

road between Alexandria and Cairo, requesting him to procure for me as many organic remains as he could from the Nummulite Limestone of the Mokattam range, at the foot of which Cairo is situated. He kindly complied with my request, and among other specimens which he sent there were some Ichthyolites. These I was anxious to have examined by my friend Sir Philip Egerton, our highest authority in this country in that branch of Palæontology. With his usual readiness, he has given me the benefit of his opinion; and I was desirous that his valuable communication should at once be made known to the Geological Society.—LEONARD HORNER.

### 5. CONTRIBUTIONS to FOSSIL ENTOMOLOGY.

By J. O. WESTWOOD, Esq., F.L.S. &c.

[Communicated by the Rev. P. B. Brodie, F.G.S.]

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##### Summary, and Explanation of the Plates.

*Note.*—For the generic and specific appellations, see “Explanation of Plates.”

THE valuable contributions to our knowledge of fossil entomology recently published on the Continent, and more especially the admirable work of M. Heer of Zurich, appear to have led several of our English geologists to take up that branch of Palæontology with more energy than at any previous period; the result of which has been shown not only in the large collections of Lias insects made by the Rev. P. B. Brodie, which formed the groundwork of his ‘History of the Fossil Insects in the Secondary Rocks of England,’ published nearly ten years ago, but also in the discovery of some traces of fossil insects in the Hastings series of the Isle of Wight by Professor Edward Forbes,—a large number of insects in the Wealden rocks of Hastings and its neighbourhood by Messrs. W. and H. Binfield\*,—

\* Quart. Journ. Geol. Soc. vol. x. p. 171. A rich collection of fossil insects, from the Lias of Gloucestershire, &c., has been made by W. R. Binfield, Esq., to whom also the Museum of the Geological Society is indebted for a suite of insect

a few doubtful specimens by W. R. Brodie, Esq., in the Wealden series of Punfield Bay (Swanage), and in the Tertiaries of Studland Bay,—and by still larger collections of fossil insects from the Middle and Lower Purbecks by the Geological Surveyors, the Rev. Mr. Fisher, Messrs. W. R. Brodie and C. Willcox, Capt. Woodley, and especially by the Rev. P. B. Brodie\*, who, from his attention having been especially directed to this branch of the subject, has been highly successful in detecting minute fragments of insect remains in small slabs of stone, which would to a less educated eye have been passed over as destitute of any traces of ancient animal life.

Several of these collections having been placed in my hands for examination and description, I have endeavoured in the five accompanying Plates (Pl. XIV.—XVIII.) to give a general idea of the chief remains contained therein; but the very fragmentary nature of the specimens (of which, it will be observed, there is not one entire, and not a single leg, antenna, or any trophi,—the majority, in fact, consisting only of elytra or fragments of wings and elytra) will prevent me from giving more than a very general description. This is the more to be regretted, since amongst the fragments of wings there are evidently portions belonging to forms distinct from any with which we are now acquainted, and which from their analogy would lead to the inference that they belonged to some forms of Neuropterous insects allied to *Sialis*, *Semblis*, &c., genera which are more or less aquatic in their natural habits;—an inference more strengthened by the prevalence of great numbers of Libellulideous wings in these collections (the early states of the insects of which family, I need scarcely observe, are also entirely aquatic), and by the many and great blanks now existing in the series of the Order *Neuroptera*, doubtlessly attributable to the extinction of some of the connecting links.

In the following observations it will, perhaps, be most convenient to describe the collections according to their localities and owners; reserving the general observations which are suggested by their review, including a comparison of the Middle with the Lower Purbeck insects, as well as of the Purbeck insects of Dorset with those of the Wiltshire Purbecks †, to the end of the communication.

The reader will bear in mind that in the Plates the lines drawn by the side of the different figures represent their natural length; the majority of the specimens being of minute size.

#### I. FOSSIL BEETLE FROM THE STONESFIELD SLATE ‡.

##### Pl. XIV. fig. 13.

A fragment of a large fossil Beetle, discovered in the Stonesfield Slate by Lord Enniskillen, has been kindly placed in my hands for

remains from the Lias of Lyme Regis. A fossil insect has been lately met with in the Great Oolite of Lincolnshire by Mr. Morris, F.G.S. See also 'Catalogue of British Fossils,' new edit. p. 116, for fossil insects found in Britain.

\* In the Quart. Journ. Geol. Soc. vol. ix. p. 51, Mr. Brodie has also recorded his discovery of a coleopterous wing-case in the Kimmeridge Clay of Ringstead Bay, Dorsetshire. † Termed 'Wealden' in 'History of Fossil Insects,' &c.

‡ Four species and numerous relics of insects from the Great Oolite of Stonesfield, &c. are noticed in 'Morris's Catalogue,' 2nd edit.

description by Sir Philip Egerton, and is figured in Plate XIV. fig. 13. This represents the mesosternum, metasternum, and ventral surface of the abdomen of an insect, which, from its structure, must have been of heavy aspect and most probably of slow motion, and which must have lived in dark and obscure situations.

This I infer from the circumstance that the elytra are deflexed at the sides, forming a groove for the lateral margins of the abdomen, a peculiarity which implies—1st, that the elytra, if separate, could only be raised with difficulty; 2ndly, that they were more probably soldered together along their dorsal suture; and, 3rdly, that the wings were wanting. These are characteristics of several groups of beetles, amongst which are the Darkling Beetles (*Blapsidæ*) and the larger species of the Ground Beetles (*Carabidæ*). In these families short broad forms occur in the genera *Blaps* and *Pimelia*, and in *Cychrus*.

As to the decided affinities and position of this fossil beetle, we must take into consideration the form of the two sterna and the form and number of the segments of the abdomen. The recent investigations of Coleopterists have proved that these characters, and especially the latter, are among the best and safest clues to the natural classification of the Order. In the fossil before us, the mesosternum is advanced in a triangle between the cavities for the insertion of the middle legs; the metasternum is very short, and is extended slightly backwards, and divided into two small lobes by an impressed line; and its hinder notched edge meets the advanced wide lobe of the short basal segment of the abdomen. The second, third, and fourth segments of the abdomen are of nearly equal width; but the extremity of the fourth and the remainder of the ventral surface are abraded. Now the relative size of the sterna agrees better with the *Blapsidæ* than with the *Carabidæ*; but the short basal segment of the abdomen occurs in *Cychrus*, only it is soldered to the next segment, so as to be but little distinct.

From the appearance of the fossil, I should conceive that the lost extremity of the abdomen comprised only a single segment; if so, it would be even longer than the preceding, whereas in the *Blapsidæ*, owing to the large size of the basal segment, the two terminal segments are very short. The fossil beetle differs, therefore, from both these tribes, and it is much to be regretted that its fragmentary condition will not allow of its relations being more satisfactorily determined.

A small spiral univalve shell is imbedded in the same slab with the beetle.

## II. LARGE FOSSIL DRAGON-FLY FROM THE STONESFIELD SLATE. Pl. XVII. fig. 20.

A pair of large wings of a Dragon-fly found in the Stonesfield Slate\*, at Eyeford, on the Cotswolds, by the Rev. P. B. Brodie, are represented

\* For an account of the Stonesfield Slate of Gloucestershire, see a paper by Messrs. Brodie and Buckman, Proc. Geol. Soc. vol. iv. p. 437, 1844; see also Brodie's 'Fossil Insects,' p. 39, &c.

in Pl. XVII. fig. 20. Two slabs, containing the fossil and its cast, were found, but unfortunately the surface of the stone is in both so much abraded that the precise form of the "cells" cannot be determined. This, together with the fact of only one pair of wings, apparently the anterior, being preserved, will prevent its relations being determined, as the form of the anal angle of the several wings (unfortunately lost in the specimen before me), and other minute characters presented in the structure of the head, eyes, and ocelli, are the chief characters adopted for generic distinction in this family.

The discovery of this and many other fine fossil wings of Dragonflies, in the Lias, Oolite, and Purbeck formations, is interesting in several respects, both geological and zoological. Their presence in the winged state in a form so identical with those of the existing races of these insects, implies, of course, an abundance of winged, and, for the most part, herbivorous insects; whilst the aquatic condition of their larvæ implies a condition of the water identical with that which is now in existence, as it must have been similarly acted upon chemically by the curious respiratory apparatus of these larvæ. Moreover, whilst the remarkable fact obtains in the present physical condition of the insect world, that many of the largest aquatic insects occur in temperate climates (the gigantic *Nepidæ* forming the only exception), we find only amongst these fossil insects traces of the *Libellulidæ*, the great Water-beetles of the families *Dyticidæ* and *Hydrophilidæ* never appearing, as far as hitherto ascertained, amongst these fossil remains.

