The Morning Chronicle's

LABOUR AND THE POOR

Volume VIII

THE MINING AND MANUFACTURING DISTRICTS OF WALES

FROM OUR
SPECIAL CORRESPONDENT

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Cover Image:
Nant Y Glo (Monmouthshire)
From "The History of Wales"
Bernard Bolingbroke Woodward
Published 1853
Image courtesy of The British Library

"Thieves, prostitutes, vagrants, the idle, the reckless, and the dissolute, here live in a miserable companionship. This neighbourhood formed the main scene of our inquiries; and what I that day saw of misery, degradation, and suffering, I shall remember to the end of my life."

Contents

List of Illustrations

Preface

This work attempts to be a faithful reproduction of the "Labour and the Poor" letters as printed in *The Morning Chronicle*. Only obvious typographical errors and omissions have been corrected. Variations in the spelling and hyphenation of words have largely been retained. We hope any such inconsistencies prove to be of some historical interest to the reader.

As much as possible we have tried to recreate the original layout and styling of the text and all factual tables have been reproduced as closely to the originals as possible with only minimal alterations made where necessary to improve readability.

Not all letters were titled. Where missing we have added titles to the Table of Contents to assist navigation and explanation of content. The letters themselves are as per the originals.

A handful of illustrations have been added to each volume. These did not appear in the original text but hopefully provide added interest.

R. W.
K. B.

Introduction

In 1849 a leading London-based newspaper, *The Morning Chronicle*, undertook an investigation into the working and living conditions of the poor throughout England and Wales in the hope that their findings might lead to much needed change.

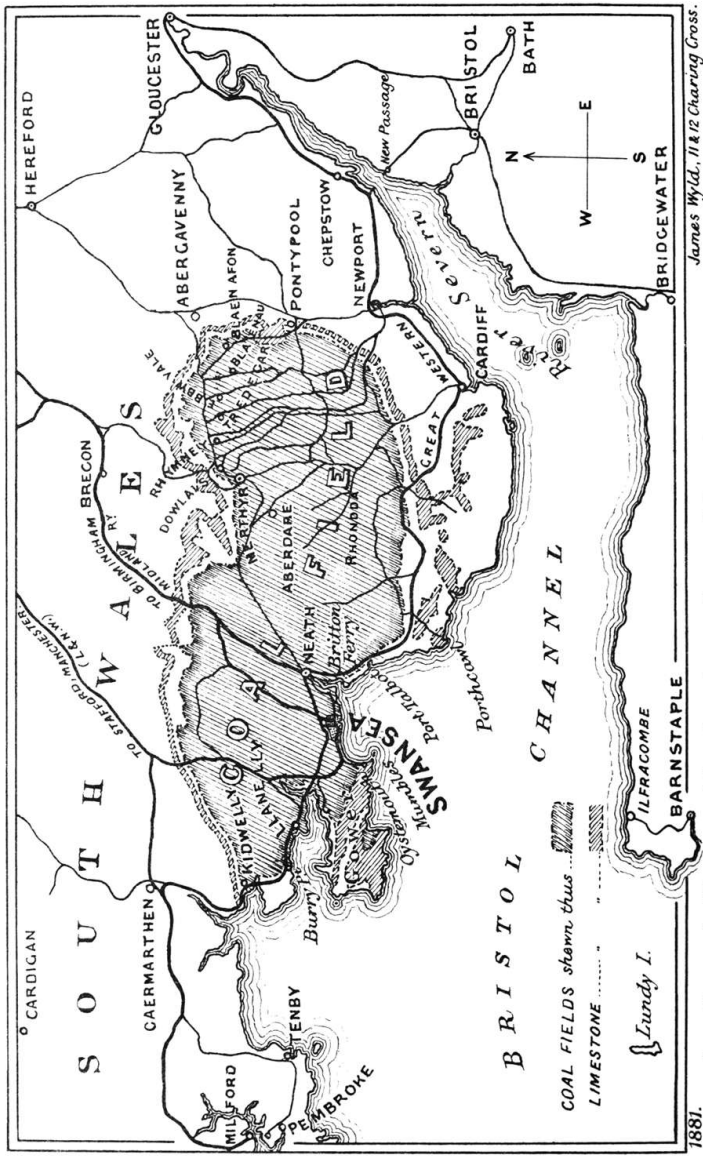
The reputed catalyst for their "Labour and the Poor" series was an article written by Henry Mayhew recording a journey into Bermondsey, one of the most deprived districts of London, which was printed in September 1849. Following this it was proposed that an in-depth investigation be carried out and "Special Correspondents", the investigators, were selected and distributed around the country. The first article or "Letter" appeared on the 18th of October 1849 and the series would run for almost 2 years and 222 letters.

The well-known and respected writers and journalists recruited for the task included Henry Mayhew who was assigned to the Metropolitan districts, Angus Bethune Reach to the Manufacturing districts, Alexander Mackay and Shirley Brooks to the Rural districts and Charles Mackay to investigate the cities of Birmingham and Liverpool. The author of the letters from Wales is as yet unknown.

The "Labour and the Poor" letters were extremely popular at the time, being widely read throughout the nation and even abroad. The revelations in them caused quite a stir amongst the middle and upper classes of Victorian society. *Letters to the Editor* poured in with donations for specific cases of distress that appeared in the letters and also for the general alleviation of the suffering of the poor. A special fund was set up by *The Morning Chronicle* to collect and distribute these donations.

These *Letters to the Editor* have been included in this series, predominantly in the Metropolitan district volumes whose letters elicited the majority of responses. They provide a unique window into the thoughts and sentiments of the Victorian readership as they react to the incredible accounts of misery and desperation being unveiled.

