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XXXIII.—Supplement to a Catalogue of Irish Zoophytes

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rell's specimen was much smaller than mine, too much stress must not be laid on this circumstance. It deserves to be noticed, however, that this specimen had a gall-bladder like the *A. neglecta*, small yet quite distinct, which Mr. Yarrell's had not. Hence this organ is certainly sometimes present, and at other times absent, in the same species, unless we imagine, which I conceive very improbable, that the one here described was different from his.

The stomach was of the same form as in the *A. arvalis* and *A. neglecta*. The liver consisted of seven distinct lobes, five large and two smaller ones.

I have already stated that this specimen was taken at Aberarder, in Inverness-shire; and Mr. Thompson informs me, that, supposing it to be the *A. riparia* of Mr. Yarrell, he believes it to be the most northern British habitat for this species.

Swaffham Bulbeck, April 26, 1841.

XXXIII. — *Supplement to a Catalogue of Irish Zoophytes.* By ARTHUR HILL HASSALL, Esq. Read before the Natural History Society of Dublin, November 6th, 1840.

[With Five Engravings.]

Mr. Chairman and Gentleman,

As to many of my hearers the subject of the present communication, entitled a 'Supplement to a Catalogue of Irish Zoophytes,' published in the November Number of the 'Annals and Magazine of Natural History,' may be altogether new, I propose, before entering upon the consideration of it, to make some observations on Zoophytes generally. This course will, I hope, serve both to interest my audience, as well as to relieve, in some measure, the tediousness of a mere enumeration or technical description of species, which, however valuable to science itself, possesses but little to attract or engage the attention. The most careless wanderer on the sea-shore must often have noticed the beauty and delicacy of the conformation of these interesting productions, rivalling in their purity and freshness the element which they inhabit and adorn, and have been struck with wonder and admiration at the evidence of designing care which they so remarkably exhibit even in their general appearance. Nor is the beauty and elegance so observable in their outward form diminished by a closer inspection. If the power of a microscope be applied to them, and their more intimate structure be disclosed, new beauties

and wonders are made manifest to the admiring gaze. In this particular all natural productions differ from those of man and art, in whose works a minute examination renders apparent defects, rudeness and deformity.

But little more than a century has elapsed since the true nature of the productions about to occupy our attention was first discovered: prior to that period various opinions were entertained respecting them. By one class of persons, and these were by far the most numerous, they were regarded as the undoubted subjects of the vegetable kingdom, and were so arranged and classified in the various systems of the most learned botanists of that day. Nor is this to be wondered at, when we consider the striking resemblances which these objects bear to vegetables, both in form and habits; some of them being eminently arborescent in their mode of growth, and being fixed by roots, either imbedded in the sand, or attached to rocks, stones and other substances, in the same manner as sea-weed, and consequently being incapable of locomotion, a character at that time considered essential to constitute an animal, being possessed in common by all the animals then known.

By a second set of persons, at the head of whom stands the name of the illustrious Linnæus, all the horny and flexible Zoophyta were considered to hold a station intermediate between the animal and vegetable kingdoms, partaking of the nature of both. The Lithophyta were, however, arranged by him in the animal kingdom, on the supposition that lime was always an animal product. "The animalcules of the Lithophyta, like the testaceous tribes," he said, "fabricated their own calcareous polypidom, forming the whole mass into tubes, each ending on the surface in pores or cells, where alone the animal seems to dwell; but the polypes of the proper Zoophyta, so far from constructing their plant like polypidoms, were, on the contrary, the productions or efflorescences of it; just as the flowers do not make the herb or tree, but are the results of the vegetative life proceeding to perfection. Polypes, according to this fancy, bore the same relation to their polypidom that flowers do to the trunks and branches of a tree; both grew by vegetation: but while the one evolved from the extremities blossoms, which shrunk not under external irritation, and were therefore properly flowers, the other put forth flowers, which, because they exhibited every sign of animality, were therefore, with reason, considered animals." In a letter to Ellis he remarks, alluding to the Zoophytes, "they are, therefore, vegetables, with flowers like small animals." In his 'Diary' he further observes, that they are "vegetables with re-

spect to their stems, and animals with respect to their florescence."

