



PARALLEL ROADS  
OF  
LOCHABER

1874



Campbell 2.a 7





# NOTES

ON THE

## PARALLEL ROADS OF LOCHABER,

BY

MAJOR-GENERAL SIR HENRY JAMES, R.E., F.R.S., F.G.S., &c.,  
DIRECTOR-GENERAL OF THE ORDNANCE SURVEY;

WITH

## ILLUSTRATIVE MAPS AND SKETCHES

FROM THE

ORDNANCE SURVEY OF SCOTLAND.

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ORDNANCE SURVEY OFFICE SOUTHAMPTON,

1874.

They on the whole run nearly horizontally, although there are small deviations in those parts where streams from the mountains above have cut small watercourses through them. They follow all the sinuosities of the ground like the beaches of lakes or arms of the sea, and in fact are universally recognised as such, although they have received the name of roads, from having for ages been used as such by cattle as well as man, and it will be convenient to retain this name.

To each of these roads there is a pass or col into the adjoining glen, the height of which is a few feet lower than the highest level of the road corresponding to it as given in the following table:—

#### LEVELS OF PARALLEL ROADS.

Glen Gloy.					Glen Roy.					Glen Spean.				
Road.	Highest Level.	Lowest Level.	General Average Level.	Col.	Road.	Highest Level.	Lowest Level.	General Average Level.	Col.	Road.	Highest Level.	Lowest Level.	General Average Level.	Col.
	Feet.	Feet.	Feet.	Feet.		Feet.	Feet.	Feet.	Feet.		Feet.	Feet.	Feet.	Feet.
1	1173	1156	1165	1172	1	1155	1144	1148	1151					
					2	1077	1062	1067	1075					
					3	862	850	855	848	1	862	850	855	848

#### SKETCHES FROM THE POINTS MARKED BY CORRESPONDING NUMBERS ON THE MAP.

The appearance of these beaches in the landscape will be illustrated by the sketches, principally from the master hand of Captain White, R.E., who had charge of the "hill-sketching" branch of the survey of this part of Scotland.

No. 1. Is probably the most characteristic, as it shows the manner in which the beaches appear on both sides of Glen Roy.

No. 2. Represents the parallel roads in Glen Gloy, but Captain White observes, "The two upper tracks though well marked to the eye from this point of view, and parallel to the lower one, show nothing when you reach the ground to indicate roads." An observation which is equally applicable to other places.

No. 3. The lower road is here marked most distinctly on the south side of Glen Spean, along the face of Beim Chhinaig (2343 feet high), one of the range of mountains extending from Ben Nevis (4406 feet high) to opposite the entrance of Glen Roy. The other quasi horizontal shelves are of a different nature from the parallel roads.

No. 4. The lower road is again well seen here extending along the face of Creag Dhubh (2161 feet high), on the north side of Glen Spean.

No. 5. Shows the entrance to Glen Treig and the remains of some of the remarkable gravel deposits in Glen Spean.

No. 6. Represents shelves on the north side of Loch Laggan, nearly opposite to Ardverikie. These are not horizontal or parallel to each other.

No. 7. Alluvial flats in Glen Spey, 2 miles west of Laggan Bridge.

#### TERMINATION OF ROADS.

The upper road in Glen Gloy, on the north-west side, terminates within about a mile of Loch Lochy, the distance to the corresponding end on the south-east side being  $\frac{3}{4}$  of a mile. It is quite possible that the upper road in Glen Roy was formed at the same time as that in Glen Gloy, the water from the lake in Glen Gloy flowing into that in Glen Roy and from thence into the

Spey. The upper roads in Glen Roy terminate as is represented on the plan at Bohuntine Hill which occupies a position a little to the west of the centre of the glen, and indicates the position of a barrier which dammed back a lake on whose margin the upper road or beach was formed at the height of 1155 feet above the mean level of the sea, and by its col, which is a little under the same level 1151 feet, the water flowed into Glen Spey and so preserved a constant level of the water in the lake whilst the beaches were forming.

