SCIENCE

7 November 1958

Volume 128, Number 3332

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

HF* . . . . . NOW IN A NEW 1-LB PATENTED FUNCTIONAL CONTAINER

WITH A CONTROLLED-DELIVERY CLOSURE

This new patented container is made of "Marlex" polyethylene. In addition to controlled drop or flow action, the container sucks back HF remaining on the delivery spout.

Specify Mallinckrodt Acid Hydrofluoric 48% A.R. . . . manufactured in a new plant supplying you with the highest quality, laboratory-reagent-grade HF available.

***Remember** . . . for safety, convenience and economy Mallinckrodt provides HF in the 1-lb. container illustrated . . . and in 10-LB SINGLE-TRIP "MARLEX" polyethylene containers.

5. Also in 10-lb., no-deposit, single-trip container

Another example of
Superior Mallinckrodt Packaging

ORDER FROM YOUR AR DISTRIBUTOR

Mallinckrodt®

MALLINCKRODT CHEMICAL WORKS

ST. LOUIS · NEW YORK · MONTREAL

an entire research library in your hands . . . with MICROCARDS*

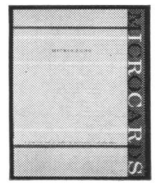
There are countless applications of MICROCARDS in every field of science. With MICROCARDS, you can have, at your fingertips, reference data not otherwise available – foreign journals, exhaustive government research reports, limited-edition monographs – on easy-to-use, easy-to-read cards. They do not smear when handled, and the image remains sharp, clear and legible indefinitely.

* A registered trademark. A MICROCARD is an opaque 3″ x 5″ card on which we record photographically, in miniature, as many as 80 pages of full-size documents. You can keep a complete library at hand in an ordinary card file, locate particular references easily and read them clearly . . . with a magnifying MICROCARD reader. A great amount of original source material is already available from MICROCARD publishers. Their current catalogs are available to you on request.

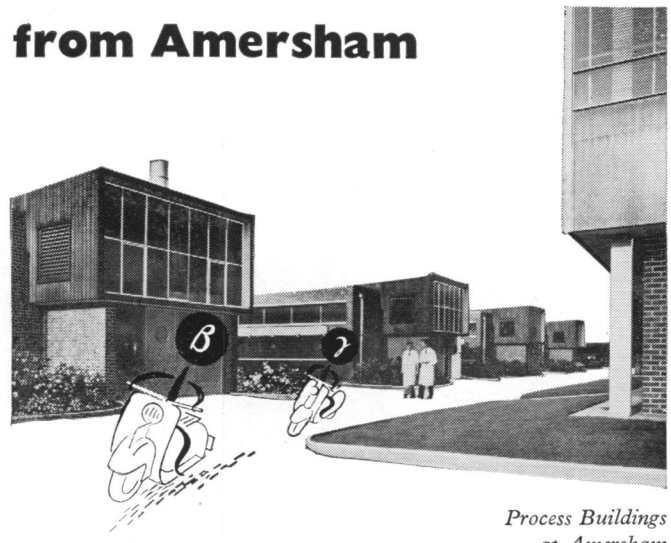
MICROCARD CORPORATION
West Salem, Wisconsin

FREE BROCHURE

Write today for more information what's now available on MICROCARDS, where you can get your own material converted to MICROCARD FORM.



The world's widest range of Radiochemicals comes from Amersham



Process Buildings at Amersham

Each year at the Radiochemical Centre we prepare over five hundred labelled compounds incorporating some twenty different isotopes. Of carbon-14 alone over two hundred compounds are available, mostly from stock. Our range covers all the important tracer isotopes —S-35, P-32, I-131, T-3, Cl-36, etc.

We cater for many interests—for biologists with labelled steroids, sugars, amino acids, carcinogens, vitamin B12, etc.—for industrial chemists with labelled weedkillers, pesticides, fertilisers, detergents.

To all tracer users we are pleased to offer advice—and often to make special labelled materials for their use. Write to Amersham for our general lists or tell us about your particular problem.

U·K·A·E·A
THE RADIOCHEMICAL CENTRE

THE RADIOCHEMICAL CENTRE

AMERSHAM, BUCKINGHAMSHIRE, ENGLAND

Effects of High Energy Radiation"; 28 and 29 Dec.

Part I: "Small Molecules"; Leo A. Wall, National Bureau of Standards, presiding. Introductory remarks (Leo A. Wall); papers on characteristic features of radiation chemistry (Milton Burton, University of Notre Dame); the radiation chemistry of low molecular weight hydrocarbons (Leon Dorfman, Argonne National Laboratory); the effect of linear energy transfer on radiation chemical reactions (Robert Schuler, Mellon Institute); indirect and direct action of radiation on organic compounds containing the N-C bond (Warren M. Garrison, University of California).

