

Cheshire, and Lancashire. Three or four beds of igneous rock, called toadstone, lie in the limestone. The Millstone grit of these areas is much mingled with shale, and between it and the Carboniferous Limestone there are often thick beds of shale and sandstone, called the Upper Limestone Shale, or Yoredale rocks. North of the Ribble the Carboniferous Limestone itself is divided by numerous interstratifications of sandstone and shale, with occasional beds of thin coal, and this increasing in the northern parts of Northumberland, the equivalents of the southern mass of Carboniferous Limestone die away into a few subordinate beds of limestone, and fairly pass by degrees into a lower coal-field, with several poor beds of coal.

The Lancashire, Cheshire and North Staffordshire coal-fields, exclusive of the Millstone grit, vary from about 3,500 to 7,500 feet in thickness, counting from the beds on which the unconformable Permian strata happen to rest. They include about 30 coal-beds in North Staffordshire, in Lancashire 14 good seams about St. Helens, 15 at Wigan, 16 between Manchester and Bolton, and 13 at Burnley. Many of these, which in different districts go by different names, are equivalent beds. Fish remains and many marine and estuarine or fresh water shells occur among the interstratified shales and sandstones. There are also many beds of ironstone. The Nottingham, Derbyshire, and Yorkshire coal-fields united give about 15 beds of workable coal. All these are ironstone areas, and North Staffordshire is the great pottery district of England. The finer clay is imported, only the coarser qualities for tiles, &c., being native.

The Newcastle coal-field is about 1,600 feet thick, and contains about 16 beds of coal throughout the