SCIENCE

5 April 1963

Vol. 140, No. 3562

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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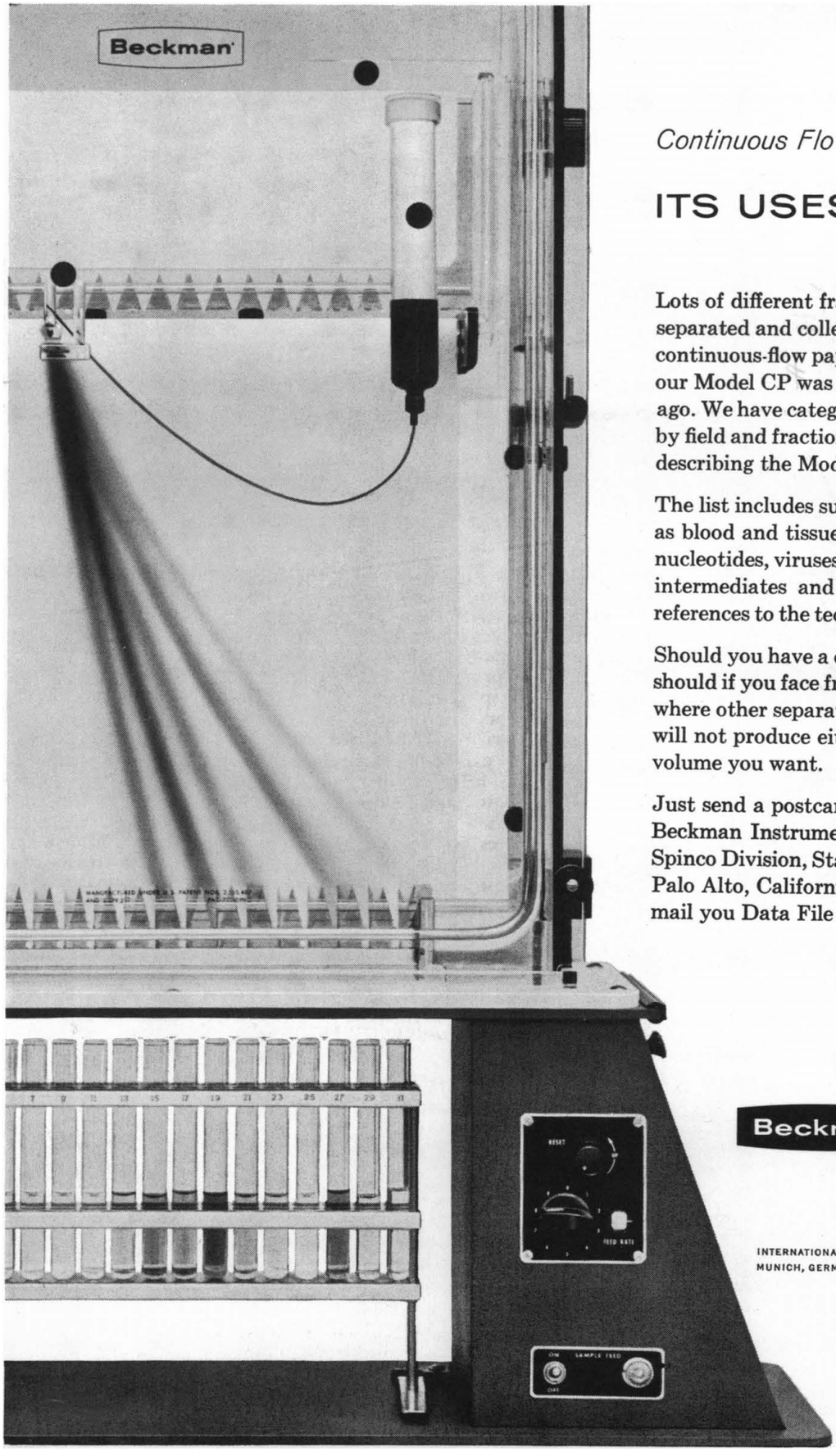

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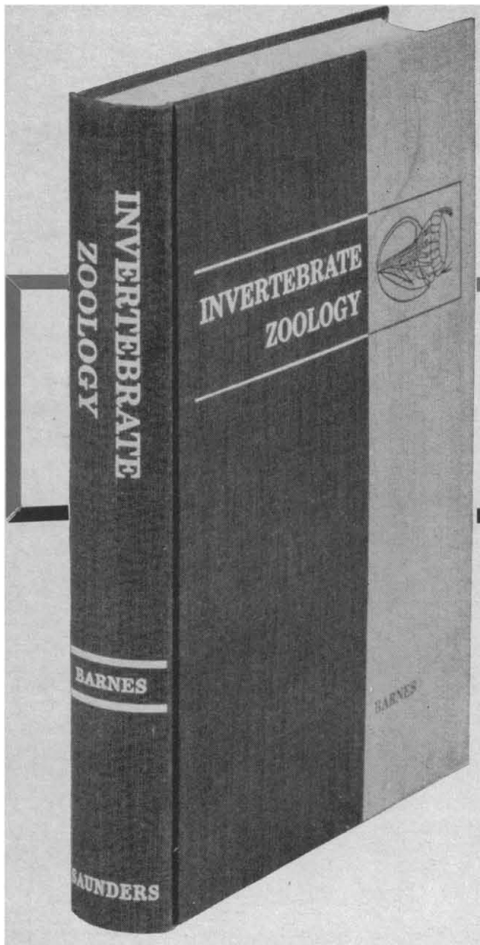

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This unusually well written new text is designed for upper division courses in Invertebrate Zoology, filling a long-felt need for a comprehensive introduction to the field. It requires at least one year's background in biology or zoology.

Dr. Barnes' approach to the invertebrates is an evolutionary one. Each of the invertebrate groups is systematically covered and correlated to the others through their phylogenetic relationships. For each individual phylum the author discusses anatomy, physiology, embryology, ecology and taxonomy. The author examines each group from a *general standpoint,* thus avoiding the distorted and confining concepts often produced in student through overemphasis of one "representative" species. Those representative invertebrates commonly used as laboratory specimens, however, are referred to throughout the text, familiarizing the student with the particular characteristics that these forms exhibit. Every life form usually covered in invertebrate zoology is fully discussed in this text. You'll find complete chapters on: Protozoans, Sponges, Ctenophores, Annelids, Mollusks, Echinoderms, etc. For each phylum, class, or group of phyla and classes, Dr. Barnes sets forth a wealth of applicable information on such aspects as: Form and structure—Locomotion—Nutrition and feeding mechanisms—Water balance, excretion and sensory structures—Circulation—Respiration—Reproduction embryology and life cycles—Economic importance—etc. Here is a random sampling of the type of coverage you'll find: Feeding mechanisms in *Acartai*—Egg deposition of Acoela—Adoral zone of membranelles—Asexual reproduction in oligochaetes—Molting in barnacles—Budding in annelids—Water circulation in *Lepidochitona*—Light response in *Tylos*—Hydroid colony—Color vision in crustaceans—Cyclomorphosis in *Daphnia.*

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*The book has been lavishly illustrated with 490 illustrations, the majority of these executed by the author.

