New Things in Three Dimensions

Large-scale exhibits have been an integral and important feature of AAAS meetings since 1924. In accord with the diversity of the Association's conventions, with all principal fields of science represented by the programs of the sections and the participating societies, the exhibits are both numerous and varied. Each of the major fields of science is sufficiently represented at the meetings to warrant the participation of exhibitors with lines of particular interest. Thus, for example, some exhibits will appeal especially to astronomers, geologists, physicists, biologists, or medical researchers, but will not be without interest to those in other disciplines. In recent years, the publishers, instrument makers, and larger supply houses have been joined by such agencies as Biological Abstracts, the Educational Testing Service, the National Science Foundation, and the Oak Ridge Institute of Nuclear Studies, as well as a growing number of large industries showing highly informative institutional exhibits.

At Indianapolis this year, the AAAS Annual Exposition of Science and Industry will be especially rich in displays of advances in pharmaceuticals and electronics and of the components and adjuncts of jet aircraft and guided missiles. This is apparent from the list of this year's exhibitors and the descriptions of their exhibits which is to be found in subsequent pages of this issue. The 1957 Exposition is worth a trip to Indianapolis for itself alone. We hope those who are going for the sessions will not fail to budget time for an adequate survey of the Exposition.

The exhibitors have much to offer visiting scientists and, conversely, they may receive much in return. The representatives of the participating firms, in addition to showing their latest aids for science, may also be able to provide just the bit of information or the helpful suggestion on techniques that one can use; in return, they will welcome expressions of new needs or requirements from those they serve.

During the brief span of the meeting period, both those who produce the tools of science and those who use them have opportunities to meet each other on a scale that dwarfs the number of calls the same representatives can make to widely scattered campuses, when, also, scientists may be preoccupied with their daily activities. The exhibitors and the scientists meet each other not primarily to place or accept orders at the moment, but essentially to exchange information in a way that no printed brochure or sales letter can match.

In a literal sense, the actual display of the latest in books, instruments, and laboratory supplies—or some of the most recent technological advances of industry—are three-dimensional, tangible information pieces, willingly explained to all who are sufficiently interested to pause before a booth.——RAYMOND L. TAYLOR
HOW BAUSCH & LOMB EDUCATIONAL INSTRUMENTS

MAKE SCIENCE EASIER TO TEACH, EASIER TO UNDERSTAND...

• B&L TRI-SIMPLEX MICRO-PROJECTOR
Projects more vivid views of microscopic specimens—easier to see and understand—than any other micro-projector anywhere near its low budget price. Easy projection of:

1. Screen images of prepared microscope slides
2. Screen images of living micro-organisms in liquid
3. Table-top images for tracing

• B&L "FL" MICROSCOPE
Standard size and operation; students learn better—the right way. Pre-focusing gage saves valuable class time. 100 × and 430 ×.

• B&L BALOPTICON® PROJECTORS
Brilliant full-screen images of slides, opaque objects, even chemical reactions!

• B&L STEREOMICROSCOPES
Natural 3-D detail, widest field of view, simple to use. 6.6 × to 150 ×.

• B&L SPECTROSCOPES
Easy-to-see spectra of elements make chemical analysis easy to understand.

TRY THEM! USE THEM! SEE FOR YOURSELF IN FREE CLASSROOM DEMONSTRATION!
(Just Mail Coupon)
with female nuclei, in contrast to the variable and less severe testicular pathology in Klinefelter's syndrome with male nuclei. W. M. Davidson and D. Robertson Smith confirmed sporadic reports that the incidence of female-type neutrophils may be unexpectedly low in patients with Klinefelter's syndrome and female nuclei elsewhere. The cause of this discrepancy is obscure, but it cannot be attributed to a leftward shift in the Arneth index of nuclear lobulation.

P. M. F. Bishop, M. A. Ferguson Smith, B. Lennox, F. Polani, and J. S. S. Stewart found that the incidence of defective color vision in Klinefelter's syndrome was consistent with the sex chromosome constitution (XX in one group, XY in the other) as inferred from cytological tests of chromosomal sex. J. S. S. Stewart, M. Izatt, M. A. Ferguson Smith, B. Lennox, and W. S. Mack found a high incidence of sterility among the uncles of patients with Klinefelter's syndrome. Paternal uncles were affected in cases where the patients had female nuclei, and maternal uncles were affected in cases where the patients had male nuclei. A hereditary mechanism was postulated, based on an autosomal translocation involving the masculinizing (M) genes (female nuclei = MMMXX, male nuclei = MXY).

The application of the sex chromatin principle to the study of tumors was the subject for the third and final session of the symposium, with M. L. Barr acting as chairman. L. Myers presented data on the nuclei of teratomas. The nuclei were female in tumors from female hosts, except that the sex chromatin could not be identified accurately in a few tissues of malignant teratomas. Tumors from male hosts had, for the most part, typical male or female nuclei, as has previously been reported. However, some testicular tumors were encountered with a mosaicism of the nuclei, since they were female in some tissues and male in others. Discussants of the paper felt that the latter observation did not necessarily invalidate the etiological hypotheses of Hunter and Lennox and of Tavares (both hypotheses having haploid cells as their starting point), when chromosomal anomalies in malignant cells and technical difficulties are taken into consideration.

A. S. Tavares reported on the sex characteristics of differentiated-cell carcinomas compared with undifferentiated-cell carcinomas, using malignant tissues from female hosts. The sex chromatin of differentiated-cell carcinomas was similar to that of nonmalignant tissues. In undifferentiated-cell carcinomas, on the other hand, the incidence of sex chromatin in a population of nuclei was exceedingly variable, the figures for some tumors falling within the male, or an intermediate, range. N. B. Atkin described the chromosomes and sex chromatin of human cancer cells from female hosts, as seen in squash preparations. One mass of sex chromatin per nucleus was the rule for most of the tumors. However, there was no typical sex chromatin in the nuclei of a few tumors (they may have lost the XX complex), and two masses of sex chromatin were present in most nuclei of other tumors (they were probably tetraploid, as indicated by nuclear size, chromosome counts, and deoxyribonucleic acid content).

The symposium concluded with a summary by Barr. A committee was appointed to consider a revision of the classification of sex anomalies and their terminology in the light of current developments. Robert Platt, president of the Royal College of Physicians, was the principal speaker at a dinner given by the dean and council of King's College Hospital Medical School.

