
Chapter 28 Cambrian rocks in the island of Skye

By C. T. Clough. A few paragraphs have been supplied by A. Harker. The district described in this chapter is included in Sheet 71 of the Geological Survey Map of Scotland, on the scale of 1 inch to a mile (1:63360).

The Cambrian rocks of Skye are confined to the neighbourhood of Ord and the district between Broadford Bay and Loch Slapin. The total area occupied by them is less than ten square miles. The different divisions here represented are as follows:

Cambrian limestone and dolomite	(Ben Suardal limestone. Probably homotaxial with the Balnakiel or Croisaphuill zone of Sutherland. Strath Suardal and Beinn an Dubhaich limestone. Sangomore limestone (?) Sailmhor limestone Eilean Dubh limestone Ghrudaidh limestone
Serpulite grit	
"Furoid" shales	including thin bands of limestone
Quartzite	Upper quartzite or pipe-rock, divisible into many zones. Lower or false-bedded quartzite

All the exposures of these rocks have probably been driven forward by the great post-Cambrian thrusts, but in some cases such displacement cannot be proved, though the strata have been sharply folded. One instance of a possibly unthrust condition extends from Coill' a Ghasgain to Loch Eishort, and includes the quartzite, the furoid shales, the serpulite grit, and part of the Ghrudaidh limestone.

Quartzite

Near Ord the quartzite forms little hills, about 900 feet high, the whiteness of which contrasts strongly with the brown or red tints of the adjacent Torridonian rocks. The largest mass, which includes both Sgiath-bheinn an Uird and Sgiath-bheinn Chrossavaig, is a little more than three miles in length from N.N.E. to S.S.W. It is divided by thrusts into different portions, all of which belong to a single inlier which has once been covered by rocks brought forward on a more important thrust-plane. This plane has been folded into an anticline, and the rocks below certain parts of it have been exposed by denudation.

West of this inlier another band of quartzite runs from Sgiath-bheinn Tokavaig to the coast of Loch Eishort, and then forms a chain of islands across the loch, on the northern side of which it emerges, but is soon concealed under Mesozoic rocks. This band likewise forms part of an inlier which has once been covered by rocks thrust over it, and the overlying thrust-plane has also been folded into an anticline. The sedimentary rocks seen above the thrust-plane are all Torridonian, except at the coast near Ord, where various small exposures of the lower quartzite and other Cambrian rocks appear above that plane.

The quartzite is seen every here and there on the foreshore W.S.W. of Ord as far as the north side of Ob Gauscavaig, while on Eilean Ruairidh a considerable exposure shows the junction of the lower and upper quartzite.

Between Loch Eishort and Loch Slapin an area of quartzite, about 500 yards long and 100 yards broad at its greatest width, rests on Torridon Sandstone, and the two rocks are cut off on the north side by a normal fault that brings up the Cambrian limestone. On the south side they are unconformably overlain by the conglomerate at the base of the Mesozoic rocks.

Another patch of quartzite occurs in Allt Beinn Deirge, south-east of Beinn na Caillich, just above the sharp bend of the stream where it emerges on the open strath. Torridon Sandstone, doubtless an outlier above the Ben Suardal thrust, is

exposed in the stream for about 100 yards, and is accompanied for perhaps 20 yards by basal quartzite, which is conglomeratic, and must represent the base resting on the Torridonian rocks.

At the bottom of the lower quartzite the pebble bed or conglomerate is generally to be seen, never more than five or six feet thick, and sometimes only a few inches. Its pebbles are here chiefly of quartz. In one section on the east side of Sgiath-bheinn Chrossavaig (two miles north-east of Tarskavaig), where it is about five feet thick, its pebbles are as large as beans and walnuts, but in other sections near this the conglomerate is much less coarse. The thickness of the lower or false-bedded quartzite may be about 330 feet.

