

are usually local, and quite short, the latter are sometimes of great length, and produce much confusion over large districts.

If the fissure is open and of considerable width, and is succeeded at each extremity by a wider valley, it is called a *gorge*, as *c*, in Fig. 41.

If it be still wider, with the sides sloping or rounded at the bottom, a *valley* is produced.

In a similar way most of the valleys of primitive countries were formed.

CLASSIFICATION OF ROCKS.

One of the great objects sought by geologists is a complete knowledge of the classification, or the order of the succession of the different formations. There are two difficulties in their way. First, there is no district in the world where all the formations are found placed directly over another; and, secondly, the rocks in one country have sometimes little or no external resemblance to those of the same age in another country; or if developed at all their thickness varies greatly. It is even the case that large formations are developed upon one continent which are entirely wanting in another. Could the successive formations be placed upon one another in regular order in any one place, and an excavation be made through them which a geologist might examine, the task of classification would be comparatively easy.

Among all the fossiliferous formations there exists an invariable order of superposition. Rocks of different age may be brought together by the absence of an intermediate group; but the newer never underlies the older, except in a few cases of folded axes, or inverted anticlinals.

A formation in America is identified with the corresponding strata in Europe chiefly by means of organic remains *characteristic* of that group. Previously, the European strata had been thoroughly examined, both as to their mineralogical and organic characters; and had received a local name. Thus one of the lowest series of the Palæozoic system was first explored in Wales. Hence it was called *Silurian* (an ancient name for the district). Now when *synchronous** strata are found in America they are

* *Synchronous* strata are those which are formed simultaneously in different terrains.