AMERICAN IRON AND STEEL ASSOCIATION

1877.

STATISTICS

OF

THE AMERICAN AND FOREIGN IRON TRADES.

1876

ANNUAL REPORT OF THE SECRETARY

OF THE

AMERICAN

IRON AND STEEL ASSOCIATION,

CONTAINING

STATISTICS OF THE AMERICAN IRON TRADE TO JANUARY 1, 1877, AND A REVIEW OF THE PRESENT CONDITION OF THE IRON INDUSTRY IN FOREIGN COUNTRIES.

JAMES M. SWANK,
SECRETARY.

PRESENTED TO THE MEMBERS, JUNE 15, 1877.

PHILADELPHIA:
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ANNUAL REPORT OF THE SECRETARY.

SAMUEL J. REEVES, Esq.,

President of The American Iron and Steel Association.

SIR:—I have the honor herewith to present to you and the members of the Association my Annual Report for the year 1876, containing full statistics of the production of iron and steel in the United States in that year and in previous years; statistics of the stocks of pig iron on hand at the close of 1874, 1875, and 1876; detailed statistics of American imports and exports of iron and steel; tables showing the prices of American pig iron, bar iron, and iron and steel rails for a series of years; tables relating to immigration, railway mileage, the production and prices of coal and iron ore, our foreign commerce in late years, etc.; also, a review of the present condition of the iron, steel, and coal industries in foreign countries, compiled from the latest official and other authoritative sources of information. The various subjects treated in the Report are more fully enumerated in the accompanying table of Contents.

I am gratified in being able to present the statistics of the production of iron and steel in 1876 several weeks earlier in the year than has been possible with previous statistics of production. When the vast extent of country over which American ironworks are scattered is considered, and when the variety and complexity of the information collected by this office are also considered, it is to be expected that there should be delay in receiving returns from remote or possibly recalcitrant establishments; but that all establishments should be heard from, as they have been, and that their returns should be tabulated, digested, and printed within five months after the close of the year for which information is given, is an achievement of which The American Iron and Steel Association has reason to be proud, and for which it is mainly indebted to the uniform courtesy with which its requests are received and the promptness with which they are answered by American iron and steel manufacturers. In individual cases there has, of course, been difficulty, but when this has occurred the generous assistance of the special correspondents of this office has not failed to secure the information that has been sought. To them and to the trade generally my thanks are again due.

I am also under renewed obligations to my assistant, Mr. George W. Cope, for hearty co-operation in the various labors of this office, and to Dr. Edward Young, the obliging and capable Chief of the National Bureau of Statistics, for official courtesies of special value.

I take especial pleasure in calling attention to the complete tables of prices of pig iron, bar iron, and iron and steel rails in this country, which will be

found in the Report; also, the complete tables of prices of coal. These tables cover the whole field of prices of these products for many years, and are the most comprehensive that have ever been published.

In the preparation of the foreign part of the Report I have consulted all reliable sources of information accessible, including the valuable contributions to the *Journal* of the British Iron and Steel Institute of Mr. David Forbes, its Foreign Secretary, whose death in 1876 I regret to record. I have also quoted from the report of Mr. Forbes's successor, M. Deby. From Sweden, Austria, and some other countries I have been fortunate in directly obtaining late authoritative publications of much statistical value. It is only proper to say, however, that the work of comparing and verifying foreign statistical information has been no easy task. Especially has great care been taken to avoid mistakes of a serious nature.

Very Respectfully,

JAMES M. SWANK,
Secretary

PHILADELPHIA, MAY 31, 1877.

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GENERAL ANALYSIS, IN NET TONS OF 2,000 POUNDS.

We give in the following table an analysis of the total iron and steel production of the United States during the past five years.

PRODUCTS.	1872.	1873.	1874.	1875.	1876.
Pig iron	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236
All rolled iron, including nails and rails,	1,941,992	1,966,445	1,839,560	1,890,379	1,921,730
All rolled iron, including nails and excluding rails	941,992	1,076,368	1,110,147	1,097,867	1,042,101
Bessemer steel rails	94,070	129,015	144,944	290,863	412,461
Iron and all other rails	905,930	761,062	584,469	501,649	467,168
Street rails, included in iron rails	15,000	9,430	6,739	16,340	13,086
Rails of all kinds	1,000,000	890,077	729,413	792,512	879,629
Kegs of cut nails and spikes, included in all rolled iron	4,065,322	4,024,704	4,912,180	4,726,881	4,157,814
Crucible cast steel	29,260	34,786	36,328	39,401	39,382
Open-hearth steel	3,000	3,500	7,000	9,050	21,490
All other steel, except Bessemer	7,740	13,714	6,353	12,607	10,306
Bessemer steel ingots	120,108	170,652	191,933	375,517	525,996
Blooms from ore and pig iron	58,000	62,564	61,670	49,243	44,628

PRODUCTION OF PIG IRON IN 1876.

The production of pig iron in the United States in 1876 was 2,093,236 net tons, against 2,266,581 tons in 1875, 2,689,413 tons in 1874, 2,868,278 tons in 1873, and 2,854,558 tons in 1872. The decrease in 1876, as compared with 1875, was 173,345 tons, or about 8 per cent. Since 1873, the year of greatest production, each year

has shown a decrease as compared with the preceding year, the percentage of decrease being as follows: 1874, 6 per cent.; 1875, 15 per cent.; 1876, 8 per cent. From 1873 to 1876 the decrease has been 775,042 tons, or 27 per cent. This is a very great shrinkage, and indicates, with concurrent low prices, a very great depression in the pig iron industry of the country. If the rate of decrease which marked the period from 1873 to 1876 were to be continued, the production of pig iron in the United States would entirely cease in 1884, less than eight years from the present time, and our furnace stacks would only be useful as observatories for the study of astronomy. But our pig iron industry is not destined to come to such an untimely end, for we see that the heavy percentage of decrease which had characterized the year 1875 was not continued in 1876—the decrease in the former year being 15 per cent., and in the latter year only 8 per cent. It seems plain, from a consideration of the relative decrease in these two years, that the mere production of pig iron commenced last year to rally from the effects of the panic of 1873, and this view is strengthened by reference to the statistics of the stocks of pig iron on hand and unsold at the close of the last three years, which will be found elsewhere in this report. At the close of 1874 these stocks amounted to 795,784 net tons; at the close of 1875 to 760,908 tons; and at the close of 1876 to 674,798 tons. A decrease in stocks at the close of last year, and the arrest in 1876 of the headlong decline in production which characterized 1875, are certainly strong symptoms of an early increase in the manufacture of American pig iron. We believe that we stand even now within the shadow of this increase. From information in our possession, and from a careful survey of the whole field embraced by the iron and allied industries of the country, we feel entirely safe in predicting that the production of pig iron in 1877 will be at least as great as it was in 1876. It is for the producers to decide whether it is wise to increase production at present prices.

Twenty-three States and the Territory of Utah made pig iron in 1876. Pennsylvania made almost one-half of the total product, namely, 1,009,613 net tons, or 48.2 per cent., slightly increasing its production over that of 1875, and largely increasing its percentage, which was 42.4 in that year. Ohio came next to Pennsylvania in 1876, making 403,277 tons, or 19.2 per cent., showing a slight decrease upon its production in 1875, but also a slight increase in its percentage, which was 18.3 in 1875. New York decreased its production from 266,431 tons in 1875 to 181,620 tons in

1876; New Jersey from 64,069 tons in 1875 to 25,349 tons in 1876; Massachusetts from 21,255 tons in 1875 to 5,040 tons in 1876; Maryland from 38,741 tons in 1875 to 19,876 tons in 1876; Virginia from 29,985 tons in 1875 to 13,046 tons in 1876; Kentucky from 48,339 tons in 1875 to 34,686 tons in 1876; Indiana from 22,081 tons in 1875 to 14,547 tons in 1876. A few other States show a slight decrease in 1876 upon their production in 1875. Of the States which followed the example of Pennsylvania by increasing their production, West Virginia increased from 25,277 tons in 1875 to 41,165 tons in 1876; Illinois from 49,762 tons in 1875 to 54,168 tons in 1876; and Missouri from 59,717 tons in 1875 to 68,223 tons in 1876.

The table which shows the production of pig iron in late years in leading districts will be found to possess some interesting features. The production of the Lehigh Valley has declined from 449,663 net tons in 1872 to 261,274 tons in 1876; that of the Schuylkill Valley from 232,225 tons in 1872 to 144,969 tons in 1876; that of the two Susquehanna valleys from 286,565 tons in 1872 to 182,586 tons in 1876. The Shenango and Mahoning valleys did not jointly or severally produce as much pig iron in 1876 as in 1872, but each district increased its production in 1876 over that of 1875—the Mahoning Valley in a marked degree. In the Hanging Rock district the production of coke pig iron almost doubled from 1872 to 1876, while the production of charcoal pig iron declined a little more than one-half in the same period.

Of the total production in 1876 of 2,093,236 net tons of pig iron, 990,009 tons were smelted with bituminous coal and coke; 794,578 tons with anthracite coal; and 308,649 tons with charcoal. The production of bituminous coal and coke pig iron first exceeded that of anthracite in 1875, and then by only 39,499 tons; but in 1876 anthracite fell 195,431 tons below its rival, and 113,468 tons below its own production in 1875. The production of bituminous pig iron was greater in 1876 than in 1872, and 42,464 tons greater in 1876 than in 1875. The production of charcoal pig iron has declined almost fifty per cent. from 1874 to 1876. In the latter year the production was 308,649 tons, against 576,557 tons in 1874, and 410,990 tons in 1875.

The whole number of completed furnaces in the country at the close of 1876, which were either active or capable of being transferred to the active list on short notice, was 714, against a similar total of 713 at the close of 1875. We are advised that 10 new furnaces were completed in 1876, and that 9 old furnaces were

abandoned. The greatest activity in the erection of new furnaces has been shown in the Hocking Valley, in Ohio, where several bituminous furnaces have been built since the beginning of 1876, while others are now in course of erection or definitely projected. Of the furnaces which were built in 1875 and blown in in 1876, we note the Centennial furnace of the Cambria Iron Company, 75 feet high by 20 feet at the bosh.

Of 714 completed furnaces at the close of 1876, 236 were in blast and 478 were out of blast. Of 713 furnaces at the close of 1875, 293 were in blast, and 420 were out of blast. The productive capacity of the furnaces of the country is at least twice the actual yield of either of the last two years.

PRODUCTION OF PIG IRON FROM 1854 TO 1876.

Below we present a table showing the growth of the various branches of the pig iron trade of the United States from 1854 to 1876, compiled from statistics procured by this Association. In this table the tons used are net tons.

YEARS.	Anthracite.	Charcoal.	Bituminous Coal and Coke.	Total.
1854	339,435	342,298	54,485	736,218
1855	381,866	339,922	62,390	784,178
1856	443,113	370,470	69,554	883,137
1857	390,385	330,321	77,451	798,157
1858	361,430	285,313	58,351	705,094
1859	471,745	284,041	84,841	840,627
1860	519,211	278,331	122,228	919,770
1861	409,229	195,278	127,037	731,544
1862	470,315	186,660	130,687	787,662
1863	577,638	212,005	157,961	947,604
1864	684,018	241,853	210,125	1,135,996
1865	479,558	262,342	189,682	931,582
1866	749,367	332,580	268,396	1,350,343
1867	798,638	344,341	318,647	1,461,626
1868	893,000	370,000	340,000	1,603,000
1869	971,150	392,150	553,341	1,916,641
1870	930,000	365,000	570,000	1,865,000
1871	956,608	385,000	570,000	1,911,608
1872	1,369,812	500,587	984,159	2,854,558
1873	1,312,754	577,620	977,904	2,868,278
1874	1,202,144	576,557	910,712	2,689,413
1875	908,046	410,990	947,545	2,266,581
1876	794,578	308,649	990,009	2,093,236

The following table gives the ascertained and estimated production of pig iron in the United States from 1810 to 1852, in gross tons of 2,240 pounds. We preserve the gross ton in this table because the figures contained in it have now become historical.

YEARS.	Pig Iron.	YEARS.	Pig Iron.	YEARS.	Pig Iron.
1810.....	54,000	1831.....	191,000	1847.....	800,000
1820.....	20,000	1832.....	200,000	1848.....	800,000
1828.....	130,000	1840.....	315,000	1849.....	650,000
1829.....	142,000	1842.....	215,000	1850.....	564,755
1830.....	165,000	1846.....	765,000	1852.....	500,000

PROBABLE CONSUMPTION OF PIG IRON IN LATE YEARS.

Below is a statement which approximately shows the consumption of pig iron in the United States in the last six years. In this calculation it has been assumed that the quantity of pig iron carried in stock has not greatly varied from year to year.

COMMERCIAL MOVEMENT.	1871. Net tons.	1872. Net tons.	1873. Net tons.	1874. Net tons.	1875. Net tons.	1876. Net tons.
Production	1,911,608	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236
Importation	245,535	295,967	154,708	61,165	66,457	83,072
Total supply	2,157,143	3,150,525	3,022,986	2,750,578	2,333,038	2,176,308
Exportation	2,330	1,477	10,103	16,039	8,738	3,805
Total consumption	2,154,813	3,149,048	3,012,883	2,734,539	2,324,300	2,172,503

The figures indicate that the consumption in 1876 was equal to that in 1871, the year which marked the beginning of the "iron famine." The changed condition since that year of the pig iron branch of the American iron trade is seen more in the fall in prices than in the decrease in production.

PRODUCTION OF ROLLED IRON IN 1876.

The total production of all kinds of rolled iron in the United States in 1876 was 1,921,730 net tons, against 1,890,379 tons in 1875, 1,839,560 tons in 1874, and 1,966,445 tons in 1873. As 1873 was the year of greatest production of rolled iron in this country, the steady maintenance in each of the succeeding years of a production only slightly less than the production of that year shows that our rolling-mills have been more actively employed than is generally supposed. The country rolled almost as much iron in 1876 as in 1873. Even the decline in the demand for American rails has not been so marked as to justify the prognostications of evil that have been uttered on every hand,—the difficulty here being that Bessemer rails have been largely substituted for iron rails, and not

that rails of any kind have not been wanted. The following table will show how evenly the production of rails has continued since 1872, when the production of 1,000,000 tons was achieved under an immense pressure from railway companies; and it will show also how the production of other forms of rolled iron has steadily and with great uniformity exceeded since 1872 the production of that year.

YEARS.	Rails. Net tons.	Other Rolled Iron. Net tons.	Total. Net tons.
1864	335,369	536,958	872,327
1865	336,292	500,048	836,340
1866	430,778	595,311	1,026,089
1867	462,108	579,838	1,041,946
1868	506,714	598,286	1,105,000
1869	593,586	642,420	1,236,006
1870	620,000	705,000	1,325,000
1871	775,733	710,000	1,485,733
1872	1,000,000	941,992	1,941,992
1873	890,077	1,076,368	1,966,445
1874	729,413	1,110,147	1,839,560
1875	792,512	1,097,867	1,890,379
1876	879,629	1,042,101	1,921,730

In speaking of the demand for rails, we do not overlook the fact, which will be referred to farther on, that the country laid down during the few years preceding the panic a large quantity of foreign rails in addition to the home supply. The point we make is that the demand for American rails and other rolled iron of American manufacture has not greatly declined since the panic.

It is again apparent that the difficulties under which the American iron trade has labored since the panic of 1873 relate more to prices than to the decrease in demand. We simply do not purchase abroad the large quantities of rails, bar iron, and pig iron that we once did; but of the home supply of these products we consume nearly as much as we ever did, except of pig iron in the exceptional years of 1872 and 1873.