### III. SUPPOSED INSECT FROM THE LIAS. Pl. XVIII. fig. 2.

In Pl. XVIII. fig. 2 is represented a dark-coloured obscure object, about  $\frac{1}{4}$  inch long, which was found in the Lias by the Rev. P. B. Brodie. This exhibits a triangular space in front, which has the appearance of a scutellum together with the closed wing-covers of one of the *Pentatomidæ*. It is preceded by a small dark space, which may represent the advanced pronotum; but I dare not pronounce upon its character with any attempt at precision.

### IV. INSECT REMAINS FROM THE CORFE CLAY\*.

Pl. XVI. figs. 34, 35.

Four small slabs of white tertiary clay, from the Leaf-beds at Creech, near Corfe and Wareham, have been forwarded to me by the Rev. P. B. Brodie, from the collection of W. R. Brodie, Esq., of Swanage. Each little slab contains an elytron of a distinct species of Beetle.

The most characteristic, represented in Pl. XVI. fig. 34, is 4 lines long; very narrow; flattened, and gradually attenuated to the tip; with eight distinct, punctated, longitudinal striæ, and a short one near the base of the suture. This was probably the elytron of some narrow beetle allied to *Agrius*, amongst the *Buprestidæ*.

The second elytron is 6 lines long; of nearly equal width for two-

\* These specimens were noticed in Quart. Journ. Geol. Soc. vol. ix. p. 51.

thirds of its length, and then gradually attenuated; the surface is now nearly smooth, but it may probably have been originally punctured and subsequently abraded. This specimen may belong to the *Helopidæ*.

The third elytron, represented in Pl. XVI. fig. 35, is 3 lines long; oval; very convex; marked with seven rows of very deep round punctures, the lateral rows rubbed down, and bearing a subsutural row of small tubercles. This belonged most probably to one of the *Curculionidæ*.

A fourth object, which may possibly not be an insect remain, is 2 lines long, very oval and convex, with a granulated surface, partly abraded. It has, however, somewhat the appearance of the elytron of a very gibbose beetle of the family of *Chrysomelidæ* or *Curculionidæ*.

#### V. INSECT? REMAINS FROM THE HASTINGS SANDS.

The Rev. Mr. Brodie has forwarded me four specimens, found by Mr. W. R. Brodie in the Hastings Sands of Swanage Bay, which are of doubtful character. The first has the appearance of an elytron,  $\frac{1}{2}$  inch long, and nearly 3 lines wide for three-fifths of its length, and then gradually attenuated; the surface smooth, but with a deep longitudinal, possibly accidental, impression from the base. The second and third are small dark patches of membrane upon the surface of the stone, which are traversed by straight longitudinal veins emitting parallel branches; but as in the larger specimen the veins radiate nearly from a point, somewhat like the ribs of a fan, I should rather regard them as vegetable. The fourth has the appearance of a small semi-oval elytron, 2 lines long; but the surface is irregularly longitudinally rugose, like that of the hard seed-vessels of some fruits.

#### VI. FOSSIL INSECTS FROM THE MIDDLE PURBECKS OF DORSET\*. Pl. XV. figs. 6 to 26.

A large collection of Insect-remains, consisting of 118 small slabs, of various sizes, some containing many specimens, has been made by the Rev. Mr. Brodie from the top of the Middle Purbecks of Durdlestone Bay, Dorset. They are chiefly from the "Pecten and Corbula bed," No. 31 of the stratigraphical list in Mr. Austen's 'Guide to the Geology of the Isle of Purbeck'; but a few are from the bed No. 58. They are of a hard blue slaty calcareous rock.

The most remarkable of these Insect-remains are represented in Plate XV. figs. 6-26.

*Elytra and Bodies.*—The greater portion of these remains consist of small elytra, perfect or fragmentary, or of entire bodies or parts of bodies of insects.

The following are the chief specimens:—

Pl. XV. Fig. 6. Right-hand figure—the abdomen of a small flat beetle.

\* Collected by the Rev. P. B. Brodie.

Pl. XV. Fig. 8. Left-hand figure—possibly the segment of the body of an elongated insect.

Fig. 9. Abdomen of a very small broad beetle;—*Coccinellidæ*?

Fig. 10. Abdomen of a small beetle.

Fig. 11. Metasternum and abdomen of a small beetle.

Fig. 12. Mesonotum and abdomen of a small beetle;—very obscure.

Fig. 13. Larger figure—mesosternum of a beetle; probably one of the small *Dyticidæ*.

Right-hand figure—abdomen of a small beetle.

In addition to these, there are—the thorax and elytra (in place, but crushed) of a small beetle; one and a third of a line long; of a broadly ovate form:—the abdominal portion, 3 lines long, of a beetle, without its elytra, but covered apparently with the wings folded up:—and two small flattened insects, each a line and a half long, which look like little beetles, or *Cimicidæ*, without wings; the limbs and the elytra are wanting, and the articulations very indistinct.

A great number of elytra (of which the majority of these fossils consist) are of very small size, not being more than  $1\frac{1}{2}$  or 2 inches in length, varying from the narrow form of an *Agrilus* to the oval form of a *Chrysomela*, and with the surface plain, simply striated, punctate-striated, or deeply punctured.

Pl. XV. fig. 8, right-hand figure, and fig. 13, two upper figures, represent several of these small elytra.

The finest pair of elytra is represented in Pl. XV. fig. 7, of the natural size. The base and apex in these elytra are unfortunately wanting, both in the specimen and its cast. The surface is abraded; it has, however, evidently been finely punctured, and bears several plain narrow longitudinal costæ. It may have belonged to a broad species of *Prionus* or *Buprestis*, both of them lignivorous beetles.

*Wings.*—The wings, although numerous, and presenting many distinct types, are, like the foregoing, unfortunately in general only fragments of single wings, and unaccompanied by any portions of the bodies to which they belonged; so that we can judge only by analogy as to whether these insects possessed one or two pairs of these organs.

It is remarkable that there is only one fragment of the wing of a Dragon-fly; this is the middle portion of a wing quite similar to that from the Lower Purbecks figured in Pl. XV. fig. 5.

The chief types exhibited by the other wings are given in the following figures:—

Pl. XV. Fig. 6. Upper figure—the small wing-cover apparently of one of the *Cicadellinæ*.

Lower left-hand figure—the extremity of the upper surface of the closed wing-cover of a *Reduvius*?

Fig. 14. A slab containing a number of fragments of wings, and magnified figures of five of them beneath. Of these, \* and © are probably por-

tions of wings of small *Trichoptera*; \* is the upper wing of one of the *Cercopidæ*; † is part of the wing-cover of a small Blattideous insect; and ‡ is part of the wing of a Grasshopper.

Pl. XV. Fig. 15. The wing of a small Dipterous insect, apparently allied to *Simulium*.

Figs. 16 & 17. Portions of the wings of Neuropterous insects, apparently allied to *Corydalis*.

Fig. 18. The lower wing of a species of the *Cicadellinæ*.

Figs. 19, 20, 23, 26. Apparently portions of wing-covers of various species of *Blattidæ*.

Fig. 21. Wing of a small Dipterous insect, allied to *Chironomus* or *Cecidomyia*.

Figs. 22 & 24. Portions of wings of Neuropterous insects of doubtful family.

Fig. 25. A remarkable spotted wing-cover, apparently of some curious Cimicideous insect.

Among other fragments of wings, there is also one,  $4\frac{3}{4}$  lines long, with a few slight longitudinal veins, one of them next the costa being forked: this may perhaps be a portion of the under wing of a small Nepideous insect.

#### VII. FOSSIL INSECTS FROM THE DORCHESTER QUARRIES §.

Pl. XVI. fig. 3. Pl. XVIII. figs. 9 & 14.

Twelve specimens of fossil insects from the Ridgway Quarries near Dorchester, from the bed No. 106 of the Rev. O. Fisher's Section ||, have been forwarded to me by the Rev. Mr. Brodie; and, being from a distinct bed, it has been thought advisable that they should be noticed separately.

Pl. XVIII. Fig. 9 represents a small insect, destitute of legs, antennæ, or wings, and which may possibly be the immature state of a *Naucoris*, or an allied Nepideous insect. The centre of the abdomen is longitudinally impressed; and there is a slight depression on either side, parallel with the lateral margin.

Fig. 14 may possibly be an insect closely allied to fig. 9; it is, however, far less clearly defined, especially in the anterior half of the body.

There is another insect similar in size to the two preceding, but so slightly indicated that it cannot be described.

Pl. XVI. Fig. 3 represents a portion of one of the slabs, in which it will be seen that a great mass of elytra, of different sizes and forms, have been deposited; and it is to be observed, that in the original the large dark-coloured elytron has ten, very

§ Collected by the Rev. O. Fisher, F.G.S.

|| Large Sheet. 1852, Dorchester, Foster.

fine, longitudinal, plain striæ; and that the striæ of the large central elytron are punctured.

