

*March 18th.*

The President, DR. BRIDGES in the Chair.

Twenty-eight members present.

This meeting having been held for the purpose of attending the funeral of our late lamented and distinguished member, Dr. Thomas B. Wilson, it was immediately adjourned for that purpose.

---

*March 21st.*

The President, DR. BRIDGES, in the Chair.

Eighteen members present.

A paper was presented for publication entitled "Notice of some new types of Organic Remains from the Coal Measures of Illinois." By F. B. Meek and A. H. Worthen.

---

*March 28th.*

The President, DR. BRIDGES, in the Chair.

Fifteen members present.

On the report of the Committee, the following paper was ordered to be published :

**Notice of some New Types of Organic Remains, from the Coal Measures of Illinois.**

BY F. B. MEEK AND A. H. WORTHEN.

The fossils described in this paper were discovered at a locality on the south side of the Illinois River, at Morris, Grundy County, Illinois, near the northern boundary of the Coal Measures of that State. This locality is already well known from the numerous beautiful specimens of fossil ferns it has afforded, as well as from the discovery there of a remarkable extinct Neuropterous Insect, described by Prof. Dana in vol. xxxvi. 2d ser. p. 34, Am. Journ. Sci. The bed from which all these interesting fossils were obtained, holds a position near the base of the Illinois Coal Measures, somewhat above the horizon of the second seam of coal. At the out-crop, where these specimens were collected, a thickness of about twenty feet of strata is exposed, consisting of sandy shale, passing downwards into a more argillaceous shale, forming the bed of a small stream; while a short distance further down this little stream, and at a lower horizon, a thin seam of coal crops out. No workable beds of coal are known in the State north of this County, and the Coal Measures here rest directly upon Silurian Rocks.

The fossils at this locality are immediately enveloped in biscuit-shaped iron-stone nodules. These nodules are not generally composed of concentric layers, but show, on weathered surfaces, a tendency to a laminated structure, the planes of lamination being flat, parallel to the greater diameter of the concretions, and probably also coincident with those of the shale, as they lie in the bed. On breaking open these concretions, the laminated structure is generally found not to extend within; the interior having a homogeneous, rather compact structure, and a grey or brownish grey color, (the iron being usu-  
1865.]

ally in the condition of a carbonate), while more or less arenaceous and argillaceous matters also enter into their composition. Some of the concretions seem to contain no organic remains, but often in breaking open others, a fossil is found to have formed the nucleus around which the concretionary action took place.

It is an interesting fact that we find here, near the base of the Illinois Coal Measures, a species of the remarkable genus *Bellinurus*, an intermediate link, (hitherto only known to occur in the lower Coal Measures of England and Ireland,) between the older Trilobites, and the existing genus *Limulus*. In England it is found enveloped in similar iron-stone nodules, at Cole-Brook-Dale, where three species have been discovered, one of which (*B. bellulus*, Koenig, = *B. rotundatus*, Prestwich) is closely related to our Illinois species.

We likewise find at the Morris locality a species of the genus *Anthropalemon*, Salter, (or a closely allied type) which in Scotland also occurs in the lower Coal Measures, while neither of these genera are known in the subcarboniferous, or any lower formation. These facts furnish additional evidences, if any were necessary, (coinciding with all the other palaeontological, as well as stratigraphical, evidence) of the fallacy of an opinion recently expressed by a writer in the Bulletin of the Geological Society of France, that our western Coal Measures, and particularly those of Illinois and the adjoining States, belong not to the horizon of the true Coal Measures of Europe, but to the subcarboniferous or mountain limestone series.

In a paper by one of the writers, published in the March number of the American Journal of Science, 1865, after speaking of the general distribution of marine remains in our western Coal Measures, he remarked (which was strictly in accordance with his observations up to that time) that after more than twenty years familiarity with the fossils of the coal formation of the Western States, he had never seen amongst them any terrestrial or fresh-water types, other than plants. Since investigating the fossils described in this paper, however, amongst which it will be seen there is believed to be a Caterpillar, we can but regard the Morris bed as an exception to this general rule. If the fossil to which we allude is a true Caterpillar, its presence there, along with the insect described by Prof. Dana, would indicate that this bed was probably deposited in an estuary, into which this little worm-like larva, and the other insect, were doubtless carried from the land by an inflowing stream or the ebbing tide. This suggestion also receives some support from the affinities of the associated crustacea, since the genus *Bellinurus*, from its relations to the existing genus *Limulus*, might have been capable of living at least in brackish waters, although the English species are associated with marine forms. The genus *Anthropalemon* is also supposed, by Prof. Dana, to have been related to *Eglea*, a fresh-water type. In addition to these facts, no unquestionable, strictly marine forms of any kind have, so far as we know, been yet found in this bed.

The existence of this exceptional case (if it is such) of terrestrial and fresh or brackish-water fossils in our western Coal Measures, has no bearing, however, against the general conclusions in connection with which the statement above alluded to was made; nor even, indeed, against the general accuracy of the statement itself, since the fact of the almost exclusive and general distribution of marine animal remains in our western Coal Measures, stands unshaken.

