

hundred and forty feet thick. Metalliferous veins are generally much narrower, but the mines of Pasco, in Peru, are situated in a vein of brown iron-stone, containing silver, which is thirteen hundred yards wide. Some of the tin veins of Cornwall are not more than three inches thick, while others are thirty feet. The general thickness of the copper and tin veins in this country is from a foot to three feet, and it has been observed that the ore of these is much less intermixed with foreign ingredients than that of wider veins.

When a vein that has been productive in one rock enters another, it very rarely continues to be equally rich; and it is a remarkable fact, that veins are found to be rich or poor, according to the nature of the rock in which they happen to lie. When they pass through sandstone or slate into limestone, they enlarge and grow rich, and it is well known that all the lead mines of Northumberland and Durham are situated in this rock. In these counties, the deeper the lead veins are followed, the poorer they become, while in the copper mines of Cornwall they become richer; and it is said they are never known to come to an end, although several of them have been traced to a depth of one thousand feet from the surface, and a few for fifteen hundred feet.

There is only one ore of tin, called the native oxyde, and it is sometimes, though rarely, found with the copper ores, but it is not at all uncommon for them to follow each other. Tin will perhaps be traced for eighty or one hundred feet, and then a course of copper; but when a rich copper is found at the commencement of the vein, tin has never been known to succeed it.

The most recent veins, which run north and south, are called cross veins, and pass through those which lie east and west. This circumstance leads us to the deduction that the east and west are older than the north and south, which are usually filled with clayey substances, and contain but little ore: the metalliferous veins are those that run east and west. A cross vein frequently disturbs the direction of a vein that lies east and west so much, that it is lost sight of by the miners, and months or years may be spent in the effort to find it again. Not long ago a vein was recovered four hundred and fifty feet from the cross vein that altered its course.

The origin of metallic veins is not by any means so clear as that of the granitic. It is quite possible that many of them