PRODUCTION OF RAILS IN 1876.

Passing from a general statement of the rolled iron production of the country to the particulars of that production, we find that in 1876 there were rolled 879,629 net tons of rails, an increase of 87,117 tons, or 11 per cent., upon the make of 1875, which was 792,512 tons. Of the total production in 1876, there were 412,461 tons of Bessemer steel rails and 467,168 tons of iron rails, against 290,863 tons of Bessemer steel rails and 501,649 tons of iron rails

in 1875. The production of Bessemer steel rails almost overtook that of iron rails in 1876. Included in the above figures of the production of iron rails are a few tons of steel rails and steel-headed rails, not Bessemer. The production of rails of this class in late years has been as follows:—1873, 26,377 net tons; 1874, 17,181 tons; 1875, 19,436 tons; 1876, 12,791 tons.

The production of street rails in late years is included in the aggregates of iron and steel rails above given. The exact figures are as follows:—1873, 9,430 net tons; 1874, 6,739 tons, of which 1,000 tons were Bessemer steel; 1875, 16,340 tons, of which 2,308 tons were Bessemer steel; 1876, 13,086 tons, of which 3,563 tons were Bessemer steel.

Nineteen States and the Territory of Wyoming made rails in 1876, and the percentage of the whole product which each produced is as follows:—Pennsylvania, 40.24; Illinois, 20.63; Ohio, 11.46; New York, 6.52; Maryland, 2.14; Wisconsin, 2.41; Indiana, 3.34; Massachusetts, 1.03; Missouri, 2.38; Tennessee, 2.43; California, .98; Wyoming Territory, 1.40; Georgia, 1.02; Vermont, 1.05; Kentucky, .17; Kansas, 1.68; Maine, .85; New Jersey, .03; West Virginia, .06; Michigan, .18.

At the close of 1876 there were in twenty-five States and the Territory of Wyoming 338 rolling-mills, containing 4,488 single puddling furnaces, each double furnace being counted as two single furnaces. Of the whole number of mills, 260 were in operation during the whole or a part of the year. Of the whole number, 98 were built to make rails—60 heavy and 38 light rails; and of these, 40 heavy and 16 light rail mills—56 in all—made rails in 1876. The rolling-mill capacity of the country, like its blast furnace capacity, is at least double the production of 1876.

PRODUCTION OF RAILS FROM 1849 TO 1876.

The production of rails of all kinds in the United States from 1849 to 1876 has been as follows, in net tons:

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1849.....	24,318	1856.....	180,018	1863.....	275,768	1870.....	620,000
1850.....	44,083	1857.....	161,918	1864.....	335,369	1871.....	775,783
1851.....	50,603	1858.....	163,712	1865.....	356,292	1872.....	1,000,000
1852.....	62,478	1859.....	195,454	1866.....	430 778	1873.....	890,077
1853.....	87,864	1860.....	205,038	1867.....	462,108	1874.....	729,413
1854.....	108 016	1861.....	189,818	1868.....	506,714	1875.....	792,512
1855.....	138,674	1862.....	213,912	1869.....	593,586	1876.....	879,629

The following table shows the production in net tons of rails of all kinds in the United States from 1871 to 1876, arranged by States.

STATES in the order of their rail production in 1876.	1871.	1872.	1873.	1874.	1875.	1876.	Percentage of the whole product made in each State in 1876.
Pennsylvania	335,604	449,113	328,522	259,288	255,136	353,925	40.24
Illinois	91,178	107,496	135,102	125,103	188,248	181,490	20.63
Ohio	75,782	138,165	130,326	82,561	91,775	100,799	11.46
New York	87,022	86,518	59,764	46,979	82,960	57,306	6.52
Indiana	12,778	23,893	26,579	20,617	23,309	29,383	3.34
Tennessee	9,667	14,620	13,973	13,693	12,250	21,394	2.43
Wisconsin	28,774	37,284	39,495	29,680	28,403	21,280	2.41
Missouri	8,200	15,500	14,020	24,017	17,396	20,903	2.38
Maryland	44,941	30,533	42,356	48,008	30,619	18,844	2.14
Kansas	.....	.....	.....	2.000	5,000	14,707	1.68
Wyoming Territory	.....	.....	.....	.....	7,000	12,320	1.40
Vermont	.....	.....	6,088	10,400	6,204	9,183	1.05
Massachusetts	28 864	29,242	34,034	24,765	18,391	9,061	1.03
Georgia	7,840	6,930	8,275	8,061	6,500	9,000	1.02
California	.....	.....	475	7,016	8,073	8,629	.98
Maine	13,383	14,058	16,500	14,650	4,050	7,500	.85
Michigan	14,000	9 883	4,433	2,448	.....	1,600	.18
Kentucky	6,000	7,480	11,386	6,068	5,851	1,524	.17
West Virginia	5,000	20,100	4,000	522	406	538	.06
New Jersey	6,700	9,185	13,749	3,537	941	243	.03
Total	775,733	1,000,000	890,077	729,413	792,512	879,629	100.00

PRODUCTION OF CUT NAILS AND SPIKES IN 1876.

Sixty-four rolling-mills in thirteen States made cut nails and spikes in 1876. The number of machines contained in these mills was over 3,800, although the whole number were not employed. The total production of cut nails and spikes in 1876 was 4,157,814 kegs, against 4,726,881 in 1875, 4,912,180 in 1874, and 4,024,704 in 1873. The American keg of nails weighs 100 pounds: this we mention for the benefit of our foreign readers.

PRODUCTION OF BAR, ANGLE, BOLT, ROD, HOOP, PLATE, AND SHEET IRON IN 1876.

Having referred to the production of rails and nails, there remain of the total rolled iron product of the country the above-named specialties, and it is curious to observe how uniform their production has been during the past four years, the first year being the year of the panic and the year of greatest production of these forms of iron. In 1873 their production was 875,133 net tons; in 1874, 864,538 tons; in 1875, 861,524 tons; in 1876, 834,211 tons.

PROBABLE CONSUMPTION OF ROLLED IRON IN LATE YEARS.

The probable consumption of all rolled iron, except rails, from 1871 to 1876, is given in the following statement:

COMMERCIAL MOVEMENT.	1871. Net tons.	1872. Net tons.	1873. Net tons.	1874. Net tons.	1875. Net tons.	1876. Net tons.
Production	710 000	941,992	1,076,368	1,110,147	1,097,867	1,042,101
Importation	148,032	112,788	81,675	35,090	28,481	28,569
Total supply	858,032	1,054,780	1,158,043	1,145,237	1,126,348	1,070,670
Exportation	233	527	541	4,925	9,693	3,559
Total consumption	857,799	1,054,253	1,157,502	1,140,312	1,116,655	1,067,111

The following table will show the production, importation, and probable consumption of rails in the United States in the ten years from 1867 to 1876:

CALENDAR YEARS.	Made in United States. Net tons.	Imported. Net tons.	Probable Consumption. Net tons.
1867	462,108	163,049	625,157
1868	506,714	250,081	756,795
1869	593,586	313,163	906,749
1870	620,000	399,153	1,019,153
1871	775,733	Iron, 515,000 Steel, 50,701	1,341,434
1872	1,000,000	Iron, 381,064 Steel, 149,786	1,530,850
1873	890,077	Iron, 99,201 Steel, 159,571	1,148,849
1874	729,413	Iron, 7,796 Steel, 100,486	837,695
1875	792,512	Iron, 1,942 Steel, 16,316	810,770
1876	879,629	Iron, 287 Steel, None	879,916

PRODUCTION OF BESSEMER STEEL IN 1876.

Eleven Bessemer steel establishments were in operation in the United States in 1876, of which 5 were in Pennsylvania, 3 in Illinois, and one each in New York, Ohio, and Missouri. The Vulcan at St. Louis did not go into operation until September, 1876. Of the others it may be said that some of them, if not all, could have made a larger product than they did if orders had been more abundant. It is probable that the Bessemer product of 1877 will considerably exceed that of 1876. The number of net tons of pig iron and spiegeleisen converted by the Bessemer process in 1876 was 539,474, against 395,956 tons in 1875, and 204,352 tons in 1874. Of spiegeleisen alone there were used 45,980 net tons in 1876, against 33,245

tons in 1875. The number of net tons of Bessemer steel ingots produced in 1876 was 525,996, against 375,517 tons in 1875, and 191,933 tons in 1874. The number of net tons of Bessemer steel rails produced in 1876 was 412,461, against 290,863 tons in 1875, and 144,944 tons in 1874. In the ten years during which the Bessemer steel industry of this country may properly be said to have had an existence, there has been produced a total of 1,163,028 net tons of steel rails. It has really had a slow growth until within the last few years, but it is to-day a leading branch of the iron industry of the country. In 1876 it consumed one-fourth of the total pig iron product of that year, and produced more tons of steel rails than the country had produced of iron rails in any year prior to 1866. The number of Bessemer converters in use in 1876 was 22.

The number of net tons of spiegeleisen produced in this country in 1876 was 6,616, against 7,832 tons in 1875. W. P. Ward, of Cartersville, Georgia, made 100 net tons of ferro-manganese in 1876. The use of ferro-manganese in the Bessemer process is rapidly increasing in this country. If compelled by necessity, we could upon short notice make all our own spiegeleisen and ferro-manganese, as we have long made all our own Bessemer pig iron.

Full details of the Bessemer steel industry in this country for 1874, 1875, and 1876 are as follows:

DETAILS OF PRODUCTION.	1874. Net tons.	1875. Net tons.	1876. Net tons.
Pig iron and spiegeleisen converted	204,352	395,956	539,474
Ingots produced	191,933	375,517	525,996
Rails produced	144,944	290,863	412,461

As we have previously explained, the Bessemer steel produced which is not rolled into rails is used in various forms as a substitute for wrought iron or other kinds of steel. Every indication points to an increase of this use of Bessemer steel. The production of Bessemer steel rails in this country since 1867, when they were first made upon orders, has been as follows:

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1867	2,550	1871	38,250	1875	290,863
1868	7,225	1872	94,070	1876	412,461
1869	9,650	1873	129,015		
1870	34,000	1874	144,944	Total	1,163,028

PRODUCTION OF STEEL OTHER THAN BESSEMER IN 1876.

Forty-seven establishments made crucible, puddled, blister, and open-hearth steel in the United States in 1876. These establishments were located in New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Maryland, and Tennessee. There are also steel works in Rhode Island, Georgia, Kentucky, and Illinois, but they were not in operation last year.

The total production in 1876 of all the kinds of steel named above was 71,178 net tons, against 61,058 tons in 1875, and 49,681 tons in 1874. Of the product of 1876, 39,382 tons were crucible steel, 21,490 tons were open-hearth steel, and 10,306 tons were puddled and blister steel. The table below shows the production by States of the various kinds of steel in 1876.

DISTRICTS AND STATES Making Steel in 1876.	Crucible Steel. Net tons.	Puddled, Open-hearth, and Blister Steel. Net tons.	Total. Net tons.
New England	1,098	6,085	7,183
New York	2,300	139	2,439
New Jersey	6,806	652	7,458
Pennsylvania	28,217	15,148	43,365
Ohio	700	9,558	10,258
Maryland and Tennessee	261	214	475
Total	39,382	31,796	71,178

The production of open-hearth or Siemens-Martin steel made but slow progress in this country until 1872, when 3,000 net tons were produced. In 1873 the production amounted to only 3,500 tons; in 1874 it reached to 7,000 tons; in 1875 to 9,050 tons; and in 1876 it jumped to 21,490 tons, the product of ten establishments.

Below is a table showing, in net tons, the total production in this country of all kinds of steel other than Bessemer during the past twelve years.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1865	15,262	1869	23,000	1873	52,000
1866	18,973	1870	35,000	1874	49,681
1867	19,000	1871	37,000	1875	61,058
1868	21,500	1872	40,000	1876	71,178

PRODUCT OF FORGES AND BLOOMARIES IN 1876.

In the United States the above terms are often used interchangeably, but we have found it most convenient to adopt the New

York nomenclature, forges in that State embracing establishments which make iron direct from the ore. Necessarily this classification reverts all establishments which make blooms from pig and scrap iron to another class, and we have therefore designated them as bloomaries. Blooms and billets from ore are mainly made in the Champlain district of New York; blooms from pig and scrap iron mainly in Pennsylvania. The make of each product in the last four years is given below, in net tons.

KIND OF PRODUCT.	1873.	1874.	1875.	1876.
Blooms and billets from ore.....tons,	32,863	36,450	24,416	20,784
Blooms from pig and scrap iron..... "	29,701	25,220	24,827	23,844
Total.....tons,	62,564	61,670	49,243	44,628

The production of both products since 1865 has been as follows. The figures show a steady decline since 1868.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1865	63,977	1869	69,500	1873	62,564
1866	73,555	1870	62,259	1874	61,670
1867	73,073	1871	63,000	1875	49,243
1868	75,200	1872	58,000	1876	44,628

IMPORTS OF IRON ORE IN 1876.

The value of the iron ore imported into the United States in 1876 was much less than in some previous years, as will appear from the following table. The number of tons imported in any one year may be approximately ascertained by dividing the value of the imports for that year by two, the invoice value of all the ore that has been imported being about two dollars a ton.

Fiscal Years.	New York.	Boston.	Baltimore.	San F'nisco.	Lake Ports.	Philadelphia.	Other Ports.	Total.
1870	.....	.....	.....	.....	$34,439	.....	$165	$34,604
1871	$153	.....	.....	.....	66	.....	143	362
1872	2,116	.....	.....	.....	49,607	.....	1,590	53,313
1873	29,152	$1,434	.....	$385	92 856	.....	575	124,402
1874	21,544	173	$11,520	.....	105 167	.....	110	138,514
1875	16,253	.....	.....	.....	74,425	$53,896	85	146,659
1876	12,030	.....	.....	.....	32,446	7,692	673	52,841

IRON SHIPBUILDING IN THE UNITED STATES.

According to a statement recently placed at the disposal of the New York *Tribune* by the Register of the Treasury, there have been built in the United States, since 1866, for American owners, 251 iron vessels of all sizes, having a total measurement of 197,500 tons. About 150 were vessels of good size. They rank as follows:

Less than 100 tons	57	From 2,000 to 3,000 tons	9
From 100 to 500 tons	73	From 3,000 to 4,000 tons	8
From 500 to 1,000 tons	41	Over 5,000 tons	2
From 1,000 to 2,000 tons	61	Total	251

The following table exhibits the iron tonnage built in the United States in each fiscal year, ending June 30, since 1868, as reported to us by the Register of the Treasury. We have no report of the number of iron vessels built prior to 1871; only the tonnage is reported, but the figures quoted above from the New York *Tribune*, which cover the period from 1866 to 1876, are doubtless correct.

KIND OF VESSELS.	1868.	1869.	1870.	1871.		1872.		1873.		1874.		1875.		1876.	
	Tonnage.	Tonnage	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Sailing	None.	1 039	679	.....	2,067	.....	None.	.....	None.	.....	None.	.....	None.	.....	None.
Steam..	2,801	3,545	7,602	20	13,412	20	12,766	26	26,548	23	33,097	20	21,632	25	21,346
Total..	2,801	4,584	8,281	20	15,479	20	12,766	26	26,548	23	33,097	20	21,632	25	21 346

Of the 25 vessels built in the fiscal year 1876, 2 vessels, aggregating 139.78 tons, were built at Buffalo; 1 vessel, of 12.99 tons, was built at Burlington, New Jersey; 11 vessels, aggregating 11,980.94 tons, within the jurisdiction of the port of Philadelphia; 9 vessels, aggregating 8,298.08 tons, in the State of Delaware; and 2 vessels, aggregating 915.12 tons, at New Orleans. At the present time there are building, or under contract, on the Delaware river, 9 large iron steamships of the best class, ranging from 1,800 to 2,500 tons burden, including two monitors for the United States government, besides a number of powerful iron tugs of 200 or 300 tons burden, and other small craft.

