

heads gives them great consideration as warriors and men of wealth. But this uncomfortable custom, owing to the influence of the Sarawak Government, is gradually becoming a thing of the past. It is disappearing as European influence is spreading, and even now it is confined in a great measure to the more savage tribes. We pass with our author to Brunei, the capital of Borneo Proper, where he went on an official visit in April, 1851. He describes the appearance of Labuan, the British colony at the entrance to the bay on which the capital of Borneo is situated. He follows the course of the river, presenting a picture of the scenery in the midst of which the "Venice of the East" is built. He dashes off a description of the town and a portrait of the reigning sovereign, with a graphic power that enables the reader to realize both town and sovereign without much difficulty. He then takes you off with him, and introduces you to a new tribe, the Kayans of the river Baram. Here again we have strange manners and customs noticed, and the narrative is varied by amusing anecdotes and picturesque descriptive writing. The Kayans received Mr. St. John in a friendly manner. They talked to him at his first meeting about steamers, balloons, and rockets, and they particularly wished to know if we had a telescope that could discover the hidden treasures of the earth, as they had heard we possessed one that showed mountains in the moon. Mr. St. John entered freely into intercourse with them, drinking as they drank tumblerfuls of raw spirits, joining in convivial choruses, talking pleasantly and sociably, and generally suiting himself to his company with great tact and great success. He even went the length of becoming a brother of the chief by the singular ceremony of imbibing each other's blood, which was spread on a leaf of tobacco, and so smoked by each of them. While with the Kayans he went on a bird's nest-hunting expedition, which he describes in a very interesting manner. The edible nest is the workmanship of a species of swallow. They are found in caves, generally in the recesses of them. They look like pure isinglass, with some amount of roughness on its surface. They are about four inches round the upper edge, and appear like a portion of a whitish cap stuck against a wall.

We will not dwell upon the description of the Land Dayaks. The difference between them and those already noticed is not very remarkable. Perhaps the most curious customs mentioned are those by which a warrior is rendered invulnerable, and the strange ceremony of blood sprinkling which Mr. St. John was called on to perform at an unguarded moment. A long and interesting chapter is devoted to a full account of the religious services, sacrifices, ordeals, and omens of these primitive people. In it, perhaps, the most remarkable are the feasts and incantations connected with farming operations. They have a ceremony for blessing the seed, a feast of first fruits, a harvest home, and more extraordinary than all, an important service for "securing the soul of the rice."

Many readers will find the ascent of Kina Balu the most interesting portion of Mr. St. John's book. In the description of his ascent of that mountain he shows himself to be not only a man worthy of being enrolled among the muscular brotherhood of the Alpine club, but what, possibly, he will deem of more importance, a botanist, a naturalist, and a physical geographer of more than average attainments. Kina Balu terminates the chain of mountains that runs in a north-easterly direction from Sarawak, rising after a gradual elevation to a height of nearly 14,000 feet above the sea. There had been no very successful ascent before Mr. St. John accomplished it. In 1851, Mr. Low, Colonial Treasurer at Labuan, who accompanied our author on both his expeditions, had very nearly succeeded in reaching the summit. In 1856, Mr. Lobb, a naturalist, reached the foot of the mountain, but was not allowed to ascend it by the natives. In April, 1858, Mr. St. John and Mr. Low started on their first expedition, and got to the top, but only with great difficulty and danger. They were not satisfied with this attempt, and determined to make another in August, and this was perfectly successful. The second volume opens with the "Limbang Journal," the narrative of his exploring expedition among the tribes to the south-west of Brunei. This journey was no child's play. It was not a *biase* tourist's luxurious pleasure-trip up the Nile, with all his comforts provided for him by an obsequious dragoman, nor was it an idle sportsman's butchering pursuit of useless river birds. The voyage of discovery up the Limbang was a very different matter. We have not space to follow Mr. St. John's excursion to the islands of the Sulu Archipelago, and his account of the kingdom of Borneo Proper. The British colony of Labuan and the development of the government of Sarawak are described. We believe with Mr. St. John that the time is not far distant when Labuan will become a most important little colony, and will exercise a most beneficial effect upon the trade and life of the Indian Archipelago.