MURRAY L. BARR
Department of Microscopic Anatomy, University of Western Ontario, London, Canada

Ethology and Comparative Psychology

Between 9 July and 3 August a conference on ethology and comparative psychology was held at the Center for Advanced Study in the Behavioral Sciences, Stanford, Calif. The purpose of the conference was to facilitate the exchange of ideas between representatives of ethology and comparative psychology. No formal program or agenda was drawn up in advance of the meeting, and no “papers” in the usual sense were presented. Each participant reported results of his more recent investigations. This took approxi-
SMALLWOOD BIOLOGICAL CHARTS

60 CHARTS IN DIAGRAMMATIC COLORS

Over 1,000 Illustrations - 700 Practical Applications

These Widely Used Charts Are a Valuable Addition to the Elementary Biology Laboratory

UP-TO-DATE — EASY TO UNDERSTAND
DETAILED BUT NOT COMPLICATED

30 BOTANICAL CHARTS with more than 400 drawings
30 ZOOLOGICAL CHARTS with more than 350 drawings

SIZE: 24 x 36 INCHES with NON-CLARE, WASHABLE PROTECTIVE COATING

Available for Constant Pupil Reference

NO. 6939—BOTANICAL CHARTS, Set of 30, in Charthead with Tripod or Wall Bracket Mounting
Set, $27.50

NO. 6940—ZOOLOGICAL CHARTS, Set of 30, in Charthead with Tripod or Wall Bracket Mounting
Set, $27.50

NO. 6941—BIOLOGICAL CHARTS, Set of 60, 30 Botanical and 30 Zoological Charts, in Charthead with Tripod or Wall Bracket Mounting
Set, $45.00

W. M. WELCH SCIENTIFIC COMPANY
DIVISION OF W. M. WELCH MANUFACTURING COMPANY
ESTABLISHED 1880
1515 Sedgwick Street, Dept. E Chicago 10, Illinois, U. S. A.
Manufacturers of Scientific Instruments and Laboratory Apparatus
THE CHEMOSTAT
A continuous culture apparatus for micro-organisms

A constant flow of nutrient liquids are used to maintain a population of constant size, growing at an arbitrary fixed rate under constant conditions. It can be used for experiments in the physiology and genetics of microorganisms.

The glass apparatus you see is the reservoir with feeder and growth tube attached. The Chemostat, ready for use, can be furnished as a complete unit with an attractive gray crinkle finished stand with all the controls mounted on the stand, such as pressure regulating tubes, air drying, collecting vessels, valves, micro switches, synchronous motors for a time table cycle.

The Chemostat can be operated in a battery of two on one stand which can be furnished.

Write for prices and our booklets “The Growth of Bacteria and Genetic Mechanisms in Bacteria and Bacterial Viruses” and “Cold Springs Harbor Symposia on Quantitative Biology” to Delmar Scientific Laboratories.

Delmar
Scientific Laboratories
4701 WEST GRAND AVENUE • CHICAGO 39, ILLINOIS • TELEPHONE EV 4-5911

A Classified Bibliography of Gerontology and Geriatrics
Supplement One, 1949-1955

Nathan W. Shock. Almost as many articles have been published on the problems and processes of aging in the period covered by this supplement as were published from 1900 to 1948, the period covered by Dr. Shock’s original Bibliography. The Supplement fills the urgent need for a convenient guide to the most recent references in the field.

Trends in Gerontology Second Edition

Nathan W. Shock. Recent developments in gerontology are described in this completely revised edition of a book which provides an accurate and comprehensive view of the varied problems of aging. The range of the revised edition has been greatly extended as a result of the author’s visits to research laboratories in England, the Scandinavian countries, Germany, Switzerland, and France.

International Biochemistry Congress

The National Science Foundation, the American Society of Biological Chemists, and the Division of Biological Chemistry of the American Chemical Society are cooperating to support the travel of a limited number of American scientists to the fourth International Congress of Biochemistry, to be held in Vienna, Austria, 1–7 September 1958. The closing date for the receipt of applications is 1 February 1958. Application blanks are available from the National Science Foundation, Washington 25, D.C.

The size of each grant will be sufficient to defray only a part of the travel costs incurred in attending the congress. An attempt will be made to have the awards approximate air-coach fare from the scientists’ home institutions to Vienna and return. As in the past, a portion of the funds will be used to support the travel of qualified younger investigators who have not had the opportunity to attend an international congress.
Conference on Salt Marshes

The Marine Institute of the University of Georgia has announced that a Conference on Salt Marshes is to be held at Sapelo Island 25-28 March 1958. The conference, which is being sponsored jointly by the institute and the National Science Foundation, will be international in character. A group of about 25 people has participated in the conference; however, invitations will be extended on request to a limited number of additional persons who wish to attend at their own expense. The conference is under the direction of Alfred C. Redfield of Woods Hole, Mass. Inquiries should be directed to Dr. Robert A. Ragotzkie, University of Georgia Marine Institute, Sapelo Island, Ga.

Forthcoming Events

December


The following 44 meetings are being held in conjunction with the AAAS annual meeting.

AAAS Acad. Conference, annual (Father P. H. Yancey, Spring Hill College, Mobile, Ala.). 28 Dec.


American Geophysical Union (E. M. Brooks, Dept. of Geophysics, St. Louis Univ., St. Louis 8, Mo.).

American Medical Assoc. Committee on Cosmetics (Mrs. V. L. Conley, AMA, 555 N. Dearborn St., Chicago, Ill.). 28-29 Dec.

American Meteorological Soc. (K. C. Spengler, AMS, 3 Joy St., Boston, Mass.).


American Physiological Soc. (F. A. Hitchcock, Dept. of Physiology, Ohio State Univ., Columbus 10.)


These Schwarz fine chemicals satisfy the exacting requirements of products intended for laboratory and biochemical use.

To assure the user of highest quality and purity, rigid specifications in accordance with latest literature are established for each product, each lot is carefully analyzed and checked before shipment, complete records are permanently kept, and an analysis is furnished the user if desired.

Quantity production resulting from the wide preference and demand for Schwarz high-quality biochemcials provides ample supplies at low cost. Write for informative technical bulletins, specifications, references to literature and latest complete price list.

SCHWARZ LABORATORIES, INC.
Leading Manufacturers of Yeast Biochemicals and Fine Chemicals
230 WASHINGTON STREET, MOUNT VERNON, NEW YORK
Break-Resistant Lip Erlenmeyer Flasks*

another First BY BELLCO!

- Bellco Break-Resistant Lip Flasks reduce breakage losses from 42% to 3% . . . based on actual field tests.
- Danger of lacerated fingers eliminated.
- Saves fire-polishing, repair expense and inconvenience.
- Made of Pyrex Brand Glass.
- Available in wide and narrow mouth.

Write for descriptive literature and prices

BELLCO GLASS INC. VINELAND, N.J.

"Research deserves the best"

*N. Pat. applied for

SCHOTT
Narrow Band Interference Filters

Transmission up to 45% . . . Half-band width down to 5 μm . . . Peak wave-length region: from 400 to 1,000 μm . . . Size of filters: 2" x 2" . . . Regular quality IL: Tolerance at peak wave length ±1% . . . Precision quality PIL: Tolerance at peak wave length ±0.5%.

Ask for Bulletin NBF-339

SCHOTT Monochromatic Interference Filters

for the 310 to 389 μm Ultraviolet Spectral Region.

Ask for Bulletin 302UV

SCHOTT-JENA Raw Optical Glass

Made in West Germany

FS Multi-Layer Interference Films

Part of the spectrum is strongly reflected and the balance strongly transmitted, according to requirements. Absorption is negligible. Transmission or reflection peaks as high as 85 to 90% but the spectral bands are relatively broad.