Part II: "Polymers"; Milton Burton, University of Notre Dame, presiding. Papers on irradiation of polyethylene, IV: oxidation effects (H. Matsuo and Malcolm Dole, Northwestern University); the radiation-induced cis-trans isomerization of polybutadiene (Morton A. Golub, B. F. Goodrich Company); gamma irradiation of poly-α-methylatyrene (A. M. Kotliar, Naval Research Laboratory); radiation chemistry of polydimethylsiloxane (A. A. Miller, General Electric Company); gamma irradiation of fluorocarbon polymers (Roland E. Florin and Leo A. Wall, National Bureau of Standards); gamma irradiation of collagen (James Cassel, National Bureau of Standards).

Part III: "Irradiation Techniques"; S. David Bailey, Quartermaster Research and Development Command, presiding. Papers on irradiation-induced polymerization (Ed F. Degering, G. J. Caldarella, and M. A. Mancini, Quartermaster Research and Development Command); monitoring irradiation effects on monomers and polymers by mass spectrometry (Charles Merritt, Jr., Ed F. Degering, and Maurice L. Bazinet, Quartermaster Research and Development Command); irradiation of organic polymers in nuclear reactors (Oscar Sisman, Oak Ridge National Laboratory); competitive reagents and the radiolysis of glycine (Charles Maxwell, National Institutes of Health); low-temperature radiation studies (Daniel W. Brown and Leo A. Wall, National Bureau of Standards).

Contributed papers; 30 Dec. Part I, Gilbert W. Castellan, Catholic University of America, presiding. Papers on factors governing the deposition of suspensions by nonuniform electric fields (Herbert A. Pohl and James P. Schwar, Princeton University); the photolysis of acetone in perfluorocarbon solvents (Gilbert J. Mains, Carnegie Institute of Technology); strontium-90 balance in man (E. Lenhoff, H. Spencer, J. Samachson, and Arthur R. Schulert, Lamont Geological Observatory); ultraviolet absorption measurements of some aromatic compounds in solutions in the

solid state (M. Ellen Dolores Lynch, Dunbarton College, Washington, D.C., and Columba Curren, Notre Dame University); ionization constants of derivatives of fluorene and other polycyclic compounds (Preston H. Grantham, Elizabeth K. Weisburger, and John H. Weisburger, National Institutes of Health); improved synthesis of amides (David W. Young and Eileen M. Paré, Sinclair Research Laboratories). Part II, George N. Kowkabany, Catholic University of America, presiding. Papers on a possible mechanism for respiratory chain phosphorylation (the pyridine nucleotide cycle) (Theodore I. Bieber, University of Mississippi); quantitative determination of adrenocortical steroids in the urine of pregnant women (David F. Johnson, Daniel François, and Erich Heftmann, National Institutes of Health); isolation of steroids from human feces (Erich Heftmann, Ekkehard Weiss, and Erich Mosettig, National Institutes of Health); activities of division of chemistry and chemical technology of the National Research Council (Clem O. Miller, National Research Council).

American Association of Clinical Chemists. Symposium: "Biochemical Studies in Schizophrenia"; moderated by Seymour S. Kety, National Institute of Mental Health; 29 Dec.; Elizabeth G. Frame, National Institutes of Health, presiding. Papers will be read on sources of error in biochemical research in schizophrenia (Seymour S. Kety); studies on ceruloplasmin and ascorbic acid in schizophrenia (Roger K. McDonald, National Institute of Mental Health); metabolism of epinephrine and norepinephrine (Julius Axelrod, National Institute of Mental Health); observations on catechol amines in blood and urine in mental illness (Hans Weil-Malherbe, National Institute of Mental Health); the significance of aromatic compounds in the urine of schizophrenics (Elwood H. LaBrosse, National Institute of Mental Health); some aspects of tryptophan metabolism in schizophrenia (Irwin J. Kopin, National Institute of Mental Health).

American Association of Clinical Chemists dinner; 29 Dec.; Oliver H. Gaebler, Edsel B. Ford Institute for Medical Research, presiding. Medical research observed in the Soviet Union (Thelma B. Dunn, National Cancer Institute).

Contributed papers; 30 Dec. Part I, Albert E. Sobel, Jewish Hospital of Brooklyn, presiding. Papers on chelated iron (Martin Rubin and J. V. Princiotto, Georgetown University Medical Center); effects of growth hormone and corticotropin on total output and partition of N^{15} from glycine, alanine, and ammonium citrate (O. H. Gaebler, Dorothy Kurrie, and Thomas Maska-

point. Opportunity was provided for numerous small conferences and meetings, permitting valuable discussions and interchange of ideas and viewpoints. It was a conference that no one who was present is likely ever to forget, and it is to be hoped that the place and time of the second such conference may be decided soon.

Forthcoming Events

December

7–10. American Inst. of Chemical Engineers, annual, Cincinnati, Ohio. (F. J. Van Antwerpen, 25 W. 45 St., New York, N.Y.)

