

sense of the term, would explain their diversity. Knowing, however, from his own observations what is meant by the statement that the Foraminifera are liable to great variation, he was prepared to say that the shells of the Marine Entomostraca do not at all show this liability; the forms are clearly defined, and distinct from one another, and intermediate forms blending the characters of two others rarely if ever occur.

Then as to the last objection which was brought forward, namely the difficulty of defining what a species is, he believed that practically it might be put aside altogether; for the fact was that any creature whatever which could be shown to be clearly distinct from all others that had been described must be admitted as a species, and must remain a species until it could be proved to be unworthy of this distinction. In conclusion he would say that he had no strong opinion as to whether this question of what a species is could or could not be answered, but he felt sure that to take Prof. Williamson's suggestion, and merge some ten or twenty of these forms of Marine Entomostraca into one species would be to make it impossible to form even a conjecture of what is meant by that term.

A Paper was read "On the Chætopod Annelides of the Southport Sands," by BENJ. CARRINGTON, M.D.

AMPHINOMADÆ.

Aphrodite aculeata, L. Found sparingly near low-water mark; more frequent after storms.

Pholoë inornata, Johns. Very rare.

Polynoa squamata, Sav. Found occasionally within old shells; frequent among oysters, and the refuse from the fishing boats.

There are two well-marked varieties:

- a. with a dark-brown crescentic mark on each of the elytra.

β. ochracea, uniform pale orange or stone colour.

Polynoa cirrata, Johns. Very rare.

P. asterinæ, sp. nov. Linear-oblong, scales twenty pairs or more, smooth, with a black entire border, seated on each third ring; intermediate feet cirriferous, bearing at the base a ciliated crest. Upper antennæ three, the central one longest.*

Not uncommon, occupying the groove between the suckers, of *Asterias aurantiaca*. I was first led to suspect the presence of some foreign species, by observing a blue phosphorescent light, given off from defined points of the rays, when the star-fish was placed in fresh water. It seems a very sluggish worm, and how it contrives to escape the surrounding suckers, and whether it shares the food captured by the star-fish, are points yet to be determined.

Body one to two inches long, by a line in breadth, posterior segments narrowed, ending in two filiform styles. Peach-blossom, or flesh coloured; very fragile, so that it is almost impossible to obtain an entire specimen. Scales white, chartaceous, with a narrow black border; first six pairs placed on alternate feet, the remainder on each third foot, not broader than the body, so that the feet are exposed, easily detached. In a line with the pedicels of the scales, on the intermediate rings, we find on each side a crest-shaped process, ending towards the mesian line in a short papilla. These are ciliated, as are the upper margins of the feet, so

* In describing a species, I have thought it best to follow the nomenclature now in use, although I agree with Professor Huxley that a change is desirable. He proposes, after Milne Edwards, that the rings shall be called *somites*, the head *prestomium*, central antenna *prestomial tentacle*, upper and lower lateral antennæ *superior* and *inferior prestomial cirri*, foot tubercle *parapodium*, its upper and lower rami *notopodium* and *neuropodium*, &c.

I think it right also to state, that as my acquaintance with Marine Zoology is very recent, and I have been unable to consult several foreign works on the subject, I introduce the following species with great diffidence. To the best of my belief they are new to the British fauna, nor have I been able to identify them with species described by *Aud.* and *Edwards*, *Oersted*, *Grube*, *Ehlers*, &c.

that horizontal currents are produced, as well as a central one from before backward. The dorsal papillæ seem to perform the functions of branchiæ. They also contain ova, which the ciliary currents serve to distribute.

Feet simple, with seven to ten strong spear-shaped golden setæ, apex toothed on one side. Near the dorsum of the foot is a small fascicle, containing four to six short curved toothed bristles.

Head concealed, roundish, emarginate. Upper antennæ three, the lateral ones very short, two jointed, central one much longer, equal to the two lower antennæ. Eyes four, distant. Tentacular cirri two pairs.

Readily distinguished by the long, flesh-coloured body, and marginate, smooth scales. In some young specimens, the black border is absent or ill-defined.

P. maculosa, sp. nov. Scales kidney-shaped, smooth, entire, membranous, having a dark curved spot round the centre, seated on alternate feet, intermediate feet bearing cirri; superior antennæ three equal; ventral surface of posterior rings, marked with four black dots.

