EXPLANATIONS

TO ACCOMPANY

SHEET 184 OF THE MAPS

OF THE

GEOLOGICAL SURVEY OF IRELAND,

ILLUSTRATING PART OF

THE COUNTY OF KERRY.

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The observations made in the course of the Geological Survey are entered, in the first instance, on the Maps of the Ordnance Townland Survey, which are on the scale of six inches to the mile. By means of marks, writing and colours, the nature, extent, direction, and geological formation of all portions of rock visible at the surface are laid down on these maps, which are preserved as data maps and geological records in the office at Dublin.

The results of the Survey are published by means of coloured copies of the one-inch map of the Ordnance Survey, accompanied by printed explanations.

Longitudinal sections, on the scale of six inches to the mile, and vertical sections of coal-pits, &c., on the scale of forty feet to the inch, are also published, or in preparation.

Condensed memoirs on particular districts will also eventually appear.

The heights mentioned in these Explanations are all taken from the Ordnance Maps.

EXPLANATION

OF SHEET 184 OF THE MAPS

OF THE

GEOLOGICAL SURVEY OF IRELAND.

General Description.

The district included in this sheet extends from the southern part of the Lower Lake of Killarney to the head of Kenmare bay. The principal places in it are the town of Kenmare and the villages of Kilgarvan and Cloghereen or Muckross.

1. *Form of the Ground.*

The principal features in the form of the ground which lies within the limits of this sheet, are two nearly parallel ranges of mountains, and two corresponding longitudinal valleys.

The general direction in which these mountains and valleys run is a little N. of E. and S. of W.

Range of the Reeks.—The northern mountain range is that of which the widely-known Reeks of Magillicuddy* form a part. It extends from the Lower Lake of Killarney to the broad valley of Glencar, and is at one part almost divided transversely into two by the pass known as the Gap of Dunloe. The summit nearest above the lake is Glenna, 1,820 feet (called on the Ordnance Map Shehy). Next come the two Peaks of Toomies, 2,503 feet and 2,415 feet. Purple Mountain, having a height of 2,739 feet, overhangs the Gap of Dunloe.

From the summit of Purple Mountain there is one continuous slope into the Gap of Dunloe, in which the Black Lough is at a level of 587 feet above the sea, and Anger Lake 397 feet. The descent to the first lake, therefore, will be 2,152 feet in a horizontal distance of 4,500 feet, as measured on the six-inch map. The highest point of the road through the glen is 800 feet above the sea.

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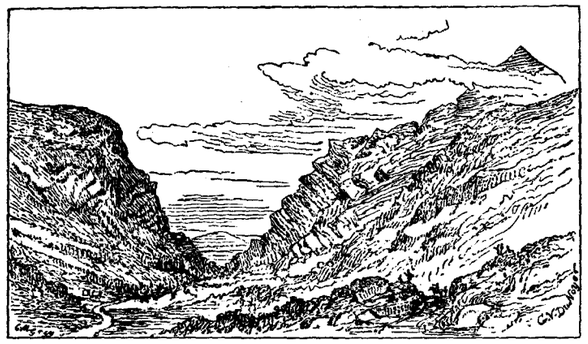
* In the pronunciation of this word the syllable "gil" should be almost omitted, and the word spoken nearly as if spelt Maclicuddy.

Fig. 1.



This view is taken from the southern extremity of the Gap, at the highest point of the road, looking north. The peak of Purple Mountain is seen on the right, and the low Coal measure hills of Milltown in the distance.

Immediately west of the Gap of Dunloe rise the summits, which are properly called the Reeks. These are several peaked eminences, ranged along the edge of a sharp rocky ridge, having altitudes varying from 2,398 to 3,191 feet. This ridge runs in a rather winding line, with steep slopes on either hand, often becoming precipitous towards the south, and is continued up to Carrantuohill (3,414 feet), the loftiest summit in Ireland.—(See figures 2 and 3)

From this point this lofty ridge diverges into two, the northern one running up to Benkearagh (3,314 feet), and then crossing Knockabinnia (2,782 feet) slopes down to the plain of Killorglin, while the other runs off to the W.S.W. to a peak of 3.200 feet, called Caher, beyond which it declines rapidly into the valley of Glencar.