Gladly sent to teachers on approval

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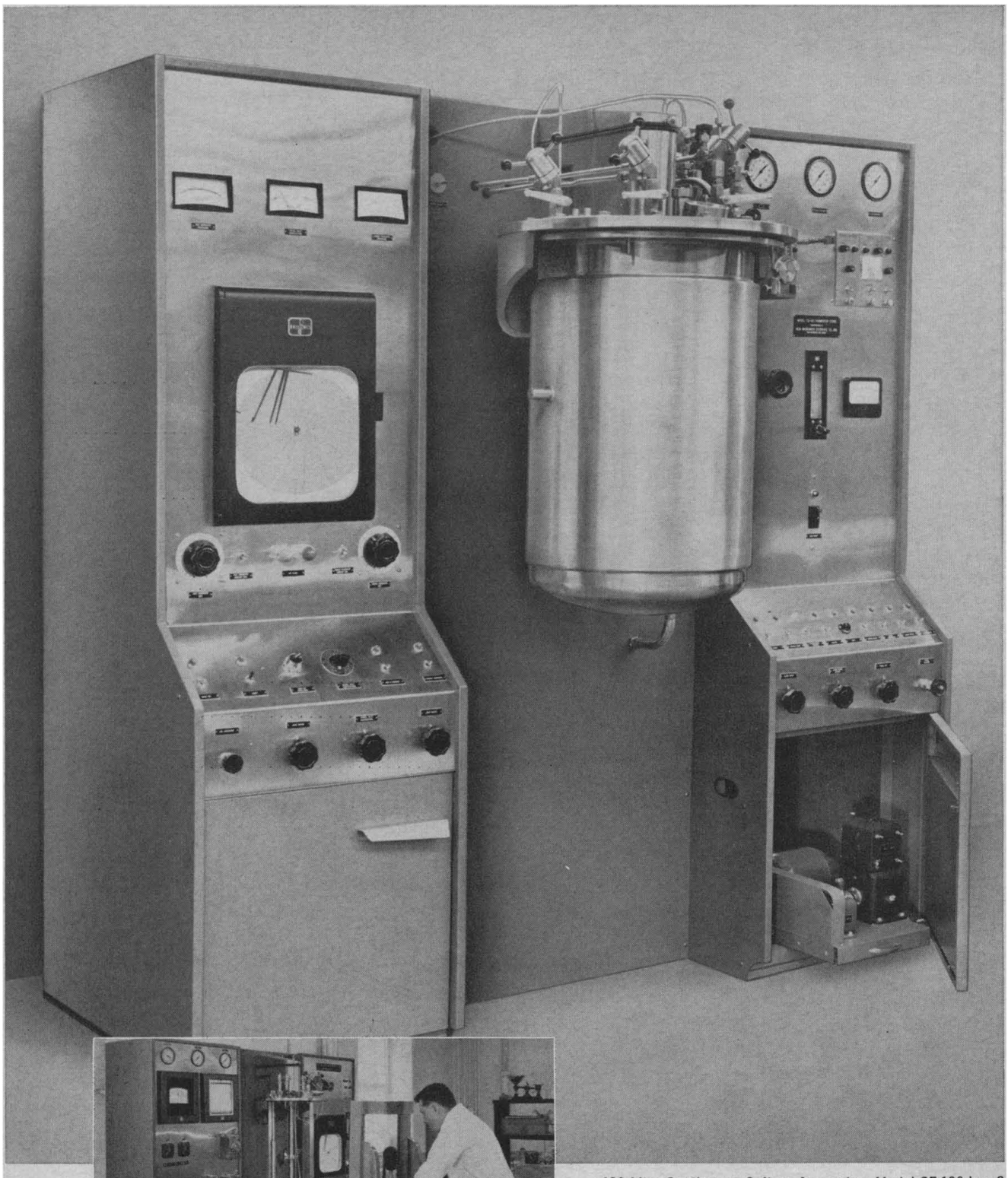
COVER

A chip of porous glass whose 100-angstrom interconnected pores have been filled with lead. These pores have been enlarged from the original 60- to 70-angstrom pores of the glass by etching with hydrofluoric acid. The original electron micrograph has been printed in reverse; hence the white portions of the photograph represent the metal. This material is one type of high-field superconductor. The electron micrograph (× 100,000) was taken by E. F. Koch from material prepared by R. J. Charles and W. G. Schmidt, all of the General Electric Research Laboratory. See page 26.



130 Liter Continuous Culture Apparatus: Model CF-130 has 2 Variable Speed Tubing Pumps (behind front doors) which are set for desired rate of feed and automatic harvesting, while constant working volume is maintained. Portable stand (not shown) brings operator to convenient working height.

Mr. Edwin Bailey, left, Assistant Engineer of the Pilot Plant at the Institute of Microbiology, in Rutgers—The State University in New Jersey, uses a mobile lift to remove the 50 liter Fermentor Vessel. Model F-50, shown, includes an Automatic pH Control System, and is used for pilot plant studies, including small production runs.

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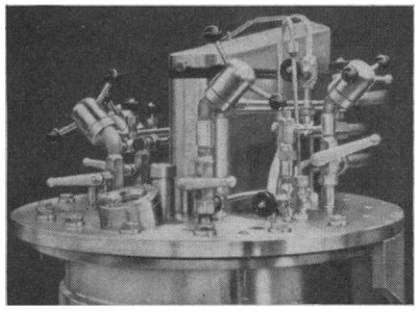

Fermentor Head Plate: Photo shows top viewing window, Inoculum Filling Port, plus steam-sterilizable ports for addition of nutrient, inoculum and antifoam, as well as for sampling and harvesting.

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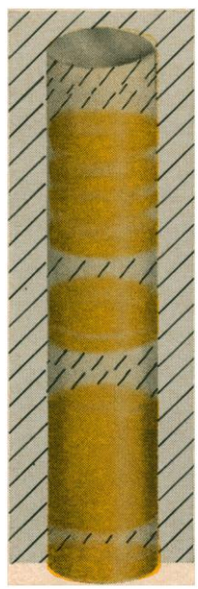

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GC DETERMINES ALCOHOL IN BLOOD

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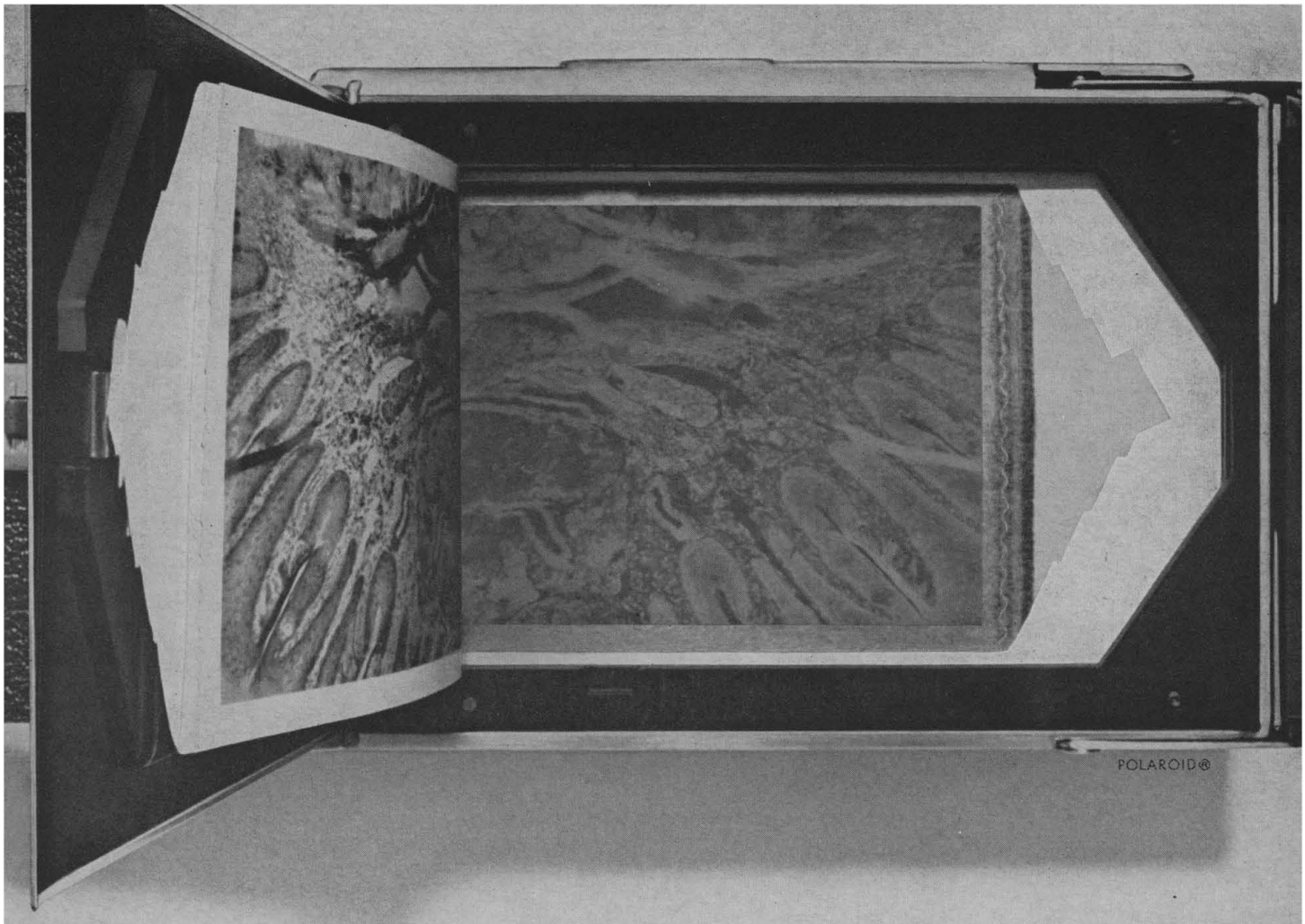