By a third party Zoophytes were deemed to be of a mineral origin. This theory was particularly advocated by Henry Baker: "The rocks in the sea on which these corals are produced," he says, "are undoubtedly replete with mineral salts, some whereof, near their surface, being dissolved by the sea-water, must consequently saturate with their saline particles the water round them to a small distance, where, blending with the stony matter with which the sea-water always abounds, little masses will be constituted here and there and affixed to the rocks. Such adhering masses may be termed roots, which roots, attracting the saline and stony particles, according to certain laws in nature, may produce branched or other figures, and increase gradually by an apposition of particles becoming thicker near the bottom, where the saline matter is more abounding, but tapering or diminishing towards the extremities, where the mineral salts must be fewer in proportion to their distance from the rock whence they originally proceed; and the different proportions of mineral saline particles of the stony or other matter wherewith they are blended, and of marine salt, which must have a considerable share in such formations, may occasion all the variety we see. Nor does it seem more difficult to imagine that the radiated, starry, or cellular figures along the sides of these corals, or at the extremities of their branches, may derive their production from salts incorporated with the stony matter, than that the curious delineations and appearances of minute shrubs and mosses on slates, stones, etc., are owing to the shootings of salts intermixed with mineral particles; and yet *these* are generally allowed to be the work of mineral steams or exhalations." It is scarcely necessary to observe, that the whole of the theories of which I have given but a very short outline, highly ingenious and interesting as they are, are yet untenable: the beautiful and poetic hypothesis of Linnæus is, however, the nearest approximation to the truth. We learn from Dr. Johnston's excellent 'Introduction to his British Zoophytes', from which I have had occasion to quote largely, when speaking of the opinions of Linnæus, and to which I must again refer when mentioning those of Ellis, that Ferrante Imperato, an apothecary in Naples, was the first naturalist, according to M. de Blainville, distinctly to publish as the result of his proper observations the animality of corals and madrepores; and he is said to have accompanied the description of the species which fell under his notice with illustrative figures of considerable accuracy. His 'Historia Naturale' was printed at

Naples in 1599; but although again reprinted in 1672, the book and the knowledge it contained had sunk into such oblivion, that when Peyssonnel, in the year 1727, communicated the same discovery to the Academy of Sciences in Paris, it was received by the members of that learned body in a manner which is sufficient to convince us that it was entirely new to them, and exposed the author to the obloquy and censure which are the usual portions of an original discoverer.

To John Ellis, however, a merchant in London, is to be accorded the honour of having placed the fact of the animality of Zoophytes beyond all doubt or controversy. The inquiries entered into by this individual were prosecuted with an ardour and a diligence worthy of the subject, and affording a bright and refreshing example for others to imitate; and it is pleasing to notice, that the zeal he displayed and the labour he bestowed were amply recompensed by the importance of the results to which his investigations led. "There was nothing unformed or mystical in Ellis's opinion. Certain marine productions, which, under the names of Lithophyta and Ceratophyta, had been arranged among vegetables, and were still very generally believed to be so, he maintained and proved, with a most satisfactory fulness of evidence, to be entirely of an animal nature, the tenements and products of animals similar in many respects to the naked freshwater polype. By examining them in a living state, through an ordinary microscope, he saw these polypes in the denticles or cells of the zoophyte; he witnessed them display their tentacula for the capture of their prey; their varied actions and sensibility to external impressions and their mode of propagation; he saw further that these little creatures were organically connected with the cells, and could not remove from them, and that although each cell was appropriated to a single individual, yet was this united by a tender threadly line to the fleshy part that occupies the middle of the whole coralline, and in this manner connected with all the individuals of that coralline. The conclusion was irresistible: the presumed plant was the skin or covering of a sort of miniature hydra,—a conclusion which Ellis strengthened by an examination of their covering separately, which he said was as much an animal structure as the nails or horns of beasts, or the shell of the tortoise: for it differs from sea-plants in texture as well as hardness, and likewise in their chemical production; for sea-plants, properly so called, such as the Algæ, Fuci, etc., afford in distillation little or no traces of a volatile salt; whereas the corallines afford a considerable quantity, and in burning yield a smell somewhat resembling that of burnt horn and other animal substances, which of itself is a

proof that this class of bodies, though it has the vegetable form, yet is not entirely of a vegetable nature."

Among the many recent cultivators of this interesting department of natural history, the name of Dr. Johnston of Berwick stands pre-eminent, whose excellent work on the British Zoophytes has done much to exalt the subject, and to diffuse a more general taste for its cultivation. I trust that ere long we shall be favoured with a second volume on the Zoophytes of Great Britain by that gentleman.