FERTILIZATION OF ORCHIDS.*

THE announcement of this wonderful volume will at once excite either apprehension or interest, in proportion as more or less of the theological element entered into the feelings with which Mr. Darwin's celebrated work on the origin of species by means of natural selection was regarded by its readers. Though forming only a part of one great whole, there is happily nothing in it which can immediately grate against the most sensitive theology; and now that one of the most ardent opponents of Mr. Darwin's views at the great Oxford meeting two years ago, has so far fallen in with them as apparently to allow the possibility of the whole ornithological world being derived from a single type, it can scarcely be apart from any consideration of the extent of his theory, to be taken by itself for at least what it is worth, and, if we mistake not, inasmuch as it trenches on less dangerous or rather perhaps less convertible ground, it will be received, as it ought to be received, with mixed feelings of admiration at the wonders which it unfolds, and the talent and patience with which they have been investigated. Most certainly, so far from justifying any one in considering the author as heretofore as a heathen man and an heretic for the enunciation of his theory, the whole series of the Bridgewater Treatises will not afford so striking a set of arguments in favour of natural theology as those which he has here displayed.

Every one is acquainted more or less with the family of orchids, either as

singular objects of cultivation in our stoves, or as profusely adorning the calcareous districts, especially, of this kingdom. The marked resemblance which many of them bear to insects, the strange variety of colouring which they exhibit, the extraordinary forms assumed by one or more of their petals, the immense length to which certain parts are produced, as the spur of *Angraecum sesquipedale* or the lateral petals of *Cypripedium caudatum*, and the peculiar mode of growth of many, on account of which they are known familiarly as air-plants, have always made them objects of interest. Those, moreover, who have examined their structure more closely, have found enough to puzzle them, and whether in point of the peculiar disposition of their constituent parts, or their mode of fertilization, it has fallen to the lot of but few botanists only, to form anything like comprehensive notions of their mutual affinities or external relations. Sprengel, as long ago as 1793, asserted, to use the words of Mr. Robert Brown, "that the pollen masses were applied directly to the secreting or viscid surface in front of the column, or, in other words, the stigmata, and that insects are generally the agents in the operation;" and Mr. Brown himself, in 1831, says, that with respect to the agency of insects in the fecundation of the two orders about which he writes (*Asclepiads* and *Orchids*), it is very frequently employed in the *Orchideae*. The fact, moreover, was pretty generally recognized after the appearance of his paper, that orchids in general are not fertile if left to themselves, and in consequence, since 1830, when the method was first employed by Morren, artificial impregnation has been successfully used in those species belonging to such genera as *Vanilla* and *Sobralia*, whose seedpods are of commercial importance under the name of Vanilla, or *Leptotes*, which has similar qualities. The plant more especially producing this condiment, is now successfully cultivated in Tahiti, Bourbon, and the East Indies, but it does not fruit without artificial aid, and for more than five and twenty years Mr. I. Henderson, A.L.S., the scientific gardener of Earl Fitzwilliam, has produced annually a large crop, first at Milton and afterwards at Wentworth, equal if not superior in quality to the finest imported samples. Where the necessity of artificial impregnation has not been recognized, or the proper insects have been wanting, the Vanilla plant has in vain been introduced, exactly as clover and some other leguminous plants, which depend on bees or other insects of peculiar species for fertilization, fail when introduced into countries where they cannot meet with their proper fertilizers.

Before the action of insects in the fertilization of orchids was generally recognized, several theories were brought forward to explain the mode of impregnation, but most of them depended far more upon fancy than upon any accurate knowledge of the parts of fructification. All that was really known by many was, that the situation of the stigma was such as in most instances to make impregnation impossible in the ordinary way, and, like most theories founded on inaccurate observation, they failed when put to the test of experience or closer research.

