SCIENCE

Vol. 87 FRIDAY, MARCH 18, 1938 No. 2255

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa. Garrison, N. Y.

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

THE PRESENT STATUS OF ANTHROPOLOGY[1]

By Professor RALPH LINTON

COLUMBIA UNIVERSITY

THE anthropologist modestly delimits his field as the study of man and his works; the most ambitious claim ever staked by any scientific investigator. Under such a definition there is no branch of human knowledge or activity which does not fall within the scope of his interest. Even astronomy or atomic physics can be included on the basis that, although the phenomena with which they deal are extra-human, the technique for investigating these phenomena and all knowledge which has been acquired regarding them are parts of man's culture. However, there is a wide divergence between the high hopes embodied in the anthropologist's delimitation of his subject-matter and the actual content of the science as it exists to-day. Anthropology was one of the last sciences to take form, and by the time it appeared it found the center of its hypothetical field already occupied by a series of other disciplines with well-developed techniques and extensive bodies of knowledge and theory. Whatever its ambitions, anthropology was compelled to find a place for itself in those areas which had not already been preempted. It became a sort of peripheral science working in the corners and interstices not covered by the older disciplines. Thus in the study of physical man it found itself confronted by the vested interests of anatomy, physiology and more recently genetics and turned its attention to the study of human variations and the classification of human types. In the study of individual behavior it has encountered the vested interest of psychology, while in the study of group behavior it has been confronted by history, sociology and economics. Its response to the challenge of the last three has been characteristic of its whole course of development. With history it evaded the issue by turning its attention to the great stretch of

[1] Address of the retiring vice-president and chairman of the Section on Anthropology, Indianapolis, December 30, 1937.

mentation Station, who wanted to know if I could suggest a method whereby the amount of free water in samples of forest vegetation could be determined with reasonable accuracy. It occurred to me that by determining the heat capacity of a sample of a plant tissue, then driving off the moisture and then redetermining the heat capacity, a measure of the amount of free water, which has a specific heat of approximately one calorie per gram per degree Centigrade, could easily be obtained.

A sample experiment convinced me that the method could be used to good advantage. For my test experiment, I selected a sample of potato tissue, and in order not to destroy any of the cell structure in the process, I cooled the sample to a temperature near the freezing point of water, then placed it in a calorimeter, the water content of which had a temperature slightly above that of the room and thus determined from the temperature fall of the water the heat capacity of my weighed sample of potato tissue.

After two days and nights of gentle drying on a moderately warm radiator, I determined the heat capacity of the dry residue, subtracting this heat capacity, which was quite small, from the original heat capacity. I found that the water originally in the potato had in that state an average specific heat of .70 calories per gram per degree, indicating that only a part of this water could have been present in the form of free water. The rest must then have been present in a chemically bound form.

Since the determination of free water in plant tissue is a somewhat cumbersome process, and at times yields dubious results due to the effects of maceration, I hope this description of a calorimetric method will be found useful by horticulturists, plant pathologists and others.

G. W. HAMMAR
UNIVERSITY OF IDAHO

AN IMPROVED TISSUE CULTURE CHAMBER[1]

THE observation of tissue cultures, made in the hanging drop on a cover glass, is often difficult because of the excessive and uncontrollable thickness of the drop, and also because of the curvature of its free surface. In addition, the spherical surface of the depression in the slide increases the optical difficulties. Although there are on the market hollow slides with a plane-parallel bottom of the chamber, all of them are so thick that even the employment of a long focused condenser can not render proper illumination.

To correct these imperfections, a chamber was devised which consists primarily of an ordinary slide, about 0.75 mm thick, with a round hole of about 1.5 cm in diameter, drilled through its center. This hole is bridged over by a cover glass which is cemented to the lower surface of the slide along the edge of the hole, thus forming a shallow container with a plane and thin bottom (Fig. 1) which obviates the optical difficulties mentioned above.

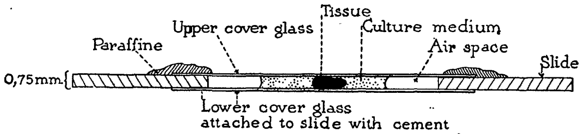

FIG. 1. Vertical section through the chamber. Note the plane-parallel surfaces of the chamber and the even thickness of the culture medium.

In preparing the tissue culture, one places the drop of the medium and the tissue particle in the center of the chamber so that the peak of the drop reaches slightly above the level of the upper surface of the slide; then the drop flattens out to a plane-parallel layer between the two cover slips. Care must be taken that the drop does not fill the entire chamber so that enough air space is left for the respiration of the tissue. The upper cover glass is sealed with paraffin in the usual manner.

The advantages of this chamber are: simplicity of construction, use of standard material (ordinary slide and cover glass), easy replacement of bottom when broken, elimination of surfaces causing optical disturbance and close proximity of culture to condensor.

GUSTAV ZECHEL
MEDICAL COLLEGE
UNIVERSITY OF ILLINOIS

[1] The work described in this paper is a part of the research done under Grant 277 made by the American Medical Association.

BOOKS RECEIVED

BAKER, MARY F. *Florida Wild Flowers.* Revised edition. Pp. xiii + 245. Illustrated. Macmillan. $3.50.

Bulletin of League of Nations Teaching, No. 4, December, 1937. The Teaching of the Principles and Facts of International Co-operation. Pp. 213. The League, Geneva. Columbia University Press, New York. $0.65.

GRABAU, AMADEUS W. *Palæozoic Formations in the Light of the Pulsation Theory, Vol. III, Cambrovician Pulsation. System, Part II.* Pp. xxx + 850. 58 figures. 3 plates. Henri Vetch, Peiping, China, $15.00; U. S., $5.50.

Hydrophobic Colloids; Symposium on the Dynamics of Hydrophobic Suspensions and Emulsions. Held at Utrecht, November 5 and 6, 1937, under the auspices of The Colloidchemistry Section of "Nederlandsche Chemische Vereeniging." Pp. 180. Illustrated. D. B. Centen's Uitgevers-Maatsch, Amsterdam. Dutch florins 4.

MORRIS, PERCY A. *Nature Photography Around the Year.* Pp. xviii + 251. Illustrated. Appleton-Century. $4.00.

Science Abstracts: Index to Vol. XL, 1937; Section A, Physics. Pp. xviii + 1278–1594. *Vol. 41, No. 482, February 25, 1938 (Abstracts 388–899).* Pp. 97–216. Each 3s. 6d. E. and F. N. Spon, London. Chemical Publishing Company, New York.