

prevent the fluid necessary to maintain the proper moisture till another insect visits the flower more successfully. The insect now flies off with one or both of the pollen masses firmly attached and projecting like a little Charis. No anthers are these bodies in appearance that they have been described and figured as possessing frang, and indeed, within the few last weeks similar organs have been described to us from India as undoubted parasites.

But the question remains in this position, they would be chiefly used for impregnation, as the moment the insect sought another flower they would be thrust back or on one side, and no contact could take place between them and the stigma. A very curious contrivance has therefore been provided in order to effect the purpose. By some mechanical or vital action in the little oval membrane which was mentioned above, an attachment to the upper surface of the pollen, each pollen mass describes an arc of ninety degrees towards the tip of the protheca, and so becomes parallel with the part of the insect which is to be fertilised, and consequently is enabled to come in contact with the stigma. Now the surface of this is very glutinous, and the question whether the pollen mass remains attached would be between the tenacity with which it holds the pollen mass and that with which the pollen mass adheres to the pollen, for the pollen is so strongly glued to the insect that that at least is not likely to give way. Now if the whole of the mass were retained, only a single flower would be fertilised; but the effect in view is clearly to multiply the seed as much as possible, so only a very small portion may meet with such favourable circumstances as may insure their growth.* Another beautiful provision there has been made. The pollen-mass consists of a number of little distinct packets, each containing several pollen grains, attached behind to a network of delicate elastic threads, the common stalk of the mass also being highly elastic. In consequence, when the pollen-mass comes in contact with the stigma, instead of the whole mass giving way, a few only of the packets are left behind, and the insect flies off in succession to other flowers, till all are so exhausted. There is, however, still another circumstance worthy of notice in each packet containing numerous pollen grains, as the grains are numerous, each of which requires a distinct pollen tube, and, therefore, if a few pollen grains only fall on the stigma, most of the ovules would be abortive.

This is but one of the various instances which have been employed to ensure fertility, and it will be observed, contains several beautiful provisions, directed to a certain end, and showing as nice an adaptation of the mass to effect, as the several mechanical contrivances which ensure precision and steadiness of motion in a steam engine, or the keeping of equal time in a chronometer.

We should extend our limits altogether if we even alluded to other instances amongst our more normal orchids, in which the most varied means are used in the same end. We will only notice the strange exception which is afforded by the common bee-orchid, in which all impregnation is effected by a tickle, which has not escaped the notice of authors. The pollen masses here stand high where the viscidium, and in consequence their stalks are so long that they hang down loosely when they have separated from their cells, and they are then enabled at length to reach the stigma. Even here, however, an insect visiting the flower will have some pollen grains attached, and thus insure cross-impregnation as an exception to the general rule.

In most orchid stigmas it has one surface, but in *Cypripedium* there are two, and as the pollen grains themselves are glutinous, the complication of a reticulated being needless, it is altogether wanting.

It is impossible to pursue this matter any further. We must, however, notice one point of peculiar interest. Perhaps no organ amongst exotic orchids is more curious than Osmunda, in which the stigmas consist of two of the two leaves descending from the column causes the pollen mass with its stem and gland to stay off by means of the most curious mechanism with great force, and attach itself to some insect by whose means the plant may be fertilised.

But this is not exactly the point we have in view, but the relation of the genus to *Ajacis* and *Mimosa*. Sir H. Schomburgk found all the three genera contained on one stem. He found, moreover, that Osmunda was always barren, while *Mimosa* produced gigantic seed-pods, and he therefore supposed some difference in these orchids. Mr. Darwin has worked out the idea and has proved that *Osmunda*, with its dependent cysteine form, is the male plant, that *Mimosa*, the sterile form of *homo*, is the female, while *Ajacis* represents the hermaphrodite form of the genus.

We must now briefly advert to another subject, in which Mr. Darwin has proved himself equal to the most abstruse investigations.

The structure of the flower of orchids is so anomalous that the relations and true nature of the several parts has always been considered most perplexing. Mr. Brown, with his usual tact, went a great way towards the true explanation; but Mr. Darwin, at the suggestion of Dr. Hooker, instead of observing the parts in the normal condition, made some important parts, and which, according to the same authority, never speak plainly in horizontal sections, traced their course longitudinally, and thus discovered how each of the two central leaves, of which the two lower leaves form the sepals and petals, the sterile whorl of these stamens, two of which are abortive and confluent with the lip, a fourth of these stamens, all of which are abortive and confluent with the column, and the fifth of three styles, of which one is abortive and forms the postellum, and the other two are confluent, and which one or two separate or confluent stigmas. In *Cypripedium*, on the contrary, the three lower stamens are all abortive, the one corresponding with the sterile whorl of stamens which being represented by a singular shield, while two of the upper whorl are perfect, and the three stigmas are confluent, producing a single stigma without any postellum. The distance separating between *Cypripedium* and normal orchids is immense. The distance separating between *Ajacis*, another anomalous form, says Mr. Darwin, an "hermaphrodite," does not indicate to us the structure of the common parent form of an orchid, but they probably serve to show the state of the order in ancient times, when some of the forms had become so widely differentiated from each other and from the other plants in the existing orchids, and when consequently the

order had a more approach in all its characters than at present to such allied groups as the *Marantaceae*, or plants including the common Indian *Charis*.