Up to the present time the agency of insects in the fertilization of orchids, though more or less generally recognized, has received no especial study, or at most only a study confined to a few isolated species. Mr. Darwin has now broken the ground effectually, and followed up the subject in all its bearings with the utmost patience and intelligence, and, though far from professing to have left little for future research, he has collected such a mass of facts as leaves the matter beyond all doubt. Nay, in many instances his reasonings and researches are such as almost to exhaust the subject.

The great object amongst organized beings in general seems to be, first, to insure fertilization, and then, in a great degree, for the sustenance of health and vigour, and the preservation of species true to their type, to avoid self-fertilization. We see in the animal kingdom striking examples of this amongst the hermaphrodite mollusca, such as the common snail, which seem incapable of self-fertilization, though either organ is perfect, and abundant examples exist amongst the multitude of hermaphrodite plants. Both the ends above mentioned are well exemplified in orchids, where in most cases not only is impregnation by insects secured by various contrivances, but the very process by which it is effected has often a tendency to drive off the insect to some other individual plant.

It is of course impossible to enter minutely into the subject, which could in many cases scarcely be understood without figures, or an accurate knowledge of the fructifying organs. We will therefore only glance at one or two, leaving those who are desirous of more complete information to have recourse to the work itself.

It is necessary to premise that above the proper stigma there is in the greater part of orchids a peculiar process called the rostellum, which projects over it, and, in combination with the lip, absolutely prevents the pollen from having immediate access to the stigma. This process is variously constituted, but, in different ways, generally produces a glutinous substance of greater or less tenacity, sometimes drying up, when exposed to the air, more rapidly than plaster of Paris—sometimes, on the contrary, drying very slowly. The end of this gluten is at some stage of growth to become attached to the pollen masses, and then to be glued to the proboscis or other part of the insects which visit the flowers, in order that they may carry them off and deposit them when in search of honey, or some other attractive substance contained in the substance, or secreted or situated on the surface of the nectary, or the part from which it springs, wholly or in part on the true stigma. This gluten is sometimes superficial, but sometimes it is more or less covered by the cuticle, and bursts out elastically on the slightest touch of the rostellum.

Let us take, as an example, the common purple orchid of our groves. In this the rostellum assumes the form of a little pouch, which contains two globular pellets of gluten, separated from its substance by a singular dehiscence of the upper cuticle, and constantly bathed in fluid, which in this case is necessary, as the gluten sets in a few seconds after it is exposed to the air. As each pellet is separated, a little oval portion of the cuticle remains attached above, and to this is fixed the stalk of each half of the pollen mass. Suppose, then, the upper membrane of the rostellum to be ready for rupture on the slightest touch, or to be already ruptured spontaneously, and a moth in search of food to thrust in its proboscis, so as to depress the pouch and expose its contents, the consequence in most cases will be that one or both of the pellets will be attached, and when the insect leaves the flower in consequence of the slight shock caused by the attachment of the strange body, he will be scared off to some other plant. Should it not have carried off either or both the pellets, the pouch springs up again elastically, and so

* On the various Contrivances by which British and Foreign Orchids are fertilized by insects, and on the Good Effects of Intercrossing. By Charles Darwin, M.A., F.L.S., &c.; with Illustrations, pp. vi. and 396. 8vo. London: John Murray. 1862.

