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FERTILISATION OF ORCHIDS.

EVERY one at all acquainted with the wonderful structure of this curious and interesting tribe of plants, should read and study Mr Darwin's admirable book on the Fertilisation of Orchids. There is to be found a mass of information, carefully detailed, which many scientific men may have passed over without being aware of its importance, either in a practical point of view—that is with reference to crossing and hybridising those varieties that are cultivated, whether native or exotic, in this country,—or in a more strictly speaking, scientific view—that is with reference to the beautiful contrivance by which many of them are inter-crossed by insect and other agencies.

There is probably not a gardener in the country but knows that bees carry pollen from flower to flower, and many of them are all anxiety, therefore, that choice sorts from which they wish to save seeds should be protected from such foreign agency; because, although it is a well-known fact that out of a thousand seedlings you may not have half-a-dozen any better, if so good, as their parent, still it is only by careful selection of parentage that you can depend upon an occasional extra fine variety. Few gardeners, however, are aware that the reproductive organs of Orchidaceæ are so beautifully and curiously constituted in all their parts, that a bee, by seeking its way into the orifice of one of the flowers, touches

the rostellum and so ruptures it that the viscid mass sticks fast to its back. The pollinia is thus detached from the anther case, and carried from flower to flower, fructifying all those with which the bee comes in contact. It was only the other day that we saw a bee with no less than four sets of pollen masses almost in a straight line across the back. The tropical houses in which East Indian Orchids grow are not favourable for bees in this capacity, owing to the great heat and the close confined atmosphere. Such houses as are best suited for growing plants from Demerara and New Guinea are far more favourable for them humming about in and seeking nectar from flower to flower, and at the same time becoming agents in the re-crossing of different varieties.

Mr Darwin shows beautifully how this is done, and through his work I was first taught the lesson of crossing not only varieties, but acting according to the view he holds, and which is borne out in some manner by practice, I re-crossed distinct species with the best effects as to producing fertile seeds. These seeds I have by various experiments attempted to germinate, and although I have not exhausted the methods by which success possibly may be attained, I have not yet been able to rear seedlings. Barring accidents, however, I am sanguine about being able to do so; and more, I am fortified in this opinion by the successful practice of Mr Dominy, foreman of the Messrs Veitch in Exeter Nursery, who is the first person in this country—and all honour to him for it—who has raised Orchids crossed by his own hand. Mr Darwin, however, in one of his communications to me, says that he is far from sanguine about being able to germinate the seeds which he has sown in his stove, as they are not able to do so even in the Botanic Garden at Calcutta; but it is perfectly well known that these Orchids sow themselves on the trees in their native country, and are sent home here from four to five years old and upwards. Mr Low, the very enterprising gentleman who has sent home so many fine things, Phalœnopsids included, from Borneo, is crossing all the Bornean sorts that he can lay his hands upon with the beautiful Schilleriana, also taking a leaf out of Mr Darwin's book, with the view of sending home distinct cross breeds. I myself have crossed these same two varieties successfully, and have sown the seed which appears to be nearly all fertile, so that I hope to be beforehand with Mr Low at all events, although my practice has not been such as to make me at all enthusiastic.

But the strangest part of the whole is yet to be told with reference to the seeding of this great division of plants, and one which puzzles

even the scientific mind of Mr Darwin. I submitted, for his inspection in particular, a seed capsule of *Dendrobium Cretaceum*, which was formed from a flower that never expanded, that it was impossible for any bee or insect to penetrate into, or disturb the pollinia in any way. I was the more particular in my observation of this particular capsule, as I had one of the same nature from a *Cattleya Mossiæ*, which struck me as very anomalous at the time; but as I had not carefully watched it during all its phases, I was not prepared to express a decided opinion as to whether it might or it might not be exposed to atmospheric agency.

The *D. Cretaceum* following so closely after, however, made me all attention to the peculiarity, and I can now aver that these flowers or that pollinia were in no way disturbed until the pod was fairly formed, unless it was by the occasional irritation of water from a syringe, which, judging from experiments of shaking the flower stems to induce fertilisation, and some of them being fertilised thereafter, might have some effect. Here is Mr Darwin's reply:—"I have looked at the seeds which you were so kind as to send me. At first *all* seemed good; but by searching I here and there find an empty testa, and the nuclei of a few were so transparent that perhaps they would shrivel up as they became dry. But I can confidently say that I have never seen (not that my experience is large) any *native* or exotic Orchid with so many perfect seeds. It is clear that your closed flowers admit, or rather favour, very perfect fertilisation."

We look forward to the next edition of Mr Darwin's book with considerable interest, as the various experiments that have been submitted to him must have had a tendency to throw new light on the whole subject; for we might gather from the above that some occult agency accelerates the work of reproduction, which certainly, although in a great measure performed by insect agency where the plants are indigenous, the above example goes a certain way to show.

THE STUDY OF NATURAL HISTORY.

THERE are few studies which present a wider field for mental exertion and improvement than natural history. It is a cause of regret that man, who is surrounded on every side by the immensity of the works and goodness of an all-wise and beneficent Creator, and now possessing facilities beyond any ~~former~~ age for the attainment of useful and scientific knowledge, should so rarely possess a desire of becoming acquainted with the sublime productions with which both the ~~sea~~ and the dry land are teeming. It must be admitted