XI.—*Notes on the Limestone Rocks in the Parish of Veryan.*

By S. J. TRIST, Esq.

MEMBER OF THE SOCIETY.

With an APPENDIX by the Rev. J. ROGERS,

MEMBER OF THE SOCIETY.

THE limestone of Veryan occurs on the coast at Pendower beach, and may thence be traced for one mile and half inland, and is visible at the surface in three different places, nearly at the equal distances, but at different elevations; the most inland being probably a hundred and twenty or thirty feet above the level of the sea. In each instance, it crops out at the brow of a hill, as is attempted to be shewn in the section, (pl. 4), but it no where appears in the vale below; whence it should seem originally to have stretched across

the valleys, but to have been subsequently carried away, together with the accompanying matter, by diluvian action.

In breadth, it extends over a superficies of 350 yards, but alternates to a great degree with an argillaceous schist, the lime itself never exceeding three feet in thickness, and that only in the upper beds of the stratum: it amounts altogether scarcely to one-eighth of the whole mass.

It rises at an angle of 33, but varies from that to above 40; the dip is E. by S. It appears to rest on the primitive districts of the west. The bearing of the three hills in which the limestone is found, is north by east, and the strata of limestone, unlike most other rocks of the neighbourhood, has a conformable position with the formation on which it reposes, as represented by the section.

According to the *analysis* of this lime, as given in Mr. Worgan's "Agricultural View of Cornwall," on the authority of the Rev. Mr. Gregor, a good specimen yields about nine-tenths of carbonate of lime, the component parts being $89\frac{1}{8}$ grains of pure limestone, 10 silex mixed with manganese, and $\frac{7}{8}$ of a grain of oxide of iron.

A ton weight of the stone will produce in quantity nearly twenty single Winchester bushels in *shells*, or *fore-right* lime; to calcine which are required four bushels and a half of culm. A comparative scale of the produce

of the Plymouth and Veryan limestone, I have collected from the publication above alluded to.

PLYMOUTH LIME.			VERYAN LIME.		
Tons of stone, 14½ Single Winchester bushels of culm 56	produce	100 double W. bushels of shells.	Tons of stone, 11 Single Winchester bushels of culm 46	produce	100 double W. bushels of shells.

That is to say, the same quantity of shells is produced from 11 tons of the Veryan stone, as from 14½ of the Plymouth stone, and with ten bushels less of culm.

As a cement, its quality is remarkably good, occasioned, it is thought, by the presence of the two latter ingredients given in the analysis. For manure it is also much valued. Where, however, it has been tried comparatively in this respect with the Plymouth stone, there does not appear to be any difference in their produce.*

We have reason to believe it to be of transition origin. Mr. Buckland identifies it with a lime formation found at an elevation of two miles higher in the Pyrenees. No organic remains have been found in it, except in the instance of a patella, which the quarry-men declared they discovered in the body of the rock, and so nicely was it fitted to it as to make it appear to be coeval with the rock itself. It was afterwards discovered, however, to have been found in a vein of manganese.

* See 'Worgan's Agricultural Survey,' page 129.

Small spherical masses of oxide of iron occur in great abundance. They are, in the opinion of Mr. Gregor, pyrites in a state of partial decomposition, the sulphur having escaped, and the oxide of iron alone remaining.

This limestone was first discovered in 1796 on the lands of the Rev. Mr. Trist, and was quarried by him for purposes of manure and masonry, till within the last few years, when the produce ceased to pay the expense of raising it.

The colour of the rock is a deep blue, and it is frequently traversed by veins of calcareous spar. Care has been taken to furnish the Society with specimens.

Specimens have also been sent of the rocks which rest immediately on the lime; likewise of those which alternate with it, and of those on which it rests (see section, pl. 4.) In the schist which immediately reposes on the lime, mica appears in considerable abundance. A circumstance in the neighbourhood is worthy of notice. A number of vast insulated blocks of quartz rock may be traced on it, bearing along the coast for three miles eastward, and lying irregularly scattered, but in an uniform line, not exceeding half a mile in breadth. In one part, called the Carnes, near Pendover beach, scattered masses assume an imposing and fearful appearance; so that the common people, always impressed with the belief of miraculous agency,

where they themselves can assign no adequate cause, attribute them to the work of *giants!* They are wholly insulated, and stand separate from their substratum, which appears to have nothing of the same nature in it.