The Morning Chronicle's extraordinary and unsurpassed "Labour and the Poor" investigation provides an unparalleled insight into the people of the period, their living and working conditions, their feelings, their language, their sufferings and their struggles for survival amidst the poverty and destitution of 19th century Britain. An investigation of such magnitude had never before been attempted and the undertaking was truly of epic proportions. Its impact at the time was profound. Its historical importance today is without question.



Map of The Coal Field of South Wales

The Morning Chronicle, Monday, March 4, 1850.

LABOUR AND THE POOR.

THE MINING AND MANUFACTURING DISTRICTS OF SOUTH WALES.

[FROM OUR SPECIAL CORRESPONDENT.]

MERTHYR TYDFIL.

Letter I.

Charged with the duty of reporting upon the condition of the labouring classes and the poor throughout the Principality of Wales, I direct my attention, in the first instance, to the great iron-works and collieries of South Wales—because these occupy by far the most important and interesting division of the country, as regards the purposes of my inquiry, and also because, as will be seen in the course of my Letters, they stand most in need of an early investigation.

In order to convey to the reader a clear and just comprehension of the economy of the mining and manufacturing systems, as at present working in South Wales—without which he cannot fairly judge of the relative position, and the reciprocal claims and duties, of the workman and his employer—it is first necessary to give some account of the vast tract of mineral deposits which affords a field for the labour of the one, the capital of the other, and, under a proper state of things, the profit of both. This done, I shall commence my inquiries with Merthyr, the metropolis of the iron works, which affords the best opportunity for witnessing the conduct and deportment of the master and the workman, and for noting the advantages and benefits, the hardships, vices, and imperfections, which characterize the operation of the mining and manufacturing systems as long settled in these populous districts. The general plan which I intend to follow will develop itself in due course; at present it is enough to say, that I shall take the various points for observation in the order in which they naturally present themselves to a person engaged in such an inquiry, who seeks only for material and pertinent facts.

The tract of country popularly known as "the Mineral Basin of South Wales," extends from Pontypool in Monmouthshire on the

east side, through Glamorganshire, running, with its southern edge, by Risca below Caerphilly, through Pentyrch on the river Taff, by Llanharry, north of the towns of Cowbridge and Bridgend—passing under the waters of Swansea Bay, by Taibach near Aberavon—appearing again between Swansea and the Mumbles—and, after crossing the peninsula of Gower, running by Llanelly and Kidwelly in Carmarthenshire, and shaping its course for St. Bride's Bay, which forms its western extremity. To the north it stretches away through the Gwendraeth Valley, by Llandebie, Hirwain, Merthyr, Bute, Sirhowy, Nantyglo, and so round to Pontypool. Its *mean* length, for the purposes of calculation, may be laid at seventy miles, and its average breadth at twenty—which gives an area of fourteen hundred square miles. Throughout this vast space, above a thick bed of carboniferous limestone, the numerous strata of coal and iron-stone are deposited. Intervening between the limestone and the ironstone measures, lies a stratum of millstone grit—another called the Farewell Rock—and a third of sandstone so hard and durable as to be used in the construction of the smelting furnaces. Upon this repose the whole of the iron and coal measures. These rocks "crop out," as it is termed, at the edges of the coal-field, and indicate, by their appearance, its limits. In many places the coal comes actually to the surface. From the surface coal descends at an angle, which is called its dip, towards a point, which is not, however, the centre of the basin. On the north side, the angle of inclination is seldom more than ten degrees; but on the south the dip is rarely under thirty-five, and frequently it is as much as forty degrees; consequently the minerals are workable to greater advantage, and at smaller expense, on the north than on the south side of the field. The deepest part of the basin is in the neighbourhood of Neath, a little to the west of its centre; the lowest strata are there nearly 700 fathoms below the outcrops of some of the superior strata in the more hilly districts. At a depth so prodigious, it is obvious that mines could not be worked with profit. But a fortunate circumstance has rendered a vast breadth of this part of the coal-field easily available, where otherwise it would have been unserviceable. Nearly along the deepest part there occurred at some remote period a convulsion of nature, which, running east to west, has uplifted the rocky strata with the superposed minerals to the surface, dividing the great basin into what are called the north and south troughs. This friendly help to the miner, called by Conybeare "the anticlinal axis, or elevated line of division," enters the

basin near Moidart, crossing the Ebbw river, the Sirhowy, by Velin Vach, and the valley of the Taff at Newbridge—passing through Blaen Ogwr, Cwm Garw, Maesteg, Cwm Avon, on to Baglan—and running out of the coal measures, near Swansea. Within the range of this line of elevation the coal strata have been thrown up and divided into masses, north and south, which slope away gable-shaped, like the roof of a house. The dip caused by this subterrene disturbance to the respective troughs on either side, is at an angle of from 10 to 20 degrees throughout the greater part of the coalfield eastward of Cwm Avon; and the minerals are as easily worked as at the outcrop on the northern edge of the basin.

The perpendicular depth of the iron and coal strata is, according to De la Beche, 11,000 in the northern, and 8,000 feet in the southern trough—making a difference of 3,000 feet between the two outcrops. Disposed at irregular distances within these limits lie the several strata of coal and iron. Lowest and most valuable of these are the iron-stone measures, comprising the "black pins" ore and the "white ash" coal; next in ascending order come the Pennant measures, which contain the black-band iron-stone, beds of fire clay, and the "brown ash" coals; lastly, and nearest to the surface, are the Mynydd-yslwyn measures, which yield the "red ash" coals. It is the produce of this series which has been so extensively exported from Newport during the past century. Each of these groups contains several veins of coal, varying in thickness from one to ten feet. Twelve of the veins run from three to ten feet thick, making an average of 72 feet, and the remainder from one foot to three feet, so that we have 95 feet as the average thickness of the beds of coal under the surface of 1,400 square miles—a quantity which, taking our annual consumption at 20,000,000 of tons, would supply our demands (assuming the whole to be workable) for two thousand years. A cubic yard of coal weighs about a ton, and a cubic yard of stacked iron-stone, of the ordinary quality, about 35 cwt.