The middle road terminates near the entrance to the glen at Allt Ionndrain, and at the south-western extremity of Creag Dhubh, 2141 feet in height.

The third or lowest terminated on the north side of Glen Spean, at about a mile east of Spean Bridge, and on the south side of Coirecoille on the northern face of Stob Choire Claurigh.

The distance between the points where this road ends is nearly 4 miles, and the hill called Tom-an-Teine (613 feet high) occupies a central position to these ends of the roads, as Bohuntine Hill does in Glen Roy. This may be called the Spean Bridge dam or barrier, and must have been formed by the glaciers in Glen More, and those descending the northern faces of the Ben Nevis range of mountains.

#### THE THEORY OF ARMS OF THE SEA.

Amongst those who have advocated the theory of the roads having been formed on the margins of arms of the sea, we may mention the names of Darwin (who however has since abandoned it), and Nichol, but this theory is open to the objection that if it were true, the levels of the beaches in Glen Gloy and Glen Roy should agree, but they differ as may be seen by reference to the



maps, nor does there appear any reason why if this theory were true, similar roads should not be formed in all parts of the country.

We must therefore seek for some other cause to account for their appearance only in these glens.

#### THE THEORY OF FRESHWATER LAKES SUPPORTED ON GRAVEL, &c.

Another theory has been propounded to explain them, and has been supported with great ability by Milne Home, Esq. He assumes that they were the beaches of freshwater lakes, supported by gravel and other detrital matter damming up and filling the glens which has since been gradually worn down and washed away. To account for such great accumulation of gravel and diluvial debris, he assumes that there must have been a violent easterly movement of the water which covered Scotland, before its emergence from under the sea, supporting his theory by reference to the boulder-clay, and the great deposits of gravel and detritus which cover Scotland in many parts to a great height.

The difficulties of receiving this theory are great, we must assume that the same cause which filled Glen Gloy, Glen Roy, and Glen Spean, must also have filled Glen More and its lakes. Now Loch Lochy is 456 feet deep at the distance of only 1 mile from the ends of the parallel road in Glen Gloy, we must therefore assume that not only the gravel and detritus in that glen, 1080 feet high above the lake, but all the gravel in the lake had been gradually removed. The more we consider the possibility of this gravel having been gradually worn down and washed away, the greater the difficulty appears, for Lochs Lochy, Oich, and Ness, are very deep lakes (the latter 780 feet deep near Castle Urquhart) which are separated by very low necks of ground from each other mostly composed of rolled stones and gravel, and also separated from the sea at either end of Glen More

by similar low necks of land through which the River Lochy and the River Ness flow.

#### THE THEORY OF FRESHWATER LAKES SUPPORTED ON GLACIERS.

A third theory, first propounded by Agassiz, is that these glens were formerly filled by great glaciers, and that the roads were formed on the margins of lakes, supported by the glaciers. We have an example of such a lake in Switzerland, where the Merjelen See is supported by the great glacier of Aletch along the margin of which a beach similar to the parallel roads it is said may be seen, see Map N, where the relation of a great glacier to a confluent valley like Glen Gloy and Glen More may be advantageously studied. That the whole of this country has in former times been covered with ice and snow as thickly as northern Greenland is at this day, is recognised by every geologist, and also that at a subsequent date each glen had its independent glacier descending by the simple force of gravity, and then gradually disappearing altogether under the influence of a climate becoming gradually milder. We might almost parallel the great glacier (Humboldt's) in lat. 81° in Smith's Sound, which is 60 miles wide and 300 feet high, and which descends as a stream of ice from the interior of Greenland, by reference to the Ordnance map of the Frith of Forth, where it is obvious that a descending stream of ice has modified every feature of the ground, on either side from the Pentland Hills to the Lammermoors, and which must have been 40 or 50 miles broad and 1000 feet deep, along the course of which the rocks are all striated by the passage, and similar striations are observed in almost every valley in the northern part of the kingdom.

