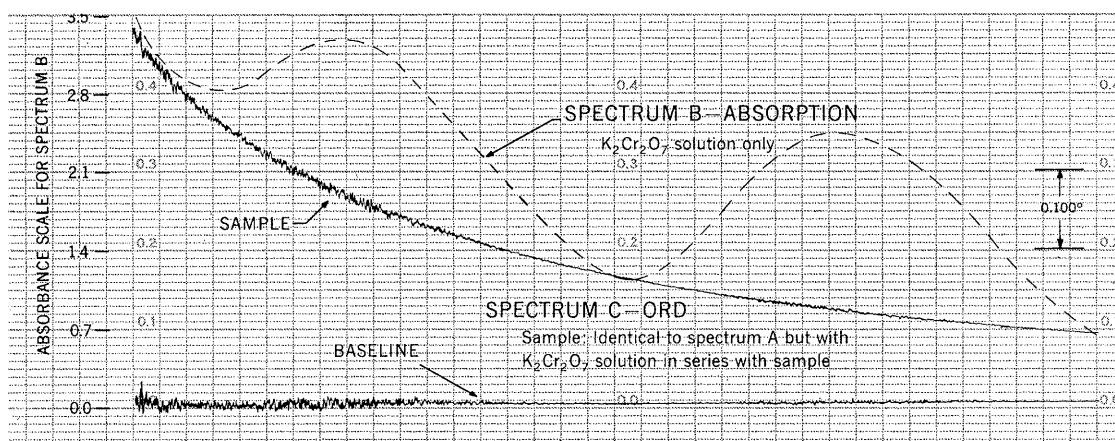
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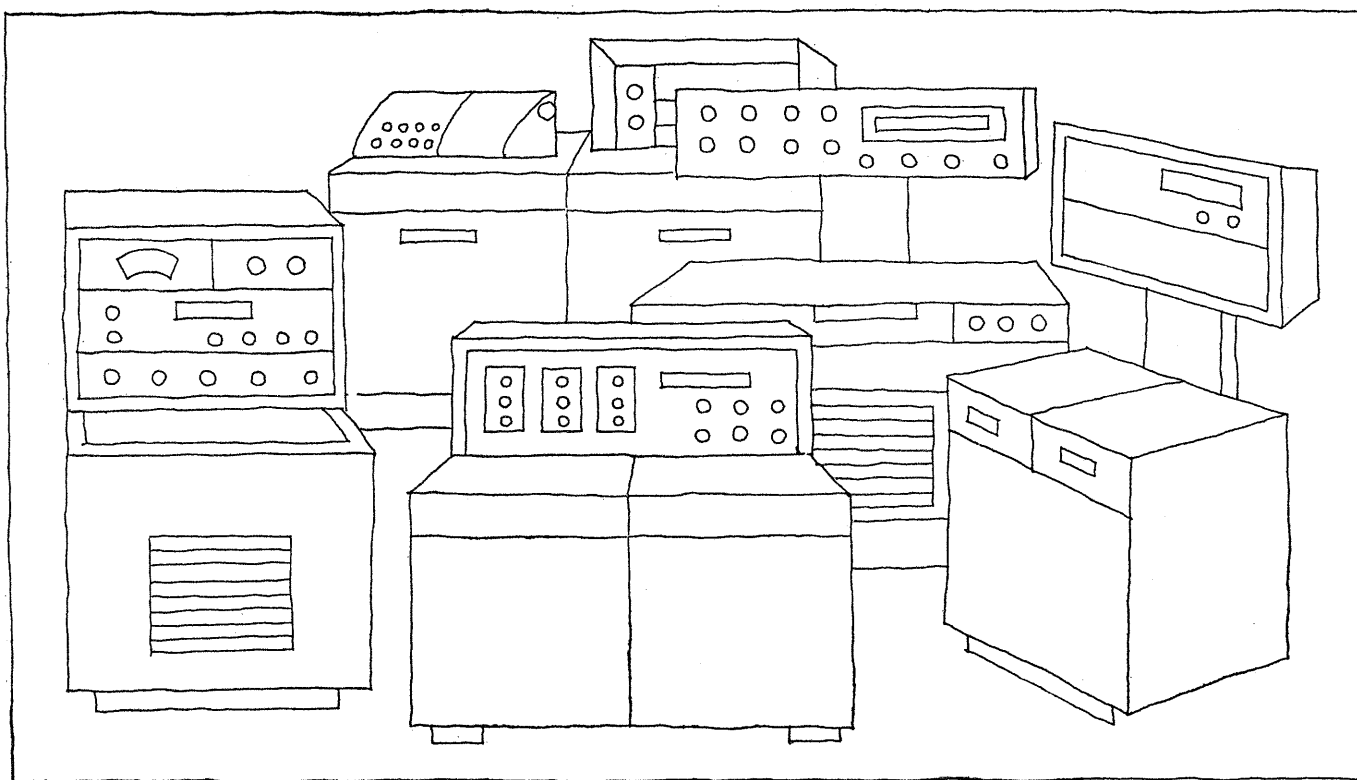
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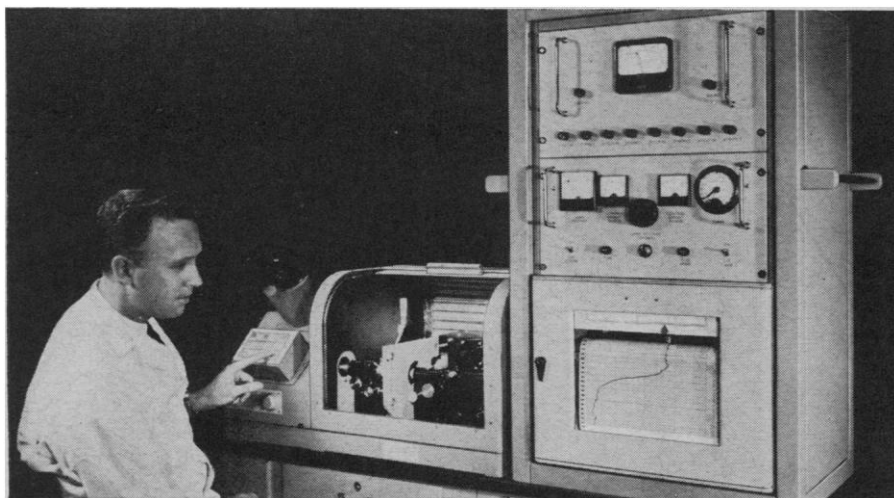
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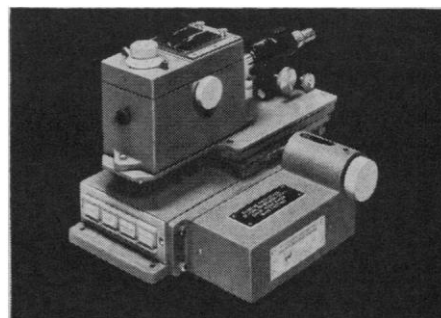
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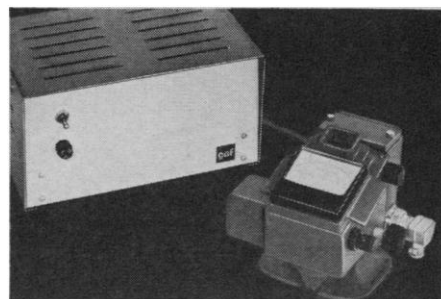
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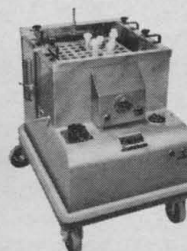
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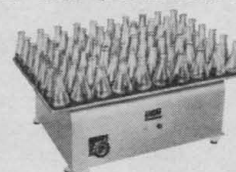
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### Model G76 Gyrotory Water Bath Shaker

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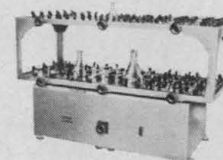
### Model G10 Gyrotory Shaker

Variable speed range: 140-400 rpm or 50-150 rpm. Uniform 1" stroke. Holds 40/250-ml flasks\*. Larger platform holds 70/250-ml flasks\*.



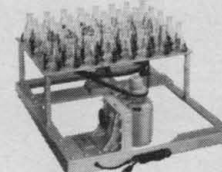
### Model G25 Gyrotory Incubator-Shaker

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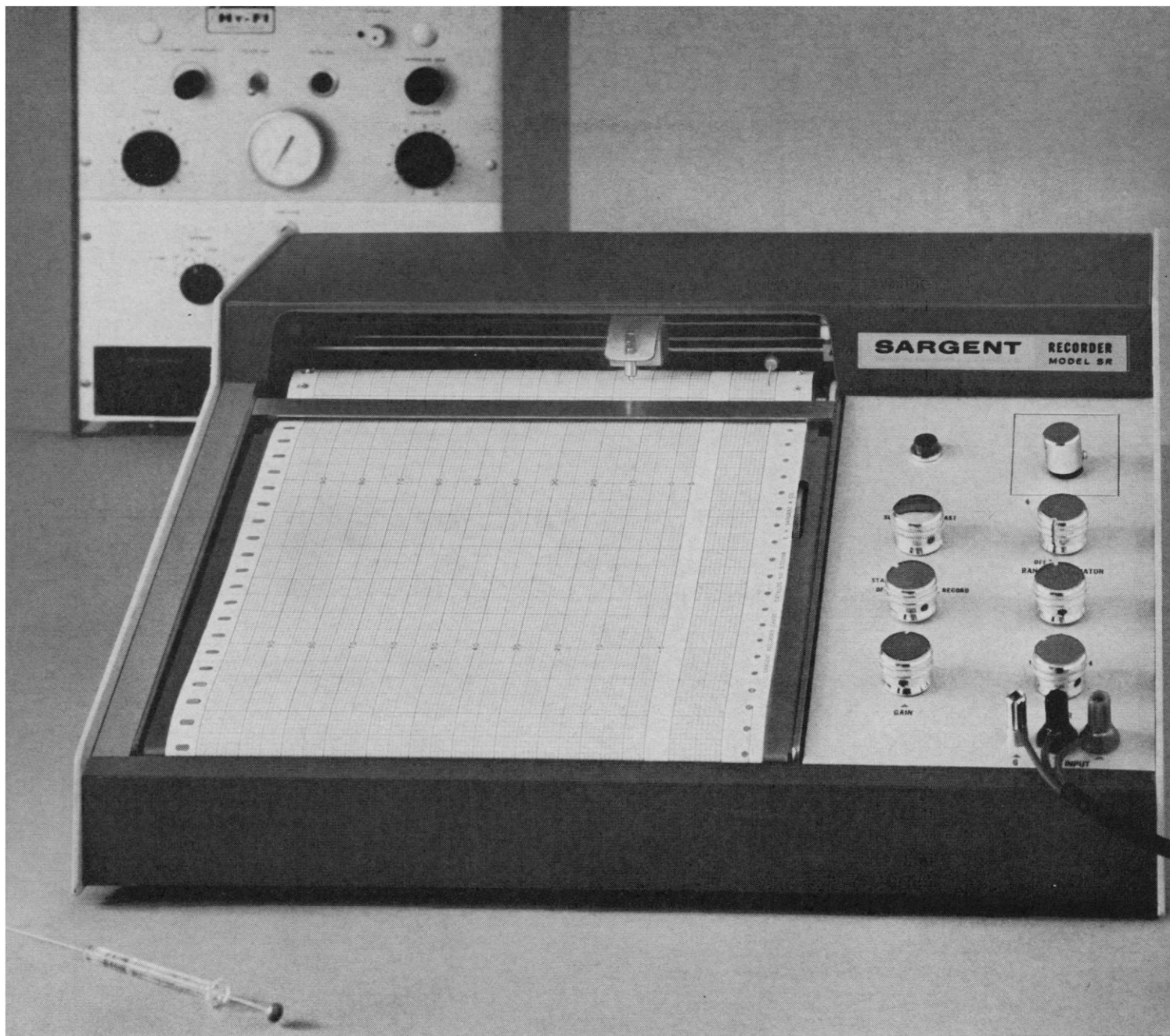
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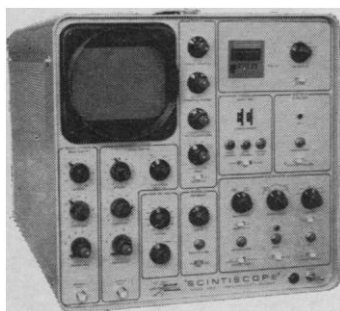
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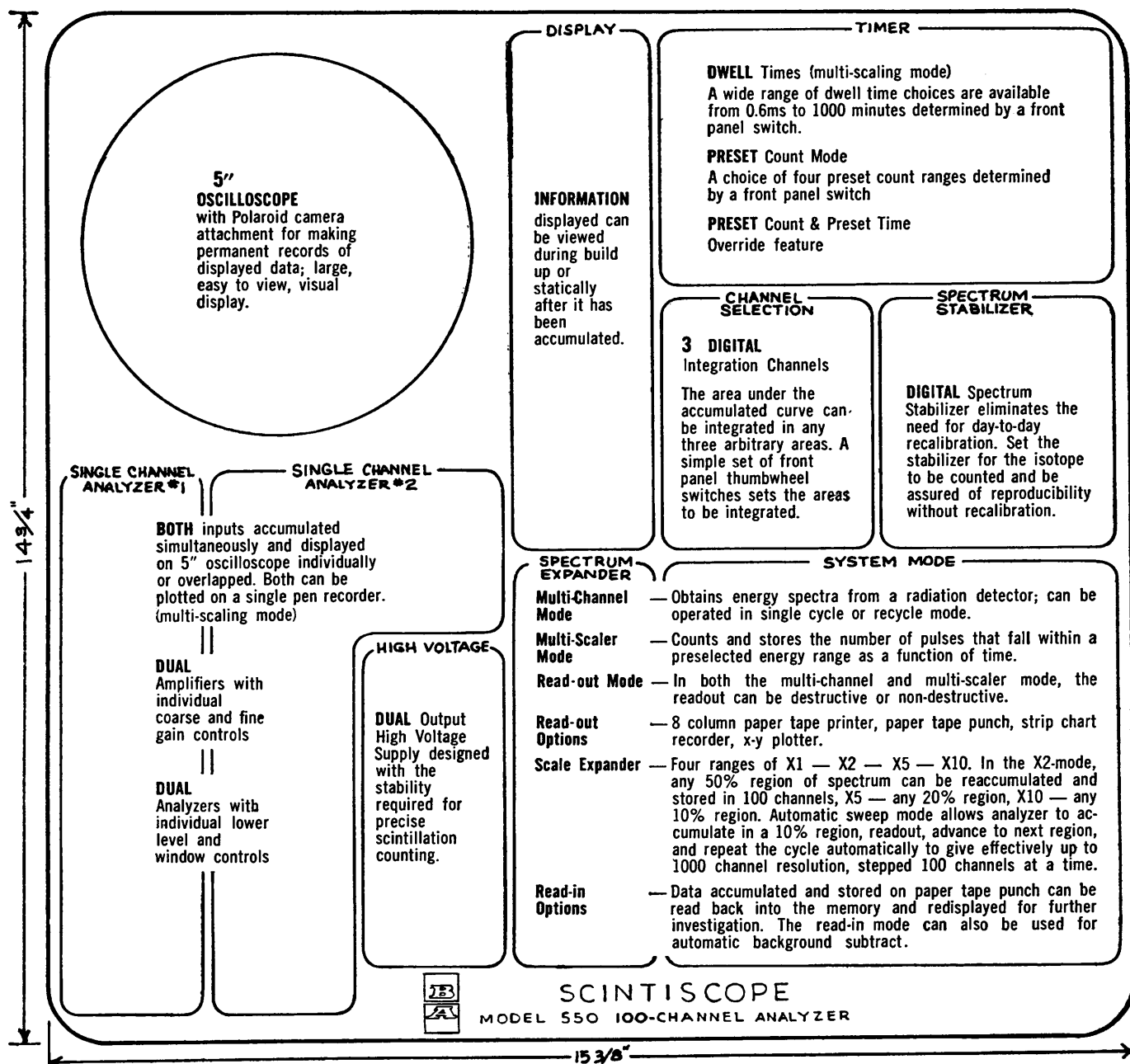
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## Genetics and Soviet Science

The article on Lysenko by Caspari and Marshak (16 July, p. 275) offered little information which has not already been generally reported and generally believed. What bothers me is that they simply reinforce impressions which, while not wrong, are distorted by a lack of context.

