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The Order of Embryonic Determination of Several Organs in *Macrosiphum solanifolii*

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embryos have been removed from the narrow confines of the egg membranes.

DEPARTMENT OF ZOOLOGY,
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THE ORDER OF EMBRYONIC DETERMINATION OF
SEVERAL ORGANS IN MACROSIPHUM
SOLANIFOLII

K. A. STILES

Aphids in nature are normally either winged or wingless. However, it has been found that there also occur individuals which are intermediate in wing development: that is to say, some individuals have only partly formed wings and therefore are intermediate between the winged and wingless types. The production of large numbers of intermediate-winged aphids can be induced in the laboratory by artificial means such as certain combinations of light and temperature.

The author's studies indicate that the intermediate-winged individuals are the result of a change from winged to wingless as well as from wingless to winged. Histologically, the direction of change may be recognized by the condition of the wing muscles. Wing muscles of intermediates which resulted in a change from wingless to winged are normal histologically but reduced in amount, whereas wing muscles of those which resulted in a change from winged to wingless were degenerate in character. It appears possible, then, by environmental means, to bring about physiological changes which will reverse the direction of development; that is, a winged form can be changed into a wingless or vice versa. This change would seem, necessarily, to be due to environment rather than to genetical factors as the experimental aphids came from a parthenogenetical line in which there was only a minimum of opportunity for genetical variation.

The various intergrades of intermediacy produced by changing aphids from winged to wingless or wingless to winged made it possible to ascertain whether the several organs of intermediacy which included ocelli, wings, and wing muscles were determined all at one time or at different times in development. It was found that the wings, wing muscles and ocelli were determined in the embryo at different times. The order of physiological determina-

tion, not morphological appearance, in the embryogeny was wings, ocelli and wing muscles. This means that in the development of this animal the several organs considered are determined physiologically in linear order, the wings being first, ocelli second and wing muscles last. This is interpreted to mean in general that the organs are determined in a definite order in the embryogeny, but this is not the set thing which some have considered it to be as the general order is frequently disturbed by irregularities.

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A RAPID CELLOIDIN METHOD FOR THE ROTARY MICROTOME

G. L. WALLS

A method is described which combines the author's hot celloidin technique (see STAIN TECHNOL., VII, pp. 135-145) with a form of the clearing-before-cutting procedure. The method requires only 16-17 days and yields a block which may be cut in any microtome, the sections being as thin as those afforded by paraffin with comparable material. The advantages of celloidin over paraffin, listed in the author's earlier paper (*v. s.*), are retained in the present method which, though consuming more time than the hot process, requires less skill and gives superior results.

Demonstration:

STEPS IN A RAPID CELLOIDIN METHOD, WITH SOME RESULTS

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INHERITANCE OF RESISTANCE AND SUSCEPTIBILITY TO SALMONELLA AERTRYCKE IN MICE

H. O. HETZER

In previous reports by the writer and others it has been shown that the resistance of a strain of mice to controlled infections of *Salmonella aertrycke* could be greatly increased by selective breeding. After fourteen generations of selection for resistance to a standard dose of 2×10^5 organisms the mortality in the selected