This glacier theory, supported as it is by reference to existing facts, appears to get rid of all the difficulties which surround the others. To the presence of glaciers in the lakes in Glen More and

their slow descent towards the sea, we may confidently attribute the formation of the lochs to such great depths below the level of the sea, and also the great accumulations of gravel at the ends of the glens. In Glen Spean there are most striking evidences, in the distribution of vast quantities of boulders, &c., of the passage of a glacier down Loch Treig. This glacier must have been at least 700 feet deep, as the moraines of it extend up to that height above the River Spean, and it must have been removed to a great extent when the barriers in Glen Roy were removed, and before the formation of the lowest of the parallel roads. But as the barrier which dammed back the water in Glen Spean, must have been at what I have called the Spean Bridge barrier, it is unnecessary to attribute any effects in forming the Glen Spean parallel roads to the presence of a glacier from Loch Treig.

It is not my intention to add to the number of writers on this subject, but rather to give a few notes on the theories which have been propounded.

The writers are very numerous, but I adopt the theory of Agassiz and its exposition by Mr. Jamieson "On the Parallel Roads, &c.," in the Quarterly Journal of the Geological Society for August, 1863.

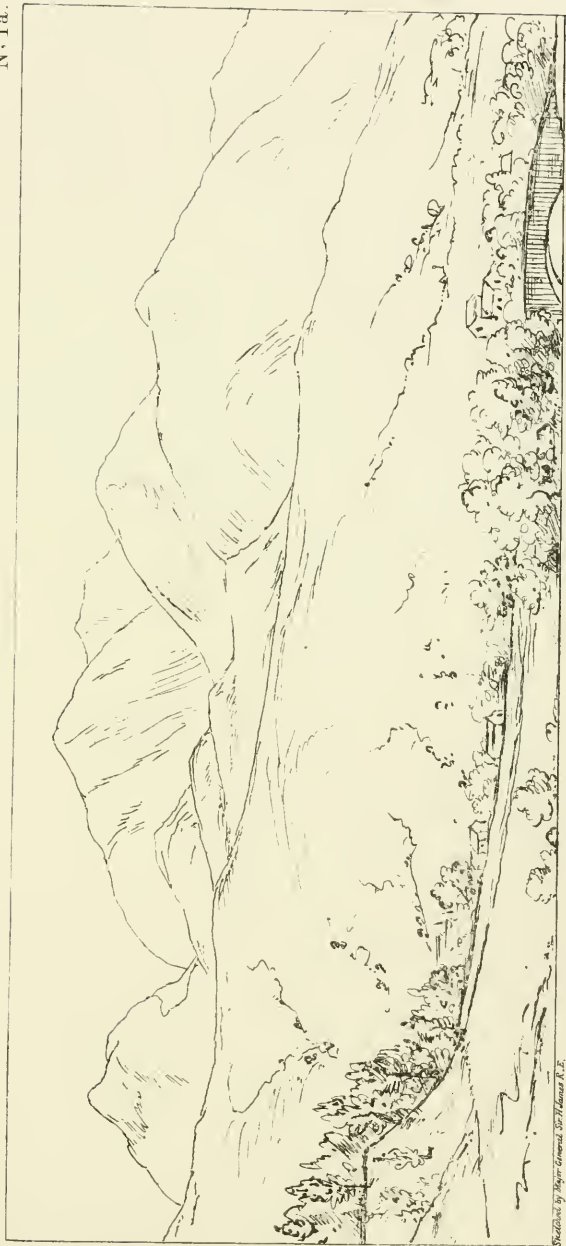
HENRY JAMES,

*Major-General.*

Ordnance Survey Office, Southampton,  
May 8th, 1874.



Nº 1 a.



Skizzen by Major General Sir Thomas A. E.

