If you have a time-saving
PROBLEM
‘Baker Analyzed’ Reagents offer these excellent
SOLUTIONS

SODIUM HYDROXIDE
50% SOLUTION

POTASSIUM HYDROXIDE
45% SOLUTION

These two ‘Baker Analyzed’ Reagents are now immediately available in time- and labor-saving solution form.

Designed especially to provide quick easy-to-use advantages to busy chemists and processors, these solutions eliminate dissolving time—permit accurate preparation of shelf and standard solutions by dilution, and are packaged in handy one-pint and eight-pint polyethylene THRO-A-WAY bottles.

For your further convenience, you’ll find the actual lot assay and actual lot analysis on every label.

So if you require Sodium Hydroxide or Potassium Hydroxide—save time and labor—get these concentrated solutions from your favorite Laboratory Supply House.

J.T. Baker Chemical Co.
Phillipsburg, New Jersey
NEW KONTES DUALL TISSUE GRINDER

Two-Stage Grinding Makes The Difference!

Grinding in conical section permits clearance to be varied depending on the relative positioning of pestle and tube. This permits adjustment for size and toughness of sample. When particle size is reduced, the material is forced past cylindrical area for final, fine homogenization.

K-88545 Tissue Grinder, Dull

Size B C D E

Capacity, ml.
(rod inserted) 5 10 30 50

Each $8.05 $8.80 11.15 14.45

One minute later—ground sample in suspension

KONTES GLASS COMPANY
Vineland, New Jersey
First Choice For Quality Technical Glassware
Midwest Distributor: Research Apparatus, Inc., Wauconda, III.

Meetings

Near Eastern Prehistory

A seminar on "The Early Appearance and Development of Agricultural Communities in Iran and Southwestern Asia" was held in the Institute of Archeology of the University of Tehran, 15–25 February 1960, under the chairmanship of Dean A. A. Sassi, with Robert J. Braidwood and Ezat O. Negahban as co-chairmen. The session was organized to take advantage of the presence, in or near Tehran, of a number of prehistoric archeologists and natural historians, both foreign and Iranian, and to consider new evidence bearing on Near Eastern prehistory (I). Background papers were submitted by Pierre Bessaignet (UNESCO), Linda and Robert J. Braidwood (Chicago), M. L. Dewan (FAO), M. H. Ganji (Tehran), R. Ghirshman (Delegation Archeologique Francais en Perse), Bruce Howe (Harvard), Indu Shekhar (Tehran), Ezat O. Negahban (Tehran), H. Pabot (FAO), Charles A. Reed (Illinois), E. H. Rieben (FAO), D. Sheikhnia (Tehran), M. L. Smith and L. Aksoy (CENTO Institute of Nuclear Science), L. Van den Berghe (Ghent), P. J. Watson (Chicago), and R. A. Watson (Minnesota).

In the general sessions, beginning with the appearance of Acheulean type hand-axes (in Iran as well as in south-western Asia generally) about 100,000 years ago, Howe described a trend towards increasing cultural complexity and variety as time went on. Following Acheulean types of tools of wide distribution and uniform type, there came the Mousterian industry, which begins to vary regionally. A date might center around 60,000 years ago. Next came the even greater variance in industries of the Upper Paleolithic blade tool tradition, ending in a flourish of micro-lithic tools. This stage covered the remainder of the last glacial period, from about 40,000 to 15,000 or even 12,000 years ago. Howe then considered the archeological traces of the very interesting transitional range of the next 2000 years, for which little open sites yield traces of intensified food collection. In a theoretical sense this transitional period must contain the incipient phases of plant and animal domestication. However, the archeological evidence for this period is so slight that its elements of food production cannot yet be defined. Indeed, the artifactual material appears still to be a part of the previous tradition associated with food collectors. It is rather by hindsight from the next stage that we postulate this incipient stage.

In his account of the first bona fide traces of the village farming communities Braidwood wondered if a reversal of the trend towards regional intensification might not now be observed. In considering archiological evidence for the earliest village farming communities the following factors must be borne in mind.

1) Increased size and depth of accumulation, including house structures, indicating permanence, stability, and at least eventual population increase. Ethnological data suggest that there may be a few exceptions to a general rule that these features imply food production.

2) The so-called "neolithic" traits—ground stone (for example, celts and milling stones), pots, weaving, and so on—probably suggest new species and genera of tools which attend establishment of the village farming community. Certain of these traits now appear to have entered the record at different times, either before or after the achievement of food production; but, Braidwood asked, "Would a constellation of these traits have been possible without (i) an assured and surplus food supply, (ii) circumstances which allowed the rise of specialist craftsmen, (iii) a blurring of Howe's regional specialization as trade, and even an exchange of ideas beginning to be evidenced?"

3) Obvious proof of the village farming community stage depends on the textually certain traces of the plant and animal domesticates.

4) Slightly weaker evidence of the village farming community stage would be artifacts for which the simplest explanation suggests techniques of food production.

Along with the immediate consequences which these four points suggest, there must have come vast changes in other realms of human culture. Matters of art, religion, politics, law, the moral order are at issue, but we have much more to learn before significant reconstructions of these can be made.

Next Negahban approached the question of whether the formative and earliest stages of the village farming community way of life may be identified on the Anatolian and Iranian plateaus. Strong typological suggestions of this early stage have been gathered from the Iranian plateau, but their serious study is impeded by lack of excavation into deposits of this stage. He next explained the archiological evidence of the well-formed village farming communities known from some eight sites in two subdivisions of cultural development, a northern and a southern one. He then posed certain questions regarding factors in the transition from food collecting to food production. He asked: (i) What was the effect of cli-
Wherever Material Values Count— AS IN "OPERATION DEEP FREEZE"
you find Boekel products!

The following were chosen as part of research equipment for use at McMurdo Base, Antarctica:

**BOEKEL CONSTANT TEMPERATURE OVENS**

For sterilizing, drying, conditioning and pre-heating, these ovens supply a constant temperature of 35°C to 200°C, with a sensitivity of ±1°C. Uniformity within the chamber depends on the load. Strategically placed coils operate at black heat for maximum efficiency and longer life. Sterilizing temperatures attained in approximately one hour. A choice of 5 models available.

**BOEKEL PIPE T WASHER AND DRYER**

In the Boekel Washer, a continuous supply of fresh water flows through the fragile pipettes cleaning them quickly and safely.

In the Boekel Dryer, circulating hot air completely evaporates moisture from all surfaces of the pipettes.

Here’s an unbeatable team—to save time, money, and pipettes.

Complete descriptions on request.

DIFCO LABORATORIES
DETROIT 1, MICHIGAN
Provides a wide range of sensitivity, stability, and linear response particularly at extreme low-light levels. Choice of interchangeable photomultiplier tubes for optimum response in selected spectral regions. This compact, easy-to-operate instrument is now available in two models: battery power supply or transformer for line operation. Either model can be supplied with a galvanometer or with a highly sensitive microammeter.

Farrand Electron Multiplier Photometer

Technical data available on request. Specify Bulletin No. 804S

Farrand Optical Co., Inc.
Bronx Blvd. and East 238th Street • New York 70, N. Y.
Engineering, Research, Development, Design and Manufacture of Precision Optics, Electronic and Scientific Instruments

NATIONAL APPLIANCE • NATIONAL APPLIANCE • NATIONAL APPLIANCE

GROWTH CHAMBERS

National Appliance has developed the only really different growth chambers built in the United States. They are built to a new concept, that it is not necessary to have a large and costly multiple-room installation, when a series of smaller modular units can offer all the versatility of climate requirements.

National Growth Chambers incorporate the advantages of large facilities with the economy of low initial cost and low cost of operation since they can be shut down between experiments.

National Growth Chambers are designed to fit a realistic concept of the biologist’s current needs. You may choose from the widest range of exactly controlled climate variables with a basic modular design.

We invite you to discover how National Growth Chambers can bring you exactly-controlled experiments at far less cost. Choose from the basic economy models or the fully-instrumented modified chambers.

Write for free Bulletin No. 5911.

National Appliance Company
7634 S.W. Capitol Highway • Portland, Oregon
CHevy 6-3316

NATIONAL APPLIANCE
CONTROLLED ENVIRONMENT

20 MAY 1960
older, simplistic generalizations on such features as end-Pleistocene lakes, sand dunes, fluvial and marine terraces, and glacial and periglacial phenomena.

Dewan emphasized that, of the whole range of soils to be found in southwestern Asia, those most pertinent to early agriculture would be the alluvial soils and the brown soils. He described their characteristics, properties, and distribution. These data he covered in much more detail in his very useful background paper.

In elaborating on his own useful background paper, Ganji also emphasized the limitations of present climatic data in arriving at a detailed picture of present climate for southwestern Asia. Thus, the projecting of climate into the past is that much more difficult. However, it is clear that gross climatic change within the last 10,000 to 15,000 years is not evidenced, although frequent minor cyclic variations can be traced. Ganji urged attention to the paleobotany of grains as a clue to understanding past climates. He summarized his observations on Iran in two detailed maps, one of rainfall and one of his adaptation of the Koeppen system for delineating the climate as applied to Iran.

Although diffident about discussing paleobotanical matters, Pabot made stimulating contributions to the central question of the seminar. He suggested that the wild wheats may have a distribution slightly further to the southeast of the Kermanshah area than those shown on Helbaek's map of 1959 (3). He also stated that he had never observed wild wheat throughout the country of the Syrian saddle except below the latitude of the Beirut-Damascus road. Southern Turkey is not under consideration here. He further stated that he would not expect the plant communities of the lush East Mediterranean strip or those of the Caspian or Black Sea littorals to have included the wild wheats, although he added that, in his opinion, the presently suggested prototypes of wheat are not yet proved to have been the ancestors of the domesticate.

