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SOME PROBLEMS OF AN EDUCATED MINORITY[1]

By Dr. OTIS W. CALDWELL

GENERAL SECRETARY, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SCIENCE has been a constant factor in the education which has brought these young men and women to this, their graduation exercises. Science represents but one division of all the studies and experiences they have encountered. During most recent years their studies have been focused toward special careers, all scientific, broadly speaking. Previous to this specialization they and thousands of companions were engaged in what we call general education. To-morrow and afterward they look toward enployment in which they may use their general and their scientific education. Some have already found positions, others will find positions suitable to their training and ambitions. Some will not be so fortunate, if we may judge by the average results throughout American higher education. These average results are not primarily to be credited to or confused with current unemployment, but go to even deeper foundations in the American system of general and special education.

In this country we promise general education to all who wish it. Furthermore, we have laws which require that all young persons participate, so that those who do not wish education are more or less forcibly exposed to it anyway. Then, the educational system was asked to extend its years and to broaden its program so as to provide a living place for youth well toward their maturity. Some of these older youth are in educational institutions because they wish to be; some because they are nowhere else.

It is not news to any college administrator nor to the head of any professional college that the present educational situation causes many educationally drafted

[1] Address at the graduation exercises of the Medical College of Virginia, June 6, 1939.

nitrocellulose cement. There is also a hole 0.5 mm in diameter just next to the window nearer the axis of the rotor to serve as reference point. About 30 cubic feet of air are required per minute if the pressure is 100 pounds per square inch. The stator should also be 7 cm in diameter.

The run is made in dim light or with a cover placed over the guard around the rotor until the record is desired, whereupon a distant light or a collimated beam is flashed on for about one second. This places upon the photographic film a spot representing the reference point, a boundary for the top of the tube or edge of the window, another for the liquid meniscus and a graduated image showing any boundary or optical inequality in the liquid from top to bottom. Only one record has been made for each run, but it should be easy to arrange a slit or opening which can be moved outwards to successive positions, and exposed in each.

This was developed for the study of petroleum products in non-aqueous solution, but we quote here some test runs on sedimentation velocity in earthworm blood diluted 10:1 with 1 per cent. potassium chloride solution. These can be made at the rate of several an hour, owing to the fact that the direct air-drive brings the rotor to full speed almost immediately, so that zero time can be taken when the air is full on. Instead of one tube, two to six can be measured simultaneously in the same rotor.

The duration of each sedimentation was 5 minutes. The values of sedimentation constant $s \times 10^{13}$ were successively 58.2, 57.7, 58.9, 55.5, 57.6, 53.7, 60.8; which, reduced to 20° C., become 59.2, 60.0, 61.0, 57.9, 60.0, 55.9 and 63.4. The mean is 59.6. Svedberg's values for $s_{20°}$ were from 56.4 to 64.3, mean 60.9.

The cylindrical tube is of course not radial, but this is of very minor importance. There is a controlled convection outwards, confined to within a few particle diameters of the periphery of the tube with the correspondingly small upward movement of all the remaining volume, thus giving a sedimentation velocity very slightly too small, as in the example given. If desired, the usual type of radial sectorial cell may be used. A detailed description of the rotor and stator will be published elsewhere.

It would appear that the ultracentrifuge in this form could now be made available for undergraduate classes in biochemisty and colloids.

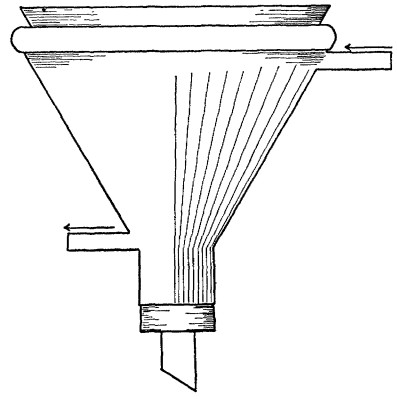
J. W. McBAIN
A. H. LEWIS

STANFORD UNIVERSITY

FUNNEL-HEATING DEVICE

WITH the necessity for frequently conducting hot filtrations has arisen the need for more efficient and practical means of keeping funnel contents hot than is afforded by older forms of funnel-heating devices. These forms, whether of coils or double-wall jackets, lack satisfactory heat transfer, making it difficult to keep alcoholic solutions boiling. There is also a serious fire hazard where gas heat has to be applied to maintain the temperature.