preserves 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 *Clavaria*. So anomalous are these bodies in appearance that they have been described and figured as parasitic fungi, and indeed, within the few last weeks similar objects have been forwarded to us from India as undescribed parasites. Did the pollen masses remain in this position, they would be wholly unfit 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 oral membrane which was mentioned above, as attached to the upper surface of the pellets, each pollen mass describes an arc of ninety degrees towards the tip of the proboscis, and so becomes parallel with the part of the insect which is to be inserted, 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 lie between the tenacity with which it holds the pollen mass and that with which the pollen mass adheres to the pellet, for the pellet 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 fertilized; but the object in view is clearly to multiply the seed as much as possible, as only a very small portion may meet with such favourable circumstances as may insure their growth.* Another beautiful provision then 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 they are all exhausted. There is, however, still another circumstance worthy of notice in each packet containing numerous pollen grains, as the ovules 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 schemes which have been employed to ensure fertility, and, it will be observed, comprises several wonderful provisions, directed to a certain end, and showing as nice an adaptation of cause 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 exceed our limits altogether if we even adverted to other instances amongst our more normal orchids, in which the most varied means are used to the same end. We will only notice the strange exception which is afforded by the common bee orchis, in which self-impregnation is the rule,—a fact, it may be observed, which has not escaped the notice of authors. The pollen masses here stand high above the rostellum, and in consequence their stalks are so long that they hang down loosely when they have escaped from their cells, and they are thus 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 orchids there is but one anther, but in *Cypripedium* there are two, and as the pollen grains themselves are glutinous, the complication of a rostellum 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 genus amongst exotic orchids is more curious than *Catasetum*, in which the slightest touch on one of the two horns descending from the column causes the pollen mass with its stem and gland to start off by means of the most curious mechanism with great force, and attach itself to some insect by whose means the plant may be fertilized.

But this is not exactly the point we have in view, but the relation of the genus to *Myanthes* and *Monacanthus*. Sir R. Schomburgk found all the three genera combined on one stem. He found, moreover, that *Catasetum* was always barren, while *Monacanthus* produced gigantic seed-pods, and he therefore suspected sexual differences in these orchids. Mr. Darwin has worked out the idea and has proved that *Catasetum*, with its dependent irritable horns, is the male plant; that *Monacanthus*, destitute of horns, is the female; while *Myanthes* 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 position of the vessels which supply the more important parts, and which, according to the same authority, never speak falsely, in horizontal sections, traced their course longitudinally, and has thus established beyond all doubts their real relations. An orchideous flower consists of five whorls, each of three constituent leaves, of which the two lowest whorls form the sepals and petals, the third a whorl of three stamens, two of which are abortive and confluent with the lip, a fourth of three 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 rostellum, and the other two are confluent, and furnish one or two separate or confluent stigmas. In *Cypripedium*, on the contrary, the three lower stamens are all abortive, the one corresponding with the fertile anther of common orchids being represented by a singular shield, while two of the upper whorl are perfect, and the three styles are confluent, producing a trifid stigma without any rostellum. The distance therefore between *Cypripedium* and normal orchids is immense. This genus, together with *Apostasia*, another anomalous form, says Mr. Darwin, as broken groups, do not indicate to us the structure of the common parent form of all orchids, but they probably serve to show the state of the order in ancient times, when none of the forms had become so widely differentiated from each other and from the other plants as the existing orchids, and when consequently the

order made a nearer approach in all its characters than at present to such allied groups as the *Marantaceæ*, or plants including the common Indian Shot.

Singular as the forms are which are assumed by these productions, it is all but certain that every anomaly has its especial use. "The study of these wonderful and often beautiful productions, so unlike common flowers, shows their many adaptations, parts capable of moving, and other parts endowed with something so like, though no doubt really different from sensibility. The flowers of orchids, in their strange and endless diversity of shape, may be compared with the great vertebrate class of fishes, or, still more appropriately, with the tropical homopterous 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 adverting to the confirmation of his peculiar views afforded by the present condition of orchids, the relations of those 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 feel satisfied by saying that each orchid was created exactly as we now see it on a certain ideal type; that the Omnipotent Creator having fixed on one plan for the whole order, did not please to depart from his plan; that he therefore made the same organ to perform diverse functions—often of trifling importance compared with their proper function—converted other organs into mere purposeless 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 monocotyledonous plant, which, like so many others of the same division, possessed fifteen organs arranged alternately, three within three, in five whorls; and that the now wonderfully changed structure of the flower is due to a long course of slow modification,—each modification having been preserved which was useful to each plant, during the incessant 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 more or less reservation, whether their general truth be allowed while certain modifications may be considered indispensable, or whether they be regarded as mere fanciful dreams of doubtful if not of dangerous tendency, one thing at least is clear, that this treatise raises Mr. Darwin, to use the words of a distinguished botanist, to the rank of the greatest living naturalist by very far. His book, this critic remarks, is perfectly astonishing. What powers 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.

