ADDENDUM ON NEBALIA.

Having twice alluded to Nebalia in the previous Memoirs, from its supposed relation to the animals which have hitherto occupied our attention, and from its being a type almost unknown to the greater part of Zoologists, and which it would be desirable to have thoroughly and perfectly scrutinized, the author has thought it advisable to re-produce the only good figures of the two described species, and to repeat what has been communicated as to the structure and habitudes of these anomalous Crustacea, in the hope that Naturalists who may reside on or visit the coasts where they are said to be found, may furnish more satisfactory details, or submit specimens to the examination of some competent micrographer.

The best informed Naturalists have associated Nebalia with the Shizopodæ from the circumstance of having their members cleft or divided into two branches, and their appearing to have a pair of pedunculated eyes; when, however, we are aware of all the anomalies which affect the limbs and visual organs in the Crustacea, we shall not be apt to attach much importance to characters derived from parts liable to such extraordinary deviations, when they are not at the same time accompanied by some approximation in the general form and structure to the rest of the animals of the group; this is by no means the case with Nebalia, which in every other respect is an animal sui-generis, but certainly bears a greater degree of affinity to the Larvæ of the Balani than to any other; its antennæ, no doubt, constitute one difference, while its eyes and tail are *exserted* beyond the boundary of the corselet, differences which we might be prepared to expect in the larvæ of the various genera of the Balani: indeed, since the discovery announced in the preceding Memoir, it is difficult to dismiss a suspicion that Nebalia may be the Larva of some one of those types, and in particular of

Coronula; the larvæ of this Genus must of necessity possess useful eyes and a more powerful and perfect natatory apparatus, in order to perceive and pursue the Cetaceous animals (Whales) upon which they finally fix themselves.

We must not, however, shut our eyes to the facts furnished by Otho Fabricius in regard to the breeding of Nebalia, which if not deceptive, completely annul any such idea, and show it to be a peculiar Genus, most nearly related to the larvæ of the Balani, to which it will thence bear the same relation, as Mysis to the Decapodous Macroura.

The first animal of the present type was discovered by Otho Fabricius, and published with a figure in his Fauna Groëlandica under the title of Cancer bipes, p.256 No.223 f. 2, which figure has been copied by Herbst in his Work on Crabs, &c. Pl. XXIV. f. 7. Montagu more lately detected on the South coast of Devon, the individual figured in the Linnæan Transactions, Vol. XI. t. 2, f. 5, and still more recently Dr. Leach, the founder of this genus, has furnished us with a third, to which he assigns as a habitation, the European Ocean, *Zool. Misc.* Vol. 1, p. 100, t. 44.

All these, Dr. Leach, Desmarets and some other Naturalists consider as identical, or of the same species, and as the former gentleman from his more intimate knowledge of the accuracy and discriminating powers of his friend Montagu, is of this opinion, it would be presumptious, in us to dispute the propriety of this decision; Mons. Lamarck not swayed by this consideration, very properly considers the Nebalia of Fabricius and Leach different from that of Montagu, the differences however, are principally such as might be supposed to arise from the latter using magnifyers of higher power, and bringing to the examination a greater or less degree of skill and scientific knowledge, thus his figure has all its members and

tail fringed with hairs and the styles of the tail annulate.

To observe animals of this small size and concealed character by simple inspection will not exactly answer the purposes of Natural Science as at present pursued, we must scrutinize, analyse and dissect, in order to determine the number, use, and structure of the various members.

Dr. Leach being the founder of this Genus, the first Crustaceologist in Europe, and of the most scrupulous exactness, we must naturally attach the greatest importance to the figure and description of Nebalia which we have from his hands, bearing in mind that the parts of the mouth remain to be dissected and made known.

Description of Nebalia.

The Cephalo-thoracic *Clypeus*, inclosing the body of the animal is large, sub-compressed, and ovalish in its lateral contour.