Ask for Bulletin MI-318

FISH-SCHURMAN CORPORATION
74 Portman Road New Rochelle, N. Y.

Fish-Schurman

THE RICKETTSIAL DISEASES OF MAN

- This symposium volume is a comprehensive survey of the general field of Rickettsial diseases in man. Among the contributors appear the names of many of the foremost American authorities in this important and relatively new field of medicine.

- The first group of papers includes discussions of the taxonomy, biology, isolation, and identification of vectors, and reservoirs of infection of the Rickettsial diseases of man. The second group of papers is devoted to discussions of serological reactions, the Weil-Felix reaction, the complement-fixation and agglutination reactions, and the preparation and standardization of Rickettsial vaccines. The final group of papers treats of insecticides, methods of their application, and mite control.

To: AAAS Publications
1515 Mass. Ave., N.W., Washington 5, D.C.

Please accept my order for one copy of The Rickettsial Diseases of Man (7½ x 10½, cloth-bound). My check in correct payment is enclosed ($5.25 to A.A.A.S. members, $6.25 to those who are not members; including postage.)

Name ....................................................
Address ..................................................
City ................................... Zone ... State .....................................

American Statistical Assoc. (V. L. Anderson, Statistical Lab., Purdue Univ., Lafayette, Ind.)


Association for Computing Machinery (J. E. Robertson, Digital Computer Lab., Univ. of Illinois, Urbana).

Astronomical League (W. Garnatz 2506 South East St., Indianapolis).

Beta Beta Beta (Mrs. F. G. Brooks, P.O. Box 336, Madison Sq. Station, New York 10.) 27 Dec.


Ecological Soc. of America (A. A. Lindsey, Dept. of Biological Sciences, Purdue Univ., Lafayette, Ind.) 27–29 Dec.

Eclecticon Assoc. (J. T. Johnson, 694 West 11 St., Claremont, Calif.)


National Assoc. of Science Writers (J. Troan, Pittsburgh Press, Pittsburgh, Pa.)


Philosophy of Science Assoc. (C. W. Churchman, Case Inst. of Technology, Cleveland, Ohio).


Sigma Delta Epsilon, annual (Miss M. Chalmers, Dept. of Chemistry, Purdue Univ., Lafayette, Ind.) 26–30 Dec.

Sigma Pi Sigma (M. W. White, Pennsylvania State Univ., University Park) 27 Dec.


Society for General Systems Research,

6 DECEMBER 1957

American

Science

Physics

Chalmers,

York

New

annual

Cleveland,

seums

Aves.,

St.,

apolis

NCS,

Troan,

W.

Dec.

litical

Physics

P.O.

Univ.

11

(L.L.

Sigma

Sigma

Scientific

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

National

Naturals...

Cary

instrument

abstracts

Cary Vibrating Reed Electrometer

simplifies C14, H3 and S35 determinations

DETECTS AS LITTLE AS 10-12 CURIES—The high sensitivity and high precision of the Cary Model 31 Electrometer permit minimum amounts of costly "tagged" materials to be used in radioactive isotope studies, saving enough to pay for the instrument in a short time and materially reducing the hazard to living experimental subjects.

This greater sensitivity, plus the development of simplified experimental procedures, make the Cary Model 31 particularly valuable in determination of C14 and H3 in biological and chemical samples. With these new techniques, the smaller samples may be used and the use of a precipitate with its inaccuracies and time-consuming preparation is eliminated. Instead, samples are directly converted into a gas which can be measured with an ionization chamber and a Cary Model 31.

The ionization chamber and vibrating reed electrometer offer the only convenient accurate method of measuring radioactivity of CO2-air mixtures in flowing systems, such as are encountered in in-vivo studies.

One research group led by Dr. Bert M. Tolbert has had considerable success in applying these procedures to a wide variety of samples and research problems, including studies of animals.

NEW REVIEW PAPER

Dr. Tolbert, now at the University of Colorado, has authored a 46-page paper covering detailed procedures for C14 and Tritium assays, ion-chamber theory, samples and sample preparations, combustion of organic compounds to CO2, design and construction of ion chambers and measurement of ion chamber currents and approximate calibration data. Copies of the paper are available from Technical Reports Section, Department of Commerce, Office of Technical Services, Washington 25, D.C., for 35 cents each. When requesting a copy, please ask for Bulletin UCRL-3496.

OTHER USEFUL APPLICATIONS

Measurement of radioactivity is only one of many applications where the Model 31 can be used advantageously. For example, amplification and measurement of ion currents in mass spectrometry, pH determinations, precise measurements of small charges, currents, or voltages from a high impedance source can all be made faster, simpler, less expensive and far more accurately using the Model 31.

BRIEF SPECIFICATIONS OF THE MODEL 31

Accuracy—Measurements reproducible to within 1%. Accuracy limited only by the accuracy of the recorder, potentiometer, or meter used.

Reliability—No grid current, greatest freedom from zero drift. Much more rugged than other types of electrometers.

Stability—Open circuit input; less than 6 x 10-16 coulombs rms short period noise; less than 5 x 10-16 amperes steady drift. Short circuit input; less than 0.02 mv rms short period noise; less than 0.2 mv per day steady drift.

10 standard ranges—Ranges provided on the Model 31 are 1, 3, 10, 30, 100, 300, 1,000 mv, and 3, 10, 30 volts. The output of the Model 31 will operate a 1 ma recording milliammeter or a standard recording potentiometer.

Accessories—Ionization chambers, recorders and various special modifications and accessories are available for all types of electrometer uses.

A new catalog on the Cary Model 31 is available. Write for your copy today to Applied Physics Corporation, 362 West Colorado St., Pasadena 1, California. Ask for Data File E9-127.
Introducing the University Series—the ultimate in sensitivity and speed for the most precise analytical needs.

NEW COMPLETE CATALOGS

Atomic Instrument Catalog A-1 features the University Series and other new B-A instrumentation for Analysis and control.

Atomic Systems Catalog A-2 presents many new and complete analytical systems for industry, medicine and research.

SPECIAL MEDICAL SYSTEMS — Scintillation Uptake System, Automatic Sample Changer, Kidney Ratio Analyzer, and Brain Tumor Scanner.

27-28. Linguistic Soc. of America, Chicago, Ill. (A. A. Hill, Box 7790, University Station, Austin 12, Tex.)
28-29. American Folklore Soc., annual, Chicago, Ill. (M. Leach, Box 5, Bennett Hall, Univ. of Pennsylvania, Philadelphia 4, Pa.)
28-30. Archaeological Inst. of America, annual, Washington, D.C. (C. Boulter, 606, Univ. of Cincinnati Library, Cincinnati 21, Ohio.)

