or other softer rock between them, it offers conditions peculiarly favourable for the formation of escarpments. In the wide basalt plateaus of the Inner Hebrides these conditions have been mani­fested on a great scale. The Carboniferous lavas of the Campsie and Fintry Hills and of the south of Dumfriesshire and Roxburgh­shire likewise rise in lines of bold escarpment.

*Lakes.—*These important features in the landscapes of Scotland present the general characters of the water-basins so profusely scattered over the northern parts of Europe and North America. They may be classified in four groups, each of which has its own peculiar scenery and a distinct mode of origin—(1) glen lakes, (2) rock-tarns, (3) moraine-tarns, (4) lakes of the plains.

1. Glen lakes are those which occupy portions of glens. They are depressions in the valleys, not due to mere local heaping up of detritus, but true rock-basins, often of great depth. Much discus­sion has arisen as to their mode of origin. They have been re­garded as caused by special subsidence of their areas, open fissures of the ground, general depression of the central part of each mountain district from which they radiate, and by the erosive action of glacier ice. That they are not open fissures and cannot be explained by any general subsidence of a neighbouring region is now generally admitted. That glaciers have occupied the glens where these lakes exist and have worn down the rocks along the sides and bottom cannot be doubted, but whether the ice would be capable of eroding hollows so deep as many of these lakes is a question which has been answered with equal confidence affirma­tively and negatively. On the other hand, to suppose that each of these hollows has been caused by a special local subsidence would involve a complex series of subterranean disturbances, for which some better evidence than the mere existence of the basins is re­quired. Under any circumstances it is quite certain that the lakes must be of recent geological date. Any such basins belonging to the time of the plication of the crystalline schists would have been filled up and effaced long ago. So rapid is the infilling by the torrents which sweep down detritus from the surrounding heights that the present lakes are being visibly diminished, and they cannot, therefore, be of high geological antiquity. It is worthy of remark that the glen lakes are almost wholly confined to the western half of the Highlands, where they form the largest sheets of fresh water. Hardly any lakes are to be seen east of a line drawn from Inverness to Perth. West of that line, however, they abound in both the longitudinal and the transverse valleys. The most remarkable line of them is that which fills up so much of the Great Glen. Loch Ness, the largest, is upwards of 20 miles long, about 11/2 miles broad, and not less than 774 feet deep in the deepest part. This great depression exceeds the general depth reached by the floor of the North Sea between Great Britain and the opposite shores of the Continent. Other important longitudinal lakes are Lochs Tay, Awe, Ericht, and Shiel. The most pictur­esque glen lakes, however, lie in transverse valleys, which being cut across the strike of the rocks present greater variety, and usually also more abruptness of outline. Lochs Lomond, Katrine, and Lubnaig in the southern Highlands, and Lochs Maree and More in the north, are conspicuous examples.
2. Rock-tarns are small lakes lying in rock-basins on the sides of mountains or the summits of ridges, and on rocky plateaus or plains. Unlike the glen lakes, they have no necessary dependence upon lines of valley. On the contrary, they are scattered as it were broadcast over the districts in which they occur, and are by far the most abundant of all tire lakes of the country. Dispersed over all parts of the western Highlands, they are most numerous in the north-west, especially in the Outer Hebrides and in the west of Ross-shire and Sutherland. The surface of the Archæan gneiss is so thickly sprinkled with them that many tracts consist almost as much of water as of land. They almost invariably lie on strongly ice-worn platforms of rock. Their sides and the rocky islets which diversify their surface have been powerfully glaciated. They cannot be due to either fracture or subsidence, but are obviously hollows pro­duced by erosion. They have accordingly with much probability been assigned to the gouging action of the sheets of land-ice by which the general glaciation of the country was effected. In the southern uplands, owing probably to the greater softness and uniformity of texture among the rocks, rock-tarns are comparatively infrequent, except in Galloway, where the protrusion of granite and its associated metamorphism have given rise to conditions of rock-structure more like those of the Highlands. Over the rocky hill-ranges of the central Lowlands rock-tarns occasionally make their appearance.
3. Moraine-tarns—small sheets of water ponded back by some of the last moraines shed by the retreating glaciers—are confined to the more mountainous tracts. Among the southern uplands many beautiful examples may be seen, probably the best known and certainly one of the most picturesque being the wild lonely Loch Skene lying in a recess of Whitecoomb at the head of the Moffat Water. Others are sprinkled over the higher parts of the valleys in Galloway. None occur in the central Lowlands. In the Highlands they may be counted by hundreds, nestling in the bottoms of the corries. In the north-western counties, where the

glaciers continued longest to descend to the sea-level, lakes retained by moraine-barriers may be found very little above the sea.

