more difficult to penetrate, more time is needed to remove resistant material.

CLARIFICATION OF SPECIMENS

After the soluble material has been removed most specimens are far from clear or transparent. These pigments may usually be cleared by the addition to formic acid liquid of 3 per cent. hydrogen peroxide in amounts of about 5 ml at a time until it is cleared. The hydrogen peroxide is usually added when the second formic acid treatment is made. This bleaching effect may be accomplished also by the addition of chlorine water in the case of plant tissues, but this is not permissible with bees, grasshoppers or other forms of animal life composed of chitin in place of cellulose for their framework, as chitin is dissolved by use of chlorine water and the structure of the specimen is then destroyed. These reactions should go on at room temperature and should not be hurried by the aid of heat as the heat weakens the framework and leaves the material in a somewhat disintegrated condition.

TRANSPARENT SPECIMENS REVEAL COMPOSITION

The transparent specimens are not only of interest because they reveal parts which were hidden in the original material, but they call attention by the varying solubilities of the different materials to the differences in composition of the body parts as only cellulose, fat, lignin, carotin, chitin, etc., escape solution. Thus, a separation is made in the cold of materials which could not be removed except by methods which would destroy the specimen for purpose of study and examination. A large quantity of transparent plant and animal material has been prepared by this method. A few specimens have been photographed and one is shown in Fig. 1.

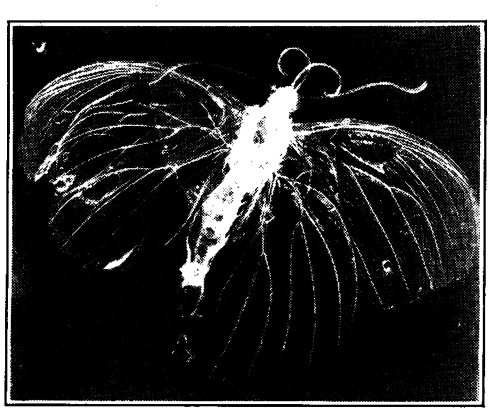

FIG. 1

The completed specimens are often so delicate and flimsy that they are difficult to handle out of water or to be prepared for photographing; they tend to tear or roll out of shape as soon as taken out of the water in which they may be kept in storage for a few days.

It was found that glass crystalizing dishes covered with watch glasses were convenient to use in preparing the specimens, as the delicate tissues, especially such as those of butterfly wings, could be held in place by watch glasses or lantern slides and thus be protected until the treatment is completed. This method of preparing transparent specimens is given with the hope that those who are working with plant and animal materials may find it useful in making more detailed examination of the whole bee or worm, etc., than was previously possible with the small sections for microscopic work. In addition, they form an attractive exhibit for the show window, especially when the specimen is held between two watch glasses (in 2 per cent. formic acid water, or other preservatives) and the edges waxed or taped to retain the liquid and so placed as to permit light from an electric light bulb to penetrate through the transparent specimen.

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BOOKS RECEIVED

DUBLIN, LOUIS I. and ALFRED J. LOTKA. *Length of Life: A Study of the Life Table.* Pp. xxii + 400. 53 figures. Ronald Press. $5.00.

EWING, SIR J. A. *Thermodynamics for Engineers.* Second Edition. Pp. xv + 389. 100 figures. Cambridge University Press, Macmillan. $6.00.

GLADSTONE, SIDNEY A. *Cardiac Output and Arterial Hypertension.* Pp. 56. The Author, New York. $1.00.

Guide to the Exhibition Galleries of Geology and Palaeontology of the British Museum (Natural History). Second Edition. Pp. vii + 74. 15 figures. 2 plates. The Museum, London.

HEITLER, W. *The Quantum Theory of Radiation.* Pp. xi + 252. 26 figures. Oxford University Press. $6.00.

LANDSTEINER, KARL. *The Specificity of Serological Reactions.* Pp. vii + 178. Charles C. Thomas. $4.00.

RAMSEY, A. S. *Hydrostatics.* Pp. viii + 169. Illustrated. Cambridge University Press, Macmillan. $2.35.

Records of the South Australian Museum. Vol. V, No. 3. Edited by HERBERT M. HALE. Pp. 255–394. Illustrated. The Board of Governors, Adelaide. 10s. 6d.

Report of the First Scientific Expedition to Manchoukuo under the Leadership of Shigeyasu Tokunaga. June–October, 1933. Section II, Part II. Pp. 58. Illustrated. Waseda University, Tokyo.

Scientific Reports of the Great Barrier Reef Expedition, 1928–29: Vol. I, No. 11. By C. M. YONGE. *Mode of Life, Feeding, Digestion and Symbiosis with Zooxanthellae in the Tridacnidae.* Pp. 283–321. 10 figures. 5 plates. Vol. 5, No. 2. By L. M. I. MACFADYEN. *Alcyonaria. (Stolonifera, Alcyonacea, Telestacea and Gorgonacea).* Pp. 19–71. 11 figures. 5 plates. British Museum, London. 5/- each.

The South African Journal of Science: Being the Report of the South African Association for the Advancement of Science. 1935 Paarl. Vol. XXXII, November, 1935. Pp. xlvi + 711. Illustrated. The Association, Johannesburg. 30s net.

ZIMMER, ERNST. *The Revolution in Physics.* Pp. xiv + 240. 58 figures. Harcourt, Brace. $3.75.