REPORT OF EXCURSIONS ARRANGED BY THE NORTH-EAST LANCASHIRE GROUP, 1924.

THERE have been eight excursions during 1924 in connection with the Local Group.

On April 26th DR. R. L. SHERLOCK, A.R.C.S., took a party from A crington over the succession in the Lower Coal Measures near **Baxenden.** Owing to bad weather only six were in the party. At Shoe Mill a marine band was seen and bullions containing *Gastrioceras carbonarium* were obtained. In Tom Dule Clough, a fault with a probable throw of 400 yards was observed. Rain brought the excursion to an early conclusion.

On May 17th, L. H. TONKS, M.Sc., conducted a party to **Helmshore and Ramsbottom.** Seventeen members and friends assembled at Helmshore Station and proceeded immediately to Sunny Bank Mill where the shales and tilestones above the Helmshore Grit were seen. Walking along the Helmshore Road towards Ramsbottom the leader took advantage of the beautifully clear day to point out the leading geological features of the district, and in particular those of the Rossendale Highland. In this district the strata lie horizontally and the different beds of grit, sandstone and shale give rise to well-marked features and shelves. The succession from the Fletcher Bank Grit on Harden Moor to the rock above the Lower Mountain Mine, which caps Whittle Pike, was clearly displayed on the southern side of the highland. The effect of the Naden Valley Fault, which brings in the lower beds on the Northern side and its course across country from Scout Moor Brook to Haslingden Workhouse were seen. The next exposures visited were in the cloughs formed by the streams flowing into the Irwell near Lumb Works. Here the magnificent exposures of the two marine bands above the Helmshore Grit were examined, and some little time was spent in collecting and discussing the forms which characterise this horizon. A ganister ironstone underlies the succeeding marine band. In this locality this rock possesses properties which make it suitable for road-mending, etc., and it is quarried and mined for this purpose. The rock was examined in a small quarry south of Pleasant View Farm, and a ½-mile further south, at the entrance to an adit into the rock, the shales above were seen and the marine band which occurs in them was examined. A pleasant walk down the hill into Ramsbottom, where tea was obtained, concluded the excursion.

W. LLOYD, B.Sc., conducted an excursion to the **Cliviger Valley** on June 14th. A party of fifteen assembled at Portsmouth Station. On a hill above the station the director pointed out

the main features of both sides of the valley. The displacement by the Cliviger Valley Fault and its branches was demonstrated. The valley is a typical example of an overflow gorge. Looking up towards Burnley several horizons of the Lower Coal Measures and the Middle Coal Measures were distinguished on the N.E. side, cut off from the Millstone Grit on the W. side by the main Cliviger Valley Fault, which here has a throw of about 400 yards. Looking south and east the party noted the bold craggy features and escarpments of the Kinderscout and Gorpley grits and the Rough Rock. Distant views of the Bride Stones and Langfield Edge make it possible to realize the main structural features of the district connected with the Pennine Anticline.

Passing Dawk Hole Wood the outcrops of the lower beds of the Lower Coal Measures were pointed out. The current-bedded character of the Woodhead Hill Rock was well seen by the bridge at the junction of Pudsey Clough, where a marine band and coal overlying the rough rock were also examined.

Pudsey Clough is a gorge in the Rough Rock, containing many fine potholes.

Proceeding up Paul Clough an examination was commenced of a descending succession of Millstone Grits. The clean exposures here render possible a detailed comparison of the lithological characters with which the various marine bands are associated.

On July 5th an excursion to **Lothersdale and Cowling** was directed by A. BRAY, B.Sc., who has spent considerable time in mapping the district. The party assembled at Colne Station and saw the main Limestone in Raygill Delf. The massive Carboniferous Limestone here is much contorted and in parts is almost vertical. No fossils were found, but specimens of Barytes and Fluorspar were obtained. Several sections in the Pendleside Limestone were noted in passing. The Limestone is not very fossiliferous and is badly exposed. The Bowland Shales were examined in detail. The junction with the Pendleside Limestone was noted and *Posidonomya becheri*, *Pterinopecten spp.* and goniatites were found at the base of the shales. The higher zones and their subdivisions (at present unpublished), were searched and the characteristic fossils found.