1) To imply baldly that the failures of Soviet agriculture are due to Soviet rejection of Mendelian genetics is professionally immodest and only partly true. Are the tasteless and unattractive Soviet apples the fault of Lysenko? I doubt it. Rather, the apples lack the long history of plant breeding that Western apples enjoyed long before the first professional geneticist was hired to work on apples. (It may be recalled that Burbank was no geneticist.) Also, there has been no history of "agricultural extension" in the lands now composing the Soviet Union. For over a century in the United States, longer in England, there has been a serious organized effort to teach farmers to farm. The most casual perusal of eastern European publications (the Israel Program for Scientific Translations provides these in English) will show that an enormous number of them are devoted to primary problems of farming, which in the United States either have been solved or can be referred to efficient agencies for solution.

Other reasons for agricultural difficulties, such as the lack of mineral fertilizers, have been discussed in popular literature. Of course, the operation of a state or collective farm by people who have a very strong tradition of village farming is difficult. Nevertheless, some of these farms succeed. I visited a successful collective farm near Alma-Ata, Kazakstan. It was named for Michurian.

2) Caspari and Marshak do not differentiate between the intentions of state planning and the unpredictable product of human beings trying to operate a system. Yes, classical genetics was officially liquidated, and several geneticists (including at least one head of an All-Union scientific institute) were exterminated. Nevertheless, there was no general deterioration of Soviet science. Moreover, there was support for some fields which are starved in the United States. For example, a recent publication of the International Bio-

logical Project described the Soviet Union as "pre-eminent" in hydrobiology. In my own field of interest, soil algae, the Soviets have probably done more work than the rest of the world combined. Efforts which might have gone into genetics have not all gone to waste.

Marvelously enough, Soviet scientists (being human) are wily in twisting the system in their own directions and in finding the smallest cracks in the system to open new inquiries. In applying for support they can inflate "practical application" as ably as their American counterparts can. . . . My own observation was that a group of plant physiologists (under the acceptable banner of environmental control of development) were probing quite deeply into the mechanisms for control of development and perhaps uncovering flexibility which strong genetic determinists would not bother to seek. A more general conclusion about the capacity of the Soviet scientist to save his soul in his system was reached some time ago by A. Vucinich in *The Soviet Academy of Sciences* (Stanford Univ. Press, 1956).

3) Why has there been a revival of Mendelian genetics in the Soviet Union? I suggest that a good part of the reason has nothing to do with agriculture, but much to do with prestige. (Similar considerations are known to affect directions of research even in the United States.) The revival started under the protection of the prestige-conscious Soviet atomic energy commission—not the Academy of Sciences or the Ministry of Agriculture. I suspect that interest in genetics will increase as long as DNA is the holy trinity of science. . . .

4) Somehow the article disparages Soviet scientists, although by omission rather than by commission. If I am overly sensitive on the point, it is the result of having come to know a number of them as friends. To picture them as cogs in the central plan is a foolish underestimation; the implication that the mere provision of money and equipment will produce scientifically significant results (either in the U.S. or the U.S.S.R.) is debatable.

I can think of an old biologist the most distinguished man I have ever known) who served out his 10 to 15 years in exile and was allowed to go back to work. His studies are not

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called genetics any more, but he otherwise remains unbowed.

I think, too, of the younger generation of biologists. Geneticists are among them, and they are known as geneticists in at least three institutes (to my personal knowledge). The younger generation is better and better trained, alert, imaginative, and unafraid. I found that they were well educated in the liberal arts, too, not through formal courses but because they had read and listened. Certainly they will begin to appear at genetic congresses—and elsewhere!

The authors failed to note that a volume on *Genetics and Selection of Microorganisms* was published in the Soviet Union in 1964—not earth-shaking perhaps, but indicative of scientific adeptness and speed.

HERMAN S. FOREST  
19 Genesee Park Boulevard,  
Rochester, New York 14611

### Making the Scene

Have we stressed molecular biology too much? In a recent examination on evolution, I asked the students to “list the five epochs of the Tertiary Period.” One answer I received was: “Pliocene, Miocene, Oligocene, Eocene, and Cytosine”!

JAMES H. CARLSON  
Fairleigh Dickinson University,  
Madison, New Jersey

### More on Metrics: Clocks, Compasses, Music, and Milk Bottles

... We count by tens because we have ten fingers. But twelve is a much better base, and its advantages are so great that duodecimal currencies, weights, and measures have, I suppose, paralleled the decimal counting system throughout history. Even in France, where the metric system has been longest established, the duodecimal system still flourishes; for example a dozen is used there as it is with us, and eighty is expressed as “four score”; and the divisions of the circle, of the year, day, hour, and minute, once decimal, have reverted to the duodecimal system. Book sizes, time division in music, and the intervals of the diatonic scale, in fact the physiology of the sense of

hearing, are all incorrigibly nondecimal. I suspect that a little reflection would produce many other similar instances.

It seems to me that the French and Russian revolutionaries missed their greatest opportunity to improve the world: rather than adopting the minor improvement of a decimal system of weights and measures, they could have made a major improvement by adopting the duodecimal system of counting, and a consistent compatible system of weights and measures. . . .

S. T. FISHER  
53 Morrison Avenue,  
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... Great numbers of persons are already using the metric system in the U.S., and conversion will be of importance to the scientist. But we have to realize that the whole population of the U.S. is not scientists, and the common man has always been very reluctant to change the units he is used to. In many countries the metric system was enforced by law, and there were fines and prison sentences for those not accepting it. To illustrate the slowness of change, I may cite an experience of our engineering firm. Here in Madrid, 100 years after Spain's adoption of the metric system, in a design project for a new highway the prices of the land were given to us for our counterpart of acres and square feet (which are different from the British and different even from those of other Spanish regions). Of course in our plans we have used metric units. . . .

To gain mass support for a conversion, I have proposed a metricized British system [M. Mateos, *Mech. Eng.* **85**, 50 (1963)]. In this system, by making the quart and the pound slightly bigger we could have 1 metric quart (1 m-quart) = 1 liter, and 1 metric pound (1 m-pound) = ½ kilogram; and by making the inch a bit shorter, 1 metric inch (1 m-inch) = 25 millimeters. This change should be made in stages over a period of at least 10 years. It could be done first as a trial by one big industry—for instance the milk or gasoline industry—in order to appraise the results.

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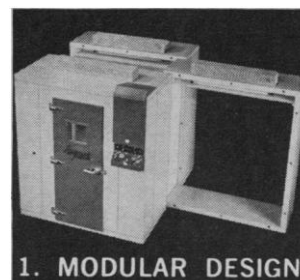
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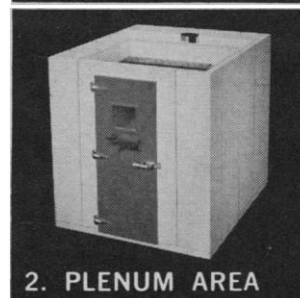
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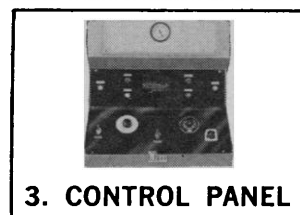




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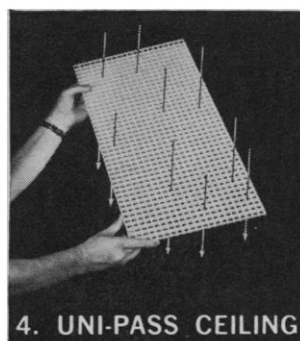


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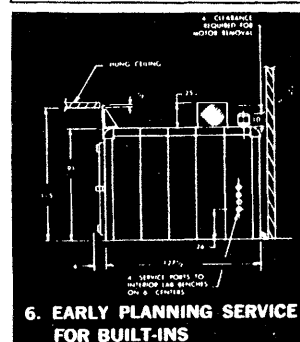
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## The Freshman Class

Newspapers over the country are reporting record college enrollments and the largest freshman classes ever. The increase is largely attributable to the jump in number of births that occurred in 1947; but there is also a continuing tendency for a larger percentage of young people to enter college. Moreover, many college presidents are claiming that their freshmen are smarter than those of earlier years. The facts seem to justify these claims, not only in those colleges that have become more selective but for the nation as a whole.

The best basis for predicting what a person will do in the future is knowledge of what he has done under similar circumstances in the past. It is therefore reasonable to find that school grades and tests of academic aptitude or intelligence constitute the best predictors of college grades. Data recently published by Project Talent (200 South Craig Street, Pittsburgh) and similar data published in 1954 by the Commission on Human Resources and Advanced Training lead to curves showing the relationship between the intelligence test scores of high school graduates and the probability of their entering college. Comparison of the two curves shows that students from the bottom third of their high school classes are just about as likely to get to college now as they were a dozen years ago; those from the middle of the class are a little more likely now than then to enter college; those from the top third are substantially more likely now to enter college. So far, the rise in numbers has been accompanied by a rise in average quality.

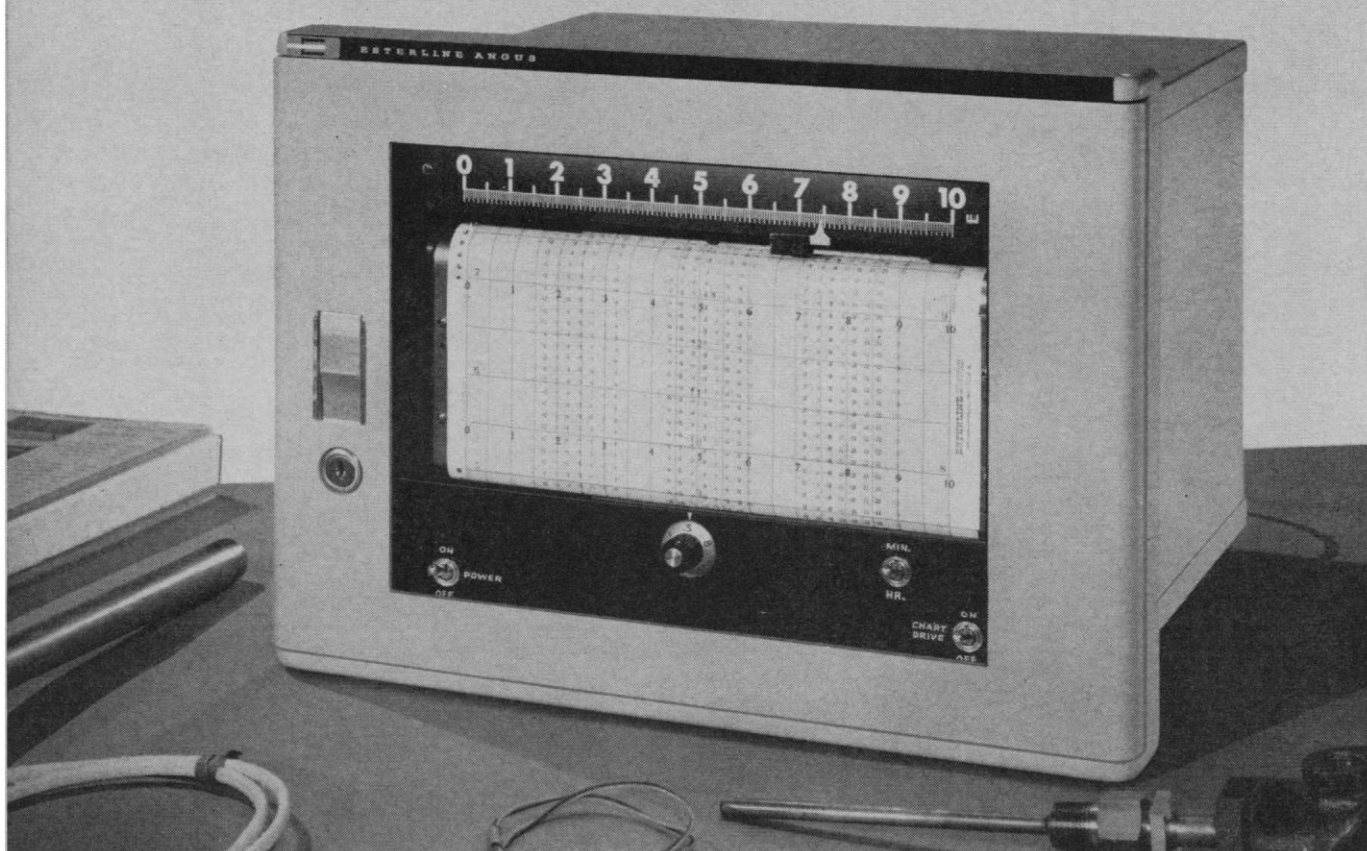
It is reassuring to know that quality is not being watered down and that fewer of the highly talented are having their education cut off prematurely. But the measures of general academic ability and aptitude that justify these reassuring statements leave much to be desired in the help they can give in the identification, encouragement, and utilization of all of the diverse talents in the student population. The star in mathematics may not do equally well in other studies. The most creative writer may not shine so brightly in mathematics or physics. The correlations are positive, but a considerable number of students who are not in the top 10 or 20 or 30 percent on an overall basis may have very high potential in music or mathematics or something else.

Moreover, as both everyday observation and more precise psychological studies demonstrate, college grades and the measures that best predict them are relatively poor predictors of other kinds of achievement and of later success in most professional fields. Stories of the class dunce who turns out to be the most successful alumnus are at best atypical, but the correlations between intelligence or class standing and later success in science, medicine, law, military life, or any other profession are usually discouragingly close to zero. Completely accurate predictions could never be expected; other variables are important in professional success, and much happens after the school years are over. Yet it is nevertheless true that good predictors of professional accomplishment are stubbornly elusive.

Here, then, is a nice problem for anyone interested in the development and utilization of all the diverse forms of human talent. Research on this complex problem goes on, and more should be encouraged. It is useful to know how to select students who can earn good grades. It would be more useful to know better how to select those who will be real achievers in a variety of fields.

