MEMOIRS OF THE GEOLOGICAL SURVEY. ENGLAND AND WALES. THE GEOLOGY OF THE COAST SOUTH OF BERWICK-ON-TWEED

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649265404

Memoirs of the Geological Survey. England and Wales. The Geology of the Coast South of Berwick-On-Tweed by W. Gunn

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

W. GUNN

MEMOIRS OF THE GEOLOGICAL SURVEY. ENGLAND AND WALES. THE GEOLOGY OF THE COAST SOUTH OF BERWICK-ON-TWEED

Trieste

2 NEW SERIES.
110 N.E. OLD SERIES.

MEMOIRS OF THE GEOLOGICAL SURVEY.

ENGLAND AND WALES.

THE

GEOLOGY

OF THE COAST SOUTH OF

BERWICK-ON-TWEED.

(EXPLANATION OF QUARTER-SHEET 110 N.E., NEW SERIES, SHEET 2.)

BY

W. GUNN, F.G.S.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF HER MAJESTY'S TREASURY.

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY EYRE AND SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from
EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or
JOHN MENZIES & CO., 12, HANOVER STREET, EDINBURGH, and
90, WEST NILE STREET, GLASGOW; or
HODGES, FIGGIS, & CO., LIMITED, 104, GRAFTON STREET, DUBLIN.

1897.

Price Ninepence.

PREFACE.

THE Map described in the present Memoir represents a small triangular piece of the extreme north of the county of Northumberland, about 14 square miles in area, lying immediately to the south of Berwick-on-Tweed, and including the coast-line from the mouth of the Tweed to Goswick. It was surveyed geologically by Mr. W. Gunn, under the supervision of Mr. H. H. Howell, and was published in 1884.

Under the whole of the district various members of the Carboniferous Limestone series extend, the thicker limestones being representatives of the Yoredale series of Yorkshire. Tolerably complete sections of these strata can be seen along the shore south of Spital, where the rocks have a general easterly dip at high angles. The area here described is contained in Sheets 4 and 7 of the 6-inch Map of Northumberland, of which MS. copies are deposited in this Office for reference.

The Geology of Berwick-on-Tweed has already been described in the "Geology of Eastern Berwickshire" (Sheet 34, Scotland), published as far back as 1864.

Mr. Gunn, who surveyed the Map, has also prepared the following brief account of it.

ARCHIBALD GEIKIE,
Director General.

Geological Survey Office,
28, Jermyn Street, London.
8th July, 1897.

e 97819. 500.—10/97. Wt. 4136.

CONTENTS.

ILLUSTRATION.

THE GEOLOGY OF THE COAST SOUTH OF BERWICK-ON-TWEED.

CHAPTER I.—INTRODUCTION.

Physical Features.

The area to be described in this memoir comprises the coast from Berwick to Goswick in Northumberland, and the country inland as far as Ancroft. The highest ground, close to the high road near Spring Hill, south of Berwick, is 296 feet above the sea. From this point the ground slopes rapidly to the north and east, and more gently to the south, where there is much low-lying land. Catchlaw Crag, south of Heatherytops, is 289 feet. The 100-foot contour keeps nearly along the railway to Philadelphia, and then turns southward to Cheswick and westward to the Cat Inn and Ancroft. The alluvial flats at Goswick and Windmill Hill are not 20 feet above the sea-level. The whole area drains directly into the sea by small streams; the larger of which, Allerdean Burn and Haiden Dean Burn, unite at Ancroftsteads, and form the North Low, which enters the sea at Goswick.

Geological Description.

The rocks to be described belong wholly to the Carboniferous Limestone Series, and consist of alternations of Limestones, Sandstones, and Shales with Coals—the equivalents of the Yoredale Series and Scar Limestone of Yorkshire. They fall naturally into three divisions. The highest (*Calcareous Division*) contains all the thick limestones, and of these a fairly good section is seen along the coast. The middle portion (*Carbonaceous Division*) contains nearly all the important coal-seams, with very thin limestones, which will be elucidated by pit-sections. These two divisions were named and defined by George Tate. The lowest division (*Fell Sandstone Group*), consisting mainly of thick Sandstones with some shale, occupies only a small area about Sunnyside, in the northern corner. The general dip of the beds inland is to the S.E. or S.S.E. at angles of 10° to 15°; but near the coast they dip nearly due east at high angles, inclining to the north of east at Berwick and Spital, so that along the greater part of the coast-line, where the beds are exposed, we find them dipping as high as from 30° near Scremerston to as much as 60° at Berwick.

Boulder clay and other superficial deposits cover by far the larger portion of the area, and are everywhere based on the Carboniferous rocks.

TABLE OF FORMATIONS.

Post-Glacial	Blown Sand. Raised Beaches. Alluvium.
Glacial	Sand and Gravel. Boulder Clay.
Carboniferous Limestone Series.	Limestone Group, or Calcareous Division. Scremerston Coal Group, or Carbonaceous Division. Fell Sandstone Group.

CHAPTER II.—CARBONIFEROUS.

Fell Sandstone Group.

The thick sandstones occurring below the Scremerston Coal Series have been called further south the Fell-Sandstones. We have not the whole thickness of them here, nor have we any complete section of those beds which do occur in the area and whose thickness we estimate at over 300 feet.

Sandstones and shales, with some thin coals, belonging to the higher portion of the series, were visible at one time in the lower part of the Sunnyside Cut in the road east of Tweedmouth Cemetery; but they are now nearly covered up. The dip here is about 10° to S.S.E. A coal, 4 inches thick, is visible in the top of the King's Quarry now turned into a cemetery. Massive sandstone was formerly worked here, and some is still to be seen.

A lower part of the series is seen about Tweedmouth Station, and in the cutting for the Tweedmouth Dock Railway; in old quarries near the Tower Foundry; and by the side of the Spital Road north of Tweedmouth Tower, where the sandstone is fine and white, and looks crushed. The change in the dip of the beds from S.S.E. to nearly E.N.E. can be well traced here. At low-tide sandstone can be seen in the bed of the river on the east side of Berwick Old Bridge, dipping 30°–35° to the E.N.E., and the series crops out on the north side of the river along the New Walk.

There seems considerably more shale in the group at Berwick than there is further south, and we think that the character of this sandstone group is approximating to that of the group below, described in the Explanation of the adjoining sheet to the west.*

* Geology of Norham and Tweedmouth, by W. Gunn.