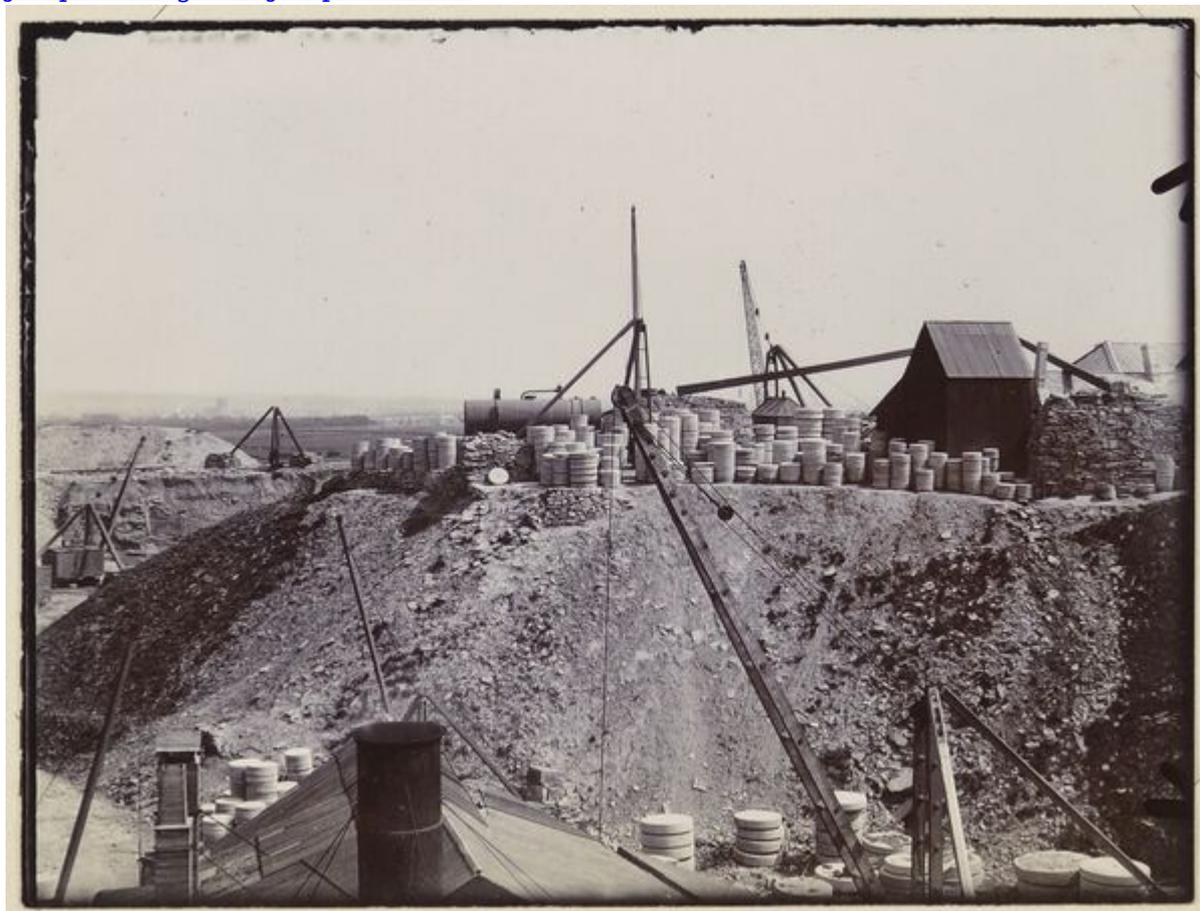


# Excursion to Sunderland and Tynemouth. Whitsuntide, May 24th to 30th, 1912 - Geologists' Association excursion

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## Excursion to Sunderland and Tynemouth. Whitsuntide, May 24th to 30th.1912 (Transcription from: GA Circular No. 144. Session 1911-1912. p. 4-7)

**DIRECTOR:** D. WOOLACOTT, D.Sc., F.G.S.

**EXCURSION SECRETARY:** A. H. WILLIAMS, 385, Holloway Road, London, N.

Headquarters : Grand Hotel, Percy Street, Newcastle-on-Tyne. Terms, 7s. 6d. per day (lunch not included).