ROY BRIDGE.  
(LOOKING SOUTH)



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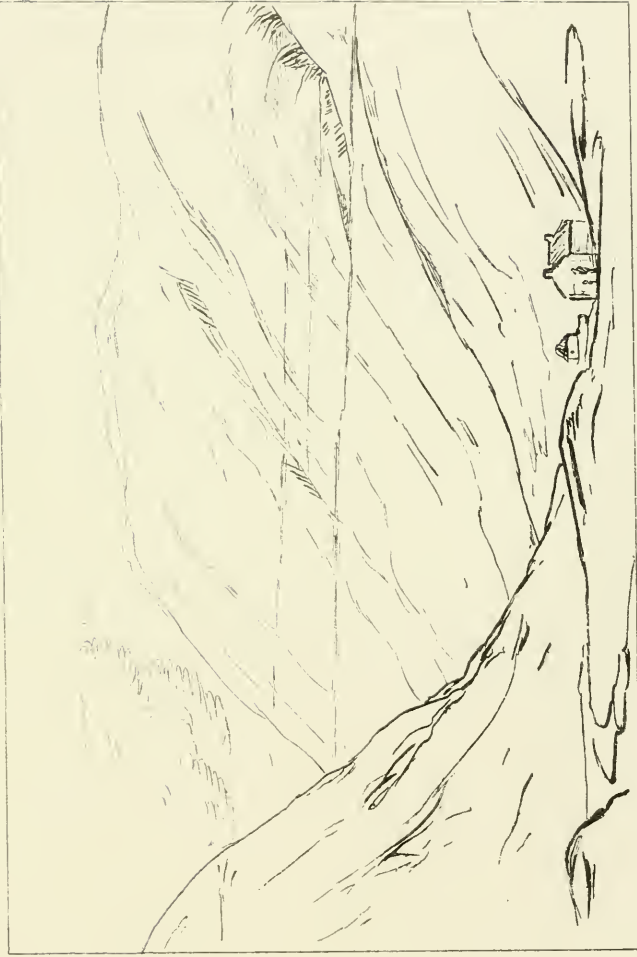
Sketch by Cooper White, B.E.

GLEN ROY  
(3 MILES ABOVE ROY BRIDGE)





