valley than a strath, though the names have not always been applied with discrimination. Most of the Highland valleys are true glens, Glencoe being the best-known example. The hills rise rapidly on each side, sometimes in grassy slopes, sometimes in rocky bosses and precipitous cliffs, while the bottom is occupied by a lake. In the south of Scotland the larger streams flow in wide open valleys called *dales,* as in Clydesdale, Tweeddale, Teviotdale, Liddesdale, Eskdale, Nithsdale. The strips of alluvial land bordering a river are known as *haughs,* and where in estuaries they expand into wide plains they are termed *carses.* ’The carses of the Forth extend seawards as far as Bo'ness and consist chiefly of raised beaches. The Carse of Gowrie is the strip of low ground intervening between the Firth of Tay and the Sidlaw Hills. *Brae* signifies the steep bank of a river, and so any slope or hill-side.

River-gorges are characteristic features in many of the valleys. In the Old Red Sandstone they are particularly prominent where that formation has lain in the pathway of the streams sweeping down from the Highlands. In the basin of the Moray Firth some fine examples may be seen on the Nairn and Findhorn, while on the west side of the Cromarty Firth some of the small streams descending from the high grounds of the east of the shire of Ross and Cromarty have cut out defiles in the Conglomerates, remarkable for their depth and narrowness. Towards the south margin of the Highlands notable instances of true *canyons* in the Old Red Sandstone are to be seen where the Isla and North Esk enter that formation. The well-known gorge in which the Falls of Clyde are situated is the best example in the Lowlands. (For the chief rivers see the separate articles on them, and also the section on the

physical features in the article on the different shires of Scotland.)

The topography of the country being the result of prolonged denudation, it is reasonable to infer that the oldest surfaces likely to be preserved are portions of some of the platforms of erosion successively established by the wearing down of the land to the sea-level. Relics of these platforms occur both in the Highlands and among the Southern Uplands.

Allusion has already been made to the flat-topped moorlands which in the eastern Grampians reach heights of 3000 to 4000 ft. above the sea. The most familiar example perhaps is the top of Lochnagar, where, at the level of 3500 ft., the traveller finds himself on a broad undulating moor, more than a mile and a half long, sloping gently towards Glen Muick and terminating on the north in a range of granite precipices. The top of Ben Macdhui stands upon nearly a square mile of moor exceeding 4000 ft. in elevation. These mountains lie within granite areas; but not less striking examples may be found among the schists. The mountains at the head of Glen Clova and Glen Isla, for instance, sweep upwards into a broad moor some 3000 ft. above the sea, the more prominent parts of which have received special names—Driesh, Mayar, Tom Buidhe, Tolmount, Cairn na Glasha. It would hardly be an exaggeration to say that there is more level ground on the tops of these mountains than in areas of corresponding size in the valleys below. That these high plateaus are planes of erosion is shown by their independence of geological structure, the upturned edges of the vertical and contorted schists having been abruptly shorn off and the granite having been wasted and levelled along its exposed surface. Among the Southern Uplands exist traces of a similar tableland of erosion. The top of Broad Law on the confines of Peeblesshire and Selkirkshire, for example, is a level moor comprising between 300 and 400 acres above the contour line of 2500 ft. and lying upon the upturned edges of the greatly denuded Silurian grits and shales. An instructive example of the similar destruction of a much younger platform is to be found in the terraced plateaus of Skye, Eigg, Canna, Muck, Mull and Morven, which are portions of what was probably originally a continuous plain of basalt. Though dating back only to older Tertiary time, this plain has been so deeply trenched by the forces of denudation that it has been reduced to mere scattered fragments. Thousands of feet of basalt have been worn away from many parts of its surface ; deep and wide valleys have been carved out of it; and so enormously has it been wasted, that it has been almost entirely stripped from wide tracts which it formerly covered and where only scattered outliers remain to prove that it once existed.

It is curious that broad flat-topped mountains are chiefly to be found in the eastern parts of the country. Traced westwards, these forms gradually give place to narrow ridges and crests. No contrast, for instance, can be greater than that between the wide elevated moors of the eastern Grampians, and the crested ridges of western Inverness-shire and Argyllshire—Loch Hourn, Glen Nevis, Glencoe— or that between the broad uplands of Peeblesshire and the pre- cipitous heights of Galloway. Geological structure alone will not account for these contrasts. Perhaps the cause is to be sought mainly in differences of rainfall. The western mountains, exposed to the fierce lash of the Atlantic rains, sustain the heaviest and most constant precipitation. Their sides are seamed with torrents which tear down the solid rock and sweep its detritus into the glens and sea lochs. The eastern heights, on the other hand, experience a smaller rainfall and consequently a diminished rate of erosion. No doubt, too, the preponder­ance of rainfall in the west has persisted for an enormous period.