Very rare; only one specimen found in company with *P. asterinæ*.

The specimen before me, which unfortunately has lost the anal segment, is oblong-obtuse, slightly narrowed from the middle, breadth two lines, by $\frac{3}{4}$ inch long. Scales twelve pairs, covering the head and feet, firmly attached, hyaline, especially near the border, which is slightly undulated, crossed from the inner margin by a retort-shaped black mark. Feet obtuse, obscurely biramous; upper branch much shorter, the setæ short, falcate, and serrate; lower branch bearing a tuft of twenty to thirty slender, half spear-shaped, oblique, pale setæ, toothed on one side, and ending in one or two larger teeth; shaft long, smooth, terete.

Head concealed, round, notched in front; eyes four, placed on the occipital portion; upper antennæ three equal, two

jointed, the central one stout apiculate; two lower antennæ much longer, and exceeding the tentacular cirri. When viewed from the ventral surface, the basal portion of the antennæ is nearly black, the three central ones converging like the rays of a tripod, of which the dark-coloured oblong oral opening forms the handle. Posterior segments after the fifteenth marked with four rows of stellate spots.

Distinguished from *P. asterinæ* by the larger thin translucent scales, which are firmly attached and not bordered, by the more numerous and slender setæ, the equal upper antennæ, and the absence of the ciliated processes on the dorsal surface.

There is no other British species with smooth scales with which it is likely to be confounded. From *P. spinifera*, Ehlers, (which seems to me identical with Johnston's *P. scabra*,) and from *P. pellucida*, Ehlers (Annelid. Chætop., t. iii. f. 1—13), it may be known by the scabrous cirri and antennæ of those species. *P. maculata*, Grube, seems to be a form of *P. cirrata*, having the scales garnished with a few large papillæ.

Sigalion Carringtonii, nov. sp. Body vermiform, obtuse at both ends. Scales very numerous, attached to each ring, pellucid, outer border fringed with pectinate glands; feet exposed, bifid, densely setigous. Attached to the pedicel at the base of each foot is a curved ciliated cirrus.

Met with occasionally, near low water mark, on the Birkdale shore, buried in the moist sand, where it lies coiled in a spiral manner. First discovered in July, 1864, when exploring the sands with my friend *Mr. C. H. Brown*, who named it as above.

Body linear, obtuse in front, tapering very gradually towards the anal segment, which terminates abruptly in two long styles. Length two to three inches by two lines in breadth. Colour greyish-white, opalescent, reflecting prismatic tints. Feet very numerous, slender at the base, biramous, upper

branch gibbous at the apex, from which depends a short cirrus, furnished with a dense tuft of long silky setæ, fine as spun glass, which arch backward towards the scales, and a lower tuft of jointed ones; inferior ramus, bearing two kinds of setæ, the lower very long and flexible, and the intermediate ones jointed, the blade filiform, rough, articulate like the hair of a mole.

Scales smooth, hyaline, persistent, convex, closely imbricated, not covering the feet, fringed at the outer margin with a few pectinate-pinnate processes. Some of the anterior scales are seated on alternate feet, but the majority arise from a large ovate tubercle, which is found at the base of each foot. These tubercles are filled with ova, and appear like a white opaque spot through the scales, and from their outer border a stout curved cirrus originates, clothed with vibratile cilia on the lower side, and extending a little beyond the scales.

Head small, concealed, hemispherical; eyes four, minute, the pairs approximate. Upper antennæ minute, two on each side, placed at the angles of a broad basal portion, which, like the feet, bears a tuft of silky setæ; lower antennæ much longer. The anterior feet exceed the head in length, and project beneath it almost to the median line, so that it is difficult to make out the exact details.

Proboscis as broad as long, compressed; the lips clothed with a row of simple fimbriæ; jaws four, alternate, pointed.

The worm is sluggish in confinement, generally remaining coiled spirally like a serpent. Under the lens it is a beautiful object, the long silky setæ spreading like the feathers of a bird of paradise—the daintily fringed, translucent scales, through which the ciliated tentacles are seen in constant motion—and the play of prismatic colours on the surface—are sure to excite wonder and admiration.

NEREIDÆ.

Phyllodoce lamelligera, Johns. Rare; at low water mark

buried beneath the sand. It is a beautiful species, swimming freely in sea-water.

