May it not be that hæmoglobin still appears in the blood of *Daphnia* as a functionless by-product of metabolism, as it must once have done in the early history of animals, before natural selection seized upon its potentially valuable property of reversible oxygenation ?

These results will be published in detail shortly. The investigation is being continued.

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Technique for Rearing Thrips in the Laboratory

Methods of rearing thrips in the laboratory have been described by Bailey[1] and Rivnay[2], among others. The following simple technique differs from their methods, and has been used with success at the Imperial College of Tropical Agriculture for work on the cacao thrips, *Selenothrips rubrocinctus* (Giard). Several other thrips, such as *Dinurothrips hookeri* Hood, *Hercothrips insularis* Hood and *Heliothrips hæmorrhoidalis* (Bouché), have also been reared by this method for life-history studies.

Thrips were reared in small solid watch glasses or small Petri dishes. The watch glasses were of the type used for embryological work and measured 40 mm. square with a cavity 32 mm. in diameter and 10 mm. deep. They were provided with close-fitting square glass covers. The Petri dishes were 50 mm. in diameter and 10 mm. in depth. A small piece of blotting paper was placed in the bottom of each watch glass or Petri dish and kept slightly moist.

Disks 18 mm. in diameter were cut from appropriate fresh leaves by means of a large cork borer. These leaf disks were used as food material, being placed on the blotting paper, which was kept no more than slightly damp. When conditions were too wet, moulds developed and the leaf disks rotted in a day or two. In favourable circumstances they remained in good condition and served as food for about a week or longer.

With this technique it was possible to make constant observations of all developmental stages of the thrips. Leaf disks could be readily removed from the watch glass or Petri dish with a pair of forceps, and the eggs, larvæ and other stages examined under a hand lens or binocular microscope. The immature stages and adults could be transferred when necessary to a fresh leaf disk by lifting them with a fine damp sable-hair paint-brush placed carefully beneath the abdomen. With care even the very delicate newly hatched first instar larvæ could be transferred in this way without injury.

No originality is claimed for the above method, but the following flotation technique appears to be new. This is a modification in which the cavity of the watch glass or lower Petri dish is filled with water or a nutrient solution and the leaf disk is floated on the surface of the liquid. Glass covers are unnecessary, as the immature stages at least show no inclination to leave the floating disk, due to the surrounding fluid. Adults of species such as the cacao thrips have little tendency to flight, but in others the adults fly readily from the leaf disks. If glass covers are used to prevent their escape, they usually become trapped in the liquid on which the disks float or in the condensed moisture on the inside of the covers.

An advantage of this flotation method is that the leaf disks remain fresh for an extended period, even for the duration of the life-cycle of the thrips. Disks containing eggs can therefore be cut from the leaves of infested plants and serve as food for the immature stages throughout their life. Stephenson[3] has shown that leaves from cacao plants grown with cultural solutions containing more than 50 p.p.m. of potassium are distasteful to the cacao thrips. The use of the disk flotation method with nutrient solutions instead of water may make it possible to compare the effect of various solutions on the palatability to thrips and other small sucking insects of small samples of their food material.

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'Water Excretory Threshold' as a Measure of Kidney Efficiency

In 1926 Rehberg[1] suggested that the function of a kidney might be measured by the extent to which intravenously administered creatinine could be concentrated during the elaboration of the urine. He also claimed that the creatinine clearance measured quantitatively the glomerular filtrate.

Comparison of the simultaneous creatinine and inulin clearances[2] gave rise to the view that creatinine was secreted by the renal tubules, since its clearance exceeded that of inulin. However, this discrepancy has been shown[3] to be due to the fact that the method of estimating creatinine used in these studies was not specific. If a sufficiently specific method be used, the endogenous creatinine clearance agrees with the inulin clearance and can, therefore, be safely assumed to measure glomerular filtration-rate.

Glomerular filtration-rate may, therefore, be expressed in symbol form as $U.V/P$, where U is the urinary concentration of creatinine, P the plasma concentration of creatinine and V the minute-volume of urine. The amount of fluid reabsorbed then becomes

$$\frac{U.V}{P} - V.$$

Barclay and Cooke[4] showed that for electrolytes a value for a reabsorptive threshold, or 'threshold plasma-level'[5], could be obtained by referring the amount reabsorbed per minute to a constant rate of glomerular filtration. A similar method may be used in the case of water reabsorption, and so obtain a value for the volume of water reabsorbed from each ml. of glomerular filtrate.

$$R = \frac{\frac{U.V}{P} - V}{U.V/P}.$$

Let $U/P = C$ (the concentration ratio of Rehberg).

$$\text{Then } R = \frac{C.V - V}{C.V} = 1 - \frac{1}{C}.$$