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ORIGINAL ARTICLES.

I.—On *Orithopsis Bonneyi*, a new Fossil Crustacean.

By James Carter, M.R.C.S., etc.

(PLATE XIII. FIG. 1.)

In a paper, "On the Geology of the South Coast of England," published in the Transactions of the Geological Society, vol. i., 2nd ser., pl. iii., fig. 2,[1] p. 42, Sir H. de la Beche has figured a crustacean from the Greensand of Lyme Regis, to which he has not applied any name, or given any other description than that it is "the back of a singular fossil crab." The specimen is imperfect, and not very accurately drawn; but Prof. Bell, in his monograph, published by the Palæontographical Society (1862), expresses his opinion that it is an "unmistakeable figure" of *Necrocarcinus tricarinatus*.

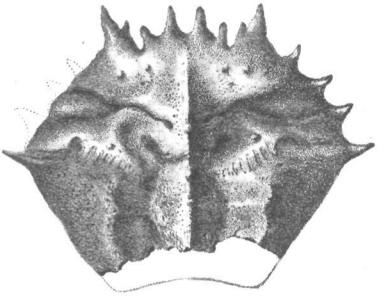
A crustacean from the Gault of Folkestone is figured and described by Mr. Woodward in the Geological Magazine, Vol. V., Pl. XIV., Fig. 4, p. 259, which he regards as also a specimen of *N. tricarinatus*. Unfortunately the anterior portion of the carapace is broken, and does not exhibit the important characters of the orbito-frontal region.

The well-preserved specimen from the Greensand of Lyme Regis, figured in Pl. XIII., Fig. 1, has been recently added to the Woodwardian Museum at Cambridge, and I have a smaller one from the same locality in my own collection.

There cannot, I think, be a doubt but that the crustacean figured by Sir H. de la Beche and by Mr. Woodward, as also the specimens from Lyme Regis, are all examples of one and the same species. It is, moreover, evident, as Mr. Woodward observes, that this species is generically distinct from *Necrocarcinus Woodwardii* and *N. Bechei*. I would add that it is equally distinct from *N. tricarinatus*. Indeed, so far as I know, it is not referable to any described genus. I therefore propose to establish a new one, which I would designate

[1] Not fig. 1, as stated by Mr. Woodward and Prof. Bell in their respective papers.

1.



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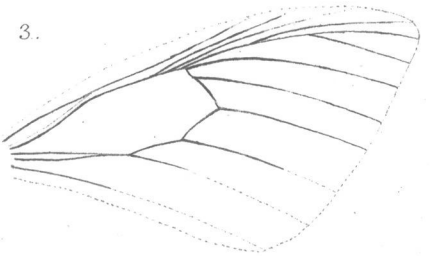

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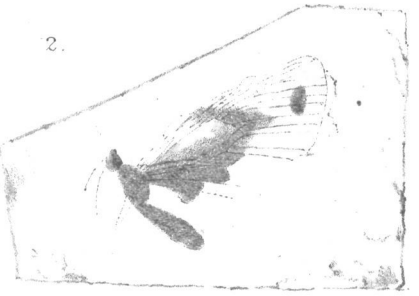

G. R. DeWilde del. et lith. W. West & Co. imp.

Fig. 1. *Orthopsis Bonneyi, J. Carter, U. Greensand. Lyme Regis.*
Figs 2 & 3. *Satyrites Reynesii, Scudder, Tertiary, Aix in Provence.*

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Orithopsis, from the apparent affinity to the recent *Orithyia*. I dedicate the species to the Rev. T. G. Bonney, of St. John's College, Cambridge, whose active interest in the advancement of geological science is attested by his frequent and valuable communications to this and to other scientific journals.

In general form this species has so great a resemblance to *Necrocarcinus tricarinatus*, as at first sight to suggest the probability that the difference may result from better preservation than usual. Closer examination, however, shows that the two species are really distinct, and that the modification of character cannot be attributed to attrition or any other accidental cause. Most of the fossils from the Cambridge Greensand are more or less worn, and the degree to which this has occurred may be determined by comparing them with specimens from other localities. The distinctness of the two forms would, moreover, seem to be conclusively proved by the occurrence of both of them in the same "gisement"—the Gault of Folkestone, as I recently discovered among the series of fossils from that locality in the Woodwardian Museum, several specimens of *N. tricarinatus*, precisely identical in character with the Cambridge and Wiltshire forms. A careful examination of a series of some fifty specimens convinces me that *N. tricarinatus* is a good species, and that, so far as its details are known, it is properly classified with *N. Woodwardii* and *N. Bechei*.

Orithopsis differs from all the species of *Necrocarcinus* by the conformation of the rostrum and of the orbital regions, as also by the greater development of the spines of the antero-lateral margin. These characters can scarcely be regarded as of mere specific value, inasmuch as they are modifications of normal and typical points of structure, and therefore have a morphological signification of such importance as to warrant generic interpretation in classification. It is almost impossible to assign the zoological affinities of the genus with any precision, as the structure of the mouth, abdomen, and limbs is unknown, and consequently we have no knowledge of the important functions of nutrition or locomotion. So far, however, as the characters of the carapace will indicate, the affinity, as Mr. Woodward has remarked, is rather with the *Portunidæ* than with the *Corystidæ*. The orbito-frontal characters are very similar to those of *Orithyia*; but the armature of the antero-lateral margin—especially the well-developed metabranchial spine—approximates *Matuta*. The zoological position of *Orithopsis* would appear to be between these two genera.