Pabot was firmly convinced that the present natural habitat of the wild wheats lies above approximately 1000 meters. He also made stimulating comments about how the wild grains may have been taken into domestication and first utilized. He remarked that the wheats under primitive conditions may have been rather rare grains and are adapted to areas of disturbed soil conditions. Furthermore, the reaping process could have involved plucking plants out by the roots. Interestingly, Pabot concurred with the notions of Reed and of the archeologists that the transition to cereal domestication may have taken about 2000 years.

---

**WOULD YOU LIKE TO KNOW...**

**WHEN**
- a machine is productive or idle?
- a circuit breaker opened or closed?
- a control system acts?

**HOW LONG**
- a machine is idle?
- a power outage lasted?
- a rubber or plastic molding cured?

**HOW MANY**
- telephone calls are made?
- bottles are filled by an automatic machine?
- articles are made by a screw machine?

Let an Esterline-Angus Event Recorder give you written, permanent, indisputable answers to these and a host of other important questions that help control processes, improve operations and protect your plant. Available with as many as 20 pens writing simultaneously.

Send for Bulletin 1156 A.

The ESTERLINE-ANGUS Company

No. 1 in fine Recording Instruments for more than 50 years

DEPT. L, BOX 596, INDIANAPOLIS 6, INDIANA

---

**STEREO-MICROSCOPE**

IMMEDIATE DELIVERY
Long Working Distance
Superb Optics
Magnifications 6X-200X
Large Variety of Accessories
Old World Craftsmanship

ERIC SOBOTKA CO.

108 West 40th St.
New York, 18, N. Y.
Specialists in Imported Equipment

---

**Fresen**

**MODEL 805**

LOW TEMPERATURE INCUBATOR
AND BOD CABINET

NEW 11 Cubic Foot Model

Temperature range from 5° to 50°C with overall temperature uniformity meeting rigid APHA specs...more than a BOD cabinet...versatile enough for drug storage, serum studies, dairy product testing, many more tasks...external controls...forced air circulation...unobstructed interior...increased working space at NO increase in price...write today for Bulletin 303 and the name of your nearest stocking distributor.

SINCE 1920

PRECISION SCIENTIFIC CO.

3735 West Cortland St., Chicago 47, Ill.
Local Offices in Chicago • Cleveland • Houston New York • Philadelphia • San Francisco

---

SCIENCE, VOL. 131
Sheikhnia then emphasized the importance of the forest trees and of fruit trees and viticulture in the development of the village farming community way of life.

Rieben posed a very interesting problem which he realized was not immediately relevant to the purpose of the seminar but which is, nevertheless, of potentially great importance. He described nearly horizontal layers of mud and gravel just east of Tehran. These features might represent either an extinct lake beach or the trace of a more recent large artificial canal.

Smith discussed in general terms the potential contribution to archeology of the physical sciences, considering matters of identification, utilization of materials, and physical chronologies. He clearly described the radioactive carbon method of age determination, noting the degree of physical and statistical error which is necessary in expressing the age determination. Even more important is the possibility of contamination of samples in situ which might result in larger degrees of error than those expressed by the statistical formula. The still remote possibilities for dating baked-in-place pottery by means of the earth's magnetism were discussed. The possibilities for identification of materials by neutron activation and beta-ray back scatter were also considered.

Bessagnet introduced the subject of the pertinence of social-anthropological studies to archeological interpretation, noting the cautions necessary in extrapolating backwards from present-day tribal behavior to a reconstruction of past social organization.

In originally proposing the seminar the co-chairmen had hoped that it might clarify understanding of how and under what circumstances man, for the first time in his history, achieved food production and settled community life in southwestern Asia. One of the most important challenges in any scientific research is that of finding how to pose the questions properly for further research, and it was the firm conviction of the organizers of this seminar that the questions had become more clear. The proceedings of the seminar will be published by the Institute of Archeology of the University of Tehran.

ROBERT J. BRAIDWOOD
University of Chicago,
Chicago, Illinois

BRUCE HOWE
Harvard University,
Cambridge, Massachusetts

EZAT O. NAGHBAKHAN
University of Tehran, Tehran, Iran

References

20 MAY 1960
Multi-layer Interference Films

for dichroic and achromatic beam splitters and filters.
High efficiency. Relatively wide band.

MULTI-LAYER HEAT DEFLECTORS
XUR-96. Reflects substantial portion of infrared spectrum while transmitting nearly all of the visible radiation.

Colorless, non-absorbing filter. Completely removes the ultra-violet and reflects the infrared. Transmits about 90% from 425 to 700mu reflecting longer wavelengths. Half transmission points at 412mu and 725mu.

Cold Mirror IRT-211. To reflect visible radiation from 400 to 700mu and transmit from 725 to 1200mu and longer.

Ask for Bulletin MI-318

LOW REFLECTING COATING
Double and triple layer with minimum reflection. Increases transmission to 9 micron on Germanium and Silicon.

ELECTRICALLY CONDUCTING COATING
Colorless, transparent. Resistance of 800 ohms per square while maintaining over 95% light transmission.

ANTI-STATIC FILMS RF SHIELDING FILMS
Colorless, 97% transmission.

Write for further information
Fish-Schurman Corp., 74 Portman Road, New Rochelle, N.Y.
Forthcoming Events

June


8-12. American College of Chest Physicians, Miami Beach, Fla. (M. Kornfeld, 112 E. Chestnut St., Chicago 11, III.)


9-10. American Inst. of Food Technology, 3rd annual conv., Winnipeg, Manitoba. (W. J. Eva, Box 846, Winnipeg, Manitoba)

9-10. Society of Women Engineers, 10th annual conv., Seattle, Wash. (Mrs. J. A. Troxell, 3613 E. 43 St., Seattle 5)

9-11. Acoustical Soc. of America, Providence, R.I. (W. W. Interfall, ASA, 335 E. 45 St., New York 17)


9-12. American Medical Women's Assoc., Miami Beach, Fla. (Mrs. L. T. Majally, 1790 Broadway, New York 19)


10-12. American College of Angiology, Miami Beach, Fla. (A. Halpern, 11 Hampton Court, Great Neck, N.Y.)


10-12. Society for Biological Psychiatry, Miami Beach, Fla. (G. N. Thompson, 2010 Wilshire Blvd., Los Angeles 57, Calif.)

11. American Acad. of Tuberculosis Physicians, Miami Beach, Fla. (G. P. Bailey, P.O. Box 7011, Denver 6, Colo.)

11-12. American Diabetes Assoc., Miami Beach, Fla. (J. R. Connelly, 1 E. 45 St., New York 17)

11-16. American Soc. of X-ray Technicians, Cincinnati, Ohio. (G. J. Eiler, 16 Fourteenth St., Fond du Lac, Wis.)

12. Society for Vascular Surgery, Miami Beach, Fla. (G. H. Yeager, 314 Medical Arts Bldg., Baltimore 1, Md.)


12-15. American Soc. of Agricultural Engineers, Columbus, Ohio. (J. L. Butt, P.O. Box 229, St. Joseph, Mich.)


12-17. Association for Research in Ophthalmology, Miami Beach, Fla. (L. V. Johnson, 10515 Carnegie Ave., Cleveland, Ohio)

13-14. Technical Writing Improvement Soc., 5th Southern Calif. Industrial Writing Inst., Los Angeles, Calif. (J. L. Kent, TWIS, P.O. Box 5453, Pasadena, Calif.)


13-15. Chemical Inst. of Canada, 43rd conf., Ottawa, Ontario. (CIC, 48 Rideau St., Ottawa 2, Ontario)

13-15. Herpetologists League, Eugene, Ore. (A. M. Woodbury, 248 University St., Univ. of Utah, Salt Lake City 2)


13-15. Society for Investigative Dermatology, 21st annual, Miami Beach, Fla. (H. Beerman, SID, 255 S. 17 St., Philadelphia)

13-17. American Medical Assoc., Miami Beach, Fla. (F. J. L. Blasingame, 535 N. Dearborn St., Chicago 10, Ill.)

13-17. Canadian Medical Assoc., 93rd annual, Banff, Alberta. (CMA, 244 George St., Toronto, Canada)

13-17. International Conf. of Physiological Society, 9th annual, Rio de Janeiro, Brazil.

13-17. International Cong. of Clinical Pathology, Madrid, Spain. (J. A. Garrido, Sandoval 7, Madrid)

13-17. Molecular Structure and Spectroscopy, symp., Columbus, Ohio. (R. A. Oetjen, Dept. of Physics and Astronomy, Ohio State Univ., Columbus 10)


13-19. Association for Research in Ophthalmology, Miami Beach, Fla. (L. V. Johnson, 10515 Carnegie Ave., Cleveland, Ohio)


13-19. Chemical Inst. of Canada, 43rd conf., Ottawa, Ontario. (CIC, 48 Rideau St., Ottawa 2, Ontario)

13-19. Herpetologists League, Eugene, Ore. (A. M. Woodbury, 248 University St., Univ. of Utah, Salt Lake City 2)


13-19. Society for Investigative Dermatology, 21st annual, Miami Beach, Fla. (H. Beerman, SID, 255 S. 17 St., Philadelphia)

13-17. American Medical Assoc., Miami Beach, Fla. (F. J. L. Blasingame, 535 N. Dearborn St., Chicago 10, Ill.)

13-17. Canadian Medical Assoc., 93rd annual, Banff, Alberta. (CMA, 244 George St., Toronto, Canada)

13-17. International Conf. of Physiological Society, 9th annual, Rio de Janeiro, Brazil.

