

(h) THE WHITEHAVEN COAL-FIELD.

In our progress round the Penine Chain, we have now arrived at that point where the transition group of the Cumbrian Mountains bursts from its side like an immense excrescence; around which we may still trace the formations which constitute the whole mass of the Penine Chain, ranging in nearly a complete circle; being forced, as it were, to make a long detour, as the layers of a piece of wood are seen to do in surrounding a knot. Our present concern is only with the highest of these formations, the coal-measures. These are indeed not to be met with on the south of the circle above described; for the æstuary of Morecambe bay cuts off the space in which they might be expected to exist. But on the western coast we find them near Egremont, south of Whitehaven,* whence they range in a large arc of a circle without interruption to beyond Hesket, a distance of about forty miles; and then turning towards the south, continue, though with several interruptions, to extend towards Orton, thus completing the whole of the northern semicircle round the Cumbrian mountain group, and returning to the point where this inosculates (if the expression may be allowed) with the Penine chain. The newer red sandstone of the plain of Carlisle covers it on the north throughout the whole of this range. A good

* The following particulars are extracted from Townshend's *Vind. Mos.* Cumberland abounds with coal near to many of its eastern mountains, and in various districts between Sebergham and Whitehaven, from whence collieries proceed along the coast by Cockermouth to Maryport, forming a district of about one hundred square miles, in which three coal-fields are particularly noticed.

1. Howgill, west of Whitehaven, two miles and a half wide, from the rivulet called Pow, on the eastern side, to more than one thousand yards under the sea. In this seven beds have been worked.

2. Whingill, north-east of Whitehaven, extends 3000 yards in length, by 2800 in width. The beds are from four to ten feet in thickness, and dip one yard in ten. In the depth of 165 fathoms they work seven large beds, and have noticed eighteen thin ones. The faults are about 120 feet, up or down, and run from east to west.

3. Beside these, a more extensive coal-field has been discovered to the south and south-west of Whitehaven, which is yet unexplored.†

At Preston How, south-west of Whitehaven, on the Croft Pit, they cut fourteen beds of coal before they met with any one which is considerable. But to reward their perseverance, the fifteenth bed proved more than five feet in thickness; and the seventeenth, separated from the former by twenty-four beds of slate, ironstone, sandstone, and one small bed of coal, is nearly eight feet in thickness.

† Dixon's *Life of Dr. Brownrigg.*