P. Vittata, Ehlers, *Annelid. Chætopod.*, 1864, t. vi. f. 7—14. New to Britain. Two specimens appeared in water containing a mass of *Sabellaria alveolata* from New Brighton, May, 1864 (*C. H. Brown*), and I have since met with one or two others at Southport.

Distinguished from *P. lamelligera* by its smaller size, never more than a line in breadth by two to three inches long, filiform, very active, generally assuming serpentine or spiral curves; pale olive, convex above, each ring crossed by a narrow, *stippled, steel-grey band, about a third of its breadth*. Head short, broadly ovate, obtuse; antennæ four apical, spindle-shaped; tentacular cirri four pairs, the two lowest very long (equal to five or six rings). Eyes large, black, crossed behind by the narrow first segment. Branchial leaflets ovate, reticulate, parallel with the body; lower branchiæ short obtuse, attached to the base of the feet. Anal segment bearing two leaf-like processes, resembling the branchiæ.

This active little worm resembles one figured by Sir G. Dalyell, but wants the central antenna.

P. attenuata, sp. nov.? Body very slender, from half a line to a line broad, four to six inches long; anterior rings as broad as long; branchial leaflet broadly ovate, seated on a pedicle as long as the feet, olive-brown veined; lower leaflet ovate acute; middle and posterior rings attenuated, *twice as long as broad*; branchiæ as wide as the segments over which they arch; feet small simple; bristles cultrate, curved, jointed, finely toothed at the base of the blade.

In the shape and relative size of the feet and branchial leaflets it agrees with *P. lamelligera*, but the disproportionally slender body, and oblong segments, distinguish it at a glance from any form of that species with which I am acquainted.

A solitary specimen and a portion of another are all that remain of this curious worm. Unfortunately, both head and

anal segment have been rendered indistinguishable by the action of the spirit.

P. Clava, sp. nov. Worm minute, one to two inches long by $\frac{1}{2}$ in. to $\frac{1}{8}$ in. broad; rings narrow, depressed, pale drab or greenish; feet simple, bearing on the upper side ovate *tumid* branchiæ, lying parallel to the body; near the base on the ventral side of the feet short obtuse lower branchial papillæ are attached. Rings gradually tapering, and ending in an obtuse anal segment, which bears two clavate solid styles, larger than the branchiæ. Head broad at the base, terminating in a thin ornithorhynchus-like snout, apex obtuse; antennæ four, short, divergent. First and second rings half as broad as the rest, giving attachment to four pairs of short tentacular cirri. I am doubtful about the the identity of this Annelid, as I have seen no figure of *P. clavigera*, *Aud. and Ed.*

Rare, occupying vertical burrows in the sand, about half tide mark.

Goniada Alcockiana, sp. nov. Body tapering at both ends, anterior third terete terminating in a conical horn-like snout, posterior segments depressed, broader, channelled above, ending in two long jointed styles. Eyes, and tentacular cirri 0. Proboscis very long, clavate curved, on each side of the base are eight Λ -shaped dentacles, mouth armed with seven jaws.

Body filiform, $1\frac{1}{2}$ inch long by a line wide, colour reddish brown; heteromorphous, anterior rings to the 45th, very convex, narrow; feet minute papillæform. Lower two-thirds of the worm depressed, rather broader; feet longer, oblique, from a dilated base, composed of four acute segments, the two outer shorter and divergent (branchial); each foot bears two fasciculi of bristles, the upper short curved, arising from the basal portion; lower composed of long, white, falcate jointed bristles. Apex of the conical snout bearing four minute antennæ, when the proboscis is exerted it stands up like a

small horn. Proboscis nearly as long as the terete portion of the body, curved, fluted above, armed with seven minute black jaws, five in the upper and two in the lower half; middle jaws larger tridentate. At each side of the basal portion there is also a row of minute inversely V-shaped black dentacles, eight in number.

Very rare, only one specimen collected. I have great pleasure in associating the name of Dr. Alcock, who has done so much for the spread of natural science in Manchester, with this curious species.

G. maculata, Johns; the only other British species is distinguished by its greater length, 4 to 6 inches, or, according to Oersted, 18 to 20 inches; whilst its extreme breadth is only a line and a half! This species, according to Johnson, is destitute of jaws, and Dr. Baird informs me from Oersted's figure there appear to be no anal cirri. It is distinguished also by having three brown maculæ on each segment. In *G. Norvegica*, Oers., there are eighteen dentacles on each side of the proboscis.

