

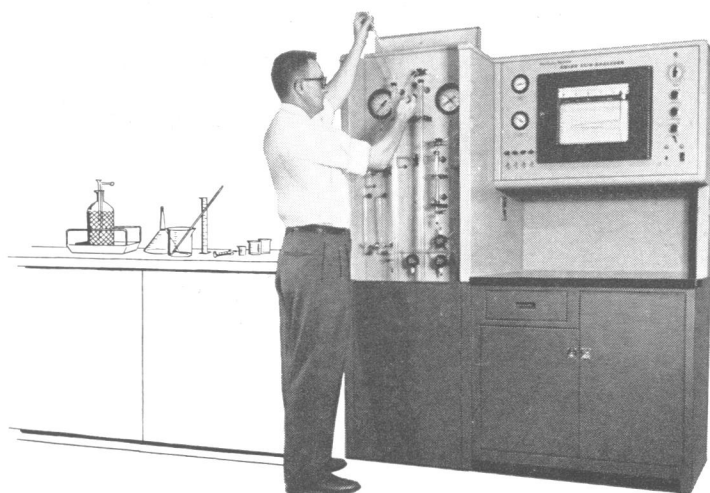
SCIENCE

21 November 1958

Volume 128, Number 3334

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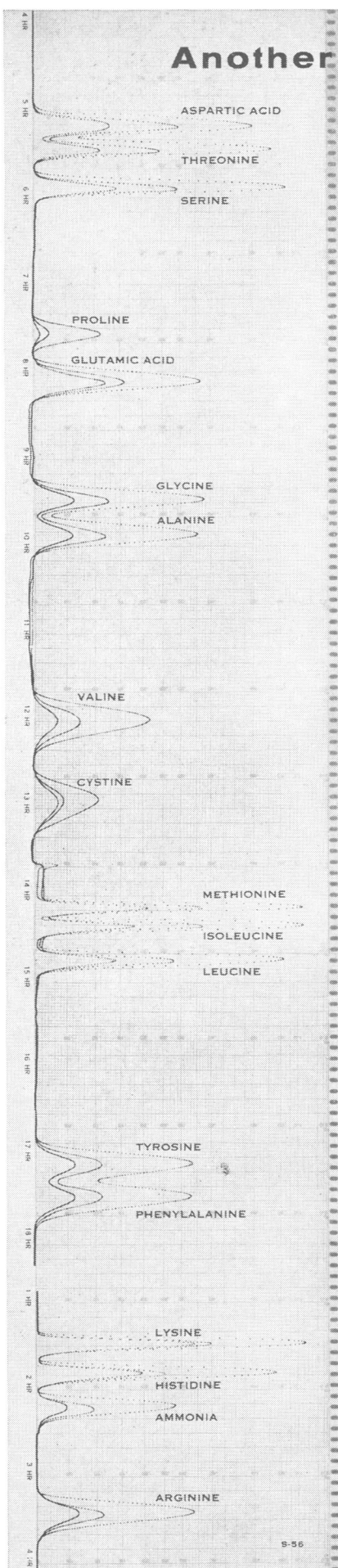
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Reference: D. H. Spackman, W. H. Stein, and S. Moore, "Automatic Recording Apparatus for use in the Chromatography of Amino Acids", *Anal. Chem.*, 30, 1190-1206, 1958.

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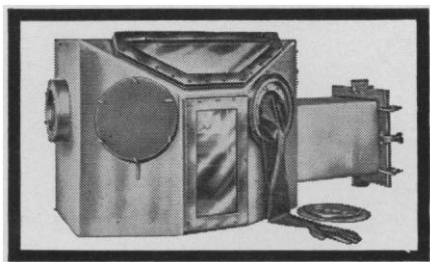
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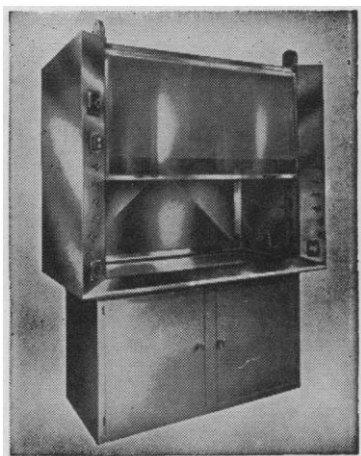
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Letters

Culturology

It may be of interest to readers of *Science* to learn that *Webster's New International Dictionary of the English Language* has included, in the addenda to the second edition (1954), the new name of a moderately old science—namely, *culturology*.

The science of culture (dealing with customs, institutions, beliefs, languages, arts, tools, and so on—in short, those characteristics which distinguish the human species from all others) was first defined, and its scope was first outlined, by the eminent English anthropologist Edward Burnett Tylor (1832–1917), in "The science of culture," the first chapter of his great work, *Primitive Culture* (1871). The scientific study of customs, beliefs, languages, and artifacts, both modern and prehistoric, has, of course, been the chief occupation of many cultural anthropologists—ethnologists and archeologists—since Tylor's day, and even long before.

But much of the work of anthropologists is not concerned with culture at all, but with the fossil remains, bones, muscles, genes, physiological processes, and so on, of men and other primates. And many "cultural" anthropologists have occupied themselves with nonculturological, psychological, psychoanalytic, and sociological (focusing upon social interaction among human beings) problems. The need arose, therefore, for a term that would distinguish the science of culture from other kinds of studies carried on by anthropologists. *Culturology* suggested itself in the tradition of scientific nomenclature that has produced *mammalogy*, *parasitology*, *mineralogy*, and so on.