The upper quartzite or pipe-rock contains "pipes" in all the beds, and its sub-divisions found in Sutherland hold good in Skye. It is seen in its least-disturbed condition on the coast at Rudha Dubh Ard (Loch Eishort), where the following zones may be made out:

6. Top rock of a white or reddish-grey colour. Often rather coarse-grained and friable. Occasional pipes with mouths three inches in diameter. 20 feet.
5. Alternating massive and thinner bands. The general colour is Indian red, but the pipes themselves are white. 20 or 30 feet.
4. Trumpet pipe-rock. White or dirty-white in colour; usually massive near the top. The mouths of the pipes vary much in diameter, some being less than a quarter of an inch wide, while others are as much as three inches. In the larger examples the mouths are oval, and the diameters decrease rapidly downwards. The bedding surfaces are often rippled, and the rock is false-bedded. About 55 feet.
3. Massive pink pipe-rock. Many of the quartz-grains are red at the outsides. In the bottom beds, about 10 feet thick, the mouths of many of the pipes are only 1/16-inch in diameter. About 55 feet:
2. Massive white pipe-rock. Pipes average a quarter of an inch in diameter, and are often closely crowded. About 35 feet.
1. Small pipe-rock. Pipes not usually more than ■-inch in diameter, generally of a purer white colour than the rest of the rock. Ripple marks common, and the rippled surfaces may for several square yards show no pipes. 50 or 60 feet.

The total thickness of the upper quartzite may be estimated to be about 270 feet.

In Ord River, nearly a quarter of a mile south-west of Teampuill Chaon, the line between the quartzite and the furoid-beds is not sharply defined. At the top of the quartzite a soft reddish-brown grit contains small dark-green grains of glauconite (?). In specimen No. 7356, induration is seen to have been effected by secondary enlargement of the quartz grains, which had been coated with ferric oxide before the enlargement took place. The layer of ferric oxide is not usually continuous round the entire outline of a grain, but may include many grains. The areas enclosed by it are much too complicated in form to represent pebbles of a composite rock. The floor on which the quartzite was deposited presents a smooth surface of Torridonian (Applecross) rocks. The difference between the dip of the two formations in Skye is not striking, and in most sections is hardly noticeable.

No cleavage has been observed in any part of the quartzite of Skye, nor any noticeable drag of the pipes out of their original vertical position. But near some of the thrusts, particularly in the south-eastern part of the quartzite between Ord River and Loch Eishort, over extensive areas the chief planes are joints and faces of fine crush.

Furoid-beds

On the west side of Sgiath-bheinn an Uird this sub-division comes in conformably over the quartzite, and can be traced in a north-north-easterly direction to Loch Eishort and south-westwards to within a mile of the Ord River. For some distance on either side of this river the outcrop is cut out by a thrust, but the band reappears again on the west side of Sgiath-bheinn Chrossavaig, and continues for nearly three-quarters of a mile further south. A little west of each of these outcrops the beds are repeated by minor thrusts. West of the quartzite of Sgiath-bheinn Tokavaig (two miles north-east of

Tarskavaig) and Rudha Dubh Ard, the fucoid-beds again occur in conformable sequence above the quartzite, but for some distance south of the Rudha they are considerably disturbed. In, and for a little distance south of, Ord Bay various exposures of this subdivision may be seen on the west side of the Cambrian limestone. They lie between two thrust lines, which appear to unite as they go south. The fucoid-beds display their usual tendency to form smooth grassy ground. Between Sgiath-bheinn Tokavaig and Cnoc an Uairidh they have given rise to a conspicuous hollow between the harder outcrops of quartzite and serpulite-grit.

A quarter of a mile S.S.W. of Rudha Dubh Ard the quartzite is immediately followed by brown-weathering sandy shales, about 30 feet thick, mixed with thin yellow calcareous flags, and covered by greenish-grey or bluish-purple shales and thin brown sandy bands. There is no black shale. This upper division seems to be as much as 50 feet thick, but perhaps some parts of it are repeated by obscure thrusts. On the north side of Ord River the total thickness of all the fucoid-beds does not seem more than 60 feet.

In many places the lower part of these beds includes one or two bands of limestone, which weathers with a deep-brown colour, but is pale-pink when fresh. A specimen taken from one of these bands half a mile south-west of Sgiath-bheinn au Ifird has a specific gravity of 2.82. Between two-thirds and three-quarters of a mile south of Teampuill Chaon (about two and a half miles north-east of Tarskavaig) a limestone appears with a thickness of about six feet, and lying 12 or 15 feet above the top of the quartzite. In a burn a little further south-east only eight or nine inches of limestone are observable, overlain by brown sandy shales mixed with calcareous gritty bands. In Ord River, about a quarter of a mile above the foot, two limestones crop out, one of which is ten feet thick.