January

6-8. Reliability and Quality Control, 4th natl. symp., Washington, D.C. (C. M. Ryerson, RCA Bldg. 10-6, Camden 2, N.J.)
7-10. Radioactive Isotopes in Clinical Application and Research) 3rd internatl. symp., Bad Gastein, Austria. (Second Medical Clinic, Vienna Univ., Vienna Austria.)
17-18. Blood Symposium, 7th annual, Detroit, Mich. (W. H. Seegers, Dept. of Physiology and Pharmacology, Wayne State Univ. College of Medicine, 1401 Rivard, Detroit 7.)
22-24. American Council of Learned Societies, 39th annual, Bloomington, Ind. (ACLS, 2101 R St., NW, Washington 8.)
NEW IMPROVED ALOE

ELECTRIC MICROTOME KNIFE SHARPENER

FOR A KEEPER EDGE IN LESS TIME

Less effort, too, in getting the keen, uniform edge you want. This new improved sharpener has heavy duty “T” guide holder that supports knife over the full length up to 13 inches, greatly simplifying operation. Holder is adjustable for differences of bevel required by various knives.

Special alloy honing wheel is powered by unusually quiet split phase 1/4 h. p. motor. Entire mechanism is enclosed in attractive gray finish rubber-footed metal housing with aluminum platform. Overall dimensions: 13½ x 11 x 9”. Operates on 115 volts A. C.

For additional information, request Bulletin 20-105.

IMPROVED STROP ASSEMBLY Standard equipment with the sharpener

Strop removes small wire or Burr left by sharpening. Puts final fine edge on knife. Assembly consists of high quality horsehide strop and linen finishing strop mounted on heavy metal frame equipped with thumb screws for adjusting tension.

60040—Aloe Electric Microtome Knife Sharpener, improved model as described, with adjustable strap assembly, 3 sticks assorted abrasive paste, one can of abrasive powder, one can of special solvent, card and plug. Each $295.00

5655 KINGSBURY, ST. LOUIS 12, MO.
14 DIVISIONS
COAST TO COAST

Now Available from Sigma

2 - DEOXY - D - RIBOSE
(or anilide)

CHROMATOGRAPHICALLY PURE (99.85% min)
M. P. 78°-82°C

α METHYL METHIONINE
(Methionine Antagonist)

New catalog in press — reserve your free copy now.

We also announce substantial price reductions on

ADENOSINE TETRAPHOSPHATE
Sodium, Sigma Grade
Now - $150 per gram
(Formerly $1000 per gram)

CYTIDINE DIPHOSPHO-CHOLINE
Sodium, Sigma, Crystalline
Now - 100 mg. - $50
10 mg. - $10

PHONE COLLECT:
DAN BROIDA St. Louis, Missouri
Day: Night:
PRospect 1-5750 WYdown 3-6418

SIGMA CHEMICAL COMPANY

3500 DeKalb St., St. Louis 18, Mo., U.S.A.
MANUFACTURERS OF THE FINEST BIOCHEMICALS AVAILABLE

6 DECEMBER 1957


28-30. American Mathematical Soc., 64th annual, Cincinnati, Ohio. (J. H. Curtiss. AMS, 190 Hope St., Providence 6, R.I.)


30-31. Mathematical Assoc. of America, annual, Cincinnati, Ohio. (H. M. Gehman, Univ. of Buffalo, Buffalo 14, N.Y.)

30-1. American Assoc. of Physics Teachers, New York. (F. Verbrugge, Univ. of Minnesota, Minneapolis.)

30-1. Western Soc. for Clinical Research, 11th annual, Carmel-by-the-Sea, Calif. (A. J. Seaman, Univ. of Oregon Medical School, Portland 1.)

31-7. Problems of Geriatrics, symp. (by invitation only), New York. (B. F. Chow, Johns Hopkins Univ., School of Hygiene and Public Health, 615 N. Wolfe St., Baltimore 5, Md.)

February


3-4. Progress and Trends in Chemical and Petroleum Instrumentation, Wilmington, Del. (H. S. Kindler, Instrument Soc. of America, 313 Sixth Ave., Pittsburgh 22, Pa.)


March


6-8. Optical Soc. of America, annual, New York. (A. C. Hardy, Massachusetts Inst. of Technology, Cambridge 38.)

10-13. American Soc. of Petroleum Geologists, annual, Los Angeles, Calif. (C. H. Dott, AAPG, Box 979, Tulsa 1, Okla.)


20-22. Pulmonary Circulation Conf., Chicago, Ill. (Wright Adams, Chicago Heart Assoc., 69 W. Washington St., Chicago 2.)

20-23. International Assoc. for Dental Research, annual, Detroit, Mich. (D. Y. Burrill, Univ. of Louisville, School of Dentistry, 129 E. Broadway, Louisville 2, Ky.)

23-26. American Assoc. of Dental Schools, annual, Detroit, Mich. (M. W. McCrea, 42 S. Greene St., Baltimore 1, Md.)


29. South Carolina Acad. of Science, annual, Charleston. (Miss M. Hess, Dept. of Biology, Winthrop College, Clemson, S.C.)


30-3. American College Personnel Assoc., annual, St. Louis, Mo. (L. Riggs, DePaul Univ., Greencastle, Ind.)

31-2. Instruments and Regulators Conf., Newark, Del. (W. E. Vannah, Control Engineering, 330 W. 42 St., New York 36.)

(See issue of 15 November for comprehensive list)
Best Where A High Degree of Cleanliness is Required for Glassware!

**NON - TOXIC** for **TISSUE CULTURE**

- 7X is instantly and completely soluble in any concentration.
- It will not leave a film nor etch glassware (pH 7.2).
- 7X is not harmful to hands.
- Excellent for washing syringes.

Used by leading laboratories and is available from your laboratory supply dealer.

Write to Dept. S1257 for information

**LINBRO CHEMICAL CO.**
681 DIXWELL AVE., NEW HAVEN 11, CONN.

---

A PRECISION INSTRUMENT

Of The Finest Quality for only $368.50

**GB-BINOCULAR OLYMPUS MICROSCOPE**

**BUILT to LAST A LIFETIME**

Service Guaranteed

**OPTICS are EXCELLENT**

A Model For Every Purpose

Write for Our Catalogue

**OLYMPUS OPTICAL INSTRUMENT CO.**
(TRANS-PACIFIC Import and Export Co.)

**KLETT ELECTROPHORESIS**

CUSTOM MADE

TOOL FOR THE ANALYSIS OF COMPLEX COLLOID SYSTEMS, AND FOR THE CONTROL OF PRODUCTION OF PURIFIED PROTEINS, ENZYMES, HORMONES

**KLETT MANUFACTURING CO.**
179 EAST 87TH STREET
NEW YORK, N. Y.
Ehrlich's Slogan

In his obituary of the Japanese bacteriologist Kiyoshi Shiga (1), Oscar Fellsenfeld mentions Shiga's association with Paul Ehrlich and writes that he "picked up a slogan, which he attributed to Ehrlich, as the motto of his life: Geld, Geduld, Geschick, und Glück (money, patience, fate, and luck). He kept repeating this saying of Ehrlich's and insisted that it governed all his decisions. Shiga, however, was not a money hunter." I can claim a degree of familiarity with the work and life of Ehrlich, my father, Felix Pinkus, having been one of his pupils (2) and later his friend (3), who at the time of his death in 1947 was engaged in writing Ehrlich's biography. I feel that the sentences quoted contain some errors of interpretation and do not do full justice to either Shiga or Ehrlich. The slogan is authentic (4, p. 48). My father told me that Ehrlich often said these "four G's" were essential for successful research. However, that the word Geld (money) is put first in certainly no indication that Ehrlich was a money hunter. Although his discoveries brought him wealth late in life, only a few of his worst enemies accused him of seeking it (5, p. 216). Whoever knew him well testified that he handled his own affairs rather poorly, that he often spent beyond his means for books and scientific implements, and that he loaned and gave money freely to friends and even to relative strangers who sought his help (4, pp. 50-53; 5, p. 65).