It remains to speak of the iron-stone. This valuable mineral is found below the coal-measures, and interstratified amongst them. It varies in thickness from an inch to ten inches; it presents various appearances, but generally is a dark-coloured, compact, and heavy stone. It is of two kinds—argillaceous or clay, and carboniferous or blackband ironstone. Carbonic acid, alumina, and silica are the substances which chiefly compose the former—carbonic acid, alumina, silica, and bitumen, the latter. We shall see, hereafter, when I come

to treat of the process of smelting and manufacturing iron, the interesting mode in which the workman, ignorant of chemistry, and following only the sure guides of practice and experience, disengages the metal from the carbonic acid, the flint, and alum, with which it is incorporated. The average yield of Welsh iron-stone, according to the analysis of Dufresnoy and Berthier is—usual ore, 31.4; rich ore, 42.0 per cent.; the same calcined stands 44.7 and 60.0. The abundance and richness of this invaluable mineral in the Welsh coal-field are testified by Mr. Moses, a well-known mining-engineer, in a very useful little book, written with the purpose of giving his peculiar views of the geology of the Welsh mineral basin to the scientific world. He says:—

> "In the district between the river Taff and Swansea bay there has been found, by actual workings in those places some distance apart, a thickness of upwards of 100 inches of ironstone in 100 yards depth of ground, yielding on an average 35 per cent. of iron. There is to be observed in these lower rakes of ironstone a *pin*, which is designated by the miners *tobacco pin*, from its resemblance to a roll of twisted tobacco. In the Merthyr district, and along the north and east outcrop, it accompanies the *rough pin* between the second and third vein of coal, in ascending order in the coal strata. On the south outcrop it is met with between two seams of coal, identical in position with those it intervenes on the north crop, and known as the two *Criburs*. We also find in this series nodules of ironstone, comprising compartments with the impressions of plants, and sometimes leaves, as it were, around which argillaceous matter and carbonate of iron have been collected, forming, in many instances, balls of ironstone from six to eighteen inches in diameter. Perhaps the most interesting nodule of ironstone to be met with in this series is that which presents when broken an oval-shaped cavity of from two to three inches in diameter. In the invert dome of this we have repeatedly observed a crystal of wonderful brilliancy, many of which were little inferior in lustre to a sudrass, a Sulbampoor diamond of the fourth class. It is rather a remarkable circumstance that diamonds of the first water are occasionally found imbedded in iron ores in South America, occupying a drusy cavity in much the same manner as the crystal met with in the ironstone nodule just mentioned."

I was shown some of these crystals a few days ago—they were of hexagonal form, varying in size from that of a small peppercorn to that of a large pea. Some were as pellucid as clear water—one

in particular, a small one, showed the prismatic colours like the diamond, sparkling most brilliantly. They were collected by an ironmaster named Wayne, as the best he had met with. There are few miners who have not some taste for natural history; many possess specimens of these crystals. The miner's cabinet is his cupboard, where he keeps these little curiosities in a wine glass or a tobacco-box.

The approach to the mineral district of South Wales lies on all sides, except the north, over richly cultivated flats and fertile slopes; but when you reach the point where the limestone appears, upon which the iron and coal repose as above stated, suddenly the face of the landscape changes—and there rise before you lofty barriers of rocky mountains, nearly destitute of cultivation, whose storm-blanched summits and heather-clad declivities afford sustenance only to the heathcote and a few small sheep—all is dreariness and sterility. But the value of every acre of this land is immense. Mr. Moses states, in the book I have referred to, that he "is acquainted with landed property in the mineral basin of South Wales which at the present time is considered to be worth upwards of £100,000, and which could have been purchased fifty years since for less than £1,000." I was myself shown, by Mr. Joseph, of Plymouth works, on the side of the mountain facing the new forge at Duffryn, a small farm of fifty acres, which, as the deeds of conveyance show, was sold in the reign of Charles II. for £27; at present the lease of the minerals only, the surface being let separately, brings in upwards of £1,000 a year to the fortunate proprietor. This is but one of several striking instances of the increased value of property which have been pointed out to me.

It is for the most part in the valleys which convey the waters from the mountains southward to the sea, that the iron works are situated. Here they are surrounded with the materials they consume, for which there is an easy descent; while they at the same time have a facility of outlet for the manufactured iron to the port where it is shipped. The brawling and impetuous currents, during the course of ages, have worn deep hollows, laying bare, and in frequent instances dividing, the strata of minerals which the ground contains, so as to enable the miner to work by "levels"—that is to say by galleries driven horizontally into the body of the mountain. But in by far the greater number of instances the mines are worked by pits, and by the use of contrivances which in their proper place will be described.

There exist but scanty and imperfect materials for a history of the rise and progress of the coal-trade in South Wales. Indeed I may say,

once for all, that the information to be gleaned from books regarding the iron as well as the coal trade in the Principality is very scanty, often conflicting, always ill-arranged, and generally insufficient. Mr. Porter, though he gives several tables and much information relative to the north country collieries, is silent respecting the Welsh. However, I will do the best in my power to give an idea of the extent of the export trade; and when, hereafter, I write upon the iron works, I shall show, as far as I can, the rate of consumption in the manufacture of iron.