Several of the other slabs also contain a great number of small elytra, of different sizes, and sculptured variously; but few of these are well defined. One, however, of larger size than the rest, is of a broad semi-oval form,  $3\frac{1}{2}$  lines long, with a narrow, plain, lateral, dilated margin, and with nine longitudinal striæ, and one short, sub-scutellar, punctured stria.

In a few of the specimens of elytra, it is also to be observed that a portion of the original tegument of the elytra still exists, black and shining in appearance, and extremely brittle and friable in texture.

The only fragment of a wing amongst these Dorchester fossils is one,  $\frac{1}{2}$  inch long, which is a part of a rather narrow delicate Neuropterous wing; the narrow costal portion of which has short oblique veinlets; and the disc has a submarginal straight vein, emitting straight, oblique, longitudinal veins, similar to the extremity of fig. 33 in Plate XVIII.

#### VIII. FOSSIL ELYTRON FROM DURDLESTONE BAY.

Pl. XIV. fig. 11.

Plate XIV. fig. 11 represents, of the natural size, a very fine elytron found in the Lower Purbecks, Durdlestone Bay, Dorset, and kindly sent to me by Captain Woodley for examination. It is broad and flat, very finely punctured, of a brown colour, with part of the sutural edge finely reticulated with black, each reticulation being punctured; and it has three, smooth, plain, narrow, longitudinal costæ on the disc.

This specimen appears to be very nearly related to the fossil elytra from the Middle Purbecks represented in Pl. XV. fig. 7, above-described.

#### IX. FOSSIL INSECTS AND ISOPODS FROM THE LOWER PURBECKS\*.

Pl. XIV. figs. 9, 10, 12, 14–21. Pl. XV. figs. 1, 2, 4, 5. Pl. XVII. figs. 1–19, 21.

An extensive suite of fossil insects, amongst which are some of the finest I have hitherto examined, has been forwarded to me, through the Rev. Mr. Brodie, by Mr. Willcox, by whom they were collected from the Purbeck insect-beds near Swanage. They consist of sixty small slabs of various sizes, some containing a considerable number of insect remains. The most remarkable specimens are represented in the lower part of Plate XIV. by figs. 9, 10, 12, 14–21, and in Plate XV. by figs. 1, 2, 4, 5, and by the whole of Plate XVII., excepting fig. 20.

*Isopods*.—Pl. XIV. fig. 12. This is the most interesting of the whole of the series of fossils from the Lower Purbecks, not only on account of its being so far perfect as to show the general form of the

\* Collected by C. Willcox, Esq.



body, but also from its belonging to the Crustacean order, *Isopoda*, which are very rare in the fossil state, and from its close relationship with the species of Isopod discovered in the "Insect limestone" of Wiltshire by Mr. Brodie, and figured in his work upon the Insects found in the Secondary Rocks of England, pl. 1. figs. 6–10, under the name of *Archæoniscus Brodiei*, applied to it by M. Milne-Edwards.

Two specimens, of one of which a cast is also preserved, were found by Mr. Willcox; and, as they are represented, in Pl. XIV. fig. 12, of the natural size, it will be seen that they are larger than the ordinary specimens of *A. Brodiei*, although the individual figured in Hist. Foss. Insects, pl. 1. fig. 7, is of equal size.

The tegument of the body, which remains in a few parts of the fossil, appears to have been a thin shell, somewhat like that of a shrimp. Neither antennæ nor legs are visible; and I cannot detect any trace of the eyes. There appears to have been an elevated ridge down the middle of the body, terminating at the base of the large, transversely oval, anal plate; and several of the articulations preceding the latter are much shorter and less distinct than the anterior segments; the terminal plate, moreover, exhibits no traces of the lateral caudal appendages, except a slight thickening and elevation of the basal lateral angles.

*Insects.*—Of entire insects or portions of their bodies there are but very slight traces to be found in this collection. Pl. XV. fig. 1 represents a part of the articulated elongate abdomen of a small insect, which seems most like a part of some Tipulideous specimen; and Pl. XVII. figs. 8 & 18 represent two small abdomens, which seem more like those of Hemipterous or Homopterous, than Coleopterous insects.

Of the elytra of *Coleoptera* there is a very extensive series, consisting generally of single detached specimens, but occasionally of the two elytra conjoined. Pl. XIV. figs. 14 & 15 are pairs of elytra of two small beetles, which were about  $\frac{1}{3}$  inch long.

Pl. XIV. figs. 16–21 and Pl. XVII. figs. 1–6 represent single elytra belonging to insects of different families. Of these the largest, Pl. XIV. fig. 17, must have been part of a beetle about 1 inch long. Several of these are also remarkable for the very distinct manner in which they are spotted and striped, especially the striato-punctate forms in Pl. XIV. fig. 19 and Pl. XVII. figs. 3 & 5; the first and last of which seem to have belonged to the *Buprestidæ*, and the other to the *Harpalidæ*.

I will not, however, pretend to assign all these elytra to their families; the forms and markings vary so infinitely in every Coleopterous family of any extent (many of the families containing several thousand distinct species in each), that the attempt would be very hazardous.

Pl. XVII. fig. 1, as well as fig. 7, and possibly fig. 9, seem to me to have rather doubtful claims to be considered as insect remains. It is possible that they may be of vegetable origin; but the first looks like an elytron, the irregularity of the surface of which may have been caused by abrasion; and fig. 9 may be a strongly granulated or tuberculated elytron, of which a portion of the inner margin

has been abraded ; but I know of no insect to which fig. 7, if belonging to an Annulose animal, can satisfactorily be referred.

Of naked-winged insects there is a considerable collection of interesting fragments, amongst which those belonging to the *Libellulidæ* are pre-eminent, as usual, for their size. Pl. XV. fig. 4 represents a portion (near the extremity) of one of the wings of a *Libellula* of very large size. Fig. 5 is one of the wings of a Dragon-fly with very small meshes, and with the characteristic triangle occupying a higher position than in the typical *Libellulæ*. Pl. XVII. fig. 21 is a portion of a wing, drawn of the natural size, which, from its general character, is evidently Libellulideous ; but I know no species with such an arrangement of veins ; and, compared with the ordinary types of the family, this fossil insect must have been quite gigantic in size.

Pl. XVII. Fig. 12 represents one of the wings of a Neuropterous insect, allied to *Sialis* or *Panorpa* ; and fig. 16, one allied to *Raphidia*.

Fig. 19 appears to be one of the narrow elongate tegmina of a Grasshopper ; and figs. 10 and 13, tegmina of *Blattidæ*.

Fig. 11 seems to be a portion of one of the upper wings of a Homopterous insect.

Figs. 14 and 15 are a wing and wing-cover of a small Cimicidæ insect.

Pl. XV. Fig. 2 appears to be a portion of a wing of a Tipulideous species.

Pl. XVII. Fig. 17 represents a number of fragments of delicate tegument covered with minute punctures and traversed by straight and somewhat radiating veins, which appear like portions of the hind-wing of some species of Butterfly, entirely denuded of scales. A fragment of larger size will be noticed amongst the Rev. Mr. Brodie's Lower Purbeck insects.

#### X. FOSSIL INSECTS FROM THE LOWER PURBECKS, DURDLESTONE BAY, DORSET \*. Pl. XIV. figs. 1-8.

A small collection of insect-remains, 22 in number, collected by W. R. Brodie, Esq., of Swanage, Dorset, has been communicated to me through his cousin the Rev. P. B. Brodie. A few of the more interesting of these are represented in the upper part of Pl. XIV. As in the other collections, the greater portion consist of single elytra.

Pl. XIV. figs. 1, 2, 3, are three of the best-marked specimens, the others being of small size. The first of them appears to belong to one of the *Elateridæ* ; the second is Helopideous ; and the third is Curculionideous.

Pl. XIV. fig. 4 appears to me to belong doubtfully to an insect :

\* Collected by W. R. Brodie, Esq.

it may indeed possibly represent a spotted elytron, with a fragment of a wing; but I cannot regard it as such with any degree of certainty. Fig. 6 seems to be the short coriaceous upper wing, or wing-cover, of some Cercopideous insect among the *Homoptera*. Figs. 5 & 7 may also be portions of the wing-cover and wing of a Grasshopper. But all these (figs. 4, 5, 6, 7) have somewhat of a vegetable character.

Pl. XIV. fig. 8. This is the most interesting specimen of all the insect-remains yet discovered amongst the Lower Purbeck series. It is, in fact, the wing of a gigantic Ant, which, in its perfect state, must have measured at least 2 inches across the expanded wings; and it is most nearly allied to some of the exotic forms of which *Myrmica* is the type in our temperate regions.

The discovery of such an insect is of the highest importance in respect to the question of the geographical range of the insects imbedded in the Lower Purbeck series.

The wing of a second species of Ant (Pl. XVIII. fig. 21), closely allied to the foregoing, but differing from it generically, occurs in the Rev. Mr. Brodie's collection, and will be subsequently noticed.

