transmission disappear together (MacIntosh[10]), at a time when conduction in the preganglionic fibers is still unimpaired (Bacq and Coppée[11]).

(3) When Locke's solution containing no glucose is perfused through a ganglion, continued stimulation of the preganglionic nerve rather rapidly exhausts the mechanism of synaptic transmission, and the output of acetylcholine fails with it; both being promptly restored when glucose, lactate or pyruvate is added to the perfusion (Kahlson and MacIntosh[12]).

(4) Perfusion of a ganglion with Locke's solution lacking calcium, while it renders nerve fibers and ganglion cells abnormally excitable, in particular by K-ions, stops the release of acetylcholine by preganglionic impulses, and therewith synaptic transmission, both again being promptly and simultaneously restored by addition of calcium to the perfusion (Harvey and MacIntosh[13]).

Many observations by other workers could be cited, such as the important, though less direct, evidence of Cannon and Rosenblueth,[14] which Dr. Forbes mentioned. Even this limited selection, however, from those with which I have been directly in touch, seems to me to contain points worthy of critical examination by a supporter of a purely electrical theory, who, unless he can show that they are not valid as facts, should be prepared to explain how that theory accommodates them.

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THE USE OF PRONTOSIL AS A VITAL DYE FOR INSECTS AND PLANTS[1]

RECENT studies by the writer on the effect of sulfanilamide compounds on a leafhopper vector of a virus disease have resulted in some incidental observations of some general interest.

One of these compounds, Neoprontosil,[2] has proved to be a useful vital stain for both plant and insect. Young corn seedlings, with or without the roots cut off, take up the dye with extreme rapidity, it being a matter of seconds for the leaves to be visibly streaked with red. After a few hours, the entire plant may show the red color diffused throughout or the lower leaves only may be entirely colored, with color on the upper leaves showing only as streaks in some of the fibrovascular bundles.

When nymphs and adults of *Peregrinus maidis* Ashm., the corn leafhopper, were caged on these dye-saturated leaves, the presence of the dye in the insect could be easily observed through the body wall, after feeding a day or two.

The experiment was tried of caging three or four of the insects in a cage which limited feeding of the group to a portion of the leaf tissue less than 1 sq. cm in area. Under these circumstances, great variation in the amount of dye visible in the individual insects could be observed, varying from no outward evidence at all to complete diffusion through the body of the insect. An insect showing no evidence of coloration from the outside may still have ingested the dye, as may be seen from colored defecations. This variation in amount of dye absorbed may be due either to variations in the amount of feeding by individual insects or to differences in the permeability of the intestinal tracts of individuals of the same species or to the specific plant tissues reached by individual insects. This last alternative is not confirmed by experiments wherein the insects were fed on solutions of the dye through membranes. Again, similar differences in amount of visible dye were to be found, insects caged on a single membrane showing all the degrees of color variation from none to a dense red diffused color.

Solutions up to 5 per cent. strength have been used, with one per cent. sucrose added for food, when the dye was administered through membranes.

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FORMATION OF A LARGE ALCOHOL BEAD

A SLIGHT vacuum was applied to the residual lime mass in the preparation of absolute alcohol. The alcohol came over quite rapidly and formed a somewhat warm layer. As the rate of distillation became less, the drops of alcohol distillate were cooler and formed beads very readily on the surface of the liquid in the receiver. A short while later the surface of the alcohol had risen to touch the tip of the delivery tube, and a bead about 2.5 cm in diameter and hemispherical in shape was seen to be attached to the delivery tube. Distillation was proceeding at the rate of about 140 drops per minute, and the bead kept increasing in size, until at the end of 18 minutes it measured about 7.5 cm in diameter. The bead was in constant rhythmic pulsating motion, changing its shape from that of a wide shallow saucer-like object to that of a narrow deep bowl. It seemed to be much more highly refractive than the bulk of the alcohol distillate. Finally the bottle became so full of alcohol that distillation had to be stopped, and when the receiver was disconnected, the bead burst.

Thus, in the time during which the bead was observed, the volume increased from 4.1 cm^3 to 110.5 cm^3, and the total stable existence of this bead becomes

10 MacIntosh, *Jour. Physiol.*, 92: 22 P., 1938.
11 Bacq and Coppée, *Jour. Physiol.*, 92: 17 P., 1938.
12 Kahlson and MacIntosh, *Jour. Physiol.*, 96: 277, 1939.
13 Harvey and MacIntosh. In course of publication.
14 Cannon and Rosenblueth. *Am. Jour. Physiol.*, 119: 221, 1937.