Fucoid-like markings are well seen on the hillside a little more than half a mile south-east of Sgeir Gormul (Loch Eishort), by the roadside 250 yards S.S.W. from the bridge at the foot of Ord River, and also in the burn three-quarters of a mile south of this foot. A. Macconochie has proved the presence of the *Olenellus* fauna in the fucoid-beds near Ord, and in the burn about three-quarters of a mile south of the mouth of Ord River. In the shale exposed at low water in the bay a quarter of a mile S.S.W. of Rudha Dubh Ard he failed to find the *Olenellus* layer, but from a thin hard ferruginous band he collected a fragment of a trilobite and specimens of *Hyalithes*. No cleavage has been detected in any of the fucoid-beds of Skye.

Serpulite (*Salterella*) Grit

The largest outcrop of this subdivision comes conformably above the fucoid-beds and quartzite of Sgiath-bheinn Tokavaig and Cnoc an Uairidh (one-third of a mile east of Ord). Another exposure, on top of the fucoid-beds, extends from the sea coast 1000 yards E.S.E. of Sgeir Gormul to a third of a mile south-west of Sgiath-bheinn an Uird. A little west of this outcrop others make their appearance owing to repetition by minor folds. In, and a little south of, Ord Bay an obscure thrust patch of fucoid-beds and serpulite-grit lies between the limestone and the lower quartzite.

The serpulite-grit is of much the same character in Skye as in Sutherland, except that serpulite-remains seem here to be rarer, distinct remains of these organisms having only been detected in one place — an exposure near the middle of Ord Bay. About 700 yards slightly west of south of Rudha Dubh Ard the grit contains marks resembling the mouths of large pipes. A quarter of a mile E.N.E. of the mouth of Ord River the thickness of the serpulite-grit is about 50 feet.

The Calcareous Series

The limestone occurs in Skye near Ord and near Broadford. Dr. Macculloch, in 1815, after an investigation which he states "was attended with more labour and doubt than that of all the other rocks of Sky", finally decided that it was an altered form of the Secondary limestone<ref>A Sketch of the Mineralogy of Skye, *Trans. Geol. Soc.*, vol. in., p. 1.</ref>, in the neighbourhood of which it is frequently seen; but for years afterwards a keen controversy raged regarding its true character, and it was not until 1888 that Sir A. Geikie finally proved its Palaeozoic age by finding fossils in it.<ref>On the Altered Limestones of Strath, Skye, *Quart. Jour. Geol. Soc.*, vol. xlv., p. 62.</ref> The outcrops of this part of the Cambrian formations near Ord do not cover so much as a square mile, but show three or four of the lower divisions into which the calcareous series is divided. The chief outcrop extends from the islands on the west side of Rudha Dubh Ard in

a southerly direction past Ord, its length, including the islands, is rather less than two miles, and its average breadth a quarter of a mile. The western boundary is formed by the western limb of a folded thrust-plane, along which both the Torridonian and the Cambrian rocks have been driven over the limestone. In most places on the east and south-east sides the outcrop comes conformably above that of the serpulite-grit. The rock-mass now referred to has itself been thrust over another rock-mass, in which other outcrops of the limestone appear on the north side of Ord River, considerably disturbed with folds and thrusts.

The limestone in the Broadford district occupies an area of perhaps five or six square miles, and extends in an irregular curve from Torran, near the head of Loch Slapin, through Strath Suardal and Ben Suardal and Coire-chat-achan to the Sound of Scalpay. Between Loch Slapin and Ben Suardal there comes up in the middle of the limestone, and occupying approximately the centre of an anticline in it, the great intrusive mass of granophyre which forms Beinn an Dubhaich. The area between Beinn Caillich and Camas na Sgianadin is also riddled with intrusions, partly of granophyre and partly of gabbro.

On the north side of Ben Suardal the boundary of the limestone is a thrust-plane on which the Applecross grits of the Torridonian series have been pushed over the limestone. This major thrust has been folded into an anticline, with axial plane striking N.N.E. Whether the whole of the limestone is lying on another lower major thrust is not certain, but there are undoubtedly minor thrusts, and also sharp isoclinal folds, within the limestone.

The limestone is exposed in coast-sections at the west end of the Broadford district around Torran. In 'Strath Suardal a considerable extent of low ground is covered by dreary peat mosses and alluvium. Macculloch<ref>Western Isles of Scotland, vol. i., pp. 287–288.</ref> noted this barren, uncultivated tract as being singularly unlike the type of country usually seen in limestone areas.