13-17. International Cong. of Clinical Pathology, Madrid, Spain. (J. A. Garrido, Sandoval 7, Madrid)

13-17. Molecular Structure and Spectroscopy, symp., Columbus, Ohio. (R. A. Oetjen, Dept. of Physics and Astronomy, Ohio State Univ., Columbus 10)


13-19. Association for Research in Ophthalmology, Miami Beach, Fla. (L. V. Johnson, 10515 Carnegie Ave., Cleveland, Ohio)

13-14. Technical Writing Improvement Soc., 5th Southern Calif. Industrial Writing Inst., Los Angeles, Calif. (J. L. Kent, TWIS, P.O. Box 5453, Pasadena, Calif.)


13-15. Chemical Inst. of Canada, 43rd conf., Ottawa, Ontario. (CIC, 48 Rideau St., Ottawa 2, Ontario)

13-15. Herpetologists League, Eugene, Ore. (A. M. Woodbury, 248 University St., Univ. of Utah, Salt Lake City 2)


22–25. Society of Nuclear Medicine, Estes Park, Colo. (T. P. Sears, V.A. Hospital, Denver 20, Colo.)


26–1. National Education Assoc., Los Angeles, Calif. (W. G. Carr, 1201 16 St., NW, Washington 6)


27–30. Institute of the Aeronautical Sciences, Los Angeles, Calif. (R. R. Dexter, IAS, 2 E. 64 St., New York 21)


28–1. American Home Economics Assoc., Denver, Colo. (Miss M. A. Warren, School of Home Economics, Univ. of Oklahoma, Norman)


July

3–5. American Assoc. of Colleges of Pharmacy, Boulder, Colo. (G. L. Webster, College of Pharmacy, Univ. of Illinois, Chicago 12)

4–8. Polarization Phenomena of Nucleons, symp., Basle, Switzerland. (K. P. Meyer, Physikalisches Institut der Universität Basel, Klingelbergstr. 82, Basle, Switzerland)


10–14. Pan American Tuberculosis Cong., 12thh, Bahia, Brazil. (F. D. Gómez, 26, de Marzo, 1065, Montevideo, Uruguay)


Sigma is Pleased to Announce the Beginning of work on new High-Purity Reagents for HISTOCHEMISTRY

We have much to learn about this tremendously large field. With your help, we can ultimately be of considerable assistance to you. Let us know what you need. We probably won’t be able to deliver it immediately (if not already in stock), but we will certainly try to prepare it when we can.

ALREADY AVAILABLE:—
- Carbobenzoxy Chloride
- 5-Bromoindoxyl Acetate
- Indoxyl Acetate
- DL-Alanyl-β-Naphthylamide
- L-Leucyl-β-Naphthylamide
- Red Violet LB Salt
- Fast Garnet GBC Salt
- Naphthol AS-BI Phosphate
- 5-Bromo-6-Chloroindoxyl Acetate
- 5-Bromo-4-Chloroindoxyl Acetate
- o-Benzyl-DL-Serine
- N-Chloroacetyl-DL-Phenylalanine
- N-Carbobenzoxy-L-Alanine
- N-Carbobenzoxy-S-Benzyl-L-Cysteine
- N-Carbobenzoxy Glycine
- N-Carbobenzoxy-L-Methionine
- N-Carbobenzoxy-L-Proline
- N-Carbobenzoxy-DL-Serine

Others will be added regularly. Write for our list.

Sigma is the unquestioned leader in the production of highest purity Nucleotides offered at the World’s Lowest Prices!

Adenosine, Cytidine, Guanosine, Uridine Phosphates.

Deoxy Adenosine, Cytidine, Guanosine, & Thymidine Mono-, Di-, and Triphosphates.

UDP Glucose
UDP Glucuronic Acid
UDP Acetyl Glucosamine
ADP Ribose

CDP Ethanolamine
GDP Mannose
Nicotinamide Mononucleotide
Ribose-5'-Phosphate Sodium

CALL US COLLECT AT ANYTIME, JUST TO GET ACQUAINTED

Day, Station to Station, Prospect 1-5750
Night, Person to Person, Dan Broida, WYdown 3-6418

The Research Laboratories of SIGMA CHEMICAL COMPANY
3500 DEKALB ST., ST. LOUIS 18, MO., U. S. A.
All cabinets are manufactured of welded and polished stainless steel which contributes to cleanliness, appearance and serviceability. Efficiency has been accounted for in such features as high quality insulation, interchangeable storage inserts and size. The width allows passage through a normal door and the length is the only dimension changed in the three sizes. The cabinets are built with or without the CO\textsubscript{2} entering the storage compartment. The cabinet on the left is our standard model and the unit on the right is specially constructed to the customer's design.

Folder and Prices Upon Request

CUSTOM SCIENTIFIC INSTRUMENTS, INC. 541 Devon St. Kearny, N.J.

PHOENIX PRECISION INSTRUMENT COMPANY

3803-05 NORTH FIFTH ST., PHILADELPHIA 40, PENNSYLVANIA

Monro, 11 Chandos St., Cavendish Sq., London, W. 1
(K. Muto, Organizing Committee, 2nd World Conf. on Earthquake Engineering, Science Council of Japan, Ueno Park, Taito-ku, Tokyo)


18–25. French Assoc. for the Advancement of Science, 79th conf., Grenoble. (Association Francaise pour l'Avancement des Sciences, 28 rue Serpente, Paris 6)


23–28, Otolaryngology, 7th intern. conf., Paris, France. (H. Guillen, 6, avenue Mac-Mahon, Paris, 17)

24–29. American Assoc. on Mental Deficiency (London Conf. on the Scientific Study of Mental Deficiency), London, England. (H. A. Stevens, P.O. Box 3128, Madison 4, Wis.)


25–9. International Union of Geodesy and Geophysics, 12th general assembly, Helsinki, Finland. (Organizing Committee, c/o Institut Géodésique, Bulevard 40, Helsinki)

25–6. International Assoc. of Physical Oceanography, 13th general assembly, Helsinki, Finland. (B. Kullenberg, c/o Oceanografiska Institutet, P.O. Box 1038, Goteborg 4, Sweden)


31–5. Alcohol and Alcholism, 26th intern. conf., Stockholm, Sweden. (A. Tongue, Bureau International contre l'Alcoolisme, Case Gare 49, Lausanne, Switzerland)

31–5. Photobiology, 3rd intern. conf., Copenhagen, Denmark. (A. Hollaender, Biology Div., Oak Ridge Natl. Laboratory, Oak Ridge, Tenn.)
New Products

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Neither Science nor the writer assumes responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed is included in the post card insert. Circle the department number of the items in which you are interested on this coupon.

- **SHOCK TESTING MACHINE** for small electronic, electromechanical, and mechanical components accommodates specimens weighing up to 20 lb. and occupying an 8-in. cube. The machine utilizes the free-fall principle. Half-sine, saw-tooth, and square-wave pulses are produced. Drop heights may be preset for both manual and automatic cycling. When half-sine pulses are used, the specimen table is caught at the peak of rebound. (Barry Controls Inc., Dept. Sci516, 700 Pleasant St., Watertown 72, Mass.)

- **SOlVENT EVAPORATOR** combines a controlled temperature-vacuum system with rotary vibration. Test tubes or centrifuge tubes from fraction collectors are processed in groups of ten in the apparatus. Typical evaporation rates cited are 0.75 ml/min for water and 7.5 ml/min for acetone in each tube. Vacuum is furnished by a water aspirator and is controlled for each test tube by a separate stopcock. The instrument is 15 in. in diameter and 21 in. high. (Laboratory Glass and Instruments Corp., Dept. Sci517, 514 W. 147 St., New York 31)

- **PUNCHED-TAPE READER** and companion spooler mechanism is a completely transistorized read-out system with output said to be compatible with most data-processing systems. Reading speeds up to 200 characters per second are possible with the spooler, which accommodates paper or Mylar tape up to 1 in. in width on reels 8 in. in diameter. Without the spooler, reading rates up to 1000 characters per second are possible. (Potter Instrument Co., Inc., Dept. Sci521, Plainview, N.Y.)

- **PORTABLE RECORDER** is a 6-in. strip-chart potentiometer type with selectable 9- to 120-mv span. Optional features include ball-point pen, 1-mv span preamplifier, and resistance-bulb bridge for temperature measurement. Balance time is 0.8 sec; sensitivity is ±0.25 percent of full scale. Gear-shift selection of chart speed is provided. (Sytron Corp., Dept. Sci522, 950 Galindo St., Concord, Calif.)

- **FLUORINE ANALYZER** employs nuclear-magnetic-resonance techniques. Fluorine can be detected in liquids down to 3 mg in any sample size from 0.2 to 40 ml. An integrator accessory provides linear response in terms of mass of...
fluorine present. When chemical shift is great enough, each peak in an unknown mixture can be separately integrated. Precision of the analyzer is said to be ±1 percent of the signal. Sweep amplitude is 0.1 to 20 gauss in a choice of eight settings; sweep time is 0.5 to 4 min. (Schlumberger Well Surveying Corp., Dept. Sci 520, Ridgefield, Conn.)

- SILICON CARBIDE HEATING ELEMENTS for temperatures up to 1575°C are fabricated in one piece with the hot zone in the form of a spiral. Elements are available with over-all lengths up to 63 in. and hot-zone lengths from 7 to 40 in. A double-spiral hot-zone model requires connection at one end only. (Morganite Incorporated, Dept. Sci 524, 3302–3320 48th Ave., Long Island City, N.Y.)

- COUNT-RATE METER is a completely transistorized unit with eight scale ranges extending to 600,000 count/min. Three time constants, 1, 5, and 10 sec, can be selected with a front-panel switch. Input is sensitive to a 250-mv negative pulse; output is provided for 0-to-1-ma or 0-to-10-mv recorder. (Interstate Electronics Corp., Dept. Sci 525, Anaheim, Calif.)