Mr. W. R. Brodie has also sent me a slight sketch of an insect with four wings of equal size, which he found in the stratum marked No. 116 in the list in Mr. Austen's 'Guide.' This is about the size, and has somewhat the appearance, of the common *Panorpa*. It is now, I believe, in the Museum at Cambridge.

XI. FOSSIL INSECTS FROM THE LOWER PURBECKS OF DURDLESTONE BAY\*. Pl. XV. fig. 3; Pl. XVI. figs. 1, 2, 4-33, 36-38; Pl. XVIII. figs. 1, 3-8, 10-13, 15-43.

By far the largest collection of insect-remains from the Lower Purbecks is that formed by the Rev. P. B. Brodie, who has placed in my hands his entire series, consisting of 350 small slabs of stone, of various sizes. Upon many of these only a single fragment of an insect occurs; but upon a considerable number the remains are very numerous, the fragments being crowded together, and often lying upon one another. Of this condition a slight idea may be obtained from Pl. XV. fig. 14, and Pl. XVI. fig. 3.

The representation of the more interesting of these fossil remains is given in Pl. XV. fig. 3, Pl. XVI. figs. 1, 2, 4-33, 36-38, and Pl. XVIII. figs. 1, 3-8, 10-13, 15-43.

With the exception of the Dragon-flies, of which there are as many as thirty-four fragments of single wings (from which, however, it is impossible to affirm either a moderate or tropical climate and geographical range), and of the large Ant wing, Pl. XVIII. fig. 21, it is worthy of remark, that the whole of these remains, not fewer in number than 700 or 800, are those of minute insects not more than a fourth or a third of an inch in length.

A few of the more remarkable elytra, which I have selected for illustration, belong to Beetles half an inch long or thereabouts; and

\* Collected by the Rev. P. B. Brodie, F.G.S.

there are half a dozen, at the most, of Beetles which were not more than an inch or 15 lines long.

*Bodies of Insects.*—Mr. P. B. Brodie's collection of Lower Purbeck fossils presents to us very few specimens of the entire bodies of insects; none, in fact, in which the antennæ and limbs are preserved. The bodies or abdomens of a few minute insects alone occur, the most perfect of which are represented in the upper part of Pl. XVIII. Of these, fig. 1 represents the under side of the thorax and abdomen of a beetle, probably Carabideous: fig. 12, the head and body of a minute *Haltica* or other Chrysomelideous beetle: fig. 16 appears to be the prothorax of some small beetle: figs. 6, 10, 18, & 19 appear to be the abdomens of minute beetles: fig. 17, the abdomen of a small Cimicideous or Homopterous insect: fig. 11 may be the scutellum and closed wings of a beetle deprived of elytra, or those of a Cimicideous insect: figs. 7, 8, 13, & 15 appear to be portions of the thorax of various insects: there are several specimens like fig. 7; it appears indeed to be reproduced in the front part of fig. 13.

In addition to the above, there are the bodies of three minute insects of an oval flattened form, about one-eighth of an inch long, resembling Pl. XVIII. fig. 12. There is also a small object, 1 line long, which looks like the head of a beetle with the two excavations for the base of the antennæ and the transverse labrum. There are several mesonotums and metanotums of minute beetles, and a few minute abdomens of beetles, and several objects that appear like the articulations of small annulose animals in a greater or less state of dislocation.

*Elytra.*—As above stated, elytra, generally of minute size, and rarely appearing in pairs, constitute the greater portion of this suite of insect-remains. The most interesting and best defined of these are represented in Pl. XVI., which, with the exception of figs. 3, 34, & 35, is entirely occupied with them.

Pl. XVI. fig. 1 represents one of the commonest occurrence. The extremity, which terminates in an obtuse point, is here broken off. This specimen is about 4 lines long, and is marked with ten plain fine striæ. I presume it to be Carabideous. Pl. XVI. fig. 2 is a small object, which may possibly be an elytron; it is convex and smooth. Figs. 8 & 9, although approaching fig. 2 in form, are, on the other hand, evidently elytra of some short and very convex beetle, such as *Coccinella* or *Scymnus*. Fig. 4 is a minute elytron, interesting on account of the fossil still retaining a small black portion of the original tegument of the beetle: it seems to have belonged to a small *Elater*. Fig. 5 is the largest elytron of the series, and appears to have belonged to the same family as fig. 4. Figs. 6, 23, 29, & 32 represent elongated elytra, pointed at the tip, with the outer margin slightly serrated, and the disc marked with dark cloudy spots: these appear to have belonged to species of *Agrius* among the *Buprestidæ*. Figs. 11, 22, 31, 36, 37, 38 are interesting on account of the original light-coloured spottings on a dark ground being still visible. Figs. 15 & 24 are pale coloured, with small dark spots on the interstices of the striæ. Fig. 13 is also one of the commonest elytra; it has

a flattened lateral margin, and as many as eighteen very fine longitudinal plain striæ; it may have belonged to a Helopideous or Diapereideous beetle. Figs. 10, 12, 17, 30, & 33 deserve notice on account of the deep punctures or other rugosities which are still retained in the specimens; figs. 10 & 30 may be Carabideous, and fig. 33, Curculionideous. Fig. 19 is a fragment of a very fine elytron, remarkable for having the deep lateral impression similar to that of the elytra which are so common in the Stonesfield Slate, upon the relations of which I commented in Mr. Brodie's work, p. 122. The other elytra do not appear to merit any particular mention.

*Wings.*—The remains of insect-wings likewise constitute a very large portion of the series of Mr. P. B. Brodie's specimens. Of these the finest and largest are the remains of wings of Dragon-flies, of which there are thirty-four fragments. In no instance is there a perfect wing.

In the arrangement of the veins, especially those of the characteristic triangle, they agree with that in Pl. XV. fig. 5. In one specimen, however, the outer side of the triangle, instead of being vertical, or nearly so, as in that figure, is very oblique, so that the outer angle is very acute, as in *Æschna* (Quart. Journ. Geol. Soc. vol. v. pl. II. fig. B). There is also considerable difference in the size of the cells of the wings; in some specimens these are very small, whilst in one they are very large and quadrangular: this specimen must, I apprehend, have belonged to a very large species of *Agrion*.

Other Neuropterous wings occur also, but always fragmentary. Pl. XVIII. fig. 24 represents a wing of an insect allied to *Sialis*; to which also figs. 35 & 37 may be allied. Figs. 25, 28, 31 are probably portions of wings of insects allied to *Phryganea*. Figs. 22, 23, 26, 32, 33, 34, 38, 40, 41, 42, & 43 appear to be Orthopterous; some of them, as figs. 22, 32, & 43 (of which there are a great number of specimens), being probably the wing-covers of *Blattidæ*; as well as figs. 23, 26, & 33. Fig. 21 is a wing of a gigantic species of Ant, closely allied to, but differing from, fig. 8 of Pl. XIV. in the position of the cells.

Pl. XVIII. figs. 27 & 30 appear to be portions of the hind-wings of some species of Butterfly; still they have very much of a vegetable aspect. The surface is covered with minute punctures, which may be the cells for the insertion of the quills of the coloured scales which are all removed, supposing the specimens to be Lepidopterous. If such should prove to be really the case, by the discovery of more characteristic specimens, it will form an interesting addition to our knowledge of fossil entomology. M. Boisduval has, however, described, in the *Annales de la Société Entomologique de France*, a fossil Butterfly under the name of *Cyllo sepulta*, which has given rise to a remarkable controversy between himself and M. Alex. Lefebvre, published in the same work.

Pl. XVIII. figs. 4 & 29 may possibly be the wing-covers of Cimicidæ insects much abraded. Figs. 3, 5, 36, and Pl. XV. fig. 3, are portions of the wing-covers and wings of Cercopideous insects. Pl. XVIII. fig. 20 is the wing of a Tipulideous insect.

The Museum of Practical Geology in Jermyn-street also possesses a fine series of fossil insects from the Purbecks. This series agrees in general characters with the Rev. Mr. Brodie's collection, but comprises several specimens of Dipterous insects in a much more perfect condition.

In the British Museum also there are a few fossil insects from the same formation; and there are several other specimens in the Cambridge and Dorchester Museums.

#### SUMMARY.

The microscopical examination which I have been compelled to make of so many hundreds of fossil insect-remains, for the most part in a fragmentary condition, from the Lower Purbecks of Dorset, although beyond measure tedious from the unsatisfactory results afforded by the nature of the specimens, has still enabled me to arrive at some results, and to form a general comparison of these insect-deposits with those which I similarly investigated whilst preparing the plates of Mr. P. B. Brodie's work on the fossil insects of the Wiltshire Purbecks, &c.