[FOURTH NOTICE.]

293. *G. B. O'Neill: The Quaker and the Tax-gatherer.*—This may serve as a sample of various pictures sprinkled through the exhibition, and which purport to represent mere facts as such, with a spice of mild fun guiding the choice of them. Mr. Morgan's "Income-tax, Day of Appeal," is another instance. In Mr. O'Neill's picture we have a quaker shopkeeper who will not pay his taxes in money, but goes through the show of a distraint upon his spoons. It might be hardly fair to omit all mention of pictures of this class, carried out with as much competence of expression and execution as the two which we here specify; but we cannot spend time upon describing and appraising them individually, the aim being absolutely unpictorial. Literality, even in a subject without special beauty or character, is a legitimate aim of art, as far as it goes; but the sort of semi-literality which makes an exceedingly small drama out of an exceedingly small subject, on the ground that there is something in it which the spectator will recognize as "funny," is "most tolerable, and not to be endured." We say it for art's sake, and not to disparage Messrs. O'Neill and Morgan, who fall not much below the small-souled ideal which they propose to themselves.

296. *Keyl: Chinese Lapdog, the Property of Her Majesty; painted by command.*—A funny little animal, like a spaniel-pug, and showing the truth of type of certain very grotesque beasts familiar in Chinese art. The colour is carried farther than Mr. Keyl's wont, but continues hard.

302. *Gordon: Edward Ayshford Sanford, Esq., of Minehead Court, Somerset; painted for presentation, by subscription of the Friends and Neighbours of Mrs. Sandford.*—This is one of the year's portraits which may be considered good, realizing the type of intense county-magistrate respectability, with complete ease and directness, though, as usual with our present school of portraiture, it reaches to little beyond this.

308. *Leighton: Duett.*—A country-boy piping, and a blackbird warbling. Mr. Leighton has obtained as model a lad of remarkable vigour and sensitiveness in the character of the head; yet we consider this small picture a decided failure, chiefly on account of its dingy colour. A change in the whitey-brown smock-frock might do something.

309. *Millais: Parable of the Woman seeking for a Piece of Money.*—This is one of a series of designs made by Mr. Millais from the parables, and executed on wood. The present subject will be found in the Octagon-room as a woodcut (No. 938); the oil-picture has been modified from it in various minor respects. It is a most vigorous and brilliant piece of candle-light effect, with a blue night-sky outside, touched with a mystery of dim prismatic hues by the serene moon; the woman's face is of fine contour, and gives all that is required by the subject in actuality of expression. Yet, with everything to praise and nothing to blame in this rich piece of painting, we must add that it has no suggestiveness. We see a woman looking for something on the floor, but not, in any special sense, the woman of the parable. It may be mainly the fault of the subject.

321. *Creswick and Bottomley: The Halfway House.*—This is the best of Mr. Creswick's contributions; pleasant and natural, no doubt, in its degrees, yet realizing nothing up to any true standard of art. It is the "half-way house" between inefficiency and capacity;—no more.