The fossils here noticed will be fully illustrated and described, and such additional facts given as we may in the mean time learn from other specimens, in the forthcoming report of the Illinois Geological Survey, for the publication of which we are happy to announce the Legislature has made a liberal appropriation.

We are indebted to Prof. Dana for the use of several specimens of some of the crustacea described in this paper, as well as for suggestions in regard to their affinities; also to Dr. Stimpson for suggestions respecting the same.

[Mar.

We are likewise under obligations to Mr. Joseph Evans, of Morris, Illinois, who first discovered the fossils at this locality, for the use of several specimens. Amongst others, the form we have supposed to be a Caterpillar and that we have referred to *Anthrapalæmon*, belonging to him.

### CRUSTACEA.

#### ENTOMOSTRACA.

#### XYPHOSURA.

##### Genus BELLINURUS, Kœnig.

Not having had an opportunity to consult Kœnig's original diagnosis of this genus, nor indeed a good description of it by any other author, we are not aware what characters were assigned it, or how its author proposed to distinguish it from the existing genus *Limulus*. Most authors, including Milne Edwards, Bronn, Prestwich, Mantell, Portlock, Murchison and others, referred the species to *Limulus*, though Portlock in doing so remarks that the distinct trilobation and segmentation of the abdomen in these fossil species, seem to constitute a generic distinction. Pictet admits the genus in his *Trait de Palæont.*, ii. 538, and remarks that it is distinguished from *Limulus* "by the articulation of the tail, and above all by the abdominal buckler presenting two distinct longitudinal furrows." Prof. Owen also admits the genus, in his valuable "Palæontology, or Systematic Summary of Extinct Animals," (p. 43) and says it differs from the "King-Crab, (*Limulus*) in the movable condition of the body segments."

A careful study, however, of fine specimens of the species described below, has satisfied us that the segments of its abdomen are not movable, but as firmly and completely united into a single shield as in the genus *Limulus*. We are, therefore, led to believe that this genus is mainly distinguished from *Limulus*, (so far as its characters have yet been made out) by the more transverse form of its cephalo-thoracic shield, its proportionally much longer and more slender legs\*, the transversely or subcircular form, and distinct trilobation and segmentation (not complete division, however,) of its abdomen; as well as by its flattened borders without movable spines. There are also some differences in the more anterior position of the eyes, the stronger and more continuous character of the ocular ridges, as well as in the subdivisions of the area circumscribed by these ridges in *Bellinurus*. Other differences, of perhaps greater importance, will probably be observed, when the appendages of the under side can be seen.

None of our specimens are in a condition to show the small anterior pair of simple eyes, though from the general analogy of this interesting crustacean to the genus *Limulus*, it is more than probable better specimens may show them. And yet it is possible, from the more anterior position of the eyes, corresponding to the larger reticulated pair in the genus *Limulus*, that the small supplementary pair may not have been needed. As in *Limulus*, it shows a row of six small pits in each of the longitudinal furrows of the abdomen, marking the position of the muscular apophyses within; while the condyle, for the articulation of the abdomen with the cephalothorax, seems to agree exactly with that of *Limulus*.

We are not aware of the nature of the peculiarities in the articulation of the caudal segment mentioned by Pictet, none of our specimens being in a condition to show the connection of these parts satisfactorily, while he does not explain in what the difference consists.

\* One of our specimens of the following described species, as well as one of *B. anthrax*, figured by Prestwich, (Trans. Geol. Soc., London, v. p. xli. fig. 1.) shows that at least one pair of the legs (if they were articulated around the mouth, at the middle of the cephalothorax, as in *Limulus*) must have been quite as long as the abdominal and cephalothoracic shields together; which would be proportionally more than twice the length of any of the legs in *Limulus*.

BELLINURUS DANÆ, M. &amp; W. ✓

Cephalo-thoracic shield transversely crescentic, more than twice as wide as long, moderately convex, the height nearly equalling half its length; anterior and antero-lateral margins broadly and regularly rounded; lateral angles produced obliquely backwards and outwards, with a very slight inward curve, into slender mucronate spines, terminating remote from, and nearly opposite the middle of the abdomen; posterior margin on each side for about two-thirds of the way in from the lateral angles, toward the middle, concave in outline; nearly straight or very slightly concave along the middle between these two points. Mesial lobe small, somewhat lower than the ocular ridge on either side, but rounded and well defined behind, where it supports a small central tubercle (or short spine?), thence narrowing forward, and sometimes showing a slight tendency to develop a second much smaller tubercle, at about one-third the length of the shield from its posterior margin; near which point it suddenly contracts into a mere linear carina that extends forward to the anterior transverse division of the ocular ridge. Area circumscribed by the ocular ridge, crown-shaped, or subquadrangular in outline, and composing the central third of the cephalo-thoracic shield; a little wider anteriorly than its length, which equals about five-sixths that of the shield; lateral margins concave in outline; anterior side convex, with a central emargination; internal surface divided into four irregular subordinate areas, by the mesial lobe with its linear anterior continuation, and a less distinctly defined, secondary transverse linear ridge. Ocular ridge narrow, but distinct, its lateral divisions arching inwards behind the eyes, and terminating posteriorly at the margin of the shield nearly opposite the middle of each lateral lobe of the abdomen, in a (triangular?) spine, which is directed backwards, outwards and a little upwards; anterior transverse division arching forwards on each side, and curving backwards in the middle. Compound? eyes small, remote, and located one at each antero-lateral angle of the crown-shaped central area, at points about one-third the length of the shield from its anterior margin. (Simple eyes, if they existed, unknown.)

