

**ESSAYS ON
PHYSIOLOGICAL
SUBJECTS**

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Essays on Physiological Subjects by Gilbert William Child

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GILBERT WILLIAM CHILD

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PREFACE.

THE following Essays, with the exception of the last, were contributed anonymously to various Periodicals, during the years 1862—1864.

It has long been my intention to republish several papers so contributed, in a separate form, because they deal with subjects which, though by no means unimportant in themselves, at least in a theoretical point of view, have not received much attention from English physiologists.

I am now induced by special circumstances so far to anticipate my intention as to reprint, somewhat hastily, the few which follow, and which are concerned with questions affecting vegetable no less than animal physiology.

OXFORD, *Jan.*, 1868.

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ESSAY I.

REVIEW OF MR. DARWIN'S WORK ON THE FERTILIZATION OF ORCHIDS ^a.

WE owe the appearance of this very interesting work, as the author informs us on the first page, to the demand which has been made for facts in proof of the proposition laid down in the 'Origin of Species,' that 'in no organic beings can self-fertilization go on for perpetuity.' (Ch. iv. p. 101.) It requires, therefore, to be examined from two points of view; firstly, as an account in a popular form of the reproductive system of a remarkable class of plants; secondly, in regard to the support which it affords to the above proposition, itself only a collateral branch of the author's great argument for the development of species. We have spoken of this work as giving a popular account of the fertilization of orchids, but we desire especially to avoid the

^a 'On the various Contrivances by which Orchids are fertilized by Insects, and on the good effects of Intercrossing.' By Charles Darwin, M.A., F.R.S., &c. John Murray.

sense so often attached to the word 'popular' of something inaccurate or superficial. Mr. Darwin's book is popular only in so far as it makes no demand upon the reader for special or technical knowledge of botany, but only for an intelligent interest in the subject, and a reasonable amount of attention and thought.

It has been long known and still longer suspected by botanists, that the agency of insects is in some manner necessary to the fertilization of the greater number of orchids. Mr. Darwin's special design is to show, by a detailed description of what takes place in many of them, that the object of the whole arrangement is to secure the fertilization of each individual flower by pollen taken from another.

The main points in which orchids differ from most other flowers are, as many of our readers no doubt are aware, shortly as follows:—The reproductive organs are united into one central mass, called the 'column,' instead of being disposed in two circles. The anthers are in most cases reduced to one, and the pollen therein contained is united into masses by slender elastic threads, which are in many genera woven together and prolonged into a little stalk called the 'caudicle,' the three pistils are likewise joined together, and the stigma of one of them is modified into an organ peculiar to orchids called the

'rostellum.' This organ either consists of, or contains, viscid matter, and to a portion of it, called by Mr. Darwin the 'viscid disk,' which in some cases is prolonged into a 'pedicel,' the caudicles above mentioned are firmly attached. After this description, itself abridged from Mr. Darwin's introduction, we may hope to render what follows intelligible.

Commencing with the tribe *Ophreæ*, the author first describes the structure and action of the reproductive organs in the common orchis mascula, and it is worth mentioning that the description applies equally to the orchis maculata now^b to be found in bloom in our woods. Like all the ophreæ its pollinia are furnished with caudicles congenitally attached to the viscid disk. The anther stands above the rostellum. The latter organ is nearly spherical in shape and overhangs the stigma. It consists of a membranous bag, the upper and back part of which forms the disk, to which the caudicles are attached, and which contains a thick viscid matter. This membrane possesses the peculiar property of giving way upon the slightest touch, after the flower has expanded, in such a manner that while it retains its shape it sets the disk free. It resembles, in fact, a box of which the disk forms the lid; to the top of the lid is affixed the caudicle, and, to the internal surface, the viscid matter. The position of the parts is such that an

^b July 1862.