- TARGET SIMULATOR for radar calibration furnishes delays continuously variable from 100 to 300 μsec and simulates target velocity to 20,000 ft/sec. Bandwidth is 45 percent of center frequency of up to 40 Mec/sec. Rise time is 0.1 μsec or better. Variation is servo controlled. (Andersen Laboratories Inc., Dept. Sci 528, 501 New Park Ave., West Hartford 10, Conn.)

- CONSTANT RATE BURETTE consists of a ground-glass solution barrel and plunger driven by a synchronous motor. Neoprene rings held in stainless-steel collars are used for sealing. Drive, transmitted by a lead screw and nylon follower, is self-limiting at both ends. A separate motor provides rapid motion for refilling and for discharging excess liquid and flushing. (E. H. Sargent & Co., Dept. Sci 526, 4647 W. Foster Ave., Chicago 60, Ill.)

- MICRO SYRINGE BURETTE is graduated in 0.0001-ml units. Capacity of the syringe is 0.25 ml. A lock nut permits repeated deliveries of identical volumes. Replacement of the hypodermic needle with a special glass tip converts the device into a microburette. The syringe can be emptied completely except for the volume of the 27-gage needle. (California Laboratory Equipment Co., Dept. Sci 527, 1717 Fifth St., Berkeley 10, Calif.)

- LUBRICANT PSYCHROMETER is a portable instrument that measures moisture content of air by means of wet and dry thermistor beads. The instrument has three scales to cover the temperature range −10° to +80°C. Accuracy is said to be ±0.5 percent of relative humidity. Reading of both wet-bulb and dry-bulb temperatures can be accomplished in 10 sec. A spring coil motor can be supplied in place of the battery-operated motor for hazardous locations. (Atkins Technical, Inc., Dept. Sci 531, 1276 W. Third St., Cleveland 13, Ohio)

- SIGNAL GENERATOR furnishes 20 cy/ to 20 kcy/sec sine or square waves for audio, and 20 kcy/ to 12 Mcy/sec sine and 20 kcy/ to 2 Mcy/sec square waves for video signal and video sweep, with the latter at a 60-cy/sec sinusoidal sweep rate. Outputs of a high-fre-
Now—a combination galvanometer, four-range voltmeter and four-range ammeter with figures and graduations on a large 17" scale that is plainly seen from both sides over any distance in the classroom. An accurate, versatile lecture meter with a modern, shielded movement. All parts and circuits clearly visible.

Cenco No. 82140 complete with shunts and multipliers $260.00

The ideal circulating thermostat for today's crowded laboratories is the Haake Model "F". Due to its light weight and compact design it can easily be moved around and occupies a minimum of space. It is ideal for any type of instrumentation or for ambulatory use with clinical appliances which require temperature control. Some typical applications include such liquid jacketed instruments as spectrophotometers, refractometers, viscosimeters and blood pH equipment.

SEND FOR COMPLETE DESCRIPTIVE CATALOG 32
Exclusively Lapine Beakers have die formed pouring lips; not dented rims. They pour like glass beakers, yet their heavy gauge stainless steel withstands heat and abuse like no other beaker you have ever used.

You'll appreciate the difference when you use genuine Lapine Beakers—made exclusively by Arthur S. Lapine and Company.

ORDER FROM THIS AD!
Genuine Lapine Stainless Steel Beakers
with Pour-out Spout
Catalog No. S21-43

Arthur S. Lapine and Company
6001 S. Knox Ave., Chicago 29, Illinois, U.S.A.

---

LEYBOLD Gas Ballast VACUUM PUMPS

World Famous Quality, Design and Dependability

The Leybold Gas ballast design actually prevents condensation of vapor in the pump. It prevents oil contamination from lowering ultimate pressures, cuts oil changes and pump maintenance.

Leybold Pumps can be operated with or without gas ballast, so that you get the advantages of both gas ballast and oil sealed rotary vane pumps.

WRITE FOR NEW BULLETIN TODAY!

Arthur S. Lapine and Company
6001 South Knox Avenue, Chicago 29, Illinois

LABORATORY SUPPLIES AND REAGENTS

---

THE HUMAN INTEGUMENT NORMAL AND ABNORMAL

Editor: Stephen Rothman 1959

AAAS Symposium Volume No. 54

A symposium presented on 28-29 December 1957, at the Indianapolis meeting of the American Association for the Advancement of Science and cosponsored by the Committee on Cosmetics of the American Medical Association and the Society for Investigative Dermatology. The volume offers a fair illustration of what has been achieved by modern research in cutaneous physiology and pathophysiology.

270 pp., 59 illus., index, cloth. $6.75
AAAS members' cash orders $5.75

Chapters

1) The Integument as an Organ of Protection
2) Circulation and Vascular Reaction
3) Sebaceous Gland Secretion
4) Pathogenetic Factors in Pre-malignant Conditions and Malignancies of the Skin

British Agents: Bailey Bros. & Swinfen, Ltd., Hyde House, W. Central Street, London, W.C.1

AAAS
1515 Massachusetts Ave., NW
Washington 5, D.C.

---

PLASMA FLAME SPRAY GUN is said to be capable of applying coatings of any material that can be melted without decomposition. An electric arc and inert gases are used to produce temperatures said to be as high as 30,000°F. Nitrogen with 5 to 10 percent hydrogen is used to form the plasma. Both the gun body and nozzle are water cooled. (Metallizing Engineering Co., Dept. Sci530, 1101 Prospect Ave., Westbury, N.Y.)

PROJECTOR PROGRAMMER is a modified slide projector that handles magazines of 40 slides each. A 12-bit photoelectric pickup device has been installed to read holes punched in the cardboard portion of standard 35-mm slides, permitting selection of 4096 binary codes. The magazine can be advanced or reversed by remote cable or by the output of a switching device controlled by the punched-hole reader. The device can accommodate programs 80 units in length if two magazines are taped together. (Davis Scientific Instruments, Dept. Sci533, 12137 Cantura St., Studio City, Calif.)

PRESSURE SWITCH combines a Ni-Span-C pressure capsule and a snap-action switch in a housing of less than 1 in. volume and with total weight slightly over 1 oz. Pressure setting is adjustable; ranges up to 200 lb/in.² are available. (Bristol Co., Dept. Sci534, Waterbury 20, Conn.)

DIFFERENTIAL D-C AMPLIFIER is said to provide stability of ±0.05 percent. The transistorized amplifier operates with input and output isolated from each other and from ground. Common mode rejection is said to be 10⁻⁶ to 1. Gain is variable in eight steps from 10 to 500. (Neill Instrument Corp., Dept. Sci540, 2211 E. Foothill Blvd., Pasadena, Calif.)

ANALOG MULTIPLIER-DIVIDER operates on the quarter-square principle in which the difference between the squares of the sum and difference of two signals is proportional to their product. Bandwidth is 350 kcy/sec and solution time less than 2 μsec. Phase shift is 1 deg at 12 kcy/sec. Output range is ±50 volts at ±10 ma, and accuracy is said to be ±0.25 percent of full scale. (GPS Instrument Co., Inc., Dept. Sci541, 180 Needham St., Newton 64, Mass.)

---

SCIENCE, VOL. 131
Rapid Paper Electrophoresis

New MISCO Unit Uses Organic Buffers, Completes Separations in 1 Hour

Misco's advanced multiple-cell electrophoretic techniques feature organic buffers for both analytical and clinical investigations. Usually within an hour, unknown compounds can be completely characterized or known samples separated for quantitative analysis. Just as rapidly, this flexible unit will purify up to a few milligrams of any compound that can be separated by electrophoresis.

The Misco apparatus and special organic buffers were developed by Dr. Harold T. Gordon of the University of California. Particular success has been achieved with small organic molecules such as amino acids, carbohydrates and peptides.*

The Gordon-Misco technique offers three key innovations—organic buffers in formamide, a multi-chamber cell, and reference dyes. The buffers minimize evaporation, allow much higher voltages. The multi-chamber cell is designed for running 1 to 5 samples simultaneously at 5 different pH values from 3.3 to 9.3. Reference dyes (such as Amaranth and Apolon) assure reproducible relative mobility values, often make possible the calculation of the pK and molecular weight of the unknown.

Misco will be happy to send you more information about rapid paper electrophoresis and a reprint of the Werum-Gordon-Thornburg article. Please address Dept. 98.


---

- COUNTER furnishes both digital and analog readout for operating printers and chart recorders. The instrument includes two counting sections. The first, designed for data identification, counts to $10^6$ and provides digital output. A range selector switch permits full-scale range selection for $10^4$, $10^5$, or $10^6$ counts. Resolution is $5 \mu$s for pulse pairs. (Victoreen Instrument Co., Dept. Sci536, 5806 Hough Ave., Cleveland 3, Ohio.)

- TURN TABLE CONTROL for fraction-collection turntables permits them to be operated on either a time or volume basis. The control operates with a contactor actuated by air pressure from a calibrated siphon in which the fraction is being caught. The contactor actuates the turntable to move an empty test tube under the siphon. Siphons in any size from 1 to 100 ml can be used. Operation on a time base is accomplished by allowing the control siphon to fill from a constant-head Mariotte bottle while the fractions are caught directly by the receivers. (Organomation Associates, Dept. Sci537, P.O. Box 5, Shrewsbury, Mass.)

- DENSITOMETER for photographed spectra is designed for comparing unknown spectra with master spectra and for measuring percentage transmission or density of spectrum lines. It accommodates both film and plates. Scanning in forward and reverse directions at four selectable rates is controlled by a foot switch. The instrument resolves lines 10 μ apart and provides horizontal and vertical magnifications of 1.5. Zero drift is said to be less than ±0.2 percent, full-scale drift less than ±0.5 percent, repeatability better than ±0.5 percent, and scattered light less than 1 percent. Readings are recorded on a 9½-in. wide chart moving at 3 in./min. Reading speed is up to 6 lines per minute. (Applied Research Laboratories, Inc., Dept. Sci538, P.O. Box 1710, Glendale 5, Calif.)