There are three plausible explanations for money being mentioned first by Ehrlich. Foremost, the entire slogan is a paraphrase of the much older one that three G's are needed for waging war: Geld, Geld, und nochmals Geld (money, money, and once more money) (6). Second, even modern scientists are painfully aware of the fact that funds are prerequisite to practically all experimental work. Third, a man who, like Ehrlich, had to work under restricted circumstances for many years and who was not a good businessman is apt to put first what he is least able to provide.

The second word, Geduld (patience), needs no explanation. The German word Geschick, however, has two quite different meanings (7). It is a synonym either of Schicksal (fate) or of Geschicklichkeit.

The editors take no responsibility for the content of the letters published in this section. Anonymous letters will not be considered. Letters intended for publication should be typewritten double-spaced and submitted in duplicate. A letter writer should indicate clearly whether or not his letter is submitted for publication. For additional information, see Science 124, 249 (1956) and 125, 16 (4 Jan. 1957).

ASTROPHYSICS

• The Atmospheres of the Sun and Stars

LAWRENCE H. ALLER,
University of Michigan

A significant work fully treating all major astrophysical principles such as atomic structure and spectra, gas laws and velocity distribution, ionization, excitation, etc. Applies these principles to radiation of sun and stars, continuous and dark-line spectra, solar phenomena, and solar-terrestrial relationships. "No question as to the significance of this book for astrophysics, its usefulness in physics, and the competence of the author." HARLOW SHAPLEY. 160 ills., tables; 412 pp.

$12

• Nuclear Transformations, Stellar Interiors, and Nebulae

Also by LAWRENCE H. ALLER

A pioneering study of thermal nuclear reactions, the interiors of stars, pulsating variable stars, and the interstellar medium. Treats: properties of matter at high temperatures, stellar energy generation, internal constitution of stars, stellar evolution and the origin of elements, discoveries obtained by radio astronomy, nuclear energy generation, etc. "Succeeds brilliantly in telling the reader what has been done." SKY AND TELESCOPE. 68 ills., tables; 291 pp.

$12
keit (skill, dexterity, aptitude). It is well documented (4, p. 80) that Ehrlich frequently expressed his ire against the “un-geschickte Taperkerle” (inept totterers) who did not comprehend his theories or could not verify his experimental results. Doubtless, Geschick is used here in its second sense of mental aptitude and manual skill.

Interpreted in this fashion, the slogan has valid significance, not so much as a motto for life but as a statement of the requisites of fruitful work, which can well be used to govern a man’s decisions. The two central G’s, Geduld and Geschick, have to be brought by the researcher himself. To apply them, he needs Geld, and who doubts that, to be really successful, he also needs Glück (good luck, “breaks”)?

Hermann Pinkus
Wayne State University College of Medicine, Detroit, Michigan

References
4. M. Marquardt, Paul Ehrlich als Mensch und Arbeiter (Deutsche, Stuttgart, Germany, 1924).
7. Langenscheidts Taschenwörterbuch der engli-schen und deutschen Sprache, ed. 7, 1929. Other dictionaries concur.

Oscar Felsenfeld’s interesting and dig-nified obituary on Kiyoshi Shiga [Science 126, 113 (1957)] mentions that Shiga adopted Paul Ehrlich’s motto of life: Geld, Geduld, Geschick, und Glück. Fel- senfeld translates the last three words as “fate and luck.” I have doubts whether a man of Ehrlich’s ability, not only for research but also for verbal expression, would have—in his motto—used two items which are practically synonyms, as fate and luck are. While the German word Geschick indeed means “fate,” it has another quite different meaning, and it is used in this second sense very frequently in the part of Germany from which Ehrlich originated (Silesia). It is the abbreviated form of Geschicklichkeit, meaning manual (and also intellectual) dexterity, handiness, the ability to handle a given task appropriately and smartly.

It is well known that Ehrlich (as well as his pupils, his Schule) was very proud and fond of manual dexterity in his histopathological and bacteriological work, especially staining. Ehrlich is reported as having, especially as a young man, dye stains on his fingers. It is this ability for manual tasks which Ehrlich and Shiga
Science and the High-School Student

There seems to be some likelihood that the definitive results of Mead and Métraux’s study of the “Image of the Scientist among High-School Students” [Science 126, 384 (1957)] will be considered as applying only to high-school students and scientists. Since almost all of the appropriate age group attends high school these days, Mead and Métraux’s sample is essentially a sample of that age group of the whole population. It is unlikely that this image of the scientist changes much with age. Hence, one concludes that the man in the street has very much the same image. Let us not censure high-school students, even by implication only, for sharing public opinion. The high-schooler who plans to become a scientist has about the same relation to his fellow-students as the adult scientist has to his fellow citizens. He may as well get used to it while he is young.

It is likely that the same sort of results would have been obtained regarding physicians, ministers, nurses, or any other dedicated group of people. This not-for-me attitude is directed at the dedication, not at the profession. In view of the fact that about 90 percent of the population has an IQ of less than 120, the not-for-me attitude is common-sense realism, and the high-schoolers are to be congratulated on their good sense.

I suggest an unscientific generalization of the title to “Image of the Dedicated Minority as Seen by the Undedicated Majority.”

M. J. Walker
Storrs, Connecticut

In his comment on our article, M. J. Walker has combined three themes—the rejection of dedication, the extent to which the high-school student’s attitude coincides with that of the man in the street, and the reasonableness of students with an IQ of less than 120 rejecting science as a career. As we pointed out, rejection of dedication in all fields of science is a characteristic of the attitude of post-World War II youth; it would extend to any profession which was seen as requiring an extreme degree of commitment. We know of no material that suggests that rejection of dedication and low IQ are systematically related and their followers valued very highly that—I am quite sure—was expressed by the word Geschick in their motto. Shiga, the discoverer of trypan red, was, in Paul Ehrlich’s judgment, certainly a geschickter collaborator and was probably proud of it.

WILFRED C. HULSE
Mount Sinai Hospital, New York
believe that there would be variations as the career in question was phrased as more or less intellectually demanding. While the attitude of today's high-school students may be said to prefigure the attitudes of the man in the street tomorrow, it is necessary also to recognize that these students have been exposed, rather more than their forebears, to articulate and concerted attempts to involve them in scientific careers, and so they may differ somewhat from their seniors today. The report is not in any sense designed to blame the high-school students but rather to focus attention on the onenessidedness of a picture of the scientific life which overemphasizes the gap between those who do and those who do not participate in it.