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The camera (that's it at the bottom) is vertically mounted on a rigid column. It glides right down so the lensless shutter and extension tube fit over your microscope objective. You work with eye-level ground glass viewing and focusing. Click the shutter, count, and open the door. There's your finished photomicrograph.

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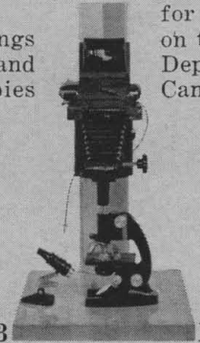

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Dual Monochromator		DK/U	DK/U	DK/U	DK/U		DK/U	DK/U	
Modes	Single-beam	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U
	Double-beam Time-shared			DK/U	DK/U		DK/U	DK/U	DK/U
	Double-beam Space-shared				DK/U	DK/U	DK/U		
Light Intensities Recorded as Function of:	Wavelength	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U
	Time	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U
	Plane of Polarization	DK/U	DK/U	DK/U	DK/U	DK/U	DK/U		DK/U
	Angle of Incidence (Light scattering)								DK/U

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5 April 1963, Volume 140, Number 3562

SCIENCE

The President's Manpower Report

Last month the President sent to Congress the first of what will become a series of annual reports on the nation's manpower requirements, resources, and utilization. "Unemployment," the President wrote, "is our number one economic problem." Much of his report, and much of the Department of Labor's accompanying analysis of labor force trends, problems, and future prospects dealt with unemployment and methods of reducing it. (The combined report is available for $1.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.)

An over-all unemployment rate of 5.5 percent has little personal meaning to the scientist, engineer, or member of some other shortage category. But in a highly interwoven economy there are, nevertheless, a number of implications that bear directly on the work of both social and natural scientists and on the work of many teachers.

The strictly economic aspects call for searching analysis. There are sociological and psychological problems to study and perhaps to learn how to counteract. Consider the effects on the country of an increasing ethnic stratification in types of jobs held and in unemployment rates that is forecast by the combined action of existing differentials: The poorly educated worker is harder to place than the well-educated one; the non-white worker worse off than the white, not only in the hiring practices he encounters but also in average educational attainment and thus in employability in a technological society.

Apart from such directly economic measures as changes in tax policy, the primary method being used or advocated to reduce unemployment is specialized job training. If this be the short-term remedy, education must also be an important ingredient of the long-term remedy. Teaching, already a shortage category, will have additional burdens in trying to prevent further increases in unemployment among the large number of young people who enter the labor force without the skills or education that are in high demand.

The natural scientists are also involved. Research and development have contributed magnificently to the growth of our economy. But now, as Herbert Holloman of the Department of Commerce has been emphasizing, our tremendous R&D effort is so largely devoted to space and military matters that the U.S. devotes a smaller fraction of its gross national product to research and development on problems bearing on the civilian sector of the economy than most other industrialized nations do. The shortage of jobs for other workers may be partly due to the shortage of scientists and engineers working on problems that lead to new industrial growth.

The idea of an annual Presidential report on manpower grew out of Senator Joseph Clark's 1960 proposal to establish an Advisory Council on Manpower that would serve the President in much the same fashion that the Council of Economic Advisers serves in its sphere. The bill did not get far, but a suggestion brought out in the hearings [*Science* **133**, 253 (1961)] was embodied in the Manpower Development and Training Act of 1962 as a request to the President for an annual report on the nation's manpower resources and utilization. Because economic, educational, and social progress are so clearly dependent upon the qualities of the men and women involved, we need at least once a year to focus attention on the question of how effectively we are developing and using our potentially available skills and talents.—D.W.

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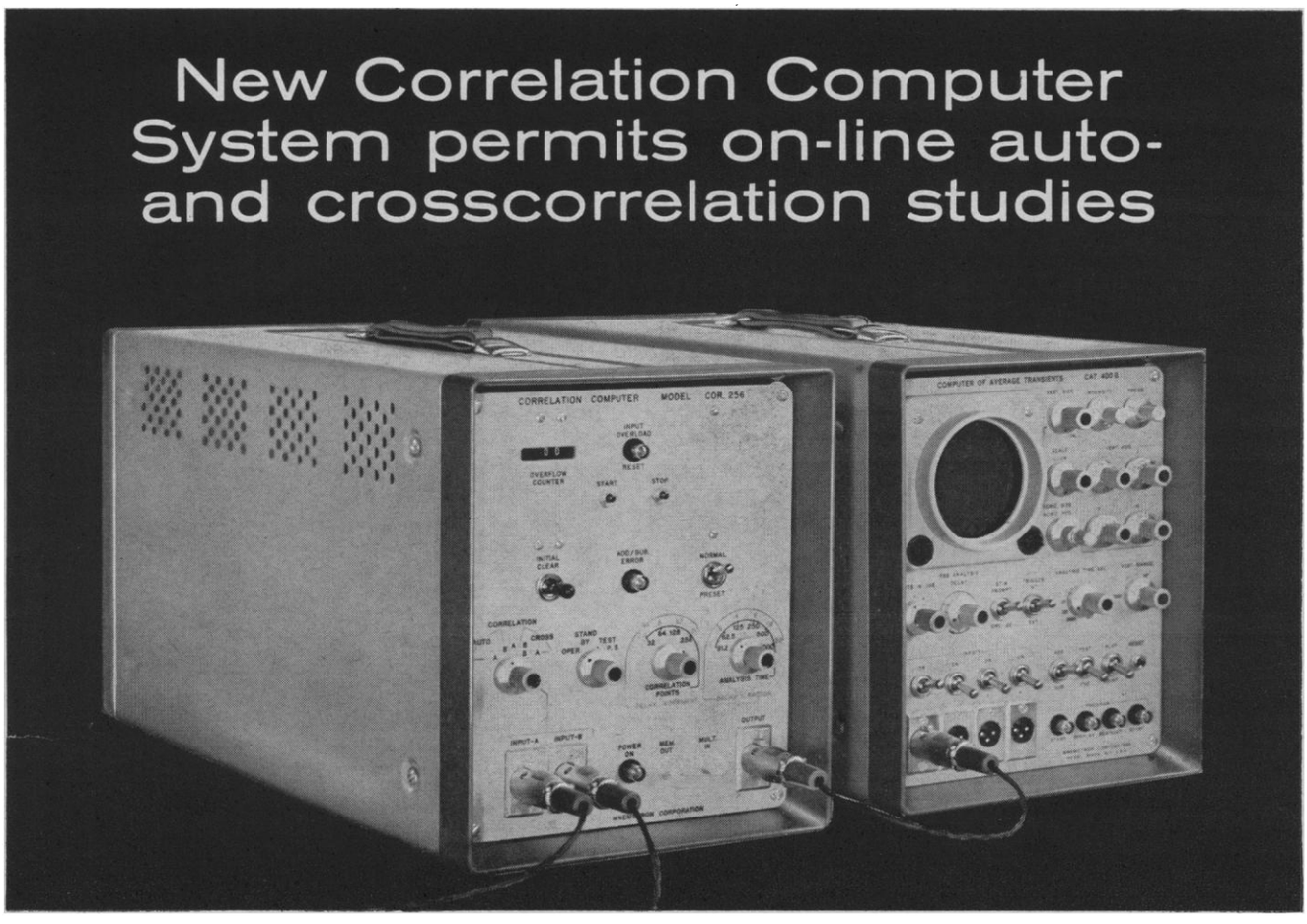