Whether they are the wreck of a formation, the softer parts of which have been worn away, a circumstance highly improbable; or whether they were conveyed thither from some distant district, and from what district, and by what mighty operation, are questions that baffle conjecture. They do not seem to have any resemblance or connexion with the rocks of our primitive hills, so as to authorize the belief of their having been detached from thence in earlier periods of the world, and their lying occasionally piled horizontally one above the other would speak to the same effect, whilst their confusion seems to indicate them not to be the remnant of a stratum no longer existing. These rocks consist of a coarse quartz of a white or greyish colour, occasionally approaching to a light blue, and are of considerable hardness.*

The slate which alternates with the limestone is strongly impregnated with lime. It is of a soft crumbling nature, decomposing upon exposure, and in that state is much esteemed as a manure. As has been before said, it con-

* An extensive farm traversed by this singular range, is called *Caregloose*, or "The White Rock."

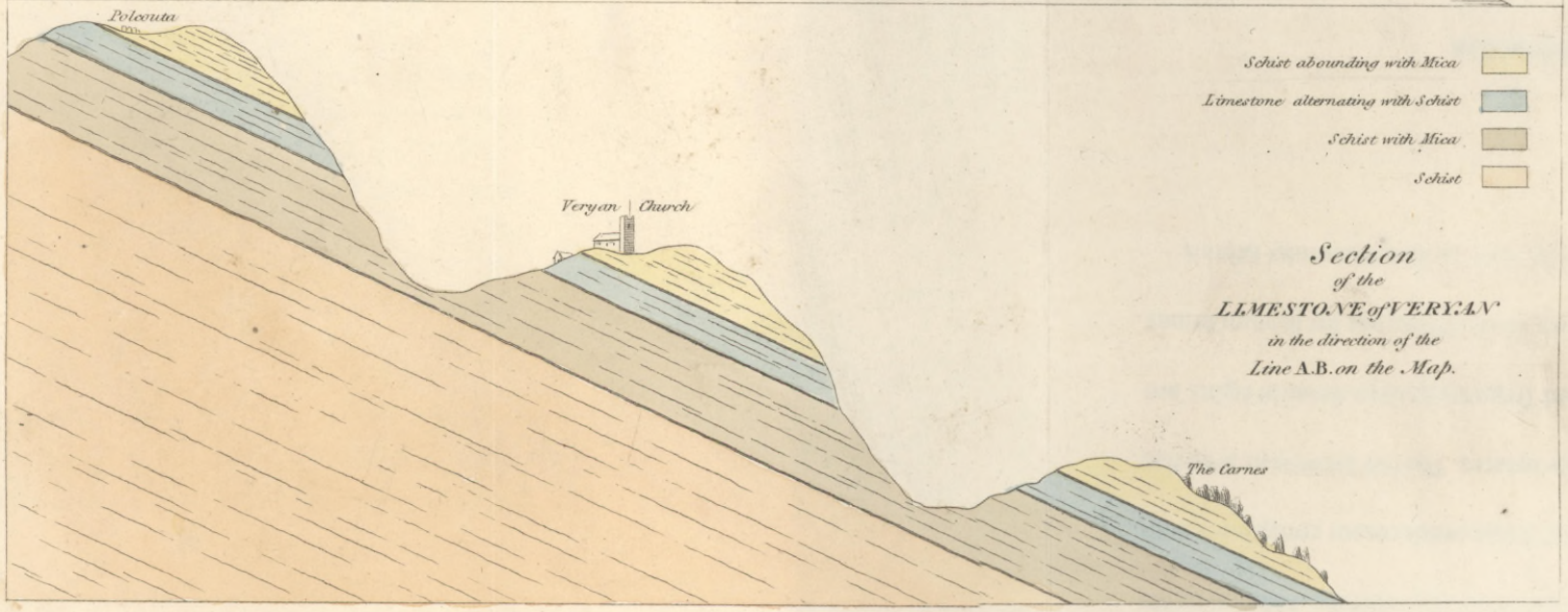
stitutes about seven-eights of the whole m
wherein the lime is found.

The *floor* on which the lime rests, is
argillaceous schist, with veins of mangan
In this ground a mine has been wrought wi
the last two years, and manganese of good q
lity, and in promising abundance, has b
found; but of late the work has not been c
ried on.