Members should apply for rooms direct, stating that they belong to G.A. party, and advise Excursion Secretary at the same time stating whether they desire dinner in the train and *enclosing stamped addressed envelope for reply*.

Special return fare for party of not less than ten travelling together from London, 30s. 6d., available to return from Sunderland.

Official train, Friday, May 24th, King's Cross 2.20 p.m., due Newcastle 8.3 p.m. ; restaurant train. Dinner at Hotel 8.30 p.m. (There may be a G.N.R. excursion from King's Cross at 3.25 p.m. for 22s., to return on following Friday only.)

## **Saturday, May 25th.**

Breakfast 8 a.m. Depart from Newcastle (Central) by 9.20 for Monk seaton Return tickets 1s.

Walk north through fields to Hartley, turn down to coast. Examine the continuous coast section from here to the mouth of the Tyne. This affords an exposure of the upper Coal Measures of the district, of the lower divisions of the Permian, and of some of the Glacial beds. Three dykes are exposed in the section : the Hartley, the Collywell (which comes to "a head" in an interesting section), and the Tyne-mouth. From Hartley southwards, the Coal Measures, consisting of sandstones, shales, coal seams (" Yard," " Bensham," "Low Main," and other seams), under-clays and mussel bands, are exposed. They are much faulted by a series of east and west faults, the chief being the Brierdene and Ninety Fathom " Dykes." The latter fault throws from 600 to 1,000 ft. in the Coal Measures, and brings the Permian rocks down against them in Cullercoats Bay. Evidences of thrusting will be seen in several sections, both in the Coal Measures and in the Permian. At Whitley Professor Lebour and Dr. Smythe have shown that thrusting has occurred in the Coal Measures along a line of local unconformity (*Q.J.G.S.*, vol. xli, Aug. 1906, p. 530), and S. R. Haselhurst has proved, that horizontal movements occurring since the post-Permian faulting of the Ninety Fathom "Dyke," have caused the dome-shaped arrangement of the Permian strata and the numerous slickensided surfaces, veins and small faults that occur in Cullercoats Bay (*Proceedings of the University of Durham Philosophical Society*, vol. iv, pt. 1, 1910-11, p. 15). The beds exposed on Tynemouth Cliff are in descending order.

	feet.
(1) Brecciated Beds (Middle Permian), breccia and "negative" breccia	18-20
(2) Beds of Lower Limestone disturbed along thrust-plane	5
(3) An arenaceous limestone passing into alternations of marls, limestones and sandstones	12-18
(4) Marl Slate	3
(5) Yellow Sands, variable in thickness	5-40
Unconformity	
(6) Red beds of Coal Measures	30

Return about 5.30. Trains run from Tynemouth to Newcastle (Central or Manors) frequently.

Total walking distance about 10 miles. Dinner 7 p.m.

## Monday, May 27th.

Breakfast 8 a.m. Depart by 9.47 train for East Boldon (fare 8d.).

Walk from station over Cleadon Hills to Marsden, passing an exposure of gravels and sands from which marine shells have been obtained, and outcrops of the Upper Concretionary Magnesian Limestone. A general view of the district can be obtained from these hills. Visit Marsden Quarries, which are worked in the Concretionary Limestone. The several beds forming this peculiar division are well exposed here. Upper Limestone fossils occur. The gravels and sands Nv ill again be seen resting on the boulder clay. Walk to the coast and examine the section of Permian rocks exposed between Marsden and South Shields. The brecciated beds which form such an interesting feature of the Magnesian Limestone are here exposed, and the evidence that they are " crush " and " thrust " breccias is clearly seen. Other features are the folding, tilting, cleaving and squeezing out of beds by thrusting. The major thrust-plane between the brecciated beds and the Lower Magnesian Limestone is also exposed. " Negative " breccia and several "breccias gashes" and "breccia fissures" occur. The Marl Slate and top of the Yellow Sands can be seen in Frenchman's Bay.

