

**MEMOIRS OF THE GEOLOGICAL
SURVEY. ENGLAND AND WALES.
THE GEOLOGY OF THE SOUTH
WALES COAL-FIELD, PART I**

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Memoirs of the Geological Survey. England and Wales. The Geology of the South Wales Coal-Field, Part I by Aubrey Strahan

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AUBREY STRAHAN

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WALES COAL-FIELD, PART I**

249.

MEMOIRS OF THE GEOLOGICAL SURVEY.

ENGLAND AND WALES.

THE GEOLOGY OF THE
SOUTH WALES COAL-FIELD.

PART I.

THE COUNTRY AROUND

NEWPORT,
MONMOUTHSHIRE.

BEING AN ACCOUNT OF THE REGION COMPRISED IN
SHEET 249 OF THE MAP.

BY

AUBREY STRAHAN, M.A., F.G.S.

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P R E F A C E.

This Memoir is the first of a series which it is proposed to issue in explanation of the new Geological Survey Maps of the South Wales Coal-field. This great industrial district was one of the earliest to be examined after the institution of the Geological Survey, as a branch of the Ordnance Survey in 1835. Much of it was mapped by Sir Henry De la Beche himself, the first Director-General, but the staff included also Professor John Phillips, Mr. D. H. Williams, Mr. (afterwards Sir) Andrew C. Ramsay, Mr. W. T. Aveline, Mr. J. Rees, and Mr. T. E. James. An important area, however, extending from Cwmavon to Carmarthen Bay had already been mapped upon the one-inch Ordnance map by Mr. (afterwards Sir) William E. Logan, and it was arranged that not only should his mapping be incorporated with the official work of the Geological Survey, but that Logan himself should become a member of the Staff.

Few records exist as to the distribution of the Staff at that early time, but so far as regards the area described in the following pages it is known to have been geologically mapped by De la Beche and Williams between the years 1837 and 1845.

In June 1891, it having been represented in the House of Commons that the original maps, admirable as they were pronounced to be at the time of their production, had become obsolete both in topography and geology, a re-survey of the whole area was sanctioned. Within five weeks thereafter this work was begun by Mr. Strahan in the neighbourhood of Newport and Pontypool, and the Sheets 249 and 232 of the New Series of Ordnance Maps on the scale of one inch to a mile were published in 1895-96. In 1893 Mr. Strahan was joined by Mr. Walcot Gibson, who surveyed a small portion of the north-west corner of Sheet 249 and part of Sheet 232, and in 1894 by Mr. J. R. Dakyns who was engaged in the northern part of Sheet 232. Subsequently this force was increased by the addition of Mr. R. H. Tiddeman and Mr. T. C. Cantrill, who have been engaged further to the south and west in the ground comprised in Sheets, 231, 248, and 263. The present Memoir has been prepared by Mr. Strahan, and the list of fossils have been revised by Mr. E. T. Newton and Dr. F. L. Kitchin.

The original Geological Survey of South Wales was unaccompanied by detailed explanatory Memoirs, but much general information was introduced by De la Beche into his treatise "On the Formation of the Rocks in South Wales and South Western England," which forms part of the first volume of the Memoirs of the Geological Survey. Analyses of the Iron Ores, at that time extensively worked, and lists of the interesting fossils contained in them appeared in the same Memoirs (The Iron Ores of Great Britain, Part III.). A First Report on the Coals suited to the Steam Navy, accompanied by analyses in which the Welsh Coals are discussed, was drawn up by Sir Henry De la Beche and Dr. Lyon (afterwards Lord) Playfair (Chemist to the Geological Survey), and was presented to Parliament. It was published as a Blue Book in 1848, and in the same year appeared in the Second Part of the Second Volume of the Memoirs of the Geological Survey. It was followed by further researches on the same subject by the same authors, which were embodied in a Second (1849), and Third Report (1851), also presented to Parliament, and published among the Parliamentary Papers. Among

the early contributions of the Geological Survey to the Geology of South Wales, reference may also be made to an account of the Usk inlier of Silurian rocks and of their fossils, which was given by Professor John Phillips, in his *Essay on the Malvern Hills*, in Part I. of the Second Volume of the *Memoirs*.