Abdomen transversely suboval, or truncato-subcircular in outline, being wider than long, and nearly straight anteriorly, with lateral margins rounding in abruptly in front, and more gradually into the regularly rounded posterior outline; generally rather more depressed than the cephalo-thorax, particularly in front. Flattened lateral border rather narrow, and regularly scalloped between its projecting marginal spines. Mesial lobe narrow, or of about the same breadth as that of the cephalo-thorax, and near half as broad as, and a little more elevated than, the lateral lobes; segments well defined; first and third each provided with a small central tubercle; sixth as long as any three of the others, rather abruptly narrowed and depressed behind, and surmounted anteriorly by a large tubercle (or spine?). Lateral lobes somewhat flattened on the inner half, and rounding down rather abruptly to the flattened free borders on each side and behind; segments defined by distinct linear ridges, which are separated by flattened spaces four or five times as wide; these ridges extend obliquely outwards and a little backwards across the lateral lobes and their flattened borders, beyond which they are produced into slender mucronate spines, of nearly equal length, curved obliquely backwards.

Caudal segment, or stylet, apparently nearly two-thirds as long as the abdomen; gradually tapering, and trigonal or sub-trigonal, being flat below, angular on each side, and angular or rounded above.

Appendages of the under side unknown, excepting one of the legs, which is seen in one specimen, projecting out from under the cephalo-thoracic shield, between its posterior margin and the abdomen. It is long and slender, and shows of the first segment projecting from under the shield, a length of about 0.12 inch. The next segment appears to be 0.25 inch in length, with a breadth of only 0.04 inch. The succeeding segment can be traced in

[Mar.]

the matrix for a distance of about 0.30 inch, being slightly curved near the extremity, and apparently tapering to a point, this was probably also provided with a movable finger as in *Limulus*, but the specimen is not in a condition to show it. It is not possible to determine which one of the legs this is.

Entire length from the extremity of the caudal segment to the anterior margin of the cephalo-thorax, about 1.90 inches. Length of cephalo-thorax, 0.57 inch, breadth of do. to the extremities of postero-lateral spines, 1.70 inches; length of area included within the ocular ridge, 0.50 inch; greatest breadth of do. (which is the distance between the eyes,) 0.60 inch. Length of abdomen, 0.65 inch; breadth of do., exclusive of the flattened margin, 0.94 inch, including it, 1.06 inch; breadth of mesial lobe, 0.23 inch; length of caudal segment, about 0.60 inch.

Of the known species of *Bellinurus*, ours seems to be most nearly related to *B. bellulus*, Koenig, (the type of the genus, if we mistake not), which is regarded as being identical with *Limulus rotundatus*, of Prestwich, (Trans. Geol. Soc., London, v. p. 413, pl. XLI. figs. 4, 6 and 7.) From this species, however, it may be at once distinguished by having the lateral angles of its cephalo-thorax produced into long, slender spines, and the flattened border of its abdomen proportionally much narrower, and armed with a series of sharp-curved spines, instead of being merely serrated.

We should also remark here, that Prof. Owen's figure of *B. bellulus*, (Palæontology, p. 42,) as well as that given by Murchison of the same, under Prestwich's name *rotundatus*, (Siluria, p. 318,) represent the eyes as being located at the lateral extremities of a large, transversely oval or subelliptical area; while within this, there is a smaller, crown-shaped area, circumscribed by a ridge, and in all its principal features, corresponding to that which in our species has the eyes located at its anterior lateral angles. This wide difference in the position of the eyes, as well as in the ridges of the central region of the cephalo-thoracic shield, if they really exist, would apparently be of more than specific importance. The close general agreement, however, of these forms, in all their other essential characters, renders it very improbable that they belong to different genera. Hence, we would suggest that there may have been some error in the figures cited above, representing the eyes (which are with difficulty seen in any but well preserved specimens) in this outer position, and the presence of a large outer ocular area surrounding that corresponding to the quadrangular one in our species. We are the more inclined to think this is the case, from the fact that Owen's and Murchison's figures appear to have been reduced from Prestwich's figures 5 and 6, cited above; which represent the two halves of a nodule, containing a specimen and its mould, of *B. bellulus*, with a large transversely oval space in the central region of the cephalo-thorax, as we must think, *accidentally crushed in*. This view seems to be sustained, too, by Mantell's figures of the same species, from specimens collected by him at the same locality, (see Medals of Creation, p. 550,) which show no traces of this outer transversely oval ocular area.