MNEMOTRON's Correlation Computer System (CC-1) consists of the COR-256 combined with the Computer of Average Transients (CAT 400B). This system performs real time auto- and crosscorrelation computations, thereby permitting the study of statistical properties of repetitive signals buried in random noise.

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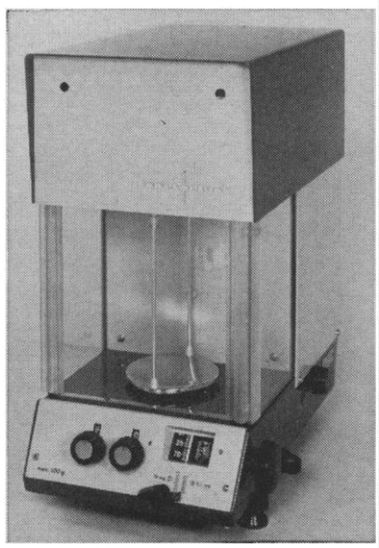

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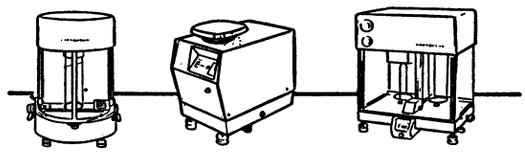

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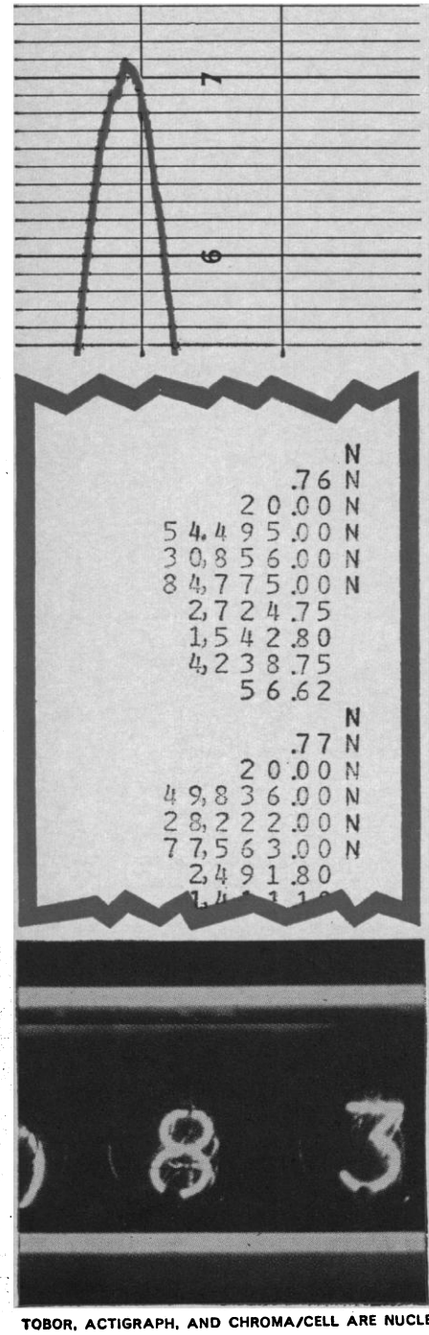

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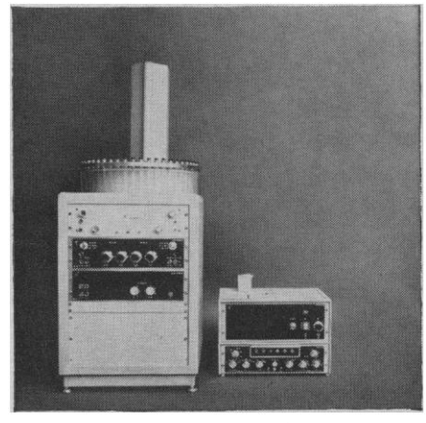
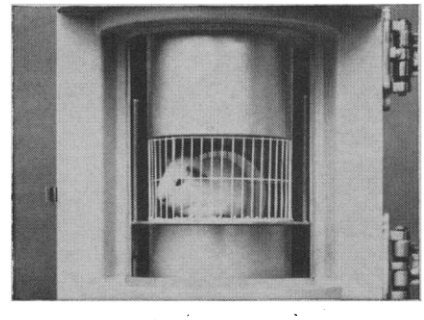


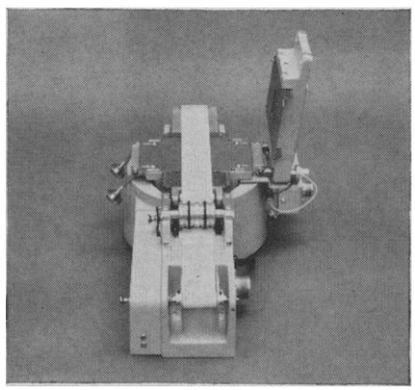
Model 1070 Automatic Sample Changer is the instrument of choice for laboratories analyzing many small-volume, solid or liquid gamma samples. It handles up to 50 samples in bottles or test tubes and can be used with Nuclear-Chicago's 2-inch or 3-inch well scintillation detectors. The simple and rugged changer mechanism with its minimum number of moving parts provides long, trouble-free life even under continuous operation.



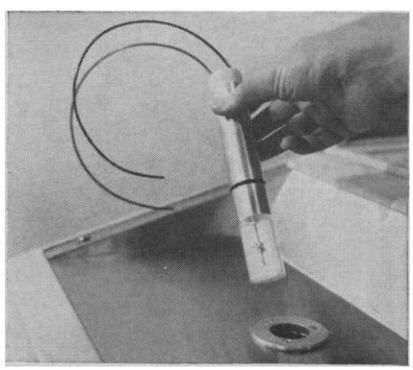
Tobor is the practical solution to many of your gamma-counting problems especially if your samples vary in volume or if they are as large as laboratory animals and human forearms. Measurements with Tobor are highly reproducible because counting efficiency is uniform over a wide range of sample volumes. Sodium iodide crystals or plastic scintillators up to seven inches in diameter can be furnished.

Radiochromatography

The data producing capabilities of analytical radiochromatography now can be expanded through the use of Nuclear-Chicago's new systems for qualitative and quantitative determinations. These versatile systems detect and record radioactivity in paper, liquid-column, or gas chromatography procedures.