Glycera alba, Lam.

A single specimen only obtained among tufts of *Antennaria antennina*.

Pollicita peripatus, Johns.

Several specimens found at the base of *Aleyonium digitatum* brought from deep water after storms.

Scyllis prolifera, Müll.

Probably abundant in wet places, covered with a stratum of mud, but from its minute size easily overlooked.

Nereis pelagica, L.

N. viridis, L. (*N. cerulia*, Penn.) Both these species are abundant in wet hollows, about half-tide mark, occupying a deep burrow in the sand. They vary much in colour, from a deep velvety green to orange. There is another form, with longer feet, bright orange or flesh-coloured, shaded with olive, which is frequent near high-water mark, where the tide is absent for months together, which may be distinct.

N. brevimana, Johns.

N. margaritacea, Leach.

N. Dumarillii, Aud. and Edw.

These species are found occasionally among oysters dredged from deep water, or the refuse from fishing boats.

Nereis bilineata, Johns.

Not uncommon. Always found occupying the terminal coils of old whelk shells, and generally those which have been taken possession of by *Pagurus Barnhardus*.

It is one of the handsomest of the Nereids.

Nephtys margaritacea, Sars.

N. Hombergii, Sav. Common in wet places, buried among the sand. Some specimens are six to eight inches long, and as thick as the little finger. Besides the above species there are several small ones, which I have not yet examined minutely, but which are probably new to Britain.

ARICLÆ.

Nerine vulgaris, Johns.

I am doubtful whether my specimens belong to this species.

N. coniocephala, Johns.

Common in damp hollows about mid-tide, along with *Arenicola*. It occupies a friable tube, descending a foot or more below the surface.

Spio seticornis, Bast. }

S. crenaticornis, Mont. } (*Leucodore ciliatus*, Johns.) These seem to me to be forms of one species, sometimes excavating a burrow between the laminæ of old shells, at others constructing a sandy tube.

S. quadricornis, Lam. Very common below high-water mark, forming a slender cylindrical sand tube; it has four tentacles, the two lower shorter, and the anal segment terminates in four ovate styles. *Branchiarius quadrangularis*, Mont., seems identical with this worm, but, as

frequently happens, the specimen had lost the anterior segments.

Ophelia coarctata, M. Edwards.

One specimen only met with. New to Britain.

Mæa mirabilis, Johns.

Frequent near low-water mark, in wet places where the sand is intermingled with mud. It bears a close superficial resemblance to the smaller Nemertoid worms, *Astemma*, &c., and has the same white colour and elastic texture. Dr. Baird informs me there is one specimen in the British Museum, from the coast of Fife. Like myself, he failed to identify it with any known form, and I had named it provisionally *Rhynophylla bitentaculata*; but, since this paper was in type, he advises me that it is probably identical with the worm described in Dr. Johnston's Catalogue, at p. 278, as *Mæa mirabilis*.

As I have not been able to compare it with the description, and it may prove distinct, I append the notes I had drawn up from the examination of living specimens.

Prestomial segment leaf-like, ovate, broader than the body, strengthened in the centre by five ribs, ciliated below, margin mobile undulated reticulate. Proboscis cordate, retractile, tumid, shorter than the upper lip, from the lower margin of which spring two long flexible trigonous tentaculæ, clothed throughout the inner surface by four to six rows of conical papillæ, resembling the suckers of *Asterinæ*. Eyes and antennæ 0.

Its hold on the sand is so firm that specimens are seldom obtained entire. When creeping through the sand the thin mobile upper lip acts as a wedge, and the turbinate soft proboscis is rapidly protruded like a bladder, enlarging the opening. When the surface is reached the head is partially withdrawn, and the two papillose tentacular cirri are directed upwards.

Body three to six inches in length, white, opalescent, as

thick as a crow quill; segments very numerous, quadrangular, slightly winged, as broad as long, the upper eight a little narrower, especially at the base, where it joins the lower portion. In addition to the small transparent branchial laminæ on the ventral surface of each of the upper segments, there is an oval appressed scale. Intestine simple, containing sand and mud. Numerous ova are found at the lateral margins of each ring after the eighth. The setæ of the eighth segment are very numerous and delicate, resembling in form the pendulum of a clock, while those of the lower rings are stronger, shaped like golf sticks.