If we take into consideration the small, and even minute size of the great majority of the insects, and indeed of the whole of the *Coleoptera*, which have been passed under review, the idea, that we have before us the wreck of an Insect Fauna of a temperate region, is at once raised; for although it would be rash to assert that a mass of remains of the existing tropical insects might not be accumulated in which a large quantity of minute beetles and flies would not be present, yet I cannot conceive any process, either arising from currents of water, or chemical dissolution of insect matter, which would carry off or destroy the many gigantic forms of insect life always occurring in the tropics.

The fossils before us show abundant evidence of the presence of numbers of Lignivorous species, such as the *Elateridæ* and *Buprestidæ*; but we nowhere find amongst them traces of the great Lamellicorn and Longicorn beetles. Herbivorous insects also occur in considerable numbers; but we do not meet with the gigantic Grasshoppers and Locusts of tropical climates. It has indeed been suggested that the remains may be those of insects living in a temperate climate and carried by currents to a tropical region; and Prof. E. Forbes has instanced the fact that he found shells of a temperate type, natives of the upper parts of the great range of the Atlas Mountains in Africa, brought down by currents and resting in the lower regions among shells of a tropical character. But, in order that the analogy should hold good, it seems to me necessary that we should find amongst the remains, not a single specimen or two (as in the case of the wings of the large Ants above-mentioned), but the remains of a great majority of tropical species mixed up with a smaller number of temperate forms. I must leave geologists to discover or to suggest the action which could have brought together and deposited such great masses of insect-remains as we find in many of the slabs of stone in these collections, and of which Pl. XVI. fig. 3 will afford an idea. Entomologists, however, are perfectly well aware that sudden

inundations or the rapid rising of rivers are sure to bring with them the most abundant entomological harvest, insects being floated down such currents in vast numbers, and congregated together in masses on the banks, as thick as bees in a hive, or ants in an ant-hill.

The circumstance also that such vast numbers of elytra have been preserved, whilst the equally hard thorax, head, antennæ, and legs have entirely disappeared, is worthy of remark. I must admit that I can offer no solution of so curious a fact, especially as the wings, notwithstanding their great delicacy, have left their impress on the stone as clearly as any of the harder elytra. We here, however, see another instance in which nature had from the earliest time adopted processes which we look upon when first applied in art or manufactures as wonderful novelties. We see, in fact, that the modern discovery of "natural printing," as it has been termed, whereby the most delicate objects leave their mark upon the hardest materials, when in contact under heavy pressure, has been anticipated in these fossil imprints of wings of some of the smallest and most delicate insects.

It has been suggested that the discovery of quantities of detached elytra in a small slab might possibly be accounted for on the supposition that the insects to which they had belonged had been devoured by some bird or other insectivorous animal, and had passed through the stomach undissolved, owing to the presence of an asserted chemical substance in the elytra, which has been termed "elytrine." I believe, however, that the term in question does not imply a distinct substance in the elytra of beetles, but was given in consequence of the experiments in which it was developed having been made upon elytra. All the parts of the outer integument of a beetle have, in fact, the same chemical composition, and consist of the substance now known by the name of "chitine," which is analogous in composition to horn. Moreover entomologists are well aware of the fact that other parts of a beetle are of as solid a nature as elytra; they know, for example, that one of the best beetle-traps is a toad, the excrement of which generally contains *entire* specimens of some of the rarest ground-beetles.

With the exception, then, of the winged giant Ants, and of some of the fragments of gigantic Dragon-flies' wings, there seems to be such a general conformity with the Purbeck insects of Wilts\*, that I may almost reiterate the whole of my observations published in the introductory part of Mr. Brodie's work. But, if the general conditions of insect-life were so similar in the two districts, as indicated by the remains in the Wilts and Dorset Purbeck formations, the mode of destruction of such insect-life must have been very different; since we found abundance of specimens of insects in a tolerably entire state of preservation in the former, whilst in the latter scarcely anything but fragments of wings or elytra, or a few segments of the abdomen, occur. This indeed is the more remarkable, because, from the tubular horny structure both of the leg-joints and antennæ, it would have been quite reasonable to have expected to have found them lying detached amongst the masses of elytra, &c. of the beetles and other insects to which they belonged. This dislocation and partial de-

\* The discovery of closely allied fossil *Isopoda* in both the localities is especially to be noticed.

struction of the insects appear to be so general, that we may almost renounce the idea of any chance discovery of perfect insects, even of fragments sufficiently distinct to allow us to form a satisfactory opinion on the general entomology of the Dorset Purbeck period.

In like manner, there is also so great a general coincidence between the insects of the Lower and those of the Middle Purbecks, including those from the Ridgway quarries (judging, as well as I am able, from the comparative paucity of materials which I have examined), that I can come to no other conclusion, than that the insects discovered in all these different strata belong to one general insectal fauna.

EXPLANATION OF PLATES XIV. XV. XVI. XVII. XVIII.

PLATE XIV.

Fig.	Probable relations.	Formations and Localities.	Collected by	Page.
1. Elytron	Elateridæ	Lower Purbecks, Durdlestone Bay.	W. R. Brodie, Esq.	387
2. Elytron	Helopideous			
3. Elytron	Curculionideous			
4. Elytron?	—?			
5. Wing-cover and wing?	Grasshopper?			
6. Wing-cover?	Cercopideous?			
7. Wings?	Grasshopper?			
8. Wing	Giant Ant	Lower Purbecks, Durdlestone Bay.	C. Willcox, Esq.	385
9. Elytron?	.....			
10. Elytron?	.....	Lower Purbecks, Durdlestone Bay.	Capt. Woodley.	385
11. Elytron	Buprestidæ			
12. Body	Archæoniscus	Lower Purbecks, Durdlestone Bay.	C. Willcox, Esq.	385
13. Part of body	Beetle	Stonesfield Slate	Earl of Enniskillen.	379
14. Elytra, united	.....	Lower Purbecks, Durdlestone Bay.	C. Willcox, Esq.	386
15. Elytra, united	.....			
16. Elytron	.....			
17. Elytron	.....			
18. Elytron	.....			
19. Elytron	Buprestidæ			
20. Elytron	Harpalidæ	Lower Purbecks, Durdlestone Bay.	C. Willcox, Esq.	386
21. Elytron	Tentyridæ			

Specific names.

Fig. 1. Elaterium Pronæus, W.	Fig. 11. Buprestium Woodlei, W.	Fig. 19. Buprestium Teleas, W.
2. Helopium Agabus, W.	12. Archæoniscus Edwardsii, W.	20. Harpalidium Anactus, W.
3. Curculium Syrichthus, W.	13. Blapsium Egertoni, W.	21. Tentyridium Peleus, W.
8. Formicium Brodiei, W.		

PLATE XV.

1. Abdomen	Tipulideous	Lower Purbecks, Durdlestone Bay.	C. Willcox, Esq.	386
2. Wing	Tipulideous			
3. Wing-cover	Cercopideous			
4. Wing	Libellulidæ			
5. Wing	Dragon-fly			
6. { Upper left-hand figure—wing-cover.	Cicadellinæ	Middle Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	382
Right-hand figure—abdomen.	Beetle			
Lower left-hand figure—wing-cover.	Reduvius?			



PLATE XV. (continued).

Fig.	Probable relations.	Formations and Localities.	Collected by	Page.
7.	Elytra, united ... Buprestidæ.....	Middle Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	382
8.	Right-hand figure —elytron. Diaperidæ .....			
	Left-hand figure segment of body of insect?			
9.	Abdomen ..... Coccinellidæ?.....			
10.	Abdomen .....			
11.	Part of body .....			
12.	Part of body .....			
13.	Two upper figures —elytra. Beetles .....			
	Large figure— part of body. Dyticidæ? .....			
	Right-hand figure —abdomen. Beetle.....			
14.	* Wing ..... Trichoptera .....			
	⊙ Wing ..... Trichoptera .....			
	* Wing ..... Cercopidæ .....			
	† Wing-cover ... Blattidæ .....			
	‡ Wing ..... Grasshopper .....			
15.	Wing ..... Dipterous .....			
16.	Wing ..... Neuropterous.....			
17.	Wing ..... Neuropterous.....			
18.	Lower wing ..... Cicadellinæ.....			
19.	Wing-cover ..... Blattidæ .....			
20.	Wing-cover? ..... Blattidæ .....			
21.	Wing ..... Dipterous .....			
22.	Wing ..... Neuropterous.....			
23.	Wing-cover ..... Blattidæ .....			
24.	Wing ..... Neuropterous.....			
25.	Wing ..... Cimicideous .....			
26.	Wing-cover ..... Blattidæ .....			

Specific names.

Fig. 2. Corethrium Pertinax, W.	Fig. 8. (Right-hand figure) Diaperidium Mithrax, W.	Fig. 17. Panorpidium tessellatum, W.
3. Cercopidium Mimas, W.	14* Cercopidium Telesphorus, W.	18. Cicadellium Psocus, W.
4. Libellulum Agrias, W.	15. Simulidium priscum, W.	21. Cecidomium grandævum, W.
5. Æschnidium Bubas, W.	16. Termitidium ignotum, W.	26. Blattidium Molossus, W.
6. (Upper left-hand figure) Cicadellium Dipsas, W.		
7. Buprestium Gorgus, W.		