The moveable *Rostrum* or beak, which is one of the most remarkable characters of Nebalia, is taper, carinated above, and vaulted beneath.

The *Eyes* are rather small, and situated at the sides of the beak; they are compound, placed on short footstalks and moveable.

The *Antennæ* which arise on each side from above the eyes, consist of a single pair, each ending in two pluri-articulate setæ.

The *Anterior pair of Feet* are long and simple, serving for prehension (and are probably armed with microscopic hooks?)

The Posterior or *Natatory feet* consist of five pair, having their ultimate divisions bifid and fringed.

The Abdominal portion is composed of four or five joints, and ends in a furcate tail, the two taper styles of which end in setæ.

The Nebalia Herbstii of Dr. Leach attains to the length

of three-fourths of an inch and is of a pale red or greenish colour (greyish Leach) with black eyes, and inhabits sandy shores about Greenland and particularly the mouths of rivers, but is rare. According to Dr. Leach, it is also found in the European Ocean. The female, Fabricius says, carries her ova all winter, which begin to develope themselves in April, the young appear in May, are extremely active, *adhere* to the mother which has then but little life. In swimming they turn on the back and use their hinder feet, and when they rest, *fix themselves by the anterior pair !*

The Nebalia Montagui, which Montagu describes under the title of Monoculus rostratus, was only half the size of the former species, viz. three-eighths of an inch, is of a pale yellow colour, with a darker longitudinal line along each side ; inhabits the south coast of Devon. The fore feet, he adds, are usually motionless and brought down under the body, and that the antennæ as well as the natatory feet are continually in movement, when the animal swims.

I beg to repeat that we know these little animals too imperfectly, and that they present a field for future observers, who may happen to be so fortunate as to meet with them. We must see them reversed, the organs of the mouth and members developed and magnified, which in an animal of such size cannot be considered as a very difficult task, when we contemplate what has been performed on many of the smaller Monoculi not one-third part so large as the smaller Nebalia. In addition, it would be desirable to know whether they are really *perfect* animals, or only larvæ, determinable by keeping some of the full grown ones in sea water frequently renewed, or by the actual discovery of females provided with ova.

CIRRIPEDES.

PLATE IX. Fig. 1, Natural size and appearance of the young of the Barnacle (Lepas balanus) when reposing on its side, with its limbs concealed and the valves closed.

Fig. 2. The same somewhat magnified as seen from above, to show the turgid appearance of the valves. *a*, an elbow of the anterior members of the animal. *t*, tail part.

Fig. 3. Side view of the same more highly magnified, with its limbs protruding from the anterior opening of the valves. *b*, one of the fore feet, its fellow being removed for the sake of clearness; this member is represented as when naturally exserted by the animal when it wishes to fix itself by means of the sucker *c*, and claw *d*, a fourth large basil joint remains concealed by the shell. *f*, its six pairs of natatory members behind, seen as ready to give a stroke to the water; *t*, the bifurcate extremity of the tail. *e*, one of its peduncled eyes as seen through the shell. × presumed nucleus of future attachment on the dorsum.

Fig. 4. One of the Eyes detached and more highly magnified.

Fig. 5. The bi-articulate tail, more highly magnified ending in two long and two shorter setæ *t*. *a*, posterior part of the abdomen.

Fig. 6. One of the posterior or natatory members very highly magnified. *a* its outer division. *b*, its inner division; the rest of these members are exactly similar, and become changed into the six pair of cirri of Triton as exhibited in Plate X. fig. 1.

Fig. 7. Natural size and appearance of the animal after its metamorphosis.

Fig. 8. The same magnified, *e* rudiments of the eyes seen through the large valves of the operculum 5. the smaller valves are pointed out by fig. 6. *m* the opening or mouth of the valves, permitting the included animal to be seen. 1, 2, 3, 4 the valves of the body of the shell, separated by visible sutures. *b* the marginal projection of the basis.