As far as the lime and this formation of m
ganese extend along the beach, there is fou
on it a flat stratum of sand and pebbles.
This stratum appears occasionally in the st
of a black sandstone of the depth of two fee
sometimes as a conglomerate of sand, pe
bles, &c. amounting to more than ten f
in thickness. Upon it rests the cliff, a mass
an argillaceous friable earth, apparently
alluvial deposit. How far under the cliff th
sand formation extends, there are no immedia
means of ascertaining, but it would appear
have been thrown up by the sea, previously
the lodgment of the incumbent matter, and
have been subsequently cemented, probably b
the presence of manganese in the neighbou
hood.

It is a circumstance worthy of remark, th
its appearance abruptly and entirely ceas
with the lime on the east, and extends no fu
ther than the manganese on the west.

About half a mile further on the west, in th
parishes of Tilley and Gerrans, lime again rise



Published by W. Phillips London. 1818.

to the surface in two distinct, but not considerable formations, of a coarser grain than the Veryan lime, and with different alternations, though in other respects bearing much the same character. It rises on the coast, but has not being traced inland.

About three miles eastward also, at Polgrane, in the parish of Caerhayes, lime appears under precisely the same circumstances as the Veryan lime, though separated from it by a high and extensive ridge of land that juts into the sea, of which the main rock is greywacké. On a slight examination, this lime formation appeared to be identical with that in Veryan, the intervening land being an incumbent mass of subsequent origin.

APPENDIX.

Observations on the Limestone of Veryan and the neighbouring parishes.

By the REV. JOHN ROGERS,

MEMBER OF THE SOCIETY.

A PAPER on the limestone of the parish of Veryan was presented last year to the Cornwall Geological Society, by Mr. Samuel Trist.—Since that time I have examined most of the places at which it occurs, and beg leave to present to the Society some specimens of the limestone, and of the slate with which it is accompanied; together with a few remarks, in addition to those already made by Mr. Trist.

The furthest point to the west at which I observed the limestone, is below Cargurrel, north-east of Creek Stephen, in the parish of

Gerrans, where I found it dipping east by south, at an angle of about 40 degrees. This lime, as will be seen by the specimen, contains small scales of mica, and in this respect differs from that of Caerhayes and Veryan. Going towards the east, it next occurs on the right side of the road leading from Pendower beach to Gwendra; and again on the right side of the road from Pendower beach to Carne, and from Criddlewell on Pendower beach, to one hundred yards beyond the eastern extremity of the beach. In all these places, as well as in the rock behind the new school near the church, the veins of limestone dip about south-east, at an angle of between 35 and 45 degrees, excepting at the place where it is seen for the last time, about one hundred yards east of Pendower beach, and where the dip is east by north, at an angle of about 40 degrees.—Here the limestone is bounded by clay-slate and greywacké, and by the immense boulders of quartz, mentioned by Mr. Samuel Trist in his observations.

The furthest point to the north at which the limestone is found, is at Polconta. It may be seen there on each side of Fisher's-lane, in veins about twelve or thirteen inches thick, dipping east south-east, at an angle of 45°. and passing from thence down the valley to the sea; it is found again at Badger's-hole, dipping E. S. E. at an angle of 60 degrees: but it has not been seen west of the rivulet. I am told

it has also been found at Caregloose, in the parish of Veryan, but I had not an opportunity of examining that spot.

Limestone exactly resembling that of Veryan is also found at Polgrean, in the parish of Caerhayes, and at several places on each side of the road leading from thence to Portholland. It is found in veins from one to four feet wide, dipping E. S. E. at an angle of 40°.

On the right hand going to Portholland, about a quarter of a mile from thence, is a large mass of greywacké rocks.

Having no instrument with me to measure the dip of the limestone at the several places at which it occurs, I have stated it as nearly as I could judge by the eye.

In conclusion, I have to observe, that limestone occurs also at the following places:— In the parish of South Petherwin, limestone was raised about half a century ago, and has been much used in the neighbourhood of Launceston. (See Worgan's Survey of Cornwall.) This limestone is found half a mile north-east of the church. Limestone has been found in a quarry at Tredinick, a mile below Trengoff, on the banks of the Worlegan river; at Newport, near Launceston; in Tregarla slate-quarry, in the parish of Menhiniot; in the parish of Crantock, between Trevemper and the Gunnel, and likewise at Padstow. I am informed that it has also been found

on an estate belonging to Sir Christopher Hawkins, near the Lizard. Further inquiries will probably discover other places where this valuable mineral is to be found; a subject no less interesting to the landholder and to the farmer, than to the geologist.