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.