serves to extend our horizon in the biologic significance of viruses at a time when this is sorely needed. His account of symbiotic organisms is also timely. If their presence had always been recognized, some workers might have been spared waste of time and disillusionment in the search for organisms pathogenic for man and domestic animals. There is a very useful bibliography, a brief analysis of subjects and author and subject indices. The illustrations are excellent. The infections of insects are treated more thoroughly and more critically than has ever been done before. The volume should be of great service to biologists, pathologists, entomologists, public health officials and to all those who realize the economical and medical importance of insects in human welfare.

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FORAMINIFERA

Foraminifera, Their Classification and Economic Use, second edition, and *An Illustrated Key to the Genera of Foraminifera.* By JOSEPH A. CUSHMAN, Cushman Laboratory for Foraminiferal Research, Special Publication Nos. 4 and 5. Sharon, Massachusetts, 1933.

JOSEPH A. CUSHMAN, in 1928, issued, under the title "Foraminifera, Their Classification and Economic Use," the most comprehensive review of the Foraminifera published up to that time. In August of 1933 appeared a second edition of this work, revised and greatly enlarged, and accompanied by "An Illustrated Key to the Genera of the Foraminifera." In this new edition, many additional plates show the evolution of the genera and families, and several introductory plates illustrate the more common structures for the especial use of students beginning work on these forms. Also, many generic diagnoses new to the first edition have been added. The chapters on the two specialized fields of Fusulinidae and Orbitoididae were written by Professor Carl O. Dunbar, Yale University, and Professor T. Wayland Vaughan, respectively, specialists in these two fields.

The author has visited many of the foreign museums and examined their types, with the result that the types or topotypes of at least 95 per cent. of the known genera have come directly under his observation; so that the work is based upon actual material rather than upon the often inadequate original descriptions and figures. It is also apparent that this classification of the Foraminifera is based not alone upon the personal ideas formed during the author's thirty years of intensive study, but cognizance is taken of the best thought developed by the many workers since Brady's classification in 1884.

The extensive bibliography arranged by subjects which brings the volume to a conclusion will be an immense help to all students of these forms, as will also the ten introductory chapters upon the living animal, methods of study, distribution and other general topics.

In appearance these volumes leave nothing to be desired. Of a size convenient for handling, the excellent paper, type and unusually fine illustrations reflect great credit upon the Cushman Laboratory. The plates in the "Key" are particularly attractive and set forth a new feature, namely, the carrying out of the figures nearly to the edge of the plates, thereby permitting the placing of more figures on each plate and thus rendering possible direct reference from plate to description. The black background also brings out the details of the Foraminifera in a way that no other method would accomplish. Lastly, the fact that the plates can be used without constant turning, while one studies the various genera in the larger book, is a convenience that will appeal to every student. Students of the Foraminifera are to be congratulated that such a useful volume is available for their use.

R. S. BASSLER

SCIENTIFIC APPARATUS AND LABORATORY METHODS

RECOVERY OF CARBON TETRACHLORIDE[1]

IN the course of certain investigations in the laboratory of gastro-enterology at the Evans Memorial, extraction of fatty acids from previously treated bile is a part of a routine procedure.

Recovery of the carbon tetrachloride became desirable from the economic standpoint. In the course of the recovery the volatilization of the carbon tetrachloride resulted in distress among the laboratory workers. They developed nausea and dizziness. With the possibility that continued exposure to the fumes might result in chronic poisoning, the recovery of the carbon tetrachloride was studied whereby the fumes would not escape into the room and also be almost if not completely recovered.

The following method has been adopted and the apparatus for same is illustrated in Fig. 1. The carbon tetrachloride extract is placed in the Erlenmeyer flask (A). The flask is warmed by means of an electric heater. As the carbon tetrachloride is

[1] From the Department of Pharmacology, Boston University School of Medicine, the Evans Memorial and the Massachusetts Memorial Hospitals, Boston.