Fig. 9. The same seen in profile, with the arms or cirri *protruded c*. 5, anterior valves of the operculum; 6, posterior valves. – 1, posterior valve of the basis; 2, valves nearest the posterior valve; 3, valves nearest the anterior valve; 4 anterior valve; *b*, basis.

Fig. 10. One of the cirri more highly magnified, to show that although pluri-articulate, they are as yet without ciliæ.

Fig. 11. A common full-grown Barnacle of the natural size (Lepas balanus Linn.) with the animal retracted; the figures of reference point out the corresponding valves in figure 8.

Fig. 12. The same in profile, in the act of throwing off its old skin or exuvium *c*.

PLATE X. Fig. 1, the exuvium of Lepas balanus magnified. *o* oviduct. 1, 2, 3, 4, 5, 6 the six pairs of arms, each consisting of two robust basil joints, supporting two branches or cirri, which are each composed of numerous articulations, ciliate on the opposite edges; those designated by the first three figures differ considerably from the others in being shorter and more robust. *m*, mouth, covered by the first or most anterior pair of members. *b*, cast of the body.

Fig. 2. One of the first pair of members more highly magnified.

Fig. 3. Labium ? highly magnified. + basis

Fig, 4. one of the first pair of maxillæ or jaws magnified in the same degree. + point of union. *a*, apex.

Fig. 5. One of the second pair of jaws, similarly magnified. *a*, toothed margin. + basis.

Fig. 6. One of the mandibles with its palp, also highly magnified. *a* toothed apex of the mandible. + apophysis for muscular attachment. *b*, palp

Fig. 7. Lepas Balanus or common acorn-shell seen from above and of its natural size, with the valves of the operculum open *m*, and the animal exserted b, in the act of throwing off its Exuvium *c*.

NEBALIA

PLATE XI. Fig. 1, Nebalia Herbstii, after Dr. Leach, magnified; the line beneath indicates its natural size. *c*, Clypeus. *t* tail or abdominal portion. *r*, beak. *e*, eyes. *a*, antennæ. *a* 2, anterior pair of feet. *f*, the 5 posterior or natatory feet of one side, with their bifid divisions. *s*, styles terminating the tail.

Fig. 2. Nebalia Montagui, magnified; the same letters indicate corresponding parts of the former. *f* 2, short intermediate members. *f* 3, minute subabdominal fins.

ERRATA.

Page 73, line 10 from the top .. *for* Daphinia *read* Daphnia.
74, " 15 from bottom .. *for* Benache *read* Bernache.

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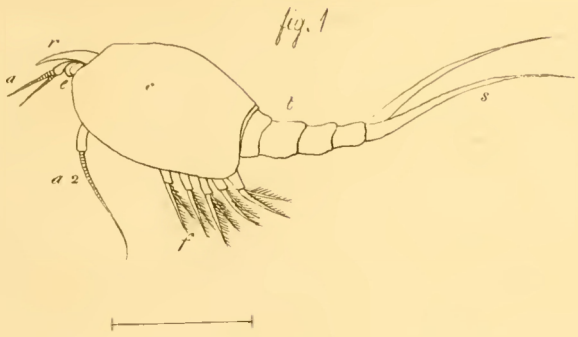

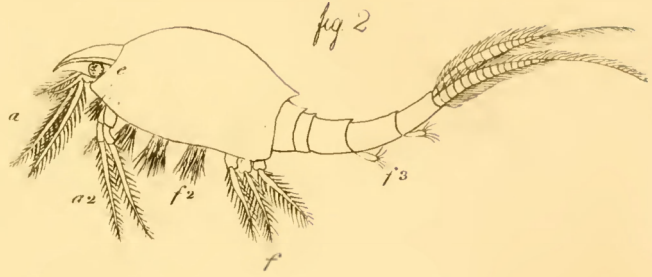

NEBALIA.

I.C.T. Sculp.