The ports of Newport and Cardiff are the principal points of outlet for the Welsh coals. Within the past ten years the export has been largely extended, owing in a great degree to the favour in which the Welsh coals are held for steam purposes. Now that a scientific inquiry by two of our most eminent geologists, at the instance of Parliament, has established their superiority over all others for the use of the steam navy, there can be no doubt that the demand, and consequently the trade, will be greatly augmented. Immense quantities of coal are sent by sea to Somersetshire, Devonshire, and Cornwall—while on the land side the counties of Cardigan, Brecon, Radnor, and Hereford, are mainly supplied from the Welsh coalfields. The following will show the increase of the coal trade at the ports of Newport and Cardiff from the year 1829 to 1843, both inclusive:—

	Tons.
1829...Coals sent to the ports of Newport and Cardiff	573,491
1839...Ditto ditto	730,130
1843...Ditto ditto	943,080

I have been unable to obtain returns for both ports subsequent to 1843, but by a statement furnished to me by Mr. Forrest, of the quantity of coals sent down the Glamorganshire Canal to the port of Cardiff in 1848, the amount was then 436,981 tons. It would seem that the rate of increase in the export of coal during the above interval of 15 years has been much greater at the port of Cardiff than at Newport. Between 1829 and 1843 the increase at the port of Cardiff was not less than 269,379 tons, while at Newport it was only 100,165 tons. This may in part be accounted for by the superior accommodation now afforded to shipping in the magnificent sea docks at Cardiff, as compared with that of Newport. The increase calculated up to last year, as regards Cardiff, was from 83,729, which was the quantity in 1829, to 436,981, making a total increase of 353,252 tons in the export of 1848, as compared with that of 1829. Large shipments of coal are

also made from the ports of Swansea, Neath, and Porthcawl, of which I can obtain no account; but the quantity shipped in the various Welsh ports of the Bristol Channel may safely be set down at 2,000,000 tons a year.

I have said that a Government Commission had been charged with the duty of inquiring what coals are best suited for the purposes of the steam navy. This task was confided to Sir Henry de la Beche and Dr. Lyon Playfair, whose second report (just published) is now before me. The "calorific value" of Welsh coals, as compared with the Lancashire and Newcastle coals, is shown as follows:—

Welsh Coals	102·52
Newcastle	93·82
Lancashire	89·68

Their relative "economic value," as tested by the number of pounds of water evaporated by equal given quantities of coal, stands thus:—

Welsh Coals	29·87
Lancashire	25·93
Newcastle	25·78

I should here explain that in making this table I took the aggregate of the highest three numbers given as the result of the experiments on the several varieties of coal—thinking it a fairer mode of showing their relative worth than simply to select the return set against the best colliery of each of those great divisions of our coal-fields. It may be useful to the public to learn that the five Welsh collieries whose coals stand highest in value in the above cited report are—

Thomas's Merthyr.
Nixon's Merthyr.
Hill's Plymouth Work, Merthyr.
Aberdare Company's, Merthyr.
Gadly's nine-feet seam, Merthyr.

By this statement it will be seen that the best steam coals existing in this country are found in the immediate neighbourhood of Merthyr.

On the subject of iron smelting, and the quantity of coals consumed in the process, we are more fully informed, though the returns for the whole of the Principality have not been brought down later than 1840. In that year there were made in South Wales 505,000 tons

of iron, in the smelting of which there were used 1,436,000 tons of coal, being something less than three tons of coal for every ton of iron produced; whilst in Staffordshire there were made 427,650 tons of iron at a consumption of 1,665,000 tons of coal. It is interesting to observe by this comparison how the comparatively limited experiments made under the superintendence of De la Beche and Playfair, as to the value of coals for rough purposes, are corroborated by the practical results of working on a stupendous scale, as in the iron works. The higher calorific value of the Welsh coal could not be more satisfactorily shown than by the number of tons used in smelting given quantities of iron in South Wales, compared with Staffordshire, as contrasted in the above statement. In fact, the Staffordshire coals appear not to have been admitted to the competition for the supply of the steam navy. The balance in favour of quantity and cost of production is largely in favour of Wales. It may be interesting to observe in this place, that the united produce of the ironworks in England and Wales is 1,155,400 tons a year. Of this, the share contributed by South and North Wales is 531,500—that by Staffordshire, 427,650 tons. Adding these amounts together, and subtracting the product from the total made in England and Wales, it will be found that the quantity made in Wales and Staffordshire comes within 196,250 tons of the total smelted in the remaining iron districts. The value and importance of the Welsh coal-fields, and the desirableness of perfecting their economy and further developing their immense resources, are, I think, abundantly shown by the facts and figures above given.

It is a happy coincidence, and worthy of remark, that the iron ore, the limestone, and the coal, each being a necessary element in the manufacture of iron, are found together, being raised from the same pits. With these may be enumerated the red sand-stone and peculiar clay from which the fire-bricks are made, for lining the furnaces, no other materials being capable of enduring the intense heat employed without fracture or fusion. It might have been that the ore, like that of copper, was to be found nowhere but at a distance from the fuel necessary for smelting it; in which case, as all our manufactures repose on our iron and coal, the expense of smelting being greater by the cost of transport than it now is, our productive industry would have been proportionally obstructed, and the national wealth would have been far less than it is at present.