In the elongated, spine-like character of the lateral angle of its cephalo-thoracic shield, as well as in having the margins of the abdomen armed with sharp spines, our species agrees more nearly with *B. anthrax* (= *Limulus anthrax*, Prestwich), but it differs in the form of the outline of the anterior side of the cephalo-thorax, as well as in the direction of its prolonged lateral angles, and its less produced spines around the flattened margins of the abdomen. Hence, it appears to be intermediate in its characters between *B. anthrax* and *B. bellulus*.

We are gratified to be able to dedicate this fine species, the first of the genus hitherto discovered in America, to Prof. James D. Dana, the author of one of the most important works on the Crustacea ever published; to whom we are indebted for the loan of one of the specimens from which the foregoing description was drawn up.

1865.]



## TETRADECAPODA.

## ISOPODA.

## (ANISOPODA.)

## ? Family ACANTHOTELSONIDÆ.

## Genus ACANTHOTELSON, Meek &amp; Worthen.

Superior antennæ nearly as long as the inferior, and provided with well developed accessory appendages; flagella of both pairs longer than the peduncles; head about equalling the length of the first two anterior thoracic segments. Thoracic and abdominal segments (except the last one) not differing materially in length, and each shorter than the head. Anterior thoracic legs longer than the others, not chelate. Telson or terminal segment simple, long, spiniform, and laterally compressed. Stylets with second segments (bifid?) much longer than the first, and similar to the telson.

The fact that the oral apparatus, and other appendages of the head, as well as the branchiæ, always so important in the classification of the Crustacea, are so rarely preserved in fossil species, especially those of smaller sizes, renders their study more difficult than that of most other organic remains. Hence, in describing new species, genera, or other groups, the palæontologist is often unable to give any information in regard to the very parts that would be the first to claim the attention of the Carcinologist in the investigation of recent species. Another difficulty also arises from the fact that, as in other departments of palæontology, it often happens in the study of fossil crustacea, we meet with types presenting a combination of characters which in existing species are distributed in widely distinct groups. So that on finding a new type showing only a part of its characters, we would often be led at once to place it in a group with which probably the next specimen found would show it to possess some one or more wholly incompatible peculiarities.

On first examining specimens of the typical species of the genus above described, our impression was, that it must be, beyond all doubt, a true *Amphipod*. A more careful examination, however, soon showed that it presented the radical difference from all the known types of that extensive group, of having only one pair of the abdominal appendages styliform, and the other five natatory, instead of three pairs styliform and three natatory; thus combining with its Amphipodan abdomen, thorax, head, anterior appendages, and general physiognomy, the single pair of styliform appendages of the *Isopoda*.

Being therefore left in doubt in regard to its affinities, we sent sketches of some of the best specimens to Prof. Dana, who had also previously received some imperfect specimens of the same species from Illinois. On examining these sketches and specimens, Prof. Dana wrote that he thinks this crustacean most probably belongs to a group holding an intermediate position between the typical *Isopoda* and the *Amphipoda*, for which he has proposed the name *Anisopoda*. This intermediate group, as first shown by Prof. Dana, is characterized, like the *Amphipoda*, by having the three posterior pairs of thoracic legs in one series, and the four anterior in another; while, as in the *Isopoda*, the branchiæ are abdominal, and only one pair of abdominal appendages are styliform, and five branchial.

In regard to the division of the thoracic legs into two series, we would remark, that we have observed no evidences of it in all the specimens we have seen, excepting one of those kindly loaned us by Prof. Dana. In this, however, four pairs of these legs seem to be directed backwards, and only three forward; which, if not produced by accidental distortion, would indicate *Isopod* affinities. Yet, in all the other specimens seen, the whole seven pairs are directed forward. Although much inclined to believe the latter their normal arrangement, it should be remembered, as suggested by Prof.

[Mar.

Dana, that however important this character may be in the study of the recent Tetradecapod crustacea, it can scarcely be made available in the investigation of crushed fossil species, where so many accidents might have occurred to place the legs in an unnatural position.

We have not been able to clearly satisfy ourselves whether or not our crustacean had squamiformly developed epimerals, as in the normal groups of *Amphipoda*; though some of the specimens appear to show indications of such development; while the shortening of the vertical diameter of the thoracic segments, as compared with those of the abdomen, would seem to be, as it were, an arrangement to make room for such scale-like epimerals. In addition to this, the fact that all of the six or eight specimens we have yet seen, lie in the concretions upon one side or the other, would appear to indicate that the lateral motion of the thoracic legs was in some way restrained so as to prevent the animal from taking an erect position, which is precisely the effect produced in the normal *Amphipoda* by the possession of well developed squamose epimerals. If this should prove to be the case, it would show that the remarkable combination of *Amphipod* and *Isopod*, or *Anisopod* characters, already alluded to in this fossil, are real, and not simulative; since it would thus present mainly the anterior structure (possibly even to the thoracic position of the branchiæ) of a normal *Amphipod*, combined with the single pair of styliform, and five natatory abdominal appendages of the *Isopoda* or *Anisopoda*.