The present device, a front view of which is illustrated, consists of a single-wall metal jacket, which fits around the bell of a funnel and makes steam-tight connections by means of a rubber gasket at the top and a bored rubber stopper on the stem. The compressive stress in the rubber keeps the device locked tightly against the glass so that no leakage of steam occurs. Inlet and outlet nipples are provided for the steam. Since the steam impinges directly against the outer surface of the glass funnel, the heat transfer is at its maximum efficiency, and alcoholic solutions can be kept at the boiling point. If a steam line is not available, the device can be operated satisfactorily with steam generated in a flask on the laboratory table. Among other desirable features are the transferability from funnel to funnel, use with funnels considerably larger than the device itself and rugged construction. The device is patented and is now on the market.



FUNNEL-HEATING DEVICE

FIG. 1

L. N. MARKWOOD

BUREAU OF ENTOMOLOGY AND
PLANT QUARANTINE,
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BOOKS RECEIVED

CHILDE, V. GORDON. *Man Makes Himself.* Pp. xii + 275. 11 figures. Oxford University Press. $2.50.

LEE, OLIVER J. *Beyond Yonder.* Pp. 169. Illustrated. Chapman and Grimes. $2.50.

LONGWELL, CHESTER R., ADOLPH KNOPF and RICHARD F. FLINT. *A Textbook of Geology; Part I, Physical Geology.* Second edition, revised. Pp. xi + 543. 340 figures. Wiley. $3.75.

WELLS, GEORGE R. *The Art of Being a Person.* Pp. vii + 300. Appleton-Century. $2.50.

NEW BOOK AND INSTRUMENT CATALOGUES

AMERICAN LIBRARY ASSOCIATION, Chicago. *Booklist Books, 1938.* Pp. 64. Price, $0.75.

AMERICAN MUSEUM OF NATURAL HISTORY, DEPARTMENT OF EDUCATION, New York. *Motion Pictures for General Circulation.* Pp. 62.

BAUSCH AND LOMB OPTICAL COMPANY, Rochester. *The Educational Focus; Spring, 1939.* Pp. 24. Illustrated.

BELL AND HOWELL COMPANY, Chicago. *Filmo Topics; Spring, 1939.* Pp. 14. Illustrated.

CENTRAL SCIENTIFIC COMPANY, Chicago. *Cenco News Chats; No. 24, June, 1939.* Pp. 24. Illustrated.

CORNING GLASS WORKS, LABORATORY AND PHARMACEUTICAL DIVISION, Corning, New York. *Laboratory Glass Blowing with Pyrex Brand Glass.* Pp. 20. Illustrated.

DUTTON, E. P. AND COMPANY, New York. *News of Books and Authors; Vol. 1, No. 1, May–June, 1939.* Pp. 8. Illustrated.

FISHER SCIENTIFIC COMPANY, Pittsburgh. *The Laboratory; Vol. 10, No. 5.* Pp. 82–107. Illustrated.

FLEXROCK COMPANY, Philadelphia. *Hand Book of Building Maintenance; Second edition.* Pp. 56. Illustrated.

G–M LABORATORIES, Chicago. *G–M Comments; No. 11, April, 1939.* Pp. 8. Illustrated.

KIPP, P. J. AND ZONEN, Delft, Holland. *Galvanometers and Auxiliary Apparatus; List "Galvo 38."* Pp. 8. 7 figures. *Precision-Apparatus for the Measurement of Dielectric Constants (Dipole Measurements); Dipol 38.* Pp. 7. 4 figures.

LEITZ, E., INCORPORATED, New York. *Leica Photography; May, 1939; Vol. VIII, No. V.* Pp. 28. Illustrated. Price, $0.10.

QUARITCH, BERNARD, LIMITED, London. *Interesting Books on a Great Variety of Subjects; No. 562, 1939.* Pp. 120. Illustrated.

RADIO CORPORATION OF AMERICA, New York. *Television.* Pp. 19. Illustrated.

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The Science Press, Lancaster, Pa.

The Foundations of Science

By H. POINCARÉ

Pp. xi + 553.

Containing the authorized English translation by George Bruce Halsted of "Science and Hypothesis," "The Value of Science" and "Science and Method," with a special preface by Poincaré, and an introduction by Josiah Royce. *Price, postpaid,* $5.00.

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