Nº 2

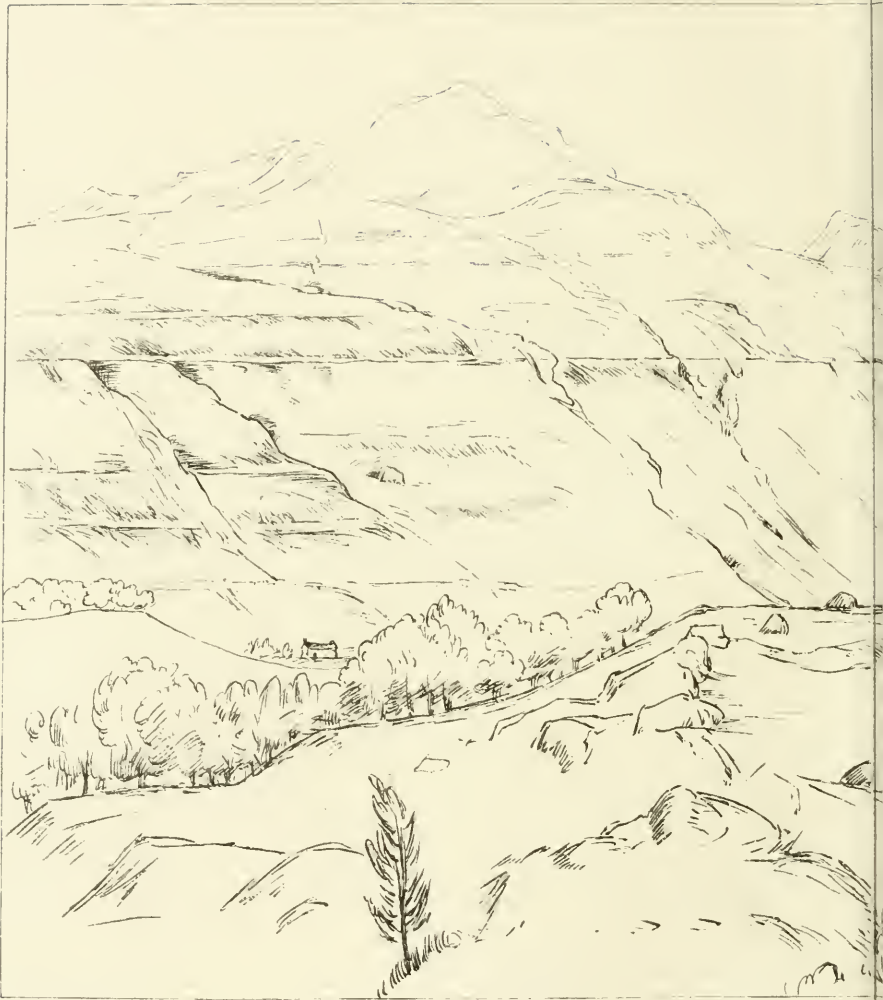


Sketched by Capt. White, R.E.

GLEN GLOY  
(FROM AUCHINVAIE)







Sketched by Capt. W. H. H. F.

GLEN F  
(FROM ABOVE THE LOWER FAL



PEAN

(2 MILES EAST OF ROY BRIDGE)







Sketched by Capt. White E.E.

GLENES  
(FROM NEAR OLD BURIAL GROVE)



Nº 4



PEAN  
(2½ MILES EAST OF ROY BRIDGE)







Sketched by Capt. White B.E.

GLEN S  
(OUTLET OF GLEN TREIG NEAR INVEPLA)

Nº5



AN  
(54 MILES FROM ROY BRIDGE)







Sketched by Capt. White R.E.

NORTH SIDE OF L-  
(NEARLY OPPOSITE)



Nº6



H LAGGAN  
(RDVERIKIE)



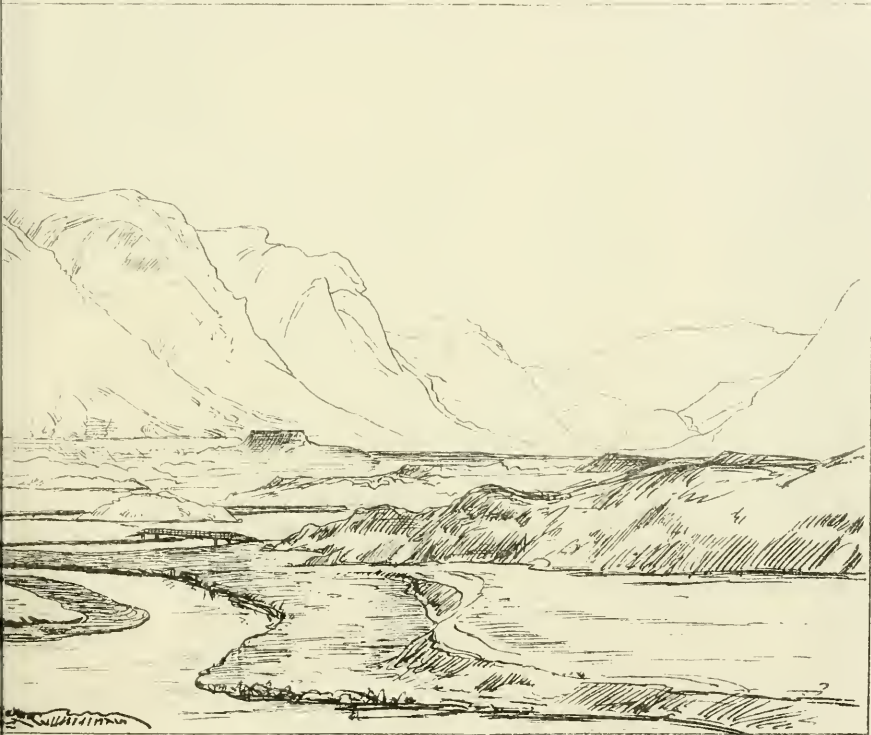




Sketched by Capt. W. White R.F.

GLEN  
FROM NEAR THE R.C. CHAPEL

Nº7



PEY  
ES WEST OF LAGGAN BRIDGE





GREAT ALETSCH GLACIER, SWITZERLAND.  
 SCALE 2 MILES TO 1 INCH





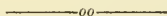




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