It must be evident, we think, that such an ensemble of characters as that presented by our fossil, would exclude it from any known family of the *Tetradecapoda*; hence we can but regard it as the type of a new family.

#### ACANTHOTELSON STIMPSONII, M. & W.

Linear or sublinear in form. Upper antennæ at least as long as the head and first five thoracic segments; peduncle moderately stout, rather longer than the head; first joint a little longer and wider than the two others, which are of nearly equal length; flagellum slender and very minutely jointed; accessory appendage nearly or quite as long as the flagellum, and like it, minutely jointed. Inferior antennæ as long as the head and seven thoracic segments; peduncle slightly longer, but otherwise similar to that of the upper antennæ; flagellum a little stouter and longer, but in other respects as in the upper pair. Head, as seen in the (compressed) side view, subquadrangular, longer on the upper than the lower side, in consequence of the obliquity of anterior side; eyes small, round, placed just below the bases of the upper antennæ. The (fourteen) thoracic and abdominal segments distinct, and (excepting the last one) of nearly equal length,—a few of those nearest the head being a little shorter than the others; all diminishing in depth (side view) from about the antepenultimate one forward; their anterior basal margins rounded; posterior rectangular, or a little rounded.

First pair of thoracic legs about one-fourth longer, and a little stouter than the succeeding five pairs, and apparently terminating in a slender, sharp dactylus; first joint above, a little shorter, narrower, and more tapering than the next—neither more enlarged than the other joints above. Five succeeding pairs of legs of nearly equal size and form; their upper two (or three?) joints very short, and not enlarged; seventh pair nearly as long as the first, and more slender than the others. Natatory abdominal appendages long and slender; styliform pair with first joint short and quadrangular; second and only other joint (double?) with each branch (if there are two) simple, equal and as long as the telson, which they nearly exactly resemble in form; their upper and lower margins each with a row of short, oblique, rather distant setæ, between which may be seen by the aid of a magnifier, a series of much more minute, closely-arranged setæ. Telson as long as the last four abdominal segments; at its base one-half as wide, vertically, as the penultimate

abdominal segment; thence tapering, at first rapidly, and then very gradually, to a mucronate point,—upper and lower margins setigerous, like those of the stylets.

It is possible that when we can have an opportunity to examine additional specimens, we may have to modify some of the characters given in the foregoing generic or specific description; though not, we believe, in any very essential particular. We hope, however, to be able, hereafter, to clear up several doubtful points in the structure of this interesting type, when we can have better specimens for study.

Length from anterior side of head to the extremity of the penultimate abdominal segment 1.30 inches; length of telson 0.31 inch; length of the first six abdominal segments 0.52 inch; length of the seven thoracic segments about 0.64 inch. Height of third abdominal segment 0.20; height of each first two or three thoracic segments 0.12 inch; length of stylets about 0.31 inch, of which the first joint forms only about 0.06 inch. Length of outer antennæ, including its peduncle, 0.66 inch.

It is with pleasure that we dedicate this typical species of a new and remarkable extinct genus to our friend Dr. William Stimpson, whose labors in carcinology, and various other departments of zoology, are well known in this country and Europe.

ACANTHOTELSON INÆQUALIS, M. & W.

The specimen upon which we propose to found this species, appears to agree with the last in almost every respect, excepting in the proportional size and the form of the segments. In the first place, the penultimate abdominal segment is nearly twice the length of any of the others, instead of being nearly or quite of the same length; while the other abdominal segments (as seen in a side view) are more cuneiform than in the last. Again, the fifth and sixth thoracic segments are longer, particularly above, and the fourth shorter, than any of the others, instead of all being of about the same length. We have not been able to see the stylets, nor to make out the nature of the legs, but from a part of one of those of the anterior pair, they would seem to be rather stouter than in the last described species.

As these differences can scarcely be due to accidental distortion, we can but regard this form, with the material now at hand for comparison, as a distinct species. If we are correct in this view, it is probable good examples will show other differences than those mentioned above.

Length of head, thorax and abdomen 0.90 inch; length of head 0.12 inch; length of the seven thoracic segments about 0.50; length of first five abdominal segments 0.26 inch; length of penultimate abdominal segment 0.09. Height of third abdominal segment (flattened side view) 0.13 inch; height of anterior thoracic segments about 0.07 inch. Length of lower antennæ at least 0.43 inch; length of upper not less than 0.36 inch, and probably a little more.

? Family PALÆOCARIDÆ.

Genus PALÆOCARIS, Meek & Worthen.

