

# REPORT

OF THE

THIRTY-SEVENTH MEETING

OF THE



# BRITISH ASSOCIATION

FOR THE

## ADVANCEMENT OF SCIENCE;

HELD AT

DUNDEE IN SEPTEMBER 1867.

LONDON:

JOHN MURRAY, ALBEMARLE STREET.

1868.

consuming 70,000,000 tons of coal. Now, when we remember the various purposes to which coal is now applied, and where even a considerable augmentation of price will not preclude its use, we must at the same time perceive the serious effect any great change in the value of fuel must exercise on the production of an iron railway bar requiring five or six tons of coal for its manufacture. In reality, this disproportion between the value of coal and iron as compared with this country is already perceived abroad, where, notwithstanding greater mining difficulties than we have to contend with, fuel commands a price sufficient to cover this, and also leave a greater margin of profit than falls to the share of the coal owner in this country.

Favoured thus, as we undoubtedly are by nature, there seems nothing wanting for our success in this noble branch of manufacturing science than a continuance of that unflagging spirit of enterprise on the part of the masters, and the exercise of that operative skill on the side of our workmen, which is still unsurpassed in any iron-producing country of Europe; but in this alliance a correct knowledge by both of the competition we have to meet, and a thorough belief in the inseparable union of the interests of each, are indispensable.

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*Third Report on the Structure and Classification of the Fossil Crustacea.* By HENRY WOODWARD, F.G.S., F.Z.S., of the British Museum.

SINCE I had the honour to submit to the British Association my last Report on the Structure and Classification of the Fossil Crustacea, the first part of my monograph on the *Merostomata* has been issued by the Palæontographical Society. About seven more plates are already prepared for the second part, of some of which I am enabled to exhibit proofs.

The magnificent collection of remains of this remarkable group of Crustacea from the Devonian of Forfarshire, belonging to Mr. James Powrie, F.G.S., of Reswallie, are on view in the Volunteer Drill Hall.

A fine series, comprising several new forms, from the black shales (Uppermost Silurian) are exhibited at the present Meeting (Panmure St. Chapel) by Mr. R. Slimon from Lesmahagow, Lanarkshire, and are worthy of a careful inspection by all who are interested in geology.

In the immediate neighbourhood of Dundee, at Montrose, at the University of St. Andrews, at Arbroath, at Rossie Priory, and in the Watt Institution in the town itself, some of the best specimens ever yet found of the remains of *Pterygotus* are to be seen; whilst Balruddery Den, Carmyllie, and the quarries in the Sidlaw Hills, exhibit the "Arbroath paving-stones" and overlying fissile shales, whence these remains were procured.

Among the new forms which have been obtained by Mr. Slimon in his exploration of the shales of Logan Water, are some almost entire remains of a form allied to *Pterygotus punctatus* (called by Mr. Salter *Pt. scorpioides*\*), which prove it to be an *Eurypterus* and not a *Pterygotus*. Another new form allied to *Pt. bilobus* and *perornatus*, but having the anterior segments much broader and shorter, and with a somewhat different form of thoracic plate,

\* A MS. label bearing this name is attached to a specimen of a portion of this same species in the Museum at Jermyn Street.

has been met with. It will be needful to modify the specific name of *Pt. bilobus*, as the new form, and *perornatus*; both have a bilobed telson likewise.

If the name is retained, it must be applied to all three forms thus:—*Pt. bilobus*, var. *inornatus*; *Pt. bilobus*, var. *crassus*\*; *Pt. bilobus*, var. *perornatus*.

In the Quarterly Journal of the Geological Society, vol. xxii. part 1, February 1867, p. 28, and in the British Association Report for 1866, p. 180, and Sections, p. 79, I pointed out the affinities of the *Limulidæ* with the *Eurypteridæ*, and in the first-named paper I recorded all the forms then known which tended to confirm their alliance.

I have now to notice a new genus from Lesmahagow, Lanarkshire, which offers further evidence in confirmation of the correctness of the above-mentioned classification.