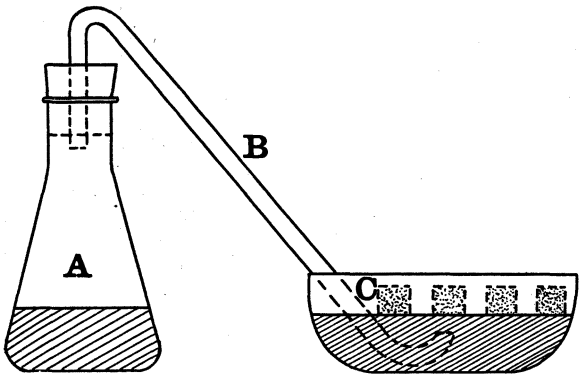

FIG. 1. Carbon tetrachloride recovery apparatus.

volatilized, it escapes through the tube. The distal end of tube (B) dips into and down to the bottom of a kidney-shaped enamel pan, which is filled to the depth of 1 or 2 inches with metallic mercury. On the surface of the mercury ice cubes (C) are placed in order to keep the mercury cool. The kidney-shaped pans are used so that they may encircle the electric heater when several extracts are volatilizing at the same time. Any suitable container for the mercury may be used.

When the electric heater is started, the volatilized carbon tetrachloride escapes through the distal end of tube (B) under the mercury. In its passage to the surface of the mercury it condenses and emerges as liquid carbon tetrachloride. The liquid carbon tetrachloride then can be readily poured off from the mercury and easily separated by use of a separatory funnel from the water which has resulted from the melting ice.

The advantages of this method are important from both the economic and health angle. Practically all the carbon tetrachloride can be recovered and the method is extremely simple. It does away with all escape of fumes into the room. Nine flasks have been used at one time, with no odor of carbon tetrachloride in the room. The distress complained of by laboratory assistants disappeared. Various other methods of recovery were tried, including removal by suction. None of them was capable of completely excluding the fumes. The method here reported has been used very successfully, is efficient and inexpensive.

W. L. MENDENHALL
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MILDRED HUNTSINGER

A SIMPLE AGITATION DEVICE[1]

A SIMPLE device for the moderate agitation of solutions is shown in the accompanying diagrams. All one side, except a strip B about one inch wide and running lengthwise, is cut out of a gallon oil-can A.

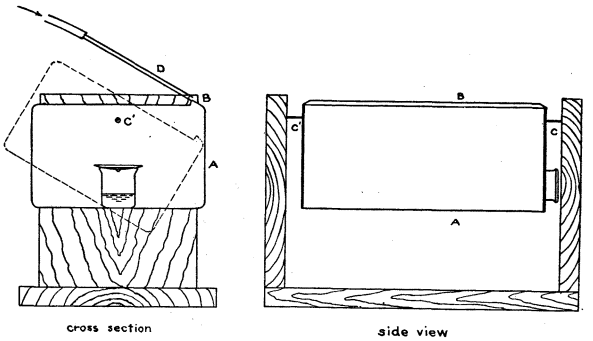

FIG. 1.

This strip is bent slightly upwards as indicated. The can is then mounted by means of nails between two upright boards. The holes in the can must be of such diameter that oscillation can occur freely. C and C′ indicate the positions of support.

When a stream of compressed air is passed through the glass tube D, striking the edge B, the can rocks back and forth on the nail supports. The amplitude may be controlled by regulating the air supply and the distance of the end of the glass tube from the edge of the can.

Vessels containing solutions to be shaken may be held in position by wires which are properly spaced and run lengthwise through the can. If beakers are used, watch glasses may be fastened on with rubber bands.

GRAHAM W. MARKS

A METHOD OF INCREASING THE YIELD OF DROSOPHILA

DURING the course of experimentation with different types of food media for raising *Drosophila melanogaster* at the University of Texas, the author discovered that the yield could be greatly increased by the addition of dried brewers' yeast to the culture media. Accurate counts were made under controlled conditions, and the yield was found to be about ten times greater after the addition of the yeast than in plain banana food and almost twice as great as in banana food with autoclaved fresh bakers' yeast added. When added to corn-meal food the brewers' yeast increased the yield in the ratio of 5:2. Since the yeast is very reasonable in price and convenient to handle, it should prove a source of great saving in the study of Drosophila.

The amount of yeast to be added depends on the richness of the food desired, but for general use about two grams per 100 cc of media will be satisfactory. It may be added as soon as the agar has dissolved and

[1] Contribution from the Scripps Institution of Oceanography of the University of California, La Jolla, California.