Regarding the existing flat-topped heights among the eastern Grampians as remnants of what was once the general character of the surface, we can trace every step in the gradual obliteration of the

tableland and in the formation of the most rugged and most indi­vidualized forms of isolated mountain. In fact, in journeying west­wards across the tops of the Highland mountains we pass, as it were, over successive stages in the history of the origin of Highland scenery. The oldest types of form lie on the east side and the newest on the west. From the larger fragments of the denuded tableland we advance to ridges with narrow tops, which pass by degrees into sharp rugged crests. The ridges, too, are more and more trenched until they become groups of detached hills or mountains. In the progress of this erosion full scope has been afforded for the modification of form by variation in geological structure. Each ridge and mountain has been cut into its shape by denudation, but its outlines have been determined by the nature of the rocks and the manner in which they have yielded to decay. Every distinct variety of rock has impressed its own character upon the landscape. Hence, amid the monotonous succession of ridge beyond ridge and valley alter valley, diversity of detail has resulted from the varying composition and grouping of the rocks.

The process by which the ancient tablelands have been trenched into valleys and confluent ridges is most instructively displayed among the higher mountains, where erosion proceeds at an accelerated pace. The long screes or talus-slopes at the foot of every crag and cliff bear witness to the continual waste. The headwaters of a river cut into the slopes of the parent hill. Each valley is consequently lengthened at the expense of the mountain from which it descends. Where a number of small torrents converge in a steep mountain recess, they cut out a crescent-shaped hollow or half- cauldron, which in the Scottish Highlands is known as a *corrie.* It is doubtful whether the convergent action of the streams has been the sole agency in the erosion of these striking cavities, or whether snow and glacier-ice have had a share in the work. No feature in Highland scenery is more characteristic than the corries, and in none can the influence of geological structure be better understood. Usually the upper part of a corrie is formed by a crescent of naked rock, from which long trails of debris descend to the bottom of the hollow. Every distinct variety of rock has its own type of corrie, the peculiarities being marked both in the details of the upper cliffs and crags, and in the amount, form and colour of the screes. The Scottish corries have been occupied by glaciers. Hence their bottoms are generally ice-worn or strewn over with moraine stuff. Sometimes a small tarn fills up the bottom, ponded back by a moraine. It is in such localities that we can best observe the last relics of the glaciers that once overspread the country. Among these high grounds also the gradual narrowing of ridges into sharp, narrow, knife-edged crests and the lowering of these into *cols* or passes can be admirably studied. Where two glens begin opposite to each other on the same ridge, their corries are gradually cut back until only a sharp crest separates them. This crest, attacked on each front and along the summit, is lowered with comparative rapidity, until merely a low col or pass may separate the heads of the two glens. The various stages in this kind of demolition are best seen where the underlying rock is of granite or similarly tough material, which at the same time is apt to be split and splintered by means of its numerous transverse joints. The granite mountains of Arran furnish excellent illustrations.

Where a rock yields to weather with considerable uniformity in all directions it is likely to assume *conical forms* in the progress of denu- dation. Sometimes this uniformity is attained by a general disintegration of the rock into fine debris, which rolls down the slopes in long screes. In other cases it is secured by the intersection of joints, whereby a rock, in itself hard and durable, is divided into small angular blocks, which are separated by the action of the elements and slide down the declivities. In many instances the beginning of the formation of a cone may be detected on ridges which have been deeply trenched by valleys. The smaller isolated portions, attacked on all sides, have broken up under weather. Layer after layer has been stripped from their sides, and the flat or rounded top has been narrowed until it has now become the apex of a cone. The mountain Schiehallion (3547 ft.) is an instance of a cone not yet freed from its parent ridge. Occasionally a ridge has been carved into a series of cones united at their bases, as in the chain of the Pentland Hills. A further stage in denudation brings us to isolated groups of cones completely separated from the rest of the rocks among which they once lay buried. Such groups may be carved out of a continuous band of rock extending into the regions beyond. The Paps of Jura, for instance, rise out of a long belt of quartzite which stretches through the islands of Islay, Jura and Scarba. In many cases, however, the groups point to the existence of some boss of rock of greater durability than those in the immediate neighbourhood, as in the Cuchullins and Red Hills of Skye and the group of granite cones of Ben Loyal, Sutherland. The most impressive form of solitary cone is that wherein after vast denudation a thick overlying formation has been reduced to a single outlier, such as Morven in Caithness, the two Bens Griam in Sutherland, and Still more strikingly, the pyramids of red sandstone on the western margin of the shires of Sutherland and Ross and Cromarty. The horizontal stratification of some of these masses gives them a curiously architectural aspect, further increased by the effect of the numerous vertical joints by which the rock is cleft into buttresses and recesses along the fronts of the precipices and into pinnacles and finials along the summits. Solitary or grouped pyramids of red sandstone between 3000 and 4000 ft.