The steeply sloping sides of this mountainous mass are deeply indented by lateral glens, in the hollows of which are small lakes surrounded on all sides but one by lofty vertical precipices. These are—Lough Googh (1,590), Lough Callee South (918), Curraghmore Lake (1,004), Loughs Eagher (1,553), and Coomloughra (1,549), Lough Gouragh (1,126), Lough Callee North (1,096), and Lough Coomeenapeasta (2,156 feet) above the sea.—(See figures 2, 3, and 4.)

Two of these lateral glens, the Hag's Glen, running in from the north, and the Curraghmore Glen from the head of the Black Valley on the south, penetrate so deeply into the range near the foot of Carrantuohill that a comparatively slight addition to the erosive action which formed them would have excavated a gap or pass right through the range, and formed a still more magnificent gorge, perhaps, than the Gap of Dunloe.

Valley of Upper Lake.—South of the range of Magillicuddy's Reeks lies the valley, in the lower part of which is the Upper Lake of Killarney. The entrance to this valley is comparatively narrow between Torc Mountain (1,764), and the Eagle's Nest, which is probably about 800 feet high. This valley runs in a W.S.W. direction for about five miles, including the narrow piece of water called the Long Range and the Upper Lake, which together are about four miles in length, and of which the water level is about seventy feet above the sea.

Just N.E. of Mangerton, close on the summit of the ridge, is the remarkable hollow so well known as the Devil's Punch Bowl, containing a lake, a third of a mile in length, the water-level of which is 2,206 feet above the sea.

From Mangerton the crest of the range runs first rather to the S.E., over eminences of 2,454 feet and 1,679 feet, and then turns north-easterly over the summit of Benaunmore to the peak of Crohane, in the adjoining map No. 185.—(See figure 11, p. 31.)

This part of the range is much broken on the north, its flanks being deeply penetrated by precipitous valleys, which cut into it more and more deeply as we proceed easterly, till we reach the valley of Glen Flesk, which penetrates right across it, forming a low and level pass from the country traversed by the Mallow and Killarney Railway to the head of the valley of Kenmare.

We may perhaps look upon the Devil's Punch Bowl as the first and most incomplete attempt at the formation of one of these transverse valleys.

The Horse's Glen is much deeper and more complete, having penetrated from the north into the heart of the range, and ap, arently even across its original crest, since Stoompa, 2,281 feet, on the one side, and a nameless peak of 2,568 feet, on the other, are much loftier than any eminence on the present watershed. The lower part of the glen runs in nearly due S. for a mile and a-half, but the upper part turns at right angles to the W. for three quarters of a mile, thus running along the direction of the range, and ends in an amphitheatrical hollow surrounded by lofty precipices. It contains three lakes, of which the uppermost, Lough Errogh, is 1,408 feet; the middle, Lough Mannagh, is 1,074 feet; and the lowest, Lough Garrygarry, 871 feet above the sea. The ridge separating the head of this glen from the Devil's Punch Bowl rises to a height of 1,038 feet above Lough Errogh, while it is only 225 feet above the water of the Punch Bowl lake. The level of Lough Errogh, therefore, is 813 feet below that of the Punch Bowl.

The next valley—that of Cappagh—runs into the range due south of Lough Guitane, and is separated from the Glen of Lough Nabroda by the rugged hill called Benaunmore.

Cappagh Glen, like the Horse's Glen, runs first of all due south for about a mile, and then turns to the west and terminates somewhat like the Horse's Glen, while the Glen of Nabroda cuts right across the range, making a narrow pass through it, although at rather a high level. The flat land at the head of the Cappagh Glen is about 555 feet above the sea, while in the glen of Nabroda Crohane Lake is 860 feet and Lough Nabroda 833 feet above the sea. The Cappagh Glen then, although narrower and smaller than the Horse's Glen, cuts 500 feet lower than it, while the Glen of Nabroda, although not so deep as that of Cappagh by about 300 feet, is yet a more complete excavation than it, inasmuch as it completely traverses the range, while Cappagh and the Horse's Glen only cut about half way through it. Lough Guitane, north of Cappagh, has a water level of only 256 feet above the sea.

