

# PART IV.

## ECONOMICAL GEOLOGY.

*Economical Geology* is an account of rocks with reference to their pecuniary value, or immediate application to the wants of society. These practical applications may be included under the three general heads of mining, engineering and architecture, and agriculture.

### 1. MINING.

*Mining* is usually understood to relate chiefly to the means employed for extracting metallic ores from veins. We shall apply it to the extraction of ores from all metalliferous deposits. Previously, then, to the details of the process, we must describe the different modes in which the metals are found, and their origin.

#### *Metalliferous Deposits.*

*Metallic Veins.*—The metallic matter, called *ore*, rarely occupies the whole of the vein; but is disseminated more or less abundantly through the quartz, sulphate of baryta, wacke, granite, etc., which constitute the greater part of the vein, and are called the *gangue*, *matrix*, or *veinstone*. Often the ore and the gangue form alternating layers. Sometimes there are cavities lined with crystals, which cavities are called *druses*.

Metallic, like other veins, vary very much in extent, both in a vertical and a horizontal direction. They are of unknown depth; for scarcely ever have they been exhausted downward. The deepest mine that has been worked, is that at Truttenburg in Bohemia, which has been explored to the depth of 3,000 feet.

In all cases metallic, like other mineral veins, are filled with matter different from the rocks which they traverse. In some instances they are obviously of the same age with the containing rock, but in a majority of cases they are fissures that have been subsequently filled. They exhibit almost every variety of dip and strike, and yet it has been thought that they very often affect an east and west direction, though frequently they run north and south, and their dip usually approaches the perpendicular. These veins often ramify and diminish until they finally disappear. Their width is very various; from a mere line up to some hundreds of feet. The metallic veins of Cornwall vary from an inch to thirty feet in width. The contents are sometimes arranged in successive and often corresponding layers on each side.

The contents of metalliferous veins often vary in the same vein, in different rocks through which it passes, both perpendicularly and in the direction of the vein. Its width also varies in the same manner.

It is often found that all the veins of the same neighborhood have essentially the same direction; and if there should be two distinct systems of veins in the same locality, one system, if they are both metalliferous, will contain a metal not found in the other.

The rock in which metallic veins are found is called the *country*; the veins themselves are *lodes*; unproductive veins, intersecting the lodes, are called *cross courses*; the dip or inclination of the vein is its *hade*, *slope*, or *underlie*;