PLATE XVI.

1. Elytron .....	Carabideous .....	Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	389
2. Elytron? .....	.....			
3. Slab with insect-remains. ....	.....			
4. Elytron .....	Elateridæ .....	Lower Purbecks, Ridgway.	Rev. O. Fisher.	384 & 388
5. Elytron .....	Elateridæ .....			
6. Elytron .....	Buprestidæ.....			
7. Elytron .....	.....	Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	388
8. Elytron .....	Coccinellidæ?.....			
9. Elytron .....	Coccinellidæ?.....			
10. Elytron .....	Carabideous .....			
11. Elytron .....	Buprestidæ .....			

PLATE XVI. (continued).

Fig.	Probable relations.	Formations and Localities.	Collected by	Page.			
12.	Elytron.....	} Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	388			
13.	Elytron..... Helopideous .....						
14.	Elytron.....						
15.	Elytron.....						
16.	Elytron.....						
17.	Elytron.....						
18.	Elytron.....						
19.	Elytron.....						
20.	Elytron.....						
21.	Elytron.....						
22.	Elytron..... Buprestidæ.....						
23.	Elytron..... Buprestidæ.....						
24.	Elytron.....						
25.	Elytron.....						
26.	Elytra, united. ....						
27.	Elytron.....						
28.	Elytron.....						
29.	Elytron..... Buprestidæ.....				} Tertiary, near Corfe.	W. R. Brodie, Esq.	381
30.	Elytron..... Carabideous? .....						
31.	Elytron..... Buprestidæ.....				} Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	389
32.	Elytron..... Buprestidæ.....						
33.	Elytron..... Curculionidæ .....						
34.	Elytron..... Buprestidæ.....						
35.	Elytron..... Curculionidæ .....						
36.	Elytron..... Elateridæ .....						
37.	Elytron..... Elateridæ .....						
38.	Elytron..... Buprestidæ .....						

Specific names.

- |                               |  |                                |
|-------------------------------|--|--------------------------------|
| Fig. 4. Elaterium Triopas, W. | Fig. 22. Buprestium Stygnus, var.?, W. | Fig. 31. Buprestium Valgus, W. |
| 5. Elaterium Barypus, W.      | 23. Agrilium Stomphax, W.              | 32. Agrilium Cyllabacus, W.    |
| 6. Agrilium Strombus, W.      | 29. Agrilium Cyllarus, W.              | 36. Ctenicerium Blissus, W.    |
| 11. Buprestium Stygnus, W.    |  | 37. Ctenicerium Hylastes, W.   |
| 13. Helopidium Ncoridas, W.   |  | 38. Buprestium Dardanus, W.    |

PLATE XVII.

1.	Elytron? .....	} Lower Purbecks, Durdlestone Bay.	C. Willcox, Esq.	} 386 & 387			
2.	Elytron? .....						
3.	Elytron .....				} [Eyeford. Stonesfield Slate, Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	380
4.	Elytron .....						
5.	Elytron .....						
6.	Elytron .....						
7.	Wing? .....						
8.	Abdomen .....						
9.	Elytron? .....						
10.	Wing-cover .....						
11.	Upper wing .....						
12.	Wing .....						
13.	Wing-cover .....						
14.	Wing .....						
15.	Wing-cover .....						
16.	Wing .....						
17.	Wing .....						
18.	Abdomen .....						
19.	Wing-cover .....						
20.	Wings .....						
21.	Wing .....						

Specific names.

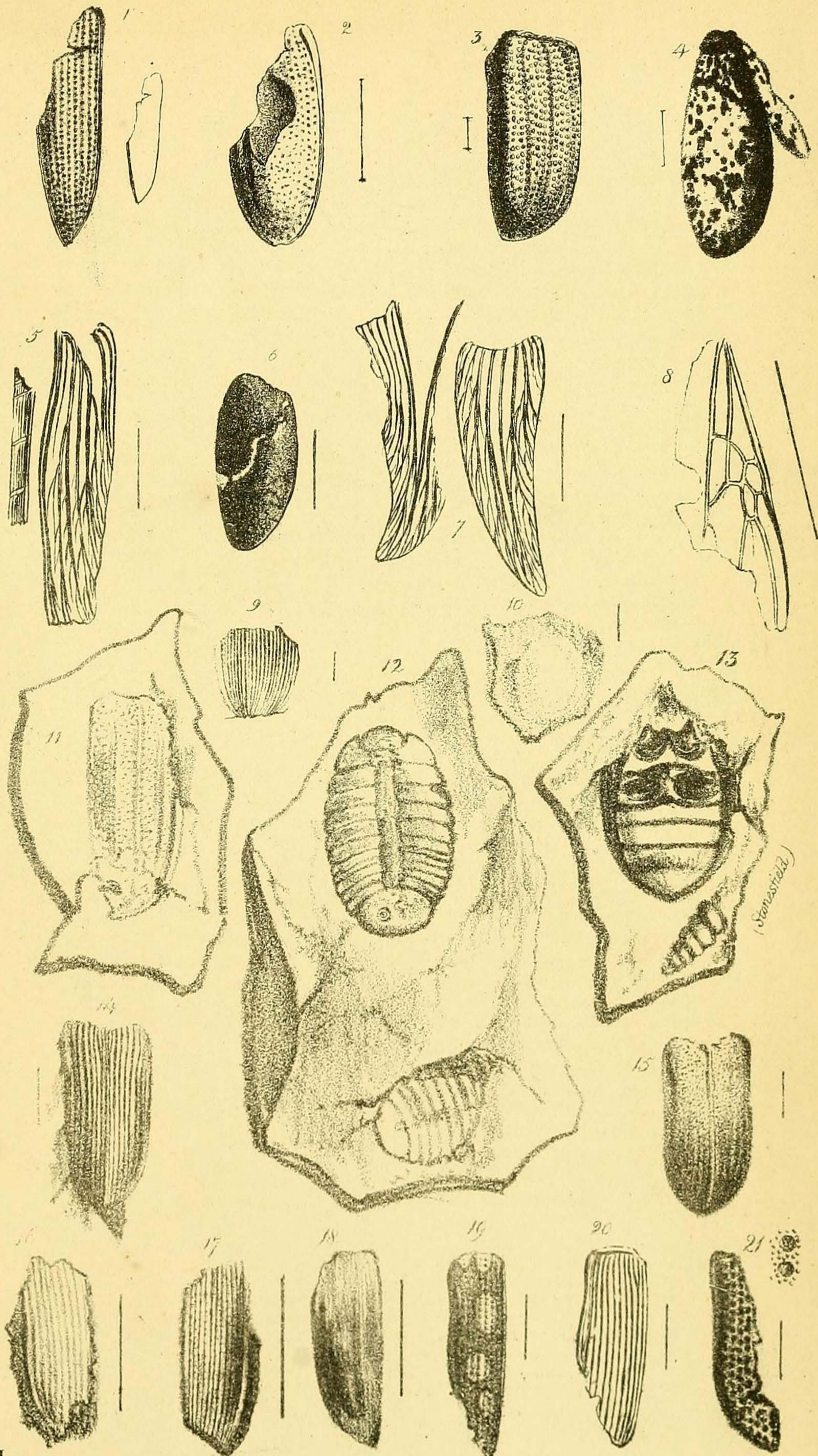
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|---------------------------------|---|---------------------------------------|
| Fig. 3. Harpalidium Nothrus, W. | Fig. 12. Panorpidium tessellatum, var.?, W. | Fig. 17. Cyllonium Boisduvalianum, W. |
| 4. Telephorium Abgarus, W.      | 15. Cimicidium Dallasii, W.                 | 19. Gryllidium Oweni, W.              |
| 5. Buprestium Bolbus, W.        | 16. Raphidium Brephos, W.                   | 21. Libellulium Kaupii, W.            |

PLATE XVIII.