1. The lakes of the plains lie in hollows of the glacial detritus which is strewn so thickly over the lower grounds. As these hollows were caused by original irregular deposition rather than by erosion, they have no intimate relation to the present drainage­lines of the country. The lakes vary in size from mere pools up to wide sheets of water several square miles in area. As a rule they are shallow in proportion to their extent of surface. Though still sufficiently numerous in the Lowlands, they were once greatly more so, for, partly from natural causes and partly by artificial means, they have been made to disappear. The largest sheets of fresh water in the midland valley are of this class, as Loch Leven and the Lake of Menteith.

*Coast-Line.—*The eastern and western seaboards of Scotland present a singular contrast. The former is indented by a series of broad arms of the sea, but is otherwise tolerably unbroken. The land slopes gently down to the margin of the sea or to the edge of cliffs that have been cut back by the waves. The shores are for the most part low, with few islands in front of them, and cultivation comes down to the tide-line. The western side of the country, on the contrary, is from end to end intersected with long narrow sea lochs or fjords. The land shelves down rapidly into the sea and is fronted by chains and groups of islands. This contrast has some­times been erroneously referred to greater erosion by the waves on the western than on the eastern coast. The true explanation, however, must be sought in the geological structure of the land. The west side of Scotland, as we have seen, has been more deeply eroded than the eastern. The glens are more numerous there and on the whole deeper and narrower. Many of them are prolonged under the sea ; in other words, the narrow deep fjords which wind so far into the land are seaward continuations of the glens which emerge from their upper ends. The presence of the sea in these fjords is an accident. If they could be raised out of the sea they would become glens, with lakes filling up their deeper portions. That this has really been their history can hardly admit of question. They are submerged land-valleys, and as they run down the whole western coast they show that side of the country to have subsided to a considerable depth beneath its former level. The Scottish sea lochs must be viewed in connexion with those of western Ireland and of Norway. The whole of this north-western coast-line of Europe bears witness to recent submergence. The bed of the North Sea, which at no distant date in geological history was a land surface across which plants and animals migrated freely into Great Britain, sank beneath the sea-level, while the Atlantic ad­vanced upon the western margin of the continent and filled the sea­ward ends of what had previously been valleys open to the sun. Not improbably the amount of subsidence was greater towards the west.

Nearly the whole coast-line of Scotland is rocky. On the east side of the country, indeed, the shores of the estuaries are gener­ally low, but the land between the mouths of these inlets is more or less precipitous. On the west side the coast is for the most part either a steep rocky declivity or a sea-wall, though strips of lower ground are found in the bays. The sea-cliffs everywhere vary in their characters according to the nature of the rock out of which they have been carved. At Cape Wrath precipices nearly 300 feet high have been cut out of the Archæan gneiss. The varying tex­ture of this rock, its irregular foliation and jointing, and its rami­fying veins of pegmatite conspire to give it very unequal powers of resistance in different parts of its mass. Consequently it projects in irregular bastions and buttresses and retires into deep recesses and tunnels, showing everywhere a ruggedness of aspect which is eminently characteristic. In striking contrast to these precipices are those of the Cambrian red sandstone a few miles to the east. Vast vertical walls of rock shoot up from the waves to a height of 600 feet, cut by their perpendicular joints into quadrangular piers and projections, some of which even stand out alone as cathedral­like islets in front of the main cliff. The sombre colouring is relieved by lines of vegetation along the edges of the nearly flat beds which project like vast cornices and serve as nesting-places for crowds of sea-fowl. On the west side of the country the most notable cliffs south from those of Cape Wrath and the Cambrian sandstones of Sutherland are to be found among the basaltic islands, particularly in Skye, where a magnificent range of precipices rising to 1000 feet bounds the western coast-line. The highest cliffs in the country are found among the Shetland and Orkney Islands. The sea-wall of Foula, one of the Shetland group, and the western front of Hoy in Orkney rise like walls to heights of 1100 or 1200 feet above the waves that tunnel their base. Caithness is one wide moor, terminating almost everywhere in a range of sea-precipices of Old Red Sandstone. Along the eastern coast-line most of the cliffs are formed of rocks belonging to the same formation. Begin­ning at Stonehaven, an almost unbroken line of precipice varying up to 200 feet in height runs southwards to the mouth of the estuary of the Tay. The southern uplands plunge abruptly into the sea near St Abb’s Head in a noble range of precipices 300 to 500 feet in height, and on the western side the same high grounds