Culturology was introduced into anthropological literature in 1939 in an article of mine, "A problem in kinship terminology" [*Am. Anthropologist* 41, 571 (1939)]. It was given greater currency in 1949 in my book *The Science of Culture*. The first person to use this term, however, as far as is known, was a distinguished German chemist, philosopher, and Nobel prize winner, Wilhelm Ostwald (1853–1932), in *Energetische Grundlagen der Kulturwissenschaft* [(Leipzig, 1909), p. 112]. Later, in "The system of the sciences" [*Rice Inst. Pam.* 2, No. 3 (1915)], he defined this concept more fully [see L. A. White, *The Science of Culture* (1949), pp. 113–117; 409–415]. I did not discover Ostwald, however, until 1949, some 15 years after I had begun to use *culturology* in my lectures.

The term *culturology* has encountered adverse criticism and opposition. Among other things, it has been called "a barbarism," an epithet applied in years gone

by to *sociology* by some of Herbert Spencer's friends in an attempt to dissuade him from using this word (see H. Spencer, *Principles of Sociology*, vol. 1, preface). By "barbarism" they were alluding to the fact that *sociology* is derived from both Greek and Latin sources—as is *culturology*—and this, according to the late V. Gordon Childe, is something that one reared on *litterae humaniores* finds objectionable. But, over the years, *sociology* won acceptance and has now become commonplace. Also, the English language itself has been quite hospitable to hybrids of Greek and Latin derivation, such as *penology*, *dictaphone*, *television*, *jurist*, *socialist*, *deist*, *scientist*, *petroleum*, and *cablegram*.

Because *culturology* is so apt, specific, and precise; because it is homologous with other names of sciences (for example, *parasitology*); because the English language has a genius for assimilating newly coined words (for example, *dictaphone*); and, finally, because *culturology* is needed to distinguish the science of culture from psychological and sociological studies of human beings, its general acceptance and use may be confidently expected. *Culturology* was included in the *Dictionary of Anthropology* (New York, 1956) by Charles Winick, and one finds it occasionally in anthropological writings. Instances of its use will undoubtedly multiply in the future.

LESLIE A. WHITE

Department of Anthropology,
University of Michigan, Ann Arbor

Names for Binary Numbers

The reading of "A system of names for binary numbers" in a recent issue of *Science* [128, 594 (1958)] impels me to describe another system devised some 6 or 7 years ago by the late D. A. Flanders, in line with some suggestions made by J. W. Givens. At that time the AVIDAC for the Argonne National Laboratory and the ORACLE for the Oak Ridge National Laboratory were both in the early stages of their construction, and we felt some concern for the problem of becoming familiar with their arithmetic to the base 2. In more practical terms, it was a question of getting used to the base 16, since it was convenient to group the binary digits together into tetrads.

The Givens-Flanders system was simplicity itself: Vowels and consonants were selected, each to represent one of the four binary pairs according to the following scheme:

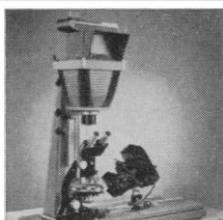
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|---|---|-----|
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| k | a | 0 1 |
| r | e | 1 0 |
| s | i | 1 1 |

A consonant is always to be followed by

(Continued on page 1298)

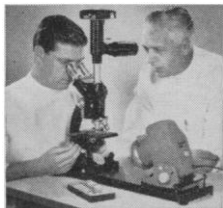


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presiding. Papers by Robert P. Fischelis, American Pharmaceutical Association; Ralph W. Ernsberger, Eli Lilly and Company; Harry E. Sagen, Abbott Laboratories; and Paul Bolton, Public Relations Foundation.

National Academy of Economics and Political Science. Symposium, jointly with the American Economic Association and Section K (Social and Economic Sciences), with the collaboration of the National Social Science Honor Society Pi Gamma Mu: "Major Problems of the American Economy"; arranged by Donald P. Ray, National Academy of Economics and Political Science; 27 Dec.; Edwin G. Nourse, Washington, D.C., presiding. Papers by Edward S. Shaw, Stanford University; D. Gale Johnson, University of Chicago; and Joseph J. Spengler, Duke University.

History and Philosophy of Science

Section L. Contributed papers; 28 Dec.; Carl B. Boyer, Brooklyn College, presiding.

Invited papers: "Science in Antiquity"; 29 Dec.; William H. Stahl, Brooklyn College, presiding. Papers by Edward Grant, Harvard University; Julian L. Huxley, Oxford University; Martin Levey, Temple University; and Derek J. Price, Institute for Advanced Study, Princeton, N.J.

Dinner and Vice-presidential address of Section L, jointly with the History of Science Society: "Mathematical Inutility and the Advance of Science," by Carl B. Boyer; 29 Dec.; Henry Guerlac, Cornell University, presiding.

Invited papers, jointly with the History of Science Society, cosponsored by the Society for the History of Technology: "History of Technology in America"; 30 Dec.; Carl W. Condit, Northwestern University, presiding. Papers by Eugene S. Ferguson, Smithsonian Institution; John B. Rae, Massachusetts Institute of Technology; E. Neal Hartley, Massachusetts Institute of Technology; and Max Jammer, Boston University.