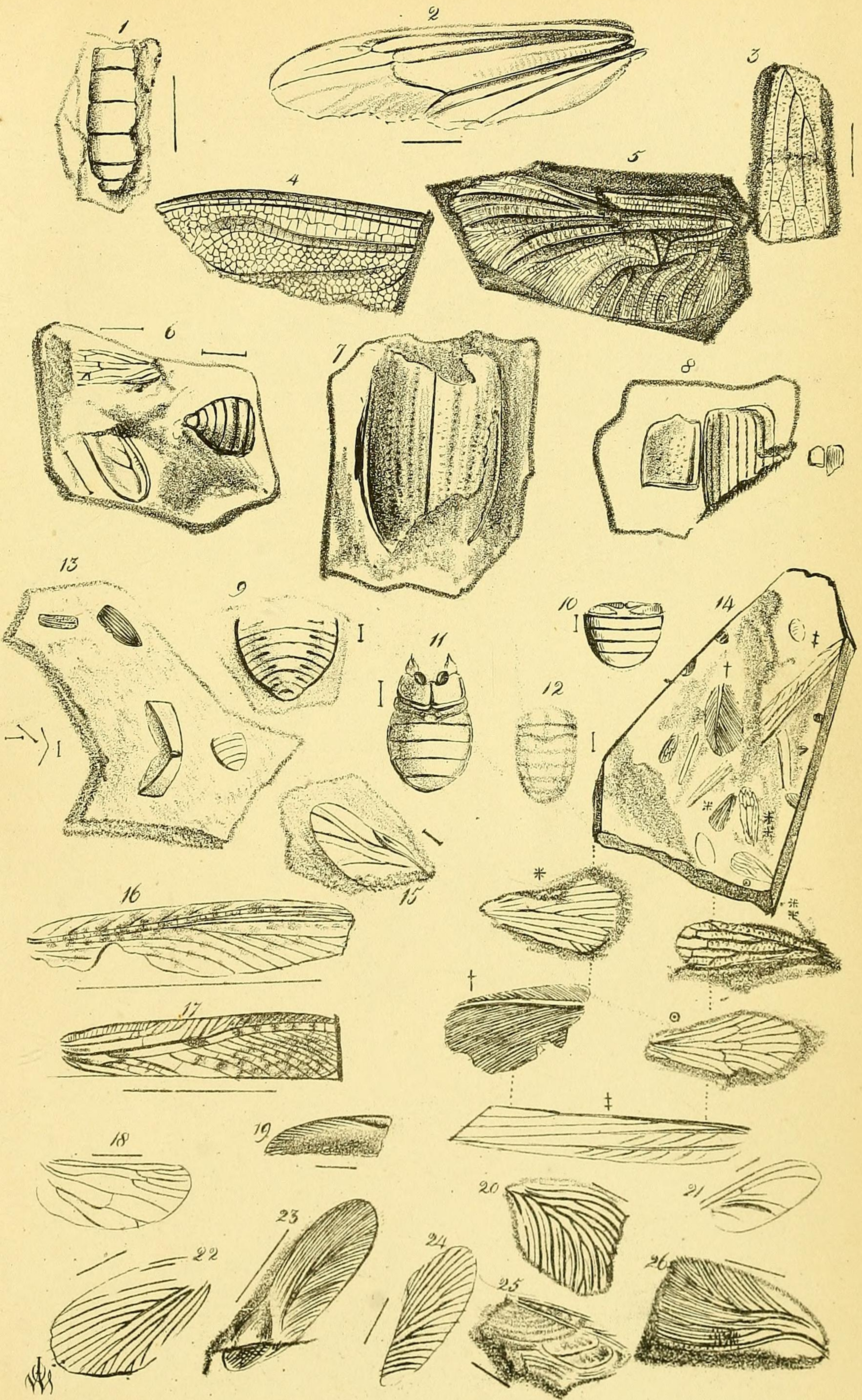
Fig.	Probable relations.	Formations and Localities.	Collected by	Page.
1. Part of body	Carabideous	Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	389
2. Part of body ?	Pentatomidæ ?	Lias	Rev. P. B. Brodie.	381
3. Wing	Cercopideous	Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	389
4. Wing-cover	Cimicideous			
5. Wing	Cercopideous			
6. Abdomen	Beetle			
7. Thorax				
8. Thorax		Lower Purbecks, Ridgway.	Rev. O. Fisher.	384
9. Body	Nepideous			
10. Abdomen	Beetle	Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	389
11. Part of body and wings.	Cimicideous ?			
12. Body	Chrysomelideous			
13. Thorax		Lower Purbecks, Ridgway.	Rev. O. Fisher.	384
14. Body	Nepideous			
15. Thorax		Lower Purbecks, Durdlestone Bay.	Rev. P. B. Brodie.	389 & 390
16. Prothorax	Beetle			
17. Abdomen	Cimicideous			
18. Abdomen	Beetle			
19. Abdomen	Beetle			
20. Wing	Tipulideous			
21. Wing	Giant Ant			
22. Wing-cover	Blattidæ			
23. Wing-cover	Blattidæ			
24. Wing	Neuropterous			
25. Wing	Phryganeidæ			
26. Wing-cover	Blattidæ			
27. Hind-wing ?	Lepidopterous			
28. Wing	Phryganeidæ			
29. Wing-cover	Cimicideous			
30. Hind-wing ?	Lepidopterous ?			
31. Wing	Phryganeidæ			
32. Wing-cover	Blattidæ			
33. Wing-cover	Blattidæ			
34. Wing	Orthopterous			
35. Wing	Neuropterous			
36. Wing	Cercopideous			
37. Wing	Neuropterous			
38. Wing	Orthopterous			
39. Wing	Neuropterous			
40. Wing	Orthopterous			
41. Wing	Orthopterous			
42. Wing	Orthopterous			
43. Wing-cover	Blattidæ			

Specific names.

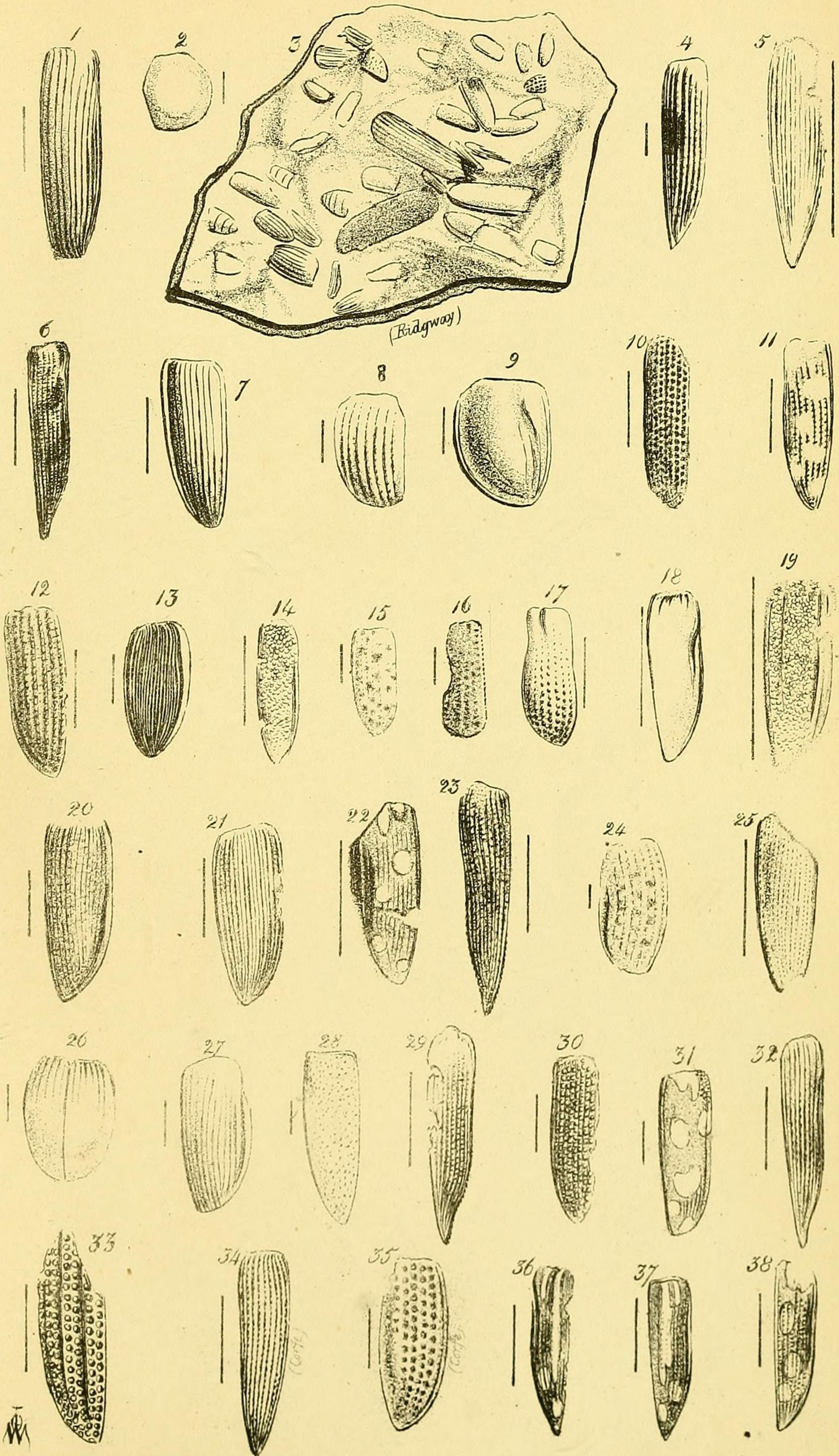
- |                                    |                                 |                                  |
|------------------------------------|---------------------------------|----------------------------------|
| Fig. 1. Carabidium Dejeanianum, W. | Fig. 23. Blattidium Nogaus, W.  | Fig. 31. Phryganeidium Pytho, W. |
| 3. Cercopidium Hahnii, W.          | 24. Sialium Sipylus, W.         | 33. Blattidium Symyrus, W.       |
| 5. Cercopidium Schæfferi, W.       | 26. Blattidium Achelous, W.     | 36. Cercopidium Signoretii, W.   |
| 9. Nepidium Stolones, W.           | 27. Cyllonium Hewitsonianum, W. | 39. Agrionidium Ætna, W.         |
| 21. Myrmicium Heerii, W.           |                                 |                                  |