The limestones of the Broadford district have been more sharply folded and more deformed than those of Ord. Two hundred yards east of Ben Suardal a dark granular limestone is isoclinally folded along axial planes that sometimes dip E.S.E. at 23°, and the under-limbs are the most thinned. On the hillside 350 yards south-east of Ben Suardal, and in other places, a close strain-slip cleavage dips steeply south-east. On the northwest side of Loch Lonachan, 700 yards S.S.W. of the outlet, the small black chert lumps in the limestone have been dragged out into trains of granules at right angles to the strike, and some of the fossils (*Maclurea*) have been elongated in the same direction. A third of a mile north of Ben Suardal the worm-casts in the limestone are elongated in a W.N.W. direction.

In the Ord district no cleavage has been observed in any part of the limestone, but in many places the rock is crossed by thin strings of calcite without any general direction: such strings are particularly abundant near the foot of Ord River. The sub-division representing the Ghrudaidh limestone of Sutherland spreads over a large space on the hillside half a mile north-east of Sgeir Gormul (Loch Eishort). Better sections, however, occur on the hillside north-east of Ord, and in the burn about 1500 yards slightly west of south of Ord. A calcareous grit, a few inches thick, sometimes comes between the serpulite-grit and the limestone. The bottom bed of limestone — in places about 25 feet thick — contains small grains of quartz, like those in the grit below, and weathers with a deeper brown colour than the overlying limestone. No distinct remains of serpulites have been noticed in it. Its texture is coarsely granular, and the specific gravity of a specimen taken from about 350 yards southeast of Ord proved to be 2.84, a figure which implies a considerable amount of dolomitisation. This basal band is surmounted by the main mass of the sub-division, which is a granular leaden-coloured limestone, with specific gravity ranging from 2.815 to 2.83, and a thickness of about 65 feet. Above it lies an alternating series of granular and more compact bands, the latter closely resembling the general type of the Eilean Dubh group of Durness. Some of the granular beds are soft and crumbly, and oolitic in structure. The oolitic grains are sometimes preserved in chert, and project on the weathered faces of the rock, but the cherty bands are never thick, and do not seem to consist of such pure chert as that of the chert lumps in the Eilean Dubh limestone. The specific gravities of two specimens of the oolitic limestone were each determined to be 2.83. The line between the Ghrudaidh and the Eilean Dubh divisions is not sharply defined, and it may possibly have been drawn at slightly different horizons at different localities. On the hill 350 yards south-east of Ord the total thickness of the Ghrudaidh group as here developed is estimated at about 115 feet.

The representative of the Eilean Dubh group of Durness covers more ground than any other of the limestone divisions near Ord, and is probably much the thickest. It is laid bare in coast-sections north and north-east of Ord, while good

exposures may be seen inland half a mile north-west and three-quarters of a mile W.S.W. of Sgiath-bheinn an Uird, on the hillside southeast of Ord, and in the wood three-quarters of a mile slightly west of south of Ord. Most of the beds in this group are flaggy, of a white or cream colour and compact texture, but mixed with these there are others of leaden colour and coarser grain. On some horizons the compact rocks are finely laminated, as in the lower half of the group on the shore a third of a mile N.N.E. of Ord, and in the upper half on the shore about 300 yards slightly east of north of Ord. Certain of the laminae contain clastic grains of quartz, and some are of a purplish-red colour, perhaps due to staining. The specific gravities of various cream-coloured specimens were found to vary between 2.81 and 2.85.

Lumps and bands of chert occur in abundance in the lower part of the group. They are well seen in the north bank of Ord River, about 300 yards above the foot. One of the cherty beds here is two or three feet thick, but only half of it consists of chert, which occurs in bands and nodules from half an inch to two inches thick, embedded in limestone of the common type. The colour of most of the chert is pale-grey or brown, but some parts are almost black and others red. Other courses of chert, two inches and three inches thick, occur just above this bed, and also below it at intervals down to the Ghrudaidh limestone. One of the lower courses shows an oolitic structure. Another is brecciated, though the adjacent limestone is not so. The central part of the group is comparatively free from chert, though in places — for instance, in the cliff 350 yards N.N.E. of Ord — some thick bands of it may be observed. The upper cherts appear in the coast near Ord, for 50 or 60 feet below the line taken as the top, and also two-thirds of a mile slightly east of south of Sgeir Gormul. The group presents no sharply-defined upper limit. On the hillside near Ord its thickness seems nearly 500 feet, but most of the beds are so much alike that any repetition of them by dislocation could not be readily noticed.

