

tain-systems. They call them "longitudinal valleys" when they extend between two mountain-chains, because they follow the direction of the length of those chains. Such are the valleys of the Tay and the Spey in Scotland; in France, that which separates the Jura and the Alps on the east, and the mountains of the Lyonnais and the Vivarais on the west.

Valleys formed by two lateral branches of a chain are called "transversal." Such are the transversal valleys of the Doubs, the Iser, and the Durance, which open on the one side into the great longitudinal valley already spoken of, and those of the Garde and the Ardèche, which open into it on the other.

If we turn our glance towards an island, or the shores of a continent, we observe that, starting from the sea, the ground rises gradually up to a certain height, which forms the water-shed or summit-line; and that from this summit it begins to decline, thus exhibiting two opposite slopes. Each general slope subdivides into numerous secondary slopes, formed by the transversal branches which project from the summit-line, and terminate at uncertain distances. The line following the bottom of the valley formed by two neighbouring slopes is called *thalweg*, from a German word which signifies a "valley-road;" it is the route, or channel, of the waters which spring from the principal summit, and descend towards the sea or towards the plain. The *thalweg* almost always becomes the bed of a river.

The high valleys often present, at their origin, a number of small secondary valleys, whose flanks have a very gentle slope, and which are frequently called *vales*. Sometimes they start from a circular basin, or amphitheatre (*cirque*), like the Cirque of Gavarnie, in the Pyrenees. Deep and narrow valleys are termed *gorges*, or, when they are of very small dimensions, *ravines*; a ravine is usually watered by a torrent.

In mountain-chains the starting-point of two opposite branches is generally marked by a sinking of the crest, and the origin of two opposite valleys is indicated by a depression which the French call a *Col*, and the *Pyrenean* mountaineers, a *Port* or Gate.