A short sketch of the history and statistics of the iron trade, as it illustrates the advance of one of the most important and thriving

branches of our manufactures, will hardly be considered out of place. In the year 1740, when charcoal was the only fuel used for the purpose of smelting iron, there were in England and Wales 59 furnaces, of which the annual produce was 17,350 tons. At that time the consumption so far exceeded the home manufacture, that it was computed that England imported annually 20,000 tons of foreign iron, of which 15,000 tons were from Sweden, and the remainder from Russia. For this we paid, mostly in money, £150,000. Petitions were presented to Parliament about that time, in which it was stated, as a reason why pig-iron from the American colonies ought to be admitted to the British market, that we "could not increase the quantity of bar iron we made, by reason of our woods being so far exhausted as to have greatly enhanced the price of cord-wood; but were we to import more pig-iron from America, and make less of it at home, we should be able, with the same quantity of wood we now consume, to make more bar iron at home."* About 1750, owing to the scarcity of wood, pit-coal came into use for smelting; but the imperfect method of "blasting," which operation was then performed by rude bellows, seldom permitted the produce of each furnace to exceed ten tons weekly, while in summer it fell below seven. In 1788 the number of tons made in England, Wales, and Scotland, had increased to 68,300, of which quantity 55,200 were smelted with coke, and the remainder with charcoal. At that time the number of furnaces had risen to 85. From that period, owing to the improvements in the steam-engine, and the substitution of cylinders for bellows in blasting, the advance was rapid. In 1796 there were in England, Wales, and Scotland, 121 furnaces, producing yearly 124,879 tons. The increase in 1806 was to 173 furnaces, yielding 258,206 tons; there were then in existence 233 furnaces, of which 60 were out of blast. In 1823 there were at work in Great Britain 259 furnaces, producing 442,066 tons. In seven years from 1823, the furnaces increased upwards of 100, about one-third of the total number. This differs, indeed, from a statement of Sir John Guest before a Parliamentary Committee, to the effect that the manufacture remained nearly stationary between 1823 and 1831, when it again advanced. But, according to the returns, there were at work in 1830 not fewer than 360 furnaces in England, Wales, and Scotland, the make from which was 678,418 tons—showing an increase of 101 in the number of furnaces, and of 236,351 tons of manufactured iron during the interval

* Scrivener, p.171.

between 1823 and 1830. The quantity of iron made in 1836 was estimated at 1,200,000 tons. In 1840, as appears by a statement drawn up by an iron-master named Jessop, there were in this country 402 furnaces in blast, of which 162 used the last improvement—hot-blast. The annual make of these furnaces was then 1,396,400 tons. Since that year no data, comprehending the whole of Great Britain, are furnished, by which the advance may be estimated; but, taking into consideration the impetus given to the trade by the vast extension of railways at home and abroad, during the past four years, it may safely be computed at one-third. Through the kindness of Mr. Robert Crawshay, and the obliging assistance of Mr. Forrest, of Navigation-house, Cardiff, I am enabled to show the increase which has taken place between 1840 and the present time, in eight of the ironworks, of which five are among the most important in the Principality. In the year 1840 there were conveyed down the Glamorganshire canal to Cardiff, the place of export, the following quantities of iron from the several works, as under:—

W. Crawshay	35,507
Pen-y-Darran Iron Company	16,130
Plymouth Forge Company	12,922
Aberdare Iron Company	10,327
Gadly's ditto	1,345
Brown, Lenox, and Co.	2,476
Taff Vale Iron Company	4,902
R. Blakemore (now Booker and Co.)	3,175
Tons	86,784

In the year ending the 31st December, 1848, there were carried down the same canal to the place of export from the above works the subjoined quantities:—

W. Crawshay	67,498
Pen-y-Darran Iron Company	21,180
Plymouth Forge Company	25,692
Aberdare Iron Company	19,652
Gadly's Iron Company	297
Brown, Lenox, and Co.	1,499
Taff Vale Iron Company	13,694
T. W. Booker and Co.	5,500
Tons	155,012

By these particulars it appears that the increase in the make of iron at the above works in the year 1848, as compared with the quantity they produced in 1840, is not less than 68,228 tons, being something more than 75 per cent.; and this notwithstanding the fact that the interval from 1841 to 1844 was one of great depression in the iron trade. I am sorry that I cannot render this account complete by the addition of the "make" of the Dowlais Iron Company, which is conveyed to the port of Cardiff by the Taff Vale Railway—since, up to the time of writing, I have not been favoured with the returns.

The total increase during the century extending from 1740 to 1840 appears to have been from 59 to 402 furnaces, and from 17,350 to 1,396,400 tons of manufactured iron—an advance which strikingly evidences the vast extension of our productive industry in this most important staple of commerce, and the proportionate enlargement of the national wealth.

I have already stated that the amount contributed by South Wales to the above total of the iron made in Great Britain in the year 1840, was 505,000 tons; and that the probable increase since that time may be estimated at a third. But were the markets propitious, the capabilities of this rich mineral basin are such as would admit of an indefinite extension in the working. At present there are miles along its southern and northern edges which offer numerous sites and abundant material for iron-works where none at present exist. This, however, is not a time for multiplying the works. The unsettled state of the Continent during the past two years, and the embarrassments of the railway companies, have greatly depressed the trade, and reduced wages. I have been unable to procure or construct a table of the fluctuations in the price of labour during the past ten years, but I shall give as much information hereafter as I can gather upon this point. In the meantime, the following statement, showing the export of manufactured iron during ten years up to 1843, from the ports of Cardiff and Newport, which are the great outlets for the produce of the South Wales iron-works, will also give, by the expansion or contraction of the "make," some idea of the fluctuations in the price of the labour, which in general advances or declines with the demand for iron:—

Number of tons of iron sent from the iron works of South Wales, to Cardiff and Newport, from 1834 to 1843 both inclusive:—

	Tons.		Tons.
In 1834	239,528	In 1839	307,584
1835	273,928	1840	326,442
1836	273,726	1841	260,380
1837	266,910	1842	310,420
1838	297,359	1843	324,688