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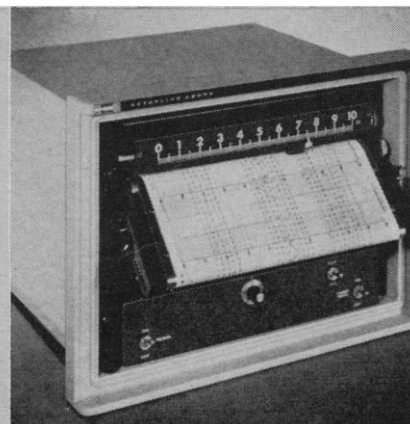
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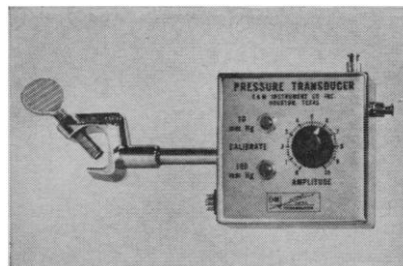
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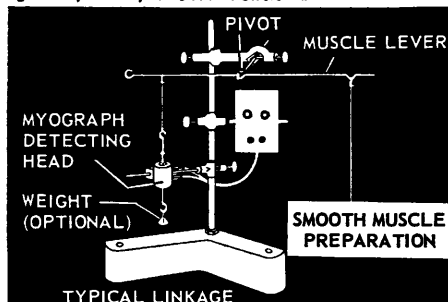


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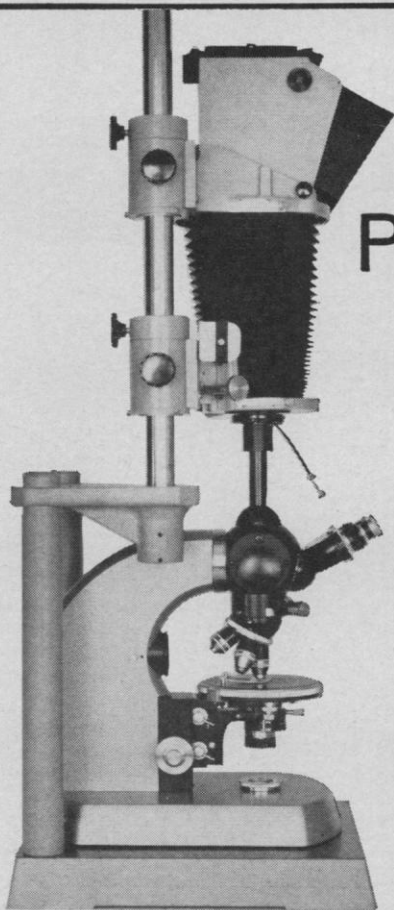
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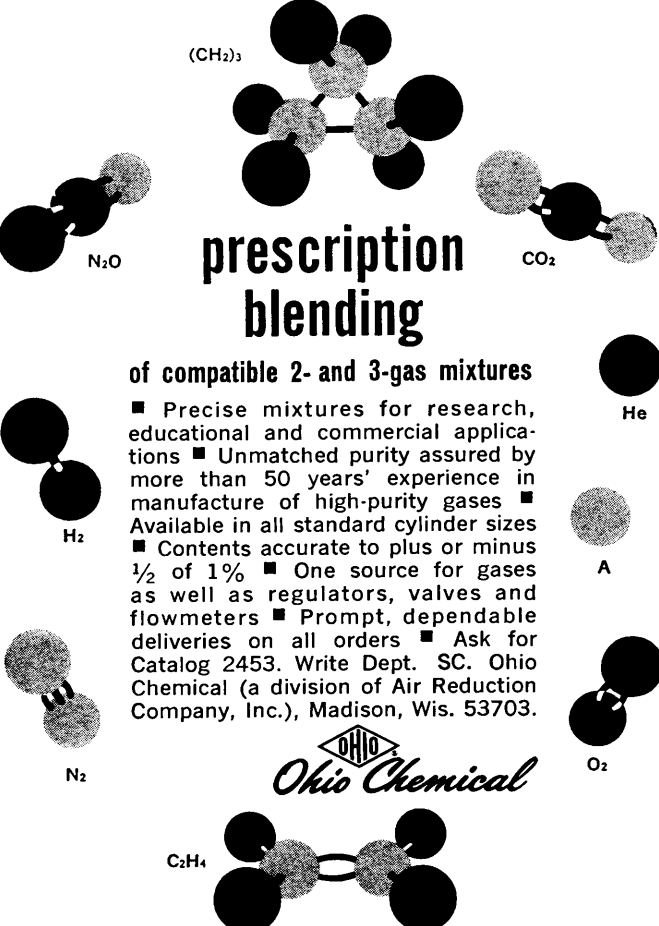
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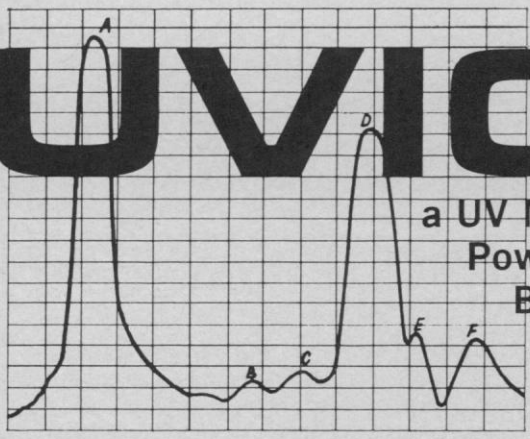
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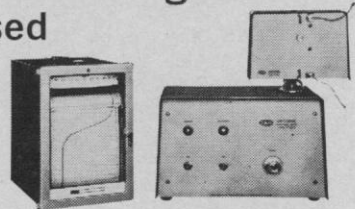
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Theoretische Physik, Universität, Mainz, Germany)

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4-13. Commonwealth Medical Conf., Edinburgh, Scotland. (Mrs. J. Hotchkiss, Ministry of Overseas Development, Stag Place, London, S.W.1, England)

5-7. Industrial and Commercial Power Systems, conf., Buffalo, N.Y. (T. O. Zittel, Bethlehem Steel Co., 3555 Lake Shore Rd., Buffalo 14219)

5-8. International Committee of Weights and Measures, session, Sèvres, France. (Intern. Bureau of Weights and Measures, Pavillon de Breteuil, Sèvres, Sein-et-Oise, France)

5-9. Infectious Pathology, 4th intern. congr., Freiburg im Breisgau, Germany. (G. Mossner, Hugertstr. 55, Freiburg im Breisgau)

5-9. Tuberculosis, 18th intern. conf., Munich, Germany. (Intern. Union Against Tuberculosis, 15, rue Pomereu, Paris 16<sup>e</sup>, France)

6-8. Dynamics of Fluids and Plasmas, symp., Univ. of Maryland, College Park. (S. I. Pai, Inst. for Fluid Dynamics and Applied Mathematics, Univ. of Maryland, College Park 20742)

6-8. Optical Soc. of America, annual meeting, Philadelphia, Pa. (M. E. Waga, OSA, 1155 16th St., NW, Washington, D.C. 20036)

6-8. Royal Inst. of Public Health and Hygiene, annual conf., Weymouth, England. (Secretary, RIPHH, 28 Portland Place, London, W.1, England)

6-10. Wood and Organisms, intern. symp., Berlin, Germany. (German Soc. for Wood Research, Danneckerstr. 37, Stuttgart S, Germany)

7-8. Fiber Soc., meeting, Wilmington, Del. (Fiber Soc., Box 625, Princeton, N.J.)

7-9. Seismological Soc. of America, eastern sec. 37th annual, Lamont Geological Observatory, Palisades, N.Y. (J. Dorman, Lamont Geological Observatory, Palisades 10964)

8-9. Atlantic Coastal Plain Geological Assoc., field trip, South Carolina. (D. J. Colquhoun, Dept. of Geology, Univ. of South Carolina, Columbia)

8-9. Indiana Acad. of Science, fall meeting, Notre Dame. (C. F. Dineen, St. Mary's College, Notre Dame)

9. Paleontological Research Inst., Ithaca, N.Y. (K. V. W. Palmer, Paleontological Research Inst., 109 Dearborn Pl., Ithaca)

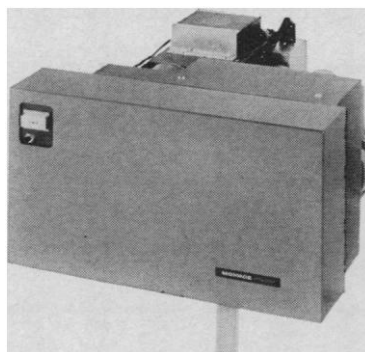
9-10. Gastroenterology, French conf., Paris, France. (R. Biguie, 79, Boulevard Malherbes, Paris 8<sup>e</sup>)

9-13. American Soc. of Clinical Hypnosis, Chicago, Ill. (F. D. Nowlin, ASCH, 800 Washington Ave., SE, Minneapolis, Minn. 55414)

9-17. Electrical, Electronics, and Mechanical Engineering, first Pan American congr., Mexico, D.F. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

10-14. Water Pollution Control Fed., 38th annual, Atlantic City, N.J. (R. E. Fuhrman, 4435 Wisconsin Ave., NW, Washington, D.C. 20016)

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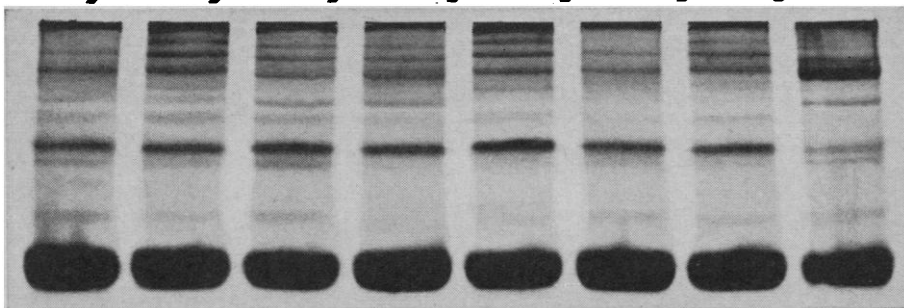
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10-15. Electrochemical Soc., meeting, Buffalo, N.Y. (Executive Secretary, ES, 30 E. 42 St., New York 10017)

10-15. Endocrinology, 6th Pan American conf., Mexico, D.F. (G. Gual, Inst. Nacional de la Nutrición, Dr. Jiménez No. 261, Mexico 7)

10-16. American Documentation Inst., Washington, D.C. (J. E. Bryan, 2000 P St., NW, Washington, D.C. 20036)

10-17. Bronchoesophagology, 1st Latin American congr., Rio de Janeiro, Brazil. (F. Aprigliano, Rua Alcindo Guanabara, 24, Sob-Loja 206, Rio de Janeiro)

10-17. Otorhinolaryngology, 14th Brazilian congr., Rio de Janeiro, Brazil. (W. Benevides, Rua Alcindo Guanabara, 24, Sob-Loja 206, Rio de Janeiro)

10-17. Plastic Surgery, 10th Latin American congr., Buenos Aires, Argentina. (J. Norberto Spera, Riglos 624, Buenos Aires)

11-13. Color Centers in Alkali Halides, symp., Univ. of Illinois, Urbana. (D. W. Compton, Dept. of Physics, Univ. of Illinois, Urbana)

11-13. Communications, 11th natl. symp., Utica, N.Y. (G. E. Brunette, Communications Div. (EMCT) Rome Air Development Center, Griffiss AFB, New York 13442)

11-13. Metabolic Roles of Lipids, symp., Cincinnati, Ohio. (C. H. Hauber, American Oil Chemists' Soc., 35 East Wacker Dr., Chicago 1, Ill.)

11-13. Manned Spaceflight, 4th meeting, St. Louis, Mo. (J. F. Yardley, McDonnell Aircraft Corp., P.O. Box 516, St. Louis)

11-13. National Acad. of Sciences, fall meeting, Univ. of Washington, Seattle. (H. Neurath, Dept. of Biochemistry, Univ. of Washington, Seattle 98105)

11-13. American Record Management Assoc., 10th annual conf., Minneapolis, Minn. (L. Loveless, Office Services, Honeywell, Inc., 2701 Fourth Ave., S, Minneapolis 55408)

11-14. Association of Official Agricultural Chemists, 79th annual, Washington, D.C. (L. G. Ensminger, AOAC, Box 540, Benjamin Franklin Station, Washington 20044)

11-14. American Oil Chemists' Soc., fall meeting, Cincinnati, Ohio. (AOCS, 35 E. Wacker Dr., Chicago, Ill. 60600)

11-15. Fall Metallurgy Days, Paris, France. (Soc. Française de Metallurgie, 25 rue de Clichy, Paris 9°)

11-16. Stomatology, 19th French congr., Paris. (R. Cayron, 99, rue de Courcelles, Paris 17°)

11-23. International Organization for Standardization, Milan, Italy. (Soc. of Motion Picture and Television Engineers, 9 E. 41 St., New York 10017)

12-13. Cardio-Renal Consequences of Sustained Hypertension, seminar, Philadelphia, Pa. (Miss S. Rosen, Symposium Office, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia 19102)

12-14. Analytical Chemistry in Nuclear Technology, 9th conf., Gatlinburg, Tenn. (C. D. Susano, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn.)

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13. **Medical Physics**, seminar, New York, N.Y. (American Inst. of Physics, 335 E. 45 St., New York 10017)

13. **Animal Nutrition Research Council**, 26th annual, Washington, D.C. (J. C. Fritz, 12314 Madeley Lane, Bowie, Md. 20715)

13-15. **Detonation**, 4th symp., White Oak, Silver Spring, Md. (S. J. Jacobs, U.S. Naval Ordnance Laboratory, White Oak, Silver Spring 20910)

13-15. **American Assoc. of Petroleum Geologists**, mid-continent regional meeting, Tulsa, Okla. (E. W. Ellsworth, AAPG, Box 979, Tulsa 74101)

13-16. **Tau Beta Pi Assoc., Inc.**, Univ. of Maryland, College Park. (R. H. Nagel, 508 Dougherty Engineering Bldg., Univ. of Tennessee, Knoxville)

13-17. **Soil Biology**, first Latin American colloquium, Bahia Blanca, Argentina. (Organizing Committee, Inst. de Edafologia e Hidrologia, Alem 925, Bahia Blanca, Argentina)

13-19. **Instrumentation and Automation**, 3rd intern. Congr., Düsseldorf, Germany. (Nordwestdeutsche Ausstellungs- und Messe-Gesellschaft, Ehrenhof 4, 4000 Düsseldorf 10)

14. **Association of Vitamin Chemists**, Chicago, Ill. (D. Olson, Dawe's Laboratories, 4800 S. Richmond St., Chicago)

14-15. **International Federation of Surgical Colleges**, 8th annual, Philadelphia, Pa.; 17, Atlantic City, N.J. (K. Cassels, Royal College of Surgeons, Lincoln's Inn Fields, London W.C.2, England)

14-16. **British Orthopaedic Assoc.**, fall meeting, London, England. (Joint Secretariat, 47 Lincoln's Inn Fields, London, W.C.2)

15. **Southern California Acad. of Science**, Los Angeles. (C. Rozaire, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 90007)

15-16. **Contributions of Cytogenetics to the Determination of Phylogenies**, 12th symp., Missouri Botanical Garden, St. Louis. (H. C. Cutler, Missouri Botanical Garden, St. Louis 63110)

15-16. **National Soc. of Professional Engineers**, 3rd annual conf., Oklahoma City, Okla. (NSPE, 2029 K St., NW, Washington 20006)

15-17. **American Heart Assoc.**, Scientific sessions, Bal Harbour, Fla. (AHA, 44 E. 23 St., New York 10010)

16-17. **Infectious Diseases Soc. of America**, Washington, D.C. (E. H. Kass, IDS, Boston City Hospital, Boston, Mass. 02118)

17-21. **Antimicrobial Agents and Chemotherapy**, 5th interscience conf./4th intern. Congr. of chemotherapy, Washington, D.C. (R. W. Sarber, American Soc. for Microbiology, 115 Huron View Blvd., Ann Arbor, Mich.)