The term *Zoophyte* is applied to all those productions which, bearing a strong resemblance to vegetables in form and some other particulars, are yet of an animal nature. The more arborescent of them are often called corallines, a name which is peculiarly appropriate, being a derivative of the word coral, to which they are intimately allied, and by means of which such gigantic changes are daily being effected. Islands, and I might almost say, without incurring the charge of exaggeration, continents are being raised from the deep abysses of the ocean, to be, perchance, at some future period clothed with vegetation, and peopled like unto our own fair land—to be the arena on which many eventful scenes in the world's history are to be performed; and these mighty results are to be brought about by the agency of insects scarcely perceptible to our unaided sight, but whose operations, though slow, silent and invisible, are yet certain and unceasing:—

"Unconscious, not unworthy, instruments,
By which a hand invisible was rearing
A new creation in the secret deep.
Omnipotence wrought in them, with them, by them;
Hence, what Omnipotence alone could do
Worms did. I saw the living pile ascend,
The mausoleum of its architects,
Still dying upwards as their labours closed:
Slime the material, but the slime was turn'd
To adamant by their petrific touch;
Frail were their frames, ephemeral their lives—
Their masonry imperishable."

In nothing is God's infinity and man's littleness more strikingly exhibited and contrasted than in the operations of nature upon a grand scale, and this is particularly evident in the instance of the formation of coral islands to which I have referred. The extreme simplicity of the means employed for the attainment of such vast ends cannot but be a subject of astonishment and admiration to every reflecting mind, and this simplicity is apparent in all the ways and workings of nature. How different is it with man's designs; how compli-

cated are the means which he employs for the attainment of his projects; and often how inefficient are they for the fulfilment of the end proposed, and how easily are they overturned and annihilated by the intervention of some natural cause—his greatest labours and most cherished hopes frequently being dashed to the ground or buried in the deep by some earthquake or storm!

“Zoophytes,” to adopt the language of Dr. Johnston, “present to the physiologist the simplest independent structures compatible with the existence of animal life, enabling him to examine some of its phenomena in isolation, and free from the obscurity which greater complexity of anatomy entails. The means of their propagation and increase are the first of a series of facts on which a theory of generation must arise; the existence of vibratile cilia on the surface of the membrane, which has since been shown to be so general and influential among animals, was first discovered in their study, and in them is first detected the traces of a circulation carried on independently of a heart and vessels. The close adhesion of life to a low organization; its marvellous capacity of redintegration; the organic junction of hundreds and thousands of individuals in one body, the possibility of which fiction had scarcely ventured to paint in its vagaries, have all in this class their most remarkable illustration.”

I have ascertained that all the more transparent Zoophytes possess highly luminous properties. This fact I first discovered in a specimen of *Laomedea gelatinosa*, and subsequently in a great variety of other species. If a portion of it, adhering to the sea-weed to which it is attached, be taken from the water and agitated, a great number of bright phosphorescent sparks will be emitted; these sparks proceed from each of the denticles of the coralline containing polypi, and the phenomenon is equally apparent, whether the specimen be in or out of water. The imagination could scarcely conceive a more beautiful spectacle than would be furnished by the shining of countless myriads of these tiny lamps, lighting up the dark recesses and caves of the ocean. I lately had an opportunity of beholding this novel and interesting sight of the phosphorescence of Zoophytes to great advantage, when on board one of the Devonshire trawling-boats which frequent this coast. The trawl was raised at midnight, and great quantities of corallines were entangled in the meshes of the network, all shining like myriads of the brightest diamonds. I would advise any person wishing to witness this beautiful spectacle on a large scale, to sally forth some dark night to the sea-shore, and disturb, either with a stick or the foot, the sea-wrack left by the

receding tide, among which numerous corallines will be imbedded, particularly if a high wind have prevailed during the day. Although I have not as yet had an opportunity of carrying into effect what I here recommend, I am convinced that any individual who would be at the trouble and possessed sufficient resolution to leave a warm fire at this uninviting season, and encounter the rough, but refreshing sea-breeze, would meet with an ample reward for the labour bestowed and self-denial exercised. The fact of the phosphorescence of one species of *Sertularia*, *S. pumila*, was, I have lately learned, discovered by Stewart some time since; but the announcement of it did not, it appears, lead to further inquiries into this interesting subject.