Much is said in these days of the necessity of reviving American commerce, and the sentiment has our hearty sympathy; but we do not sympathize with the false conclusion that, because our commerce

is in need of revival, we must therefore buy foreign ships. Ships which are fit to plow the ocean, whether of iron or wood, are built as cheaply in this country as abroad; but if they were not, it is poor policy to refuse employment to our own mechanics because they and their families are not accustomed to the hard fare and squalid surroundings of foreign mechanics. What is wanted to revive American commerce is not the admission to American register of foreign-built ships, but it is the generous aid of the United States government in establishing direct communication between the leading seaports of this country and the seaports of other countries. Thus did England build up her commerce, and thus does she maintain it. For want of this encouragement American commerce has languished, and still languishes. If our government will be but as wise and paternal as our great rival, the enterprise and the resources of the American people may be relied upon to supply whatever additional help may be needed to restore to our commerce its former pre-eminence and to open new markets to our agricultural and manufactured products.

UNITED STATES RAILWAY STATISTICS FOR 1876 AND PREVIOUS YEARS.

We reproduce below, from Poor's *Manual of the Railroads of the United States*, the following table of the progress of railway construction in this country from the year 1830, when the first 23 miles were completed. From advance statistics furnished us through the courtesy of Mr. Poor, we are enabled to bring this table down to January 1, 1877, thus embracing the construction of 1876.

YEARS.	Miles in Operat'n.	Annual Incr'se of Mileage.	YEARS.	Miles in Operat'n.	Annual Incr'se of Mileage.	YEARS.	Miles in Operat'n.	Annual Incr'se of Mileage.
1830.....	23	.....	1846.....	4 930	297	1862.....	32,120	834
1831.....	95	72	1847.....	5,598	668	18 3.....	33 170	1,050
1832.....	229	134	1848.....	5,996	398	1864.....	33 908	738
1833.....	380	151	1849.....	7,865	1,369	1865.....	35 085	1,177
1834.....	633	253	1850.....	9 021	1,656	1866.....	36,827	1,742
1835.....	1,098	465	1851.....	10.982	1 961	1867.....	39,276	2 449
1836.....	1,273	175	1852.....	12,908	1,926	1868.....	42,255	2,979
1837.....	1,497	224	1853.....	15,360	2,452	1869.....	47,208	4,953
1838.....	1,913	416	1854.....	16,720	1,360	1870.....	52,?98	5,690
1839.....	2,302	389	1855.....	18,374	1,654	1871.....	60,568	7,670
1840.....	2,818	516	1856.....	22,016	3,642	1872.....	66,735	6,167
1841.....	3,535	717	1857.....	24,503	2,487	1873.....	70 840	4,105
1842.....	4 026	491	1858.....	26,968	2 465	1874.....	72,741	1,901
1843.....	4,185	159	1859.....	28 789	1,821	1875.....	74 658	1,917
1844.....	4,377	192	1860.....	30,645	1,846	1876.....	77,514	2,856
1845.....	4,633	256	1861.....	31,286	651	.....	.....	.....

The increase in the number of miles constructed in 1876 over the increase in the two preceding years is quite marked, and shows that the lowest point of depression in railway construction in this country was reached in 1875. The revival in railway building commenced in the latter half of 1875. Of the railway mileage of 1876, nearly one-fourth was narrow gauge. At the close of 1876 the country had one mile of railroad for about every 575 inhabitants.

The editors of the New York *Railroad Gazette* make the following comments concerning the progress made in railway construction in 1876:—"In one particular the work of 1876 was much like that of 1875; to a very great extent it consisted of the construction of local lines of no great length. There were, however, a greater number of long lines built than in 1875, and the average mileage is greater than for two years previous. The chief lines now in progress which may construct a considerable mileage during the current year are the Cincinnati Southern, which will almost certainly complete its line to Chattanooga, across Kentucky and Tennessee; the Southern Pacific, which will probably reach the Colorado at an early day, and perhaps make a considerable advance into Arizona; and the Texas Pacific, which will probably do something under any circumstances, and if it gets the government aid which it asks will doubtless do a great deal."

The figures given in Mr. Poor's table denote the length of the railroad lines in the country, without regard to the number of tracks or miles of sidings constructed. He estimates that there are no less than 16,300 miles of railroad in double, treble, and quadruple tracks, sidings, etc., which would make the total length of single track equal to 93,814 miles on the 1st of January, 1877.

IMPORTS AND EXPORTS OF IRON AND STEEL IN 1876.

The tables of American imports and exports of iron and steel during 1876 and a few previous years will be found elsewhere in this report. During the year ended December 31, 1876, we imported iron and steel products aggregating $10,584,126 in value, against $15,264,131 in 1875, $24,578,638 in 1874, $45,764,670 in 1873, $61,724,227 in 1872, and $47,919,926 in 1871. Tin plate is not included in these figures. In the year ended December 31, 1876, we exported iron and steel products of domestic manufacture aggregating $15,997,643 in value, against $20,417,635 in 1875, $20,458,732 in 1874, $16,687,754 in 1873, $14,360,617 in 1872, and $15,206,179 in

1871. The decline in our imports since 1872 has been very great, but our exports have practically remained stationary during the past six years. The hopes that have been indulged by many persons that this country would soon enjoy a large export trade in iron and steel products have not been realized, and the principal reason why they have not been realized is due to the fact that other leading iron-producing countries still manufacture the coarser forms of iron and steel cheaper than we do. But there are other forms of iron and steel that we could introduce more largely than we do into foreign markets in successful competition with foreign manufacturers, and we repeat the remark we have heretofore made, that the way to extend our markets and increase our sales abroad is to display more commercial enterprise and tact than has been customary with American iron and steel manufacturers. They did not turn to best account the advantages presented by the Philadelphia Exhibition for increasing their foreign trade; they should not neglect similar advantages which will be afforded them by other exhibitions in foreign countries. And they should not be so slow as they have been to cooperate with others in endeavoring to impress upon the government the necessity of assisting its citizens to establish lines of steamers or sailing vessels between this country and such other countries as would be likely to buy our surplus iron and steel and other products.

During the year 1876 we did not import a single steel rail; in 1873 we imported 159,571 net tons. Our imports of iron rails in 1876 amounted to only 287 tons; in 1871 they amounted to 515,000 tons. While these results are gratifying, it is nevertheless a source of mortification that we should last year have bought abroad ten million dollars' worth of pig iron, bar iron, steel, etc., which our own iron and steel makers could have manufactured with the help of idle workingmen. So long as it is possible to import into this country ten million dollars' worth of foreign iron and steel in a year of such great industrial depression as last year, so long will a Protective tariff be a necessity to American iron and steel interests, and to every American citizen whose prosperity does not depend upon the sale of foreign goods.

PRICES OF IRON IN THE UNITED STATES FROM 1873 TO 1876.

Elsewhere in this report we have referred to the fact that the consumption of American iron has not greatly decreased since the commencement of the panic of 1873. This fact is, as is well known, not

significant of even moderate prosperity to the American iron trade in the time which has intervened, but it is significant of the vast quantity of iron and steel which this country will always require, even in periods of great depression, and it is also significant of the willingness and ability of American ironmasters to supply this demand at prices graduated to the means of consumers. In the period covered by the panic of 1873, consumers of iron and steel have been able to obtain all the iron and steel they needed at prices with which they have not at any time found fault. The industries of the country which have been dependent upon or closely related to our iron industry have not therefore been interrupted nor impeded by a scarcity of iron and steel, or by exorbitant prices demanded for them. Our railway companies, the builders of our cars and locomotives, the builders of our iron ships, the towns and cities requiring water and gas pipe, the builders and purchasers of iron bridges, our machinists, foundrymen, stove-makers, agricultural-implement makers, house-builders, blacksmiths, and all the other interests which require a cheap and abundant supply of iron and steel have been helped and not hindered since the panic by American iron and steel manufacturers. If our iron and steel industries had not been sustained by judicious legislation; if the supply of our iron and steel necessities had been committed to foreign manufacturers and the few domestic manufacturers who could possibly have competed with their foreign rivals, a blind man can see that neither iron nor steel could have been so cheap in this country since the panic as they have been, nor probably would their quality have been so good. The beneficial influence upon all the industries of the country of an abundant supply of good iron and good steel at low prices since the panic is incalculable, and we hazard nothing in saying that to this cause alone is due that mitigation of the effects of the panic which has saved a hundred of the leading industries of the country from utter stagnation and thousands of our countrymen from want and despair. Even the great improvement in our foreign trade during the last two or three years, upon which our statesmen and political economists build so many hopes of an early and permanent restoration of prosperity to the whole country, is largely due to the efforts which American ironmasters have made to increase and cheapen the supply to our railroads of iron and steel rails, locomotives, car wheels, etc., thus enabling these roads to transport at low rates to the seaboard the products of Western farms and other fruits of American industry and skill. We may carry this thought farther and allege

what no man will dare gainsay that many of our leading lines of railroad have been saved from bankruptcy and ruin, and the country has been saved from resultant disasters, by the cheapness with which these roads have been able to buy iron and steel rails, locomotives, car wheels, and other supplies, of American manufacture.

The following tables show the decline which has taken place in the prices of four leading products of our iron industry during the past four years, which embrace the period immediately preceding the panic of September 19, 1873, and extending to the present time. The ton quoted is the gross ton of 2,240 pounds.

MONTHS.	No. 1 Anthracite Foundry Pig Iron at Philadelphia.				Refined Bar Iron at Philadelphia.			
	1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.	1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.
January	$45.16	$32.00	$25.66	$23.25	$96.32	$73.92	$62.72	$56.00
February	48.00	32.00	26.50	23.00	94.08	73.92	60.48	52.64
March	48.37	32.00	27.00	23.00	96.32	71.68	62.72	52.64
April	47.75	32.00	27.00	22.75	94.08	71.68	62.72	52.64
May	46.00	31.50	26.00	22.00	94.08	67.20	62.72	52.64
June	45.00	31.50	26.00	22.00	91.84	67.20	62.72	52.64
July	43.75	31.50	26.00	22.00	85.12	62.72	62.72	52.64
August	43.50	31.00	26.00	22.00	82.88	67.20	60.48	52.64
September	42.80	29.50	25.00	21.75	80.64	67.20	60.48	50.40
October	38.00	29.00	24.00	21.75	76.16	67.20	60.48	50.40
November	33.00	26.25	23.75	21.50	73.92	62.72	56.00	50.40
December	32.50	24.00	23.50	21.25	71.68	62.72	56.00	49.28

MONTHS.	Bessemer Steel Rails at Works.				Best Iron Rails at Philadelphia.			
	1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.	1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.
January	$121.00	$117.50	$71.00	$67.00	$83.33	$66.00	$50.00	$43.50
February	120.00	117.50	71.00	65.00	83.00	64.00	50.00	43.00
March	122.50	115.00	71.00	62.00	83.00	62.00	50.00	42.50
April	120.25	98.66	69.00	62.00	82.00	60.00	49.00	42.00
May	120.00	98.33	69.00	62.00	80.00	60.00	49.00	42.00
June	121.75	96.25	69.00	60.00	78.00	60.00	49.00	41.00
July	121.75	91.00	69.00	59.00	76.00	60.00	48.50	41.00
August	121.75	89.25	69.00	59.00	75.00	58.00	47.00	41.00
September	118.00	78.25	69.00	56.00	75.00	58.00	46.50	40.00
October	120.00	78.25	67.00	54.00	70.00	55.00	46.00	40.00
November	120.00	75.86	66.00	53.00	68.00	52.00	45.50	39.50
December	120.00	75.66	65.00	52.00	66.00	50.00	43.75	39.00

In May, 1877, the price of No. 1 anthracite foundry pig iron had still further declined to $18.50 at Philadelphia, and the price of refined bar iron in the same market to $44.80. In May, 1877, the price of best iron rails had fallen to $37 at Philadelphia, and the price of Bessemer rails at the works to $48 and $49. These are as low prices as the country has ever known.

There is a lesson told by the foregoing tables of prices which ought not to be overlooked by those who make the laws of this country, and we hope that it will not be. It is this: the manufacturers who have made such great sacrifices as are here shown, and the large numbers of under-paid workingmen who have shared in these sacrifices, deserve friendly and not unfriendly consideration. The legislator, or the college professor, or the schoolmaster, or the hired attorney, or the trader who owes allegiance to no country but lives among us, or the cabinet minister, who would take one step that would render more difficult the task of these manufacturers, and more grievous the burdens of these workingmen, is not wise. Now that all our industries are in such great need of a healthy revival of old-time activity and prosperity, it should be the policy of all good men to let them alone, and not to handicap them by extending encouragement to foreign manufacturers to enter our markets.

IMMIGRATION INTO THE UNITED STATES FROM 1861 TO 1876.

The statistics of immigration into the United States during the past sixteen years are given below, compiled from the reports of the National Bureau of Statistics. It will be observed that there has been a steady decrease in the number of immigrants arriving in this country since 1872.

Calendar Years.	Number of Immigrants.	Calendar Years.	Number of Immigrants.	Calendar Years.	Number of Immigrants.
1861	89,720	1867	293,601	1873	422,545
1862	89,005	1868	289,145	1874	260,814
1863	174,523	1869	385,287	1875	191,231
1864	193,191	1870	356,303	1876	157,440
1865	248,394	1871	346,938		
1866	314,840	1872	437,750		

Of the immigrants arriving in 1876, England sent us 21,051; Ireland, 16,506; Scotland, 4,383; Wales, 294; Germany, 31,323; Austria, 6,047; Hungary, 475; Sweden, 5,204; Norway, 6,031; Denmark, 1,624; Netherlands, 709; Belgium, 454; Switzerland, 1,572; France, 6,723; Italy, 2,980; Spain, 597; Portugal, 816; Russia, 6,787 (principally Mennonites of German origin); Poland, 854; China, 16,879; Quebec, 15,545; Nova Scotia, 3,200; other British-American Provinces, 2,473; Mexico, 532; Cuba, 880; Bahamas, 559; other West India Islands, 115; Australasia, 1,261: the remainder came from other countries.

Early in the present year emigration agents from Australia offered at New York extraordinary inducements to skilled mechanics and others to emigrate to that country. As a consequence, between February 3d and April 14th, 603 emigrants sailed from New York for Sydney, New South Wales. Of these, 355 sailed on the last-named date, of whom there were 86 Americans, 110 English, 10 Scotch, 113 Irish, 5 Germans, 5 Swedes, 2 French, 1 Italian, 2 Poles, 20 Canadians, and 1 Maltese. This movement is not likely to be continued, as it is understood that the emigrants from our shores are not pleased with their Australian prospects.

It should be remembered that many foreigners who come to this country, expecting to find homes here, eventually return to the land of their birth and there remain. The number of those who thus return is not definitely known. It is supposed to have been larger in the last three years than in preceding years.

THE LAKE SUPERIOR IRON DISTRICT.

The following is a statement in gross tons of the aggregate yield of the mines and furnaces of the Lake Superior district from 1856 to 1876, inclusive, together with the value of the same, compiled by the editor of the Marquette *Mining Journal*, and specially revised by him for this report.

