

TRACES OF OLD GLACIERS ALONG THE
FEUGH AND AVEN.

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"I MIND it well in early date", when I was a boy at the Grammar School of Aberdeen, some sixty years ago, wandering about among the mounds of gravel and stones on which much of the town is built, and wondering how they came there. In those days we had nothing to explain or account for such features except Noah's flood, and the visions of a drowned world which it called up were anything but cheery. Since that time, however, the progress of Geology has given us clearer notions regarding the causes which have produced the present character of the surface.

During the last stage of the glacial period, or age of ice, the frozen stream which came down the valley of the Dee reached the present coast-line, and protruded some distance beyond it, with a breadth of several miles. The right flank of this glacier rested on the hills of Nigg, and its left in the parish of Belhelvie, near Tarbethill. The hills of Nigg and their extension westward being higher than the ground on the opposite side of the Dee had the effect of shunting the stream of ice a little to the north, so that it flowed out to the coast across what is now the lower end of the Don valley. This is well shown among other things by the marks left by the ice on the surface of the granite rocks at the quarries of Cairnery and Persley. I don't know whether these marks are now as visible as they were when I examined them many years ago, but at that time they were clear and distinct, and ran from south-west to north-east, pointing right across the Don, corresponding in direction to the general strike of the valley of the Dee in the lower part of its course. Well, it was during the decay and melting of this great stream

of ice that there were laid down great mounds of gravel and stones, such as the Broad Hill, the Castle Hill on which the Barracks are built, and others now covered by the streets and lanes of the city.

Such mounds constitute what are called the moraines of the glacier, being the gravel and stony rubbish carried along by the ice and laid down at its termination. In great mountainous rocky valleys, like those of the Alps, the moraines are of a rougher description, abounding in huge blocks of stone sometimes as large as cottages; but in regions where the hills are smaller and less precipitous the stuff is of a more gravelly nature, especially where it is washed down by the water produced by the melting of the ice.

Now, when the valley of the Dee was occupied by this great ice-stream, its tributary valleys had, of course, theirs also, and my object in this paper is to draw the attention of the Cairngorm Club and the readers of its *Journal* to a very interesting locality which well deserves a visit from them.

At Banchory the Dee is joined on the south side by the river Feugh, whose head-streams, the Aven and the Dye, take their rise at the foot of Mount Battock (2555 feet). On walking up the Feugh for about a couple of miles we meet with a distinct moraine on the south side of the river, at a place called Mill of Cammie. This moraine consists of a multitude of tumuli, or hillocks, of gravel and stones, protruding across the valley, some of them planted with trees. These mounds were left by the end of the glacier of the Feugh, after it had been joined by that of the Dye and the Aven, and indicate a considerable halt of the retreating ice at this spot, for it is only in those places where the end of the glacier remains for some length of time that any great accumulation of stuff is able to take place. Where the ice recedes rapidly there is no time for much to gather. A succession of warm seasons causes a great melting of the ice and a speedy retreat of the glacier, while a succession of cold, snowy years has the opposite effect, and keeps the ice at

its place, or even makes it advance beyond its former position. It is generally found that glaciers retreat in this fashion, pausing here and there for a time so as to leave great heaps of rubbish, and receding over other spaces without leaving any noticeable quantity.

A little west of Mill of Cammie there are a few more mounds, one of them of large size; then an interval occurs without any, until we come to the mouth of Glen Dye, which is about two miles further up the Feugh than the junction of the Cammie burn. Immediately after passing the mouth of the Dye, numerous great mounds make their appearance, which seem to have been left by the united ice-streams of the Feugh and the Aven. The great size of the moraine here marks a long pause of the ice at this place. The quantity of débris is enormous, especially on the south side of the Feugh, where it forms a range of large mounds composed of gravel and stones. One of them, called the Dunimore (*i.e.*, the big hillock), rises to a height of about 120 feet above its base. This is at the mouth of little Glen Dye, up which the road goes, and not far from Cuttishillock, where a market was formerly held. Burns, in one of his famous songs, alludes to this locality—

“In coming by the Brig o’ Dye,
At Dartlet we a blink did tarry”;

and he (or one of his editors) says that the Dye is “a small river in Kincardineshire, near the birthplace of the poet’s father”. I can’t find this *Dartlet* of the song anywhere on the maps, and would be glad if someone could tell me where it is, for I fancy there must have been actually some farm or house that bore the name. On the north side of the Feugh, opposite the Dunimore, some characteristic moraine hillocks are to be seen, corresponding to those on the south side, though smaller. The base of Dunimore mound is at an altitude of about 300 feet above the sea.

