

Fig. 419.



Nat. size.

Wing of a neuropterous insect, from the Lower Lias, Gloucestershire, (Rev. P. B. Brodie.)

fect in this bed. Ferns, with leaves of monocotyledonous plants, and some apparently brackish and freshwater shells, accompany the insects in several places, while in others marine shells predominate, the fossils varying apparently as we examine the bed nearer or farther from the ancient land, or the source whence the freshwater was derived. There are two, or even three, bands of "insect limestone" in several sections, and they have been ascertained by Mr. Brodie to retain the same lithological and zoological characters when traced from the centre of Warwickshire to the borders of the southern part of Wales. After studying 300 specimens of these insects from the lias, Mr. Westwood declares that they comprise both wood-eating and herb-devouring beetles of the Linnean genera *Elater*, *Carabus*, &c., besides grasshoppers (*Gryllus*), and detached wings of dragonflies and may-flies, or insects referable to the Linnean genera *Libellula*, *Ephemera*, *Hemerobius*, and *Panorpa*, in all belonging to no less than twenty-four families. The size of the species is usually small, and such as taken alone would imply a temperate climate; but many of the associated organic remains of other classes must lead to a different conclusion.

Fossil plants.—Among the vegetable remains of the Lias, several species of *Zamia* have been found at Lyme Regis, and the remains of coniferous plants at Whitby. Fragments of wood are common, and often converted into limestone. That some of this wood, though now petrified, was soft when it first lay at the bottom of the sea, is shown by a specimen now in the museum of the Geological Society (see fig. 420), which has the form of an *ammonite* indented on its surface.

Fig. 420.



M. Ad. Brongniart enumerates forty-seven liassic acrogens, most of them ferns; and fifty gymnogens, of which thirty-nine are cycads, and eleven conifers. Among the cycads the predominance of *Zamites* and *Nilsonia*, and among the ferns the numerous genera with leaves having reticulated veins (as in fig. 385, p. 314), are mentioned as botanical characteristics of this era.* The absence as yet from the Lias and Oolite of all signs of dicotyledonous angiosperms is worthy of notice. The leaves of such plants are frequent in tertiary strata, and occur in the Cretaceous, though less plentifully (see above, p. 266). The angiosperms seem, therefore, to have been at the least comparatively rare in these older secondary periods, when more space was occupied by the Cycads and Conifers.

Origin of the Oolite and Lias.—If we now endeavor to restore, in imagination, the ancient condition of the European area at the period of the Oolite and Lias, we must conceive a sea in which the growth of

* Tableau des Vég. Fos. 1849, p. 105