The party next climbed the hills formed by the Pendle and the Warley Wise Grit (Old Kinderscout Grit), and effects of faults were demonstrated.

At Gill Beck, the succession of the Sabden Shales was examined and at their base a marine band was pointed out which yielded characteristic goniatites. A considerable thickness (400 feet) of barren sandy mudstones is terminated upwards by marine shales in which two distinct goniatite faunas were shown to be present. Two definite concretionary horizons were demonstrated.

On July 12th a party of about a dozen met the REV. FATHER WADDINGTON, S.J., at Dinckley Ferry. Here the River Ribble, after following the strike of the beds, turns sharply, and as the beds are highly inclined an excellent section in the Pendleside Series is here visible. The lowest beds contain *Posidonomya becheri* and bullions with *Glyphioceras crenistria*. The shales were then traced up by means of the characteristic fossils until the river turns again at the beginning of the Millstone Grit.

The party then proceeded to Stoneyhurst College, where a very fine collection of Goniatites was examined, and an excellent tea partaken of.

In the afternoon the party, augmented by some who met us at Lower Hodder Bridge, examined the Hodder River section. The section commenced at Teddy Wheel, where various species of *Zaphrentis* occur. The beds were followed in ascending order and the hole excavated by the Rev. Father Pollen was noted, and on further examination fragments of *Phillipsia pollen* were obtained. The beds as far as the Ravensholme Limestone were mostly well seen, except where a landslip had occurred recently.

On August 23rd, Mr. A. LORD conducted an excursion to **Brex Height.**

On Sept. 6th, DONALD PARKINSON, B.Sc., F.G.S., conducted an excursion to **Worston and Pendle Hill.** The object was to examine the succession of deposits lying between the Carboniferous Limestone of the Clitheroe Anticline and the Millstone Grit (Pendle Grit) of Pendle.

The party met at Chatburn Station and proceeded on foot to Worston Village. The whole of the low ground between Worston and Pendle is occupied by the Shales-with-Limestone Group which rests on the Clitheroe knoll limestones, and underlies the Pendleside limestone. Fossiliferous exposures in the shales were seen along the banks of Worston Brook. The fauna is scanty. The lamellibranchs include *Pterinopecten* cf. *papyraceus*. *Polecanites compressus* occurs, along with other goniatites which cannot at present be named owing to their bad state of preservation. High in the series a bed of limestone was examined above Angram Green Farm and abundant goniatite remains were found. A little higher, a small patch of limestone enveloped in shales occurs, containing *Cyathaxonia rushiana* and Zaphrentid corals. Still higher in Burst Clough, a little above the base of the Pendleside Limestone proper, specimens of the coral *Lithostrotion arachnoideum* were obtained. Above this bed is a massive light brown dolomitized limestone containing a few corals.

From the top of Burst Clough, the party walked along the strike of the summit of the Pendleside Limestone to Little Mearley Clough. At the top of Mearley Wood the uppermost beds of the Pendleside Limestone, which are probably representatives of the Ravensholme Limestone of Hind and Wilmore, are more fossiliferous than at Burst Clough, but good specimens of fossils are rarely obtained.

The overlying shales are poorly exposed at Little Mearley. Fragments of goniatites have been found in the lower beds which can probably be referred to *Goniatites crenistria*. Higher in the sequence, but still below the Pendleside Grit, exposures were examined containing fragmentary goniatites of the "*striatum*" group. Just above the base of the grit in an intercalated shale bed, specimens of *Posidonomya becheri* were obtained.

Above the Pendleside Grit, the (Upper) Bowland Shales are well exposed in the Little Mearley Clough and abound in crushed fossils. Immediately overlying the grit fairly good specimens of *Goniatites spirale* were obtained. The overlying beds contain abundant crushed remains of *Eumorphoceras pseudobilingue*, *Posidonomya membranacea* and *Posidoniella* spp.

The goniatite fauna appears to change again as the Pendle Grit is approached. This grit forms a thick capping to the hill.

On Sat., Sept. 27th, A. BRAY, B.Sc., conducted another excursion to **Roughlee,** where zones occur above those previously examined in Lothersdale. Six goniatite zones occur and five were found, the oncoming darkness preventing the other one from being visited.

I am indebted generally to the directors for the notes of the above excursions.

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Local Secretary.