

been considered the oldest rocks in the district. We do not find, as in the gneiss of the South, alternations and regular successions of beds lithologically distinct, gneiss, mica schists, leptynites, and amphibolites, but we have a uniform magma with a granitic structure with constituents in alignment, fibres, ribbons, micaceous and sillimanitic lenticles of amygdaloidal and polyhedric shape (granulitic gneiss). These are held to be the result of a granite (granulite) being intimately injected into shales of Brioverian age, of which the metamorphosed remains would be represented by the micaceous tissues. These tissues give the rock an interlaced character, in which wavy micaceous partings divide the lenticular sheets of massive granulite from each other. The different divisions of the granulitic gneisses in the St. Malo sheet of the map are simply mineralogical. They pass one into the other, and mark the different degrees of metamorphism of the same rocks.

At St. Malo the excursion came to an end, and the party broke up, some returning by the boat to Southampton, some making their way by Mont St. Michel to Normandy, while others started for Laval in order to examine the well-known Devonian beds of the Mayenne Department, under the kind direction of M. and Madame Oehlert.

EXCURSION TO CENTRAL BRITTANY.

Directors: P. LEBESCONTE AND T. BEZIER.

(*Report by* FREDERICK MEESON.)

On *Thursday, May 18th*, a portion of the party visiting Brittany set out from Rennes to examine the fossiliferous Carboniferous and Devonian formations of Central Brittany.

The course taken was by St. Grégoire, Melesse, St. Germain-sur-Ille, St. Aubin d'Aubigné, Andouillé-Neuville, and Gahard.

The Schistes of Rennes, which are identified with those of St. Lo (Brioverian), and correspond with our Longmyndian, were found to be destitute of fossils, and covered by Quaternary gravels, sands, and alluvium.

At St. Gregoire are some Miocene deposits, consisting of calcareous sand (Faluns de l'Anjou) with rolled calcareous nodules. Fragments of *Cidaris* were found.

At St. Germain-sur-Ille are magnificent quarries of sandstone, bearing the name of the place, and differing but slightly from the Grès de May of Normandy. It was pointed out that between Rennes and St. Germain there is, on account of a large thrust fault, an absence of the intermediate deposits found elsewhere in

NOVEMBER, 1899.]

Brittany. In the quarry occur many intercalations of black micaceous schist, containing the same fossils as the sandstone, and the following were found: *Diplograptus foliaceus* and *Orthis budleighensis*. The graptolitic bed is below that containing *Orthis*. On the northern side of the quarry, the faults had changed the original order of the beds.

The quarry of Carboniferous Limestone, or marble of Quenon, near St. Aubin d'Aubigné was next visited. This limestone is on the same horizon as those of Sablé (Sarthe) and Visé (Belgium), and the sandstone, schists, and porphyroids of the series seen at points on the route are analogous to the so-called Blaviérite de Changé (Mayenne). To the proprietors of the quarry the members were indebted for specimens of the following fossils found in the limestone: *Spirifera*, *Orthis*, *Leptæna*, *Chonetes*, *Euomphalus*, *Productus semireticulatus*, *Fenestella*, *Phillipsia gemmulifera*, and *P. truncatula*.

Passing a long-disused lime-kiln which presented the appearance of a tumulus, the party reached a quarry of the Rocher d'Andouillé-Neuville. This sandstone—designated Grès de Bourg-des-Comptes—is unfossiliferous, and differs in appearance from that of St. Germain. It contains intercalated bands of carbonaceous shale, in which were found *Monograptus priodon*, *M. colonus*, and *Retiolites geinitzianus*.

After lunch at St. Aubin, the course of a stream was followed, in which were exposures of the schists and greywackes of Fret (Finistère) and Greywacke of Faou (Finistère), which overlie the Devonian sandstone. The fossils found included *Leptæna*, *Spirifera macroptera*, *Orthis*, and fragments of Encrinites. Higher up, at the side of the road, were found *Phacops*, *Chonetes sarcinulata*, and *Spirifera*.

The quarry at Grénélais in Grès Supérieur d'Andouillé, with overlying nodular shales, was next visited, and *Orthoceras*, *Cardiola*, Graptolites, Ostracoda, *Boïbozoë*, and *Primitia* were found. The Calcaires de Rosan, which underlie the sandstone, are wanting here; and the sandstone is overlain by schist with the Wenlock fauna.

The classical ground of La Lézaie was reached, and in a section on the road between Lézaie and Thebaudais-en-Gahard was seen the greywacke of Faou, in which were found *Spirifera*, *Orthis*, *Pleurodictyum problematicum*, and fragments of Crinoids.

The next visit was to a quarry of Grès de la Boë or Gahard sandstone, which is very fossiliferous, *Orthis monnieri* being one of the characteristic fossils.

The last section seen was the grand one of Bois-Roux, in the limestone bearing its name. Amongst the fossils found were *Homalonotus gervillei*, *Cryphæus michelini*, *Leperditia armoricana*, *Bembexia*, *Euomphalus*, *Loxonema*, *Murchisonia*, *Nucula*, *Athyris* (*Spirigera*) *undata*, *Orthis striatula*, and *Rhynchonella fallaciosa*.

The following table gives the order of the beds :

Carboniferous	...	...	Limestone of Quenon.
Mid. Devonian	...	...	Schists and Greywackes of Fret.
Lower Devonian	...	...	Greywacke of Faou.
"	"	...	Limestone of Bois Roux.
"	"	...	Greywacke of Faou.
"	"	...	Sandstones of Gahard and La Boë.
"	"	...	Nodular Shales of Grenelais.
Silurian	...	...	} Sandstones of Andouillé.
Ordovician	...	...
Brioverian	...	...	Sandstone of St. Germain-sur-Ille, and May (Calvados).
			Schists of Rennes and St. Lo.

SUPPLEMENTARY EXCURSION TO LAVAL.

THURSDAY, MAY 25TH, 1899.

(Report by R. S. HERRIES.)

IN response to a kind invitation from M. and Madame Oehlert, a party, numbering eleven, travelled from St. Malo to Laval on Wednesday, May 24th, in order to see the fossiliferous beds of that district. After dinner they repaired to the house of M. Oehlert, and were most hospitably entertained by their kind host and hostess.

On Thursday, May 25th, the party started in a brake under the direction of M. Oehlert, being accompanied by Madame Oehlert, and M. Lebesconte, who had come over from Rennes. The route taken was in a northerly direction, following the course of the Mayenne, and at right angles to the strike of the various beds. The following succession of beds in descending order was thus passed over :

CARBONIFEROUS	.	.	{ Shales.
			{ Limestones.
			{ Conglomerates.
DEVONIAN	.	.	{ Limestones and shales.
? SILURIAN	.	.	{ Sandstones with <i>Orthis monnieri</i> .
			Folded beds.
ORDOVICIAN	.	.	{ Slates.
			{ Armorican sandstone.
PRE-CAMBRIAN	.	.	Shales and conglomerates.
GRANITE.			

On reaching the edge of the great granite mass at Montflours the road to the west was taken as far as Andouillé, where a halt was made for luncheon. Just south of the village an opening by the roadside afforded an abundant supply of Ordovician fossils. The beds were now crossed in reverse order, and the next stopping place was at the great limestone quarries of St. Germain-le-Fouilloux, which yielded numbers of Lower Devonian fossils. Two smaller quarries were visited between St. Germain and St. Jean-sur-Mayenne, where the road of the morning was rejoined.

At both these points the limestone was found to be very rich.

NOVEMBER, 1899.]