Years.	Iron Ore.	Pig Iron.	Ore and Pig Iron.	Value.
1856	7,000	.....	7,000	$28,000
1857	21,000	.....	21,000	63,000
1858	31,035	1,629	32,664	249,202
1859	65,679	7,258	72,937	575,529
1860	116,908	5,660	122,568	736,496
1861	45,430	7,970	53,400	419,501
1862	115,721	8,590	124,311	984,977
1863	185,257	9,813	195,070	1,416,935
1864	235,123	13,832	248,955	1,867,215
1865	196,256	12,283	208,539	1,590,430
1866	296,972	18,437	315,409	2,405,960
1867	466,076	30,911	496,987	3,475,820
1868	507,813	38,246	546,059	3,992,413
1869	633,238	39,003	672,241	4,968,435
1870	856,471	49,298	905,769	6,300,170
1871	813,379	51,225	864,604	6,115,895
1872	952,055	63,195	1,015,250	9,188,055
1873	1,167,379	71,507	1,238,886	11,395,887
1874	935,488	90,494	1,025,982	7,592,811
1875	910,840	81,753	992,593	5,788,763
1876	977,233	61,911	1,039,144	5,397,785
Total	9,536,353	663,015	10,199,368	$74,553,279

First-class specular ore sold at Cleveland, in 1876, at about $7.

IRON AND STEEL PRODUCT OF PITTSBURGH AND ALLEGHENY COUNTY, PENNSYLVANIA, IN 1874, 1875, AND 1876.

YEARS.	Number of Rolling Mills.	Product of Rails, Bar, Angle, Bolt, Rod, and Hoop. Net tons.	Product of Sheet and Plate. Net tons.	Product of Nails. Kegs of 100 pounds.	Total Rolled Iron, including Nails. Net tons.
1874	31	194,114	52,361	562,995	274,625
1875	32	177,733	45,773	442,359	245,624
1876	32	225,604	31,488	538,874	284,036

YEARS.	Number of blast furnaces.	Make of Pig Iron. Net tons.	Number of Steel Works.	Make of Crucible Steel. Net tons.	Make of Blister, German, and Open-hearth Steel. Net tons.	Total make of Steel. Net tons.
1874	11	143,660	10*	17,915	6,000	23,915
1875	11	131,856	13*	22,942	6,860	29,802
1876	11	128,555	13*	25,009	7,302	32,311

* Bessemer steel not included, but four of these works are also iron rolling-mills.

OUR FOREIGN COMMERCE SINCE 1861.

The marked improvement in the foreign commerce of the United States during the past few years, and especially in the fiscal years 1876 and 1877, is believed to be of sufficient importance to warrant a reference to it in this report. The following table has been compiled from the reports of the National Bureau of Statistics, and shows the gold value of our total imports and exports of merchandise and specie for sixteen years and nine months, beginning with June 30, 1860, and ending with March 31, 1877. By net imports is meant commodities retained in the country for consumption; merchandise and specie imported and then exported not being noted.

FISCAL YEARS ENDED JUNE 30.	NET IMPORTS. *Gold Value.*		DOMESTIC EXPORTS. *Gold Value.*	
	Merchandise.	Specie.	Merchandise.	Specie.
1861	$274,656,325	$40,348,401	$204,899,616	$23,799,870
1862	178,330,200	10,572,063	179,644,024	31,044,651
1863	225,375,280	1,421,056	186,003,912	55,993,562
1864	301,113,322	8,192,633	143,504,027	100,473,562
1865	209,656,525	6,784,970	136,940,248	64,618,124
1866	423,470,648	7,209,395	337,518,102	82,643,374
1867	381,043,768	16,178,299	277,641,893	54,976,196
1868	344,873,435	4,150,247	269,389,900	83,745,975
1869	406,555,379	5,585,462	275,166,697	42,915,966
1870	419,803,113	12,147,315	376,616,473	43,883,802
1871	505,802,414	7,231,395	428,398,908	84,403,359
1872	610,904,622	6,664,395	428,487,131	72,798,240
1873	624,689,727	10,777,909	505,033,439	73,905,546
1874	550,556,723	21,524,187	569,433,421	59,699,686
1875	518,846,825	12,625,704	499,284,100	83,857,129
1876	439,471,155	15,936,681	525,582,247	50,038,691
1877 (nine months)	304,999,762	29,593,940	460,361,331	24,331,000

NOTE.—The Canadian reports of imports into Canada from the United States indicate that in addition to the above "Domestic Exports" there were exported in 1874 merchandise of the gold value of $10,200,059; in 1875 merchandise of the gold value of $15,596,524; and in 1876 merchandise of the gold value of $10,507,563.

TOTAL PRODUCTION OF PIG IRON IN 1872, 1873, 1874, 1875, AND 1876, BY STATES.

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES.	Whole Number Completed Furnaces, December 31.				Condition of Furnaces on December 31, 1876.		Make of Pig Iron in net tons. (Tons of 2,000 pounds.)				
	1873	1874	1875	1876	In.	Out.	1872.	1873.	1874.	1875.	1876.
Maine	1	1	1	1	1	.....	.....	780	1,661	2,046	3,002
Vermont	2	2	2	2	.....	2	2,000	3,100	3,450	2,400	550
Massachusetts	6	6	6	6	1	5	17,070	21,136	27,991	21,255	5,040
Connecticut	10	10	10	10	4	6	22,700	26,977	14,518	10,880	10,160
New York	53	58	57	57	23	34	291,155	296,818	326,721	266,431	181,620
New Jersey	16	17	18	18	4	14	103,858	102,341	90,150	64,069	25,349
Pennsylvania	262	266	278	279	113	166	1,401,497	1,389,573	1,213,133	960,884	1,009,613
Maryland	22	23	24	24	5	19	63,031	55,986	54,556	38,741	19,876
Virginia	35	38	34	33	6	27	21,445	26,475	29,451	29,985	13,046
North Carolina	8	8	8	8	.....	8	1,073	1,432	1,340	800	400
Georgia	8	10	12	11	2	9	2,945	7,501	9,786	16,508	10,518
Alabama	11	14	14	13	5	8	12,512	22,283	32,863	25,108	24,732
Texas	1	1	1	1	.....	1	619	280	1,012	.....	426
West Virginia	6	9	12	12	1	11	20,796	23,056	30,134	25,277	41,165
Kentucky	25	27	23	23	4	19	67,396	69,889	61,227	48,339	34,686
Tennessee	20	22	22	24	5	19	42,454	43 134	48,770	28,311	24,585
Ohio	88	93	100	100	38	62	399,743	406,029	425,001	415,893	403,277
Indiana	8	8	9	9	3	6	39,221	32,486	13,732	22,081	14 547
Illinois	10	10	12	12	3	9	78,627	55,796	37,946	49,762	54,168
Michigan	33	34	34	34	7	27	100,222	123 596	136,662	114,805	95,177
Wisconsin	13	14	14	14	5	9	65,036	74,148	50,792	62,139	51,261
Missouri	18	19	19	19	6	13	101,158	85,552	75,817	59,717	68,223
Oregon	1	1	1	1	.....	1	.....	.....	2,500	1,000	1,750
Utah	.....	1	1	2	.....	2	.....	.....	200	150	65
Minnesota	.....	1	1	1	.....	1	.....	.....	.....	.....	.....
Total	657	693	713	714	236	478	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236
ANTHRACITE.											
Massachusetts	1	1	1	1	.....	1	4,250	5,432	10,214	11,140	.....
New York	36	41	41	41	18	23	271,343	267,489	298,428	254,935	173,535
New Jersey	16	17	18	18	4	14	103,858	102,341	90,150	64,069	25,349
Pennsylvania	149	152	161	164	62	102	968,453	913,085	775,008	554,992	588,829
Maryland	4	5	3	3	1	2	21,908	20,407	22,344	15,840	6,013
Virginia	1	1	1	1	.....	1	.....	4,000	6,000	7,070	852
Total	207	217	225	228	85	143	1,369,812	1,312,754	1,202,144	908,046	794,578
BITUMINOUS COAL AND COKE.											
Pennsylvania	74	75	78	76	35	41	388,011	430,634	397,147	371,401	397,685
Maryland	4	4	6	6	.....	6	12,079	5,264	7,209	1.751	.....
Virginia	.....	.....	5	5	1	4	.....	.....	.....	7,519	4,844
North Carolina	.....	.....	1	1	.....	1	.....	.....	.....	.....	.....
Georgia	1	1	3	3	1	2	.....	.....	5,516	12,685	10,018
Alabama	.....	.....	2	2	1	1	.....	.....	.....	.....	1,415
West Virginia	2	5	6	6	1	5	19,846	21,106	26,734	24,177	40,865
Kentucky	3	4	4	4	2	2	27,697	27,670	24,583	26,060	17,472
Tennessee	3	4	4	4	2	2	8,360	8,602	11,543	10,300	14,517
Ohio	51	56	63	63	27	36	304,121	305,531	332,166	353,922	354,346
Indiana	7	7	8	8	2	6	39,221	32,486	11,632	20,381	12,869
Illinois	10	10	12	12	3	9	78,627	55,796	37,946	49,762	54,168
Michigan	4	4	4	4	1	3	13,382	9,531	7,693	13,000	12,700
Wisconsin	3	3	3	3	0	3	37,246	35,268	21,819	36,656	25,000
Missouri	9	8	8	8	2	6	55,569	46,016	26,724	19,931	44,110
Utah	.....	.....	.....	1	0	1	.....	.....	.....	.....	.....
Total	171	181	207	206	78	128	984,159	977,904	910,712	947,545	990,009

PRODUCTION OF PIG IRON IN 1872, 1873, 1874, 1875, AND 1876.—*Continued.*

CHARCOAL.

STATES.	Whole Number Completed Furnaces, December 31.				Condition of Furnaces on December 31, 1876.		Make of Pig Iron in net tons. (Tons of 2,000 pounds.)				
	1873.	1874.	1875.	1876.	In.	Out.	1872.	1873.	1874.	1875.	1876.
Maine	1	1	1	1	1	.....	.....	780	1,661	2,046	3,002
Vermont	2	2	2	2	.....	2	2,000	3,100	3,450	2,400	550
Massachusetts	5	5	5	5	1	4	12,820	15,704	17 777	10,115	5,040
Connecticut	10	10	10	10	4	6	22,700	26,977	14,518	10,880	10,160
New York	17	17	16	16	5	11	19,812	29 329	28,293	11,496	8,085
Pennsylvania	39	39	39	39	16	23	45,033	45,854	40,978	34,491	23,099
Maryland	14	14	15	15	4	11	29,044	30,315	25,003	21,150	13,863
Virginia	34	37	28	27	5	22	21,445	22,475	23,451	15,396	7,350
North Carolina	8	8	7	7	.....	7	1,073	1,432	1,340	800	400
Georgia	7	9	9	8	1	7	2,945	7,501	4,270	3 823	500
Alabama	11	14	12	11	4	7	12,512	22,283	32,863	25,108	23,317
Texas	1	1	1	1	.....	1	619	280	1,012	....	426
West Virginia	4	4	6	6	.....	6	950	1,950	3,400	1,100	300
Kentucky	22	23	19	19	2	17	39,699	42,219	36,644	22,279	17,214
Tennessee	17	18	18	20	3	17	34,094	34,532	37,227	18,011	10,068
Ohio	37	37	37	37	11	26	95,622	100,498	92,835	61,971	48,931
Indiana	1	1	1	1	1	.....	.....	.....	2,100	1,700	1,678
Michigan	29	30	30	30	6	24	86,840	113,975	128,969	101,805	82,477
Wisconsin	10	11	11	11	5	6	27,790	38,880	28,973	25,483	26 261
Missouri	9	11	11	11	4	7	45,589	39,536	49,093	39,786	24,113
Oregon	1	1	1	1	.....	1	.....	.....	2,500	1,000	1,750
Utah	.....	1	1	1	.....	1	.....	.....	200	150	65
Minnesota	.....	1	1	1	.....	1	.....	.....	.....	.....	.....
Total	279	295	281	280	73	207	500,587	577,620	576,557	410,990	308 649

RECAPITULATION.

KINDS OF PIG IRON.	Whole Number Completed Furnaces, December 31.				Condition of Furnaces on December 31, 1876.		Make of Pig Iron in net tons. (Tons of 2,000 pounds.)				
	1873.	1874.	1875.	1876.	In.	Out.	1872.	1873.	1874.	1875.	1876.
Anthracite	207	217	225	228	85	143	1,369,812	1,312 754	1,202,144	908,046	794 578
Charcoal	279	295	281	280	73	207	500,587	577,620	576,557	410,990	308,649
Bituminous coal and coke	171	181	207	206	78	128	984,159	977,904	910,712	947,545	990,009
Total	657	693	713	714	236	478	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236

PRODUCTION OF PIG IRON IN CERTAIN DISTRICTS.

Pennsylvania.											
Lehigh Valley	47	47	50	51	24	27	449,663	389,969	316,789	280,360	261,274
Schuylkill Valley	40	43	50	50	14	36	232,225	236,409	232,420	123,184	144,969
Upper Susquehanna	25	25	25	26	6	20	127,260	129.304	88,243	71,731	79,217
Lower Susquehanna	37	37	36	37	18	19	159,305	157,403	137,556	79,717	103,369
Shenango Valley	31	32	32	30	12	18	160,188	160,831	156,419	137,025	138,495
Pittsburgh and Allegheny County	11	11	11	11	5	6	110,599	153,789	143,660	131,856	128,555
Miscellaneous coke	32	32	35	35	18	17	117,224	111,014	97,068	102,520	130,635
Ohio.											
Hanging Rock coke	7	10	15	15	4	11	23,169	28,601	26,015	36,899	44,260
Mahoning Valley	22	22	22	20	8	12	152,756	136,972	121,403	115,993	137,546
Hocking Valley	.....	.....	1	4	2	2	.....	.....	.....	1,250	7,483
Miscellaneous coke	22	24	25	24	13	11	128,196	139,958	184,748	199,780	165,057
Hanging Rock charcoal	33	34	34	34	10	24	87,440	92,365	85,873	57,413	42,822
Miscellaneous charcoal	4	3	3	3	1	2	8,182	8,133	6,962	4,558	6,109

STOCK OF PIG IRON, UNSOLD, DECEMBER 31, 1874, DECEMBER 31, 1875, AND DECEMBER 31, 1876.