The representative of the Sailmhor limestone occupies three areas — one on the hillside two-thirds of a mile slightly east of south of Sgeir Gormul, another on Eilean Dubh, and a third, of considerable size, east and south of Ord Bay. The best sections are those on the coast to the north-west of Ord, and a little inland to the S.S.W. of that place. The limestone of this group is granular, and in most parts of a leaden colour, but other parts are pale buff. Chert is abundant in it, and occurs in bands and lenticles, some of which are more than a foot thick. The chert bands are composed of laminae of different colours — dull red, brown, pale grey, or dark grey, and the laminae sometimes show an arrangement resembling false-bedding. One specimen of the limestone gave a specific gravity of 2.85, while another showed 2.83. On the supposition that no thrust repeats the strata, the thickness of the Sailmhor group in the area east and south of Ord Bay appears to be about 270 feet.

An obscure exposure, which may possibly represent a portion of the Sangomore limestone of Sutherland, has been noted on the west side of the Sailmhor limestone in the wood 700 yards S.S.W. of Ord. It is of a white colour, granular, and contains bands of white chert as much as two or three feet thick. Two specimens gave specific gravities of 2.80 and 2.84 respectively.

In certain areas of the Broadford district the Cambrian limestones admit of being divided into three divisions, which may be named as follows, after places where they are well seen:

- Ben Suardal limestones, containing many small black cherts, and some fossils.
- Strath Suardal limestone, with cherts which resemble sponges in shape, but which do not apparently show any organic structure.
- Beinn an Dubhaich limestone, with ball-like structures, each composed of a number of concentric rings.

The order in which the divisions are here placed is not meant to imply that the lowest is the oldest, but it agrees with the order of superposition which is at present most usual, and which existed in the Beinn an Dubhaich area at the time of the intrusion of the granophyre. The middle division, the Strath Suardal limestone, does not appear in all the localities where we should expect it. Its absence may possibly be explained in two different ways. Either it has been concealed by the agency of obscure thrusts, which have had the effect of pushing the Ben Suardal limestone over it, or else it and the Beinn an Dubhaich limestone are merely one division of limestone, which has been altered in different places to different degrees by contact metamorphism. On the latter supposition, the Beinn an Dubhaich limestone represents the most-altered portion of the division.

The Beinn an Dubhaich limestone occupies a considerable area on the north-east, north-west, and south-east sides of the Beinn an Dubhaich granophyre, and in the vicinity of Torran. It is always in a highly metamorphosed condition, and is generally called the Strath marble. It is said to have been used for ornamental purposes in Armadale Castle, the Palace of Versailles, and the Vatican.

On the east side of the burn rather more than a quarter of a mile S.S.W. of Suardal, the spheroidal or oval forms in the limestone are well seen. The cross-sections show a succession of concentric rings, each of which projects slightly on the weathered face from the intervening substance, and is of a pale buff colour. Sometimes ten or twelve rings can be counted in the breadth of an inch. In the middle of many of the forms the centre projects on the weathered face, and consists partly of an aggregate of malacolite crystals, and partly of chert or quartz in a crypto-crystalline condition. The boundary between the Beinn an Dubhaich and Strath Suardal limestone is not well defined. The rings gradually diminish in width, and show in their centres forms which, towards the Strath Suardal limestone, are generally larger and more sponge-like.

In the old quarry half a mile south-east of Cill Chriosd (two and a half miles east of Torran), the ring structures contain a soft green serpentinous substance in concentric laminae near their centres. In the quarries three-quarters of a mile S.S.W. of Kilchrist (Cill Chriosd) similar serpentinous laminae occur in a more prominent manner, and with the intervening carbonate layers they give rise to appearances which closely resemble *Eozoon Canadense*. Messrs. King and Rowney<ref>On the so-called Eozoonal Rock, *Quart. Jour. Geol. Soc.*, vol. xxii., p. 185.</ref> have described these Eozoon-like structures, and they find in them close similarities to the Archaean examples.

Many samples of the Beinn an Dubhaich limestone have been weighed. They give specific gravities varying from 2.71 to 2.86. The exposures which seem the most altered by the granophyre usually give low figures, and are not magnesian. The less-altered rocks must be partially dolomitised.

The largest area of the Strath Suardal limestone lies between Loch Cill Chriosd (Kilchrist) and Coire-chat-achan. It is a mile long and two-thirds of a mile broad at its widest part, and has other smaller exposures a little way to the north-west of it. The limestone, also, forms a thin band north-north-west and another north of Beinn Suardal, and appears in these places to be lying over the Ben Suardal limestone. ° It has not been found with its normal characters anywhere north-west of the granophyre of Beinn an Dubhaich, nor in the Torran district.