17-21. **Metallurgical Soc. of American Inst. of Mining, Metallurgical, and Petroleum Engineers**, Detroit, Mich. (American Inst. of Mechanical Engineers, 345 E. 47 St., New York 10017)

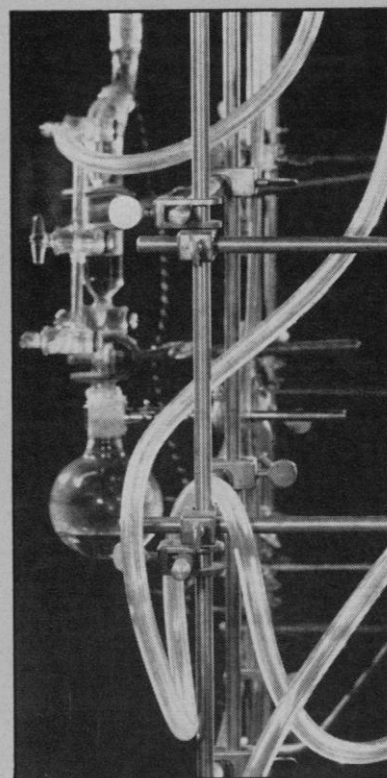
18. **Industrial Pharmacy** sect., American Pharmaceutical Assoc., 4th annual mid-west regional meeting, Chicago, Ill. (C.

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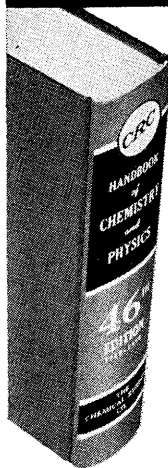
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18-19. Systems Science, conf., Case Inst. of Technology, Cleveland, Ohio. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18-20. Dynamic Stability of Structures, intern. conf., Evanston, Ill. (G. Herrmann, Technological Inst., Northwestern Univ., Evanston 60201)

18-20. Electromagnetic Radiation in Agriculture, intern. conf., Roanoke, Va. (D. P. Brown, Niagara Mohawk Power Corp., 300 Erie Blvd. W., Syracuse, N.Y. 13202)

18-20. American Soc. of Lubrication Engineers, San Francisco, Calif. (D. B. Sanberg, 5 North Wabash Ave., Chicago, Ill.)

18-20. Canadian Inst. of Mining and Metallurgy, annual western meeting, Winnipeg, Canada. (CIMM, 906 Drummond Bldg., 1117 St. Catherine St. W., Montreal 2, P.Q., Canada)

18-20. Nuclear Science, 12th symp., San Francisco, Calif. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18-20. Applied Spectroscopy, 12th symp., Ottawa, Ont., Canada. (R. V. Baker, Aluminum Co. of Canada, Arvida, P.Q., Canada)

18-21. Advances in Gas Chromatography, 3rd intern. symp., Houston, Tex. (A. Zlatkis, Dept. of Chemistry, Univ. of Houston, Houston)

18-21. Management Information and Data Transfer Systems, American Univ., Washington, D.C. (R. I. Cole, Center for Technology and Administration, American Univ., 2000 G St., NW, Washington, D.C. 20006)

18-22. American Soc. of Civil Engineers, Kansas City, Mo. (W. H. Wisely, ASCE, 345 E. 47 St., New York 10017)

18-22. Society for Nondestructive Testing, 25th natl. conv., Detroit, Mich. (N. H. Cale, Anaconda American Brass Co., Research and Technical Center, P.O. Box 747, Waterbury, Conn.)

18-22. American Public Health Assoc., 93rd annual, Chicago, Ill. (APHA, 1790 Broadway, New York, N.Y.)

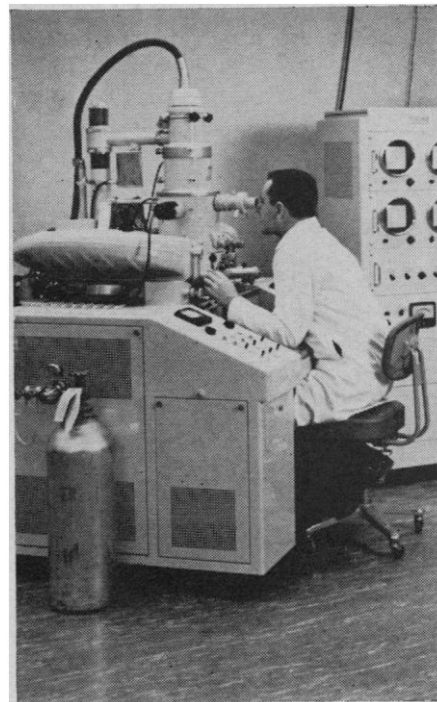
18-22. Radioisotope Instruments in Industry and Geophysics, Warsaw, Poland. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C.)

18-22. American Soc. for Metals, natl. congr., Detroit, Mich. (A. R. Putnam, ASM, Metals Park, Ohio)

18-22. Application of Radioisotopes in Gastroenterology, symp., Lausanne, Switzerland. (A. Vannotti, Clinique Médicale Universitaire, Hôpital Cantonal, Lausanne)

18-22. American College of Surgeons, annual clinical congr., Atlantic City, N.J. (American College of Surgeons, 55 East Erie St., Chicago, Ill. 60611)

19-20. International Rhinologic Soc., 1st congr., Kyoto, Japan. (H. A. E. van Dishoeck, Academisch Ziekenhuis, Leiden, Netherlands)



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19-21. Cloud Physics and Severe Storms, conf., American Meteorological Soc., Reno, Nev. (K. C. Spengler, 45 Beacon St., Boston 8, Mass.)

19-21. Radio Astronomical and Satellite Studies of the Atmosphere, 2nd symp., Boston, Mass. (G. A. Cushman, Wentworth Inst., 550 Huntington Ave., Boston)

19-22. Economics of Automatic Data Processing, symp., Rome, Italy. (Intern. Computation Center, Viale della Civiltà del Lavoro, 23, P.O.B. 10053, Rome)

20-21. Airborne Infection, 2nd intern. symp., Johns Hopkins School of Medicine, Baltimore, Md. (E. K. Wolfe, Fort Detrick, Frederick, Md. 21701)

20-21. International Soc. of Audiology, 2nd congr., Kyoto, Japan. (M. Goto, Dept. of Otolaryngology, Kyoto Univ., Shogoin, Sakyo-ku, Kyoto)

20-22. Circuit and System Theory, Alerton Conf., Univ. of Illinois, Monticello. (M. E. Van Valkenburg, Dept. of Electrical Engineering, Univ. of Illinois, Urbana 61803)

20-22. Design of Experiments, 11th conf., Hoboken, N.J. (F. G. Dressel, Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706)

20-22. Parenteral Drug Assoc., annual conv., New York, N.Y. (PDA, Western Saving Fund Bldg., Broad and Chestnut St., Philadelphia, Pa. 19107)

21. New Mexico Acad. of Science, Albuquerque. (K. S. Bergstresser, 739 42nd St., Los Alamos, N.M.)

21-22. Copolymer conf., Ludwigshafen, Germany. (Deutsche Bunsen-Gesellschaft für Physikalische Chemie, Varrentrappstr. 40-42, 6 Frankfurt am Main, Germany)

21-22. Electrochemical Current Sources, symp., Frankfurt am Main, Germany. (Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main)

21-23. Microminiaturization in Automatic Control, symp., Munich, Germany. (G. Müller, Siemens & Halske AG, Wernerwerk für Messtechnik, Postfach 834, Karlsruhe, Germany)

21-23. Society of Photographic Scientists and Engineers, symp., Washington, D.C. (W. S. Dempsey, Houston Fearless Corp., 1413 K St., NW, Washington 20005)

22-23. Data Processing in Public Libraries, conf., Drexel Inst. of Technology, Philadelphia, Pa. (M. D. Warrington, Graduate School of Library Science, Drexel Inst. of Technology, Philadelphia 19104)

23-28. American Acad. of Pediatrics, annual, Chicago, Ill. (R. G. Frazier, AAP, 1801 Hinman Ave., Evanston, Ill. 60204)

24-27. Society of American Foresters, annual, Detroit, Mich. (Society of American Foresters, 1010 16th St., NW, Washington 20036)

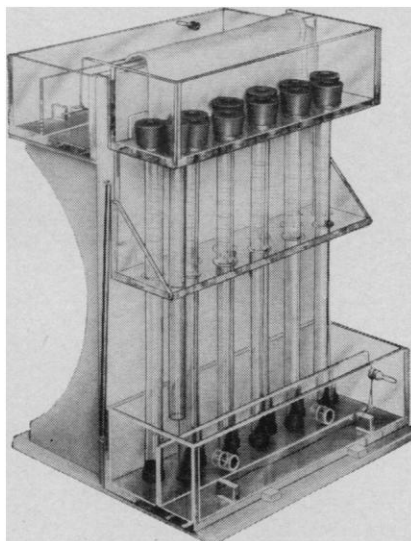
24-29. Stable Isotopes, 4th symp., Leipzig, East Germany. (Inst. für Stabile Isotope, Deutsche Akademie der Wissenschaften, Permoserstr. 15, 705 Leipzig)

24-30. American College of Gastroenterology, Bal Harbour, Fla. (D. Weiss, 33 W. 60 St., New York 10023)

25-27. Chemical Engineering, 15th

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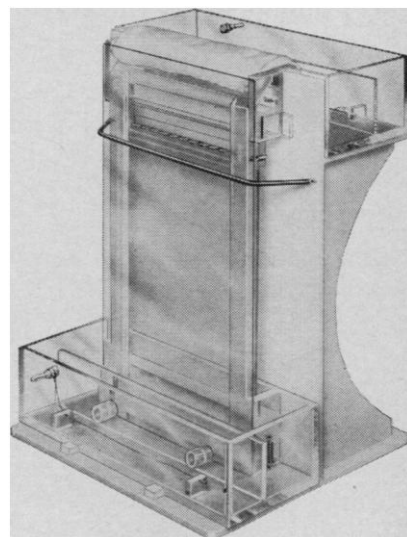
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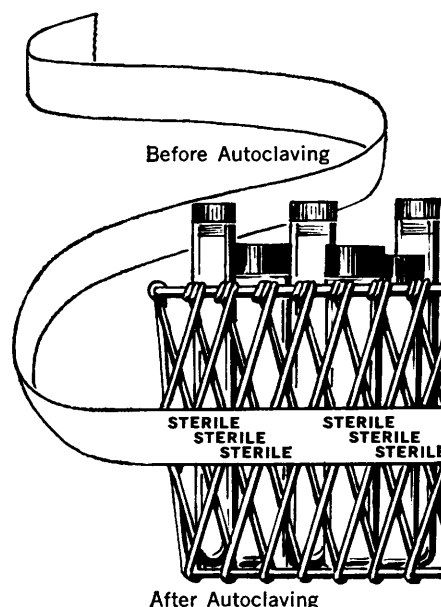
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25-27. **Functional Organization of the Compound Eye**, symp., Karolinska Inst., Stockholm, Sweden. (W. E. Savely, Air Force Office of Scientific Research, Washington, D.C. 20333)

25-27. **Electrical Insulation**, Natl. Acad. of Sciences-Nat. Research Council conf., Buck Hill Falls, Pa. (D. W. Thornhill, NAS, 2101 Constitution Ave., NW, Washington, D.C.)

25-27. **Electronics**, natl. conf., Chicago, Ill. (R. G. Brown, Dept. of Electrical Engineering, Iowa State Univ., Ames 50010)

25-27. **Nuclear and Engineering Ceramics**, conf., Harwell, England. (G. H. Stewart, British Ceramic Soc., Shelton House, Shelton, Stoke-on-Trent, England)

25-27. **Society of Rheology**, Case Inst. of Technology, Cleveland, Ohio. (J. C. Miller, Union Carbide Plastics Co., Bound Brook, N.J.)

25-29. **Hypotensive Polypeptides**, intern. symp., Florence, Italy. (E. G. Erdős, Dept. of Pharmacology, Univ. of Oklahoma Medical Center, Oklahoma City 73104)

27-29. **Electronic Data Processing Systems** for State and Local Governments, 2nd natl. conf., New York Univ., New York, N.Y. (H. G. Berkman, Graduate School of Public Administration, 4 Washington Sq. N., New York 10003)

27-30. **Neurological Surgeons**, 15th annual congr., Chicago, Ill. (J. R. Russell, 1815 N. Capitol Ave., Indianapolis, Ind. 46202)

28-29. **Educational Records Bureau**, 13th annual conf., New York. (A. E. Traxler, Educational Records Bureau, 21 Audubon Ave., New York 10032)

28-29. **Energy Conversion and Storage**, 3rd annual conf., Oklahoma State Univ., Stillwater. (C. M. Summers, School of Electrical Engineering, Oklahoma State Univ., Stillwater 74075)

28-29. **Microwave Acoustics**, symp., Hanscom Field, Bedford, Mass. (T. G. Burnhagen, Air Force Cambridge Research Laboratories, Cambridge, Mass.)

28-30. **American Soc. for Aesthetics**, Washington, D.C. (J. R. Johnson, Cleveland Museum of Art, Cleveland, Ohio 44106)

28-4. **Psychology as a Theoretical and Applied Discipline**, seminar, Gujarat Univ., Ahmedabad, India. (P. H. Prabhu, School of Psychology, Education, and Philosophy, Gujarat Univ., Ahmedabad 9)

29-30. **Society for the Scientific Study of Religion**, annual, New York, N.Y. (SSSR, 1200 17th St., NW, Washington, D.C. 20036)

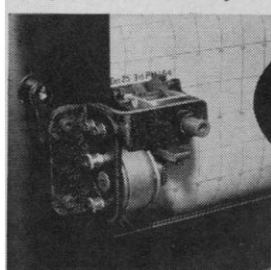
30-31. **Bronchoesophagology**, 11th intern. congr., Hakone, Japan. (C. M. Norris, 3401 N. Broad St., Philadelphia, Pa. 19140)

30-2. **American Speech and Hearing Assoc.**, Chicago, Ill. (K. O. Johnson, 1001 Connecticut Ave., NW, Washington, D.C.)