The Kenmare Valley, or that of the Roughty River, is the second great longitudinal valley, and lies south of the range just described,

the bottom of the valley being at a distance of three or four miles from the crest of the range. The general direction of the valley, within the limits of this sheet, is about E.N.E. and W.S.W., the drainage falling towards the west into the head of Kenmare Bay. The general width of the valley is five or six miles, the hills that bound it on the south being the advanced spurs of a range, the crest of which lies at some distance south of the limits of the map. Lateral valleys, with their tributary streams, descend on either hand towards the Roughty River, which is the main artery of drainage in the bottom of the valley, these lateral valleys being separated from each other by the spurs of the two bounding ranges.

Near Kilgarvan two large lateral valleys come in, one on the north and another on the south. That on the north is the valley of the Owbeg River, between Mangertonbeg (1,278 feet) and other hills on the east, which rise to 1,339 feet. That on the south is the valley of the Slaheny River, which has hills over 900 feet to the east of it, while on the west there are several eminences, known as Carricknagown, 880 feet, Knockback, 1,452 feet, and Bird Hill, 1,339 feet in elevation.

West of Mangertonbeg is the valley of the Cleady River, and beyond, that of Finnihy, running out at the town of Kenmare itself, and on the south side of the Roughty, the Sheen River, with many beautiful waterfalls, issues from a deep and wide valley, which lies chiefly in map No. 192.

Along the western margin of Map No. 184 we have, first, the upper part of Glencar, with the head waters of the Carragh River; and next the valley of the Blackwater River, which, rising in Map No. 183, receives the Kealduff Brook from Lough Brin, the valley forming the western termination of the Mangerton and Knocklomena range.

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2. *Geological Formations, or Groups of Rock.*

Aqueous Rocks.

			Colour on Map.
		Alluvium, Peat-Bog, &c., Drift.	*Sepia. Engraved dots.*
Carboniferous Limestone.	d^2	Lower Limestone.	*Prussian blue.*
	d^1	Lower Limestone Shale.	*Prussian blue and Indian ink.*
Old Red Sandstone.	c^3	Upper Old Red.	*Indian red (dark.)*
	c^2	Old Red.	*Indian red (pale.)*
	c^1	Glengariff Grits.	*Indian red (pale.)*

Igneous Rocks.

F.	Felstone.	*Bright red.*
Fs.	Felstone Ash.	*Pale do., with dots.*

Aqueous Rocks.

Old Red Sandstone.—The Old Red Sandstone of this district consists of green and red grits and slates. The green colour is predominant in the lowest part of the formation that is visible, while the upper is more completely red or purple. In like manner the lower

We are compelled to conclude that at their first formation the whole of the beds of the Old Red sandstone, and Carboniferous limestone, were horizontal. They were all formed beneath the sea, and the whole area was once covered by horizontal sheets of limestone, even if that rock was not also covered by two or three thousand feet of horizontal Coal-measure shales and sandstone.

Even the igneous rocks of the Horse's Glen and Cappagh must have lain once concealed under a vast thickness of Old Red sandstone and Carboniferous limestone, as is shown by the perfect interstratification of the ashes with the sandstones, and their all partaking together of the same accidents of "lie and position." The columnar mass of Benaunmore doubtless marks the central focus of intrusive igneous matter, from which the "ashes" proceeded; that central mass having perhaps stood more firmly, and been less disturbed than the more flexible beds around it. It may thus retain somewhat of the original form that it assumed after cooling and consolidation, and which was subsequently buried in the deposits of the Old Red sandstone sea, in the bed of which its eruption took place.

At some geological period later than that known as the Carboniferous period, probably (if we may judge by analogy) in the interval between the Primary and Secondary Epochs, the mass of the Old Red sandstone and Carboniferous limestone, with their included igneous rocks, first began to be elevated above the sea, and to be inclined in different directions. The upper surface of the elevated rocks would first begin to suffer from erosion when they reached the surface of the sea, and became a prey to its breakers and currents. The two forces, that of elevation acting from below, and that of erosion acting from above, have since then had an almost infinite series of ages, in which to produce their effects, and the result has been the lifting up of beds once deep beneath the sea, to the summit of the loftiest mountains, and the removal of sheet after sheet of rock, till beds once buried beneath accumulations thousands of feet in thickness, have been eventually brought again to the surface.