- EMERGENCY OXYGEN UNIT that provides approximately 7 gal of gaseous oxygen measures 11-in. high by 3-in. in diameter and weighs 20 oz. Oxygen can be administered by pressing a button on the top of the container. A disposable face mask is included with the unit. (Linde Co., Dept. Sci544, 420 Lexington Ave., New York 17, N.Y.)

- FREQUENCY STANDARD provides frequency signals stable to $5 \times 10^{-6}$/wk and $3 \times 10^{-6}$ over short intervals. Output includes six sinusoidal signals at decade intervals from 10 cy to 1 Mcy/
TCrystals are not just a sideline at ISOMET. Years of research and development have enabled us to produce consistently the highest quality crystals obtainable and at attractive prices. We go all out to serve you with HIGHEST QUALITY ATTRACTIVE PRICES * PROMPT DELIVERY —three good reasons why leading spectroscopists everywhere are turning to ISOMET for their crystal needs. Why don’t you try us on your next order.

NaCl, KBr, KCl, KI, CsBr, CsI, BaF₂, MgO
Rough blanks, polished windows, prisms, special shapes,
Standard liquid and gas cells; special cells.
Repair and polishing service for cells and windows.
KBr Pellet Powder.

WRITE TODAY for price list and free Technical Bulletin No. 1577.

Klett Manufacturing Co.
179 East 87 Street, New York, New York

Infrared Spectroscopists
Dependable, Prompt Delivery on Cell Windows, Prisms, Accessories

NaCl, KBr, KCl, KI, CsBr, CsI, BaF₂, MgO
Rough blanks, polished windows, prisms, special shapes,
Standard liquid and gas cells; special cells.
Repair and polishing service for cells and windows.
KBr Pellet Powder.

WRITE TODAY for price list and free Technical Bulletin No. 1577.

1552 SCIENCE, VOL. 131
see and four pulse signals from 10 cy to 10 kcy/sec. A timing comb is included for calibration and for measurement of sweeps and time intervals. A built-in oscilloscope permits Lissajous comparisons. Rated load is 50 ohm at 1 Mcy/sec and 100 kcy/sec and 5000 ohm at lower frequencies. (Hewlett Packard Co., Dept. Sci539, 275 Page Mill Rd., Palo Alto, Calif.)

- SAMPLING TOOL for taking pin samples from solid materials is essentially a drill with a hollow bore that cuts into metal, leaving a center core or pin standing. A companion device shears the pin at its base for removal. The drilling chips produced are also available for analysis. Pins are nominally 3/16 in. in diameter and 1/2 to 1 in. long. (Laboratory Equipment Corp., Dept. Sci535, St. Joseph, Mich.)

- ATMOSPHERIC CONTAMINATION ANALYZER measures traces of gases or vapors that will ionize in water. The sample is bubbled through demineralized water, and the conductivity of the water is measured before and after the bubbler. Purity of the water is restored by self-contained ion-exchange columns. Alarm and indication are provided. (Industrial Instruments Inc., Dept. Sci542, 89 Commerce Rd., Cedar Grove, N.J.)

- CENTRIFUGE for acceleration testing of products accommodates two matched objects up to 5 lb and larger than 3 in. Acceleration up to 100 grav is provided. Accuracy of rate of rotation is said to be better than ±1 percent. Eight slip rings are rated at 2 amp for continuous duty. (Gyrex Corp., Dept. Sci543, 3003 Pennsylvania Ave., Santa Monica, Calif.)

- CONSTANT CURRENT SUPPLY furnishes 0.04 to 5.00 amp at 0 to 8.0 volts. Regulation is ±0.01 percent for 10 percent line change or 8 volts load change. Hum is 0.01 percent. Operation is on 105 to 125 volts a-c. Shorting of output does not cause damage. An ammeter is included. (Industrial Measurements Laboratory, Dept. Sci545, 40 Great Jones St., New York 12, N.Y.)

- ELECTRON SPIN RESONANCE SPECTROGRAPH records the first derivative of the electron-spin-resonance absorption as well as direct absorption of the observed sample as a function of magnetic field. Magnetic field coils are of the air-core type in a Helmholz configuration. Coils for fields of 0 to 10 and 0 to 100 oer are supplied, and a unit for 0 to 1000 oer is available as an accessory. Operating frequencies of the basic instrument are 60 and 90 Mcy/sec; 10, 30, and 1000 Mcy/sec sensors are available. Frequency stability and magnetic field

---

For Faster Better Mixing of Fluids In Test Tubes

The new Vortex Mixer has applications in many operations requiring test tube washings, titrations, precipitations, turbidity measurements, etc. Designed for 10 to 16 mm or 18 to 25 mm diameter test tubes of various heights, the Vortex Mixer will save considerable time needed for washing Protein Bound Iodine determinations.

Other features include elimination of stoppers and corks; and non-contamination due to use of unclean stirring rods or other apparatus. Requires only one hand to insert or remove test tubes.

Available in both the 2 and 4 test tube models. Write for full details.

 aloescientific

DIVISION OF THE BRUNSWICK-BALKE-COLLENDER COMPANY

General Offices: 1831 Olive St. • St. Louis 3, Missouri
FULLY STOCKED DIVISIONS COAST-TO-COAST
CARTESEAN MANOMETER
for both absolute and differential readings

PRICE: $35.00

Now...Read 0-10 mm. Pressure Measurements Easily on a Convenient, Accurate 100 mm. Long Scale!

CARTESIAN MANOMETER
for both absolute and differential readings

RANGE: 0-10 mm. Hg.
GRADUATION: 0.1 mm. Hg.
ACCURACY: 1% of full scale
CONSTRUCTION: All glass

This new Cartesian Manometer simplifies readings in the difficult 0-10 mm. region of absolute pressure measurement...providing convenience no McLeod gauge can match, and accuracy far beyond that of ordinary coarse manometers. By using a 100 mm. long scale, the Cartesian Manometer magnifies 0-10 mm. pressure measurements by a factor of 10, making exact readings far more readily obtainable. The Cartesian Manometer employs a stopcock for easy conversion from differential to absolute readings. The instrument can be read continuously and directly. Because of its ease of use, the Cartesian Manometer is particularly valuable for vacuum distillations, oven drying, accurate differential pressure measurement, flow measurement, and a host of other applications.

TIP: Use a Carteresian Manometer complete and ready for use, but without mercury...$29.00 ea.

The EMIL GREINER Co.
Dept. 427, 8-20/26 N. Moore St., N. Y. C. 13

NEW SHARP FLAME SURFACE-MIXED GAS-OXYGEN HAND TORCH

Hotter and lighter than conventional hand torches, the surface-mixing SHARP FLAME has phenomenal range—from tiny flame to a wide, long fire. One tip for all flame sizes—can be rotated—silent burning. Won’t blow out—can’t even be shaken out—and can’t flash back. Overall length 11”—weight 7/8 oz.

Price
$35.00

Bethlehem Apparatus Company, Inc.
Hellertown, Pennsylvania

Now, introducing the BETHLEHEM SHARP FLAME SURFACE-MIXED GAS-OXYGEN HAND TORCH.

Stability are said to be better than 10^-5. The instrument accommodates samples 12 mm. in diameter and 25 mm long; larger volumes and flow designs are available. Sensitivities cited as typical are 5 x 10^-9 electron spins at 1000 Mpy/sec and 5 x 10^-9 electron spins at 50 Mpy/sec. Scanning speeds range from 0.005 to 10 ore/sec. Osciloscope display and strip-chart recording are provided. (Elion Instruments, Inc., Dept. Sci548, 430 Buckly St., Bristol, Pa.)

Survey meter is a self-contained gamma-ray responsive instrument using an 8-in.-diameter plastic scintillator as detector. Sensitivity is 15,000 count/min above 0.15 Mev for natural sea-level background of 0.01 mr/hr. Indication is provided by a meter with choice of full-scale values up 0.4 mr/hr. Preamplifier and amplifier are transistorized. (Franklin Systems, Inc., Dept. Sci546, 2734 Hillsboro Rd., West Palm Beach, Fla.)

Recorder provides full-scale voltage ranges of 10 and 100 mv and 1, 10, and 100 volts with 1 megohm input resistance and current ranges of 1, 10, and 1000 uA and 1 and 10 ma. Operation can be with zero at left, right, or center. Four-times chart width expansion is provided on all ranges. Recording is rectilinear by means of a galvanometer and chopper bar clamped every 2 sec on a chart 2.31 in. wide. Chart speeds are 1 and 15 in./hr with auxiliary gears available for other speeds. Accuracy is said to be ±2 percent on all ranges. (Yellow Springs Instrument Co., Inc., Dept. Sci547, Yellow Springs, Ohio.)

Plant growth chamber permits variation of light intensity from 700 to 3000 ft-ca and control of temperature from 45° to 110°F with full light load. An aluminum roof immediately above the fluorescent lamps is cooled by three fans to eliminate a large part of the heat load. Inside dimensions are 93/8 by 62/8 by 85/8 in. high. Fluorescent lights, incandescent lights, and temperature are individually adjustable. Filtered air is provided, up to 12 changes per hour. (Percival Refrigeration and Manufacturing Co., Dept. Sci553, Boone, Iowa)

Gaussmeter is a rotating coil type that develops an a-c voltage proportional to the magnetic field and compares this in a null-deflection system with a locally generated reference voltage. Range of the instrument is 0 to 10,000 gauss when null deflection is used and 0 to 120,000 gauss with meter indication. Accuracy is said to be ±0.1 percent between 1000 and 10,000 gauss with use of null technique. Probe
**GILLINGS-BRONWILL**
**THIN SECTIONING MACHINE**

FOR RESEARCH AND PRODUCTION

STONE • BONE • TEETH • CRYSTALS

Cut sections of teeth and bone as thin as 35 microns, stone and crystal to .005" thinness. Specimens require little or no polishing. High speed 6500 RPM diamond wheel, automatic table feed. Immediate delivery.