History of Science Society. Invited papers: "Studies in Pre-Darwinian Evolution"; 29 Dec.; Conway Zirkle, University of Pennsylvania, presiding. Papers by Robert C. Stauffer, University of Wisconsin, and Loren C. Eiseley, University of Pennsylvania. Invited papers: "Problems and Studies in 19th Century Science"; 30 Dec.; Morris C. Leikind, Armed Forces Institute of Pathology, presiding. Papers by L. Pearce Williams, University of Delaware, and Nathan Reingold, National Archives.

Society for General Systems Research. Symposium: "Population Dynamics"; arranged by Richard L. Meier, Univer-

sity of Michigan; 29 Dec.; Kenneth E. Boulding, University of Michigan, chairman. Papers by Jerzy Neyman and Elizabeth L. Scott, University of California; Lawrence B. Slobodkin, University of Michigan; Mervyn L. Cadwallader, San Jose State College. Contributed papers; 29 Dec.; Kenneth Boulding, presiding.

Engineering

Section M. Four-session symposium: "National and International Aspects of Systems of Units in Coordinated Disciplines of Science and Technology"; arranged by a committee, Carl F. Kayan, Columbia University, chairman; 29 and 30 Dec.

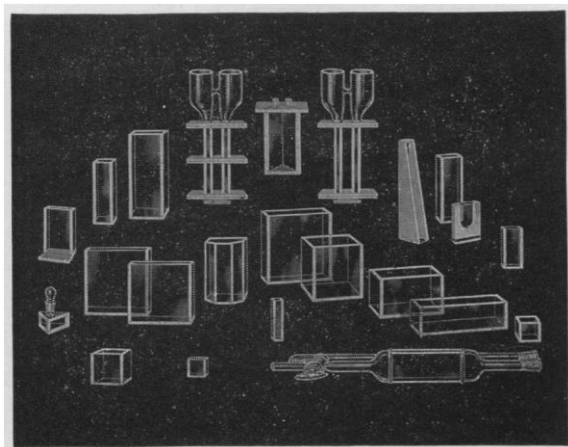
Part I: "Measurement Units: Present Situation in the United States and Abroad"; Carl F. Kayan, presiding. Papers by George F. Hussey, American Standards Association; F. B. Silsbee, National Bureau of Standards; J. J. Moran, Kimble Glass Co.; E. L. Ruh, Esso Research and Engineering Co.; and R. D. Thompson, Taylor Instrument Co.; Chauncey D. Leake, Ohio State University; Irvine C. Gardner, National Bureau of Standards; and A. H. Hughes, Metric Committee, British Association for the Advancement of Science.

Part II: "Practices and Problems in Technology"; Ralph A. Sherman, Battelle Memorial Institute, presiding. Pa-

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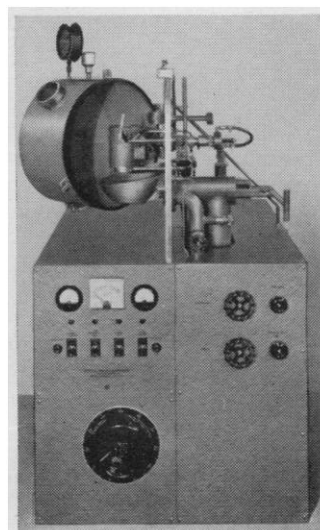
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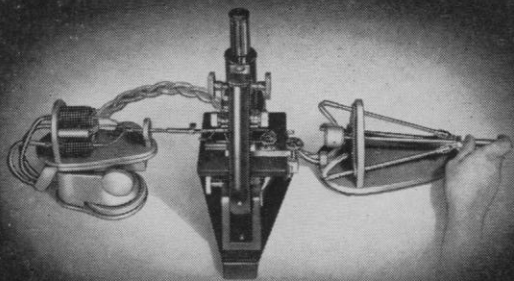
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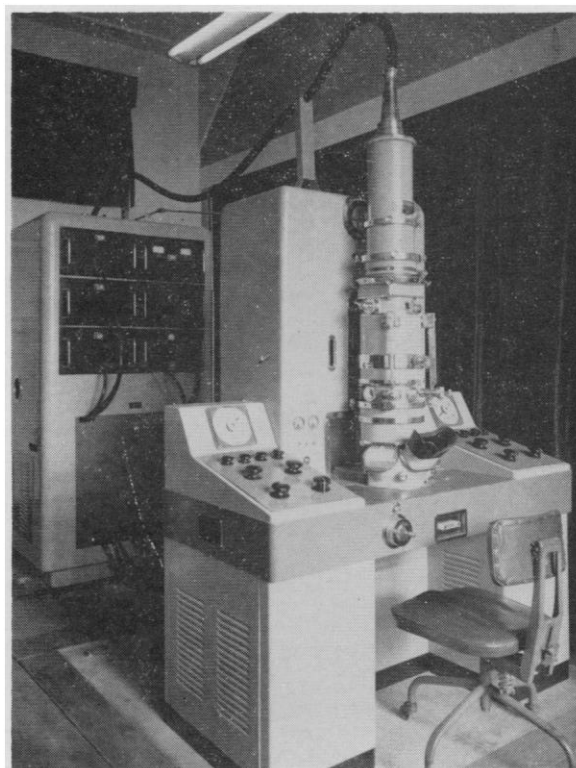
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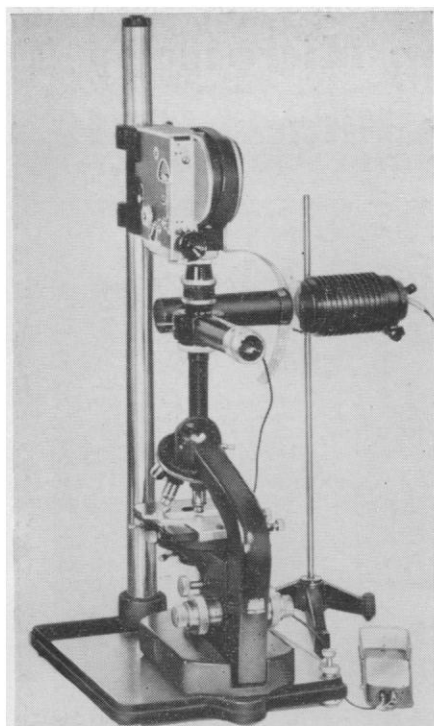
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Part III: "Practices and Problems in Industry, Commerce, and Defense"; Robert J. Painter, American Society for Testing Materials, Philadelphia, presiding. Papers by Erwin G. Loewen, Taft-Pierce Co.; Roy P. Trowbridge, General Motors Co.; Allen Latham, Jr., Arthur D. Little, Inc.; James F. Young, General Electric Company Engineering Laboratory, Schenectady, N.Y.; Harry C. Trelogan, U.S. Department of Agriculture; and John R. Townsend, Office of the Secretary of Defense.