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES AND DISTRICTS.	Anthracite.—Net tons.			Bituminous Coal and Coke.—Net tons.			Charcoal.—Net tons.			Total.—Net tons.		
	1874.	1875.	1876.	1874.	1875.	1876.	1874.	1875.	1876.	1874.	1875.	1876.
New England and New York	101,096	81,052	70,227	.....	.....	.....	37,128	43,455	31,397	138,224	124,507	101,624
New Jersey	37,959	26,095	1,742	.....	.....	.....	.....	.....	.....	37,959	26,095	1,742
Pennsylvania. Lehigh Valley	28,791	50,878	47,000	.....	.....	.....	.....	.....	.....	28,791	50,878	47,000
Pennsylvania. Schuylkill Valley	40,787	79,155	99,876	.....	.....	.....	.....	.....	.....	40,787	79,155	99,876
Pennsylvania. Upper Susquehanna	12,868	13,980	29,566	.....	.....	.....	.....	.....	.....	12,868	13,980	29,566
Pennsylvania. Lower Susquehanna	22,990	19,163	18,953	.....	.....	.....	.....	.....	.....	22,990	19,163	18,953
Pennsylvania. Shenango Valley	.....	.....	.....	87,650	35,097	27,443	.....	.....	.....	87,650	35,097	27,443
Pennsylvania. Allegheny County	.....	.....	.....	12,230	4,920	4,000	.....	.....	.....	12,230	4,920	4,000
Pennsylvania. Miscellaneous bituminous	.....	.....	.....	15,591	21,323	30,018	.....	.....	.....	15,591	21,323	30,018
Pennsylvania. Charcoal	.....	.....	.....	.....	.....	.....	21,533	22,392	14,843	21,533	22,392	14,843
Total for Pennsylvania	105,436	163,176	195,395	115,471	61,340	61,461	21,533	22,392	14,843	242,440	246,908	271,699
Maryland	4,497	4,183	758	3,853	256	.....	7,608	9,326	5,559	15,958	13,767	6,317
Virginia, Georgia, Alabama, and Texas	.....	235	.....	3,989	3,331	4,300	35,053	30,504	27,830	39,042	34,070	32,130
West Virginia	.....	.....	.....	5,601	300	2,200	3,370	3,100	1,257	8,971	3,400	3,457
Kentucky	.....	.....	.....	8,080	11,295	10,614	24,912	16,295	7,875	32,992	27,590	18,489
Tennessee	.....	.....	.....	2,781	2,000	991	24,985	17,559	12,385	27,766	19,559	13,376
Ohio. Hanging Rock	.....	.....	.....	11,450	17,523	13,324	58,297	53,882	45,910	69,747	71,405	59,234
Ohio. Mahoning Valley	.....	.....	.....	25,777	14,611	25,697	.....	.....	.....	25,777	14,611	25,697
Ohio. Miscellaneous	.....	.....	.....	11,952	31,828	42,991	10,608	10,189	11,832	22,560	42,017	54,823
Total for Ohio	.....	.....	.....	49,179	63,962	82,012	68,905	64,071	57,742	118,084	128,033	139,754
Michigan and Indiana	.....	.....	.....	8,796	7,181	1,000	57,891	51,367	24,055	66,687	58,548	25,055
Illinois	.....	.....	.....	7,229	5,816	4,746	.....	.....	.....	7,229	5,816	4,746
Wisconsin	.....	.....	.....	.....	1,639	1,000	9,138	8,753	8,256	9,138	10,392	9,256
Missouri	.....	.....	.....	11,500	8,362	5,978	39,794	53,407	40,635	51,294	61,769	46,613
Pacific States and Territories	.....	.....	.....	.....	.....	.....	.....	454	540	.....	454	540
Grand Total	248,988	274,743	268,122	216,479	165,482	174,302	330,317	320,683	232 374	795,784	760,908	674,798

NOTE.—The above figures were obtained from the furnacemen themselves, and therefore only indicate the quantity of pig iron in the hands of the producers and their agents. The pig iron in the hands of creditors, importers, speculators, and consumers is not considered in this table.

PRODUCTION OF ALL ROLLED IRON IN THE UNITED STATES IN 1873, 1874, 1875, AND 1876.

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES.	Bar, Angle, Bolt, Rod, Hoop, Plate, and Sheet Iron. Net tons.				Cut Nails and Spikes. Net tons.				Iron and Steel Rails, all sizes. Net tons.				Total Rolled Iron, including Rails of all kinds. Net tons.			
	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.
Maine	4,710	3,994	3,700	3,314	.....	.....	350	.....	16,500	14,650	4,050	7,500	21,210	18,644	8,100	10,814
New Hampshire	300	300	1,000	1,900	.....	.....	.....	.....	.....	.....	.....	.....	300	300	1,000	1,900
Vermont	.....	.....	.....	.....	.....	.....	.....	.....	6,088	10,400	6,204	9,183	6,088	10,400	6,204	9,183
Massachusetts	53,312	46,916	53,731	47,183	31,323	28,819	27,590	22,332	34,034	24,765	18,391	9,061	118,669	100,500	99,712	78,576
Rhode Island	8,000	7,170	6,648	6,900	3,662	3,446	2,936	494	.....	.....	.....	.....	11,662	10,616	9,584	7,394
Connecticut	11,409	11,921	9,618	10,114	.....	.....	.....	.....	.....	.....	.....	.....	11,409	11,921	9,618	10,114
New York	90,796	80,590	94,585	69,821	4,222	5,949	4,063	3,580	59,764	46,979	82,960	57,306	154,782	133,518	181,606	130,707
New Jersey	41,112	26,901	28,198	35,048	22,827	27 643	26,110	17,120	13,749	3,537	941	243	77,688	58,081	55,249	52,411
Pennsylvania	447,282	463,730	417,781	401,926	59,780	75,151	65,913	68,409	328,522	259,288	255,136	353,925	835,584	798,169	738,830	824,260
Delaware	11,617	11,818	15,252	17,598	.....	.....	.....	.....	.....	.....	.....	.....	11,617	11,818	15,252	17,598
Maryland	15,669	20,883	16,068	12,337	.....	.....	.....	.....	42,356	48,008	30,619	18,844	58,025	68,891	46,687	31,181
Virginia	7,462	11,086	12,744	11,334	5,346	5,602	6,099	5,972	.....	.....	.....	.....	12,808	16,688	18,843	17,306
Georgia	1,840	1,406	3,360	2,251	509	.....	465	750	8,275	8,061	6,500	9,000	10,624	9,467	10,325	12,001
Alabama	500	1,000	1,000	1,000	.....	.....	.....	.....	.....	.....	.....	.....	500	1,000	1,000	1,000
West Virginia	3,863	1,609	2,105	3,651	43,933	54,201	51,788	45,447	4,000	522	406	538	51,796	56,332	54,299	49,636
Kentucky	26,569	23,359	29,936	24,391	.....	5,121	7,174	4,959	11,386	6,068	5,851	1,524	37,955	34,548	33,961	30,874
Tennessee	2,588	1,573	1,005	1,450	.....	669	490	430	13,973	13,693	12,250	21,394	16,561	15,926	13,745	23,274
Ohio	118,709	110,556	116,178	119,857	23,031	27,253	29,638	28,672	130,326	82,561	91,775	100,799	272,066	220,370	237,591	249,328
Indiana	4,500	7,376	11,465	16,164	4,927	7,514	9,299	9,715	26,579	20,617	23,309	29,383	36,006	35,507	44,073	55,262
Illinois	5,240	4,740	8,000	9,921	1,675	4,250	4,428	10	136,102	125,103	188,248	181,490	143,017	134,093	200,676	191,421
Michigan	4,109	5,760	3,450	3,725	.....	.....	.....	.....	4,433	2,448	.....	1,600	8,542	8,208	3,450	5,325
Wisconsin	.....	275	14,437	8,700	.....	.....	.....	.....	39,495	29,680	28,403	21,280	39,495	29,955	42,840	29,980
Missouri	8,601	12,370	14,144	18,790	.....	.....	.....	.....	14,020	24,017	17,396	20,903	22,621	36,387	31,540	39,693
Wyoming Territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,000	12,320	.....	.....	7,000	12,320
Kansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000	5,000	14,707	.....	2,000	5,000	14,707
California	6,945	9,205	6,121	6,836	.....	.....	.....	.....	475	7,016	8,073	8,629	7,420	16,221	14,194	15,465
Total	875,133	864,538	861,524	834,211	201,235	245,609	236,343	207,890	890,077	729,413	792,512	879,629	1,966,445	1,839,560	1,890,379	1,921,730

PRODUCTION OF RAILS IN THE UNITED STATES IN 1873, 1874, 1875, AND 1876.

Statistics collected from the manufacturers by The American Iron and Steel Association.

In the following table Bessemer steel rails of all sizes, except street rails, are necessarily classed with iron rails.

STATES.	Iron and Bessemer Steel Rails, except street rails, all sizes—Net tons.				Steel Rails, other than Bessemer, and Steel-headed Rails—Net tons.				Street Rails—Net tons.				Total—Net tons.			
	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.
Maine	16,500	14,650	4,050	7,500	.....	.....	.....	.....	.....	.....	.....	.....	16,500	14,650	4,050	7,500
Vermont	5,554	9,400	6,204	9,183	534	1,000	.....	.....	.....	.....	.....	.....	6,088	10,400	6,204	9,183
Massachusetts	34,034	24,765	18,391	9,061	.....	.....	.....	.....	.....	.....	.....	.....	34,034	24,765	18,391	9,061
New York	43,569	32,487	65,488	44,615	15,953	14,007	17,472	12,691	242	485	.....	.....	59,764	46,979	82,960	57,306
New Jersey	7,215	2,423	765	57	6,474	597	.....	.....	60	517	176	186	13,749	3,537	941	243
Pennsylvania	321,937	254,994	245,369	343 740	1,022	1,377	464	100	5,563	*2,917	†9,303	¶10,085	328,522	259,288	255,136	353,925
Maryland	42,356	48,008	30,619	18 844	.....	.....	.....	.....	.....	.....	.....	.....	42,356	48,008	30,619	18 844
Georgia	8,275	8,061	5,000	9,000	.....	.....	1,500	.....	.....	.....	.....	.....	8,275	8,061	6,500	9 000
West Virginia	4,000	522	406	538	.....	.....	.....	.....	.....	.....	.....	.....	4,000	522	406	538
Kentucky	10,928	5,650	5,251	960	.....	.....	.....	.....	458	418	600	564	11 386	6,068	5,851	1,524
Tennessee	13,923	13,693	12,250	21,347	.....	.....	.....	.....	50	.....	.....	47	13,973	13,693	12,250	21,394
Ohio	126,402	80,485	89,589	99,828	1,175	200	.....	.....	2,749	1,876	2,186	971	130,326	82,561	91,775	100,799
Indiana	26,579	20,617	23,077	29,285	.....	.....	.....	.....	.....	.....	232	98	26,579	20,617	23,309	29,383
Illinois	134,625	125,017	186,099	181,074	1,219	.....	.....	.....	258	86	‡2,149	416	136,102	125,103	188,248	181,490
Michigan	4,433	2,448	.....	1,600	.....	.....	.....	.....	.....	.....	.....	.....	4,433	2,448	.....	1,600
Wisconsin	39,495	29,680	28,403	21,280	.....	.....	.....	.....	.....	.....	.....	.....	39,495	29,680	28,403	21,280
Missouri	14,020	24,017	16,022	20,360	.....	.....	.....	.....	.....	.....	1,374	543	14,020	24,017	17,396	20,903
Kansas	.....	2,000	5,000	14,707	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000	5,000	14,707
Wyoming Territory	.....	.....	7,000	12,320	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,000	12,320
California	425	6,576	7,753	8,453	.....	.....	.....	.....	50	440	320	176	475	7,016	8,073	8,629
Total	854,270	705,493	756,736	853,752	26,377	17,181	19,436	12,791	9,430	6,739	16,340	13,086	890,077	729,413	792,512	879,629

*Includes 1,000 tons of Bessemer steel street rails. †Includes 1,386 tons of Bessemer steel street rails. ‡Includes 922 tons of Bessemer steel street rails. ¶Includes 3,063 tons of Bessemer steel street rails.

PRODUCTION OF ROLLED IRON (EXCLUDING RAILS) AND OF CUT NAILS AND SPIKES IN THE UNITED STATES IN 1873, 1874, 1875, AND 1876.

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES.	Bar, Angle, Bolt, Rod, and Hoop Iron. Net tons.				Plate and Sheet Iron. Net tons.				Cut Nails and Spikes. Kegs of 100 pounds.			
	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.	1873.	1874.	1875.	1876.
Maine	4,710	3,994	3,700	3,314	.....	.....	.....	.....	.....	.....	7,000	.....
New Hampshire	300	300	1,000	1,500	.....	.....	.....	400	.....	.....	.....	.....
Massachusetts	44,490	40,324	40,336	33,857	8,822	6,592	13,395	11,326	626,465	576,376	551,798	446,638
Rhode Island	8,000	7,170	6,648	6,900	.....	.....	.....	.....	73,249	68,920	58,730	9,956
Connecticut	11,409	11,921	9,618	10,114	.....	.....	.....	.....	.....	.....	.....	.....
New York	85,908	76,590	90,583	66,323	4,888	4,000	4,000	3,498	84,438	118,985	81,263	71,591
New Jersey	35,954	24,645	24,584	32,305	5,158	2,256	3,614	2,743	456,537	552,867	522,198	342,391
Pennsylvania	333,556	343,632	300,784	301,350	113,726	120,098	116,997	100,576	1,195,609	1,503,019	1,318,259	1,368,163
Delaware	8,274	6,860	9,316	11,168	3,343	4,958	6,936	6,430	.....	.....	.....	.....
Maryland	1,960	8,455	6,279	3,167	13,709	12,428	9,789	9,170	.....	.....	.....	.....
Virginia	7,462	11,086	12,744	11,334	.....	.....	.....	.....	106,922	112,034	121,976	119,426
Georgia	1,840	1,406	3,360	2,251	.....	.....	.....	.....	10,183	.....	9,300	15,000
Alabama	500	1 000	1,000	1,000	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	2,863	1,609	1,805	1,704	1,000	.....	300	1,947	878,653	1,084,027	1,035,772	908,934
Kentucky	25,675	18,239	13,936	16,658	894	5,120	7,000	7,733	.....	102,411	143,473	99,161
Tennessee	2,588	1,573	1,005	1,450	.....	.....	.....	.....	.....	13,210	9,795	8,609
Ohio	103,898	94,413	93,890	104,512	14,811	16,143	22,288	15,345	460,618	545,052	592,768	573,439
Indiana	4,500	7,376	11,465	13,664	.....	.....	.....	2,500	98,530	150,279	185,988	194,296
Illinois	5,240	2,500	6,000	9,921	.....	2,240	2,000	.....	33,500	85,000	88,561	200
Michigan	2,284	4,207	.....	1,900	1,825	1,553	3,450	1,825	.....	.....	.....	.....
Wisconsin	.....	275	14,437	8,700	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	7,608	10,870	10,144	17,028	993	1,500	4,000	1,762	.....	.....	.....	.....
California	6,945	9,205	6,121	6,836	.....	.....	.....	.....	.....	.....	.....	.....
Total	705,964	687,650	668,755	668,956	169,169	176,888	192,769	165,255	4,024,704	4,912,180	4,726,881	4,157,814