31-4. **American Soc. of Agronomy**, 57th annual, Columbus, Ohio. (ASA, 677 South Segoe Rd., Madison, Wis. 53711)

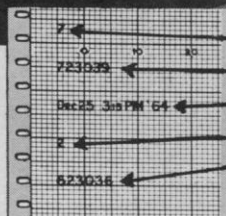
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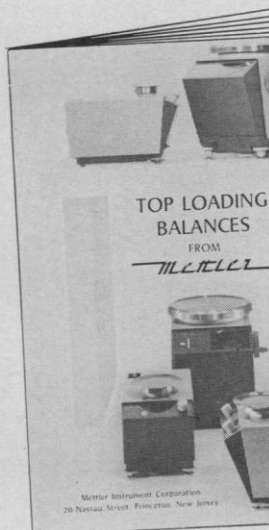
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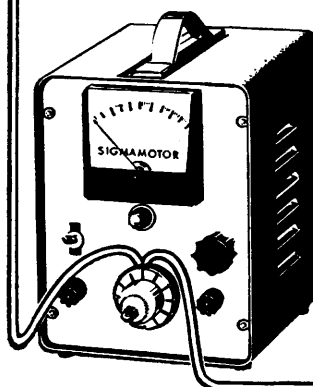
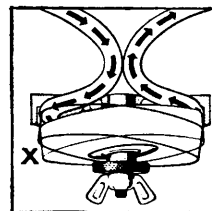
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## NEW BOOKS

(Continued from page 1493)

**silas.** John H. Blakelock. Wiley, New York, 1965. 360 pp. Illus. \$15.75.

**Basic Electrical Engineering.** A. Kasatkin and M. Perekalin. Translated from the Russian. George Yankovsky, Translation Ed. Gordon and Breach, New York; Noordhoff, Groningen, Netherlands, 1965. 386 pp. Illus. \$9.50. Russian Monographs and Texts on Advanced Mathematics and Physics, vol. 23.

**Basic Statistical Methods.** N. M. Downie and R. W. Heath. Harper and Row, New York, ed. 2, 1965. 343 pp. Illus. \$6.95. Education for Living Series, edited by H. H. Remmers.

**Chemistry of Organic Compounds.** Carl R. Noller. Saunders, Philadelphia, ed. 3, 1965. 1123 pp. Illus. \$14.

**Chemistry: Principles and Concepts.** Malcolm Sturchio, Howard Nechamkin, and Harry Dorfman. Prentice-Hall, Englewood Cliffs, N.J., 1965. 415 pp. Illus. \$5.96.

**Concepts and Models of Inorganic Chemistry.** Bodie E. Douglas and Darl H. McDaniel. Blaisdell, New York, 1965. 530 pp. Illus. \$10.50. A Blaisdell Book in the Pure and Applied Sciences.

**Condensation Polymers: By Interfacial and Solution Methods.** Paul W. Morgan. Interscience (Wiley), New York, 1965. 579 pp. Illus. \$25. Polymer Reviews, col. 10, edited by H. F. Mark and E. H. Immergut.

**Conformation Theory.** Michael Hanack. Translated from the German manuscript by Helmut C. Neumann. Academic Press, New York, 1965. 392 pp. Illus. \$14.50. Organic Chemistry Series of Monographs, vol. 3, edited by Alfred T. Blomquist.

**Dictionary of Organic Compounds.** vols. 1 to 5. vol. 1 (620 pp.); vol. 2 (650 pp.); vol. 3 (754 pp.); vol. 4 (768 pp.); vol. 5 (554 pp.). J. R. A. Pollock, R. Stevens, and G. Harris, Eds. Oxford Univ. Press, New York, ed. 4, 1965; *First Supplement* (213 pp.). Illus. \$280 set.

**Digital Computer Applications to Process Control.** Proceedings, First International Conference (Stockholm, September 1964), sponsored by the International Federation for Automatic Control and The International Federation for Information Processing. William E. Miller, Ed. Plenum Press, New York, 1965. 615 pp. Illus. \$17.50. Twenty-two papers.

**Digital Computer Programs for Physical Chemistry.** vol. 2, *Autoplotter, Expansion, Self-Judgment, Spectral, Polarization, Conductance, Kinetic, and Special Iterative Programs.* Paul A. D. de Maine. Macmillan, New York, 1965. 523 pp. Illus. \$19.95.

**Distillation.** E. S. Perry and A. Weissberger, Eds. Interscience (Wiley), New York, ed. 2, 1965. 858 pp. Illus. \$24. Eleven papers. Technique of Organic Chemistry Series, vol. 4, edited by Arnold Weissberger.

**Distributions, Complex Variables, and Fourier Transforms.** Hans Bremermann. Addison-Wesley, Reading, Mass., 1965. 198 pp. Illus. \$7.95. Addison-Wesley Series in Mathematics.

**Electromechanical Control Systems and**

**Devices.** Eugene B. Canfield. Wiley, New York, 1965. 342 pp. Illus. \$13.50.

**Electronic Analog Computer Primer.** James E. Stice and Bernet S. Swanson. Blaisdell (Ginn), New York, 1965. 172 pp. Illus. Paper, \$2.75. A Blaisdell Book in the Pure and Applied Sciences Series.

**Elements of Hypersonic Aerodynamics.** R. N. Cox and L. F. Crabtree. Academic Press, New York, 1965. 255 pp. Illus. \$6.50.

**Elements of Linear Circuits.** Ronald E. Scott. Addison-Wesley, Reading, Mass., 1965. 414 pp. Illus. \$9.75. Addison-Wesley Series in Electrical Engineering.

**Image Furnace Techniques.** Tibor S. Laszlo. Interscience (Wiley), New York, 1965. 205 pp. Illus. \$12. Technique of Inorganic Chemistry Series, vol. 5, edited by Hans B. Jonassen and Arnold Weissberger.

**Information, Computers, and System Design.** Ira G. Wilson and Marthann E. Wilson. Wiley, New York, 1965. 361 pp. Illus. \$12.50. Wiley Series on Systems Engineering and Analysis, edited by Harold Chestnut.

**Interaction of Metals and Gases.** vol. 1, *Thermodynamics and Phase Relations.* J. D. Fast. Academic Press, New York, 1965. 312 pp. Illus. \$13.

**Introduction to Algebra.** Donald J. Lewis. Harper and Row, New York, 1965. 332 pp. Illus. \$8.50. Harper's Series in Modern Mathematics, edited by I. N. Herstein and Gian-Carlo Rota.

**An Introduction to Mathematical Learning Theory.** Richard C. Atkinson, Gordon H. Bower, and Edward J. Crothers. Wiley, New York, 1965. 443 pp. Illus. \$9.95.

**Introduction to Plate and Shell Theory.** C. E. Turner. Elsevier, New York, 1965. 220 pp. Illus. \$6.50.

**An Introduction to the Theory of Superfluidity.** I. M. Khalatnikov. Translated from the Russian by Pierre C. Hohenberg. Benjamin, New York, 1965. 220 pp. Illus. Paper, \$5.45; cloth, \$9.90. Frontiers in Physics Series, edited by David Pines.

**Introductory Network Theory.** Amar G. Bose and Kenneth N. Stevens. Harper and Row, New York, 1965. 373 pp. Illus. \$9.75. Harper's Electrical Engineering Series, edited by Henry C. Bourne, Jr.

**Laboratory Manual in Geology for Engineers.** Arthur H. Brownlow and Mahlon J. Reinhard. Brown, Dubuque, Iowa, 1965. 153 pp. Illus. Paper, \$3.50.

**Linear Geometry.** Rafael Artzy. Addison-Wesley, Reading, Mass., 1965. 283 pp. Illus. \$9.75. Addison-Wesley Series in Mathematics.

**Low Reynolds Number Hydrodynamics, with Special Applications to Particulate Media.** John Happel and Howard Brenner. Prentice-Hall, Englewood Cliffs, N.J., 1965. 566 pp. Illus. \$20.

**Mathematics of Choice, or How To Count Without Counting.** Ivan Niven. Random House, New York, 1965. 214 pp. Illus. Paper, \$1.95. New Mathematical Library Series.

**Methods in Computational Physics: Advances in Research and Applications.** vol. 4, *Applications in Hydrodynamics.* Berni Alder, Sidney Fernbach, and Manuel

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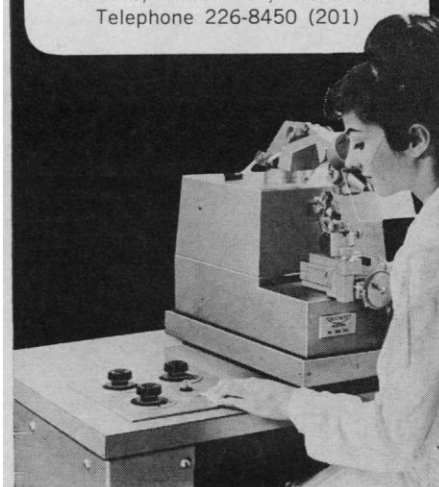
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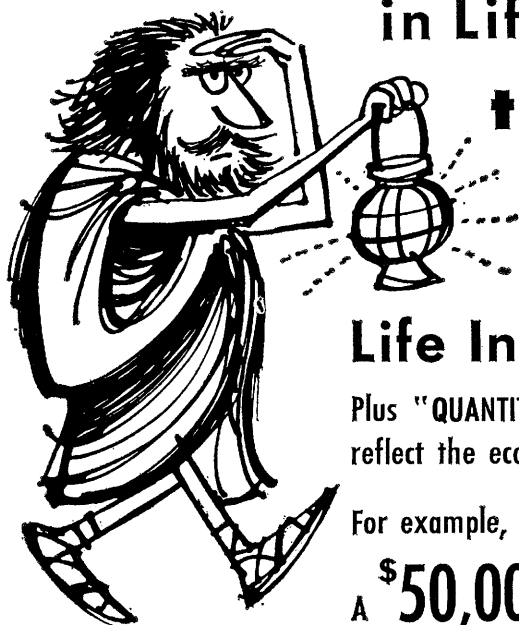
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Rotenberg, Eds. Academic Press, New York, 1965. 397 pp. Illus. \$14. Ten papers: "Numerical simulation of the earth's atmosphere" by Cecil E. Leith; "Non-linear effects in the theory of a wind-driven ocean circulation" by Kirk Bryan; "Analytic continuation using numerical methods" by Glenn E. Lewis; "Numerical solution of the complete Krook-Boltzmann equation for strong shock waves" by Moustafa T. Chahine; "The solution of two molecular flow problems by the Monte Carlo method" by J. K. Haviland; "Computer experiments for molecular dynamics problems" by R. A. Gentry, F. H. Harlow, and R. E. Martin; "Computation of the stability of the laminar compressible boundary layer" by Leslie M. Mack; "Some computational aspects of propeller design" by William B. Morgan and John W. Wrench, Jr.; "Methods of the automatic computation of stellar evolution" by Louis G. Henyey and Richard D. Levee, and "Computations pertaining to the problem of propagation of a seismic pulse in a layered solid" by F. Abramovici and Z. Alterman.

**Methods of Orbit Determination.** Pedro Ramon Escobal. Wiley, New York, 1965. 483 pp. Illus. \$17.50.

**Microelectronic Circuits and Applications.** John M. Carroll. McGraw-Hill, New York, 1965. 368 pp. Illus. \$9.75.

**Nonlinear Partial Differential Equations in Engineering.** W. F. Ames. Academic Press, New York, 1965. 525 pp. Illus. \$16. Mathematics in Science and Engineering Series, edited by Richard Bellman.

**Nuclidic Masses.** Proceedings of the Second International Conference on Nuclidic Masses (Vienna, Austria), July 1963. Walter H. Johnson, Jr., Ed. Springer-Verlag, New York, 1964. 481 pp. Illus. \$29. Thirty-eight papers.

**Organosilicon Compounds.** vols. 1 and 2, pts. 1 and 2. vol. 1, *Chemistry of Organosilicon Compounds* (616 pp.); vol. 2, pts. 1 and 2, *Register of Organosilicon Compounds* (pt. 1, 699 pp.; pt. 2, 544 pp.). Vladimír Bažant, Václav Chvalovský, and Jiří Rathouský. Translated from the Czechoslovakian by Arnost Kotyk and Jiří Salák. Czechoslovak Acad. of Sciences, Prague; Academic Press, New York, 1965. Illus. \$25 each.

**Oxygen: Elementary Forms and Hydrogen Peroxide.** Michael Ardon. Benjamin, New York, 1965. 118 pp. Illus. \$6.75. The Physical and Inorganic Chemistry Series, edited by Robert A. Plane and Michell J. Sienko.

**Plasma Physics.** J. L. Delcroix. Wiley, New York, 1965. 278 pp. Illus. \$7.75.

**Practical Vacuum Techniques.** William F. Brunner, Jr., and Thomas H. Batzer. Reinhold, New York; Chapman and Hall, London, 1965. 208 pp. Illus. \$8.25.

**Problems for Computer Solution.** Fred Gruenberger and George Jaffray. Wiley, New York, 1965. 417 pp. Illus. Paper, \$4.50.

**Proceedings of the International Council of the Aeronautical Sciences.** 4th Congress (Paris), August 1964. Robert R. Dexter, Ed. Spartan Books, Washington, D.C.; Macmillan, London, 1965. 1149 pp. Illus. \$34.50. Forty-five papers on the following topics: Supersonic aircraft (20

papers); Simulation of flight dynamics (2 papers); Reliability (7 papers); Flight of winged space vehicles in the atmosphere (12 papers); and General lectures (4 papers).

**Quantum Mechanics in Chemistry.** Melvin W. Hanna. Benjamin, New York, 1965. 267 pp. Illus. Paper, \$3.95; cloth, \$7. Physical Chemistry Monograph Series, edited by Walter Kauzmann.

**Semiconductor Junctions and Devices: Theory to Practice.** William B. Burford III and H. Grey Verner. McGraw-Hill, New York, 1965. 348 pp. Illus. \$12.

**Signal Flow Analysis.** J. R. Abrahams and G. P. Coverley. Pergamon, New York, 1965. 168 pp. Illus. Paper, \$3.75. The Commonwealth and International Library of Science.

**Solid State Physics: Advances in Research and Applications.** vol. 17. Frederick Seitz and David Turnbull, Eds. Academic Press, New York, 1965. 397 pp. Illus. \$14. Four papers: "The effects of high pressure on the electronic structure of solids" by H. G. Drickamer; "Electron spin resonance of magnetic ions in complex oxides: Review of ESR results in rutile, perovskites, spinel, and garnet structures" by W. Low and E. L. Offenbacher; "Ultrasonic effects in semiconductors" by Norman G. Einspruch; and "Quantum theory of galvanomagnetic effect at extremely strong magnetic fields" by Ryogo Kubo, Satoru J. Miyake, and Natsuki Hashitsume.

**Solutions, Minerals, and Equilibria.** Robert M. Garrels and Charles L. Christ. Harper and Row, New York, 1965. 464 pp. Illus. \$14.25. Harper's Geoscience Series, edited by Carey Croneis.

**Some Aspects of Crystal Field Theory.** Thomas M. Dunn, Donald S. McClure, and Ralph G. Pearson. Harper and Row, New York, 1965. 125 pp. Illus. Paper, \$3.95; cloth, \$6. Harper's Chemistry Series, edited by Stuart A. Rice.