Part IV: "Proposals for Unification and Simplification"; Clarence E. Davies, United Engineering Trustees, Inc., New York, presiding. Papers by P. G. Belitsos, General Electric Company; Matts Bäckström, Royal Institute of Technology, Stockholm, Sweden; Ralph A. Sherman, Battelle Memorial Institute; G. Ruppel, Verein Deutscher Ingenieure, Düsseldorf, Germany; Ralph W. Ernsberger, Eli Lilly and Co.; Carl C. Chambers, University of Pennsylvania; E. J. Leffevre, Queen Mary College, London; G. Lorentzen, Institute of Technology, Trondheim, Norway; Peter Grassmann, Federal Institute of Technology, Zurich, Switzerland; and Ernst Schmidt, Institute of Technology, Munich, Germany.

American Society of Photogrammetry. Two-session symposium, cosponsored by Sections B (Physics), D (Astronomy), E (Geology and Geography), F (Zoological Sciences), H (Anthropology), M (Engineering), N (Medical Sciences), P (Industrial Science), and O (Agriculture): "Photogrammetry in Science"; arranged by Richard G. Ray, U.S. Geological Survey; 29 Dec.; David Landen, U.S. Geological Survey, presiding.

Part I: papers by Paul Baker, Pennsylvania State University; William Francis Thompson and Dan Wiley Clancy, Fisheries Research Institute, University of Washington; J. Thomas Dutro, Jr., U.S. Geological Survey, and Ralph M. Berry, University of Michigan.

Part II: papers by Hugh Bradner, University of California; S. Vasilevskis, Lick Observatory; R. A. Laflamme, Massachusetts Institute of Technology; Austin Hasel and Earl J. Rogers, U.S. Forest Service; and Alfred O. Quinn, Aero Service Corporation.

Instrument Society of America. Symposium: "Instrumentation of Precision Measurements"; 30 Dec.; arranged by Orval L. Linebrink, Battelle Memorial Institute, who will preside. Papers by L. B. Macurdy, H. A. Bowman, and

Hilding E. Elmer, National Bureau of Standards; W. J. Darmody, Sheffield Corporation; A. O. McCoubrey, National Company, Inc.; and Sumner B. Irish, Princeton University.

Agriculture

Section O. Four-session symposium, cosponsored by Section E (Geology and Geography), American Geophysical Union, American Meteorological Society, American Society for Horticultural Science, American Society of Agricultural Engineers, American Society of Agronomy, American Society of Civil Engineers, Gamma Sigma Delta, Geological Society of America, Society of American Foresters, and the Soil Conservation Society of America: "Water and Agriculture"; arranged by Roy D. Hockensmith, Soil Conservation Service, U.S. Department of Agriculture; 29 and 30 Dec.

Part I: "Water for the Future"; D. A. Williams, Soil Conservation Service, U.S. Department of Agriculture, presiding. Papers by Edward A. Ackerman, Carnegie Institution of Washington; Clarence A. Davis, Washington, D.C.; Carl B. Brown, Soil Conservation Service; and R. L. Nace, U.S. Geological Survey. Discussion leader: Bernard Frank, Forest Service, U.S. Department of Agriculture.

Part II: "Water Sources"; H. J. Sloan, University of Minnesota, presiding. Papers by William C. Ackermann, Illinois State Water Survey Division, Urbana; Howard T. Orville, Beckman and Whitley, Inc.; C. H. M. Van Bavel, Agricultural Research Service; and G. L. Barger, U.S. Weather Bureau. Discussion leader: Vincent J. Schaefer, The Munital Foundation, Inc.

Part III: "Water Planning and Use"; Roy L. Lovvorn, North Carolina Agricultural Experiment Station, presiding. Papers by Cecil H. Wadleigh, Agricultural Research Service, U.S. Department of Agriculture; Herbert C. Storey, Forest Service, U.S. Department of Agriculture; Wayne D. Criddle, Utah State Engineer; and William I. Palmer, Bureau of Reclamation, Washington, D.C. Discussion leader: William G. McGinnies, Central States Forest Experiment Station, Columbus, Ohio.