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE FISCAL YEARS 1871 TO 1876.—CURRENCY VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.		1876.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
IRON, AND MANUFACTURES OF:												
Pig iron.....Net tons	3,967	$111,033	2,269	$69,331	3,154	$140,683	10,798	$414,728	17,681	$489,362	7,607	$181,663
Bar iron..... "	203	16,754	40	4,532	345	33,767	2,201	173,168	5,962	392,420	9,407	607,921
Boiler-plate iron..... "	29	3,096	53	8,047	41	4,589	112	13,440	126	12,674	59	5,370
Railroad bars and rails..... "	246	17,445	96	7,167	1,416	104,054	382	25,356	1,959	101,557	1,122	57,109
Sheet, band, and hoop iron..... "	43	4,810	140	13,030	66	6,068	69	11,082	98	10,058	56	5,004
Castings not specified.....	.....	105,044	.....	128,017	.....	153,234	.....	226,288	.....	374,356	.....	269,322
Car-wheels.....No.	2,317	42,791	4,760	99,826	7,515	137,458	11,905	189,869	6,125	122,038	6,505	132,930
Stoves and parts of.....	.....	72,132	.....	92,337	.....	115,792	.....	102,398	.....	137,829	.....	128,660
Steam-engines, locomotive.....No.	38	536,746	72	953,881	58	952,655	79	1,147,366	79	996,639	44	561,559
Steam-engines, stationary..... "	29	55,729	42	118,312	46	111,507	48	74,749	39	65,565	60	74,363
Boilers, separate from engines.....	.....	54,532	.....	178,520	.....	232,546	.....	127,992	.....	119,316	.....	103,429
Machinery not specified.....	.....	1,515,843	.....	2,499,744	.....	3,120,984	.....	3,357,909	.....	3,973,906	.....	2,709,439
Nails and spikes.....Net tons	2,503	259,324	2,225	241,429	2,998	356,990	4,039	410,850	5,536	481,177	5,105	381,236
Sewing-machines and parts of.....	.....	1,898,864	.....	2,436,085	.....	2,150,720	.....	1,594,296	.....	1,797,929	.....	1,700,798
Fire-engines and apparatus.....	.....	40,025	.....	12,243	.....	12,688	.....	19,852	.....	21,294	.....	19,854
All other manufactures of iron.....	.....	2,020,271	.....	2,398,210	.....	3,262,170	.....	3,303,499	.....	3,725,985	.....	3,619,889
STEEL AND MANUFACTURES OF:												
Ingots, bars, sheets, and wire...Net tons	8	2,538	33	8,146	9	3,955	338	26,691	64	16,830	67	13,208
Cutlery.....	.....	114,142	.....	58,030	.....	47,346	.....	47,162	.....	38,080	.....	43,766
Edge tools.....	.....	424,821	.....	577,813	.....	846,452	.....	941,016	.....	676,933	.....	628,681
Files and saws.....	.....	9,282	.....	16,884	.....	10,171	.....	21,496	.....	32,134	.....	37,282
Muskets, pistols, rifles, sporting-guns.....	.....	13,463,916	.....	1,037,117	.....	1,181,869	.....	2,340,138	.....	5,502,320	.....	3,667,050
Manufactures of steel not specified.....	.....	174,830	.....	236,733	.....	297,541	.....	225,457	.....	116,559	.....	226,633
Total.....	.....	$20,943,979	.....	$11,195,434	.....	$13,283,239	.....	$14,794,802	.....	$19,204,961	.....	$15,175,166

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1871 TO 1876.—CURRENCY VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.		1876.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
IRON, AND MANUFACTURES OF:												
Pig iron.....Net tons.	2,330	$67,481	1,477	$72,818	10,103	$414,349	16,039	$447,619	8,738	$250,919	3,805	$94,314
Bar iron..... "	179	14,830	329	31,929	367	40,404	4,717	331,341	9,548	675,465	3,383	222,284
Boiler-plate iron..... "	24	3,517	33	5,041	125	14,519	122	13,219	66	6,272	93	8,417
Railroad bars or rails..... "	333	23,813	1,212	86,820	375	30,743	1,257	73,159	1,210	67,064	3,665	153,465
Sheet, band, and hoop..... "	30	3,518	165	13,781	49	7,108	86	12,284	79	8,481	81	5,998
Castings, not specified.....	.....	126,499	.....	144,653	.....	201,459	.....	271,276	.....	369,170	.....	243,062
Car-wheels.....No.	4,043	82,467	4,873	97,090	12,274	196,438	6,644	137,589	370	120,688	6,738	133,614
Stoves, and parts of.....	.....	79,909	.....	101,959	.....	101,397	.....	141,953	.....	133,299	.....	119,228
Steam-engines, locomotives.....No.	62	820,943	55	774,296	68	1,109,482	77	1,145,669	69	761,718	43	534,907
Steam-engines, stationary..... "	42	105,857	40	89,556	49	125,037	41	51,296	56	84,872	52	75,412
Boilers, separate from engines.....	.....	114,703	.....	166,554	.....	254,290	.....	95,604	.....	130,688	.....	70,879
Machinery, not specified.....	.....	1,890,880	.....	3,160,538	.....	3,011,111	.....	4,153,258	.....	2,966,848	.....	2,554,335
Nails and spikes.....Net tons.	2,355	245,289	2,682	322 879	3,409	371,663	5,139	481,010	4,897	434,743	4,405	313,902
All other manufactures of iron.....	.....	2,191,059	.....	2,737,588	.....	3,528,941	.....	3,279,704	.....	3,919,087	.....	3,299,213
STEEL AND MANUFACTURES OF:												
Ingots, bars, sheets, and wire.....Net tons.	30	7,364	9	3,624	26	5,481	343	29,557	50	13,968	85	17,051
Cutlery.....	.....	90,064	.....	31,889	.....	54,409	.....	50,805	.....	30,318	.....	45,188
Edge-tools.....	.....	532,395	.....	691,415	.....	862,096	.....	875,538	.....	671,123	.....	626,597
Files and saws.....	.....	13,222	.....	14,536	.....	16,520	.....	28,173	.....	34,279	.....	36,535
Muskets, pistols, rifles, and sporting-guns.....	.....	5,215,128	.....	1,165,424	.....	1,548,227	.....	3,613,430	.....	5,184,576	.....	3,054,723
All other manufactures of steel.....	.....	207,197	.....	317,735	.....	236,265	.....	157,323	.....	229,328	.....	185,619
AGRICULTURAL IMPLEMENTS:												
Fanning mills.....No.	36	1,066	25	689	120	4,330	48	1,379	146	14,863	69	1,656
Horse-powers..... "	25	10,410	26	7,876	43	5,726	95	47,806	119	32,434	29	12,154
Mowers and reapers..... "	3,509	377,719	6,636	765,511	9,882	1,266,761	17,230	1,886,324	13,057	1,446,681	12,027	1,223,214
Plows and cultivators..... "	12,999	169,764	24,781	320,493	27,008	368,462	13,109	169,032	12,203	142,127	15,260	132,230
All others not specified.....	.....	461,861	.....	670,509	.....	868,703	.....	1,041,952	.....	804,697	.....	986,665
SCALES AND BALANCES.....	.....	107,516	.....	173,423	.....	187,380	.....	134,996	.....	156,346	.....	146,947
SEWING-MACHINES.....	.....	2,232,697	.....	2,376,873	.....	1,829,675	.....	1,770,951	.....	1,715,312	.....	1,657,077
FIRE-ENGINES AND APPARATUS.....	.....	9,009	.....	15,118	.....	26,778	.....	16,485	.....	12,269	.....	42,957
Total.....	.....	$15,206,179	.....	$14,360,617	.....	$16,687,754	.....	$20,458,732	.....	$20,417,635	.....	$15,997,643

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE FISCAL YEARS 1871 TO 1876.—GOLD VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.		1876.	
	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.
Pig iron	199,515	$3,105,490	277,232	$5,122,318	241,355	$7,203,769	103,086	$3,288,022	59,849	$1,458,688	88,990	$1,918,547
Castings	2,203	32,679	433	34,333	364	32,113	215	15,905	30	3,093	38	3,711
Bar iron	101,751	4,058,126	118,227	5,133,472	83,008	5,288,481	38,515	3,012,311	26,552	1,728,137	25,831	1,563,819
Boiler iron	549	31,284	700	57,392	587	55,030	77	11,177	64	9,229	14	1,833
Band, hoop, and scroll iron	11,220	506,501	11,708	573,457	12,830	846,973	3 007	200,574	429	24 062	324	18,743
Railroad bars or rails of iron	513,022	17,360,297	472,365	15,778,941	240,504	10,541,036	20,379	987,260	2,198	69,283	296	6,738
Railroad bars or rails of steel*	.....	.....	122,935	6,277,694	160,041	9,199,666	146,410	9,771,175	44,934	2,863,027	4,977	314,282
Sheet iron	10,488	610,809	14,754	1,116,200	14,943	1,287,072	6,166	808,016	5,358	852,426	4,729	732,730
Old and scrap iron	174,502	3,782,526	258,455	6,040,678	228,567	6,643,512	57,530	1,495,142	36,356	792,136	26,315	400,355
Hardware	.....	141,493	.....	204,992	.....	371,518	.....	265,678	.....	311,807	.....	133,326
Anchors, cables, and chains of all kinds	5,525	472,782	5,505	490,275	5,799	675,184	3,498	437,582	2,892	339,806	2,057	219,695
Machinery	.....	907,371	.....	1,054,045	.....	1,693,966	.....	1,293,774	.....	697,060	.....	705,953
Muskets, pistols, rifles, and sporting-guns	.....	706,988	.....	711,858	.....	822,119	.....	873,430	.....	655 204	.....	498,887
Steel ingots, bars, sheets, and wire	.....	3,750,702	.....	4,033,508	.....	4,155,234	.....	2,960,055	.....	2,539,906	.....	1,808,459
Cutlery	.....	1,956,351	.....	2,143,708	.....	2,234,355	.....	1,586,194	.....	1,440,429	.....	1,088,508
Files	.....	604,153	.....	583,058	.....	770,986	.....	575,211	.....	359,437	.....	219,204
Saws and tools	.....	514,346	.....	542,377	.....	265,637	.....	48,210	.....	24,712	.....	20,403
Other manufactures of iron and steel	.....	4,883,075	.....	5,621,882	.....	7,221,801	.....	6,153,830	.....	4,307,309	.....	3,536,425
Total	1,018,775	$43,425,975	1,282,334	$55,540,188	937,998	$59,308,452	378,883	$33,793,546	178,662	$18,475,753	153,571	$13,191,618

*Previous to July 1, 1871, reported under head of iron rails.

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE CALENDAR YEARS 1871 TO 1876.—GOLD VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.		1876.	
	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.
Pig iron	245,535	$3,797,298	295,967	$7,269,850	154,708	$5,181,847	61,165	$1,738,438	66,457	$1,806,431	83,072	$1,795,365
Castings	441	28,260	407	38,564	262	19,169	74	6,261	23	3,157	35	3,128
Bar iron	122,565	5,024,686	89,576	4,837,532	62,253	4,481,614	26,876	1,936,793	24,591	1,729,743	26,652	1,532,233
Boiler iron	322	27,351	684	59,993	464	44,324	53	7,669	45	7,272	15	1,273
Band, hoop, and scroll iron	13,098	594,166	12,379	748,509	8,245	537,140	1,425	91,475	228	13,596	144	9,309
Railroad bars or rails, of iron	515,000	19,132,359	381,064	14,498,012	99,201	4,708,189	7,796	393,589	1,942	67,862	287	6,603
Railroad bars or rails, of steel	50,701		149,786	8,207,013	159,571	8,984,103	100,486	6,838,875	16,316	1,140,394	.....	.....
Sheet iron	12,047	857,895	10,149	1,263,112	10,713	1,090,486	6,736	1,007,988	3,616	631,174	1,758	211,397
Old and scrap iron	220,340	4,845,092	278,257	7,617,463	168,838	3,061,759	40,746	949,942	25,856	498,682	14,149	236,455
Anchors, cables, and chains of all kinds	5,434	460,116	5,875	622,908	4,658	565,656	3,219	390,619	2,004	256,183	1,863	192,534
Hardware	.....	134,427	.....	325,208	.....	288,706	.....	303,728	.....	241,004	.....	99,243
Machinery	.....	891,408	.....	1,148,713	.....	1,941,053	.....	790,512	.....	708,920	.....	755,536
Muskets, rifles, pistols, and sporting-guns	.....	599,388	.....	811,872	.....	886,307	.....	691,990	.....	603,728	.....	351,106
Steel ingots, bars, sheets, and wire	.....	3,460,735	.....	4,106,087	.....	3,865,316	.....	2,678,611	.....	2,152,303	.....	1,508,851
Cutlery	.....	2,051,750	.....	2,272,467	.....	1,989,595	.....	1,453,570	.....	1,239,709	.....	901,777
Files	.....	595,539	.....	676 814	.....	744,798	.....	430,688	.....	276,549	.....	187,546
Saws and tools	.....	695,275	.....	476,927	.....	52,509	.....	32,674	.....	24,405	.....	14,262
Other manufactures not specified	.....	4,724,181	.....	6,743,183	.....	7,322,099	.....	4,835,216	.....	3,863,019	.....	2,777,508
Total	1,185,483	$47,919,926	1,224,144	$61,724,227	668,923	$45,764,670	248,576	$24,578,638	141,079	$15,264,131	127,975	$10,584,126

WHAT ONE AMERICAN IRON SHIPYARD HAS ACCOMPLISHED.

The carefully-prepared table given below shows the amount of material of all kinds consumed and the amount of money paid out therefor, and for wages for the construction of iron ships and marine engines, at the shipyard of John Roach & Son, at Chester, Penna., and at their marine engine works at New York, during the six years in which shipbuilding has been carried on by that firm.

MATERIALS.	1872.		1873.		1874.		1875.		1876.		1877. To September 1st		TOTAL.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		$		$		$		$		$		$		$
Plate iron.....lbs.	5,821,779	319,937	13,678,722	691,150	10,629,173	545,316	13,399,357	518,635	6,402,012	220,668	8,597,542	228,365	58,528,585	2,524,071
Angle iron.....lbs.	1,641,563	71,062	2,913,410	136,580	2,511,830	116,455	4,169,582	155,070	1,634,793	55,904	2,153,576	53,818	15,024,754	588,889
Deck beams.....lbs.	517,474	27,688	1,068,475	58,898	681,010	36,751	1,193,422	57,755	417,124	16,716	705,824	22,938	4,583,329	220,746
Rivets.....lbs.	464,821	34,270	725,594	50,591	682,621	43,087	939,670	57,161	420,330	20,805	681,300	27,752	3,914,336	233,666
Bar iron and forgings....tons.	772	88,719	2,188	216,480	1,159	106,728	1,413	101,232	1,103	67,396	1,285	67,834	7,920	648,389
Pig iron.....tons.	2,737	122,191	3,233	135,777	2,122	77,223	1,776	56,472	1,192	34,027	1,506	31,648	12,566	457,338
Steel.....lbs.	19,972	2,898	43,464	7,675	38,304	6,285	11,155	2,117	5,812	831	7,160	1,074	125,867	20,880
Ingot copper.....lbs.	89,651	34,205	265,528	74,293	273,632	66,847	224,870	50,520	70,836	14,467	103,959	20,824	1,028,476	261,156
Sheet copper and brass.....lbs.	49,239	17,009	102,525	38,959	70,944	22,702	66,139	20,921	43,678	14,301	69,575	22,264	402,100	136,156
Tin.....lbs.	11,016	4,921	22,152	8,621	26,653	7,047	18,401	4,515	7,930	1,654	9,640	1,735	95,792	28,493
Spelter.....lbs.	18,767	1,603	21,086	1,693	25,640	2,024	16,806	1,279	3,545	270	13,640	992	99,484	7,861
Brass and condenser tubes, lbs.	25,696	11,563	89,610	37,044	69,696	25,605	77,133	26,602	29,485	8,835	56,125	17,081	347,745	126,730
Iron boiler tubes.....	.....	24,884	.....	30,671	.....	13,726	.....	20,707	.....	8,791	.....	11,621	.....	110,403
Brass boiler tubes.....	.....	.....	.....	49,407	.....	10,498	.....	.....	.....	15,437	.....	34,656	.....	109,998
Lumber.....feet.	2,028,290	88,380	3,764,730	168,605	1,904,768	86,915	3,303,430	135,274	1,488,870	51,017	2,887,800	88,641	15,377,888	618,832
Paints.....	.....	10,875	.....	16,233	.....	25,174	.....	19,158	.....	7,568	.....	14,137	.....	93,145
Files, hardware, bolts, etc.....	.....	18,536	.....	37,424	.....	24,489	.....	36,488	.....	16,012	.....	21,684	.....	154,633
Steam pumps.....	.....	4,107	.....	10,700	.....	14,600	.....	9,064	.....	2,700	.....	5,200	.....	46,371
Windlasses.....	.....	2,823	.....	10,145	.....	10,182	.....	8,534	.....	2,250	.....	10,800	.....	44,734
Boats.....	.....	1,681	.....	5,892	.....	9,446	.....	569	.....	1,050	.....	6,245	.....	24,883
Wire rope.....	.....	3,707	.....	5,269	.....	12,554	.....	6,377	.....	1,046	.....	4,635	.....	33,588
Manilla rope.....	.....	6,547	.....	5,820	.....	12,673	.....	3,144	.....	1,824	.....	9,643	.....	39,651
Sails.....	.....	1,107	.....	5,874	.....	8,573	.....	846	.....	950	.....	7,890	.....	25,240
Tackle blocks.....	.....	1,754	.....	3,187	.....	6,790	.....	1,446	.....	678	.....	3,987	.....	17,842
Steam and gas pipe, etc.....	.....	8,254	.....	18,346	.....	15,490	.....	8,392	.....	6,328	.....	6,176	.....	62,986
Anchors and chains.....lbs.	30,723	2,237	145,932	12,189	.....	15,390	.....	1,202	38,726	1,721	249,754	11,175	.....	43 914
Coal.....tons.	7,819	38,096	8,616	47,612	9,816	53,468	7,475	40,722	4,680	23,701	5,200	20,800	43,606	224,399
Lead.....	.....	3,491	.....	5,528	.....	9,518	.....	8,878	.....	4,061	.....	4,872	.....	36,348
Plumbing.....	.....	9,398	.....	7,405	.....	22,881	.....	13,300	.....	1,400	.....	10,850	.....	65,234
Improvements of shipyard.....	.....	85,680	.....	167,483	.....	38,374	.....	101,493	.....	21,321	.....	.....	.....	414,351
Sundries.....	.....	28,936	.....	37,214	.....	48,227	.....	36,082	.....	14,427	.....	34,596	.....	199 482
Wages.....	.....	986,398	.....	1,785,476	.....	1,596,942	.....	1,212,819	.....	745.413	.....	942,684	.....	7,269,732
Total.....	.....	2,062,957	.....	3,888,244	.....	3,091,980	.....	2,716,774	.....	1,383,569	.....	1,746,617	.....	14,890,141

PRICES IN DOLLARS PER GROSS TON OF AMERICAN BEST HAMMERED BAR IRON AT PHILADELPHIA, FROM 1794 TO 1844.