The physiological signification of that remarkable character—the carination of the metabranchial lobes—has yet to be determined; but that it cannot be regarded as of specific value only is demonstrated by its occurrence, either as a ridge, or as a row of tubercles, in several other London-clay genera—*Portunites*, *Campylostoma*, *Rhachiosoma*, etc.

It is worthy of observation that in *Orithopsis* the marginal armature is well developed, but the large dorsal tubercles are almost obsolete; in *Necrocarcinus*, however, the reverse occurs—the dorsal

tubercles being more developed than the marginal spines. This fact is of interest as an indication that there is a difference in the morphological signification of these respective characters.

Description.—Generic characters:—Carapace rather wider than long, rostrum bifid, orbits opening forwards, orbital lobes well developed, antero-lateral margin with acute spines, gastric regions obscurely defined, branchial regions distinct, metabranchial lobe longitudinally carinated.

Orithopsis Bonneyi (Carter).—*Dorsal surface* of carapace considerably arched transversely, less so in the direction of the mesial ridge; minutely granulated, and still more minutely punctated. *Antero-lateral margin* rounded, rendered irregular by the unequal prominence of the hepatic and anterior branchial lobes. A well-developed, acute, slightly-curved *marginal spine* arises from the hepatic and from each of the branchial lobes, that from the anterior angle of the metabranchial being the larger; a fifth—the stoutest of the normal series—is constituted by the external orbital lobe. *Postero-lateral margin* nearly straight, inclining inwards so as to render the posterior about equal to the orbito-frontal border. *Rostrum* broad, widely bifid, divided into two stout, slightly-diverging lobes. *Orbits* opening forwards, bordered above by two distinct superciliary lobes, which are separated from each other by a deep sinus and from the external orbital lobe by a sharp fissure; the external angle of orbit much produced, extending nearly as far forwards as the rostral spines; all the orbital spines are directed horizontally forwards and outwards. Orbito-frontal region measuring rather less than half the greatest width of the carapace. A distinct sinuous sulcus separates the anterior gastric and the hepatic from the branchial regions, but does not cross the dorsal carina, ceasing abruptly at the point of junction of the meso- and meta-gastric lobes; a sulcus completely separates the posterior gastric from the cardiac regions. *Branchial regions* sharply defined; a triangular epibranchial terminates about midway between the margin and the median dorsal ridge, and is marked off from the meso-branchial lobe by an undulating sulcus; a similar and nearly parallel groove—the inner half of which is obliquely crossed by a series of elongated foveæ—divides the meso- from the metabranchial lobes. The metabranchial and cardiac lobes occupy the larger posterior half of the carapace; a prominent, granulated, longitudinal ridge, slightly inflected in the middle, carinates each metabranchial lobe. A median carina marks the anterior two-thirds of the carapace, extending along the gastric and cardiac regions. There are a few faintly-marked large tubercles, of which two occur on each proto-gastric, one on the inner portion of the mesobranchial lobe, and three or four on the median ridge; those on the metabranchial carina scarcely distinguishable.

Length of carapace $1\frac{1}{4}$ in.; width (not measuring marginal spines) $1\frac{5}{8}$ in.

Localities.—Upper Greensand, Lyme Regis, and Gault, Folkestone.

The following differences of character will distinguish this species from *Necrocarcinus tricarinatus*:—

Orithopsis.	*Necrocarcinus.*
Rostrum bifid.	Rostrum acute, triangular.
Orbits looking forwards; orbital lobes well produced.	Orbits open above; orbital lobes rather small.
Antero-lateral border with acute spines, of which the metabranchial is the largest.	Antero-lateral border with short, stout spines, of which the mesobranchial is the largest.
Width of orbito-frontal region not exceeding half the greatest width of carapace.	Width of orbito-frontal region exceeding half the greatest width of carapace.
Large dorsal tubercles indistinct.	Large dorsal tubercles distinct.

II.—Description of a New Fossil Butterfly[1] (*Satyrites Reynesii*), found at Aix in Provence.

By Samuel H. Scudder, Esq., of Boston, U.S.

(PLATE XIII., FIGS. 2 and 3.)

During a recent visit to the Marseilles Museum, and while examining the rich collection of fossil insects preserved there, my attention was attracted by two specimens of the remains of a fossil butterfly. Although not very well preserved, nor indeed so perfect as the specimen of a fossil butterfly from the same formation, which was described thirty years ago by Dr. Boisduval, it was evident, at first sight, that the remains in question belonged to a different species, since the lateral moulding of the principal wings was very much inflated.

No similar form having to my knowledge been described from the formation in which this was found, Dr. Reynes, the eminent Director of the Museum, courteously placed in my hands the best specimen, so that I might examine it more attentively. The second specimen is very imperfectly preserved, but nevertheless it undoubtedly belongs to the same species.

The fossil is the natural imprint of a butterfly—the insect being placed on its side, with the wings elevated one against the other, the legs spread out as if it were suspended, the spiral proboscis unrolled, and the antennæ lowered in the same direction as the legs. The first wing on the right, which is found underneath, is slightly turned up and disturbed along its margin, which shows that the specimen has undergone great maceration in quiet water, before being covered up by the deposits which have preserved its most essential features. The condition and the position of all the parts of the fossil lead us to conjecture that it has been carried away to its fixed place of repose by a feeble current, which has left its most slender organs in the direction which it took.

It is evident that the object in question is an imprint, for the mouldings of the uppermost wing are imprinted in a hollow like those which may be observed in the upper part of the wings of the living Satyrides, whilst those on the wing which is below are reproduced in relief, as may be observed on the lower surface of the

[1] Translated from the "Révue et Magasin de Zoologie," 1872.