Inner and outer pairs of antennæ of nearly equal length, the former each bearing a well developed accessory appendage; peduncles of both pairs shorter than the flagella. Head about as long as the first two abdominal segments. Thoracic legs long and slender; anterior pair not chelate. Telson long, tapering and horizontally flattened; stylets with first joint very small, second double, and also flattened horizontally.

This is another remarkable type, presenting, so far as can be determined, even a more puzzling combination of characters than that we have described under the name *Acanthotelson*. In the nature of its antennæ, with their apparently well-developed basal scales, the structure of its caudal appendages, and its long, slender legs, spread out on each side, for walking in an erect

[Mar.



attitude; as well as in the depressed, slender form of its abdomen and thorax, it seems to present decidedly the aspect of a *Macrural Decapod*. Yet, on a closer examination, we can see no traces of a carapace,—the thorax being apparently divided into seven segments, like those of the abdomen, and each provided with a pair of legs, as in the *Tetradecapoda*. If we are not mistaken in these latter characters, and we certainly believe we are not, it must show a most extraordinary union of characters, which, amongst recent crustacea, belong to different primary divisions. From all that can be made out of its structure, we are therefore inclined to view it as one of the “embryonic” or “comprehensive” types, so often met with in various departments of palæontology, and which furnish the advocates of the Darwinian hypothesis with some of their strongest arguments.

For the present, this genus is placed, provisionally, along with the *Tetradecapoda*, though it cannot, we think, be included in any known family of that division; while if it should prove to be an embryonic or low type of the *Decapoda*, it may be even necessary to establish for its reception, a division of more than family importance. It is proper to remark here, however, that we have not seen any one specimen showing the caudal appendages we have described, along with the other characters of the thoracic and cephalic members, mentioned above. One imperfect specimen shows the seven thoracic and five or six of the abdominal segments, with their legs and natatory appendages, the head, antennæ, and apparently their basal scales; while another shows the caudal appendages, and all of the thoracic and abdominal segments, very distinctly, without any of the other members. The general agreement, however, of these specimens, in the parts preserved in each, is such that scarcely a doubt can be entertained that they belong to the same species. Yet, in order to prevent confusion, we would remark, that in case they should prove to belong to different genera, or species, that it is the form showing the head, antennæ, thoracic and abdominal segments, with their appendages, &c., that we regard as the type of the genus.

PALÆOCARIS TYPUS, M. & W.

Linear, with thorax slightly wider near the middle than the abdomen; thoracic and abdominal segments of nearly equal length. Inner antennæ equalling the length of the head and thorax; peduncles stout, first joint a little longer and wider than either of the other two, which are of nearly equal length, and minutely and closely setigerous on their inner margins; flagellum very slender, and minutely jointed; accessory appendage nearly or quite as long as the flagellum, and scarcely differing from it otherwise. Outer antennæ possibly a little longer than the others, peduncles slightly longer than those of the other pair, and like them minutely setigerous in front; basal scales (?) oblong, about as long as first joint of peduncles, squarely truncated. Thoracic legs slender and long, anterior ones apparently not longer or larger than the others, none of them (so far as can be seen) chelate, or with any of the segments enlarged; all the others with the first two or three joints very short; fourth? joint horizontally extended, tapering, and about as long as four segments of the body; succeeding joints (in the specimen examined) very slender and abruptly bent downwards and backwards. Natatory abdominal appendages acutely lancelinear, and some of them as long as four of the abdominal segments. Telson nearly as broad at the base as the penultimate segment, tapering, and as long as two and a half of the abdominal segments; minutely setigerous on each side. Stylets, with first joint very minute; second with each division as long as the telson, and lancelinear in form, with pointed extremities, and parallel, more or less setigerous margins.

Length of head, thorax, and first six abdominal segments, 0·78 inch; do. of head, 0·12 inch; do. of the seven thoracic segments, 0·35 inch; do. of

the first six abdominal segments, about 0.31. Length of telson, about 0.14 inch; do. of stylets, near 0.13 inch. Length of lower or outer antennæ, not less than 0.38 inch, (probably more), of which the peduncle forms 0.15 inch; do. of inner, near 0.40 inch. Breadth of thorax, 0.13 inch.

## DECAPODA.

### MACRURA.

? Genus ANTHRAPALÆMON, Salter, 1861.

The genus *Anthrapalæmon* was proposed by Mr. Salter in the Quarterly Journal of the Geological Society of London, vol. xvii., p. 529, for the reception of a Crustacean from the Coal Measures of Scotland. His description of the genus reads as follows:—

“Carapace scarcely so broad as long, (except when crushed flat), simple, flatter than semicylindrical, the sides a little arched outwards. A strong central ridge in front, projecting as a thick (serrate?) spine is separated by a concave space, or slight furrow, from a posterior central ridge, which only occupies (in the type species, *Grossarii*) a small portion of the length. Front margin serrated. The outer antennæ have wide, square basal joints, apparently *without any advantage*;\* the 2d and 3d joints not much oblique; the rest about as broad as long. Abdomen as broad as long, of six joints (besides the telson), broad and very short; the pleuræ, except the 2d, pointed. Telson very broad; appendages to the penultimate joint, double on each side, subtrigonal, broad.”