8–10. American Nuclear Soc., winter, Detroit, Mich. (ANS, P.O. Box 963, Oak Ridge, Tenn.)

9–10. Conference on Learning Effectiveness, Univ. of Pennsylvania, Philadelphia, Pa. (Air Force Office of Scientific Research, Air Research and Development Command, U.S. Air Force, Washington 25.)

10–16. American Acad. of Optometry, annual, Boston, Mass. (C. C. Koch, 1502 Foshay Tower, Minneapolis, Minn.)

12–13. Association for Research in Nervous and Mental Disease, annual, New York, N.Y. (R. J. Masselink, 700 W. 168 St., New York 32.)

15–17. American Soc. of Agricultural Engineers, winter, Chicago, Ill. (J. L. Butt, American Soc. of Agricultural Engineers, St. Joseph, Mich.)

15–19. Radiation Biology, 2nd Australian conf., Melbourne, Australia. (J. H. Martin, Physics Dept., Cancer Inst. Board, 483 St. Lonsdale St., Melbourne, Victoria.)

17. Institute of Aeronautical Sciences, Washington, D.C. (R. R. Dexter, IAS, 2 E. 64 St., New York 21.)

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.)

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.)

(See issue of 17 October for comprehensive list)

Erratum: The American Rocket Society will meet in New York 17–21 Nov. 1958, and not 1–5 Dec. 1958.

Letters

Science Teaching

Many people will be interested in "1958 Parliament of Science," published in *Science* of 18 April [**127**, 852 (1958)], reporting the Washington, D.C., convention of the parliament on 15–17 Mar. 1958, conducted by the American Association for the Advancement of Science. However, the problems and recommendations must be supplemented by a practical program for the achievement of the aims and must reach those who have power to put the recommendations into effective practice, or the parliament has substantially failed.

Recommendations 51 through 55 stress the need to increase the subject-matter knowledge of people who are now teaching science and who propose to teach science. This can be accomplished in two ways: (i) Existing teachers must be given the credit which leads to higher salary if they take subject-matter courses in the liberal arts departments; (ii) prospective teachers must be permitted to substitute liberal arts courses for the education department courses presently required for certification. These reforms involve changes in university management and changes in the various state regulations, and both changes must be accomplished through political rather than scientific channels.

Recommendation No. 55 is the masterpiece of understatement in the whole report: "We believe that in many cases it is possible to reduce the number of hours in professional education courses required for certification or graduation, and that the corresponding increase in opportunity for other courses would improve teaching effectiveness." Every educated person knows that the world's great teachers, from Buddha, Aristotle, and Jesus Christ down to include most of our finest contemporary teachers, never had *any* courses in an education department.

We need a drastic reduction in the number of hours in professional education courses required for teacher certification or graduation. Science departments, not education departments, should select science teachers! A science-department teaching recommendation should be accepted legally as a substitute for, and in lieu of, education department courses. It is certainly not in the public interest that capable scientists, including even the President's science adviser, should be barred from teaching in the public schools by legal requirements imposed through the political influence of those less competent to judge qualifications of a science teacher.

A first step in improving science education and teaching is to get rid of the

arbitrary regulations which prevent the use of the potential talent we have. This will be difficult if not impossible under present conditions. The professional educationists now have political control of (i) the curriculum (what shall be taught) and (ii) teacher certification (who shall teach it). Published articles by educationists indicate that efforts to reduce this control will be resisted.

The United States education problem is too big to depend on the efforts of only one department (the education department) of the universities. The policy-making level and control must be widened to include representatives of all departments of American education—all university departments and all the learned professions. The narrow and limited background of the education department alone (or of any other single department) is inadequate. This plan has been tried and found wanting; yet California teachers wishing to improve their status encountered the following situation at the University of California (Los Angeles) summer session for 1958, as set forth in the official catalog: Department of education and physical education, 70 faculty members, 102 courses; department of physics, 6 faculty members, 14 courses; department of mathematics, 7 faculty members, 20 courses; department of chemistry, 8 faculty members, 11 courses. It is clear, here, that mere money and salary increases alone will not further the parliament's aims regarding improving science teaching. The education department would get ten times as much money as the mathematics department—and with no improvement in the teaching of mathematics.

The situation calls for a realistic, practical, and aggressive program by the American Association for the Advancement of Science, directed toward informing the public and appropriate officials that (in most states) the education department courses required for high-school teaching credentials are unnecessary and excessive and that the maintenance of such requirements is an obstruction to improved science education and teaching.

WILLIAM W. PORTER II
Los Angeles, California

Too Many Authors

A letter from Z. I. Kertesz [*Science* **128**, 610 (1958)] deplores references which use "*et al.*" after the first author's name, particularly when more than three authors are involved. There is cogent argument that, for anything short of a monographic treatment, the indication of more than three authors is not justifiable, in general. In fact, minor contributors should be listed—and their spe-