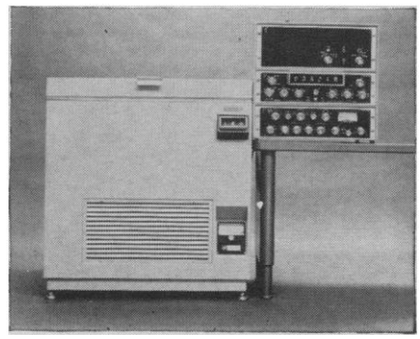
Model 1032 Actigraph is the only strip chromatogram scanner that offers 4-pi detecting geometry with a choice of window or windowless operation. By scanning both sides of the strip, the Actigraph virtually doubles the sensitivity of the 2-pi method and delivers correspondingly higher resolution. Efficiencies of 10% for carbon-14 and 2% for tritium can be obtained with a background of 15 counts per minute or less. Paper strip loading is simple, and gas consumption is low.



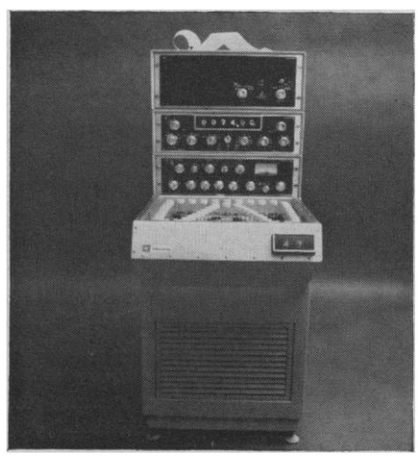
The Chroma/Cell scintillation detector automatically and continuously monitors the radioactive effluent of a liquid chromatography column. Efficiencies are as high as 28% to 40% for carbon-14 and 1% to 2.5% for tritium. Data presentation options include fast digital print-out and analog recording with choice of linear or logarithmic ratemeters and single-channel, dual-channel, or integrating graphic recorders.

Liquid scintillation counting

The new Series 6720 liquid scintillation spectrometry systems permit routine, accurate counting of any sequence of carbon-14 and tritium samples with efficiencies as high as 90% and 40% respectively. The systems offer important time-saving conveniences: fast data print-out, automatic calculation of counts per minute and channels ratios, large capacity sample changer, and selective sample programming. The Series 6720 three-channel analyzer is uniquely suited to the short-duration pulses produced by beta particles.



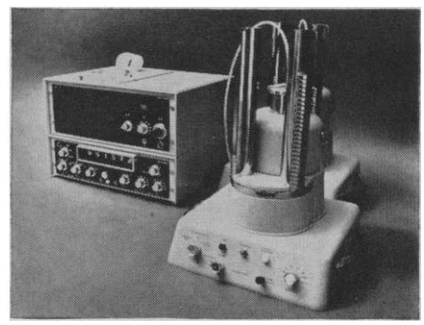
Models 6724 and 6725 are automatic systems with controlled-temperature chambers that maintain optimum counting environment for up to 150 samples. A solid-state, three-scaler/timer provides preset time, preset count, or time/count.



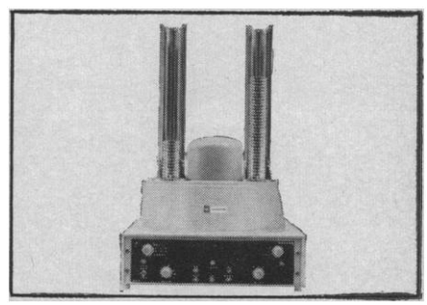
Models 6722 and 6723 are room-temperature versions of the Series 6720. They handle 50 samples automatically with only a small sacrifice in counting efficiency. A single-sample manual system, Model 6733, is also available at moderate cost.

Automatic planchet counting

Nuclear-Chicago's automatic planchet counting systems for solid-phase beta emitting isotopes insure precise geometrical reproducibility for every sample. Each system is offered with monitoring instruments that provide fast digital read-out of time, count, and sample number, as well as automatic calculation of counts per minute.



Proved reliability has established Model 1040 as the most widely accepted sample changer for samples of 1¼ inch diameter or smaller. The instrument will automatically handle over 70 samples. It can be operated with a windowless or thin-window gas-flow detector. Low-energy beta samples require minimum background rates for best accuracy. Model 1046 system effectively delivers this accuracy by reducing net background to less than 2 counts per minute. It utilizes the same dependable automatic changing mechanism as Model 1040.



Model 1100 accommodates samples as large as 2 inches in diameter, and can be equipped with magazine extensions for a maximum capacity of 150. The large-area gas-flow detector used with this automatic system permits more sample to be placed on the planchet so that a high count rate can be achieved for low-activity samples.

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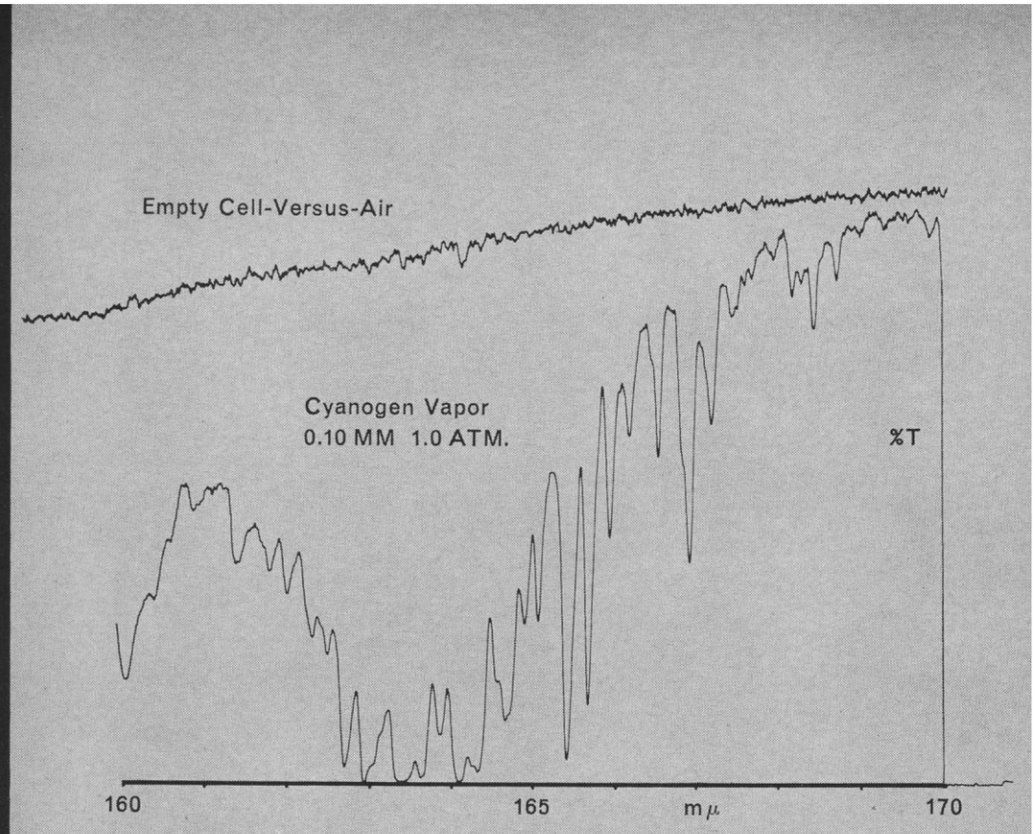
now! go to 160 mμ without vacuum



New Beckman Far Ultraviolet DK-2A Spectrophotometer at work. Note the absence of hydrogen lamp line spectra and the high level of energy still available at 160-170 mμ. Both curves demonstrate negligible stray light.

From Beckman—first with a purged instrument to go to 185 mμ, then first to go to 170 mμ—comes another major advance in far-ultraviolet spectrophotometry. With the new Far UV DK-2A, you can perform analyses all the way to 160 mμ. It's a 15 mμ bonus over competitive instruments.