**Some Aspects of Non-Equilibrium Thermodynamics in the Presence of a Radiation Field.** Based on a set of lectures given at the University of Paris, February and March 1961. Richard N. Thomas. Univ. of Colorado Press, Boulder, 1965. 224 pp. Illus. \$5.

**Space Physics with Artificial Satellites.** Ya. L. Al'pert, A. V. Gurevich, and L. P. Pitaevskii. Translated from the Russian (Moscow, 1964) by H. H. Nickle. Consultants Bureau, New York, 1965. 250 pp. Illus. \$25.

**Stochastic Processes: Basic Theory and Its Applications.** N. U. Prabhu. Macmillan, New York, 1965. 247 pp. Illus. \$7.95.

**Stress Analysis.** Recent developments in numerical and experimental methods. O. C. Zienkiewicz and G. S. Holister, Eds. Wiley, New York, 1965. 479 pp. Illus. \$15.50. Seventeen papers.

**The Structure of Matter: An Introduction to Modern Physics.** Robert W. Christy and Agnar Pytte. Benjamin, New York, 1965. 565 pp. Illus. \$10.75.

**Studies in Non-Linear Stability Theory.** Wiktor Eckhaus. Springer-Verlag, New York, 1965. 125 pp. Illus. \$5.50. Springer Tracts in Natural Philosophy Series, vol. 6, edited by C. Truesdell.

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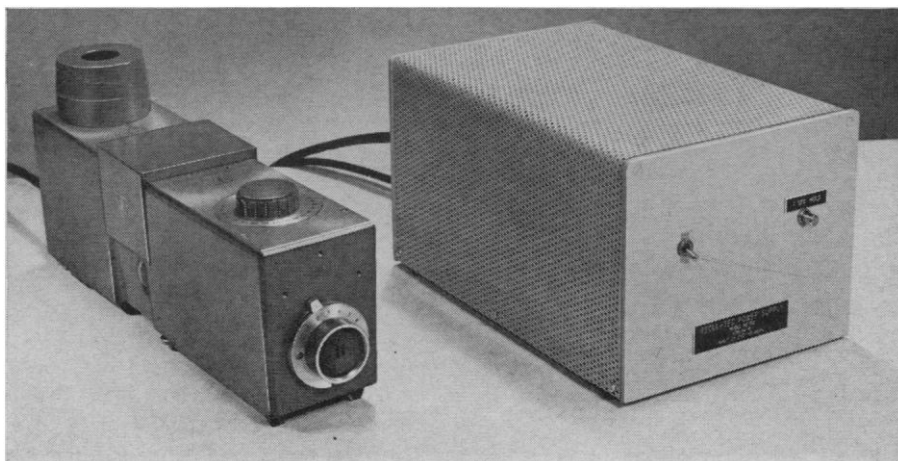
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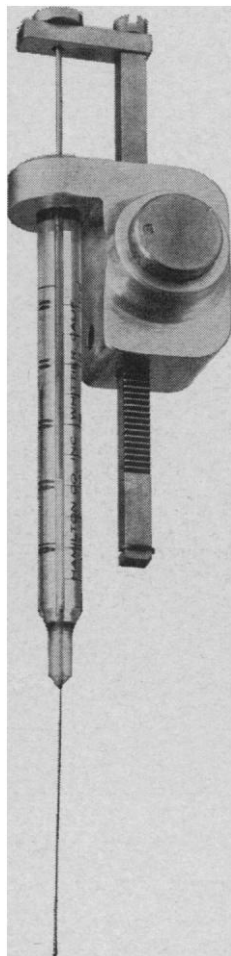
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**Technical Thermodynamics.** V. V. Sushkov. Translated from the Russian by George H. Hanna. Gordon and Breach, New York; Noordhoff, Groninger, Netherlands, 1965. 397 pp. Illus. \$12.50. Russian Monographs and Texts on Advanced Mathematics and Physics, vol. 20.

**Telemetry Systems.** LeRoy E. Foster. Wiley, New York, 1965. 318 pp. Illus. \$12.75.

**Theory of Optimum Aerodynamic Shapes.** Extremal problems in the aerodynamics of supersonic, hypersonic, and free-molecular flows. Angelo Miele, Ed. Academic Press, New York, 1965. 477 pp. Illus. \$16.50. Twenty-nine papers: Applied Mathematics and Mechanics Series, edited by F. N. Frenkiel and G. Temple.

**The Theory of Sets and Transfinite Arithmetic.** Alexander Abian. Saunders, Philadelphia, 1965. 420 pp. Illus. \$10. Saunders Mathematics Books.

### Economics and the Social Sciences

**Eskimo Townsmen.** John J. Honigmann and Irma Honigmann. Canadian Research Centre for Anthropology, Ottawa, Canada, 1965. 298 pp. Illus. Paper, \$6.50.

**Induced Political Change in the Pacific.** Symposium (Honolulu), August-September 1961. Roland W. Force, Ed. Bishop Museum Press, Honolulu, 1965. 113 pp. Paper, \$3.50. Six papers: "Political change in Micronesia" by Roland W. Force and Maryanne Force; "Personality and structure: Political acquiescence in Truk" by Marc J. Swartz; "Three American legislative bodies in the Pacific" by Norman Meller; "Administrative problems facing independent Western Samoa" by Fay C. Ala'ilima; "The effect of limited anthropological theory on problems of Fijian administration" by Cyril S. Belshaw; and "Changing leadership in western New Guinea" by J. V. de Bruijn.

**The New Utopians: A Study of System Design and Social Change.** Robert Boguslaw. Prentice-Hall, Englewood Cliffs, N.J., 1965. 223 pp. Illus. \$6.35.

**The Pathology of Thinking.** Blyuma Vul'fovna Zeigarnik. Translated from the Russian edition (Moscow, 1962) by Basil Haigh. Consultants Bureau, New York, 1965. 227 pp. Illus. \$12.50. The International Behavioral Sciences Series, edited by Joseph Wortis.

**Politics, Law, and Ritual in Tribal Society.** Max Gluckman. Aldine, Chicago, 1965. 371 pp. Illus. \$7.50.

**The Prediction of Academic Performance: A Theoretical Analysis and Review of Research.** David E. Lavin. Russell Sage Foundation, New York, 1965. 182 pp. Illus. \$4.

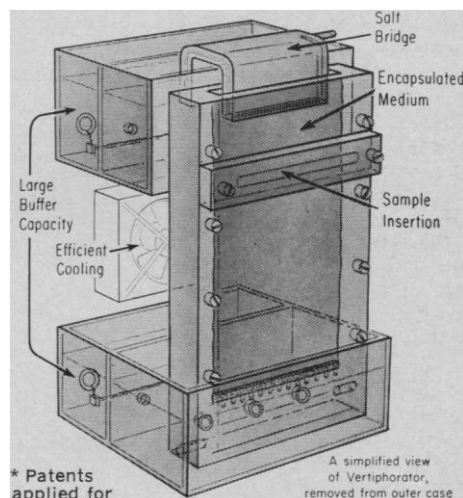
**Readings in Early Anthropology.** J. S. Slotkin, Ed. Aldine, Chicago, 1965. 547 pp. \$9.75. Readings on anthropology, from the end of the 14th century to the 18th century.

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Reading Institute (Philadelphia, Pa.), January 1964. Marjorie Seddon Johnson and Roy A. Kress, Eds. Temple Univ., Philadelphia, 1964. 112 pp. Illus. Paper, \$2.50. Eleven papers by Roy A. Kress, Herman S. Belmont, Jules C. Abrams, Juanita Kidd Stout, Marjorie Seddon Johnson, Paul R. Daniels, George Bond, Matilda Bailey, and Thomas J. Edwards.

**Speech Analysis Synthesis and Perception.** James L. Flanagan. Springer, Berlin; Academic Press, New York, 1965. 325 pp. Illus. \$14.50. Kommunikation und Kybernetik in Einzeldarstellungen, vol. 3, edited by H. Wolter and W. D. Keidel.

**Stimulus Generalization.** David I. Mostofsky, Ed. Stanford Univ. Press, Stanford, Calif., 1965. 397 pp. \$11.50. Twenty-two papers.

**Strategic Aspects of Competitive Bidding for Corporate Securities.** Charles Christenson. Graduate School of Business Administration, Harvard University, Boston, 1965. 128 pp. Illus. \$6. Studies in Managerial Economics.

**Stratification in Grenada.** M. G. Smith. Univ. of California Press, Berkeley, 1965. 285 pp. Illus. \$6.

**Wayward Servants: The Two Worlds of the African Pygmies.** Colin M. Turnbull. Published for the American Museum of Natural History by Natural History Press, Garden City, N.Y., 1965. 404 pp. Illus. \$7.95.

#### General

**Early Seventeenth Century Scientists.** R. Harré, Ed. Pergamon, New York, 1965. 200 pp. Illus. Paper, \$5. Commonwealth and International Library. The seven scientists considered are William Gilbert, Francis Bacon, Galileo Galilei, Johannes Kepler, William Harvey, Johann van Helmont, and René Descartes; the contributors are R. Harré, J. J. Macintosh, M. Deutcher, D. Knight, D. Goodman, and J. Mephman.

**Fortran IV: Programming and Computing.** James T. Golden. Prentice-Hall, Englewood Cliffs, N.J., 1965. 284 pp. Illus. Paper, \$6.

**A Guide to the Natural World: and Index to the Life Nature Library.** Editors of Life. Time Inc., New York, 1965. 210 pp. Illus. \$3.95.

**The Human Revolution.** Ashley Montagu. World, Cleveland, Ohio, 1965. 224 pp. Illus. \$4.95.

**Land Behind Baghdad: A History of Settlement on the Diyala Plains.** Robert McC. Adams. Univ. of Chicago Press, Chicago, 1965. 252 pp. Illus. \$8.50.

**Medicine in Transition.** Iago Galdston. Univ. of Chicago Press, Chicago, 1965. 232 pp. \$5.95.

**Organizational Scientists: Their Professional Careers.** Barney G. Glaser. Bobbs-Merrill, New York, 1965. 160 pp. Paper, \$1.95.

**Philosophies of Religion.** William S. Sahakian. Schenkman, Cambridge, Mass., 1965. 493 pp. \$6.95.


**Public Contracts and Private Wages: Experience Under the Walsh-Healey Act.** Herbert C. Morton. Brookings Institution, Washington, D.C., 1965. 152 pp. Paper, \$2; cloth, \$3.50.

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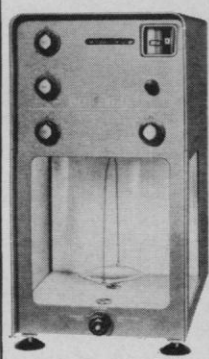
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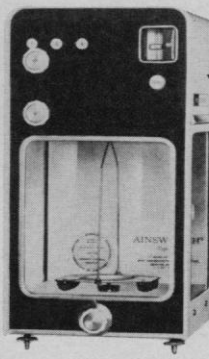
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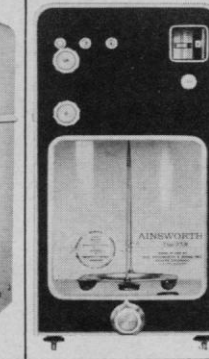
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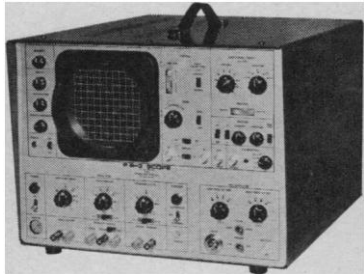
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**Public Papers of the Presidents of the United States: Harry S Truman, 1950.** General Services Administration, Washington, D.C., 1965 (order from Superintendent of Documents, Washington, D.C.). 506 pp. \$7.75. Contains the public messages, speeches, and statements of the President.

**Science Citation Index, 1964.** vols. 1 to 8. Prepared and published by the Institute for Scientific Information, Philadelphia, 1965. Unpaged. Rate A, \$1250; Rate B, \$1950. Volumes 1 through 4 are the alphabetically arranged citation index, volume 5, the patent citation index, and volumes 6, 7, and 8 the source index. The 1961 citation index was reviewed in *Science* [145, 142 (1964)] by H. B. Steinbach.

**Speaking of Research.** C. Guy Suits. Wiley, New York, 1965. 478 pp. Illus. \$7.50.

**Sphereland: A Fantasy About Curved Spaces and an Expanding Universe.** Dionys Burger. Translated from the Dutch edition by Cornelia J. Rheinboldt. Crowell, New York, 1965. 220 pp. Illus. \$4.95.

**Twelve Doors to Japan.** John Whitney Hall and Richard K. Beardsley. McGraw-Hill, New York, 1965. 671 pp. Illus. \$9.95. With chapters by Joseph K. Yamagiwa and B. James George, Jr.

#### Biological and Medical Sciences

**Abnormal Haemoglobins in Africa.** A symposium organized by the Council for International Organizations of Medical Sciences established under the joint auspices of UNESCO and WHO (Ibadan, Nigeria), March 1963. J. H. P. Jonxis, Ed. Davis, Philadelphia, 1965. 493 pp. Illus. \$20. Twenty-five papers.

**Advances in Child Development and Behavior.** vol. 2. Lewis P. Lipsitt and Charles C. Spiker, Eds. Academic Press, New York, 1965. x + 269 pp. Illus. 68s. Eight papers: "The paired-associates method in the study of conflict" by Alfred Castaneda; "Transfer of stimulus pre-training in motor paired-associate and discrimination learning tasks" by Joan H. Cantor; "The role of the distance receptors in the development of social responsiveness" by Richard H. Walters and Ross D. Parke; "Social reinforcement of children's behavior" by Harold W. Stevenson; "Delayed reinforcement effects" by Glenn Terrell; "A developmental approach to learning and cognition" by Eugene S. Gollin; "Evidence for a hierarchical arrangement of learning processes" by Shelton H. White; and "Selected anatomic variables analyzed for interage relationships of the size-size, size-gain, and gain-gain varieties" by Howard V. Meredith.

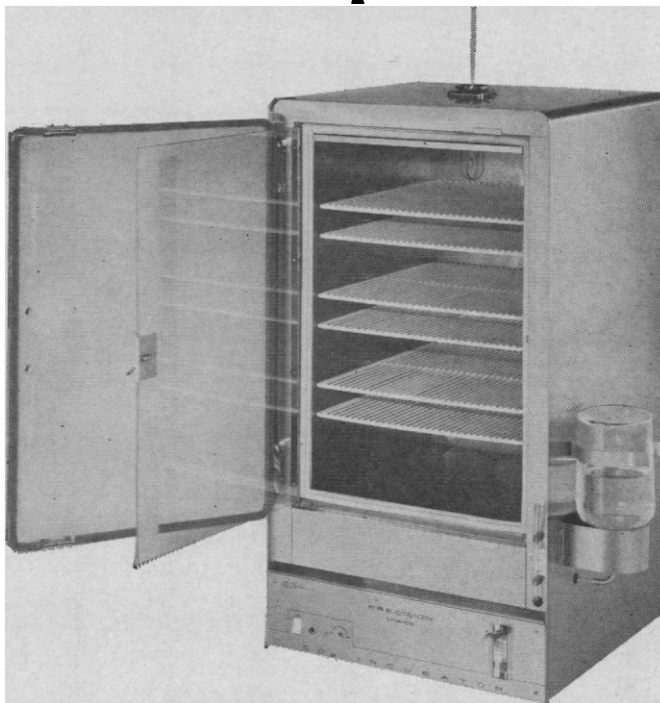
**Akute Schlafmittelvergiftung: Behandlung mit modernen Wiederbelebungsverfahren.** Sverre J. Loennecken, W. Scheid, and W. Tonniss. Schattauer, Stuttgart, 1965. 108 pp. Illus. Paper, DM. 20.