The following table of prices of American best hammered bar iron was furnished us by Charles J. Rowland, of Philadelphia, and was extracted in 1844 from the books of James Rowland, iron merchant, of Philadelphia. These prices were paid to Eastern Pennsylvania forge-owners for hammered iron delivered in Philadelphia, in regular course of business, and were not predicated on occasional sales.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	$	$	$	$	$	$	$	$	$	$	$	$
1794	.....	.....	75	.....	.....	.....	.....	.....	.....	.....	.....	80
1795	.....	.....	.....	80	.....	.....	.....	.....	.....	.....	.....	85
1796	.....	.....	93⅓	99⅓	104	.....	112	112	112	112	.....	.....
1797	.....	.....	.....	.....	.....	.....	103½	.....	.....	.....	.....	99⅓
1798	.....	.....	.....	.....	99⅓	.....	.....	96	.....	.....	.....	.....
1799	.....	98⅔	.....	.....	.....	.....	.....	.....	.....	98	.....	.....
1800	100	100	100	100	.....	.....	.....	.....	.....	.....	102½	.....
1801	106⅔	.....	.....	110	.....	.....	.....	115	124	125	.....	124
1802	.....	.....	.....	.....	100	100	.....	.....	.....	97½	.....	.....
1803	.....	97½	97½	97⅓	97⅓	.....	.....	.....	.....	.....	.....	.....
1804	.....	.....	.....	97⅓	.....	.....	.....	.....	.....	.....	.....	100
1805	.....	100	.....	102	.....	.....	.....	.....	.....	.....	.....	.....
1806	.....	.....	.....	.....	103	.....	.....	108	.....	.....	112	.....
1807	.....	112	.....	.....	.....	.....	.....	113	.....	.....	106	.....
1808	.....	104	104	104	104	.....	.....	.....	.....	.....	104	.....
1809	.....	107	107	107	107	.....	.....	108	.....	.....	.....	.....
1810	.....	108	.....	.....	108	.....	.....	.....	.....	.....	108	.....
1811	.....	108	.....	.....	104	.....	.....	.....	.....	.....	103	.....
1812	.....	.....	.....	.....	106½	.....	.....	.....	.....	.....	106	.....
1813	.....	107	.....	.....	.....	.....	.....	105	.....	.....	.....	.....
1814	.....	115	.....	.....	120	.....	.....	.....	.....	.....	142½	155
1815	.....	155	.....	.....	145	.....	.....	140	.....	.....	138	.....
1816	.....	.....	.....	.....	136	.....	.....	130	.....	.....	115	.....
1817	.....	.....	115	115	115	115	115	.....	.....	.....	110	.....
1818	.....	.....	110	110	110	110	110	110	.....	.....	.....	.....
1819	.....	.....	.....	110	110	110	110	110	.....	.....	.....	110
1820	.....	.....	.....	.....	107	.....	.....	.....	.....	.....	100	.....
1821	.....	95	.....	.....	90	90	90	90	90	90	90	.....
1822	.....	90	.....	.....	95	95	95	95	95	95	95	.....
1823	.....	.....	.....	.....	90	90	90	90	90	90	90	.....
1824	.....	.....	.....	.....	85	.....	.....	.....	.....	.....	80	.....
1825	.....	90	95	.....	100	.....	.....	.....	.....	.....	105	.....
1826	105	.....	.....	100	.....	.....	.....	.....	.....	.....	100	.....
1827	100	100	100	100	100	100	100	100	100	100	100	100
1828	100	100	100	100	100	100	100	100	100	100	100	100
1829	100	100	100	100	100	95	95	95	95	95	95	95
1830	90	90	90	90	90	90	85	85	85	85	85	85
1831	85	85	85	85	85	85	85	85	85	85	85	85
1832	85	85	85	85	85	85	85	85	85	85	85	85
1833	82½	82½	82½	82½	82½	82½	82½	82½	82½	82½	82½	82½
1834	82½	82½	82½	82½	82½	82½	82½	82½	82½	82½	82½	82½
1835	80	80	80	80	80	80	80	80	80	85	.....	90
1836	90	.....	95	105	.....	.....	.....	.....	.....	.....	110	.....
1837	.....	.....	.....	115	.....	.....	110	.....	.....	.....	107½	.....
1838	95	.....	.....	.....	90	.....	.....	.....	.....	.....	95	.....
1839	95	.....	.....	.....	100	.....	.....	.....	.....	95	.....	.....
1840	95	95	95	95	95	.....	90	85	85	85	85	85
1841	.....	.....	85	.....	.....	.....	.....	.....	.....	.....	.....	85
1842	85	85	85	.....	.....	.....	.....	.....	.....	80	.....	.....
1843	.....	.....	80	.....	.....	.....	.....	.....	.....	.....	.....	75
1844	.....	75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

In 1793 bar iron was sold at $80 per ton. In 1794 rod iron was sold at $100 per ton. On September 30, 1800, Mr. Rowland bought a lot of Spanish iron of T. Murgatroyd & Son at $80, at 90 days' credit; in 1802 he bought 20 tons of Russian iron at $95 per ton. In 1831 some iron was sold at $80 $82, and $83; in 1832 some was sold at $80 and $82; in 1835 some was sold at $72; in 1841 and 1842 some was sold at $90. In January, 1826, Russian iron was sold for $105, and in April for $100; in 1827 it was sold for $95. The above iron came from the forges of Cyrus Jacobs, R. Jenkins, Robert Coleman, E. & G. Brooke, and others.

WHOLESALE STORE PRICES IN DOLLARS OF BEST REFINED ROLLED BAR IRON IN PHILADELPHIA, FROM 1844 TO 1877. TONS OF 2,240 POUNDS.

Compiled by The American Iron and Steel Association, from the sales books of several prominent Philadelphia iron merchants.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	$	$	$	$	$	$	$	$	$	$	$	$	$
1844...	90 00	90 00	90 00	90 00	90 00	82 50	82 50	82 50	82 50	82 50	82 50	82 50	85 62
1845...	82 50	87 50	92 50	100 00	100 00	100 00	93 00	92 50	92 50	92 50	95 00	95 00	93 75
1846...	95 00	95 00	90 00	92 50	92 50	92 50	93 00	92 50	90 00	90 00	90 00	85 00	91 66
1847...	85 00	85 00	85 00	85 00	85 00	90 00	90 00	85 00	87 50	85 00	85 00	85 00	86 04
1848...	85 00	85 00	85 00	85 00	85 00	80 00	80 00	80 00	75 00	75 00	67 50	70 00	79 33
1849...	70 00	70 00	70 00	70 00	70 00	70 00	65 00	65 00	65 00	65 00	65 00	65 00	67 50
1850...	65 00	65 00	65 00	62 50	60 00	57 50	57 50	57 50	57 50	56 00	56 00	55 00	59 54
1851...	55 00	55 00	55 00	55 00	55 00	55 00	55 00	55 00	54 00	54 00	54 00	54 00	54 66
1852...	54 00	54 00	52 50	52 50	52 50	52 50	52 50	55 00	60 00	70 00	70 00	80 00	58 79
1853...	90 00	90 00	90 00	87 50	85 00	80 00	80 00	77 50	77 50	80 00	80 00	85 00	83 50
1854...	90 00	90 00	90 00	90 00	90 00	92 50	95 00	95 00	95 00	92 50	90 00	90 00	91 33
1855...	82 50	80 00	75 00	72 50	70 00	70 00	70 00	72 50	72 50	75 00	77 50	77 50	74 58
1856...	75 00	77 50	77 50	77 50	75 00	72 50	70 00	70 00	72 50	72 50	72 50	72 50	73 75
1857...	72 50	72 50	72 50	72 50	72 50	72 50	70 00	70 00	70 00	70 00	70 00	67 50	71 04
1858...	65 00	65 00	65 00	62 50	62 50	65 00	62 50	60 00	60 00	60 00	60 00	60 00	62 29
1859...	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00
1860...	60 00	57 50	57 50	57 50	57 50	57 50	57 50	60 00	60 00	60 00	60 00	60 00	58 75
1861...	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	62 50	62 50	62 50	62 50	60 83
1862...	62 50	62 50	62 50	62 50	65 00	65 00	70 00	72 50	75 00	77 50	82 50	87 50	70 42
1863...	87 50	90 00	90 00	90 00	90 00	87 50	87 50	87 50	87 50	90 00	95 00	110 00	91 04
1864...	115 00	125 00	130 00	140 00	150 00	160 00	165 00	170 00	160 00	150 00	147 50	145 00	146 46
1865...	142 50	135 00	130 00	110 00	100 00	92 50	90 00	85 00	92 50	95 00	100 00	105 00	106 38
1866...	105 00	100 00	97 50	95 00	92 50	95 00	105 00	100 00	100 00	97 50	95 00	95 00	98 13
1867...	95 00	92 50	92 50	90 00	87 50	87 50	85 00	82 50	82 50	82 50	82 50	85 00	87 08
1868...	85 00	85 00	85 00	87 50	87 50	87 50	85 00	85 00	85 00	85 00	85 00	85 00	85 63
1869...	82 50	82 50	82 50	82 50	82 50	82 50	82 50	82 50	80 00	80 00	80 00	80 00	81 66
1870...	80 00	77 50	77 50	77 50	75 00	77 50	80 00	85 00	82 50	80 00	77 50	77 50	78 96
1871...	72 50	75 00	75 00	77 50	75 00	77 50	77 50	80 00	82 50	82 50	82 50	85 00	78 54
1872...	73 92	78 40	87 36	94 08	96 32	98 56	103 04	105 28	107 52	118 72	107 52	100 80	97 63
1873...	96 32	94 08	96 32	94 08	94 08	91 84	85 12	82 88	80 64	76 16	73 92	71 68	86 43
1874...	73 92	73 92	71 68	71 68	67 20	67 20	62 72	67 20	67 20	67 20	62 72	62 72	67 95
1875...	62 72	60 48	62 72	62 72	62 72	62 72	62 72	60 48	60 48	60 48	56 00	56 00	60 85
1876...	56 00	52 64	52 64	52 64	52 64	52 64	52 64	52 64	50 40	50 40	50 40	49 28	52 08
1877...	49 28	49 28	48 16	45 70	45 25	.....	.....	.....	.....	.....	.....	.....	.....

The highest price in any month in the above table was reached in August, 1864, $170; the lowest price in any month was in May, 1877, $45.25. The highest average price reached in any year was in 1864, $146.46; the lowest average price in any year was in 1876, $52.08. Previous to the present era of low prices, the lowest point touched was $52.50 in March to July, 1852; and the lowest average reached in any year was $54.66 in 1851.

PRODUCTION OF ALL KINDS OF STEEL IN THE UNITED STATES.

Statistics collected from the makers by The American Iron and Steel Association.

KINDS OF STEEL.		1872.	1873.	1874.	1875.	1876.
Crucible cast steel	Net tons.	29,260	34,786	36,328	39,401	39,382
Open-hearth steel	"	3,000	3,500	7,000	9,050	21,490
All other steel, except Bessemer	"	7,740	13,714	6,353	12,607	10,306
Bessemer steel ingots	"	120,108	170,652	191,933	375,517	525,996
Total		160,108	222,652	241,614	436,575	597,174

PRICES IN DOLLARS PER GROSS TON OF CHARCOAL PIG IRON AT PHILADELPHIA FROM 1799 TO 1849.

Compiled by The American Iron and Steel Association.

