down to its present depth of two hundred and ten fathoms from the surface. It ought, however, to be added, that some portion of tin was found in different parts of the vein, which may therefore be said to have prevailed more or less from the surface to the present workings.'?*

The thickness of veins, and the quantity and quality of the ore they contain, vary in every mine. Some veins are only a few inches wide; others are several feet, and sometimes several yards, in width. Veins are often narrow in one part, and swell out in another. The vein at the Dolcoath mine in Cornwall, varies from two or three feet to forty feet; and in some places it contracts to little more than six inches. The veinstone is quartz, in which are imbedded masses called bunches of copper pyrites, consisting of copper combined with sulphur and iron.

Beside rake veins, there are other mineral repositories, called flat veins, or flat works, and pipe veins. In some instances, a rake vein declines from its regular inclination, takes the direction of the beds of rock, running between them for a greater or less extent, and then resumes its former inclination. In other instances, the cavities between beds or strata, are filled with metallic ores, lying between an upper and lower stratum, like a seam of coal, and are subject to similar dislocations: but these are not regular strata; they may, frequently, be traced to a perpendicular or rake vein, from which they appear to be lateral expansions; see Plate VII. fig. 2., in which the regular vein is seen descending, and the flat vein branching off on each side near the bottom.

There is, generally, what is called a rider, or mass of mineral matter, between the ore of very strong rake veins, and that in the flat veins, at the place of junction. The flat veins that run parallel between the strata, frequently open into large cavities filled with ore and veinstone; these cavities close again by the contracting, or what the miners call twitching of the sides, by which the ore is nearly or totally excluded. Such expansions and twitchings are also common to rake veins, as represented at *c c*, Plate IV. fig. 4.

The blue john, or fluor spar mine, near Castleton, is of this kind. The vein which contains this spar is separated from the limestone rock by a lining of cawk or sulphate of barytes, and by a thin layer of unctuous clay; it swells out into large cavities, which contract again, and entirely exclude the ore, leaving nothing but the lining of the vein to conduct the miner to another repository of the spar. The crystallizations and mineral incrustations on the roof and sides of the natural caverns which are passed through in this mine, far exceed in beauty those of any other cavern in England; and were the descriptions of the Grotto of Antiparos translated into the simple language of

* Transactions of the Geological Society, vol. ii.