Singular as the forms are which are assumed by these productions, it is all but certain that every anomaly has its special use. "The study of these wonderful and often beautiful productions, as well as those of the flowers, shows they have adaptations, quite capable of moving and other parts endowed with something so like, though in detail not different from sensibility. The flowers of orchids, in their strange and endless diversity of shape, may be compared with the great vegetable class of fishes, or still more appropriately, with the tropical lampbrush insects, which seem to us in our ignorance as if modelled by the wildest caprice."

We should not be doing justice to Mr. Darwin if we closed our notice without alluding to the confirmation of his general views afforded by the present condition of orchids, the relations of these which exist at the present day, and the departure from what may be presumed to have been the original type.

"Can we," he says, "in truth be satisfied by saying that such orchids were created exactly as we now see it on a certain ideal type? Did the Osmunda flowers having fixed on one plan for the whole order, did not the *Cypripedium* depart from this plan, that by therefore made the same organs perform diverse functions—often of differing importance compared with their proper function—converted other organs into more purposeful rudiments, and arranged all as if they had to stand separate, and then made them to cohere? Is it not a more simple and intelligible view that all orchids owe what they have in common to descent from some most archetypal plant, which, like so many others of the same family, retained its organs simple and unaltered, while others, in the course of their life, and thus the now wonderfully changed appearance of the flower is due to long years of slow modification,—such modifications having been preserved which were useful to each plant, during the constant changes to which the organic and inorganic world has been exposed?"

Such are the terms in which he states his views; and whether they be accepted with ease or less reservation, whether their general truth be allowed while certain modifications may be considered inadmissible, or whether they be regarded as more fanciful dreams of doubtful if not of dangerous tendency, one thing we least in doubt, that this treatise raises Mr. Darwin, to the rank of a distinguished naturalist, to the rank of the greatest living naturalist by very far. His book, like other works, is perfectly astonishing. It has power of observation, investigation, and experiment—what infinite skill, close reasoning, and sound judgment—and, after all, this is only a little episode in his great labours!

ART AND MUSIC.

THE ROYAL ACADEMY EXHIBITION.

[SECOND WEEK.]

281. G. E. O'Neil. *The Quaker and the Tea-potter*.—This may serve as a sample of various pictures exhibited through the exhibition, and which appear to represent some facts or each, with a spice of wild fun grilling the choice of them. "Mr. Stanger's" "Innocence, Day of Ajacis" is another instance. In Mr. O'Neil's picture we have a quaker shopkeeper who will not pay his taxes in money, but goes through the show of a distasteful tale of apocryphal. It might be hardly fair to criticise all manner of pictures of this class, mixed out with so much composition of expression and execution as the two which we have here; but we should spend time upon describing and appraising them individually, the art being extremely unimportant. Littering, even to a subject without special beauty or character, is a legitimate aim of art, as far as it goes; but the work of some. *Stanger's* makes an exceedingly small dinner out of an exceedingly small subject, in the ground that there is something in it which the operator will recognise as "funny," is not tolerable, and not to be noticed. "We say it is Mr. Stanger's, and not to Stanger's House." O'Neil and Stanger, who fill not much the small-sized ideal which they propose to themselves.

282. *Expit*. Chinese Ladies, the Property of the Majesty, painted by command.—A fine little animal, like a quagga, and, showing the traits of type of certain very grotesque breeds familiar to Chinese art. The colour is carried further than Mr. Expit's work, but continues here.

283. John Edward Lydell Knight, Esq., of Manchester Court, Somerset, painted by subscription, by subscription of the Friends and Acquaintances of Mr. Lydell.—This is one of the year's portraits which may be considered good, evincing the type of intense steady-concentrated responsibility, with complete ease and disinterestedness, though, as usual with our present school of portraiture, it reaches to little beyond this.

284. Englishes. Fruit.—A country-boy piping, and a blackbird warbling. Mr. Leighton has obtained so much of a bad of extraordinary rigour and sentiment in the signature of the hand, yet we consider this small picture a finished fellow, chiefly on account of the happy colour. A change in the white-brown smock, had might be something.

285. *Illness*. *Female of the Women working for a Piece of Money*.—This is one of a series of designs made by Mr. Killalee from the painting, and executed on wood. The general subject will be found in the Catalogue under a woodcut. (No. 100.) *Illness*—picture has been modified from its original source. It is a more vigorous and brilliant piece of middle-light effect, with a blue night-sky, touched with a mystery of the sun's primitive hue by the serene moon; the woman's face is of the contour, and gives all that is required by the subject in intensity of expression. Yet, with everything to praise and nothing to blame in this risk given of painting, we must add that it has no suggestions. We see a woman toiling for something on the floor, but not, in any special sense, the woman of the proverb. It may be mainly the work of the artist.

286. *Cremated and Reddified*. *The Halfway House*.—This is the best of Mr. Gower's contributions; pleasant and natural, so fresh, in its design, yet maintaining up to us by its standard of art. It is the "halfway house" between halfheartedness and capacity—no more.

* According to some it is the insect, depending the circumstances under which the seed of the orchid is deposited. Some of the insects are said to be the same as those which are the first insects to visit the flowers, and that they are the same as those which are the first insects to visit the flowers, and that they are the same as those which are the first insects to visit the flowers.



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