gritstone; we shall then have a model of the coal strata in many parts of England, and their situation over the metalliferous lime, with the beds of sandstone, by which they are separated from it.

From the inclination or bending of coal strata, they always rise near to the surface in some parts of their course, and would be visible if not covered by soil or gravel. In the intersections formed by rivulets, or by accidental fractures on the sides of hills in a district, the nature of the strata may often be determined, and should be ascertained before any expense be incurred in boring or sinking for coal. When this is done, a proper station should be chosen; which requires great judgment; otherwise it is possible to bore or sink to great depths, and miss a bed of coal which exists very near the place. This will be evident from the inspection of the two stations, *a* and *b*, Plate IV. fig. 2.; in the latter it would be impossible to meet with the bed of coal, c, because the search is made beyond the line where it rises to the surface, or, in the miner's language, crops out. At *a*, coal would be found after sinking only a few yards.* In most situations, it is better to search for coal, as deep as can be done without expensive machinery, by sinking a well in preference to boring. By sinking, a decisive knowledge of the nature and thickness of the strata can be ascertained as far as you descend, which can be only imperfectly known by boring; for the latter mode is liable to great uncertainty of result, from bendings or slips of the strata. If, for instance, the borer be worked in the situation *a*, Plate IV. fig. 2., it will pass through a great depth of coal, which in reality may not be more than a few inches in thickness. Besides the uncertainty of the results, the grossest impositions are sometimes practised to answer interested purposes, and induce proprietors to continue the search, where there is no reasonable probability of success. Where coal strata come to the surface, they are generally in a soft decomposed state, and intermixed with earthy matter. They frequently present no appearance of coal, but the soil may be observed of a darker colour. The real quality of the coal cannot be ascertained until it is found below, in its natural undecomposed state, lying between two regular strata of stone or indurated clay. In general it is observed, that the same bed improves in quality, as it sinks deeper into the earth. Coal strata are generally split or divisible into rhomboidal blocks, by vertical joints: these are called slines; the oblique shorter joints are called cutters.

From what will be stated in the subsequent chapter, it will appear that there is more than one third of England in which all search for valuable coal is useless: the knowledge of a negative fact becomes

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* In 1811, I saw in Radnorshire, a fruitless search for coal of this kind; a bed of coal of a bad quality rose near the surface, and the attempts to obtain it were made beyond the outcrop of the bed.