The name *Anthrapalæmon* was proposed from its supposed affinities to the recent genus *Palæmon*, but Prof. Dana thinks it more nearly related to *Æjlea* and *Galathea*.

#### ANTHRAPALÆMON GRACILIS, M. & W.

It is with considerable doubt that we venture to refer this species to Mr. Salter's genus, the only specimen we have seen being imperfect, and not in a condition to show the more important characters. In form and general appearance, however, as well as in such of its details as can be made out, it seems to agree well with that genus. The specimen consists of the abdomen and caudal appendages, (in a crushed condition), and an impression in the matrix of the under side of the carapace, the outer pair of antennæ, and apparently of the eyes. The carapace, as seen from above, presents nearly an oblong form, excepting that the lateral margins are moderately convex in outline; the two extremities are truncated, and the breadth nearly or quite equalling three-fourths the length. Its lateral margins, in front of the middle, are each finely serrated by six small, sharp, projecting points as in the type of the genus, excepting that they are sharper, and directed more obliquely forward. At each antero-lateral angle, there is also a considerably larger projecting point, forming a short spine, exactly as in the type of the genus, excepting that it is extended more nearly directly forward. The outer pair of antennæ are moderately stout; each peduncle showing three joints, diminishing rather gradually in size, the first longer than wide, and the other two apparently of nearly equal length and breadth, and obliquely articulated. The flagellum is narrower at its base than the last joint of the peduncle, and composed of very short segments, which are scarcely more than one third as long as wide. The entire length of the antennæ cannot be determined, as neither flagellum is entire in the specimen examined, but as the portion remaining tapers very gradually, they were probably rather long. They are both, in the specimen examined, deflected abruptly outwards, nearly at right angles to the longer diameter of the carapace, which would seem from the

\*Is not this a misprint of the word *appendage*?

oblique articulation of the second and third joints of the peduncles, to be their natural position. (Inner antennæ unknown.)

Immediately between the bases of the two outer antennæ, the specimen shows what appear to be impressions of the two globose eyes, which with their peduncles extend forward about two-thirds as far as the peduncles of the antennæ. These may possibly be the peduncles of the inner antennæ; but they look very much like globular eyes, on more slender peduncles.

The abdomen is more than half the length, and about two-thirds the breadth, of the widest part of the carapace. It shows five short segments, and apparently part of another, the first of which is a little smaller, and the second a little larger than the others. None of them, however, are more than one-fifth as long as the breadth of the abdomen.

The caudal appendages being unfortunately bent down and crushed, it is not possible to make out the form of the telson or the details of the other parts, though the whole together seem to have been wider than the abdomen, and as wide as the carapace. No surface sculpturing can be clearly made out, though there is some appearance of a few irregular scattering granules near the margins of the carapace. (Other parts unknown.)

Entire length, from the stalked eyes? to the extremity of the caudal appendages, about 1.13 inches; length of carapace, 0.63 inch; breadth of do. near the middle, 0.45 inch; at the extremities 0.31 inch; length of abdomen, 0.30 inch; breadth of do. near the middle, 0.26 inch. Length of peduncles of the antennæ 0.15 inch; do. of eyes? and their peduncles, 0.13 inch.

It will be observed from the foregoing description that our specimen shows no traces of the central spine or beak, extending forward from the anterior extremity of the carapace, nor of the longitudinal carina connected with it, which constitutes such a marked feature in *Anthrapalæmon*. It is possible, however, that this character may have been obliterated in breaking open the concretion, since our specimen only shows an impression of the under side of the carapace, while the appendage alluded to projects forward from the upper side, and may consequently be embedded in the other half of the concretion, which we have been unable to obtain. Still as it is possible that this appendage may be wanting in our fossil, we should not be surprised if it would prove to belong to an allied but distinct genus.

Specifically at least, it differs from *A. Grossartii*, of Salter, in the proportionally much shorter joints of the flagella of its outer antennæ, and the oblique articulations of the segments of their peduncles; while the latter, as well as the surface of other parts, are without any traces of the fine pitting represented by Mr. Salter's figures. Our specimen also shows traces of what appear to be squarely truncated basal scales to the outer antennæ, about as long as their first joints, while Mr. Salter's figure (1), represents apparently a triangular scale over the left antenna.

Length from the end of the caudal extremity, to the anterior margin of the carapace, 1 inch. Length of carapace, 0.60 inch; breadth of do. 0.43 inch. Length of abdomen, about 0.30 inch; breadth of do. 0.27 inch. Length of caudal appendages, 0.10 inch.

## MYRIAPODA.

? Genus ANTHRACERPES, Meek & Worthen.

ANTHRACERPES TYPUS, M. & W.