It is a small Limuloid form†, the carapace of which measures only 6 lines in breadth and 2 in length, having 5 thoracic and 3 abdominal segments, all of which appear to be free and distinct. The telson is unfortunately wanting, the specimen being close to the border of the matrix.

This little form carries the *Limulidæ* back in time from the Coal-measures to the Uppermost Silurian, a great and important extension.

I shall take an early opportunity to describe this form in detail, and to work out its relationship to *Belinurus* on the one hand and *Hemiaspis* on the other.

#### *New Lower Lias Crustacean from Barrow-on-Soar.*

A new Crustacean, obtained some years since by Sir Philip Egerton, Bart., M.P., from the Lower Lias of Barrow-on-Soar, has since been also found by Mr. Charles Moore, F.G.S., near Bath. It is quite distinct from every other form which I have examined from the Lias or Oolite. Its nearest analogue is the recent *Atya scabra* of Leach, from South America. The limbs are monodactylous and extremely rugose; the antennæ are rigid, and the basal joints thick and spinose, resembling in these points of structure the genus *Palinurina*. The rostrum is short and curved downwards. The carapace was extremely thin, and less chitinous than in the genera *Aeger* and *Pencæus*, it is therefore more easily destroyed or distorted.

I propose to name this new form *Præatya scabrosa*.

#### *Upper Lias Crustacea from Ilminster.*

Having been favoured with the loan of a large series of specimens for examination from the Upper Lias of Ilminster, collected by Mr. Charles Moore, F.G.S., of Bath, I have been enabled to add a considerable number of genera and species to our list of Liassic Crustacea.

The two species of *Eryon*, *E. antiquus* and *E. Moorei*, have been already noticed by me from this locality (see Quart. Journ. Geol. Soc. vol. xxii. p. 499, pl. 25, fig. 3).

I have since determined the following genera and species, which will be described at length in a paper by Mr. Charles Moore on the Ilminster Lias, now in preparation‡:—

\* This interesting form of *bilobus* exhibits in one instance well-preserved *branchiæ*, to which attention was called, and drawings of which were shown by Mr. Woodward. They will be figured in the Palæontographical Society's Monograph on the *Merostomata*.

† The original specimen was exhibited of this, and also figures and specimens of the other forms from Mr. Slimon's collection, believed to be new.

‡ See the Proceedings of the Somersetshire Archæological and Natural-History Society vol. xiii. Published November 1867. Taunton.

1. *Eryon*, Desmarest.  
    — *antiquus*, Brod. sp.  
    — *Moorei*, H. W.
2. *Palinurina*, Münster.  
    — *pygmæa*, Münster. Upper Lias, Ilminster.  
    — *longipes*, Münster. Upper Lias, Ilminster.
3. *Pencæus*, Fabricius.  
    — *latipes*, Oppel. Upper Lias, Ilminster.
4. *Eryma*, Meyer.  
    — *elegans*, Oppel. Upper Lias, Ilminster.  
    — *Greppini*, Oppel. Upper Lias, Ilminster.  
    — *fuciformis*, Oppel. Upper Lias, Ilminster.
5. *Hefriga*, Münster.  
    — *Frischmanni*, Oppel. Upper Lias, Ilminster.
6. *Glyphæa*, Meyer.  
    — *Heeri*, Oppel. Upper Lias, Ilminster.
7. *Pseudoglyphæa*, Oppel.  
    — *Winwoodi*, H. W. Lias, Weston.

(Figures and specimens of these new species were exhibited.)

The above list shows an addition to our Liassic Crustacea of seven genera, and probably nine species new to Britain.

It is extremely interesting to notice so many forms common to our Lias and to the Lithographic stone of Solenhofen in Bavaria.

The persistence of such forms as *Eryon*, *Eryma*, and *Glyphæa* through the whole Oolitic series seems clearly to demonstrate that having escaped total extinction in the Lower Lias sea, they migrated from time to time to more favourable areas, and thus were enabled to live on during the periods of time represented by the long series of deposits from the Lower Lias to the Lithographic stone, in which so many examples are found fossil.