This worm shows no disposition to swim in water, but remains in one place, with the leaf-like snout curved upwards. The blood is colourless or nearly so, and I could make out no circulation as in many worms, but the margin of the snout is covered with a delicate net-work of vessels, and the tentacular papillæ are each supplied with a vascular loop. These papillæ are depressed at the apex, and supplied with muscular fibres like true suckers, but I have never seen them used to seize any object, or aid in progression.

Arenicola piscatorum, Lam. Very abundant.

LUMBRICINÆ.

Lumbricus lineatus, Müll.

Very rare, among surface mud.

L. capitatus, Johns.

Only one specimen, constricted below the snout.

L. pellucidus, Temp. (*Clitelis minutus*, Temp.)

Found within putrid specimens of the heart urchin, and among other rejectamenta of the tide.

CAPITIBRANCHIATA.

Pectinaria belgica. Lam.

Empty tubes common, living worms occasionally found near low-water mark.

Sabellaria Anglica, Grube, (*S. alveolata*, Sav.)

Very common within shells, especially the whelk.

S. Crassissima, Lam. Rare.

Terebella conchilega, Pall.

Frequent near low water.

T. chrysodon Mont.)

T. nebulosa, Mont.)

T. constrictor, Mont.)

Attached to shells, &c.—not rare.

I have found two specimens of a minute species with only eight tentacles, among tubes of *sabellaria*, perhaps the young of some larger form, they resemble *T. ostreata*, Dalyell.

Ops, gen. nov. (*One of the names of Cybele.*)

Tube slender, strong but flexible when moist, coated with minute, closely imbricated fragments of shell, attached edgewise.

Worm terete, of equal breadth throughout ($\frac{1}{25}$ inch). Branchial fans two, terminal, very short, composed of soft, thick, pectinated processes, the apices bifid, obtuse, incurved, surrounding the mouth like a star, not ciliated. Between the fans is a small scoop-like lip.

Rings distant, the upper one contracted at the apex, with lateral tufts of setæ, much shorter than the succeeding segments, which are six to eight times longer than broad.

Ventral surface channelled, on each side of it are pencils of slender setæ: and surrounding all but the ventral aspect of each ring, a narrow rough band like a rasp, the surface studded with conical papillæ. No lateral hooks.

Anal rings narrower, ending in an obtuse point.

O. digitata, sp. nov. Frequent opposite the Whitworth guns, near low tide mark, accompanying species of *Terebella*.

Tube three to four inches long, tapering a little at each end, which is open, as thick as a crow-quill. It has a very neat appearance from the uniform size of the shell fragments. Intestine simple, undulating, filled with mud and sand. Peristome not longer than broad, when closed conical, the

flat, obtuse, fleshy segments curling inwards over the mouth. Colour pinkish. There is a blood vessel on each side of the intestine, but I could trace no circulation in the pectinated fans, which seemed to be used by the worm to collect the grains of sand, &c. The rasp-like collars, surrounding each ring, are very curious.

There is an animal figured by Dalyell, *Powers of the Creator*, &c., Vol. II., Pl. xxxv. f. 4, 5, under the name of *clymene borealis*, which may be identical with our species, but the peristome is said to consist of 16 to 24 teeth, which are figured as simple and recurved, "forming a shallow funnel."

This Annelid is simple in structure and very sluggish, and it bears more resemblance to the *Sipunculidæ* than to the higher worms. In the peristome it reminds us of *Chirodota digitata*, Esch. From *Orthonia* it differs in the rasp-like band which surrounds each segment.

Sabella ventilabrum. Rare, cast up from deep water after storms.

Serpula trigueta, L. } Not uncommon on shells.
S. contortuplicata, L. }

Spinorbis communis, Flem. } Attached to sea-weed, some-
S. lucidus, Mont. } times abundant.
S. minuta, Mont. }

ECCLES, APRIL 2, 1865.

April 24th, 1865.

THOMAS ALCOCK, M.D., in the Chair.

Donations.

Captain Mitchell of Madras, three slides of Indian Diatomaceæ, and contents of seers fishes' stomachs almost entirely consisting of Diatomaceæ.

Dr. ALCOCK read a communication on "Southport Natural

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