Part IV: "Water Control"; Louis M. Thompson, Iowa State College, presiding. Papers by T. W. Edminster, Agricultural Research Service, U.S. Department of Agriculture; F. L. Timmons and D. L. Klingman, Agricultural Research Service, U.S. Department of Agriculture; G. Earl Harbeck, Jr., U.S. Geological Survey, Denver; and C. B. Tanner, University of Wisconsin. Discussion leader: Waldo E. Smith, American Geophysical Union.

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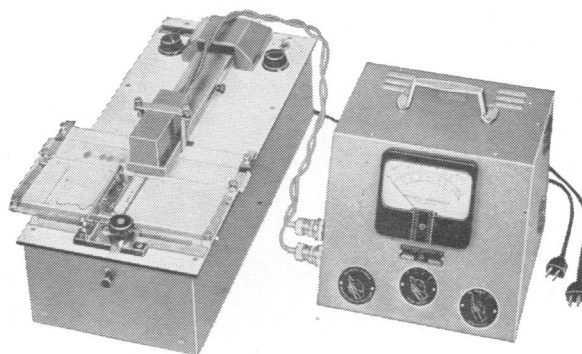
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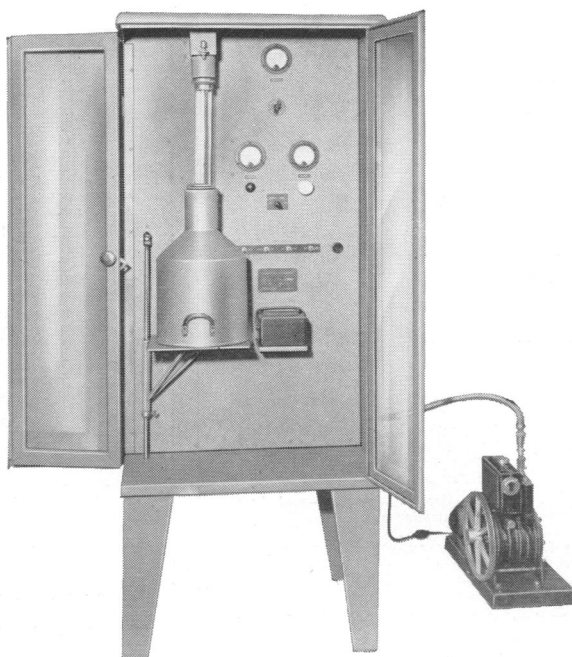
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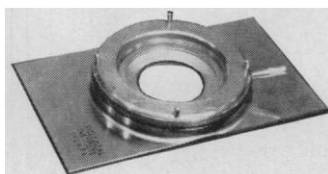
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Meetings

American Nuclear Society

L. R. Hafstad, research vice president of the General Motors Corporation, and Walker L. Cisler, president of the Detroit Edison Company, will serve as general chairmen of the 1958 annual meeting of the American Nuclear Society, which is to be held at the Sheraton-Cadillac Hotel in Detroit, 8-10 December. The meeting will draw 1400 engineers and scientists, including representatives from European and South American countries.

Highlight of the meeting will be a report on the United Nations Second International Conference on the Peaceful Use of Atomic Energy. Twenty-four technical sessions have been arranged, featuring approximately 175 papers covering all phases of nuclear science and technology. Alfred Amorosi, Technical Director of Atomic Power Development Associates, Inc., has been appointed local program chairman. He reports that field trips are being planned to the Enrico Fermi Atomic Power Plant near Monroe, Mich., and to the University of Michigan Phoenix Memorial Project, including the Ford Test Reactor on the north campus at Ann Arbor.

Ice Age History

A paper to be presented at the December meeting of the AAAS in Washington, D.C., will include a proposal for a wholly new concept of ice age history. Full treatment of this subject will be presented in the future, but it is sufficient to announce at this time that abundant new data have been collected at the department of geography of Clark University during the present International Geophysical Year.

1) Deposits formerly attributed to four or five separate Pleistocene glaciations, both in America and in Europe, are deposits of a single glaciation.

2) Limits of the glaciation in the Missouri-Mississippi-Ohio drainage basin are marked by southern borders of the so-called Nebraskan, Kansan, and Illinoian till sheets, and on Long Island, by the terminal moraine.

3) At the climax of glaciation a depressed state of the earth's crust under the icecap centering in the region of Hudson Bay permitted waters of the lowest position of Glacial sea level to form estuaries penetrating to the ice border in the Mississippi embayment and in the Columbia River basin. These synchronous marine stages, known as the "Levertt Sea," were kept fresh by large outflow, like headwaters of the Baltic today.

4) Normal retreat of the borders of

the icecap permitted the Leverett Sea to expand into valleys of southern New England and the lower Hudson valley, and, in the Mississippi basin, over the whole area of the so-called Nebraskan, Kansan, and Illinoian glaciations, so that an immense ice-marginal body of water was formed, extending from Ohio to Montana and from the Gulf of Mexico to the Wisconsin driftless area. Iceberg-rafted erratic stones and boulders became grounded on the submerged topography of northern Kentucky, southwestern Missouri, and eastern Iowa (the so-called "Iowan" stage). Gumbo clays, until recently interpreted to be weathered tills, were deposited within the expanse of the sea-level waters, along with driftwood and other organic material heretofore interpreted to be "interglacial deposits." Immense kames and eskers were built by subglacial rivers emerging from beneath the ice border under water.