#### *Oolitic forms of Decapoda Brachyura.*

The genus *Prosopon* was established by H. von Meyer for certain minute forms of Crustacea from the Upper White Jura of Oerlinger Thal, and other localities in Germany, of which he has described 29 species (see *Palæontographica* for December 1860, vol. vii.). In addition to these he has described 1 species from the Lower Oolite, 3 from the Coral Rag, and 1 from the Neocomian.

Amongst them, however, are placed forms belonging to a widely different genus in no way related to the *Corystidæ*.

In Professor Bell's monograph on the Crustacea from the Greensand and Gault (*Pal. Soc. Mon.* 1862) he has figured and described one of these, and has correctly referred it to the *Pinnotheridæ*, under the generic name of *Plagiophthalmus*.

This genus would probably include the following species of H. von Meyer:—*Prosopon hebes*, *P. simplex*, *P. rostratum*, *P. spinosum*, *P. elongatum*, *P. depressum*, *P. obtusum*, *P. læve*, *P. sublæve*, *P. punctatum*, *P. Stotzingense*, *P. tuberosum*.

The following are doubtful: *P. insigne*, *P. æquilatum*, *P. marginatum*, *P. grande*, *P. excisum*, *P. lingulatum*.

For the remainder the generic name *Prosopon* should be retained, viz.: *P. aculeatum*, *P. ornatum*, *P. torosum*, *P. Heydeni*, *P. æquum*, *P. paradoxum*.

To this last division I have now the pleasure to add a new British species from Stonesfield.

This form was first noticed by Professor Morris, F.G.S., who obtained an imperfect carapace many years since; it was next observed by Mr. Samuel Stutterd, of Banbury, but likewise in an imperfect state. The perfect carapace now exhibited was kindly lent me by George Griffith, Esq., M.A., the Assistant-General Secretary of the British Association. All these three specimens are from Stonesfield, and they add another new genus to our list of British Oolitic Brachyura. I propose to name it *Prosopon mammillatum*.

*New Fossil Land-Crab from the Lower Eocene.*

Lastly, I wish to call attention to a new genus of Crustacea from the Red Marl of the Plastic Clay, High Cliff, Hampshire, and is, I believe, the first discovered example of a British land-crab, or shore-crab, yet met with. Its oblong quadrangular-shaped carapace, with obtusely rounded anterior angles and short blunt rostrum, remind one immediately of the *Ocypoda*. In addition to this, the eyes have extremely elongated peduncles, which are seen preserved in the fossil, lying in the groove along the fronto-orbital margin of the carapace, as in the recent genera *Gelasimus*, *Macrophthalmus*, and *Ocypoda*. The hands are both small; and from this, as well as from the very broad posterior border of the carapace, I infer that this is a female example, as in most of the recent species of *Quadrangulares* the male has one hand enormously developed for burrowing, whereas the hands of the female are both small and very feeble. The other limbs are, like those of the recent species, well formed for rapid movement along the ground. I propose to name this interesting little Crustacean *Goniocypoda Edwardsi*, in honour of the great French carcinologist to whom science is so much indebted\*.

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*Report on the Physiological Action of the Methyl Compounds.*

By BENJAMIN W. RICHARDSON, M.A., M.D., F.R.S.

IN the present paper I produce the fourth of a series of Reports which I have had the honour to prepare for the British Association. The Reports have all had relation to the physiological action of bodies of organic type. The first Report treated of the action of the substance known as nitrite of amyl. The second was on amylic alcohol, acetate of amyl, and iodide of amyl. The third was on the nitrite of amyl as a remedy, and the action of the amyls as anti-septics; it included also notes of a research on the physiological action of absolute ether, hydrofluoric ether, acetate of ethyl, and nitrite of ethyl.

As the matter of the present Report is long, I shall not attempt to recapitulate at any length the results of previous Reports; I shall be content to offer as the more salient points the following facts:—

In respect to the amyls—

1. Nitrite of amyl was found to be the most active known excitant of the circulation.

\* See Geol. Mag. Dec. 1867, vol. iv. p. 529, pl. 21. fig. 1.