* Something remains to be known respecting the circumstances under which the seed of orchids germinate. Some of the most practical observers have had reason to think that the young plants are in the first instance parasitic. This was, at least, the opinion of Mr. J. Henderson, who had paid much attention to the subject.

preserve 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 thistle. The anthers are thus bodies in appearance that they have been described and figured as persistent fungi, and indeed, within the few last weeks similar objects have been forwarded to us from India as undescribed parasites. Did the pollen masses remain in this position, they would be chiefly useful 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 anthers which was mentioned above, as attached to the upper surface of the pollen, each pollen mass describes an arc of ninety degrees towards the tip of the pistil, and so becomes parallel with the part of the insect which it is to impregnate, and consequently is enabled to come in contact with the stigma. Now the action of this is very ingenious, 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 pistil, for the pistil 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 object in view is clearly to multiply the seed as much as possible, as only a very small portion may meet with such favourable circumstances as to insure their growth. Another beautiful provision then has been made. The pollen-mass contains a multitude of minute pistillate packets, each containing several pollen grains, attached behind to a network of delicate elastic threads, the common stalk of the mass 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 they are all exhausted. There is, however, still another circumstance worthy of notice in each packet containing numerous pollen grains, as the anthers 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 anthers would be abortive.

This is but one of the various schemes which have been employed to ensure fertility, and it will be observed, contains several wonderful provisions, directed to a certain end, and showing as nice an adaptation of means 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 northern 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 self-impregnation is the rule,—a fact, it may be observed, which has not escaped the notice of authors. The pollen masses here stand high above the rest, and in consequence their stalks are so long that they hang down loosely when they are swept from their cells, and they are thus 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 its exception to the general rule.

In most orchids there is but one anther, but in *Ophrys* there are two, and as the pollen grains themselves are glutinous, the complication of a pistil being twofold, it is altogether wanting.

It is impossible to pursue this matter any further. We must, however, notice one point of peculiar interest. Perhaps no genus amongst orchids is more curious than *Oncidium*, in which the slightest touch on one of the two leaves descending from the column causes the pollen mass with its stem and gland to start off by means of the most curious mechanism with great force, and attach itself to any 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 *Aspidistra* and *Mimosa*. Sir R. Schomburgk found all the three genera combined on one stem. He found, moreover, that *Oncidium* was always barren, while *Aspidistra* produced gigantic seed-pods, and he therefore suspected a difference in these orchids. Mr. Darwin has worked out the idea and has proved that *Oncidium*, with its dependent crystalline horns, is the male plant, that *Mimosa*, the deciduous form of *Aspidistra*, is the female; while *Aspidistra* represents the hermaphrodite form of the genus.

We must now briefly allude 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 position of the venule which supply the most important parts, and which, according to the natural tendency, and but thus established beyond all doubts their real relations. An orchidaceous flower consists of five whorls, each of three constituent leaves, of which the two lowest whorls form the sepals and petals, the staminal whorl of these stamens, two of which are abortive and confluent with the lip, a fourth of three stamens, all of which are abortive and confluent with the column, and the fifth of three stamens, of which one is abortive and forms the pistillate, and the other two are confluent, and which one or two separate or confluent stamens. In *Ophrys*, on the contrary, the three lower stamens are all abortive, the one corresponding with the female anther of common orchids being represented by a singular shield, while two of the upper whorls are preserved, and the three upper are confluent, producing a third stamen without any anther. The difference between *Ophrys* and common orchids is immense. This genus agrees with *Aspidistra*, another anomalous form, says Mr. Darwin, in broader groups, do not indicate to us the structure of the common parts from all orchids, 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 nearer approach in all its characters than at present to such allied groups as the *Mimosa*, or plants including the common Indian *Aspidistra*.