The Permian rocks exposed on this day are in descending order :

	feet.
Upper Concretionary Limestone	100
Flexible Limestone	10
Middle yellow-bedded limestone of Marsden Bay	100
Middle brecciated beds	60
Lower regularly bedded limestone of Frenchman's Bay	40
Marl Slate	3
Yellow Sands	3

Walk to South Shields and train back to Newcastle at 5.30 (fare 6d.) The coast section forming the latter part of this day's work is fully described and illustrated in

a paper by Dr. Woolacott, "On a case of thrust and crush brecciation in the Magnesian Limestone, County Durham," University of Durham Philosophical Society, Memoir No. 1.

Total walking distance about 8 miles. Dinner 7 p.m.

## Tuesday, May 28th.

Breakfast 8 a.m. Leave Central by 9.17 express for Sunderland (return fare 1s. 8d., pleasure party tickets 1s. 3d.).

Take tram to Kayll Road, walk to Claxheugh. Examine the exposure here of the lower divisions of the Permian. The Yellow Sands, Marl Slate, Lower bedded limestones, and Middle fossiliferous limestone are here seen faulted against the Coal Measures. The section is peculiar in that the two middle members have been tin ust out in one part of the section. The debris of two recent landslips (the first in Septerber, 1905) is still seen. Walk to small quarry where the Fossiliferous limestone is exposed. A good collection of fossils can be obtained here. Drive round by Grindon to examine a Kame which is being worked for sand, and by Humbledon Hill (one of the early collecting grounds of King, Howse and Kirkby) to Tunstall Hills, where the Fossiliferous limestone, reaching about 200 ft. in thickness, is exposed and from which a general view of the country can be obtained. Walk to the

coast at Ryhope and examine the section between that place and Sunderland. Slickensided brecciated beds in Middle Limestone are seen at Jane Jiveson's Rock, and this division is thrust over the Upper Concretionary Limestones in one part of the exposure. Phacoidal structure has been developed in the Middle Limestone along the thrust-plane. The Concretionary beds with the underlying Flexible limestone form the section for some distance northwards until they gradually sink beneath sea-level and are covered by a thick deposit of boulder clay.

Walk into Sunderland. Total walking distance about 8 miles. Trains leave at 5.15 and 6.0 for Newcastle. Dinner 7 p.m.

## Wednesday, May 29th.

Breakfast 8 a.m. Leave Newcastle by 9.17 express for Sunderland. Take tram to Roker.

Examine highest beds of the Magnesian Limestone (the Upper yellow bedded Roker limestone). It is sometimes compact and crystalline, but is often pseudo-oolitic in appearance, being composed of minute hollow spheres. Underlying this bed is the top of the Concretionary Limestone, which is here a "cannon ball" limestone. If exposed the submerged forest in Whitburn Bay will be examined. Walk up to Fulwell Quarries, where the upper Concretionary Limestones are better developed than in any other exposure. The various types of concretions—cannon ball, honeycomb, coralloid, etc.—can be studied here. Fish remains are occasionally found. The section here, nine years ago, was, according to Dr. George Abbott:

	ft.	in.
Boulder Clay.		
Cellular Limestone (Main Course)	20	0
Boulders (Marl and Dunstone)	10-12	0
Cellular Limestone (Flags)	10	0
(20 in. "Marl" bed)	1	8
Cellular Limestone (Greystone)	1	4
("Marl")	25	0
Fish bed	1	6

(Some 16 in. beneath this bed the Brecciated Beds of the Middle Limestone occur.)

Gravels and sands resting on boulder clay and containing marine shells can be seen here at a height of 150 ft., and occasionally a glaciated surface is exposed.

Walk back to Sunderland, and if time permit the peculiar sections beneath Sunderland Bridge, showing the top of the Brecciated Beds, may be examined, or a visit might be paid to Sunderland Museum, where some interesting local specimens are exhibited. Trains leave for Newcastle frequently. Dinner 7 p.m.

Those returning to London leave Sunderland at 4.20 p.m. for King's Cross, due 10.45, restaurant train.

## Thursday, May 30th.

If any of the party care to extend their visit the Director will be pleased to arrange an excursion for a further study of the Permian, e.g., the series of exposures of the lower divisions on Boldon Hills

could be visited from East Boldon Station, or some structural and chemical peculiarities in the middle divisions of the limestone to the south of Seaham Harbour examined, or a visit to a coal mine arranged.

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Geological Survey Maps (for other days), Sheet 105 S.E.

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