MARGARET MEAD
RHODA METRAUX

New York, New York

Grants Without Grind

An editorial in Science [125, 97 (18 Jan. 1957)] has helped to dispel ignorance among scientists about where and how to seek support for research. It has made me think of ways in which foundations, on their part, could improve their relations with research workers.

Years ago, that task would have been simple. The foundation would have endowed a university or a museum, which then would have hired a staff with tenure for life. That kind of security still works well in respect to basic research in many fields. But there is a greatly increased need today for the support of studies related to specific questions of current interest—a support that does not permit so-called "crash" programs to become "slap-dash" programs.

The amount of time and effort of research workers, and of research administrators, that is required to prepare requests for grants and fellowships has become appalling. At a recent conference of foreign medical educators, one of our European colleagues wondered why so large a proportion of the advance made in his field comes from European, rather than American, scientists, despite the greater funds available here. He hinted that this may be because "we in Europe are free from your kind of red tape." While he and his colleagues pursue their studies, we spend our time preparing requests for funds—often repeatedly, because many of them are rejected. The unsuccessful applicant as a rule does not receive the benefit of the critical appraisal which the foundation's advisers may have spent many hours in preparing. One foundation reports that the average number of references is seven; it costs the time of seven scholars to write seven thoughtful letters. (If, occasionally, such letters are written carelessly, both the

Packard Instruments

1 Liquid Scintillation Spectrometers
2 Automatic Fraction Collectors
3 Windowless and Flo-Window Counters

TRI-CARB LIQUID SCINTILLATION SPECTROMETERS

For counting Tritium, Carbon-14 and other beta emitting isotopes.
Provides the most simple and convenient method for precise counting of beta samples that go into solution with liquid phosphors.
Aqueous samples of various types may also be readily counted.
Certain materials that are not soluble in liquid phosphors may be counted in suspensions.

AUTOMATIC FRACTION COLLECTORS

For precise column chromatography.
Provides both time and drop counting. Can be furnished for time operation only at commensurately lower cost.
Drops from column fall directly into test tubes. There are no intermediate collecting vessels, glass arms, or funnels to cause mixing, contamination, evaporation, etc.
This is important where accurate separations are required or where radioactive tracers are used.

WINDOWLESS AND FLO-WINDOW COUNTERS

Both types can be used for Geiger and proportional operation.
Windowless Flow Counter, Model 200A, provides maximum sensitivity for counting solid samples which emit very soft radiations. Has essentially unlimited life. Physical arrangement of sample in chamber makes it possible to achieve full 2π geometry.
Flo-Window Counter, Model 210, features a very thin metalized window of Du Pont Mylar which offers a minimum of obstruction to low energy radiation. Isolates counting chamber from sample. Eliminates static charge, vapor effects, accidental contamination, etc.
 applicant's and the foundation's time may be wasted.)

Yet another matter deserves attention. In one case our school received a personally written letter asking it to apply for a fellowship, only to learn afterwards that the foundation had thus addressed a hundred times as many people as it had fellowships available. In another instance we applied for funds from one agency, and when the request was rejected, the administrator of another chided us for not having simultaneously applied to his—on another set of forms. In spite of a reputation for liberality in this respect, one national foundation refused to accept a duplicate of an application we had submitted to a federal agency and demanded 20 copies of an application in a different format.

We need a closer link, it seems to me, between foundations and research workers if the most important phase of research—the planning—is to be adequately supported. At the very least, granting agencies should pay the costs of duplication, circulation, and evaluation of applications and should accept the responsibility of telling unsuccessful applicants in detail why their projects are rejected. Removing the secrecy which now prevails in this respect admittedly would add to the foundation's job, but to the benefit of science. Moreover, when the foundation executive believes that support for a particular study might more suitably come from another agency, he would render a real service, not alone to the applicant but to scientific progress, by so informing him.

Donors of funds know in a general way what they want of science. So does the public. One of the foundation's functions is to translate such felt purpose into effective scientific research. Scientists share this objective. To achieve this common end, should not the foundation inform the applicant more often than it now does of ways in which he could make his project acceptable? Far from interfering with freedom of research, this form of friendly collaboration would actually advance it by removing one of the frustrations which so often beset the path of the scientist.

GABRIEL W. LASKER
Wayne State University
College of Medicine

Invisible Words—Invisible Evidence

Your recent editorial [Science 126, 681 (11 Oct. 1957)] was as usual of timely interest, but it was inaccurate in one respect. The existence of subliminal perception is not as well established as you suggest.

The crux of the problem is the meaning of \textit{limen} or \textit{threshold} in this context. In psychophysical research, thresholds are usually defined as the least intensity, size, duration, position, and so on, of a physical stimulus (absolute threshold), or least change in one physical stimulus, or difference between stimuli (difference threshold), which will elicit verbal recognition as determined by the average of a series of measurements. The question is whether it has been demonstrated that physical stimuli below one of these thresholds can influence behavior. I have recently reviewed the considerable experimental work on this question and have arrived at the seemingly obvious conclusion that the demonstrations of the phenomenon are far from conclusive [Perceptual and Motor Skills 7, 29 (1957)].

Therefore it is yet to be proved that anyone could have his subconscious polluted by subliminal messages. Being a resident of the Cornhusker State, however, I'm all for it if it can be used to increase the sale of popcorn.

R. C. WILCOFT
Nebraska Psychiatric Institute,
University of Nebraska College of Medicine, Omaha
DI FIORE—AN ATLAS OF HUMAN HISTOLOGY. New. 215 pages, 7/" x 10\%". 99 original color plates. 156 fgs. $7.50


CLAUS—GATHERCOAL AND WIRTH PHARMACOLOGY. 3rd edition. 731 pages, 7/" x 10\%”. 306 illustrations and 1 plate in color. $12.50

FAUST AND RUSSELL—CLINICAL PARASITOLOGY. New 6th edition. 1078 pages. 346 illustrations and 7 plates in color. 23 tables. $15.00

MORRISON AND CHENOWETH—NORMAL AND ELEMENTARY PHYSICAL DIAGNOSIS. 5th edition. 412 pages. 208 illustrations. $5.50


BOYD—INTRODUCTION TO MEDICAL SCIENCE. 4th edition. 304 pages. 124 illus. and 3 plates in color. $4.50

SIMMONS AND GENTZKOW—MEDICAL AND PUBLIC HEALTH LABORATORY METHODS. 6th edition. 1191 pages. 115 illus. and 9 plates in color. 127 tables. $18.50

THIENES AND HALEY—CLINICAL TOXICOLOGY. 3rd edition. 457 pages. Illustrated. 33 tables. $6.50

SMITH AND JONES—VETERINARY PATHOLOGY. New. 959 pages, 7/" x 10\%”. 661 black and white illustrations on 263 fgs. and 6 in color on 1 plate. $17.50

McGRATH—NEUROLOGIC EXAMINATION OF THE DOG. 181 pages, 120 illustrations. $5.00

LEVISON AND MACFATE—CLINICAL LABORATORY DIAGNOSIS. 5th edition. 1246 pages. 244 illus. and 13 plates, 11 in color. 142 tables. $12.50

