

**MEMOIRS OF THE GEOLOGICAL SURVEY
OF GREAT BRITAIN AND THE MUSEUM
OF PRACTICAL GEOLOGY. THE
GEOLOGY OF THE COUNTRY AROUND
OLDHAM, INCLUDING MANCHESTER
AND ITS SUBURBS**

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EDWARD HULL & J. W. SALTER

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MEMOIRS
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GEOLOGICAL SURVEY
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GREAT BRITAIN
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MUSEUM OF PRACTICAL GEOLOGY.

THE GEOLOGY OF
THE COUNTRY AROUND OLDHAM,
INCLUDING
MANCHESTER AND ITS SUBURBS.

(SHEET 88 S.W., AND THE CORRESPONDING SIX-INCH MAPS 88, 89,
96, 97, 104, 105, 111, 112; LANCASHIRE 259, 271.)

BY
EDWARD HULL, B.A., F.G.S.
WITH AN APPENDIX ON THE FOSSILS;

BY
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CONTENTS.

	PAGE
PHYSICAL GEOGRAPHY - - - - -	1
GEOGRAPHICAL FORMATIONS—	
<i>Yoredale Rocks</i> - - - - -	9
<i>Millstone Grit</i> - - - - -	10
<i>Lower Coal-measures</i> - - - - -	16
<i>Middle Coal-measures</i> - - - - -	20
<i>Upper Coal-measures</i> - - - - -	33
PERMIAN FORMATION - - - - -	37
NEW RED SANDSTONE - - - - -	44
POST-PLIOCENE OR DRIFT—	
<i>Lower Boulder Clay</i> - - - - -	46
<i>Middle Land</i> - - - - -	48
<i>Upper Boulder Clay</i> - - - - -	50
<i>Boulders</i> - - - - -	51
RIVER TERRACES - - - - -	53
FAULTS - - - - -	54
APPENDIX OF FOSSILS - - - - -	59

AUTHOR'S PREFACE.

IN the survey of the northern portion of this Sheet, especially in the neighbourhood of Rochdale, and the mountainous tract around Delf and east of Staleybridge, I had the benefit of the assistance of my colleague, Mr. A. H. Green.

It is my agreeable duty to acknowledge, on the part of Mr. Green and myself, the assistance received from the colliery proprietors and managers in the neighbourhood of Rochdale, Oldham, Ashton-under-Lyne, and Manchester, without which it would have been impossible to carry out an accurate geological survey of the district.

Amongst so many to whom our acknowledgments are due, we may particularly mention Mr. Higson, Her Majesty's Inspector of Mines, and his sons, who were always ready to give us the benefit of their knowledge of the Coal-measures of Ashton-under-Lyne; Mr. Peace, manager of Lord's Field Colliery; Mr. Garside, manager of Mr. Buckley's colliery; Mr. Astley, proprietor, Mr. Charlton, manager, and Mr. Seddon, underlooker, of the Great Dukinfield Collieries; Mr. Wyld, of Staleybridge, who kindly accompanied me in examining the sections along the new road between that town and Ashton-under-Lyne; Mr. Fletcher, the trustee, and Mr. Bains, manager, of Haughton Colliery; J. Redfern, underlooker, who kindly assisted me in examining the river section in that district, with which he has a life-long acquaintance; Mr. Goodwin, of Hyde; Mr. Clayton, manager of Mr. Jowett's collieries; the proprietor and manager of Mottram Colliery; Mr. J. Hibbert, manager of Mr. J. Harrop's colliery Bardsley; Mr. Wyld and Mr. Collinge of Glodwick; Messrs. Baily and Marland of Cross Colliery, near Oldham. To the former gentleman I am specially indebted for personal assistance on several occasions. Mr. Butterworth, of Bent Grange Colliery; Mr. Mayall, of Oldham Edge Colliery; Mr. Bagnall, of Royton Colliery; Mr. Evans, of Edge Lane Colliery.

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The proprietors and managers of the collieries of Moston, Middleton, Hopwood, Boarshaw, and Crompton, afforded us ready assistance in elucidating the structure of a rather obscure tract of country.

For information on the district around Rochdale our thanks are also due to Mr. Roscoe, of the firm of Messrs. Roscoe and Lord, Mr. W. Beswicke, the Messrs. Knowles, Messrs. Fishwick, Mr. Lomax, Mr. Stott, and Mr. Whitehead, mineral surveyor. Nor must we forget to name Mr. John Smith, of Baglata, the underlooker of Bamford Colliery.

In our investigations on the structure of the Manchester Coalfield and neighbourhood we received much assistance from Mr. Mellor and son, the managers of the limestone pits of Messrs. W. Brocklehurst and Co., Mr. Bradbury and son, of Clayton Colliery, and Mr. Livesey and son, of Bradford Colliery. We have also had recourse to the publications of Mr. E. W. Binney, F.R.S., in the Transactions of the Geological, and the Literary and Philosophical Societies of Manchester, as well as the communications of other authors, which have thrown so much light on the structure of that interesting district.

From the Chamber Colliery Company no information could be obtained.

GEOLOGY OF THE COUNTRY AROUND OLDHAM, &c.

CHAPTER I.

Physical Geography.

THE district embraced by this memoir includes portions of the counties of Lancashire, Yorkshire, and Cheshire, the boundaries of the three counties meeting at a point on the river Tame, near Mossley. It comprehends also the following important towns:—Manchester at the south-west, Rochdale at the north, Ashton-under-Lyne and Staleybridge near the south, and Oldham in the centre. It is traversed by portions of several considerable streams:—The river Roch, which taking its rise in the high moorlands north of Rochdale, passes through that town, and after winding through some hilly ground, composed of Lower and Middle Coal-measures, and opening out several fine sections in these strata, joins the Irwell, south of Bury.