Write for Specifications

BRONWILL SCIENTIFIC Division of Will Corporation
3903 Russell St., Box 3927, Rochester 10, N.Y.

---

**THE CHROMATOGRAPHY BOOK**

Most complete catalog of Chromatography Equipment and Supplies ever published.

One of Over 400 Featured Items

SC-9276 RSCo FRACTION COLLECTOR, basic Volumetric Siphoning Unit. Complete with one receiver table and one volumetric siphon. Complete interchangeable controls and accessories available but not included ............................................. $587.50

SPECIAL – Complete section of Spectrophotometry plus extra insert on pH and Electrodes.

*Write for Specifications*

---

**BLICKMAN SAFETY ENCLOSURES**

Look for this symbol of quality

22 types of SAFETY ENCLOSURES for handling hazardous substances

**VACUUM DRY BOX**

for work in controlled atmosphere • sloping front • round autoclave-type air lock.

**Safety is the first consideration** in this newly-designed stainless steel laboratory equipment. These enclosures make it safer—and easier—for the technician to work with contaminants, micro-organisms, live viruses, infected animals, poisonous and radioactive substances. Stainless steel constructed with crevice-free surfaces, generously rounded corners, for easy cleaning and decontamination. Write for illustrated folder describing 22 different kinds of enclosures. S. BLICKMAN, INC., 6905 GREGORY AVENUE, WEHAWKEN, N. J.

UNITIZED ENCLOSURES
Low in cost • Stainless steel • Modular construction adapts to many uses.

CALIFORNIA-TYPE FUME HOOD
For handling radioactive materials • dual-sided for double operation.

MICRO-BIOLOGICAL SAFETY CABINET
Back or top mounting of biological filter canister • air lock if wanted.

---

**SCHAAR**

and Company

7300 WEST MONROSE AVENUE • CHICAGO 34, ILLINOIS

20 MAY 1960
dimensions are 1/4 in. in diameter and 17 in. long. Rotating-coil diameter is approximately 1/6 in. (Rawson Electrical Instrument Co., Dept. Sci550, 101 Potter St., Cambridge, Mass.)

- **COUNT RATE** METER is completely transistorized. Eight scale ranges extend to 600,000 count min. Three time constants, 1.5, and 10 sec, can be selected with a front-panel switch. Input is sensitive to 250 mv negative pulse. Outputs are available for 0 to 1 ma or 0 to 10 mv recorder. (Interstate Electronics Corp., Dept. Sci554, 707 E. Vermont Ave., Anaheim, Calif.)

- **PHOTOELECTRIC MICROMETER MICROSCOPE** can be used to read scales and circles marked with lines from 0.0001 to 0.0015 in. wide. Accuracy over the total range of 0.05 in. is said to be ±0.00004 in. The instrument eyepiece incorporates a photocell preceded by a vibrating slit. A setting is made by rotating a micrometer drum until the slit oscillates symmetrically about one of the engraved lines at which point an indicating meter reads null. Settings are said to be repeatable to within 20 µin. (Hilger and Watts, Ltd., Dept. Sci554, 98 St. Pancras Way, Camden Road, London, N.W. 1.)

- **AUTO COLLIMATOR** comprises a sensing unit, an amplifier, and an indicator. Indicating range of the sensing unit is ±25 sec with a working distance up to 30 ft between sensing unit and reflecting surface. Response time is 20 msec. Drift is said to be less than 1 percent in 24 hr after initial warmup. An optical wedge permits checking of indicator calibration. Sensitivity is said to approach 0.02 sec. Output is suitable for chart-recorder operation. (Keuffel and Esser Co., Dept. Sci561, Third and Adams Sts., Hoboken, N.J.)

- **PULSE HEIGHT ANALYZER** is an automatic-scanning, single-channel type that presents data in both digital and analog form. Scanning capacity is 100 channels with capability of being set to recycle automatically at 10-percent points. Counting time for full scan is variable between 1.0 and 100,000 min. Major components include a linear amplifier, analog and digital readout sealer, electronic timer, printer and recorder, and power supply. (Victoreen Instrument Co., Dept. Sci558, 5806 Hough Ave., Cleveland 3, Ohio.)

- **DUST HOOD** allows full visibility and unimpeded movement of arms and hands for performing laboratory operations under dust-free conditions. A blower at the top of the unit forces air into the transparent plastic hood through a large-area filter maintaining a positive pressure that prevents room air from entering the open front. Working volume is 34 by 24 by 19½ in. The opening is 34 in. wide by 8½ in. high. (Air Shields, Inc., Dept. Sci556, Hatboro, Pa.)

- **VOLTAGE MEASURING SET** compares d-c voltages with preset limits and displays and records results. Input voltages up to 1000 volts are handled in four decade ranges. Input signals in ten manually selected channels are converted to frequency and compared digitally with panel-set values. Over-all accuracy is said to be ±0.1 percent of input range plus 1 count. (Hewlett-Packard Co., Dept. Sci557, 395 Page Mill Rd., Palo Alto, Calif.)

**Rapid, Precise Pipetting**

You can get smooth control of the meniscus with Hamilton Pipet Controls, assuring rapid and precise pipetting. The liquid meniscus is raised with the free sliding plunger almost to the calibration line, then the thumbwheel control brings it accurately to the scribe line.

- 1, 2 and 5 ml capacity controls available
- Glass and stainless steel construction
- Tygon tubing connection provides clean, flexible coupling

**Order direct, or write today for literature and prices. Also available through your supply house.**

**Hamilton Company, Inc.**

P.O. Box 307-K, Whittier, California

**Precision Measuring Equipment for Clinical and Medical Research**

**Joshua Stern**

National Bureau of Standards, Washington, D.C.
ABNORMAL

clinical chemistry control serum

containing elevated concentrations of

Amylase
Alkaline Phosphatase
Bilirubin

Creatinine
Non-Protein Nitrogen
Protein-bound Iodine
Phosphorus, inorganic
*Transaminase (SGO-T)
Urea Nitrogen

NORMAL

clinical chemistry control serum

containing normal levels of

Albumin
Calcium
Chloride
Cholesterol
Creatinine
Globulin
Glucose
Non-Protein Nitrogen

Phosphorus, inorganic
Potassium
Protein-bound Iodine
Sodium
Total Protein
*Transaminase (SGO-T)
Urea Nitrogen
Uric Acid

*The transaminase values in Hyland Clinical Chemistry Control Serums represent actual enzyme activity, completely controlling all procedures, including spectrophotometric.

HYLAND LABORATORIES
4501 Colorado Blvd., Los Angeles 39, Calif.
160 Lockwood Ave., Yonkers, N. Y.

PHOTOVOLT
DENSITOMETRIC EQUIPMENT
for ELECTROPHORESIS and CHROMATOGRAPHY

New building-block system permits adding of units as required, from manual and semi-automatic operation to fully-automatic recording and integrating

- For scanning of electrophoresis strips and readings on large sheets in chromatography
- For work in visible and ultraviolet ranges
- For evaluation by color-transmission, reflection or fluorescence
- For readings on filter paper, agar, starch and other gels

Write for Bulletin 800-S to:
PHOTOVOLT CORPORATION
95 Madison Avenue • New York 16, N. Y.

20 MAY 1960
**Letters**

Small High Schools

James B. Conant concludes from his survey of the American public high school system that it is burdened with far too many small schools. He says, "The country over, something like a third of our youth are attending high schools that are too small. As a result, one of the most precious assets of our nation is being squandered—the potential talent of the next generation. It is almost impossible for students graduating from many of the small schools later to become members of learned professions [The Child, the Parent and the State (Harvard Univ. Press, Cambridge, Mass., 1959), p. 37]. ... The elimination of the small high school through district reorganization and consolidation should have top priority" (ibid. p. 39). Conant's studies lead him to believe that comprehensive high schools with graduating classes of fewer than 100 students inevitably provide an inferior education.

Conant’s analyses and arguments, which are based upon his observations of the curricula, the organization, and the staffing of high schools, seem reasonable. But considering how little we really know of the consequences of various educational practices and arrangements, one wishes for data on how students turn out. Some data on this point have come to hand in a recent issue of Science.

Harmon [Science 130, 1473 (1959)] in connection with another analysis of public high school graduates, reports data showing that 35 percent of the science doctorates awarded in 1957 and 1958 went to persons who had been educated in small high schools (schools with fewer than 100 graduates each year), and that 6 percent of the degrees were earned by the graduates of very small high schools (schools with fewer than 20 graduates each year). Statistics assembled by the U.S. Office of Education (Statistics of Public Secondary Day Schools, 1957–58) show that when most of these 1957–58 science doctors were graduating from high school, about 36 percent of all public high school students attended small schools, as defined above, and 5.5 percent attended very small schools.

Some estimation is necessary here, for Harmon reports class size and the Office of Education reports school size, is not known with precision. The figures given are based upon 1946, the best estimate of the year of graduation for which data are available; the estimates would

---

**COLEMAN**

**AUTOFILLER**

The push-button burette filler automatically fills burette to zero mark

The Coleman Model 27 Autofiller eliminates two of the most irksome and time-consuming operations in titrating...refilling the burette and adjusting the volumetric zero. It increases accuracy too—by always refilling to exactly the same titrant level. The Autofiller works with any standard, side-fill burette.