An important distinctive character between Ascidian Zoophytes and those of other classes, may be derived from the arrangement of the tentacula. In the Ascidian type of Zoophytes the tentacula are arranged in a determinate order, being disposed either in a crescent, as in some freshwater species, or in the form of a bell, as in the marine orders of this class; whereas in the Hydroid, Helianthoid and Asteroid classes they do not describe any regular figure, but are irregularly disposed around the mouths of the polypi. An Ascidian zoophyte, therefore, may at once be distinguished from all others by observing the arrangement of the tentacula, and without reference to internal organization. It is difficult to conceive anything more strikingly beautiful, on a small scale, than one of these Ascidian Zoophytes viewed under the field of a microscope: the regular and elegant cup-like form described by the tentacula; the ceaseless and rapid action of the cilia; the uniform direction of the current which flows over these, carrying with it numberless revolving particles, some whereof are destined for the little creatures' sustenance; and all these, if seen through a strong light, clothed in the brightest prismatic colours, cannot fail to elicit the admiration of the beholder. Should the slightest motion occur to disturb it, the polype instantly withdraws itself within the shelter of its little habitation, at once its home and its grave, and is concealed from sight; its beauties are however again displayed as soon as the agitation of the surrounding water ceases. It is difficult, I say, to conceive a more beautiful or interesting spectacle than is furnished by a *single* polype when thus viewed; but what must be the appearance formed by the countless thousands of these animals which daily thus display themselves, peopling cave, rock and pool! and yet nearly six thousand years have elapsed since their first creation before the eye of man rested on them.

Not amongst the least pleasurable of the emotions which we experience in the study and contemplation of these beautiful productions, is that feeling of health and vigour which attends us in our excursions in search of them. At one time wandering upon the smooth and golden strand, exploring among the tangled sea-wrack left by the receding tide for these minute treasures of creation; now diving into some deep and dark caverns, in which the waves roar and dash against the rocks with terrific violence, but still producing an effect upon the mind pleasing and enchainning; at another stretching oneself at full length beside some clear and liquid pool, in which the most beautiful and diversified landscapes may be described—rocks, trees, shrubs and flowers in miniature, all are palpable to the least imaginative mind, the colours of the sea-weed rivalling the brightest and most varied tints of an autumnal forest.

How superior, in the purity and satisfaction resulting from their pursuit, are the pleasures which we derive from the contemplation of the works of God, as manifested in the creation, to those sought after, by so many, and with such eagerness, in crowded and bustling cities!

“I care not, Fortune, what you me deny;
You cannot rob me of free nature's grace;
You cannot shut the windows of the sky
Through which Aurora shows her bright'ning face;
You cannot bar my constant feet to trace
The lonely shore at dewy morn and eve.
Let health my nerves and finer fibres brace,
And I their toys to the *great* children leave:
Of nature, feeling, virtue, nought can me bereave.”

Among the uses of these minims of creation, one of the highest appears to me to be, that of exciting in the mind of man a spirit of inquiry, calculated to detach his thoughts from the sordid selfishness of worldly occupation, and to raise them with feelings of admiration and love to that Omnipotent Being, who at the first formation of things pronounced all his works “very good.”

Entreating the attention of the Society for a short time longer, I shall at once proceed to the consideration of the matter of the ‘Supplement’ itself.

The species are enumerated in the order in which they occur in Dr. Johnston's ‘Zoophytes.’

Coryne squamata. Found growing upon *Fucus siliculosus*, opposite Sea-point, south side of Dublin Bay, above low-water mark.

Hermia glandulosa. This species sometimes attains a height of three inches. The glandular heads of the tentacula appear to be

furnished with minute cups, similar to those of the Cuttle-fish, by means of which the polypi are enabled to hold their prey; and not, as stated by Mr. Lister, covered with "short projections, like blunt hairs." The reproductive gemmules are supported on a short foot-stalk, and are fewer in number and several times larger than those of the preceding species.

Dublin Bay, on various Fuci; not common.

Tubularia larynx. Both varieties of this species are trawled up in great abundance off Howth and Lambay. They are also found attached to the under surface of stones, on the east side of Kingstown Harbour.

Thoa muricata.—Giant's Causeway.

Sertularia Margareta. Polypidom branched, branches alternate; rachis straight; cells nearly opposite, ovato-tubular, contracted on the outer side; vesicles 4-sided, armed with 8 long teeth.

This species, in the absence of its remarkable vesicles, requires a very careful examination to distinguish it from *S. abietina*. There are, however, well-marked differences between them. The stem in this species is straight, whereas in *S. abietina* it is flexuose; the cells are more nearly opposite, and are contracted on the outer side; apertures plain. The branches are alternate; there are three cells on the rachis in the interval between each branch. Vesicles 4-sided, very large, increasing in size at the distal end, and armed near the summit with 8 stout spines, two placed at each angle.