One of the results of the present re-survey has been the sub-division of great masses of strata hitherto grouped together. The Old Red Sandstone of South Wales has been shown to include representatives of both the Upper and Lower divisions of other parts of the Kingdom, though, so far as at present examined, the formation appears to exhibit an unbroken sequence such as occurs nowhere else, unless among equivalent strata in Devonshire. The true relations of the Upper and Lower Old Red Sandstone to one another, and to the formations above and below them, can only be elucidated by the examination of a wide area.

The Coal-measures, hitherto represented by one colour only on the map, have long been known to include a mass of sandstone by which an upper is separated from a lower series of coal-producing measures. The representation of these three sub-divisions by colour on the map has served well to illustrate the structure of the Coal-field. The anticlinal and synclinal folds into which the measures have been thrown, and the faults by which they are cut through have been traced out with an amount of detail which was impossible to the original surveyors. It was only after the progress of mining had thrown more light on the geological structure of the ground, and maps on the scale of six inches to a mile were available for use in the field that such a task could be undertaken. The importance of an accurate knowledge of the structure of the Coal-field in view of future mining operations can hardly be over-estimated, and an instance is given in this Memoir where many thousands of pounds were wasted for want of it.

While the revision is in progress the boundaries of the Superficial Deposits are traced at the same time as those of the solid rocks underneath, and are shown by colour on a "Drift Edition" of the map. The examination of the Glacial phenomena has led to results of much interest.

At present the map is published on the one-inch scale only, in two editions, one of which ("Solid Rocks Edition") shows the distribution and connections of the solid rocks, apart from the covering of superficial deposits that so often obscures them; the other ("Drift Edition") represents these deposits as they are distributed over the district, and only marks the solid rocks where they lie bare at the surface.

Manuscript copies of the original six-inch field maps are deposited in the Geological Survey Office, where they can be consulted, and copies can be supplied when desired at the cost of drawing and colouring. One Sheet of Vertical Sections (No. 80) has been published in illustration of the particular area described in the present Memoir.

Our thanks are due to a large number of Colliery Managers, Mining Engineers, and Surveyors for assistance given by them during the re-survey of the Coal-measures. Information and access to plans have in all cases been freely accorded to us.

Geological Survey Office,
28, Jermyn Street, London,
25th November, 1899.

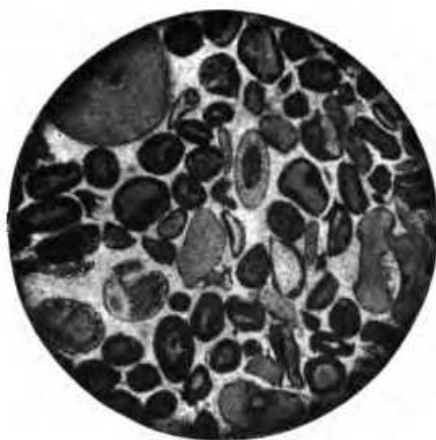
ARCH. GEIKIE,
Director-General.

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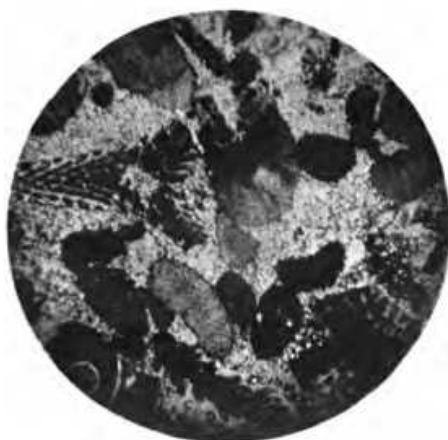
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(A) Section of the Lower Limestone, Risca.



(B) Section of the Rhubina Iron Ore.

MICROSCOPIC SECTIONS OF CARBONIFEROUS LIMESTONE
MAGNIFIED TEN DIAMETERS.