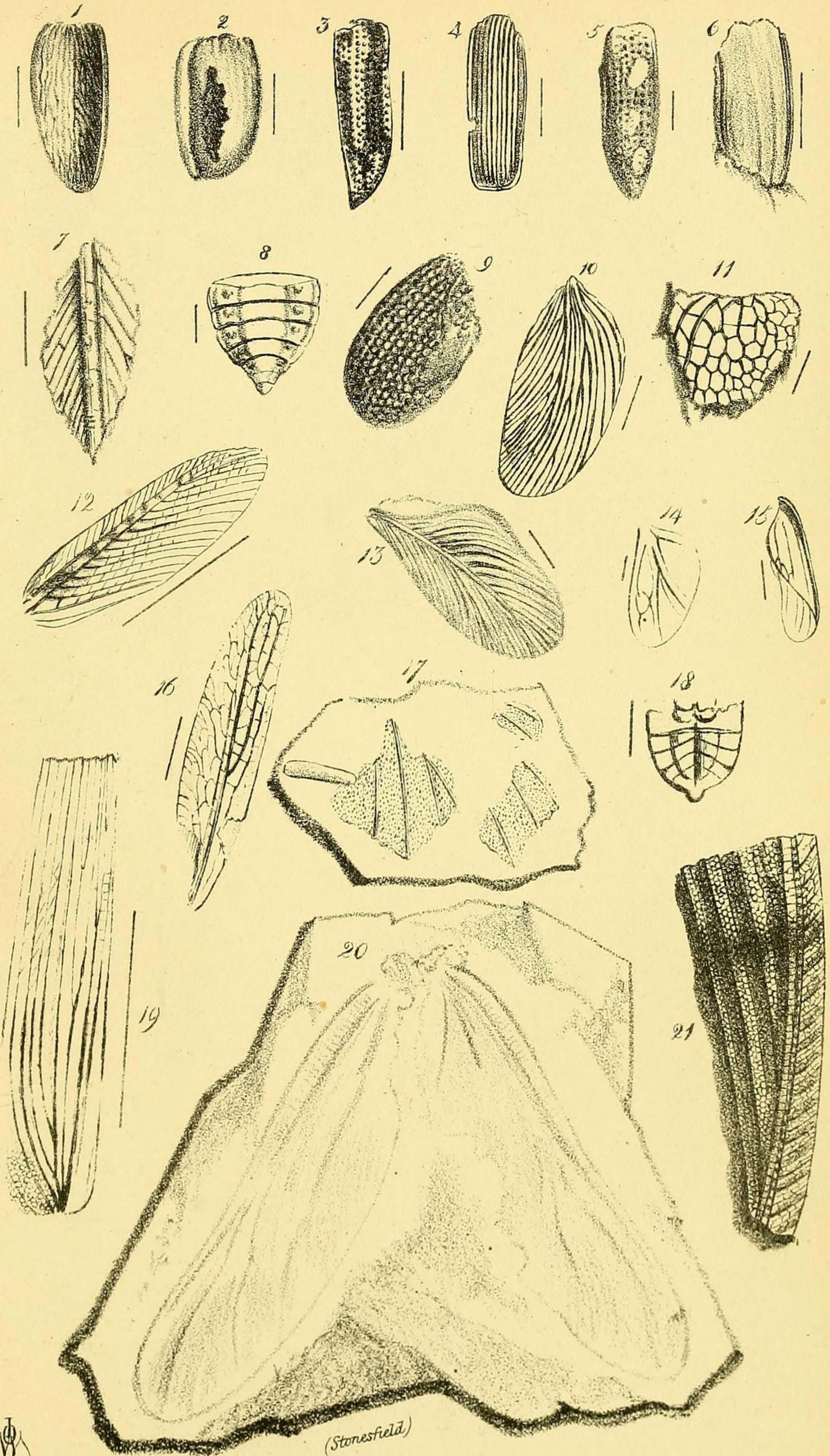
Fossil Insects (*Purbeck & Stonesfield* [Fig 13])



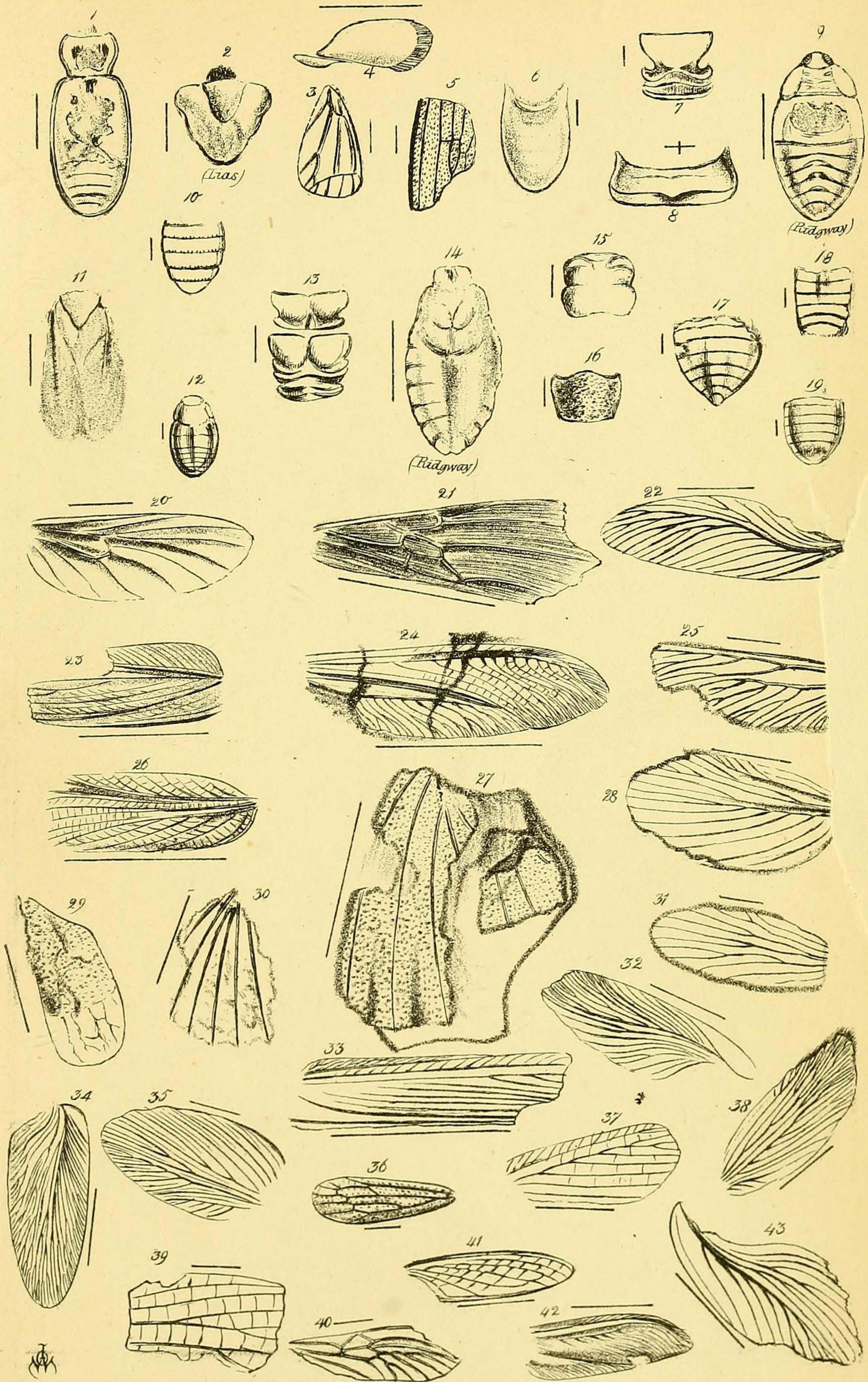
Fossil Insects (Purbeck)



Fossil Insects (*Tertiary* [34. 35.] & *Purbeck.*)



Fossil Insects (*Purbeck & Stonesfield*. [Fig 20])



Fossil Insects (Purbeck & Lias [Fig 2])