

BOOK NOTICES

A CONTRIBUTION TO THE MORPHOLOGY AND BIOLOGY OF INSECT GALLS. By A. Cosens. (Reprinted from the Transactions of the Canadian Institute, Vol. IX., pp. 297-387, 13 pls., 1912.)

That aspect of cecidology which treats of the causes that are operative in the formation of insect galls and the manner in which the plant tissues react to the stimulus is one that has been much neglected, particularly by American students of the subject. Mr. Cosens' work throws considerable light on these interesting problems and is one of the most important contributions to our knowledge of the morphology of galls that has ever been published.

The greater part of the work is devoted to descriptions of the anatomy of sixty-eight kinds of American insect and phytoptid galls. The descriptions are arranged in the order in which the producers are classified, most of the gall-producing families, except those of the Coleoptera, being represented.

Although dealing mainly with matters that are chiefly of interest to the botanist, the author has also cleared up some important difficulties concerning the feeding habits of various gall-producing insects. Cynipid larvæ were found to secrete an enzyme which converts the starch in the nutritive layer of cells surrounding the larval chamber into sugar, which is taken up by the larva through the mouth. The cells of the larval chamber thus remain unbroken, and their inner surfaces present a marked contrast to the ragged cell-layer lining the cavities inhabited by inquiline larvæ. This view is confirmed by the discovery that though, contrary to current views, the intestinal tract in Cynipid larvæ is complete, an anus being present, no frass is expelled, as would be the case were the entire cells devoured, as they are in sawfly galls.

It is suggested that this ferment "may indirectly stimulate cell proliferation by storing the nutritive zone with an unusually large quantity of available nourishment, which can diffuse to all parts of the gall."

Adler's discovery that the gall of *Nematus vallisnerii* is partly formed while the larva is still within the egg, was confirmed in