

The crest lines of the normally carved mature ridges are rather sharp and somewhat serrate. The slight convexity of the slope lines as they reach the crest shows that those processes of weathering in which changes of volume act nearly normally outwards from the weathered surface there have a relatively large share, along with gravitative down-slope washing, in the reduction of the mountain mass.

This systematic combination of normally eroded forms was seen not only about Kugart pass, but in various other ranges, and in varying degrees of development; but many of the higher ranges exhibited forms of another kind, imposed, as it were, upon the normal forms of the valley heads; and as these additional forms were, in all cases where they could be closely examined, systematically associated with moraines, they may at once be ascribed to glacial erosion and called glacial forms. The glacial forms are no novelty; they are well known in other mountains. They are described here merely to show how systematically they repeat the features of similar forms seen elsewhere. Their most significant features are as follows: They occur at great altitudes, such as 8,000 feet, in ranges that rise to still greater altitudes, such

as 12,000 feet or more. They are independent of rock structures.

When considered in profile they involve a double change of slope from that of normal forms. If

A B C (fig 53) represents a normal slope, a glaciated slope, D E B,

is steeper than normal in the upper part, D E, and less steep than normal in the lower part, E B.

The steeper upper slope, D E, may be surmounted by a less steep slope, A D, or it may rise directly to the crest line. When two such slopes meet, back to back, the crest is an unusually sharp and serrate arête. The lower slope, E B, may be hollowed to a basin form.

When considered in plan, the glacial forms are simpler than the normal forms that they have replaced, for they involve the substitution of a single broad-floored concave form for a number of interlocking ravines and spurs. When two simple forms of this kind are associated, the smaller one may open its floor in the wall of the larger one, so that the two floors do not join at accordant grade.

Glaciated valley heads are so well defined that they have received a special name from mountaineers in different countries—*cirque* and *kar* in the Alps, *botn* in Norway, *cwm* in Wales, *corrie* in Scotland. All these features have been abundantly described by various writers—Böhm, Richter, De Martonne, Harker, Johnson, Gannett, Gilbert, Lawson, to name no more.

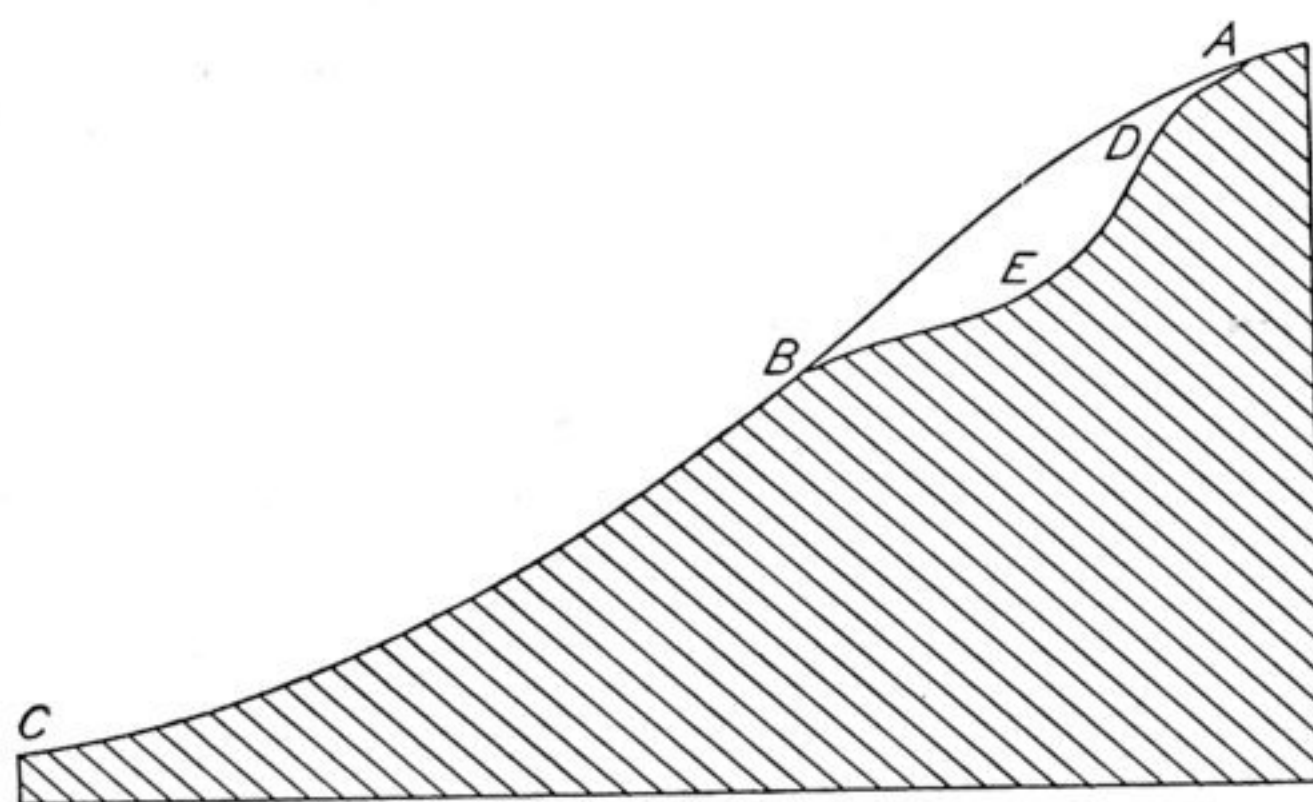


Fig. 53.—Profile of a Cirque at the Head of a normal Valley.

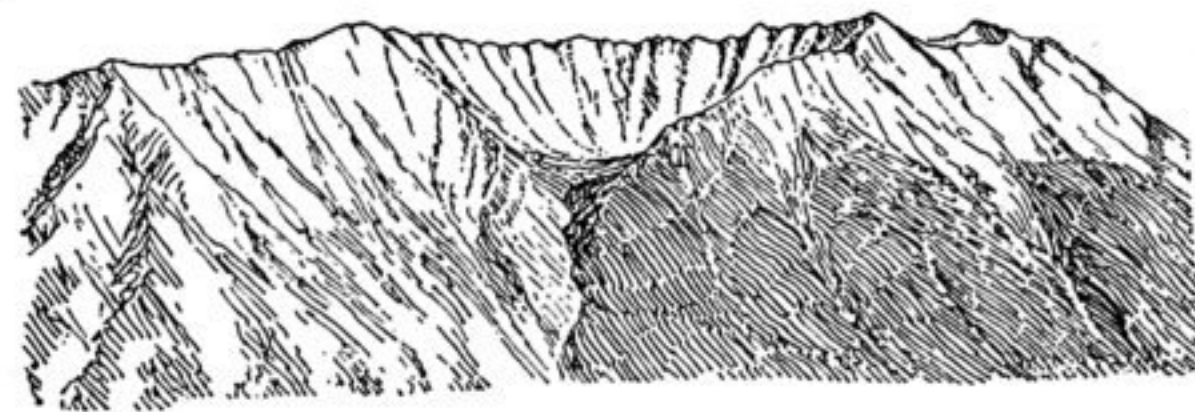


Fig. 54.—Cirque in the Kalkagar-tau.