5) When the edge of the icecap had melted and calved back to the so-called "Wisconsin" ice-border position, the relief from ice weight inaugurated a great upwarping movement of the earth's crust (called the Hubbard uplift), which lifted the entire glaciated area from the Atlantic to the Pacific. As the land rose and assumed directions of slope away from the ice, the ice-frontal estuaries of the Leverett Sea drained away and were replaced by the post-Glacial Ohio, Mississippi, Missouri, and Columbia rivers, thereby originating such features as the submerged channel of the Hudson River and the channeled scablands of the state of Washington. The Hubbard uplift took place shortly after New Haven, Connecticut, was uncovered, shortly before Indianapolis was uncovered, and long before the uncovering of the Glacial Great Lakes. At the end of the movement the ice border was almost all on dry land, on which thereafter it formed subaerial outwash plains, valley trains, and successive moraines. Drumlins which made their appearance during the ensuing retreat had been generated by land movement under the ice; dissection of many of the older submergence deposits commenced; and conditions became ideal for widespread loess deposition. The contrast in appearance of submergence deposits and deposits formed after the uplift partly explains how the concept of "Older" and "Last" glaciations came about.

6) During the Hubbard uplift the outer boundary of upwarping shifted inward from a Hubbard hinge line of undetermined location outside the limits of glaciation to the Whittlesey hinge line in the Erie-Michigan basins. At the end of the Hubbard uplift the Leverett marine-water plane in the Mississippi embayment was left in the upwarped position it has today—submerged about 450 feet below present sea level in Louisiana,

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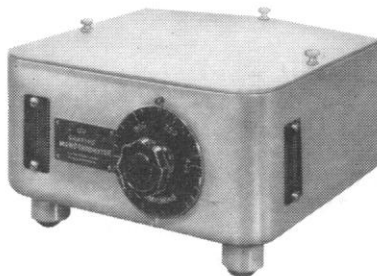
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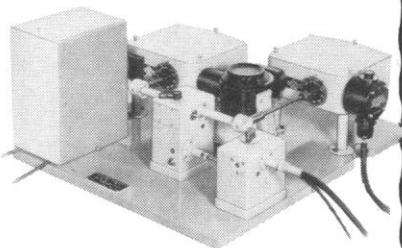
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raised 540 feet above present sea level in southeastern Missouri, and raised over 800 feet in northwestern Illinois.

7) Further recessional events followed essentially the present historical concepts, with a Glacial Great Lakes stage, additional marine stages (the De-Geer in Maine and in Puget Sound and the Champlain in the St. Lawrence), and iceward migration of hinge line activity from the Whittlesey to the Algonquin hinge line, as upwarping continued.

8) Reduction of the ice age to "unity" shortens geological history and nullifies the present meaning of the terms *Nebraskan*, *Kansan*, *Illinoian*, *Wisconsin*, and the several "interglacials." Ice age history appears to have been influenced or regulated far less by climatic changes and moraine building than by the intermittent character of the great land movements which continue to the present. There is urgent need in America and Europe for a tectonic chronology of the ice age, based on transatlantic correlation of marine stages and simultaneous timing of the continental uplifts.

RICHARD J. LOUGEE

Clark University,
Worcester, Massachusetts

Clinical Chemistry

More than 200 clinical chemists attended the recent meeting of the American Association of Clinical Chemists in Iowa City, 4-6 September. The program included a symposium on the applications of quality control to clinical laboratories and a series of 46 papers dealing with various aspects of clinical chemistry.

In the presidential address, Oliver Gaebler briefly reviewed the history of the AACC; then he pointed out that contact with scientists in other disciplines is the best way for stimulating not only clinical chemistry, but the individual clinical chemist.

A highlight of the meeting was the presentation of the Bischoff Award to Marschelle H. Power, senior consultant in biochemistry at the Mayo Clinic, "for outstanding contributions to clinical chemistry." The award, which is sponsored by the Ames Company of Elkhart, Ind., consists of a medal, a citation, and an honorarium of \$500. The 11th annual meeting will be held in Cleveland, Ohio, in the fall of 1959.

Biology Teaching

The second annual meeting of the Association of Midwest College Biology Teachers was held at Western Illinois University (Macomb), 10-11 October. More than 200 representatives of some 90 colleges and universities attended. The primary purpose of the organization

is to seek and develop ways of improving the teaching of biology at all levels of instruction.

Most of the meeting was devoted to seven discussion sections. Among the topics considered were the nature of the first course in biology, the biology-major program, the preparation of high school biology teachers, the education requirements for high school teachers, the graduate preparation of college biology teachers, laboratory and field work in the first course, and special readings for biology majors. Two addresses were given: one by W. H. Bragonier, Iowa State College, "Science Education and You," and the other by James F. Crow, University of Wisconsin, "What Is a Gene?"

Willis H. Johnson of Wabash College succeeds Leland P. Johnson of Drake University as president of the association.

Forthcoming Events

December

18-20. American Physical Soc., Los Angeles, Calif. (K. K. Darrow, APS, Columbia Univ., New York 27.)

26-31. American Assoc. for the Advancement of Science, annual, Washington, D.C. (R. L. Taylor, AAAS, 1515 Massachusetts Ave., NW, Washington 5.)

The following 47 meetings are being held in conjunction with the AAAS annual meeting.

AAAS Committee on the Social Aspects of Science (C. D. Leake, Ohio State Univ. College of Medicine, Columbus, Ohio). 27 Dec.

AAAS Cooperative Committee on the Teaching of Science and Mathematics (J. W. Buchta, Univ. of Minnesota, Minneapolis, Minn.). 28 Dec.