QUICK—HEMORRHAGIC DISEASES. New. Illustrated. 31 tables. $9.50

WINTROBE—CLINICAL HEMATOLOGY. 4th edition. 1184 pages, 236 illus. and 20 plates, 18 in color. $15.00

REDDISS—ANTISEPTICS, DISINFECTANTS, FUNGI-
CIDES AND CHEMICAL AND PHYSICAL STERILIZATION. New 2nd edition. 975 pages. 67 illustrations. 134
plates, $15.00

GRAY’S ANATOMY OF THE HUMAN BODY. 26th edition. Edited by CHARLES MAYO GOSS, M.D. 1480 pages, 7/" x
10\%”. 1202 illustrations, mostly in color. $16.00

KUNTZ—THE AUTONOMIC NERVOUS SYSTEM. 4th edition. 605 pages. 94 illustrations. $10.00

BUCHANAN—FUNCTIONAL NEURO-ANATOMY. New 3rd edition. 362 pages. 7/" x 10\%”. 273 illus., 18 in color. $7.50

GROLLMAN — PHARMACOLOGY AND THERAPEUTICS. New 3rd edition, in press

STARLING—PRINCIPLES OF HUMAN PHYSIOLOGY. 12th edition. 1233 pages. 721 illus., some in color. $12.50

WOHL AND GOODHART—MODERN NUTRITION IN
HEALTH AND DISEASE. Dietotherapy. 1062 pages, 80 il-
lustrations. 127 tables. $18.50

CHANDLER—DECIDUOUS ORCHARDS. New 3rd edition. 492 pages. 128 illustrations. $7.50

CARD—POULTRY PRODUCTION. 8th edition. 416 pages. 216 illustrations and 4 plates, 2 in color. $5.00

Want to make light work of your heavy sterilizing loads?

Big sterilizing requirements are made easy when you have a Castle large-capacity rectangular Autoclave.

Sizes range from 24" x 24" x 36" to 36" x 42" x 84" inside dimensions. These big capacities take 2 to 9 times as much as the average sterilizer! Your work goes faster, easier.

And they’re built to last. Steel-backed nickel-clad interiors protect against corrosion. Welded and fabricated to meet all A.S.M.E. requirements.

Standard equipment includes all parts and piping for manual operation, with Automatic Steam Pressure Regulator (range 7 to 17 p.s.i.).

For full details and other sizes, (or for Cylindrical Autoclaves) phone your Castle dealer, or write for Bulletin Q-8.

LEA & FEBIGER
Washington Square Philadelphia 6, Pa.
New

ACADEMIC PRESS
Books

Jets, Wakes, and Cavities
By G. Birkhoff and E. H. Zarantonello
Volume II of Applied Mathematics and Mechanics, Editor-in-Chief, F. N. Frenkel
1957, 353 pp., illus., $10.00

Biochemical Cytology
By J. Brachet
1957, 516 pp., illus., $8.80

Biological Ultrastructure
By Anne Engström and J. R. Finch
February 1958, 326 pp., illus., $8.00

Quantum Chemistry
An Introduction
By Walter Kaufmann
1957, 744 pp., illus., $12.00

Some Principle of Energetics in Biochemical Reactions
By I. M. Klotz
1957, 64 pp., 5½ x 8½", illus., $3.00

Thermodynamics of One-Component Systems
A Textbook for Engineers
By W. N. Lacey and B. H. Sage
1957, 376 pp., illus., $8.00

Quantum Mechanics
Second Edition
By F. Mandl
1957, 267 pp., illus., $6.50

Introduction to Enzymology
By A. H. Mehlber
1957, 425 pp., illus., $10.80

Biochemistry of the Amino Acids
By Alton Meister
1957, 465 pp., illus., $10.00

Gas Dynamics
By Klaus Oswatitsch
English version by C. Kuerti
Volume I of Applied Mathematics and Mechanics, Editor-in-Chief, F. N. Frenkel
1957, 610 pp., illus., $12.00

Drug Resistance of Microorganisms
By R. J. Schenitzer and E. Gunneweg
1957, 395 pp., illus., $10.00

Special leaflets available upon request

Academic Press Inc.
Publishers

111 Fifth Avenue, New York 3, N.Y.

EQUIPMENT NEWS

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Science does not assume responsibility for the accuracy of the information. All inquiries concerning items listed should be addressed to Science, Room 740, 11 W. 42 St., New York 36, N.Y. Include the name(s) of the manufacturer(s) and the department number(s).

- Tuning-fork-controlled power supply, completely transistorized, designed to operate 50- to 60-cy/sec synchronous motors from a 12-volt source. Power is sufficient for operation of motors rated up to 140 VA input. Output waveform is a modified square wave. Output frequency is accurate and stable to ±0.01 percent. Input voltage may vary from 10.5 to 13.0 V. (Mandrel Industries, Dept. S762)

- Flow computer is a system which computes flow through an orifice and produces a printed record. Necessary corrections are introduced automatically. Results are indicated in analog as well as in digital form for flow rate and integrated flow. Accuracy is ±1 percent of full scale under all operating conditions. (Southwestern Industrial Electronics Co., Dept. S764)

- Megohmmeter covers six decades in a single range. Range is from 10^1 to 10^15 ohm. Accuracy of ±1 percent of full scale is maintained at every point. Test potentials of 5, 50, and 500 V are available. (Keithley Instruments Inc., Dept. S768)

- Hand vibrograph is a self-contained instrument for making records of machinery vibration on a continuous paper chart. Magnifications of 5, 10, 20, and 40 are externally selectable. Measurements can be made directly on the surface of rotating shafts. (Vibroscope Co., Dept. S769)

- Test chamber to cover a range from -100°C to +300°C features a low-mass heating unit and Dry-Ice cooling with by-pass damper for economical operation. The interior is made of stainless steel. Accessories available are multipane windows, added penetrations, temperatures to ±425°F or higher, and casters. Standard test space dimensions are 18 by 18 by 18 in. (Experimental Equipment Co., Dept. S749)

- Electrometer can detect current differences of 5 x 10^-18 amp; five ranges extend from 5 x 10^-9 to 2.5 x 10^-12 amp. With minimum capacitance in the circuit, the RC time constant is approximately 10 sec. Each additional picofarad of capacitance increases the time constant by 1 sec. Accuracy is better than 1 percent, and stability exceeds 1 percent in 24 hours. Linearity is ±1 percent of full scale. (Victoreen Instrument Co., Dept. S772)

- Analog multiplier generates a voltage proportional to the instantaneous product of two input voltages from 0 to 5 kV/sec with less than 5-μsec delay. Accuracy is ±0.1 percent of full scale. Stability over an 8-hr period is ±0.25 percent after an initial warm-up. The instrument operates with a 450 kV/sec carrier which is phase and amplitude modulated by the two inputs. (Chadwick-Helmuth Co., Dept. S784)