We have no warrant for concluding that these forces, enormous as may appear their result, were more rapid in their rate, or more convulsive in their action than the rate and the action of the same forces, which are at work on different parts of the globe at the present day. Granting a sufficient lapse of time, the widest valley, the most rugged glen, the deepest ravine, and the most lofty precipice, may all be but the work of the breakers and currents of the sea, as the land grew slowly up through its surface, and had for thousands of centuries each yard of ground exposed to its action.

The features thus modelled have since been in some places strengthened, in others more or less obliterated, by the action of the weather, and the motion of fresh water during still greater periods of time, while the rocks have formed dry land. Those periods may have been inconceivably great since they may include all the Secondary and almost all the Tertiary Epochs—a time sufficient perhaps for mere atmospheric influences to have produced effects far greater than we should at first seem inclined to suppose.

At a late Tertiary time, during part of the Glacial Period, the country was again beneath the sea, having been at one time de-

pressed to a depth probably of 2,500 feet below its present level. Heaps of sand, gravel, and boulders, all water-worn materials, may be observed up to that height, occurring in greater and greater masses in some directions as we descend, although in others the rocks are quite bare. Most of the rock surfaces too, below that level show marks of the smoothing and polishing caused by the rubbing of ice, and many of them are scratched and grooved by the same action. Great blocks of rock too have been left perched here and there in situations, to which they could only have been transported by ice, moving either as a glacier over dry land, or an iceberg on the water. Vast piles of drifted materials have been accumulated in some places on the low land near the mouths of the glens, as will be described more particularly further on.

J. B. J. and G. V. D.

[The district included in this sheet was surveyed by different officers: the Kenmare Valley by W. L. Willson; the parts about the Lakes of Killarney, and thence to Carrantuohill by G. V. Du Noyer; the Trappean district S. of Lough Guitane, in the first instance by Mr. Foot, and afterwards by Mr. Du Noyer; while other parts were examined by G. H. Kinahan, J. O'Kelly, and A. B. Wynne. Mr. Du Noyer has compiled most of the following detailed descriptions from his own notes, and those of the other observers.]

Detailed Descriptions.

4. *Lie and Position of the Rocks.*

Old Red Sandstone.—The lowest beds of the Old Red sandstone series are those exposed along the margin of the Upper Lake of Killarney. They consist of a series of greenish-gray and very hard grits, often conglomeritic (the pebbles being small well-rounded fragments of quartz and hard grit), bands of purple and green slate, brownish purple grit, and Cornstone layers, which weather to a rusty brown colour. Plant-like impressions have been obtained from some of the greenish-gray grits, north of Windy Gap.

These rocks are well exposed along the Killarney and Kenmare road, where it skirts the margin of the Upper Lake of Killarney at Cromagloun Mountain; and again along the same road, between Looscaunagh Lake and Windy Gap.

All the beds which appear around the Upper Lake are bent into an anticlinal curve, causing the beds to dip N.N.W. on the one side, and nearly due S. on the other. The longest axis of this curve runs nearly E. and W. The lie of the rocks forming Arbutus Island will give a good idea of the form of this contortion. The grits observed in that part of the lake called the Long Range, belong to those lying on the northern portion of the anticlinal, while the cliffs of Cromagloun are part of the southern.

As the rocks just described dip northwards from the head of the Upper Lake, their top beds form the base of Sheahy, Toomies, and Purple Mountains; gradually passing up into the purple sandstones and slates, which form the summits of those mountains. These upper rocks can be well studied in the sections exposed on the southern flanks of Purple Mountain and the stream courses which traverse it, and the passage upwards from the greenish-gray grits, into the purple beds is very well seen. At and near the summit of Purple Mountain the purple beds contain a few thin layers of fine conglomerate.

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