To this new and interesting species I have assigned the Christian name of a lady, distinguished not only for an ardent love of the works of nature, but as a zealous collector in various branches of natural history on these shores. See Plate VI. fig. 3, 4.

A *Sertularia* is figured and described in Ellis's and Solander's 'Zoophytes' under the name of *S. pinaster*, which bears a considerable resemblance to the above. I do not, however, believe them to be of the same species, as the vesicles in this are furnished with but four spines.

Dredged up off Howth sparingly; also found near the Giant's Causeway.

S. pumila. The number of tentacula in this species is not very constant, but usually about 16; they are not disposed in any determinate order, as they always are in the Ascidian type of Zoophytes, but are variously arranged.

Sertularia flicula. This species was incorrectly enumerated as among those found in Dublin Bay in my Catalogue. It is not met with upon that coast; I have, however, obtained a few specimens in the neighbourhood of the Giant's Causeway.

Thuiaria articulata. The stem in the specimens found in Dublin Bay is not naked on the lower half, as it is generally described, but is clothed with pinnæ to near its base, giving the polypidom a very beautiful appearance. See Plate VII. fig. 1, 2. The specimen figured in this plate is the finest I ever saw, and I could not resist the temptation of giving a drawing of it.

Not unfrequently obtained by trawling off Howth.

Plumularia pinnata. Is generally found growing on a long filamentous sea-weed, up the stem of which it creeps often for more than a foot in extent, and round which the root-fibres form a complete sheath. The specimens thrown up by the sea are usually denuded of the short branches which proceed from the pinnæ. The vesicles are produced in great abundance, pyriform, blunt and plain above: each vesicle contains 3 or 4 dark-coloured ova. Dr. Johnston, in a letter I lately received from him, remarks, "I long ago discovered the error of giving *toothed* vesicles to *Pl. pinnata*: they are only toothed from laceration, after the ova have escaped. It is curious that the ova should be produced in such numbers from the root-fibres; but such is a common occurrence with this pretty species."

Tolerably abundant in various parts of Dublin Bay.

Pl. setacea. The upper part of the vesicles of this species is prolonged into a short tube, affording an additional distinctive character between it and *Pl. pinnata*, which it so closely resembles.

Trawled up off Howth, very rare.

Pl. Catharina. Frequently trawled up off Howth and Lambay, in deep water, and but rarely cast upon the shore.

Pl. cristata. I have examined a specimen of this species, obtained by my friend G. J. Allman, Esq., near Cork, having plumes nearly three inches in length, and in which the ovarian vesicles are produced only from the main stalks or midribs, giving to the whole polypidom a very beautiful and unique appearance.

Pl. myriophyllum. Not common: obtained only by trawling off Howth and Lambay,

Pl. frutescens. I have met with but one specimen of this species, consisting of a single plume elegantly tapering to a point above. See Plate VIII. fig. 1.

Alcyonidium rubrum, Müller. Dr. Johnston considers this to be but a mere variety of *Alcyonidium digitatum*, or that species in its "primary crustaceous condition." That it is not *Alcyonidium digitatum* in its primary crustaceous condition, I am convinced, from the circumstance of having frequently met with it of a very large size, as large as the ordinary species ever occurred to me, nor do I consider it to be a variety; for although no difference exists in the number of the tentacula or in the form of the spiculæ, it yet, in my opinion, must be regarded as a distinct species, as I have always met with it of the same uniform deep red colour; neither have I been able to detect any gradations of colour between it and the common kind, as might be expected were it but a variety. I have occasionally, too, obtained both growing upon the same shell, each possessing its own peculiar colour; and this is a strong fact in favour of their distinctness, as the great difference in colour could not be accounted for by a reference to any external causes, both specimens being subjected to the same influences.

Actinia mesembryanthemum. Everywhere common off the coast of Dublin.

A. Bellis. "Body elongated; the lower part narrow, smooth, the

upper enlarged and glandularly warty: oral disc expanded, lobed: tentacula in several rows, variegated."—*Gärtner*.