Remembering the sensation created several years ago by the application of the "hot-blast" (which is air heated to a very high temperature previously to its being used for blasting) to the smelting of iron, and the results that were then predicted in the event of its general adoption, I looked with some curiosity for the working of it when I came into this neighbourhood. To my surprise I nowhere found this greatly-vaunted improvement in operation. The chief recommendation claimed for the hot-blast was the saving of fuel; but that which was a great consideration in Scotland, where the system was first tried, is of small account in Wales. In the former country there were required 8 tons of the weak coke there made to smelt, with the cold-blast, one ton of iron; and it is stated that the same end has been effected with hot-blast of a temperature sufficient to fuse lead, and with only 2¼ tons of raw coal, which undoubtedly is a vast improvement. In Wales, the coal being very strong, very abundant, and therefore cheap, there is not the same inducement for adopting this process; independently of which there exists amongst the iron-masters a prejudice against it, founded on a belief that it does not produce such tough and serviceable iron. These circumstances sufficiently account for the adherence of the Welsh iron-masters to the old and long-tried system.

It is impossible to estimate with anything like accuracy the amount of capital embarked in the iron and coal trade throughout the Principality. The books which ought to afford such information are, on this point, as indeed on many others that require elucidation, totally silent. Could it be ascertained, the amount would astonish those who, not having seen the ironworks and collieries, have but a feeble idea of their magnitude, and of the resources necessary to work them. The large fortunes acquired by the established ironmasters tempted, more particularly within the last fifteen years, many capitalists to embark in the iron trade; and various public companies have also been established with this purpose; but an instance of complete success I cannot now call to mind, whilst of failures I could name several. In truth, whatever be the amount of capital to

work with, a new establishment must be years before it can pay. The building of furnaces, smelting-houses, refineries, forges, mills, and engine-houses, and the erection of large and costly machinery, are by no means the heaviest items of expenditure; there is the lease and royalty in the minerals, and above all the heavy charges of sinking pits, driving levels, erecting steam-pumps, and whimsies, with the various other items attendant upon the under-ground workings. Without a sufficient number of pits open, it is in vain the endeavour to make works pay. There is, indeed, an observation common in the Principality, founded, as such remarks generally are, upon experience, that "fools open pits and works, but wise men step in and work them." And this, I believe, is really the case.

The number of persons of both sexes engaged in the iron works and collieries of Wales, are stated in the last census returns as under:—

Persons engaged in mining coal in Wales .	13,801
„ „ in mining iron	1,522
„ „ in the manufacture of iron	3,966
Total	19,289

Such is the official return for 1841, but it was obviously much below the mark even then; in proof of which I may observe that at that time, when women were not prohibited by law from working in the mines, the number is stated to have been only 182—whereas, in three out of the four great iron works *at Merthyr only*, now that women are excluded from underground labour, there are at present employed, as the returns supplied to me show, no less than 545 in and about the works; an increase, in the face of a reason for a decrease, which cannot be accounted for by the extension of the trade. There are now employed in the works at Merthyr and Dowlais, under and above ground, about 20,000 hands.

The labour of these classes, from the highest to the lowest, is of the heaviest kind: often it is highly dangerous. To "win" and "get" the minerals at prodigious depths in the bowels of the earth, surrounded by a sulphurous and explosive atmosphere, and subject to accidents which no human sagacity can foresee nor any precaution avert; to convey the rough treasures to the surface; to break, cleanse, and calcine, to smelt, refine, and manufacture them—are the duties of the workman. For the successful accomplishment of these tasks, the requirements are—physical courage, strength, and endurance, and, above all,

a fair degree of practical skill; these qualities are combined in him. Although capital is the motive power, it is upon the rude virtues of the workman that the entire system of the manufacture of iron practically relies. If our coal and iron form the substantial basis of our national opulence and power, he by whose skill and labour those minerals are produced ought at least to be well clothed and well fed, to have the means afforded him of educating and advancing his children, and of providing for his old age out of the produce of his labour whilst he is capable of work. It is my duty to inquire and ascertain if opportunity for all this is afforded him by the remuneration which he receives at the present time; and to show, as far as I may be able, the relation subsisting in these districts between the price of labour and the profits of capital. It is an arduous undertaking. I enter upon it with diffidence, but will perform it to the best of my power, without favour or affection to any party.

In no other part of the mineral district of South Wales are the peculiar characteristics of the population engaged in mining and the manufacture of iron so strikingly developed as at Merthyr; nor is there any other place which affords so favourable a point for observing the merits and defects of what may be comprehensively termed the economy of the iron works. I have, therefore, come to Merthyr, and I propose going in the first place, as a stranger would, over the town itself, noting its appearance particularly in regard to its sanitary condition, as this more immediately and powerfully affects the labouring classes and the poor than any other question—wages, perhaps, excepted.

The town of Merthyr Tydfil is situated amidst lofty mountains at the upper end of a narrow valley where the Morlais unites its waters with the Taff. Extending from Plymouth Works, on the main river, it follows the course of the Taff on the left up to Cyfarthfa; branching off at an intermediate point on the right, it skirts the precipitous valley of the Morlais up to Dowlais. It is a town of modern date; for, though a village known in Welsh history as the scene of the murder of a Christian Princess, Tydfil, by a party of Saxon pagans about the eighth century, it was not until some eighty years ago, when the attention of an enterprizing man named Bacon was directed to the coal and iron mines in this neighbourhood, that it began to enlarge. So light was the value at that time set upon property in this district, that Mr. Bacon obtained a ninety-nine years' lease of a tract eight miles in length and four in breadth, for a reserved rent of £200 per annum. In 1783, after having acquired immense wealth, he dis-

