

insect remains, which have been obtained principally from the Lower Lias. These were, no doubt, blown off the land and fell into shallow water, where they were preserved in the silt on the bottom. The Neuroptera are numerous, and include several species of *Libellula*. The coleopterous forms comprise a number of herbivorous and lignivorous beetles (*Elater*, *Buprestites*, etc.). There were likewise representatives of the orthopterous, dipterous, and palæodictyopterous orders. These relics of insect life are so abundant in some of the calcareous bands that the latter are known as insect-beds.⁶⁴ With them are associated remains of terrestrial plants, cyprids, and mollusks, sometimes marine, sometimes apparently brackish-water. The marine life of the period has been abundantly preserved, so far at least as regards the comparatively shallow and juxta-littoral waters in which the Liassic strata were accumulated.⁶⁵ Foraminifera abounded on some of the sea-bottoms, the genera *Cristellaria*, *Dentalina*, *Marginulina*, *Fronicularia*, *Polymorphina*, and *Planularia* being the more important. Corals, though on the whole scarce, abound on some horizons (*Astrocoenia*, *Thecosmilia*, *Isastræa*, *Montlivaltia*, *Septastræa*, etc.). The crinoids were represented by thick growths of *Extracrinus* and *Pentacrinus*. There were brittle-stars, starfishes, and sea-urchins (*Ophioglypha*, *Uraster*, *Luidia*, *Hemipedina*, *Cidaris*, *Acrosalenia*)—all generically distinct from those of the Palæozoic periods. The annelids were represented by *Serpula*, *Vermilia*, and *Ditrupa*. Among the crustacea, the more frequent known genera are *Eryon* (entirely Liassic), *Glyphæa* (from Lower Lias to Kimeridge clay), and *Eryma*. The brachiopods are chiefly *Rhynchonella*, *Waldheimia*, *Spiriferina*, *Thecidium*, and *Terebratula*. *Spiriferina* is the last of the *Spirifers*, and with it are associated the last forms of *Leptæna*, of which five Liassic species are known from English localities (Fig. 388). Of the lamellibranchs a few of the most characteristic genera are *Pecten*, *Lima*, *Avicula*, *Gryphæa*, *Gervillia*, *Ostrea*, *Plicatula*, *Mytilus*, *Cardinia*, *Leda*, *Cypricardia*, *Astarte*, *Pleuromya*, *Hippopodium*, and *Pholadomya*. Gasteropods, though usually rare in such muddy strata as the greater part of the Lias,

⁶⁴ Brodie, Proc. Geol. Soc. 1846, p. 14; Q. J. Geol. Soc. v. 31; "History of Fossil Insects," 1846. See Scudder, Bull. U. S. Geol. Survey. No. 71, 1891, pp. 98-236, for a list of all known Mesozoic insects, and references to the authorities for the description of each species.

⁶⁵ See R. Tate, "Census of Lias Marine Invertebrata," Geol. Mag. viii. p. 4.