**only $75.00**
write for full details
BULLETIN SB-256

COLEMAN INSTRUMENTS, INC.
MAYWOOD, ILLINOIS

---

**versatile new laboratory recorder only $295**

Major Features

- Single channel, 10 calibrated ranges with continuously variable adjustment between ranges:
  - Calibrated volt and ampere ranges:
    - 10 mv.
    - 0.1 v.
    - 1 v.
    - 10 v.
    - 100 v.
  - 1 ma.
  - 0.1 ma.
- 4 times chart width zero suppression in either direction.
- Chart speed of 1 in/hr and 15 in/hr.
- Eight optional speeds by a simple gear change.
- Pressure sensitive chart paper. No warm-up. Ready to record.
- Weighs only 11 pounds. Measures 9½"x5½"x7".

Circle number below on reader service card for complete specifications.

YELLOW SPRINGS INSTRUMENT CO., INC.
YELLOW SPRINGS, OHIO

---

1560

**SCIENCE, VOL. 131**
not be appreciably changed if data for 1938 were used.

At any rate, it seems clear that the number of science doctorates awarded the graduates of these small schools is in line with the total number of students educated in these schools. How can it be that the small high schools of 1946, that presumably possessed all the curricular, instructional, and material deficiencies said to go with smallness, produced their full quota of scientists in 1957 and 1958?

Is the situation different today?

ROGER G. BARKER
University of Kansas, Midwest Psychological Field Station, Oskaloosa

Importance of Chinese for Scientific Communication

During recent years the number of scientific journals and the total volume of scientific literature published by the People’s Republic of China appear to have increased considerably. Evidence cited by Wilson (1) on the magnitude of the effort in scientific education and research leads one to expect that the increase will continue. According to a sampling of journals received by the Harvard-Yenching Institute, Cambridge, Mass., the vast majority of Chinese scientific publications appear only in the Chinese language and normally are not translated. However, two journals published in Peking, Scientia Sinica by the Academia Sinica and Science Record by the Science Press, consist of papers in Western languages, principally English. These papers, representing various fields of science, often appear previously in other Chinese-language journals.

In view of the rapidly increasing importance of Chinese scientific literature it is desirable that some scientifically trained persons now begin learning to read scientific Chinese. Only when knowledge of the language is widespread can Chinese scientific progress be evaluated accurately. The task may soon be too great for exclusive reliance on the few American scientists who speak Chinese as their native tongue.

Most of the difficulties associated with learning to read scientific Chinese are not associated with the language itself and seem to reflect a lack of interest on the part of Western scientists. According to a study that I have made the following problems stand out:

1) Because of present world unrest, publications of the People’s Republic of China do not circulate freely in the United States.

2) No textbooks and selected read-

From the RC-2, the latest in Refrigerated Centrifugation, to the SERVALL Small & Medium Centrifuges with their remarkable variety of tube combinations (ideal for the chemistry lab), there is a SERVALL Centrifuge to suit your every need in the low to Superspeed range (0 to 20,000 rpm — up to 34,800 x G). Special rotors such as virus or particle counting, and field-aligning also are available. The SERVALL 8 to 2 Tube Direct Sedimentation Continuous Flow System is still unique after having been in production for more than two years. SERVALL Instruments include the world-renowned “Porter-Blum” Ultra-Microtome (1/40 micron), Omni-Mixer Homogenizer (with or without Micro-Attachment for 0.5 to 3 ml up to 50,000 rpm), Pipettes, and the new SERVALL-Ribi Apparatus for preparative work on cell walls for research and production.

ILLUSTRATED LITERATURE AVAILABLE UPON REQUEST FOR CATALOG SC-5GC

Ivan Sorvall, Inc.
NORWALK - CONNECTICUT
AN INDEPENDENT COMPANY: NOT CONNECTED WITH ANY OTHER CENTRIFUGE MANUFACTURER. EST. 1934.

1561
Don't miss this authoritative new manual

**Handbook of Filtration**

Price $2.50
Postpaid

First complete and detailed Handbook of Filtration!

Here, for the first time between covers, is a history of the progress of filtration, based on data from many sources and from many years of research and observation. All findings are presented in an interesting and easy-to-read style. Fully illustrated with drawings, charts, and photographs.

Thorough coverage of important subjects

The highly important technical aspects of paper filtration are thoroughly covered. Permeability findings, for example, are based on results obtained with a special high-pressure tester. A five-color "pull-out" chart shows, at a glance, the permeability characteristics of 75 grades of filter paper.

Chromatography, electrophoresis, and other laboratory applications for filter papers are also discussed, as are the development and operation of various plate-and-frame filter presses, tubular filters, horizontal-plate filters, cartridge filters, ceramic filters, and leaf filters. Indeed, this 124-page volume belongs in the library of every chemist, technician, and engineer whose work touches on any filtration process. The attached coupon and your check for $2.50 brings a copy to your desk. Mail it today!

The Eaton-Dikeman Company
Filtertown, Mount Holly Springs, Pa.
Enclosed is my check for $2.50 for new "Handbook of Filtration." Please send my copy postpaid to:

Name ____________________________
Company __________________________
Street ____________________________
City ____________________________ Zone __________ State __________

---

The Scientist and Moral Values

The two letters concerning animal research [Science 131, 263 (29 Jan. 1960)] by implication raise issues of fundamental importance to the role of science and to the respect it may claim in the world of tomorrow.

The first is a question one would like to see squarely answered: Are there any moral limits at all to animal experimentation? Or is it the responsible and considered opinion of today's biologists and psychologists that any experiment, no matter how cruel, is permissible as long as it is scientifically worthwhile?

The second is a scientific problem that has been surprisingly—and significantly—little investigated: that of the psychology of scientists. Who are the people who will choose lines of research leading them to ever more cruel and, to

---

[The text continues with advertisements and other content.]
an outsider, seemingly barbaric experiments? What are their motives and the conscious and subconscious satisfactions they derive from their work? What else would they be capable of doing if given the opportunity?

In the popular view of science, the scientist too often appears as a kind of impersonal, investigating with cold detachment, and with concern only for truth. But surely this is preposterous. The scientist as a human being is very much a part of the picture of science, and science cannot be adequately understood without an understanding of the scientist; this line of research has been surprisingly shunned by scientists themselves.

With respect to animal experiments, I venture the hypothesis that, as the intrinsic scientific value of experiments decreases and the cruelty to animals increases, a critical point is reached beyond which the driving force is no longer scientific curiosity but sadism pure and simple. "Research" becomes a legalized outlet for pathological drives. Placing no moral limitations whatsoever upon research is an open invitation for this.

If the scientific community were to condone this, it could only lead to justifiable distrust of scientists in the long run. Indeed, the great claims of science in the last analysis boil down to this: that science is a form of a service to mankind. But the very idea of service to mankind is a moral ideal that is intimately linked with the whole of human morality, of which reverence for life is an essential part.

If, under the guise of science, that reverence for life were entirely discarded, the resulting moral debasement of scientists might well raise fears that, given the opportunity, they might turn against man himself in a sort of scientific folly. After all, it has already happened at least once: in Nazi Germany, where scientists performed "scientifically worth while" experiments on human beings they elected to consider "sub-human." In the modern world, scientists should not be the last to learn the lesson that, whenever the ends are thought to justify any means whatsoever, it is the means that will utterly corrupt the ends. Or, to put it in the words of a wise old Frenchman, Montaigne: "Science sans conscience n'est que ruine de l'âme (knowledge without conscience is nothing but the ruin of the soul)."

ALEXANDER WITTENBERG
Faculty of Science,
Laval University, Quebec, Canada

A recent exchange of letters on animal research left me puzzled. Can the painful problem of what constitutes proper animal experimentation be solved by the magic of words?
R. B. Kelman objects on moral grounds to experiments published by V. H. Denenberg and G. G. Karas, in which animals were starved to death to measure their resistance to stress under certain conditions. Denenberg in his reply gives relevancy, sensitivity, and precision as his criteria in selecting a dependent variable. “Any variable which satisfies these demands is scientifically valid and may be used to study subhuman organisms.” He points out that in starving animals to death survival time is a relevant dependent variable for measuring resistance to stress; that it is precise, because the same general findings can be obtained on different occasions; and that it is sensitive, since it uncovered statistically highly significant differences between different groups of animals. He concludes that survival time is a scientifically valid measure of resistance to stress; that it is specific, since “it is based upon the preservation of life”; and he adds that to him his data are most interesting.

Denenberg’s criteria for scientific validity are explicit and sufficient. They help one think up other valid experiments to measure resistance to stress, such as immersion into chemically inert hot liquids. Unlike starvation, an all-or-none affair, thermal stress can be varied in degree. Survival time in total body thermal stress (TBTS) probably depends upon the degree of stress and the surface area of the animal, or, perhaps, a surface-volume relationship; one might get a family of curves for animals of different size when plotting survival time as a function of temperature. Simple refinements of these experiments might include a one-lead electrocardiogram, to show the combined effect of nonspecific stress and rising temperature on myocardial conductivity. Or the electrical activity of the brain could be recorded during these conveniently shortened (as compared to starvation) tests for resistance to stress; a simultaneous temperature curve of the cerebrospinal fluid obtained through a needle thermocouple in one of the cerebral ventricles would provide convenient arbitrary landmarks in the gradual transition from being into nonbeing. The brief survival time would lead to a greater number of experiments, improving their reliability and increasing efficiency in utilizing scientific manpower.

Such experiments would fully satisfy the stated requirements for scientific validity, yet one would not wish to maintain that boiling them alive in mineral oil is a proper way of testing resistance to stress in mice, rats, or other “subhuman” mammals. Our criteria let us down, for at least two reasons: they have no circumscribed meaning and they are not pertinent to the issue, which is a moral one. Relevancy of survival time in indicating resistance to stress is assured by definition; no matter what we do to shorten the life of our animals, survival time will remain relevant in measuring resistance to what we are doing to them. The same is true of specificity. Sensitivity and precision, as used in this context, can be interpreted rather broadly to fit almost any experiment in biology worth reporting; they do not describe the experiments as much as the frame of mind of the person talking about them. In general, applying such terms to one’s own results amounts to little more than saying, “I like what I am doing,” in different words. Admitting this in public is proper and may even have didactic value, but it is a pity to conceal an essentially noble message behind inappropriate words.