This genus and species are founded upon a slender worm-like fossil, the relations of which have not been very clearly determined. The specimen consists of a well defined mould or impression left in a concretion, and measures 1.50 inches in length, and about 0.09 inch in breadth, (height) as seen lying upon one side. It is regularly arched from end to end, so as to form about one-third of a circle of 0.65 inch radius. For most of its length, it is

1865.]

of very uniform breadth or height, but it tapers very gradually towards what appears to be the posterior end, where the last segment terminates in three or four short, slender, spine-like appendages, directed backwards on a line with the general curve of the body. The other end being broken away in the only specimen yet known, the nature of the head and its appendages cannot be determined.

The entire body is distinctly articulated, and shows clearly nineteen segments, and part of another. The segments are of nearly uniform size, or only vary from 0.08 to 0.10 inch in length; the last one, however, has only a breadth or height of about 0.03 inch, and the next about twice that. Crossing the segments near the upper side, may be seen in the mould an undefined furrow, (produced by a ridge in the fossil itself) which bends downwards and then up again as it passes across from side to side of each segment. Anteriorly it is less distinct and placed very near the dorsal margin, but in tracing it backwards it is found to descend and become more defined, until it reaches the fourth segment from the extremity; on this it passes obliquely downward to its posterior inferior corner, so as not to be seen on any of the succeeding divisions behind. Below the middle of each segment, there is in the mould a small prominence, evidently marking the position of a corresponding pit in the fossil. These agree in position and appearance with the spiracles or breathing apertures in the *Myriapoda*. We have not been able to make out very clearly, any indications of feet or other appendages; though there is near the base of each segment of the mould, a short oblique impression, that may possibly have been left by very small feeble legs folded backwards.

As this fossil shows too many segments for a larval insect, and has not the aspect of an *Annelid*, we are rather inclined to view it as a *Myriapod*.

## INSECTA.

### LEPIDOPTERA.

Genus PALÆOCAMPA, Meek and Worthen.

PALÆOCAMPA ANTHRAX, M. & W.

The fossil for which the above generic name is proposed, is about 0.70 inch in length, and some 0.13 inch in breadth, exclusive of the projecting tufts of hairs. It is an arcuate, worm-like body, that has been divided or split lengthwise in breaking open the concretion in which it is enveloped; so that it is only a longitudinal section we see in looking at either half of the concretion. At both extremities, and along the upper or convex side of the curve, we observe densely packed tufts or fascicles of hairs individually radiating, as if from small wart-like protuberances. These hairs are straight, and about 0.30 inch in length. At one extremity, which appears to be the anterior, two of the bundles of hairs are more radiating than the others, and directed forward. The bundles distributed over the curved or dorsal side are regularly arranged, and have each a general direction at right angles from the part of the arched side from which they spring. At the posterior extremity there are also two tufts directed backwards, the individual hairs of which are less radiating than those at the other extremity. Between some of the bundles ranged along the upper side, some shorter tufts are seen, which appear as if they originate in another series of protuberances farther over on the other side embedded in the matrix. If we suppose each of these principal bundles along the curved side, and the two bundles at either end to each belong to a single segment, it would make about ten or eleven segments to the entire body.

The specimen is not in a condition to show the head or feet; yet we are strongly inclined to believe from its form, and peculiar regularly arranged bundles of hairs, that it is a CATERPILLAR. If we are right in this suggestion,

[Mar.

its discovery is certainly an interesting one, as it would present an evidence of the existence of *Lepidopterous* Insects, at a much earlier period in our world's history than has hitherto been suspected.

As this fossil will doubtless be met with in the Coal Measures at other localities, whether or not its connection with the mature Butterfly or Moth can ever be positively established, it seems desirable, for convenience of reference, that it should receive a name; although we are unable to point out any well defined characters from the only specimen seen, by which it can be distinguished from the larva of several existing types. That there is any probability, however, of its belonging to any existing genus, will, we think, not be maintained by any person familiar with the range of generic types in time.

---

*April 4th.*

Vice-President, CASSIN, in the Chair.

Twenty-two members present.

The following paper was presented and referred to a Committee:

"Diagnoses Specierum et varietatum novarum Molluscorum," etc.  
By Philip P. Carpenter.

---

*April 11th.*

The President, DR. BRIDGES, in the Chair.

Twenty-five members present.

The following were presented and referred to a Committee:

"Synopsis of the genus *Pomoxys*," "On the genus *Caulolatilus*," "On the cranial characteristics of *Gadus proximus*," and "Note on several genera of Cyprinoids." By Theo. Gill.

The Curators exhibited a large living specimen of the Great Crab-Spider, *Mygale cancerides*, recently brought from Brazil, and presented by Mr. Newton.

The Secretary announced the death, on the 30th ult., of Major Charles I. Maceuen, late a member of the Academy.

---

*April 18th.*

The President, DR. BRIDGES, in the Chair.

Twenty members present.

The following papers were presented and referred to Committees:

"Observations on the Eocene Lignite Formation of the United States," and "Catalogue of the Eocene Annelides, etc." By T. A. Conrad.

"Descriptions of three new species of Exotic Uniones." By Isaac Lea.

The Secretary read the following:

1865.]