

alternations are of constant occurrence. In some cases in East Lothian, beds of fireclay, with *Stigmaria*, and thin layers of coal lying on old terrestrial soils, immediately underlie marine limestones with *Productas*. In the Dalkeith coal-field valuable beds of coal with shales, &c. are interstratified with a thick series of beds of Carboniferous Limestone. The Burdiehouse brackish water limestone in East Lothian is the lowest of the limestones, and yields many small bivalve Crustacea of the genus *Estheria*, besides fish of the genera *Megalichthys* and *Holoptychius*.

In the East and Mid Lothian coal-fields about 20 beds of workable coal occur, besides many smaller layers. Eleven workable beds of coal are known above the Millstone grit or Moor rock, and 17 associated with the Carboniferous Limestone beds below the Millstone grit. The Carboniferous strata of the Lothians cross the Firth of Forth beneath the sea, and form great part of Kinross and Fife, where there are 29 workable beds, one of which is 21 feet, and others from 5 to 9 feet in thickness. The western part of the basin in Lanarkshire and Ayrshire yields 8 or 10 workable coal seams. It is in these districts that the well-known *black-band ironstones* occur.

I have already said that the South Wales, Dean Forest, Bristol and Devonshire Carboniferous areas originally formed one, and have been separated by disturbance of the strata and subsequent denudation. The same kind of original continuity may be inferred concerning all the coal-fields of the middle of England, North Wales, and northward to Cumberland and Northumberland, and the latter was even probably joined to the great coal-field of central Scotland. After the close of the Carboniferous epoch, this large area was