Academy Conf. (J. A. Yarbrough, Meredith College, Raleigh, N.C.). 27-28 Dec.

Alpha Epsilon Delta (M. L. Moore, 7 Brookside Circle, Bronxville, N.Y.). 27 Dec.

American Assoc. of Clinical Chemists (Miss E. G. Frame, Clinical Center, Natl. Institutes of Health, Bethesda 14, Md.). 29-30 Dec.

American Assoc. of Scientific Workers (R. J. Rutman, 6331 Ross St., Philadelphia 44, Pa.).

American Astronautical Soc. (R. Fleisig, 58 Kilburn Rd., Garden City, N.Y.). 27-30 Dec.

American Geophysical Union (W. E. Smith, AGU, 1515 Massachusetts Ave., NW, Washington 5).

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

American Nature Soc. (S. Mulaik, Biology Dept., Univ. of Utah, Salt Lake City). 26-30 Dec.

American Physiological Soc. (F. A. Hitchcock, Ohio State Univ., Columbus).

American Political Science Assoc. (E. M. Kirkpatrick, APSA, 1726 Massachusetts Ave., NW, Washington, D.C.). 27 Dec.

American Psychiatric Assoc. (L. J.

West, Univ. of Oklahoma School of Medicine, Oklahoma City 4). 27-28 Dec.

American Soc. of Criminology (D. E. J. MacNamara, Dean, New York Inst. of Criminology, Inc., 40 E. 40 St., New York 16). 27-28 Dec.

American Soc. of Naturalists (J. Schultz, Inst. for Cancer Research, Philadelphia, Pa.).

American Soc. of Photogrammetry (R. G. Ray, U.S. Geological Survey, Washington 25). 29 Dec.

American Soc. of Zoologists (G. Moment, Dept. of Biology, Goucher College, Towson, Baltimore 4, Md.). 27-29 Dec.

American Sociological Soc. (K. Davis, Inst. of International Studies, Univ. of California, Berkeley 4). 29 Dec.

Association of American Geographers, Middle Atlantic Div. (J. E. Guernsey, 9707 Parkwood Dr., Bethesda, Md.). 29 Dec.

Association for Computing Machinery (J. Douglas, Mathematics Dept., Rice Inst., Houston, Tex.).

Astronomical League (Miss G. C. Scholz, 410 Mason Hall Apts., Alexandria, Va.). 26 Dec.

Biometric Soc. (J. Cornfield, Johns Hopkins Univ., Baltimore, Md.). 30 Dec.

American Statistical Assoc. (E. Glazer, 305 George Mason Dr., Falls Church, Va.). 30 Dec.

Conference on Scientific Communication Problems (G. L. Seielstad, Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.) 28-30 Dec.

Conference on Scientific Manpower (T. J. Mills, National Science Foundation, Washington 25). 30 Dec.

Ecological Soc. of America (D. E. Davis, Johns Hopkins Univ., School of Hygiene, Baltimore, Md.).

History of Science Soc. (M. C. Leikind, 1334 Aspen St., NW, Washington 12). 29 Dec.

Instrument Soc. of America (O. L. Linebrink, Battelle Memorial Inst., Columbus, Ohio). 30 Dec.

International Geophysical Year (H. Odishaw, National Acad. of Sciences, Washington 25). 29-30 Dec.

Junior Scientists Assembly (K. C. Johnson, Supervising Director of Science, District of Columbia Public Schools, Woodrow Wilson High School, Washington 16). 27-28 Dec.

Metric Assoc. (J. T. Johnson, 694 W. 11 St., Claremont, Calif.).

National Acad. of Economics and Political Science (D. P. Ray, Hall of Government, George Washington Univ., Washington, D.C.). 27 Dec.

National Assoc. of Biology Teachers (P. Klinge, Jordan Bldg., Indiana Univ., Bloomington). 26-30 Dec.

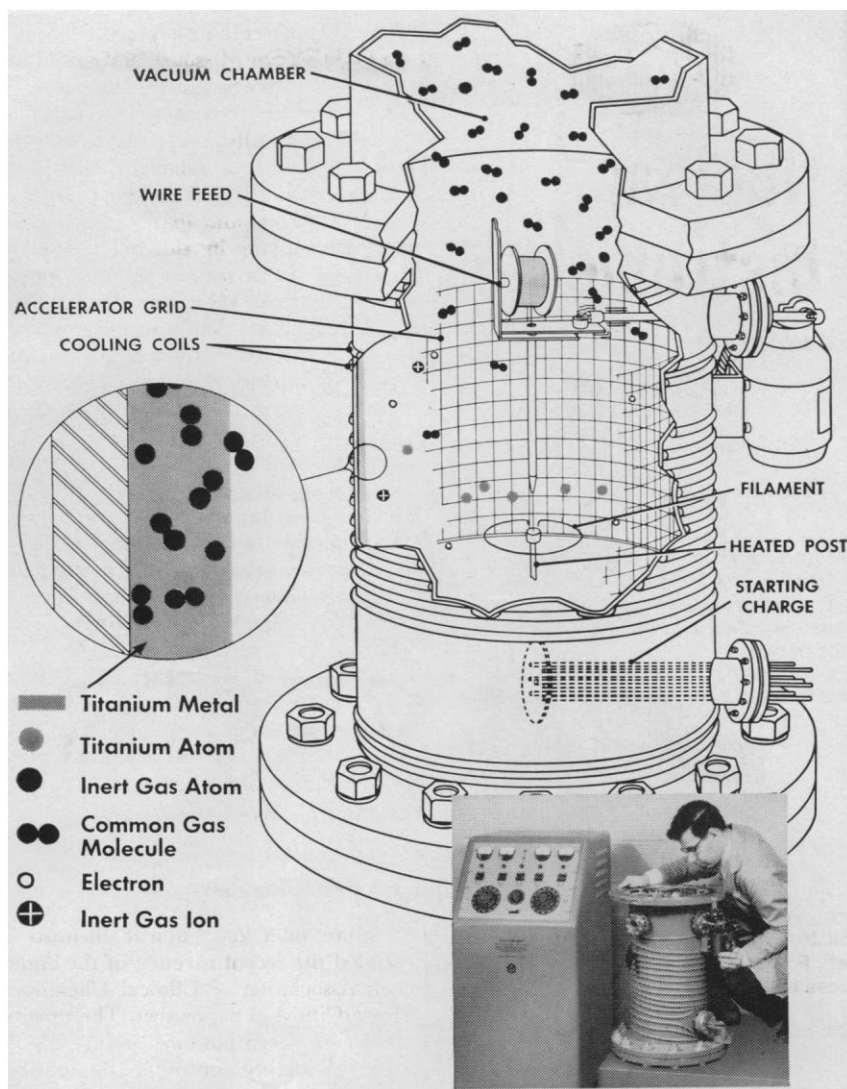
National Assoc. for Research in Science Teaching (E. S. Obourn, U.S. Office of Education, Washington 25). 26-30 Dec.