posed of the remainder of his interest in leases, the greatest portion to Mr. Crawshay, the grandfather of the present owner of Cyfarthfa works, and the remainder to Mr. Hill, whose descendant now holds the Plymouth works. At different periods the works at Dowlais and Pen-y-Darran were established, and the town, from time to time, was enlarged, co-extensively with the advance and prosperity of the iron-trade. In 1796, there were in Merthyr, including Dowlais, nine furnaces; at present, there are forty-four. The length of the town, from the turnpike near Plymouth works to the extremity of Dowlais, is two miles and a half. The population, at the census of 1841, was 34,977, but is now above 40,000. The number of inhabited houses, in the census return, is 6,413; at the present time the overseer's rate-book shows the number rateable to the relief of the poor as 7,500. The ascent from the banks of the Taff to Dowlais is continuous, and in some places steep, so as to afford every facility for sewerage and for cleansing the streets. The situation of the town is favourable for health, being open, airy, and well exposed to the sun; the lower part stands at an elevation of 500 feet above the sea docks at Cardiff, as shown by the locks in the Glamorganshire Canal, which conveys immense quantities of the iron and coal from hence to the sea. Dowlais rises about 500 feet above the lowest point of Merthyr, so that, if height has anything to do with salubrity, Dowlais, standing 1,000 feet above the sea, would be (presuming no counteracting influences at work) a healthy place. There is, then, no cause, arising from local position or climate, why Merthyr should be an unhealthy town, yet beyond question it is unhealthy. The prevailing disease is fever, from which the town is never free. During the visitation of the cholera, in the months of July, September, and October—an event which has a gloomy prominence in the memory of the inhabitants—there were attacked 3,624 persons, of whom 1,524 died; this gives a per centage of one person attacked in every twelve, and one death in every twenty-eight of the entire population. I made this calculation from the papers, with the kind assistance of Mr. Frank James, the superintendent registrar; therefore, startling as the facts appear, they may be relied on. When it is remembered that this awful destruction of human life occurred almost entirely amongst the labouring classes, the amount of destitution and suffering entailed by the loss of parents, may be in some degree imagined. The number of orphaned children thrown upon the parish for support by this fearful visitation, was 462, of whom 51 had lost both father and mother; the number of widows left to the charge of the

parish was 182. Besides these many children who have lost their parents now provide for themselves in the works, and many no doubt have wandered away in search of a better home elsewhere. It is pertinent to this part of my subject to show that, whatever it may be, there is something prejudicial to infant life in Merthyr. During seven years extending to 1847 inclusive, there died yearly, of children under five years of age in Merthyr Tydfil parish, not fewer than 607. In the same period the births were annually 1,636—this from carefully abstracted manuscript returns. The official statement of the registrar-general also shows that the mortality here is very high among children. In the unions comprising Cardiff, Bridgend, and Neath, on the southern border of the mineral basin, and containing some extensive iron and copper works, there were 1,601 births during the year 1846, and of deaths under five years, 412; while in the same year in Merthyr union, which comprises several agricultural parishes, the births were 1,381, which, it will be seen, is less than in the unions abovenamed; and the deaths under five were 496—a proportion greatly unfavourable to infant life in the Merthyr Union as compared with the others. It is clear, then, that there must exist in Merthyr some active causes prejudicial to human life; and as, whatever these may be, they cannot but tend to the unhappiness and physical depression of the poor, it becomes a legitimate subject for inquiry in their place, whether they may not be ascertained and the evil cured.

The first impression of a stranger who visits Merthyr is, that it is a town of workmen's houses. The shops are not numerous, considering the population; I should say they do not constitute more than a fifteenth part of the entire town. The professional men are not more numerous than the absolute requirements of the place demand, and there are scarcely any local gentry, so that houses of a good class are extremely rare. The style of building is of the rudest and least commodious kind, and is one cause of the low state of health above alluded to. It strikes the observer when in the lower town (still called "the village" by old people) that the houses have been formed from a low and rude model. There still exist several of the original houses, mere hovels of stone, having no upper storey, and covered with thatch, the eaves of which may be touched with the hand. On this type the builders have improved, by the addition of a loft above the ground-floor, and in many instances by a division of the dwelling into four rooms; but, as if alarmed at the innovation, they have done this timidly and scantily, for the houses are still very low and ill-ventilated. The better class

of tradesmen have advanced a little, raising their houses to a second floor, but in a narrow spirit, for the upper rooms cannot but be inconveniently low. A tradesman named James, who had lived in Manchester, but is opening business here, is building a house in the High-street, on the same scale as good houses in English towns; and though not lofty, as compared with houses in London, it overtops the adjoining tradesmen's houses, even more than the latter overtop the cottages of the labourers. It is to be hoped this model will be serviceable, and that builders here will improve by the example. The main streets have a road sound at bottom, which is all the praise that can be awarded them, for they are rarely cleansed. It is, however, in the streets and courts which branch off on the right and left, that the filthy state of the town is most apparent. There is not a public sewer or drain throughout the town of Merthyr—a place, be it remembered, having upwards of 40,000 inhabitants. In a newly-erected street there is indeed a drain, made by a private individual, of about a hundred yards long, but I am aware of no other in the town, though the slope of the ground offers every facility for cheap and effective sewerage and cleansing. The houses, those of the tradesmen excepted, have no privies, nor any receptacle whatsoever for house-refuse, nor have they, except in a few instances, any outlet behind. The consequences, as regards public decency and health, are absolutely shocking. In the district between High-street and the river in Pen-y-darran, and particularly in Dowlais, where, though the highest part of the town, cholera raged with the most deadly malignity, the heaps of putrefying and fermenting refuse are as astonishing as they are poisonous. In one of the close courts here, consisting of four houses, a woman told me there were deaths from cholera in three; and matters would have been worse, no doubt, if the medical men had not immediately cleared every house where a death occurred, sending the inhabitants to the temporary refuges erected on the surrounding hills. There is not a wall, a heap of scoria from the works, or a vacant spot of ground, that is not covered with abominations. The banks of the Taff form one vast and continuous mass of rubbish. The courts, and often the middle of the streets, are obstructed with heaps of ashes, ordure, the refuse of vegetables, and the clotted hay of which the Irish and some of the Welsh make their beds. Upon this is thrown all the slops of the houses—the consequence being that there is set up in these masses of rubbish a fermentation which disengages gas of a kind equally pungent to the smell and injurious to animal life. The roadways of the streets, espe-