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**Antiviral Substances** (*Ann. N.Y. Acad. Sci.* 130, No. 1.) Harold E. Whipple,

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Ed. New York Acad. of Sciences, New York, 1965. 482 pp. Illus. Paper, \$8. Forty-five papers presented at a conference held by the Academy in December 1964.

**Autoimmunity, Experimental and Clinical Aspects** (*Ann. N.Y. Acad. Sci.* 124, No. 1). Harold E. Whipple, Ed. New York Acad. of Sciences, New York, 1965. 411 pp. Illus. Paper, \$15. Seventy-seven papers presented at a conference held in February 1964.

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**Biochemistry of Quinones.** R. A. Morton, Ed. Academic Press, New York, 1965. 603 pp. Illus. \$18. Fifteen papers.

**Biogeography of the Southern End of the World.** Distribution and history of far-southern life and land, with an assessment of continental drift. Philip J. Darlington, Jr. Harvard Univ. Press, Cambridge, Mass., 1965. 248 pp. Illus. \$5.95.

**The Biology of Respiration.** Sir Victor Negus. Williams and Wilkins, Baltimore, 1965. 240 pp. Illus. \$12.

**Blood and Body Functions.** John H. Ferguson. Davis, Philadelphia, 1965. 352 pp. Illus. \$6.95.

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**Compensatory Adaptations, Reflex Activity, and the Brain.** Ezras A. Asratian. Translated from the Russian edition by Samuel A. Corson. Pergamon, New York, 1965. 201 pp. Illus. International Series of Monographs on Cerebrovisceral and Behavioural Physiology and Conditioned Reflexes, vol. 1, edited by S. A. Corson.

**La Découverte des Mers.** Jean-Marie Pérès. Presses Universitaires de France, Paris, 1965. 28 pp. Illus. Paper.

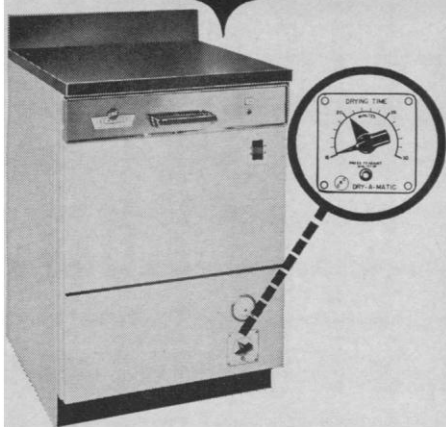
**35. Deutsche Pflanzenschutz-Tagung der Biologischen Bundesanstalt für Land- und Forstwirtschaft (Wiesbaden), October 1964.** Parey, Berlin, 1965. 244 pp. Illus. Paper, DM. 44.

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**Genetik: Grundlagen, Ergebnisse, und Probleme in Einzeldarstellungen.** vol. 1, *Kurze Geschichte der Genetik bis zur Wiederentdeckung der Vererbungsregeln Gregor Mendels.* Hans Stubbe. Fischer, Jena, East Germany, 1965. 288 pp. Illus. DM. 21.

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## NEWS AND COMMENT

(Continued from page 1486)

potential and actual output is narrowed, however, greater attention must be paid to measures for increasing productivity and enlarging the growth potential, Ackley said. Speeding up the application of new technology by means of the technical services program, he said, should be a major step in raising productivity.

President Johnson, in his remarks on the program, emphasized the importance of "local initiative and local imagination," and added: "The vehicles for success will be 250 colleges and technical schools throughout the land. They will distribute the information. They will serve as the economic planning centers for their areas." The careful cultivation of these institutions' interest in the technical services program contributed to the ease with which the bill cleared the Congress. So little opposition was there that the measure was approved by both House and Senate on voice votes without roll calls.

As early as December 1962, an advisory committee on which universities and colleges, the Department of Agriculture, and industry were represented was created by Commerce and asked to draft a plan for a university-industry technical service. Enough interest had been aroused by late 1963 that the Association of State Universities and Land-Grant Colleges adopted a resolution in favor of the proposed service.

In early 1964, and again this past May, Hollomon called national conferences at which the technical services program was taken up as part of a broad review of state science and technology. Representatives from nearly all of the states attended, many of them from college and university extension programs and from the budding agencies for the diffusion of science and technology which some states had created already.

The conferences each brought more than 100 persons to Washington, some of whom called on their congressmen and senators to urge their support of a federally aided state technical services program. Governors were apprised of plans for the program when, in late 1964, draft legislation was sent to them for comment. A survey of the responses indicated that in their attitude to the program only six of the 50 governors were lukewarm or "reserved."

As a result of this careful political

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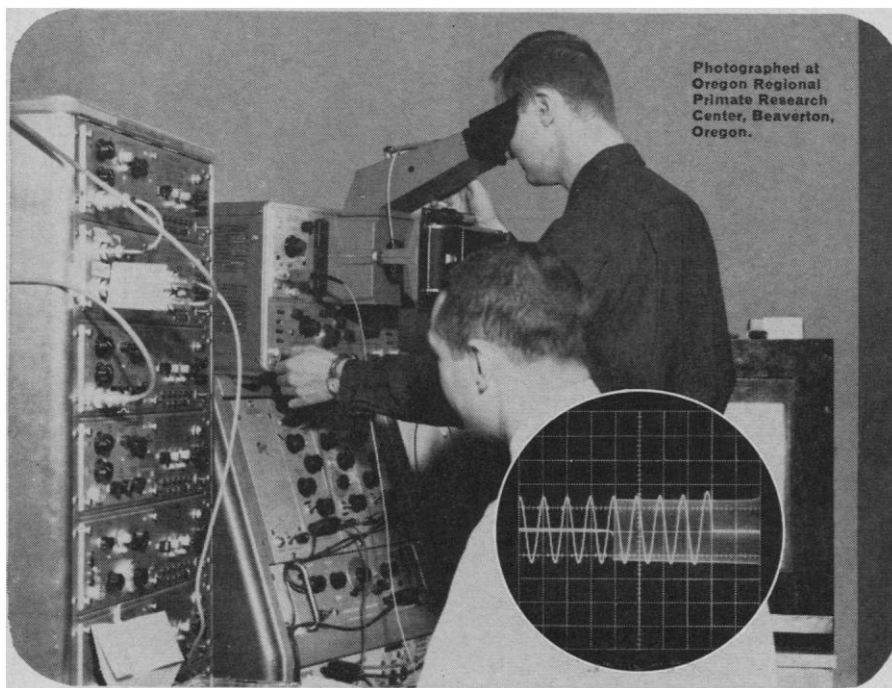
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foundation work, the Congress that convened in January was to be receptive to the technical services program. Holomon had learned from his earlier mistakes and knew better than to try to get an appropriation without specific legislative authority. So the authorizing measure was duly introduced with an impressive list of sponsors in both houses. The commerce committees of the two houses held hearings on the measure in June, and the testimony was nearly all favorable.

The National Association of Manufacturers, which opposes most administration proposals almost as a reflex, could not bring itself to favor this one, although Commerce had said no government-sponsored research would be undertaken. The NAM did not testify, but in a statement for the record said the program was unnecessary. "We submit that it is not the lack of programs or dissemination of information that limits the growth potential of small business," it said. "It is a well documented fact that small business problems center around two factors—lack of management skills, and inadequate financing."

The Consulting Engineers Council and the National Society of Professional Engineers favored the program, but said the bill needed stronger safeguards against competition by state agencies with their members. The Council, for example, proposed that the bill prohibit services that are "now available or could be made available as practically" by professional consultants. As finally passed, however, the bill simply proscribed services that are "economically and readily available" from private sources.

The administration wanted a 5-year program and a \$140-million authorization; instead it got a 3-year program with spending limited to \$60 million: \$10 million the first year, \$20 million the second, and \$30 million the third. Thirty to 35 states, most of which already have technical services programs of sorts, are expected to participate the first year. They will be able to get \$25,000 planning grants for each of the first 3 years on a nonmatching basis; but grants to implement the program, which could go up to \$2 million for the largest state, must be matched dollar for dollar from state or other nonfederal sources.

The formula for deciding each state's share will reflect population, technical resources, and degree of economic and industrial development and productive

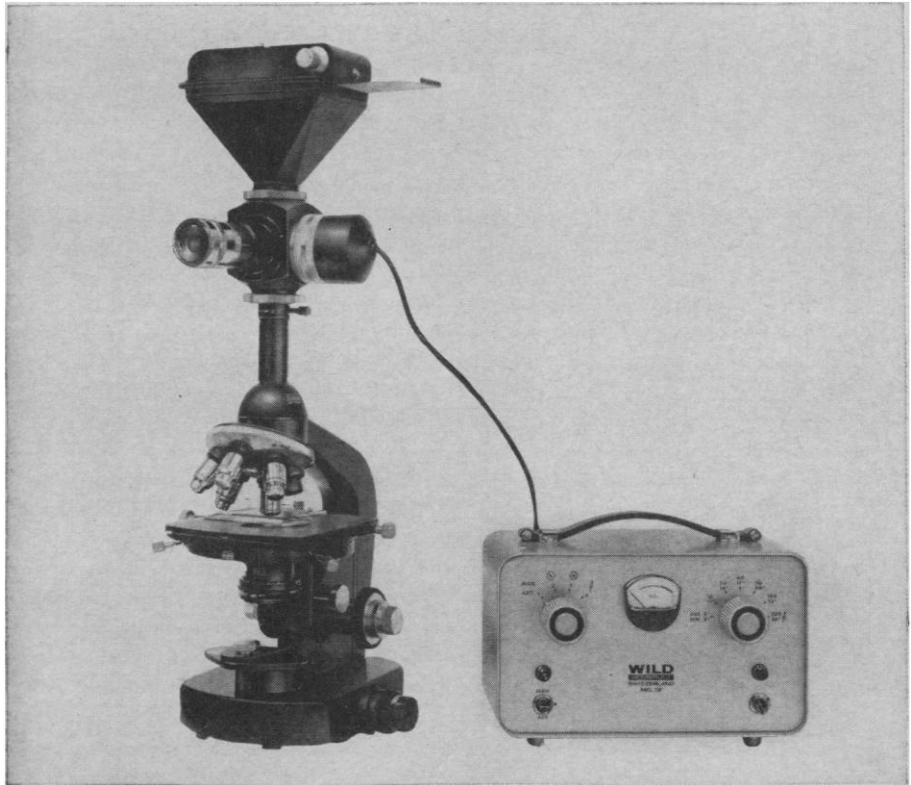
efficiency. Two or more states, if they desire, can join in a regional program. The agency responsible for the state or regional program is expected, in most cases, to be a state university, although some state science or economic development units may be designated. The agency will draw up a 5-year plan outlining the area's technological and economic conditions and identifying its major industrial problems; general methods for solving the problems through the technical assistance program will be explained. This 5-year plan, together with an annual technical services program, containing a detailed budget and description of specific steps (such as contract proposals) for aiding industry, must be approved by the Secretary of Commerce before any grants (other than for planning) are made.

An Office of State Technical Services will be established under Hollo-  
mon; the staff, limited to about 30 persons including clerical help, is expected to be headed by someone well respected in university or industry circles; his salary will be about \$24,500 a year. The Office will maintain a central reference service, drawing on such special resources as the Clearinghouse for Federal Scientific and Technical Information and the Science Information Exchange, as well as on federal information centers such as those of the Department of Defense and the space agency.

A credo of the Commerce officials in charge of the program is that in many cases technical information will not be well used unless an active personal interchange occurs between donor and recipient. Technical documents mailed to the hard-pressed owner of a small, obsolescent manufacturing plant are likely to go into the trash unread. If the representative of a state technical services agency calls on the plant owner, the chance of engaging his interest in information that may upgrade his operation is much improved. Accordingly, such existing state technical services programs as those run by Iowa and Georgia, both of which practice intensive field work, are held out as models. Seminars and workshops are viewed as other means of bringing about direct personal contact between industrialists who need help and the agencies prepared to give it.

How critical such help can be is suggested by the plight of a veneer company in North Carolina a year or so ago. Air pollution caused by another

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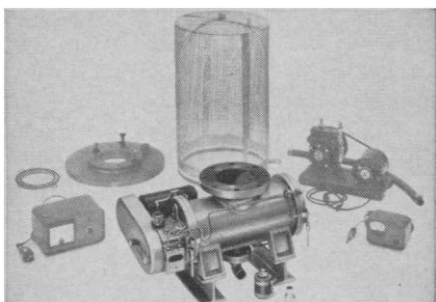
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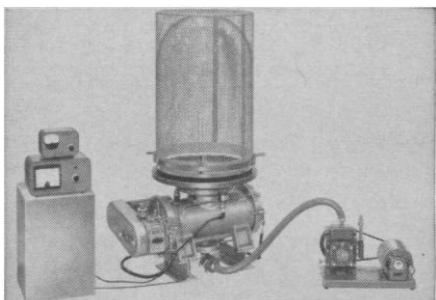


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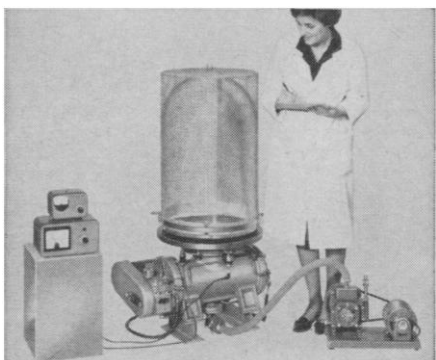
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firm nearby was making it impossible for the plant to operate; the veneer firm was thinking of moving, although this would mean the loss of a substantial investment and unemployment for several hundred persons. The industrial extension service staff at the state university helped the offending company abate the nuisance, thus avoiding a major economic loss to the community. Commerce Department files tell of other cases where small industrialists have received help from state technical advisers.