The problem of what constitutes humane experimentation on animals is painful and difficult, and most of us are reluctant to think it through. Like other moral problems, it probably cannot be solved by rules that are simple, consistent, and always uniquely applicable. Even if rules were set up they...
PORTABLE FLASH EVAPORATOR WITH CONTINUOUS FEED ADAPTER

FEATURES: Glass-to-glass connections throughout the evaporating system prevent any possibility of contamination. Distillation occurs only within glass. Balanced design permits smooth rotation without drag and larger output with less loss of material. High torque, totally enclosed motor. Build it up with accessories for large scale work and temperature control. Grows with your requirements. Unit can be easily taken apart for cleaning. Prices start from $129.35. Basic unit not illustrated.

NOW you can evaporate several litters or gallons of solution without interruption...then revert to batch operation in seconds by replacing original adapter!

For Portable Flash Evaporator models PFE-18 and PFE-2B only.
PFE-1020 Complete with teflon and glass stopcock, teflon block with ball-point connection to PF-1005 female standard 24/40 taper-joint, teflon feed-tube to evaporator flask, stopper and vacuum outlet (without stand) $28.00

Immediate Delivery! Request Bulletin PFE-1000A for details.

BUCHLER INSTRUMENTS, INC.
formerly Laboratory Glass & Instruments Corp.
514 West 147th St., New York 31, N.Y.
Telephone: ADirondack 4-2626

MC&B is one of the World's largest producers of Biological Stains...

Write for our catalog containing a valuable Cross Reference List of Stains and Indicators

Matheson Coleman & Bell
Division of The Matheson Company
Norwood (Cincinnati) Ohio

Specify MC&B
...for dependable purity in 4400 laboratory chemicals

20 MAY 1960
Barnstead Mixed-Bed Demineralizers are designed for industrial water demineralization jobs. Come completely equipped, ready to connect to raw water supply. Removes all ionizable impurities including silica and carbon dioxide... high electrical resistance... often up to 20,000,000 ohms per cc., and higher. Write for NEW Demineralizer Catalog #160. Describes Barnstead Mixed-Bed, Two-Bed, and Four-Bed Demineralizers.

Barnstead Industrial Water Still with capacity of 500 gallons per hour of distilled water of consistently high purity... Other industrial models with capacities up to 1000 gallons per hour. Catalog “G” describes Barnstead’s complete line... over 200 different models and sizes for laboratory and industrial use.

Barnstead
STILL AND STERILIZER CO.
49 Lanesville Terrace, Boston 31, Mass.

I have just read K. E. Boulding’s letter in [Science 131, 874 (1960)]. I don’t think that it will be necessary to waste any space on the proposed astronomical classification since, like his “Bimbambim” it probably won’t be used by anybody.

But I do wish to protest three statements: (i) that names like selenium, tellurium, or, for that matter, Rhynchocephalia are “unscientific”; the history of science happens to be a science too; (ii) that it is “fortunate” that most scientists are not acquainted with the “dead” languages from which nomenclature is drawn. I, for one, consider this most unfortunate, provided it were true; (iii) that the letter x cannot be used to begin a syllable. Boulding may have heard of St. Xavier at one time. To be more personal about it, my younger daughter is named Xenia, and even in grade school her classmates had no trouble learning the proper pronunciation, Ksay-niya.

Willy Ley
37-26 77th Street,
Jackson Heights, New York

As an old S-F fan I am flattered by Willy Ley’s attention to my excursion into the grain-of-truth-among-chaff business. But the history of science is not science but History, an appalling mishmash of unrepealable accidents, quite unfit company for the respectable readers of this journal. Selenium has nothing to do with the Greeks, the moon, or the metal, just as (to cover his second point) irony has nothing to do with Fe. And in a world in which so much information has to be carried in such little sculls, there is a real problem of Economy in language.

But I am sorry about x. It has always
been my favorite letter (I was practically raised on Oxo), and Xenia is a lovely name and a nice little town. But I did only need 19 consonants, and arbitrariness pursues us even across the savannahs of the blue: it is History, not Science, which gives us 360 degrees, from the Babylonians to the Bahai. But x has glories more renowned than numerology, for what is more splendid than the Unknown? And what more glorious symbol is there for that infinite pursuit of the unknown which is the Being of Science and the End of History?

Kenneth E. Boulding
Department of Economics,
University College of the West Indies,
Kingston, Jamaica

Genetical Theory

Lederberg’s remarks in his Nobel address [Science 131, 269 (1960)] demonstrate his commitment to the deoxyribonucleic acid hypothesis and show how a dominant theory enables its proponent to ignore other points of view. A section on the origin of life contains no references to Oparin [The Origin of Life on the Earth (Academic Press, New York, 1957)], Miller [Ann. N.Y. Acad. Sci. 69, 260 (1957)], or Fox [AAAS General Symposium (26 Dec. 1959)]. Pirie [Intern. Council Sci. Unions Rev. 1, 40 (1959)] is described as (of all things!) an “agnostic.” The numerous experiments reported from this laboratory [Proc. Intern. Genet. Symposium No. 42 (1957)], which demonstrate that various carbohydrates will transform a recessive gene into a dominant gene, are disregarded.

Is it proper to ignore the views and the supporting evidence of others in full knowledge? It has become the current practice of proponents of a genetical theory not to comment on work incompatible with the theory. Sinoto’s [Proc. Intern. Congr. Genet. 10th Congr. (1958), vol. 2. p. 262] recent confirmation of Lysenko’s original experiments (which have not been considered seriously by most Western geneticists because of their conflict with Mendelism) is a case in point. It is now apparent that a considerable view of views (both by East and West) must occur before a comprehensive genetical theory can be achieved. If current reviewers of genetics stated the limitations under which they were writing, it would explain their failure to refute excluded items. Otherwise they arbitrarily narrow the extent of the scientific enterprise.

Carl C. Lindegren
Biological Research Laboratory,
Southern Illinois University,
Carbondale

---

EASTMAN KODAK APPLICATION TYPifies VALUE OF BENDIX® MASS SPECTROMETER

BY IDENTIFYING MINOR CONSTITUENTS FOUND IN SOLVENTS, a Bendix Time-Of-Flight Mass Spectrometer helps maintain tight quality control over Eastman Kodak film. Similarly, important companies in chemicals, petroleum, food, drug, missiles, and many other fields are using this scientific instrument to analyze products, mixtures, and reactions in their research and quality control programs.

STUDY OF EXTREMELY FAST CHEMICAL REACTIONS is possible because the Bendix Mass Spectrometer can make 10,000 analyses or mass spectra per second. An important feature is the newly developed hot filament sample inlet system, available for new Bendix Spectrometers and those now in use. Together with line-of-sight sampling, this facilitates ready analysis of solids. Bendix wide mass range and high resolution are ideal for study of high molecular weight materials. Display may be chart recording, oscilloscope scanning, or both simultaneously.

BECAUSE THE ONE INSTRUMENT SERVES MANY USES in analyzing gases, solids and liquids, it gives greater value per-dollar-invested. To learn what advantages it may have for your business, write . . .

Department E5-20
Cincinnati Division
3130 Wasson Rd., CINCINNATI 8, Ohio

Export Sales: Bendix International Division, 205 East 43rd Street, New York 17, N. Y.
Canada: Computing Devices of Canada, Ltd., Box 508, Ottawa 4, Ontario.
R A POLY GLOVES

R A Poly Gloves provide the protection of a continuous flashless seal combined with the chemically inert properties of polyethylene. Made of thin and flaccid film, they provide the best combination of finger sensitivity and strength. They are shaped to fit either hand and may be used singly or in pairs.

RESEARCH ASSOCIATES INC.
1618 E. Elizabeth Ave., Linden, New Jersey

MICROMANIPULATOR
"CAILOUX"

Unmatched flexibility of movements in all directions in space are achieved by natural hand movements under magnifications of 100 X to 2000 X without adjustment. The "Caiiloux" advanced design combines maximum speed, precise response and stability with unusual ease of operation. Back-lash, parasitic vibrations and lag are eliminated. Prolonged manipulations can be conducted without fatigue. Includes many additional exclusive features.

LOW IN PRICE
C. H. STOEILING COMPANY

写 for additional information

424 N. HOMAN AVE., CHICAGO 24, ILL.

CMM-98 DL-Serine-1-C\textsuperscript{14}

$35 per 100 microcuries

CATALOG ON REQUEST

new england nuclear corp.

575 ALBANY STREET, BOSTON 18, MASS. Liberty 2-5964

ZOOGEOGRAPHY

Editor CARL L. HUBBS

To the Memory of Charles Darwin and Alfred Russel Wallace

AAAS Symposium Volume No. 51
510+x pp., 115 illus., 13 tables, 6x9, author index of scientific names, references, cloth

AAAS members' cash orders $10.50, Retail $12.00

August 1957 Stanford Symposium:
The Origins and Affinities of the Land and Freshwater Fauna of Western North America

December 1957 Indianapolis Symposium:
Some Unsolved Problems in Biology, 1957:
Geographic Distribution of Contemporary Organisms

... a vast storehouse of information,
... a kinetic approach, concerned with processes and explanations
... great diversity in: groups of organisms—areas covered—topics stressed—angle of approach

English Agents: Bailey Bros. & Swinfen, Ltd.
Hyde House, West Central Street, London W.C.1

American Association for the Advancement of Science
1515 Massachusetts Avenue, NW, Washington 5, D.C.