The Far UV DK-2A goes to the other extreme, too—3500 mμ. This is *the widest continuous wavelength range commercially available!* The Far UV DK-2A covers it with resolution of 0.2A for emission studies and 0.5A for absorption studies at 210 mμ. Consider also: 7 separate scanning speeds, multiple wavelength scale expansions, single-switch selection of 11 different chart ordinate presentations. Plus a wide variety of accessories.

Your Beckman Laboratory Dealer has the full Far UV DK-2A story. Also facts on the Far UV DK-1A if you want the same range in a strip-chart recording instrument. And for work in the 185-3500 mμ region, ask about the DK-1A with strip-chart recorder or DK-2A with flat-bed recorder. Contact him or write direct for Data File LUV-38-163.

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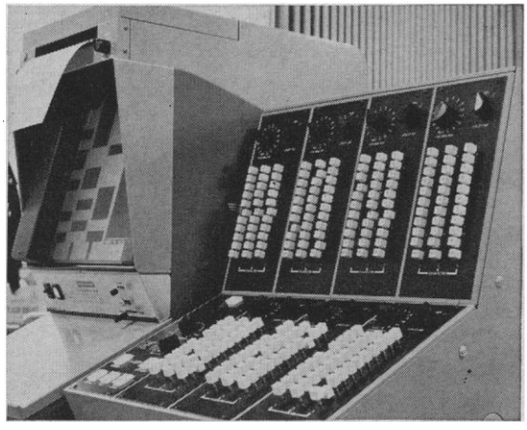
Microfilm that responds intelligently



It will be like playing the piano or the typewriter. The mind works through the fingers. The hand never touches the microfilm. The roll carrying thousands of page-images is inside a cartridge. The player will pick a cartridge and insert it. He will spell out his instructions on the keyboard: "Show me everything you have that is coded '116' in the first field *and also* carries the concept 'beryllium' in the fourth field *but only if* dated earlier than 4/15/58. Then deliver me a full-size paper copy of all pages of each document so specified. Correction: copy only the first page of each such document. Go." And it will go, and the copies will fall out of the slot at the top, and then the microfilm will retreat back into its cartridge.

It is already working for one large customer. The whole outfit, including the camera that microfilms the documents and encodes the film, will sell right off the shelf for about the annual cost of two or three well-trained secretaries.

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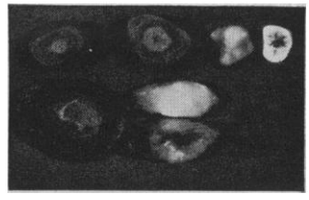
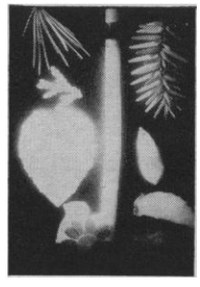
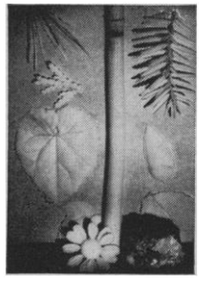
Fluorescence in the infrared

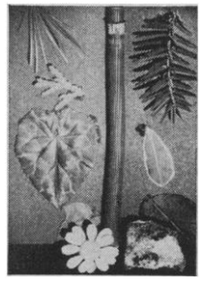
Here is an ordinary photograph of gallstones



and here they are by fluorescence in the near infrared.







Here are some plant fragments and a chunk of greenockite by infrared fluorescence, infrared reflection, and visible.

Illumination for the fluorescence shots was blue-green light with all the infrared filtered out. In front of a KODAK RETINA Reflex Camera loaded with KODAK High Speed Infrared Film, a KODAK WRATTEN No. 87 Filter passed only radiation longer than 740mμ. To record infrared reflection instead of infrared fluorescence, we removed the blue-green-passing, infrared-absorbing filter from the lamp, left everything else the same, and cut exposure time 20,000 times.

A man at Eastman Kodak Company, X-ray Sales Division, Rochester 4, N. Y. is the expert on this. His name is H. Lou Gibson. Write him if you like.

Is it an amide? Is it ether? Does it contain sulfur?

There are some 4100 EASTMAN Organic Chemicals. That's not really very many, probably less than 1% of all organics that chemists know well enough to call "chemicals." Chemists also recognize that the easy availability which arbitrarily distinguishes these from the other 99+% is an important consideration in planning laboratory work. We and the customers would love to see the measly 1% raised.

One factor that limits the growth rate of the business (and hence of the list) is the groping that so many prospective customers have to do in finding what they want among all the names we might possibly be calling it. We see no early prospects of licking this problem. It's even worse for scientific workers who are not organic chemists and not schooled in *Chemical Abstracts* nomenclature, with which for better or worse we have cast our lot.

With pity for courageous wanderers through the 221 alphabetical pages of our catalog ("EASTMAN Organic Chemicals, List No. 43"), we have lit a feeble candle. For those who know nothing whatever of organic chemistry it will shed little light, but such have no business buying EASTMAN Organic Chemicals anyway. This second edition of "EASTMAN Organic Chemicals Classified by Functional Groups" (it replaces an earlier candle of the same name, now sputtered out) is being mailed to all who automatically receive each new alphabetical catalog and to anybody else who requests it from Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company). Those who do not already have List No. 43 should say so.

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

Meetings

Memory

Memory was the topic of ten invited papers of new research findings, a symposium, and the vice-presidential address by the retiring chairman of the Psychology Section (I) at the AAAS Philadelphia meeting in December 1962. The major emphasis was on human memory and within this emphasis the principal focus was on short-term human memory.

The session of invited papers contained a variety of significant investigations. On the issue of the distinction between very-short-term stimulus traces and encoded memory traces, a reinforcement of earlier findings on distinctions between preperceptual and postperceptual (memory) traces was made. Evidence was presented that showed the memory span is greatest for digits, next for letters, and shortest for colors or shapes, and that these differences are related to differences in the time required for reading those items from the brief visual presentation plus the very-short-term visual trace (Jane F. Mackworth, Defense Research Medical Laboratories). Further discussion on the same general problem dealt with the testing and confirmation of the notion that the perceptual encoding of even a small number of dots in a two-dimensional field is sequential rather than parallel. A procedure of stimulus-trace erasure had been used to obtain these data (Emanuel Averbach, Bell Telephone Laboratories).

Several papers described the effects of repetition on short-term memory. A talk on associative memory over brief intervals of time showed an interaction of the interval between repetitions of a word-number pair and the retention interval (up to 16 seconds) in determining recall; also noted was an optimum retention interval of 8 to 16 seconds between the two repetitions prior to a 16-second recall interval (Lloyd R. Peterson, Indiana University). In discussions on immediate memory as a function of repetition, results of experiments which utilized immediate free recall of a list of 30 words were described. It was found that words occurring twice were recalled better than words occurring only once, but that this effect was not a function of the number of other words intervening between the repetitions nor of the number of repeated words in the list when

the number was greater than one. These beneficial effects of repetition were, however, present only when the subject was primed to recognize the repeated words (Nancy C. Waugh, Harvard University). Another experiment with paired letters in which the letter pairs had either low or high initial associative strength showed that recall (after 1 or 7 days) increased directly as a function of frequency of repetition. However, contrary to interference theory, recall was the same for the two types of list even though, consistent with the theory, the extra-experimental intrusion errors in recall were identifiable as previously established letter-sequence habits (Benton J. Underwood, Northwestern University).