Regular as the forms are which are assumed by these productions, it is all but certain that every anomaly has its especial use. "The study of these wonderful and often beautiful productions, so unlike those of flowers, shows their many adaptations, parts capable of moving, and other parts endowed with something as like, though no doubt real, different from sensibility. The flowers of orchids, in their strange and endless diversity of shape, may be compared with the great varietal class of fishes, or still more appropriately, with the tropical homopneustic insects, which seem to us in its appearance as if modified 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 feel satisfied by saying that such orchids were created exactly as we now see it in a certain class type, that the *Oncidium* (Cassia), having fixed on one plan for the whole order, did not seem to depart from this plan, that he therefore made the same organs to perform diverse functions—often of differing importance compared with their proper function—converted other organs into more purposeless rudiments, and arranged all as if they had been made separate, and then modified them to others? It is not a more simple and intelligible view that all orchids owe what they have in common to descent from some most symmetrical plant, which, like an many others of the same division, was once often modified, and changed within three, in the first whorl, and then the two considerably changed systems of the flower in time to a long course of slow modification,—such modifications having been preserved which were useful in each place, during the moment changes in 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 more or less reservation, whether their general truth be allowed while certain modifications may be considered inadmissible, or whether they be regarded as more than a distant dream of doubtless if not of dangerous tendency, one thing at least is clear, that this treatise values Mr. Darwin, to use the words of a distinguished historian, to the rank of the greatest living naturalist by very far. His book, this critic remarks, is perfectly astonishing. "It has power of observation, invention, 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. R. O'Neil: *The Quaker and the Tea-potter*.—This may serve as a sample of various pictures exhibited under the exhibition, and which purport to represent some facts or acts, with a spice of mild fun grilling the choices of them. Mr. Morgan's "Innocence, Day of Atonement" 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 upon his spouse. It might be hardly too to omit all mention of pictures of this class, marked out with so much compassions of expression and execution as the two which we have specially; but we cannot spend time upon describing and appraising them individually, the aim being absolutely unimportant. Littering, even in a subject without special beauty or character, is a legitimate aim of art, as far as it goes; but the art of some. Mr. Morgan'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 for Mr. O'Neil, and not to displease Messrs. O'Neil and Morgan, who fill not much better the small-minded ideal which they propose to themselves.

282. Kipli: *Chinese Laying, the Property of the Majesty*, painted by command.—A funny little animal, like a squirrel, and, showing the traits of type of certain very grotesque breeds familiar to Chinese art. The colour is carried further than Mr. Kipli's mood, but continues hard.

283. John: *Edward Lytton, Knight, Esq., of Mowbray Court, Somerset*, painted for presentation, by subscription of the Friends and Enthusiasts of Mr. Lytton.—This is one of the year's portraits which may be considered good, evincing the type of intense steady magisterial responsibility, with complete ease and dominion, though, as usual with our present school of portraiture, it reaches to little beyond this.

284. Leighton: *Death*.—A country-lay plying, and a blackbird waiting. Mr. Leighton has obtained as model a lot of remarkable vigour and sentiment in the signature of the hand; yet we consider this small picture a doubtful failure, chiefly on account of its dingy colour. A change in the whiter-brown smock-belt might be something.

285. Wilton: *Female of the Wren*, working for a Piece of Money.—This is one of a series of designs made by Mr. Wilton from the painting, and executed on wood. The general subject will be found in the Catalogue under a woodcut. (No. 101.) Single pictures have been modified from it in various minor respects. It is a most vigorous and brilliant piece of sunlight-light effect, with a blue night-sky outside, treated with mystery of line and perspective line by the screen moon; the woman's face is of fine contour, and gives all that is required by the subject in intensity of expression. Yet, with everything to praise and nothing to blame in the rich play of painting, we must add that it has no suggestions. We are a woman holding for something on the floor, but not, in any special sense, the woman of the parable. It may be mainly the fault of the subject.

286. Cranston and Schreyer: *The Halfway House*.—This is the best of Mr. Cranston's contributions; pleasant and natural, as death, in its degree, yet maintaining up to us in very standard of art. It is the "halfway house" between efficiency and capacity—no more.

* Something remains to be known respecting the circumstances under which the seed of orchids germinates. Some of the most perfect specimens have been forwarded to us from India, and are in the first instance perfect. The seed, at least, the opinion of Mr. F. Bates, Darwin, who had paid much attention to the subject.