The river Aven, which joins the Feugh a little above this, is a small stream, flowing along a deep, narrow, lonely glen between Clochnaben (1900 feet) and Peter Hill

(2023 feet). Near the entrance of Glen Aven, at an altitude of about 450 feet, there is a very characteristic crescent-shaped moraine, but of no great size, with some large granite blocks on the top of it. There it lies, clear as a sunbeam, just as the glacier left it. There are no habitations or cultivated land in Glen Aven. Its water, therefore, ought to be pure and well suited for a town or village supply, unless there should be too much peat on the hills around it. I walked over Peter Hill, which I found to be composed of reddish granite, intersected by some dikes of felspar porphyry running nearly N. and S. or N. 15° W. The principal ice-stream, I think, must have come down the Aven, as it is encompassed by higher hills than the Feugh or the Dye, and flows north-east along a deep, shaded glen, little exposed to the influence of the sun. But the Feugh has a much wider basin. The rocks on the south side of the Feugh, along its lower part, are mostly of granite, but on the north side gneiss and other crystalline schists are more common. In accordance with this, the moraine débris at the mouth of the Dye and Mill of Cammie is composed mainly of granite, whereas, in that on the opposite side of the valley, gneiss and schist prevail. Here I may mention that it is a characteristic of glacier action to keep the débris of each side of a valley distinct from that of the other side.

On the north side of the Feugh, nearly opposite Mill of Cammie, is Bowbutts, which must have been a rendezvous in olden times for practising archery. High up on the hill of Scolty, facing the mouth of the Cammie, there are gravel hillocks and great quantities of large stones which the natives have collected along their fields into wide consumption dykes. These stones had no doubt been brought there by the left flank of the glacier which lodged the moraines on the other side. I was told that the soil up here is better and more productive than it is lower down, near the base of the hill.

I walked up Glen Aven nearly to the foot of Mount Battock, but saw no more noticeable moraines, which would seem to indicate that the ice had shrunk steadily

after retreating within the entrance of the defile at Peter Hill, and had finally melted away without leaving any remarkable mounds. The hillsides in Glen Aven are smooth and steep, and clothed with heather, and there is some peat moss on the flatter spaces near the top of the hills. The surface of the granite all along here is too much weathered and disintegrated to retain any of the polish and scratches made by the ice rubbing over it. On a low ridge near the base of Peter Hill, where the glacier must have pressed heavily, the rock is a good deal bared and rounded, but none of the finer markings are left. In regard to the absence of these traces so general on the surface of the rocks here and elsewhere on Deeside, I may observe that a great many thousand years have elapsed since the glaciers disappeared from this country, so that it is no wonder we don't now find any remains of this impression left by them on the rocky surface over which they passed. The mineral quality of much of our granite is such that it yields somewhat readily to the action of the weather, as may be seen on the older tombstones in our churchyards. But where it has been covered by some depth of clay, there is more chance of the glacial dressing being preserved, especially if the stone is of a hard, close-grained texture. Accordingly, in some of our quarries, when the rock is newly "tired", the ice-marks may still be seen, as at Cairncry, Persley, Cove, and some other places. In the West Highlands they may often be observed even on the bare rocks, if these are of a hard siliceous nature. This is owing to the greater intensity and longer continuance of the glaciation in that quarter, for, as the rainfall in the western glens is two or three times as great as it is in Aberdeenshire, the fall of snow was formerly in like proportion. On the top of Ben Nevis there is sometimes as much rain in one month as we have in a whole year. The moraine mounds, however, are an almost imperishable feature, and often seem to preserve their original figure and appearance nearly unchanged.

The bottom of the Feugh valley from Mill of Cammie to near Finzean is wide and flat, covered with small

gravelly débris spread out by the spates. These flat spaces are often met with in valleys from which a glacier has retreated. The plain of Ballater is another such instance. The interesting character of Glen Feugh and its branches lies a good deal in the evidence they afford of the great development which the ice attained during this last stage of its history, even in valleys encompassed by hills of no great height. They also present a fine field for investigation within easy access from Aberdeen, so that a good deal may be seen even in a single day's visit. I hadn't time to explore the upper reaches of Glen Dye and the Feugh. No doubt they also would well repay examination.



Photo by

LOCH AVON FROM THE SADDLE.

James Porter.