One study involving the continuous presentation and recall of paired associates revealed the facilitating and inhibiting effects in short-term recall of mixing or keeping homogeneous the categories of words attached to the same or different letter stimuli (L. Starling Reid, University of Virginia). Arguments and evidence for considering recall as determined not only by previously established associations, but also by the logical processing of these memory data were presented. In support of the former a report was made on the rather extraordinary capacity of human subjects for discriminating the order of occurrence of events in the past (temporal "tags"); in support of the latter, a repetition of the Broadbent experiment on short-term memory in dichotic listening showed that the order of report was determined by the kind of event rather than the ear involved (Douwe B. Yntema, Massachusetts Institute of Technology).

Single presentation of a series of word-number pairs (or nonsense-syllable-number pairs) and recall after varying intervals up to days showed that associations involving low arousal (basal metabolism rate) at the time of presentation suffer the usual forgetting over time but that associations involving high arousal were inhibited at short retention intervals and gain in apparent strength over time. These findings were then related to the "consolidation" theory of memory traces (Edward L. Walker, University of Michigan).

A final report was aimed primarily at the methodology of memory studies. The first experiments utilized a forced-choice technique, which is designed to circumvent or manipulate the strong effects of response bias in the now widely-employed Shepard and Teght-

soonian method used for studying continuous recognition memory. The method appears to be an elegant technique for this purpose and is applicable wherever the elimination or control of response bias is essential to the matching of theory and experiment (Roger N. Shepard and Jih-Jie Chang, Bell Telephone Laboratories). In quite a different vein, other data on the retention of single events stressed the variability of retention performance as a function of time (Edward A. Bilodeau, Tulane University).

The symposium on Experimental-Theoretical Approaches to Memory was intended to set in juxtaposition the approaches of the neurophysiologist, the psychologist working within the framework of communication concepts and mechanisms, the psychologist working within the traditions of stimulus-response functionalism, and the psychologist working with the new tools for computer-modeling of behavior mechanisms. The principal emphases were concerned with: the "consolidation" hypothesis regarding fixing of neural traces for permanent storage (Ralph W. Gerard, University of Michigan); the dichotomy of short-term and long-term memory storage based principally on the non-dependence of the former on the similarity relations of disrupted and disrupting activities and the well-known dependence of the latter on such relations (Donald E. Broadbent, Applied Psychology Research Unit, Cambridge); the issues raised by evidence that the interference theory of forgetting predicts too much forgetting (Leo Postman, University of California); and the fertility and guidance value of logical, quantitative models, such as are suitable for realization on a computer, for theorizing about memory and learning (Earl B. Hunt, University of California).

The vice-presidential address by Arthur W. Melton was the final event in this series on memory. After identifying a number of current issues in learning theory as issues about the formation, storage, and retrieval of memory traces, the major general issue was identified as the question whether short-term memory and long-term memory are points on a continuum. An affirmative answer was expressed, based not only on the data of others who have used the method of recall of single to-be-remembered items following a single or very few repetitions, but also on new data that relate the slope of the short-term forgetting curve to the number of elements or encoded "chunks" in the to-be-remembered unit. Also, new data confirming and extending Hebb's repetition effect in the context of the memory-span experiment were cited as support for the continuity of short- and long-term memory. The principal consequence of this conclusion was suggested as the extension of the postulate of permanence of memory traces to include the permanence of traces established by single occurrences of events in the life of the organism, although the data also seem to suggest preferences among the alternative assumptions offered as solutions to other critical issues in general theory of memory.

The vice-presidential address, the symposium papers, and a number of the other invited papers will be published in a special issue of the *Journal of Verbal Learning and Verbal Behavior*.

ARTHUR W. MELTON
University of Michigan, Ann Arbor

Forthcoming Events

May

2–5. Cytoplasmic Streaming, Cell Movement, and Saltatory Motion of **Subcellular Particles**, symp. Princeton, N.J. (R. D. Allen, Dept. of Biology, Princeton Univ., Box 704, Princeton)

3. **Astronomy and the Peaceful Uses of Space**, Evanston, Ill. (J. A. Hynek, Astronomy Dept., Northwestern Univ., Evanston)

3–4. Colorado-Wyoming **Acad. of Science**, Fort Collins, Colo. (R. G. Beidleman, Dept. of Zoology, Colorado College, Colorado Springs)

3–4. **Endocrinology**, 2nd intern. congr., London, England. (A. S. Mason, London Hospital, Whitechapel, London, E.1)

3–4. Minnesota **Acad. of Science**, St. Paul. (M. R. Boudrye, 1821 University Ave., St. Paul 4)

3–4. Nebraska **Acad. of Sciences**, Lincoln. (C. B. Schultz, 101 Morrill Hall, Univ. of Nebraska, Lincoln 8)

3–4. North Dakota **Acad. of Science**, Grand Forks. (B. G. Gustafson, University Station, Grand Forks)

3–5. **Protides of the Biological Fluids**, 11th colloquium, Bruges, Belgium. (H. Peeters, St. Jans Hospital, Bruges)

3–5. Wisconsin **Acad. of Sciences, Arts and Letters**, Milwaukee. (T. J. McLaughlin, Univ. of Wisconsin, Milwaukee 11)

3–6. American **Psychoanalytic** Assoc., St. Louis, Mo. (H. Kohut, 664 N. Michigan Ave., Chicago 11, Ill.)

4–5. International Soc. of **Craniofacial Biology**, annual, Miami Beach, Fla. (S. Pruzansky, Univ. of Illinois, 808 Wood St., Chicago 12)

4–5. Academy of **Psychoanalysis**, an-

nual, St. Louis, Mo. (A. H. Rifkin, 125 E. 65 St., New York 21)

5–7. **Biometric** Soc., eastern North American regional, Cambridge, Mass. (J. Cornfield, School of Public Health, Johns Hopkins Univ., Baltimore, Md.)

5–8. American Inst. of **Chemical Engineers**, Buffalo, N.Y. (F. J. Van Antwerpen, American Inst. of Chemical Engineers, 345 E. 47 St., New York, N.Y.)

5–8. Physical Processes in **Radiation Biology**, intern. symp., East Lansing, Mich. (B. Alderman, Room 24, Kellogg Center, Michigan State Univ., East Lansing)

5–9. American Soc. for **Microbiology**, Cleveland, Ohio. (R. W. Sarber, 115 Huron View Blvd., Ann Arbor, Mich.)

5–9. **Orthodontists**, inter-American meeting, Miami, Fla. (J. A. Salzman, American Assoc. of Orthodontists, 654 Madison Ave., New York 21)

6–10. **Atmospheric and Space Electricity**, 3rd intern. conf., Montreux, Switzerland. (H. R. Byers, Dept. of Geophysical Sciences, University of Chicago, Chicago 37, Ill.)

6–10. American **Industrial Hygiene** Assoc., conf., Cincinnati, Ohio. (G. D. Clayton, 14125 Prevost, Detroit 27, Mich.)

6–10. American **Psychiatric** Assoc., 119th annual, St. Louis, Mo. (R. L. Robinson, APA, 1700 18th St., NW, Washington 9)

7–8. **Histochemical** Soc., 14th annual, Washington, D.C. (M. Wachstein, Dept. of Pathology, St. Catherine's Hospital, Brooklyn 6, N.Y.)

7–9. American Soc. of **Lubrication Engineers**, Chicago, Ill. (M. M. Gurgo, Humble Oil Co., P.O. Box 2180, Houston 1, Tex.)