cially in the quarters Dowlais and Pen-y-darran, are in rainy weather absolutely impassable; they are a mass of festering black mud, into which the wheels of the carts which carry coal to the houses sink deeply. Crossings are here and there made—not by the commissioners of light and paving, for there are none—not by the parish, for the roads have never been surrendered to their custody in proper repair, consequently the parish is not compellable to keep them up—not by the iron-masters, whose houses form the streets, but by the inhabitants themselves, who, for their own convenience in crossing these stinking and poisonous sloughs, have here and there, in an irregular manner, placed stones in the mud, to facilitate their transit. No wonder, with such a state of things, that disease is rife and life precarious. Looking at a gigantic heap of this refuse, stretching along the bank of the river, I was forcibly reminded of those mounds of rubbish which travellers describe as existing in Cairo and other cities of the East, and to which is attributed much of the severity of the plague. As regards results the parallel is complete, though the magnitude of the evil is, perhaps, greatest in the East. But, bad as this is at present, it is vastly better than it was before the cholera visited the town. Conscious of the frightful state of the streets and courts, and alarmed at the approach of the pestilence, the parish authorities made strenuous exertions to purify the town. Upwards of two hundred notices were served on various persons for the removal of nuisances. Many abominations were removed at the expense of the parish—amongst these was a heap of refuse that had been accumulating for fifty years by the tram-road side, which contained by measurement 500 cubic yards, and cost £15 for its removal. This I had from official authority. The next, and a still more serious, evil is the scarcity of water—that necessary element for comfort, cleanliness, and health. Carefully examining every quarter of the town, I found but three pumps and one shallow draw-well, which, being without apparatus for raising water, I conclude was of no service. In Dowlais and Pen-y-darran there are a few "spouts" fed by landsprings, from the mountain above, which afford streams insufficient in quantity and of uncertain supply. To these the women and children resort in crowds, often waiting hours before their turn comes round. In summer, when the drought cuts off the water, the sufferings of the people are very severe; women then wait the night through, in order to get in their turn a pailful of this indispensable element. This, though strange, is literally the fact. This evil is felt the more acutely, because the occupation of the colliers and miners is of so filthy a na-

ture that they are compelled to wash themselves all over at their return from their day's work, for which purpose a large quantity of water is, in this large town, daily required. Everywhere great complaints were made to me of the privations and inconvenience this circumstance occasions. One woman said, "My husband earns eleven shillings a week, and I would give one out of it for plenty of water." In the lower town, the supply is scarcely better. A woman in a wretched court informed me that they had to fetch water for domestic purposes from the other side of the Taff, which was done by wading the river, but when there was flood, they had to go round for it by the iron bridge, a distance of a mile. Almost directly afterwards, having wandered to the side of the Taff, I saw girls of from ten to fourteen years of age, wading the river, which reached above their knees, bearing on their heads small barrels, or in their hands large tin jugs, some going to, and others returning from, the well which my informant had alluded to. This scarcity of water was pointed out to me by the Rev. Mr. Campbell as the most crying grievance the people have to endure; and I am convinced it is. Yet water is abundant in the mountains above, and the traveller who, on his way to the town, passes fine reservoirs kept up apparently regardless of expense, and with extreme care, might suppose that at least the houses, if not the streets, would be well supplied. But the water in these reservoirs, and the copious streams of the rivers Taff and Morlais, are absorbed entirely in the works. The iron-masters have a long-vested and absolute right in them, and the only question affecting them in this particular is whether, knowing the condition of the town, they ought not to have assisted the inhabitants in procuring a supply from a quarter which would not affect their own interests. There is a point in the mountains not far from the town where water might be obtained from a rivulet called Taff Vachan; the ravines below it, which are nevertheless much higher than the town, might at small expense be dammed up so as to form natural reservoirs, from which a supply of pure and good water might be had at a comparatively trifling expense. But in this place the working classes and the poor are almost entirely unrepresented; they are from their circumstances and position utterly helpless as regards the improvement of the town, and although they have the sympathy of the clergy, professional men, and tradesmen, amongst whom exists a great degree of public spirit, hitherto nothing has been done. The rest of this evil is to be found in the want of a central authority—a corporation, or at least commissioners under a local act, by whom the administration of the affairs of the

town may be conducted. Though coal is to be had for almost nothing, there is not a single public lamp in Merthyr; the consequences as regards crime and public decency in a manufacturing town of forty thousand inhabitants may be well imagined. There exists, indeed, a gas company which supplies the tradesmen and such persons as care to consume gas. Formerly the town was lit by the Commissioners of Roads from the turnpike funds, but the reduction of the number of toll-gates, which took place at the period of the "Rebecca Riots," so narrowed their income as to necessitate the giving up of the public lights. Since then the town has remained unlit as it is at present.

Such, then, is the sanitary condition and outward appearance of the town of Merthyr; in my next, having in the interim visited the works, I shall describe the various processes in the manufacture of iron, the condition of the workmen, as I find them in their labour; after which I shall give my attention to the collieries, and in due course visit the cottages, and consider the question of wages, education, crime, and pauperism, with such incidental subjects as may appear to deserve remark.

Index

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