National Assoc. of Science Writers (J. Billard, U.S. News and World Report, Washington, D.C.).

National Geographic Soc. (W. R. Gray, NGS, 16 and M Sts., NW, Washington 6). 30 Dec.

National Science Teachers Assoc. (W. A. Kilgore, District of Columbia Teachers College, Washington 9). 26-30 Dec.

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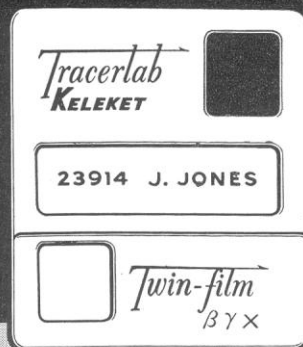
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Philosophy of Science Assoc. (C. W. Churchman, Case Inst. of Technology, Cleveland, Ohio).

Pi Gamma Mu (Mrs. Effie B. Urqhart, Winfield, Kan.).

Scientific Research Soc. of America (D. B. Prentice, 56 Hillhouse Ave., New Haven 11, Conn.).

Sigma Delta Epsilon (Mrs. V. L. Blackford, 2630 Adams Mill Rd., NW, Washington 10). 26-30 Dec.

Society for General Systems Research (R. L. Meier, Mental Health Research Inst., Univ. of Michigan, Ann Arbor). 29 Dec.

Society for Industrial Microbiology, Washington section (W. N. Ezekiel, Bureau of Mines, Washington 25). 27-28 Dec.

Society of the Sigma Xi (T. T. Holme, 56 Hillhouse Ave., New Haven 11, Conn.). 29 Dec.

Society of Systematic Zoology (G. W. Wharton, Dept. of Zoology, Univ. of Maryland, College Park). 26-30 Dec.

United Chapters of Phi Beta Kappa (C. Billman, 1811 Q St., NW, Washington, D.C.). 27 Dec.

Washington Acad. of Sciences (G. W. Irving, ARS, U.S. Dept. of Agriculture, Washington 25).

27-29. American Economic Assoc., Chicago, Ill. (J. W. Bell, AEA, Northwestern Univ., Evanston, Ill.)

27-29. Econometric Soc., Chicago, Ill. (R. Ruggles, Box 1264 Yale Station, Yale Univ., New Haven, Conn.)

27-30. American Folklore Soc., New York, N.Y. (MacE. Leach, AFS, Univ. of Pennsylvania, Philadelphia, Pa.)

28-30. Archaeological Inst. of America, Cincinnati, Ohio. (L. A. Campbell, AIA, Dept. of Classics, Brooklyn College, Brooklyn, N.Y.)

29-30. National Council of Teachers of Mathematics, New York, N.Y. (M. H. Ahrendt, NCTM, 1201 16 St., NW, Washington 6.)

28-30. Western Soc. of Naturalists, Seattle, Wash. (J. P. Harville, San Jose State College, San Jose 14.)

January

7-9. Northeastern Weed Control Conf., 13th annual, New York, N.Y. (E. R. Marshall, Carbide & Carbon Chemical Co., New York, N.Y.)

12-14. Reliability and Quality Control, 5th natl. symp., Philadelphia, Pa. (W. T. Sumerlin, Philco Corp., 4700 Wissahickon Ave., Philadelphia 44.)

20-22. American Mathematical Soc., annual winter, Philadelphia, Pa. (E. G. Begle, Leet Oliver Hall, Yale Univ., New Haven, Conn.)

21-22. American Group Psychotherapy Assoc., 3rd annual institute, New York, N.Y. (C. Beukenkamp, Public Relations Chairman, 993 Park Ave., New York 28.)

22-23. Mathematical Assoc. of America, 42nd annual, Philadelphia, Pa. (H. M. Gehman, MAA, Univ. of Buffalo, Buffalo 14, N.Y.)

23-24. American Group Psychotherapy Assoc., 16th annual conf., New York, N.Y.