1 Published with the approval of the director as Miscellaneous Paper No. 29 of the Pineapple Experiment Station, University of Hawaii.

2 Winthrop Chemical Company, Inc., 170 Varick Street, New York, N. Y.

about 19 minutes at a growth rate of 5.9 cm³ per minute.

It would, doubtless, be quite interesting to develop a technique and grow a large bead to find just how large and how stable it could be. Several attempts to do this have failed, and the phenomenon must be viewed as a combination of happy probabilities.

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SCIENTIFIC BOOKS

RECENT PUBLICATIONS OF THE BRITISH MUSEUM (NATURAL HISTORY)

THE war of 1914–18 reduced the publication of zoological research to about half its normal amount, but in the last few years there has been a complete recovery, so far as the total output is concerned. Had it been possible to maintain peace and provide opportunities for scientific cooperation all over the world, it was to be expected that the biological sciences would continue to develop at a constantly accelerating rate, to a future which we can hardly imagine. Knowledge would not only increase rapidly, but would be so organized in catalogues, monographs and the like that in spite of its bulk and variety, it would be increasingly usable. Mankind would come to an understanding of living nature far beyond that which was possible even a few decades ago.

In this great work the British Museum (Natural History) has long been a leader. Its catalogues, at first designed to enumerate the specimens in the Museum, soon developed into monographs of the various groups of animals—the birds, reptiles, fishes of the world; or detailed and beautifully illustrated revisions of particular groups, such as Boulenger's four-volume work on the "Fresh Water Fishes of Africa." Few people have any idea of the magnitude and importance of the British Museum publications, because they are rarely seen assembled together, and no one has occasion to consult all the different works dealing with so many different topics. It must be said, however, that these revisions and monographs not only serve the needs of specialists, but also contain much of general interest for the biologist, if he has patience to dig it out. The present review deals with some of the most recent publications, quite inadequately, yet perhaps with sufficient detail to arouse interest.

(1) *The British Mosquitoes.* By J. F. MARSHALL. Pp. 341. 1938. The author of this work, finding mosquitoes exceedingly abundant about his home on Hayling Island, became interested in their study and organized a control scheme in 1921. This led to the establishment of the "now well-known British Mosquito Control Institute, which has been ever since a centre for both pure and applied research upon mosquitoes, and is in addition an admirable educational museum." The British mosquitoes had been so extensively and intensively studied that one might have supposed there was nothing more to be done, but Marshall's book, dealing with every phase of the subject and beautifully illustrated, is outstanding for its originality and marks a great advance in our knowledge, as may be seen by comparison with the "Handbook of British Mosquitoes" published by the British Museum in 1920. I can strongly recommend this new mosquito book for consultation in all entomological laboratories, especially as a model for those doing graduate work.

(2) *Mosquitoes of the Ethiopian Region.* Part 1: *Larval Bionomics of Mosquitoes and Taxonomy of Culicine Larvae.* By G. H. E. HOPKINS, of the Department of Agriculture, Uganda. Part 2: *Anophelini, Adults and Early Stages.* By the late Dr. ALWEN M. EVANS, of the Liverpool School of Tropical Medicine. The first of these works (250 pp.) catalogues the species and records what is known of the larvae and their habits. The second book (404 pp.), by Miss Evans, has to do with the group which is concerned with the transmission of malaria and is therefore of prime importance in connection with public health. Miss Evans, long known as a keen student of mosquitoes, was fortunately able to visit Africa a few years ago, and after her return practically completed her monograph, and took it to the Museum. She was evidently ill at the time, and in August, 1937, she died, to the great regret of those who knew her or knew of her work. Dr. F. W. Edwards, of the Museum, saw the book through the press, adding some items to bring it quite up to date, and it was published in May, 1938.

(3) *Bombyliidae of Palestine.* By E. E. AUSTEN. Pp. 188. 1937. Major Austen, who was keeper of the Department of Entomology in the Museum, took part in the Palestine campaigns of 1917–1918, and while engaged in military service was struck by the number and variety and also the beauty of the Bombyliidae or bee-flies of that country. He accordingly collected all he could and brought together those which had been collected by others, and when on his retirement he found sufficient leisure for the work prepared the detailed and beautifully illustrated volume published in 1937. The results were astonishing: out of 128 species or varieties, 46 proved to be new. These flies are of economic importance, being parasitic in the larval state on other insects, some of them on injurious locusts.