This beautiful species is certainly no variety of *Actinia gemmacea*, as has been supposed by some from the perusal of Gärtner's description of it. It inhabits the fissures of rocks, in which the whole of the body of the polypus is concealed, the expanded cup-like head alone being visible above the margin of the fissure. The body is often lengthened to the extent of two inches; its basis is contracted, but gradually widens upwards towards the calyx; the lower portion of it is nearly colourless, higher up it becomes of a flesh colour, this changing into a greenish brown, of which it continues up as far as the feelers. The upper half of the body is covered with numerous small white glands, which possess great powers of suction. The diameter of the calyx, which is somewhat cupped, in the larger specimens often exceeds two inches; its margin does not describe a perfect circle, but is variously festooned. The colour of the disc is dark brown, ornamented with broad bands of opaque white, and finely streaked and dotted with light yellow. The feelers are very small, placed on the edge of the calyx in several rows, to the depth of $\frac{1}{3}$ rd of an inch; those nearest the disc, also, are about $\frac{1}{3}$ rd of an inch in length, and are the longest, the outermost tentacula being but little more than papillæ; they are of a lighter brown than the disc, and are variegated with transverse bands and spots of white. The shades of brown in the different parts of each *Actinia* vary considerably with the specimens.

Found in a clear pool, opposite Dalkey Island, but little below high-water mark, the only locality in which I have ever met with it; and what is not a little peculiar is, that it is confined to that one pool, although there are others in its immediate vicinity apparently equally suitable for it.

A. gemmacea. Everywhere common on the coast of Dublin.

A. dianthus. Frequently trawled up off Howth and Lambay.

A. maculata. The tentacula of this species are *not* contractile: in this particular it resembles the genus *Anthea* of Johnston.

A single specimen, trawled up off Howth.

Anthea cereus. Although this species has not the power of shortening its feelers in the same way as the Actinias, yet, if specimens be kept for some time in sea-water, their length becomes diminished, not by contraction, but by a process of invagination.

The three varieties of this species, described by Gärtner, are found in Sandy-cove, near Dublin; the green one but sparingly. They usually adhere to Fuci, generally to *Fucus serratus*, and but rarely to stones. Below low-water mark.

Valkeria cuscutea. Branches opposite; cells in clusters, oval.

The above is the correct definition of this species, which it was long ere I could identify by Ellis's description of it. He described the cells as being "in pairs, usually opposite," whereas they are really in clusters. Ellis's description is only applicable to the species in an imperfect and injured state. *Valkeria cuscutea* is readily di-

stinguishable from *V. imbricata*, with which it was at first confounded by me, first, by the more delicate texture of the whole polypidom; secondly, by the smaller size and oval shape of the cells. In *Valkeria imbricata* the cells are cylindrical; the clusters of cells in it, too, are more nearly approximated, and the number of cells in each cluster is more numerous than in *V. cuscuta*.

Abundant, Sandy-cove, near Dublin.

[To be continued.]

XXXIV.—*List of Phanerogamous Plants, together with the Cryptogamic Orders Filices, Equisetaceæ, and Lycopodiaceæ, observed in the Shetland Islands.* By THOMAS EDMONDSTON, Jun., Esq.

MONANDRIA MONOGYNIA.

1. *Hippuris vulgaris*. Deep muddy streams. Common.
2. *Salicornia herbacea*. Salt marshes. Frequent.

MONANDRIA DIGYNIA.

3. *Callitriche verna*. Pools and marshes. Common.

DIANDRIA MONOGYNIA.

4. *Veronica officinalis*. Not very common. Chiefly in dry stony places.—Var. *β. rigida*. Common in all waste grounds: stem erect; very rigid leaves, *not* serrated; all the plant glabrous; capsule very distinctly winged.
 —— *montana*. Rare. Ollaberry; Northmavin.
 —— *Beccabunga*. Rare. Near Tingwall.
 —— *Anagallis*. Rare. Brook near Laxfirth Mainland.
5. *Pinguicula vulgaris*. Uncultivated grounds. Everywhere abundant.

DIANDRIA DIGYNIA.

6. *Anthoxanthum odoratum*. Common.

TRIANDRIA MONOGYNIA.

7. *Iris Pseudacorus*. Common in all damp places.
8. *Schænus nigricans*. Damp heaths. Abundant.
 —— *albus*. Marshy places. Rare. Moola Unst.
9. *Scirpus cæspitosus*. Heaths. Very abundant.
 —— *lacustris*. Rare. Loch of Lund, Unst: probably not indigenous.
 —— *palustris*. Salt marshes chiefly. Common.
10. *Eriophorum vaginatum*. On the more elevated heaths, as Hermanness, Unst. Most common.
 —— *polystachion*. All marshy places. Common.
11. *Nardus stricta*. Heathy grounds. Common.

TRIANDRIA DIGYNIA.

12. *Phalaris arundinacea*. Common.
13. *Phleum pratense*. On the richer grounds abundant.