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# SCENERY, SCIENCE AND ART;

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#### EXTRACTS FROM THE

## NOTE-BOOK OF A GEOLOGIST

### AND MINING ENGINEER.

BY

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## PREFATORY NOTICE.

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THE following pages really are what they purport to be, extracts from the note-book of a geologist much engaged in various economic inquiries which are connected with and arise out of scientific investigations. In the course of his inquiries, the Author has often noted down in greater or less detail those events and facts that seemed to him at the time important, whether bearing directly on his immediate object, or affecting the practice of geology in other departments, or worthy of remark from their novelty or general interest. It has sometimes happened that accidental delays in travelling have enabled him to write down his impressions at once, and at some length; while not unfrequently points of the greatest interest have been very slightly touched upon, simply from want of time to record observations.

The mixed tone of scientific discussion and narrative that prevails in this book may seem tedious to some readers; while others may be willing to excuse, if they do not actually approve of it. It must be left for the critic and the public to determine whether the matter will justify the manner.

Most of the actual statements made can be depended on, as they are either the result of personal investigation or strict local inquiry. For the opinions and conclusions the author alone is responsible; and, with regard to these, he is anxious to have it understood that he is wedded to no theories, and is only desirous of bringing out the truth.

17 Manchester Street, London, 31st July, 1854.

#### LIST OF ILLUSTRATIONS.

#### LITHOTINTS.

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#### WOODCUTS.

		rage
FIGURE 1.	Section across the coal-field of Ancenis (Brittany)	7
2.	Section across the thick coal and lower seams in the Aubin coal-field (Aveyron)	14
3.	Section across the middle seams of the Aubin coal- field (Aveyron)	15
4.	Section across part of the Mondaluzac iron-field (Aveyron)	19
5.	Square arch in the Gallery of the Knights at Nîsmes, formed of solid blocks of stone	34
6.	View of the Pont du Gard, near Nîsmes	36
-7.	View of the town and château of Pau	41
8.	Costumes of fisherwomen, St. Jean de Luz, near Bayonne, on the Spanish frontier	138
9.	Group of ancient Roman vases, from the Western coast of the island of Sardinia	167
10.	Plan of a house at Gonnos Fanadiga, a village in the island of Sardinia	175
11.	Group of Sardinian villagers in their national costume	176
12.	Ancient monoliths in the island of Sardinia	178

#### LIST OF ILLUSTRATIONS.

			Page
FIGURE	13.	A Nur-hag, or ancient round-tower, in the island of Sardinia	179
	14.	Side view and intaglio of a curious <i>scarabæus</i> of green jasper, from the island of Sardinia	180
	15.	Group of ancient Roman vases, from the island of Sardinia	ib.
	15 2	bis. Costume of the Arabs of Algiers	193
	16.	Ground plan of a mosque at Algiers	197
	17.	Fac-simile of an Arabic pass from Cherchel to Tenez	240
	18.	Section of Kanawha coal (Western Virginia) across one of the lateral valleys	264
	19.	Illustration of the temporary dying out of a coal seam in the Kanawha coal-field	274
	20.	General section across the Appalachian chain, from the valley of the Ohio to the Atlantic	282
	21.	Section across the district worked for gold in the Garnett and Mosely mines, in Eastern Virginia	289

and the second s

vi

## CONTENTS.

## FRANCE.

I. Account of a Coal-field near Nantes Scenery on the Ba	anks
of the river Erdre, in Brittany	3
II. Mineral Fields and Limestone Plateau of the Departm	nent
of Aveyron (Central France)	10
III. The Plains of Languedoc and Gascony,-their To	wns,
Antiquities and Inhabitants	31

#### SWITZERLAND.

I.	Walk from Lausanne through the Jura Valleys	47
II.	Meeting of the French Geological Society at Porrentruy	
	in 1838	58

#### GERMANY.

Pyrmont, and the German Naturalists' Meeting ...... 73

#### SPAIN.

I.	The Pyrenees and the Valley of the Ebro	83
II.	Tarragona and Valencia-the Country and Towns on the	
	East Coast	103
III.	Madrid and its Museums of Science and Art	117
IV.	The Central Plateau and Natural Passes of Spain. A Visit	
	to Granada and the Alhambra	132
V.	The Valley of the Alpujarras-the last Resort of the	
	Moors in Europe	145

#### CONTENTS.

#### ISLAND OF SARDINIA.

I.	The Coast, the Country, the Towns, and the People 1	Page 167
II.	The Mines and Mineral Resources	181

#### AFRICA.

I.	The Towns and People in the Province of Algiers	193
II.	The Physical Geography, Geology, and Mineral Resources	
	of the Province	212

### AMERICA.

I.	New York and Pittsburg	243
II.	The Ohio and Kanawha Valleys, and the Coal Basin of	
	the Kanawha (Western Virginia)	255
III.	The Alleghanies and the Gold District of Eastern Virginia	277
IV.	Slavery as an Economical Question	294

#### ERRATA.

Pages 200, 201, and 202, in various places, for Cherchell read Cherchel.

## FRANCE.

- I. COAL-FIELD NEAR NANTES AND SCENERY OF THE BANKS OF THE ERDRE.
- II. MINERAL FIELDS AND LIMESTONE PLATEAU OF AVEYRON.
- III. THE PLAINS OF LANGUEDOC AND GASCONY, THEIR TOWNS, ANTIQUITIES AND INHABITANTS.