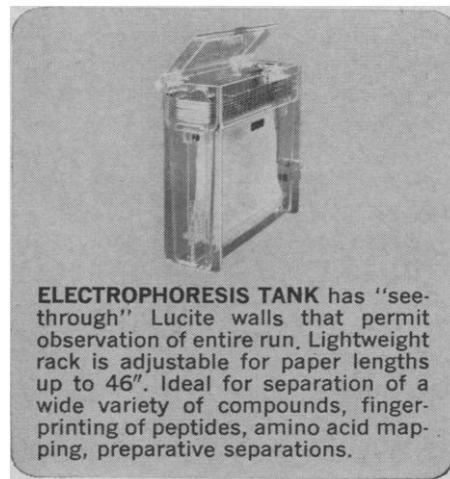
The State Technical Services Act is only a remnant—though an important one—of the ambitious plan Commerce lost in Congress in 1963. But if it manages to achieve anything approaching the successes that President Johnson has predicted for it, the act may encourage enough innovation to end all thought of direct federal support for industrial research. The act, together with other encouragement for technological change, perhaps resulting from such initiatives as the current studies of patent, tax, and antitrust policy, could facilitate the kind of industrial dynamism about which Hollomon has been talking.—LUTHER J. CARTER

### Announcements

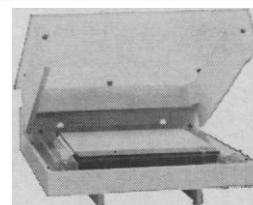
A group of about 15 laboratory business managers and administrative associates at Yale have formed an **Organization of Administrative Associates**, representing the university's various science, engineering, health, and personnel departments. The group aims to explore means for more effectively utilizing business managers to free department chairmen and laboratory heads to concentrate more on professional and policy matters. Ken Hartford, laboratory business manager in the biology department at Yale, was elected chairman of the organization.

A **Center for Research on Language and Language Behavior (CRLLB)** has been established at the University of Michigan, Ann Arbor. Plans call for programs of basic research on language learning with people of all ages and levels of language proficiency; activities to improve the techniques of language learning; applied research to field-test instructional techniques, materials, and devices; and distribution of information for the enhancement of research, development, and instruction in language learning. The Center is organized with

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representatives from the various disciplines at the university that are involved with research in speaking, hearing, and language. Harlan L. Lane is the director.

The **Philadelphia Museum of Art** has an exhibit of paintings, sculpture, surgical instruments, and other objects, depicting the history of medicine in Philadelphia from its British origins to the present. "The Art of Philadelphia Medicine" is part of that city's observance of the bicentennial of medical education in the U.S., which began with the founding of the medical school at the University of Pennsylvania. The exhibit, which began last week, will continue through 7 December.

A group of retired scientists, engineers, and other technically or professionally qualified persons are members of TEAM, Inc., an organization to provide **part-time advisers to government** and other public and social agencies "acting in the public welfare and for the human good." Technically Experienced Associates, Mobilized, offers its services gratis in the areas of research

management, scientific and technical education, public health and welfare, conservation and development of natural and human resources, and national defense. Members register their experience, qualifications, and interests with the TEAM central office, which in turn notifies institutions that may have a use for them. TEAM members donate their services for specific projects arranged by the central office, and are reimbursed only for travel and expenses. Additional information is available from TEAM, Inc., 541 Hunting Ridge Road, Stamford, Connecticut 06903.

### Meeting Notes

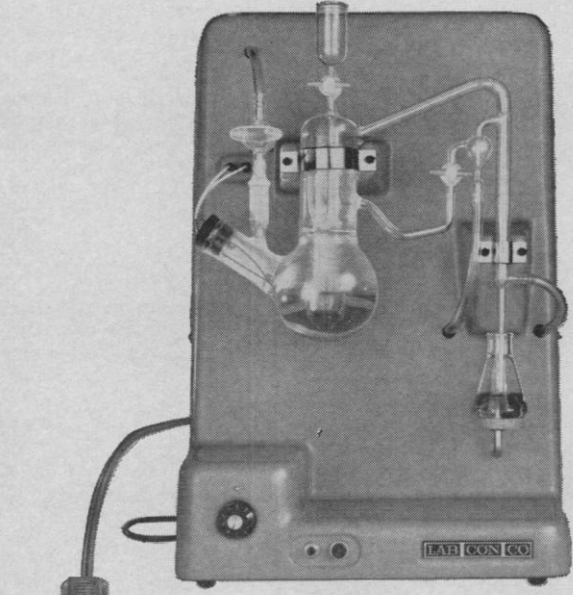
A series of seminars on **biophysics and physical chemistry of connective tissue** will be held at Stowe, Vermont, 10-16 October, sponsored by the rheumatism research unit, University of Vermont, the life sciences division of the U.S. Army Research Office; and the Geigy Chemical Corporation. Subjects to be covered include biological lubrication, water binding, macromolecular metabolism, water structure, elec-

trolytes and hydrogen ion regulation of viscosity of biological solutions, osmotic pressure, transport mechanisms, and the bionics of connective tissue. The meeting is by invitation only and about 50 participants will attend from Britain, Europe, Scandinavia, Australia, New Zealand, and the United States. (Federation of American Societies for Experimental Biology, 9650 Wisconsin Ave., Bethesda, Maryland)

The National Academy of Sciences division of earth sciences plans to hold a symposium on "time and stratigraphic problems in the **evolution of man**" 16 October at the Carnegie Institution of Washington. The symposium is intended to emphasize the importance of fundamental paleontologic and stratigraphic research in the study of the earth's history. (M. Gordon Wolman, Carnegie Institution of Washington, 1530 P Street, NW, Washington, D.C.)

The tenth **scintillation and semiconductor counter** symposium will be held in Washington, 2-4 March. Papers are invited on scintillation counters, scintillators, and photomultipliers;

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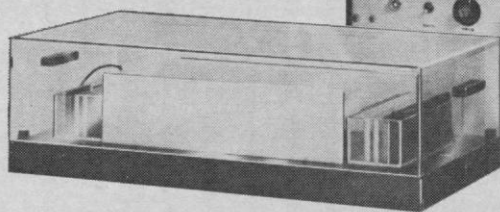
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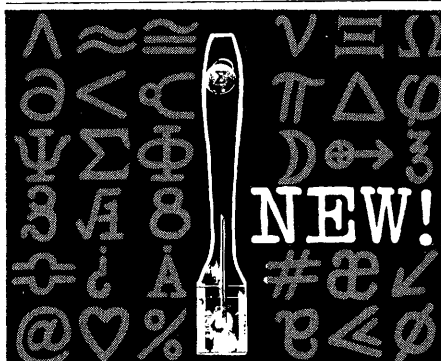
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semiconductor detectors and associated circuitry; detector logic, circuits, and data processing; spark chambers and track imaging. Emphasis is primarily on radiation detectors, secondarily on applications and related techniques. Deadline for receipt of abstracts: 30 November. (W. Higinbotham, Brookhaven National Laboratory, Upton, L.I., New York 11973)

The winter meeting of the Society of Rheology will be held at the U.S. Naval Post Graduate School, Monterey, California, 31 January to 2 February. Contributed papers are being solicited for oral presentation, and will be considered for publication in the society's Transactions. Duplicate copies of a 200- to 400-word abstract are required. Deadline: 19 November. (D. J. Meier, Shell Development Company, 1400 53 Street, Emeryville, California)

A symposium on transmission of viruses by the water route will be sponsored by the U.S. Public Health Service in Cincinnati 6-8 December. Sessions will be held on epidemiology, methods for detection and quantitation of small amounts of virus in large volumes of water, minimal infective doses, viruses that may be important in water transmission, and quantitative studies on viruses in water and sewage. Attendance will be limited. (G. Berg, U.S. Public Health Service, 4676 Columbia Parkway, Cincinnati, Ohio 45226)

### Courses

A meeting on information retrieval will be held at the University of Minnesota 10-13 November. It will focus on recent developments in indexing theories and search strategies, library mechanization of bibliographic records, and the relation of regional and specialized information services to national agencies and activities, with special reference to the biomedical sciences. A \$25 registration fee is required. (Director, Center for Continuation Study, University of Minnesota, Minneapolis)

The fourth short course on electronic information display will be presented by American University, Washington, 15-18 November. The purpose of the course is to introduce the theory, use, and general hardware aspects of electronic displays; fundamentals of display requirements; human factors; and programming. The tuition fee is \$200.



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ogy and Administration, American Uni-  
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ton, D.C. 20006)

The Association of Clinical Scien-  
tists will present an applied seminar on  
the **clinical pathology of infancy**, 12-  
13 November in Washington. The top-  
ics to be covered include: diagnosis of  
congenital biochemical disorders; jaun-  
dice; clinical pathology of systemic  
diseases; endocrinology and metabolism;  
cytogenetics. Enrollment will be limited  
to 300, and the registration fee is \$60.  
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### Grants, Fellowships, and Awards

The American Heart Association has  
established two **teaching scholarships  
in cardiology** to encourage medical  
teachers to devote the major part of  
their efforts to teaching. The scholar-  
ships will support the recipients for  
5 years; stipends are \$11,000 the first  
year, with \$1000 annual increment and  
\$1000 a year to the teacher's institu-  
tion to cover expenses for travel, minor  
items of equipment, and teaching ma-  
terials. The teaching scholars will  
work primarily at the undergraduate  
medical school level as full-time faculty  
members; they may not have private  
practice. Candidates should have com-  
pleted their residency or fellowship  
training; they may be either physicians  
or Ph.D.'s, less than 40 years old,  
and citizens of the United States or  
Canada. Deadline for receipt of appli-  
cations: *1 November*. (F. J. Lewy,  
Department of Medical Education,  
American Heart Association, 44 East  
23 Street, New York 10010)

Nominations of candidates for the  
**Woodrow Wilson fellowships** for 1966-  
67 will be accepted until 31 October.  
Candidates should be seniors or gradu-  
ates of colleges in the U.S. or Canada,  
planning a career in college teaching,  
but not yet registered in a graduate  
school; they must be nominated by  
their professors. The Woodrow Wilson  
Fellowship Foundation primarily sup-  
ports candidates in the humanities and  
social sciences. Science and mathemat-  
ics majors may be nominated, but if  
they are U.S. citizens they must apply  
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if it is offered. Recipients of the Wil-  
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and fees will be paid by the foundation to the graduate school. Nominations should be sent to the chairman of the selection committee in the college's region; names and addresses of the 15 regional chairmen can be obtained from the foundation, 32 Nassau Street, Princeton, New Jersey.

#### Scientists in the News

A. B. Kinzel, who has retired as vice president for research of the Union Carbide Corporation, has become president and chief executive officer of the Salk Institute for Biological Studies, San Diego. He recently was elected president of the National Academy of Engineering.

He succeeds **Jonas Salk**, who will continue as director and senior fellow of the Institute. Salk plans to devote his efforts to research and the academic development of the institute.

The National Science Foundation has announced the appointments of the following program directors in the social sciences:

Anthropology: **Richard W. Lieban**, on leave from the University of North Carolina, replacing **Allan H. Smith**, who has returned to Washington State University.

Economics: **Howard W. Nicholson**, on leave from Clark University, succeeding **Howard W. Hines**, who has become director of the division.

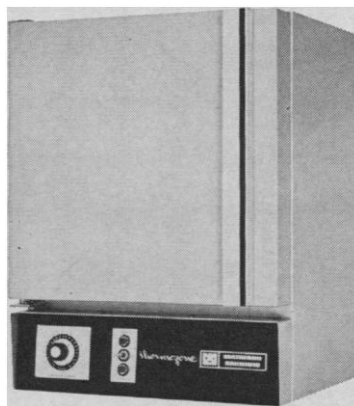
Sociology and Social Psychology: **Carl W. Backman**, on leave from the University of Nevada, succeeding **Robert L. Hall**, who has joined the University of Illinois at Chicago Circle.

**S. Douglas Cornell**, executive officer of the National Academy of Sciences—National Research Council, has been named president of Mackinac College, Mackinac Island, Michigan. He will be succeeded at NAS-NRC by **John S. Coleman**, staff deputy for plans and programs, and executive secretary of the division of physical sciences.

**John J. Pritchard**, head of the department of anatomy at Queen's University, Belfast, Northern Ireland, is visiting professor of anatomy at the University of Illinois college of medicine for the 1965–1966 term.

**Robert W. Weiger**, assistant director of the National Cancer Institute, has

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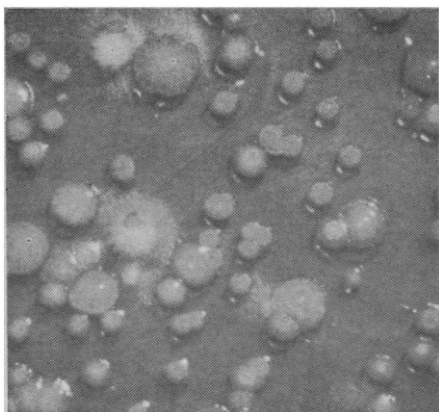
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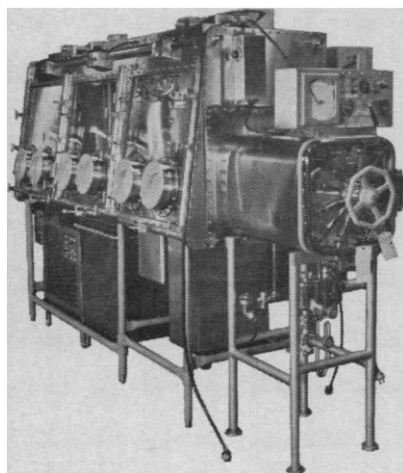
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been named chief of the Office of Pesticides in the Public Health Service. He will direct a national program to improve public health protection in the use of pesticides.

**Hurlon C. Ray**, of the Soil Conservation Service, Albuquerque, New Mexico, has been appointed chief of the pesticide intelligence system in the Department of Health, Education, and Welfare. The division, part of the recently formed Office of Pesticides, will assemble, evaluate, and issue reports on the presence of pesticides in the environment.

**Gilbert P. Haight, Jr.**, of Swarthmore College, has become a visiting professor for chemical education for the American Chemical Society and the Texas Academy of Sciences. He will be a professor of inorganic chemistry at Texas A&M University, and will be in charge of the freshman chemistry program.

**John G. Daunt**, formerly professor of physics at Ohio State University, has become professor in the physics and electrical engineering departments at Stevens Institute of Technology.

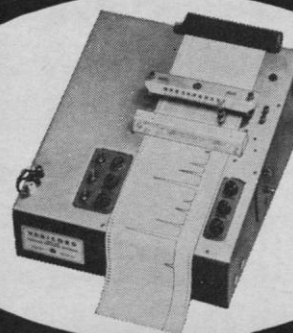
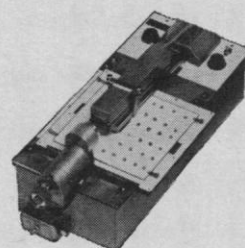
The new president of Fordham University is **Leo P. McLaughlin**, formerly president of St. Peter's College, Jersey City. He succeeds **Vincent T. O'Keefe**, who has been named assistant to the superior general of the Jesuit order in Rome.

The U.S. Naval Observatory has appointed **Victor M. Blanco**, former professor of astronomy at Case Institute of Technology, as director of its astrometry and astrophysics division; and **Gerald E. Kron**, former astronomer at the Lick Observatory, University of California, as director of the Observatory at Flagstaff, Arizona.

**Martin B. Biles**, scientific representative in the U.S. Mission to EURATOM, has been appointed the U.S. Atomic Energy Commission's scientific representative in Paris. He succeeds **Abraham B. Friedman**, who will return to the AEC headquarters in the division of research as deputy assistant director for chemistry programs.

**Hans Gaffron**, research professor of biochemistry and plant physiology at Florida State University, has received the 1965 Charles F. Kettering award

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