Most of the rock weathers with a dark-grey, almost black, colour, is coarsely granular, and of a specific gravity varying between 2.82 and 2.83. In some places white and compact beds pass quickly along the strike into dark granular limestone. The change is well seen about 1000 yards slightly west of north of Ben Suardal, where rows of sponge-like forms can be traced along the strike from a dark granular into a white compact limestone: the specific gravity of a specimen of the dark limestone is 2.84, while that of the white limestone is 2.64.

The sponge-like forms project from weathered faces, and are sometimes only attached to them by very narrow connections. They are irregular in shape, but sometimes in the form of oval bodies connected by narrow constrictions, and with the long axes parallel to the bedding. They sometimes coalesce into bands several feet long, but individual oval forms do not exceed five or six inches in length, and most of them are much smaller. The outsides are usually covered with a thin coat of dove-coloured talc (?), within which comes a layer, often from a quarter to half an inch thick, of colourless tremolite needles disposed nearly at right angles to the adjacent surfaces. In an exposure about 1000 yards W.S.W. from Loch Lonachan outlet, bits of saccharoidal marble, or of a serpentinous substance, may be seen inside the tremolite layer. In some places the material of the sponge-like forms seems to consist mainly of malacolite. Half a mile northeast of Ben Suardal the centres of the forms are of chert, and some of the chert is granulitised and traversed by little veins of calcite and tremolite.

Rather more than a third of a mile east of Ben Suardal a white limestone, without either sponge-like forms or chert-lumps, comes between the mass of the Strath Suardal and the Ben Suardal limestone. Lenticles and bands of white chert are also intimately mixed in the Strath Suardal limestone in the area between Loch Cill Chriosd and Coire-chat-achan.

The Ben Suardal limestone forms most of Ben Suardal and a large area near Torran, and is well exposed on the coast near the latter place, as well as in crags north and north-east of Ben Suardal. It occupies a larger area than either of the other subdivisions in the Broadford district, and is probably the thickest, but never more than one side is seen — probably the bottom — of the mass. The exposures are complicated with isoclinal folds and thrusts, but the thickness of this limestone is probably at least 200 feet. The rock generally weathers with a pale-grey colour, but the freshly-broken rock is dark-grey. Excepting when much altered, the texture is finer than that usual in the Strath Suardal limestone, and its specific gravity is lower, ranging between 2.71 and 2.76. The freedom from dolomitisation is not due to any accident of position, and the rock must by nature be less liable to dolomitisation than are the other sub-divisions. Again and again, when the Strath Suardal and the Ben Suardal limestones come together, the former is magnesian and the latter is not.

Small lumps and courses of black chert, usually from half an inch to an inch thick, are abundant in most of the beds, and mixed with these are worm-casts — small flattened tubes crossing one another in all directions and weathering with a pale-grey or buff colour. Both cherts and castings project from the weathered rock, but the former more than the latter.

Certain bands in the limestone contain, besides various small sponge-like forms, an assemblage of other fossil-remains which closely resembles that found in the Balnakiel and Croisaphuill limestones in Durness<ref>Sir A. Geikie published in 1888 (*Quart. Jour. Geol. Soc.*, vol. xlv., p. 69) a list of fossils which were determined by Mr. George Sharman.</ref>. The best localities for fossils are the following: The eastern slope of a bare hill nearly half a mile N.N.E. of Ben Suardal; the west side of Allt a' Mhuilinn, a little more than 1000 yards E.N.E. of Ben Suardal; the north-west side of Loch Lonachan, rather more than 700 yards and half a mile south-west of the outlet; and the coast near Torran. At the first-mentioned locality the fossils are found not more than a few feet from the Strath Suardal limestone. The exact stratigraphical positions of the fossiliferous beds at the other places are not certain. None of the other exposures lie near the Strath Suardal limestone.

About 700 yards slightly north of west from the outlet of Loch Lonachan a laminated band appears, containing oolitic structures, some of which are nearly as large as peas. The specific gravity of a specimen of the band was found to be 2.82. The position of this rock is not far above the supposed base of the limestone. In certain areas the limestone has been altered into a coarse saccharoidal marble containing needles of tremolite and prisms of malacolite. About 600 yards S.S.W. from Ben Suardal the little prisms and needles, and also the long axes of the calcite grains, display a general parallelism, and it may be conjectured that the minerals formed by contact metamorphism have followed an arrangement of the materials given at the time of the thrusting and folding.