7–9. **Electronic Components** Conf., Washington, D.C. (Inst. of Radio Engineers, 1 E. 79 St., New York 21)

7–11. East-West **Diabetic Workshop**, 2nd intern., Chicago, Ill. (R. B. Hearst, 55 E. Washington, Chicago 2)

7–27. **World Health** Assembly, 16th, Moscow, U.S.S.R. (WHO, Palais des Nations, Geneva, Switzerland)

8–10. American Inst. of **Chemists**, Philadelphia, Pa. (J. Kotrady, American Inst. of Chemists, 60 E. 42 St., New York 17)

8–12. National **Science Education** Exposition, New Mexico Acad. of Science, Albuquerque. (The Academy, 5900 Domingo Rd., NE, Albuquerque)

9–11. **Aluminum** Conf., Hungarian Mining and Metallurgical Assoc., Budapest. (Hungarian Mining and Metallurgical Assoc., Szabadsag ter 17, III/307, Budapest 5)

9–14. American Inst. of **Industrial Engineers** natl. meeting, Denver, Colo. (W. J. Jaffe, Newark College of Engineering, Newark, N.J.)

10–11. North Carolina **Acad. of Science**, Greenville. (J. A. Yarbrough, Meredith College, Raleigh, N.C.)

12. American **Pharmaceutical** Assoc., Miami Beach, Fla. (W. S. Apple, 2215 Constitution Ave., NW, Washington, D.C.)

12–13. **Biology** Colloquium, 24th annual, Oregon State Univ., Corvallis. (F. A. Gilfillan, School of Science, Oregon State Univ., Corvallis)

12–14. **Excerpta Medica** Foundation,

Amsterdam, Netherlands. (Headquarters, 111, Kalverstraat, Amsterdam)

12–17. American Soc. of **Hospital Pharmacists**, Miami Beach, Fla. (J. A. Oddis, 2215 Constitution Ave., NW, Washington, D.C.)

13–14. National Assoc. of **Boards of Pharmacy**, Miami Beach, Fla. (F. T. Mahaffey, 77 W. Washington St., Chicago 2, Ill.)

13–16. **Histochemistry**, intern. symp., Warsaw, Poland. (H. G. Godlewski, Inst. of Exptl. Pathology, Polish Acad. of Sciences, Dworkowa 3, Warsaw 12)

13–17. American Soc. of **Civil Engineers**, Milwaukee, Wis. (W. H. Wisely, ASCE, 345 E. 47 St., New York 17)

13–17. National League for **Nursing**, Atlantic City, N.J. (NLN, 10 Columbus Circle, New York 19)

13–18. **Condensation Nuclei**, 5th intern. symp., Clermond-Ferrand and Toulouse, France. (H. Dessens, Laboratoire de Physique du Globe, Faculté des Sciences, Univ. de Toulouse, Toulouse)

14–19. **Mass Spectroscopy**, 11th conf., San Francisco, Calif. (N. D. Coggeshall, Gulf Research and Development Co., P.O. Drawer 2038, Pittsburgh 30, Pa.)

15–17. **Transplutonium Elements**, symp., Argonne, Ill. (D. C. Stewart, Chemistry Div., Argonne Natl. Laboratory, 9700 S. Cass Ave., Argonne)

15–18. **Acoustical** Soc. of America, New York, N.Y. (W. Waterfall, American Inst. of Physics, 335 E. 45 St., New York 17)

16–17. **Aromatic Biosynthesis and Metabolism**, Saskatoon, Canada. (A. J. Finlayson, Prairie Regional Laboratory, National Research Council, Saskatoon)

16–17. Metallurgical Problems in **Electronic Technology**, New England regional conf., Boston, Mass. (Metallurgical Soc. of the American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 17)

16–18. International Assoc. for **Bronchology**, 13th congr., Zurich, Switzerland. (E. Steinmann, Tödstr. 36, Zurich 2)

16–18. **Diabetology**, 4th, Paris, France. (M. Rathery, Hotel-Dieu, Place du Parvis Notre Dame, Paris 4)

17–18. **Surface Physics**, symp., Pullman, Wash. (E. E. Donaldson, Dept. of Physics, Washington State Univ., Pullman)

18. Southern California **Academy of Sciences**, Los Angeles. (G. Sibley, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 7)

19–24. **Mass Spectrometry** and Allied Topics, 11th annual conf., San Francisco, Calif. (N. D. Goggeshall, Gulf Research & Development Co., P.O. Drawer 2038, Pittsburgh 30, Pa.)

20–22. Institute of Radio Engineers, Professional Group on **Microwave Theory and Techniques**, symp., Santa Monica, Calif. (I. Kaufman, Space Technology Laboratories, Inc., 1 Space Park, Redondo Beach, Calif.)

20–23. **Humidity and Moisture**—Measurement and Control in Science and Industry, intern. symp., Washington, D.C. (A. Wexler, National Bureau of Standards, Washington 25)

20–23. **Spectroscopy**, 14th annual mid-American symp., Chicago, Ill. (J. E. Forrette, Roy C. Ingersoll Research Center, Wolf and Algonquin Rds., Des Plaines, Ill.)

21–23. **Australian Mathematical Soc.**, Clayton, Victoria, Australia. (G. C. Smith, Dept. of Mathematics, Monash Univ., Clayton)

21–23. Joint **Computer** Conf., Detroit, Mich. (B. W. Pollard, Burroughs Corp., 6071 Second Ave., Detroit 32)

21–23. **Radioisotopes**, 5th Japanese conf., Tokyo. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington 25)

22–25. **Space**, 3rd European symp., Stuttgart, Germany. (U. Seeliger, Verkehrsamt der Stadt Stuttgart)

22–31. **Scientific and Technical Press and Books**, 1st intern. exhibition, Paris, France. (Groupe des Editeurs de Livres de Sciences et de Techniques, Syndicat National des Editeurs, Cercle de la Librarie, 117 Boulevard St. Germain, Paris 6)

23–24. **Radiosentisizers and Radioprotective Drugs**, 1st intern. symp., Milan, Italy. (R. Paoletti, Inst. of Pharmacology, Univ. of Milan, Via A. Sarto 21, Milan)

23–24. **Southern Textile Research**, 3rd conf., Pinehurst, N.C. (M. P. Underwood, P.O. Box A-2, Greensboro, N.C.)

23–25. American Assoc. for **Cancer Research**, Inc., Toronto, Canada. (H. J. Creech, Inst. for Cancer Research, Fox Chase, Philadelphia 11, Pa.)

23–25. American Soc. for **Quality Control**, Chicago, Ill. (C. E. Fisher, Bell Telephone Laboratories, 463 West St., New York 14)

23–26. **Nuclear Fuel** Reprocessing, Eurochemic symp., Brussels, Belgium. (O.E.C.D., European Nuclear Energy Agency, 38 Boulevard Suchet, Paris 16°, France)

26–27. Society for **Industrial and Applied Mathematics**, Menlo Park, Calif. (R. D. Gaskell, Dept. of Mathematics, Oregon State Univ., Corvallis)

26–29. Institute of **Food Technologists**, Detroit, Mich. (C. L. Willey, Inst. of Food Technologists, 176 W. Adams St., Chicago 3, Ill.)

26–31. American **Physical Therapy** Assoc., New York, N.Y. (L. Blair, APTA, 1790 Broadway, New York 19)

26–1. **Mineral Processing**, 6th intern. congr., Cannes, France. (D. A. Dahlstrom, Eimco Corp., 301 S. Hicks Rd., Palatine, Ill.)

27. **Operations Research** Soc. of America, Transportation Science Section, Cleveland, Ohio. (L. C. Edie, Port of New York Authority, 111 Eighth Ave., New York 11)

27–29. Canadian **Nuclear** Assoc., 2nd intern. conf., Montreal, Canada. (CNA, 19 Richmond St., W., Toronto 1, Canada)

27–29. **Frequency Control**, 17th annual symp., Atlantic City, N.J. (Headquarters, U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, N.J.)

27–30. **Tissue Culture** Assoc., 14th annual, Boston, Mass. (R. L. Sidman, Laboratory of Cellular Neuropathology, Harvard Medical School, 25 Shattuck St., Boston 15)

(See 29 March issue for comprehensive list)