- Transistor amplifier has an open-loop gain of 90 db and a closed-loop gain variable from 2 to 1000. Closed-loop gain stability is 1 percent from -60°C to +125°C. Bandwidth is 5 cy to 50 kV/sec. The amplifier will operate without significant increase in noise in a 40-g vibration environment. (Taber Instrument Corp., Dept. S785)

- Rate-of-change meter operates by sampling a voltage pulse at time t and storing it for comparison with a second pulse at time t + Δt. The time interval between the two pulses is precisely controlled. The output, which is the rate of change of voltage with time, is displayed directly on the meter scale. Overall accuracy is 2 percent or better. (Miljan, Inc., Dept. S786)

- Molecular still of rotary falling-film design accommodates continuous or batch feeds from 10 ml to 20 lit. Pressure range is from atmospheric pressure to 1 μHg. Temperature (to 450°C), product flow, and rotor speed can be regulated. (Schaar and Company, Dept. S770)

- Creep-testing equipment permits measurements to 2200°F in vacuum or artificial atmosphere. Load capacity is 2000 lb at maximum temperature. Specimens to 0.357 in. in diameter are accommodated. Modifications can be made to enable the equipment to accept subminiature specimen and sheet materials. (Instron Engineering Corp., Dept. S787)

- Oxygen indicator has ranges from 0 to 10 and from 0 to 100 parts per million. With calibration at 8-hr intervals, accuracy is estimated to be ±5 percent of full scale. The instrument operates on an electrochemical principle whereby the oxygen, adsorbed on a silver electrode, produces hydroxyl ions which in turn oxidize a cadmium anode. The resulting electrical signal is measured by an electronic potentiometer. Response to a change in oxygen concentration is 90 percent complete in 2.25 min. The instru-
VARIABLE-RESPONSE RECORDER
for densitometry in paper electrophoresis

Recording function electrically adjustable from linear to logarithmic and trans-logarithmic

Sensitivity adjustable from 10 to 200 millivolts

Designed specifically to be used with scanning densitometers for correctly-compensated quantitative evaluation of electrophoretic patterns on filter paper

Write for Bulletin #1100

Also: Densitometers pH Meters Colorimeters Fluorescence Meters Electronic Photometers Multiplier Photometers

PHOTOVOLT CORP.
95 Madison Ave. New York 16, N. Y.

SPECIALIZED
LABORATORY EQUIPMENT
IN STAINLESS STEEL
TRANSPARENT PLASTIC
OR NEW EPOXY FIBERGLASS

DRY BOX
CONTROL HOOD FOR
STUDENT DEMONSTRATION
OR PRODUCTION

HUMID CHAMBER
BACTERIOLOGICAL
TRANSFER HOODS

Write for Free Literature

P. M. LENNARD CO., INC.
1 HANSON PLACE, BROOKLYN 17, STERLING 9-2420
PRES sure transducer of the balanced-diaphragm type incorporates a thin silver-alloy diaphragm, one side of which is exposed to the measurand pressure. A balancing pressure is applied to the opposite side. The inequality of the two pressures is indicated by the motion of the diaphragm in one or the other direction; the motion is sensed by contact closure. Water-cooled models are available. (Photocon Research Products, Dept. S657)

Vacuum gages are offered in three models with ranges from 1 to 100 μ, 1 to 1000 μ and 1 to 20,000 μ. The gages use thermopiles as sensitive elements. The thermopiles are constructed as an array of noble metals butt-welded into continuous wires. The heated junctions reach operating temperature within 0.5 sec after the instrument is turned on. Connection to the vacuum systems is made through a ¾ in. mole-threaded connection. (F. J. Stokes Corp., Dept. S696)

Diodes incorporating alloys of silicon and germanium are said to combine the higher reverse resistances of silicon diodes with the fast transient response and high forward conductance of germanium diodes, particularly at elevated temperatures. (Clevite Transistor Products, Dept. S700)

Single-element infrared lenses are designed to have minimum spherical aberration when imaging an object at infinity at a dominant wavelength of 3.5 μ. Reasonably good performance is said to extend from 2 to 5 μ. Good transmission is obtained from 1 to 12 μ. Focal lengths from 2 to 12 in. and relative apertures of f/2.0 and f/4.0 are available. Anti-reflection coatings can be furnished. (Servo Corporation of America, Dept. S773)

Vacuum gage of thermocouple design is battery operated. Range is 0.5 to 1000 μ-Hg. Average battery life is 750 hr. Reading is displayed on a ¾ in. rectangular dial. (Arthur F. Smith Co., Dept. S774)

Analytical control gage is a single-purpose x-ray-fluorescence instrument. The primary components are an x-ray tube and detector assembly, a high-voltage source, and a ratio recorder. The ratio recorder compares the signals from two Geiger counters, one measuring the element being determined, the other a standard reference signal. The time con-
Depend on Clay-Adams...

The preferred source of supply for leading hospitals, laboratories and teaching institutions. Quality products through leading scientific dealers everywhere. Our 216-page catalog describes 1161 products.

Clay-Adams

141 East 25th Street • New York 10

Look for these familiar trade names—your assurance of quality:
Adams Centrifuges • Yankee Rotators • Gold Seal Slides and Cover Glasses • Adams Laboratory Counters • Counting Chambers
Yankee Shakers • Medichromes

ANNUAL REVIEWS, INC.

ENTOMOLOGY, Vol. 2 (Feb. 1957)
Editors: E. A. Steinhaus and R. F. Smith

PLANT PHYSIOLOGY, Vol. 8 (June 1957)
Editors: A. S. Crafts, L. Machlis and J. G. Torrey

BIOCHEMISTRY, Vol. 26 (July 1957)
Editors: J. M. Luck, F. W. Allen and G. Mackinney

NUCLEAR SCIENCE, Vol. 6 (Dec. 1956)
Editors: J. G. Beckerley, M. D. Kamen, and L. I. Schiff

(To Be in Science Library Exhibit)
$7.00 postpaid (U.S.A.); $7.50 postpaid (elsewhere)

ANNUAL REVIEWS, INC.
Grant Avenue, Palo Alto, California

one 19" x 19" Lab-aid unit section holds up to 6500 1" microslides

other bulky files need this much more space to hold as many slides

because every inside inch is a filing inch
a Lab-aid cabinet files 45% more

There's no waste space in a Lab-aid cabinet...no thick bulkheads, no massive tracking guides. Thanks to patented Lab-aid construction, they are built of heavy steel, strongly welded, true-tracking, beautifully finished, and...drawers are freely interchangeable, too...you can file 1" and 2" microslides, even 4" lantern slides or index cards, in the same section if need be. All are 19" x 19" square, so they stack rigidly to any height.

drawers for microslides
drawers for 2" x 2" transparencies
drawers for lantern slides and cards
sections for flat-filing slides or transparencies
combination filing-viewing sections
illuminated viewing drawer
sections for paraffin block filing

Write for Brochure L-56 describing these uniquely efficient filing aids.

THE TECHNICON COMPANY
P. O. Box 25
Chaussey, New York
Paris Office: COMPAGNIE TECHNICON • 7 rue Georges Ville • Paris

6 DECEMBER 1957