Turning southwards from the mouth of the Tees, the lias ranges beneath the west escarpment of the eastern moorlands,

The colour of the shale is a bluish grey. It varies in hardness. The upper part uf the bed near Whitby may be crumbled in pieces between the fingers, but at a considerable depth it is as hard as roofing slate. (Ibid.)

The upper part feels soft and unctuous like indurated clay; the lamellar fracture is smooth and shining, the transverse dull and earthy. (P. M. v. 51· p. 207.)

It is traversed by fissures dividing it into rhombic portions. (Ibid.)

At the depth of about two hundred and fifty feet from the top of Boulby cliffs, which rise four hundred and fifty feet above the sea, the shale loses its unctuous feel, and becomes mixed with a large portion of sand, and mica in shining scales. It becomes of a light grey colour, and encloses seams of iron-stone; but below this part, the rock resumes its softness and smoothness. (P. M. v. 51. p. 207.)

It abounds in pyrites. (Ibid.)

The upper part is most abundant in sulphur, which decreases in going down, but the bituminous substance increases, and the rock becomes hard and slaty; so that a cubic yard of rock taken from the top of the stratum, is as valuable as five cubic yards taken at the depth of one hundred feet. (N. J. v. 25. p. 241.)

When a quantity of the schistus is laid in a heap, and moistened with sea water, it takes fire spontaneously, and will continue to burn till the whole of the combustible part was exhausted. A part of the cliff which fell some years ago was exposed to the tide; it took fire and continued to burn for two or three years. (Ibid)

That part of the alum-shale of Whitby which is earthy rather than slaty, yields the greatest quantity of alum. A layer of brush-wood is made in the first instance, and shale is thrown down upon it, until a considerable mound is raised. The brush-wood is then lighted, and a slow combustion ensues; another layer of brush-wood is then placed beside the first, and is in like manner covered by a mound of shale: still others are added, and these mounds, with fires beneath, are extended on all sides; when the shale has effectually caught fire, it continues to burn without any addition of fuel. It is afterwards thrown into vats with water and boiled twenty-four hours; it is then conveyed into other vats where an alkali being added, it crystallises: it is then melted again, and purified by a second crystallisation. When so prepared it is shipped off for London and thence to Sweden and Russia. (G. Notes.)

The History of Whitby by Lionel Charlton, in one volume 4to. contains the best account of the alum works. (Ibid.)

Some parts of the alum shale at Whitby are useful as marle. (Ibid.)

It contains masses of iron ore (septaria), which, when of a globular form sometimes enclose naphtha (bitumen?); also sometimes wood more or less petrified and occasionally passing into jet (N. J. v. 25. p. 254); they are sometimes coated with pyrites,

It contains immense quantities of red iron ore at the depth of about two hundred feet from the top of the aluminous strata, in seams varying from a few inches to two feet. The iron ore yielded by analysis thirty to sixty per cent. of oxide of iron, phosphoric acid, lime, alumine and silex. It is smelted at Newcastle. (Ibid.)

It contains sulphate of lime in crystals, and carbonate of lime in veins. (Ibid.)

Under the aluminous shale formerly worked at Gisborough in Yorkshire, is a shale abounding in fossils, among which the pecten is the most frequent;