The Irk, which wanders through many miles of the central and western parts of the Sheet,* except in the immediate neighbourhood of Manchester, is almost valueless for any light it throws on the geological structure of the district. After tracing this stream to its source, the geologist is disappointed in his hopes of finding sections cut down into the solid strata, and the only object which meets his eye at every elbow of the stream are banks of sand and boulder clay.

A similar statement is applicable to the Medlock, the sections which it affords being almost exclusively contained within a short distance of Manchester and the neighbourhood of Bardsley. These, however, are of such interest as somewhat to atone for the unproductiveness of the stream in a geological point of view throughout the remainder of its course.

The most interesting of all the streams which traverse this tract, both for the number and value of the geological sections it opens up, and the beauty of the scenery along its banks, is the river Tame. It takes its rise in the high moorlands at the north-east of the district, which form the watershed of this part of England. It then flows southward, gathering strength as it goes, by the confluence of several mountain streams, of which the principal are Diggle and Greenfield brooks, also having their sources at the watershed, and continues southward to Staleybridge, when it bends sharply to the west, crossing the whole of the Coal-series at Ashton-under-Lyne, and then turning again to the southward, flows into the Mersey near Stockport. Thus within a distance of about 12 miles, measured in a straight line along its course, and obliquely to the general strike of the strata, this river passes from the Limestone Shale or Yoredale Rocks, through the

* Sheet 88 S.W., one-inch scale, of the Ordnance and Geological Surveys.

Millstone Grit, Lower, Middle and Upper Coal-measures, and Permian formations up into the New Red Sandstone, in many places affording interesting and instructive views of the formations. These sections are often cut down through a thick covering of Drift deposits of clay and sand; and the river as it flows passes gradually from the mountainous tract of the "back-bone" of England into the rich and picturesque scenery of lowlands.

All the rivers here referred to ultimately flow into the Mersey, and thus reach the Irish Sea at Liverpool.

The scenery of the tract embraced by this Sheet is highly diversified, and corresponds more or less with its geological structure. As a general rule, the lowest formations form the highest ground. The tract composed of New Red Sandstone, Permian, and Middle Coal-measures, is for the most part flat, the hills are mere undulations, formed generally of drift sand. The highest ridge in the Coal-measures is Oldham Edge, formed of a very massive red sandstone, called the "blenfire rock," which there reaches an elevation of 800 feet, and in its extension southward to Glodwick Low, rises 745 feet; but these are exceptional elevations for this part of the Coal-series.

Beyond the margin of the Middle Coal-measures there is a tract of hilly country composed of Lower Coal-measures or Gannister beds. This extends along the northern edge of the map by Birtle and Rochdale to Helpet Edge, and southward to beyond Staleybridge. It generally consists of parallel ridges of flagstone and grit, divided by valleys of shale. Reaching higher elevations than the beds of the Middle Coal-measures, but lower than those of the Millstone Grit, the Gannister beds form, both in geological position and in their outward configuration, an intermediate group, distinguishable from, yet closely related to, both. Some of its hills reach considerable elevations. Thus Tunshill Hill reaches a height of 1,000 feet, Helpet Edge 1,287 feet, Besom Hill 1,150 feet, Count Hill 1,025 feet, Boardman's Edge 911 feet, May Hill north of Staleybridge, 800 feet. The same range of hills extends southward into Cheshire, by Marple, Disley, and Kerridge.

To the northward and eastward of the range just described, the high moorlands of Lancashire and Yorkshire commence. This tract is in reality a section of that central ridge which stretches from Derbyshire northward to the borders of Scotland, generally known as the Penine chain, or back-bone of England. It marks the position of a great anti-clinal axis, along which the Lower Carboniferous Rocks have been upheaved, and by means of which the Lancashire Coal-field has been disunited from that of Yorkshire. This tract extends along both sides of the wide valley of the Tame, from Staleybridge northwards; but its more elevated portion is to the east and north of this valley. Here the hills rise into an elevated table-land, intersected by deep valleys opening out into that of the Tame. The table-land terminates westward in a series of bold bluffs and declivities, of which Warlow Pike, Buckton Castle, and Harridge Pike are the most prominent, and which end off along the line of a great fault, presently to be described. It is covered with heather, and abandoned to the use of sheep and grouse. The edges of the escarpments and the sides of the valleys are often formed of cliffs of massive dark grit, which are remarkably fine when viewed from several points along the valley of Greenfield brook. These cliffs, when traced further into the uplands, give rise to rapids and waterfalls in the brooks which descend from the moors; the torrents often rush down with great violence after heavy rains, and leave their effects visible for years. The cliffs, which form the crests of the ridges, often afford good illustrations of denudation (see Fig. 1): fantastically shaped

Fig. 1.
**OLD COAST CLIFFS, OVERLOOKING CHEW VALE, BORDERS OF
 CHESHIRE AND YORKSHIRE.**



portions of the rock standing out isolated from the main mass of the cliff, just as we often see in rocky coasts. Similar rocks are also seen on the upper surfaces of the moorlands, such as the "Rocking Stones," and "Pots and Pans,"* near Greenfield. Whatever difference of opinion may exist as to the origin of the castellated projections along the edges of the escarpments, which might possibly have been produced by atmospheric agencies acting along the lines of jointage, there can scarcely be any, with reference to such cases as that shown in the woodcut (*Fig. 2*) as having been produced by the waves of the old Glacial Sea.

Fig. 2.
ROCKING STONE, BORDER OF LANCASHIRE AND YORKSHIRE.



* Incorrectly marked as Druidical remains on the Ordnance Map.