

near Hovingham; and Valerius Vindicianus on a monument at Old Penrith. His designation is here given in the third line, but that has only been interpreted by a series of conjectural values for each letter.

There is here a fault 'throwing up' the strata to the north, about 400 feet. The effect is to place on the same level fossil plants of beds above the Lias, and fossil shells often 300 or more feet deep in it. The fallen cliffs at this point have the picturesque aspect of ruins. As nearly the whole series of Lias is here visible, and in our progress northwards we must sometimes speak of its parts by name, this appears the proper place for inserting a classification of the thick Lias formation.

Under the general cover of gritstones, which have been sufficiently noticed already, we have:—

*Upper Lias Shale*, generally about 200 feet thick; alum is made from the upper half: near the bottom are some parts firmer and harder than the rest, and through the whole run bands of scattered nodules of a ferruginous and argillo-calcareous nature. In the interior country south of Stokesley, this set of beds grows thinner, and less fitted for the preparation of alum.

*Ironstone and Marlstone series*, about 150 feet. Ironstone bands more or less mixed with shale constitute the upper part of the series, and at many parts of the coast, in Cleveland and Eskdale, and towards the base of Burton Head, Carleton Bank, and the Hambleton Hills, they have a positive commercial value. The shells which accompany these bands abundantly, add carbonate of lime to improve the fusibility of the other earthy admixtures. The produce in *iron* is about 30 per cent. Below are shales, and still lower laminated sandstones, of a soft and argillaceous character, generally very shelly, and partially ferruginous. These are the true marlstones, and make prominent edges under Rosebury Topping and the Cleveland Hills, as they also do in Lincolnshire, Northamptonshire, and Gloucestershire.

*Lower Lias series*, probably 500 feet. This is a nearly uniform mass of rather firm shale, with nodules of ironstone, in