# SCENERY, SCIENCE AND ART.

# FRANCE.

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#### CHAPTER THE FIRST.

#### ACCOUNT OF A COAL-FIELD NEAR NANTES.—SCENERY ON THE BANKS OF THE RIVER ERDRE IN BRITTANY.

I HAVE lately been examining a small and singular coal-field extending from a few miles north of Nantes eastwards to the Loire at Chalonne, and in the course of my exploration had occasion to descend from the little town of Nort by an old rickety packet-boat of some twenty horse-power to the Loire at Nantes, following the course of the river Erdre, which is chiefly known as being a part of the line of water communication between Brest and Nantes. I was so much surprised and delighted at the singular beauty of this river during the greater part of its course, that I am anxious to communicate to others a means of enjoying charming scenery in a retired corner of France, which still retains a large number of its primitive habits and costumes.

The coal-field of this part of Brittany is not very important. It consists of a singular belt of carboniferous rocks ranging nearly east and west, and reaching from the terminus of the Brest and Nantes Canal, where it enters the Erdre a few miles north of Nantes, to Chalonne, not far from Angers on the Loire, a total distance of about sixty-five miles. This belt contains two groups of coal-beds, both which are nearly vertical, but they have a uniform south dip as far as is known in the con-

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#### FRANCE.

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cession I visited, where the total number of beds is thirteen, of which however only four can be regarded as distinctly determined and available for working. They are all very irregular, varying from a few inches to 12 or 15 yards in thickness, but the average thickness may be taken at from 3 to 5 feet. The two groups are about 150 fathoms apart, and the pits hitherto sunk have been almost all on the beds to the south. The associated rocks are chiefly gritstones, more or less coarsely grained, and often stained with iron and coal. Shales occur near the coal-seams, and the presence of coal is often indicated by wet hollows. One such hollow ranges east and west, parallel with the strike of the coal and between the north and south groups. There is probably here a thick mass of shale, and possibly an east and west fault, but the fault is not proved.

The coal in this district has been partially worked for many years, and a large quantity has been got from numerous shallow pits opened on the crop of some one of the seams, and following the coal down till the pit has fallen in. It is supposed that scarcely any shafts have been sunk more than about 100 fathoms. A pair of new vertical pits has been put down in a convenient spot near a good road by the present manager, and one pit has cut the coal at ten fathoms. The coal appears to be of inferior quality, but is in demand for lime-burning in the vicinity. Numerous crops of this and other beds are easily shown by opening costeaning pits in the fields, or examining the roadside cuttings. The cost of sinking a shaft (measuring 10 feet by 7, and divided by a brattice) is not more than  $\pounds 4$  a fathom for shallow depths. but a deep pit (say 100 fathoms) would probably average £24 per fathom, including timbering. As much as fifteen fathoms per month could be sunk in the kind of rock hitherto met with in the district.

The qualities of the coal in the northern and southern beds are somewhat different; the former being sold as a smith's coal and the latter for kiln work. Each appears sufficient for the purposes to which it is applied. In appearance the coals are dirty, tender, very flaky, not very bituminous, and rather sulphury. They burn, however, with tolerable readiness and with some little flame, and do not leave a large quantity of ash.

The principal demand for this coal has hitherto arisen from numerous lime-kilns in the neighbourhood constructed on a large scale. These are said to require at least 20,000 tons a year, and no doubt a market exists for an additional quantity, taken for the use of Nantes and various towns in Brittany accessible by water carriage. It is however difficult, if not impossible, to decide whether a very greatly increased supply would be met by a corresponding demand, although it certainly appears that the supply is insufficient. The coal is not much, if at all, used for domestic purposes. The present sources of supply are the mines worked on concessions at Chalonne on the Loire towards the east and at Langhien towards the west. The capital invested has hitherto been too small to admit of any successful competition with operations conducted with due economy and on a large scale, should any such be undertaken.

The high-roads in the district are excellent, but the crossroads utterly impassable in bad weather, and bad even in summer.

The price of English coal at Nantes and Ancenis is as much as 24s. per ton (May 1853). The coal of the district is not very well adapted to the manufacture of gas, and its use must be chiefly confined to railway and steam-boat purposes, if found to be an available fuel. It could probably be sold at Nantes at a low price, provided a market could be found.

No large amount of capital and no operations on an extensive scale are either desirable or likely to bring out a successful result in the case of this property. If in careful hands and with a sufficient capital to try the experiment fairly, and provided there turns out to be a real opening for a large consumption at Nantes and Brest for steam purposes, very handsome profits might be securely realized on a small outlay, but until the coal has been tried and has proved to answer the purpose, it would be unsafe to promise any important result. If put into hands unaccustomed to the country and people, it must prove a failure, and a great increase of supply, without first ensuring a market, would probably involve a heavy loss.

The beds of coal seem to occur between a band of fine pure limestone coming out to the south, and old shales and slaty rocks to the north. The limestone forms hills, and is extensively worked for burning. Sixty or seventy huge cones for burning the lime, each provided with winding roads running up its sides, or with great bridge-like approaches from the hill-side,