The following table has been compiled from the Statistical Chart of William G. Neilson, Esq., and embraces the prices of charcoal pig iron from the beginning of the century to the time when anthracite pig iron became the standard for comparison. Until May, 1827, the following prices are for best pig iron; from May, 1827, to June, 1833, they are for an average of all grades; from June, 1833, to January, 1840, they are for gray iron; and from January, 1840, to the close of the table, they are for No. 1 foundry.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	$	$	$	$	$	$	$	$	$	$	$	$	$
1799....	36¼	36½	36¼	36¼	36¼	36¼	36½	36¼	36¼	36½	36¼	36¼	36½
1800....	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36½	36	34½	35¾
1801....	33¾	33½	33½	33½	33½	33¼	31	32½	32½	32½	32½	32½	32¾
1802....	32½	32½	32½	32½	32	31½	30¼	29¼	29	29	29	28½	30¾
1803....	28¼	28	28¼	28¾	29	29	29¼	29¾	30	30	30	30	29¼
1804....	30	30	30	30	30	30	30	30	30	29¼	29	29	29¾
1805....	29	29	29	29	29	29¼	31	32	32	32½	33	33½	30¾
1806....	35	35½	35½	34½	35½	35½	35½	35½	35½	36	36½	37	35¾
1807....	37	37	37	37½	38	40	40	40	40	40	40	40	38¼
1808....	40	40	40	40	40	40	40	40	40	40	40	40	40
1809....	40	40	40	40	40	40	40	40	40	40	40	40	40
1810....	38	38	38	38	38	38	38	38	38	38	38	39	38
1811....	38	38¼	41¼	43¼	45	45	45	45	45	46	47½	47½	44
1812....	47¼	47½	47½	47½	47¼	47¼	47¼	47¼	47¼	47¼	47½	47½	47¼
1813....	47½	47½	47½	47½	47½	47½	47½	47½	47½	47½	47½	46	47¼
1814....	45½	45	45	45	45	45	45	45	45	46	48½	52½	46
1815....	55	55	55	55	55	55	54	52¾	52½	52½	52½	52½	53¾
1816....	52	50½	50	50	50	50	50	50	50	50	50	50	50¼
1817....	50	50	50	50	50	49	47	45	44½	43	42½	42½	47
1818....	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42	41	42¼
1819....	39¾	38	38¾	37¾	35½	35	35	35	35	35	35	35	36½
1820....	35	35	35	35	35	35	35	35	35	35	35	35	35
1821....	35	35	35	35	35	35	35	35	35	35	35	35	35
1822....	35	35	35	35	35	35	35	35	35	35	35	35	35
1823....	35	35	35	35	35	35	35	35	35	35	35½	36½	35¼
1824....	37¼	37½	37¾	39	40	40	40	40	40½	41¾	42½	42¾	40
1825....	43	42¾	43½	44	47½	50	50	50	50	49	47	45	46¾
1826....	45	45	45	45¾	46¾	47½	47½	47½	47½	47½	47½	47½	46½
1827....	47½	47½	47½	46¾	36½	35¼	35	35	35	35	35	35	39¼
1828....	35	35	35	35	35	35	35	35	35	35	35	35	35
1829....	35	35	35	35	35	35	35	35	35	35	35	35	35
1830....	35	35	35	35	35	35	35	35	35	35	35	35	35
1831....	35	35	35	35	35	35	35	35	35	35	35	35	35
1832....	35	35	35	35	35	35	35	35	35	35	35	35	35
1833....	35	35	35	35	35	40	40	40	40	40½	41¾	40	38¼
1834....	35	31	30	30	30	30	30	30	30	30	29½	28½	30½
1835....	29¼	29½	29¾	30¼	30¾	30	30	30	30	30½	30¾	31¾	30½
1836....	32	32½	35	39½	41	41¼	41¼	42	45	47	49	50¼	41½
1837....	51½	52½	52¼	51	49	47	42	39	35½	34¾	35½	36	41½
1838....	35	35½	35¼	34	31	31¼	32	32	31½	31½	31½	31½	32¼
1839....	31¾	32	33	34	34	34	33½	33½	33¼	32¼	32	32	30
1840....	32	32	31½	30¾	30½	30½	30	29½	29	29	29	29	32¼
1841....	29	29	29	29	29	28½	28	28	28	28	28¼	28¾	28½
1842....	29½	29½	29	28½	28½	28½	28	27½	27¼	27½	27½	27¾	28
1843....	28¾	29	29	28	28	26	25	25	25½	25¾	25½	26	26¾
1844....	27	27	26½	26¾	28	29½	29½	29½	29¾	30	29¾	30	28¼
1845....	30	29¾	32	35	36½	35	33	32	30½	30½	31	32½	32¼
1846....	33	33	32½	32½	32½	31½	31¾	30	29½	30	29¼	30½	31¼
1847....	30¼	30½	30	30½	30	29¾	29½	30½	33	33¼	35½	34½	31½
1848....	34½	32	30½	29½	29½	29	28	27	26	26	25½	25½	28½
1849....	25½	25½	25½	25½	25	24½	23¾	23½	23¾	24	24¼	24¼	24½

PRICES IN DOLLARS OF AMERICAN BESSEMER STEEL RAILS, AT WORKS, FROM 1868 TO 1877.—TONS OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.
	$	$	$	$	$	$	$	$	$	$	$	$	
1868...	165	167½	174	172	165	162½	150	150	150	150	148	147½	158½
1869...	145	143¾	135	134	130¼	128	130	130	130	130½	130¼	120	132½
1870...	110	110	108½	107	106	109¼	110	110	108¾	101½	102½	98	106¾
1871...	95	96	106	95	103	104	103¾	104	106	105¾	105¼	106½	102½
1872..	104½	104	104¼	111½	110	113	114½	115¼	114	113½	118	120¾	112
1873...	121	120	122½	120¼	120	121¾	121¾	121¾	118	120	120	120	120¼
1874...	117½	117½	115	98⅔	98½	96¼	91	89¼	78¼	78¼	75⅔	75⅔	94½
1875...	71	71	71	69	69	69	69	69	69	67	66	65	68¾
1876...	67	65	62	62	62	60	59	59	56	54	53	52	59¼
1877...	51¼	51¼	50	49	48	.....	.....	.....	.....	.....	.....	.....	.....

PRICES IN DOLLARS OF AMERICAN IRON RAILS IN PHILADELPHIA, FROM 1847 TO 1877.—TONS OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.	Average Price of Gold.
	$	$	$	$	$	$	$	$	$	$	$	$	$	
1847...	.....	71½	70⅛	70	70	70	69½	69¼	67⅛	67	67½	67½	.....	100
1848...	63	63	63	63	63	63	63	61⅞	61½	61	61	61	62¼	100
1849...	61	57½	53¾	53⅓	54¼	53½	53½	53¼	52	51½	51¾	51½	53⅞	100
1850...	47	47½	48	49	49	50	46	46¾	47½	48	48	†48	†47⅞	100
1851...	43	†45	47½	45	45	48	46	45½	45	45	46	†46¼	†45⅝	100
1852...	46½	46¼	46½	46¼	46¼	46¼	46¼	46½	47¾	49½	51	61	48½	100
1853...	74⅛	77½	77½	77½	77½	77½	77½	77½	77½	77½	77¼	77⅜	77¼	100
1854...	81	81	81	81	81	81	81	81	81	81	77½	73½	80½	100
1855...	70	65	62½	62½	60	58⅓	59½	59½	64½	65	65	63	62⅝	100
1856...	62½	62½	63⅜	65	65	65	65	65	65	65	65	64	64⅜	100
1857*..	65½	65½	64½	65¾	67	67	67	67	67	67	58¼	50	64¼	100
1858...	50	50	50	50	50	50	50	50	50	50	50	50	50	100
1859...	49¼	49¼	49¼	50¼	50¼	50¼	49¾	48¾	48¾	48¾	48¾	48¾	49⅜	100
1860...	48¾	48¾	48¾	48¾	48¾	48¾	48¾	46	47	47½	47½	46½	48	100
1861...	44	44	44	44	44	44	44	43½	43	41¾	‡36½	‡36½	42¾	100
1862...	‡36½	‡36½	41½	41½	41¾	41½	41½	41½	43	43¾	46	46	41¾	113
1863 ..	72½	69½	72¼	73½	73½	78¾	81½	73½	72½	79½	87½	87½	76⅞	145
1864...	94	101½	105	111	120	127½	141½	152½	§153¾	140	133¾	132	¶126	202
1865...	125⅝	121¼	116¾	108½	90¾	84½	82½	86¼	90	92½	95	91	98⅜	157
1866...	90	90	87¾	84¾	84	85¾	86⅜	87	87⅝	87½	85	85	86¾	140
1867...	85	85	84¼	82⅞	82½	82½	82½	82½	82½	82½	82½	82½	83¼	138
1868...	81⅜	79	79	79	79	79	79	79	79	78¼	76	78¾	78⅛	140
1869...	76¼	76	76	76	76	76	76	80	78½	78½	78½	78½	77¼	136
1870...	74	72½	72½	72½	72⅛	72½	72½	72½	72½	72½	70½	70	72¼	115
1871...	68¼	69	69	69¾	71	71	71	71	71	71	71	71	70¾	112
1872...	71⅛	75⅜	81⅛	83⅜	90¼	90	89	87¾	88¾	88¾	88¾	85¼	85¼	112
1873...	83½	83	83	82	80	78	76	75	75	70	68	66	76½	113
1874...	66	64	62	60	60	60	60	58	58	55	52	50	58½	112
1875...	50	50	50	49	49	49	48½	47	46½	46	45½	43¾	47½	114
1876...	43½	43	42½	42	42	41	41	41	40	40	39½	39	‖41¼	110
1877...	38	38	38	37½	37	.....	.....	.....	.....	.....	.....	.....	.....	.....

From 1847 to 1866 from Philadelphia prices current, except for years 1850 and 1851, for which estimates were furnished by Mr. S. J. Reeves. From 1866 to 1877 from Bulletin of The American Iron and Steel Association, averaged from weekly quotations.

☞Prices averaged for years to nearest eighth. * For latter part of 1857 prices were probably only nominal. † Uncertain.

‡ Lowest months, $36½—{ November and December, 1861. / January and February, 1862.

‖ Lowest year, $41¼ = 1876. § Highest year, $153¾ = 1864. ¶ Highest month, $153¾—September, 1864.

☞The annual premium on gold is calculated from daily quotations of gold sales in the *Bankers' Magazine*.

PRICES IN DOLLARS IN PHILADELPHIA OF No. 1 ANTHRACITE FOUNDRY PIG IRON FROM 1842 TO 1877.—TONS OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.*	Year.
	$	$	$	$	$	$	$	$	$	$	$	$	$	
1842..	.....	.....	.....	.....	27	27	26¼	24½	25½	25	25	25	.....	..1842
1844..	24	24	24	24	24	26⅛	26½	26½	27¼	28	27½	26¾	25⅝	..1844
1845..	26¾	26½	27¼	33⅛	34½	33	31	28½	27	26⅞	28½	28	29¼	..1845
1846..	28	28	28¼	28	28½	28	29	26⅛	27¼	27	28½	28⅛	27⅞	..1846
1847..	28⅛	28½	28⅝	29	29	28⅜	28	28½	30½	33¾	35¾	33½	30¼	..1847
1848..	31	28½	27¼	26⅜	26½	26½	25¾	25⅞	25½	25	25	24⅞	26½	..1848
1849..	25	24½	24¾	24	†23½	23	†22¾	22½	†21⅝	21½	20	21	†22¾	..1849
1850..	21	21	20⅝	20⅞	20⅞	20⅛	20	20⅝	21	21	21	21¾	20⅞	..1850
1851..	21½	22	22	22	21½	21⅛	21	21	21	21	21	21	21⅜	..1851
1852..	21½	21¼	20¾	20⅜	20⅛	20½	20¼	21¼	23¾	26⅛	27¾	28¼	22⅝	..1852
1853..	32¾	36⅞	35⅝	35⅞	35⅜	36	36	36	36¼	37½	37⅞	36¾	36½	..1853
1854..	37	36¼	37	38	38	38	38	38	37¾	36½	35½	32⅞	36⅞	..1854
1855..	31½	29½	27½	26¾	26¼	26¼	26⅛	26½	28	28⅝	28½	27¾	27¾	..1855
1856..	27½	27½	27⅝	28	28	27⅝	27	27	27	26⅞	26	26	27½	..1856
1857..	26½	26½	26⅜	27¾	27¾	27⅜	27¼	26¾	26⅜	25¾	23¼	23¾	26⅜	..1857
1858..	23½	22½	22½	22¼	22½	22⅝	21⅞	21¼	22	21½	21⅜	22½	22¼	..1858
1859..	22¼	23⅝	24½	23⅞	23½	23⅛	23	23⅞	22⅞	23¼	23¼	23½	23⅛	..1859
1860..	23	23	23⅞	22⅜	22¾	22¾	22¾	22½	22¼	22⅜	22¾	22½	22¾	..1860
1861..	22⅛	21¾	21¼	21⅜	21⅝	20¼	19⅞	18¾	18¾	‡18⅝	18½	19⅝	‖20¼	..1861
1862..	20	20¾	20¾	21½	21½	22⅜	24	24⅜	24½	25¼	30¼	31½	23⅞	..1862
1863..	32	33¼	35½	36	34¾	33½	32¾	31⅜	33	35¾	41½	43½	35¼	..1863
1864..	43½	48⅝	50¼	54½	57½	57⅝	69½	§73¾	72¼	63½	61½	59½	¶59¼	..1864
1865..	58½	53⅛	50⅜	45½	39½	35	35⅜	40⅛	44½	49⅞	51	50½	46⅛	..1865
1866..	50⅜	49	46½	41¾	41⅝	43⅞	46½	47¼	48½	48¾	49½	49½	46⅞	..1866
1867..	48¾	46½	44¾	41	42¾	43	43½	44	44½	44½	43¾	42½	44⅛	..1867
1868..	38⅜	36¾	37¾	38½	37	37	38⅛	39½	40⅛	41¾	42⅞	43¼	39¼	..1868
1869..	42	40¼	41½	40	39½	40⅞	41⅝	41½	40¾	40½	39¾	39½	40⅝	..1869
1870..	36¼	34½	34½	33¼	33¼	32½	32½	33½	33¼	32¼	31½	31½	33¼	..1870
1871..	30½	30⅝	34¼	35⅜	35½	35	35¾	36	36½	36⅜	37¼	37½	35½	..1871
1872..	37	40¾	47	49½	49½	53⅜	51¼	52¾	53⅞	53⅓	51¼	47⅝	48⅞	..1872
1873..	45⅛	48	48⅜	47¾	46	45	43¾	43½	42½	38	33	32½	42¾	..1873
1874..	32	32	32	32	31½	31½	31½	31	29½	29	26¼	24	30¼	..1874
1875..	25¾	26¼	27	27	26	26	26	26	25	24	23¾	23½	25½	..1875
1876..	23¼	23	23	22¾	22	22	22	22	21¾	21¾	21½	21¼	22¼	..1876
1877..	20⅞	20¼	20	19½	19¼	.....	.....	.....	.....	.....	.....	.....	.....	..1877

* Average for year to nearest eighth.
† Uncertain.
‡ Lowest average for month, $18⅝—October, 1861.
§ Highest average for month, $73¾—August, 1864.
‖ Lowest average for year, 20¼—1861.
¶ Highest average for year, 59¼—1864.

☞ From 1842 to July, 1866, averaged monthly from weekly quotations in Philadelphia and New York prices current. From July 1866, to 1877, averaged from weekly quotations in Bulletin of The American Iron and Steel Association.

PRODUCTION OF CUMBERLAND COAL FROM THE COMMENCEMENT OF THE TRADE.—SHIPMENTS ONLY.—TONS OF 2,240 LBS.

Compiled from official sources by the Cumberland and Piedmont Railroad office of the Consolidation Coal Company.

Year.	Tons.	Year.	Tons.	Year.	Tons.	Year.	Tons.
1842...	1,708	1852...	334,178	1862...	317,634	1872...	2,355,471
1843...	10,082	1853...	533,979	1863...	748,345	1873...	2,674,101
1844...	14,890	1854...	659,681	1864...	657,996	1874...	2,410,895
1845...	24,653	1855...	662,272	1865...	903,495	1875...	2,342,773
1846...	29,795	1856...	706,450	1866...	1,079,331	1876...	1,835,081
1847...	52,940	1857...	582,486	1867...	1,193,822		
1848...	79,571	1858...	649,656	1868...	1,330,443	Total,	30,516,538
1849...	142,449	1859...	724,354	1869...	1,882,669		
1850...	196,848	1860...	788,909	1870...	1,717,075		
1851...	257,679	1861...	269,674	1871...	2,345,153		

AVERAGE PRICE IN DOLLARS OF CUMBERLAND COAL, F. O. B. AT BALTIMORE, FROM 1853 TO 1877, WITH AVERAGE FREIGHT TO BOSTON.—TONS OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average for year.	Average freight to Boston.	Average cost delivered at Boston.
1853.	.....	.....	.....	.....	3.15	.....	3.15	3.15	.....	3.15	3.62	3.50	.....	2.80	.....
1854.	3.50	.....	.....	.....	.....	.....	.....	4.00	4.25	.....	4.25	4.25	.....	2.25	.....
1855.	4.25	4.25	4.25	4.00	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.89	2.17	6.06
1856.	.....	.....	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	.....	3.75	2.37	6.12
1857.	4.35	4.35	4.35	4.50	4.28	4.24	4.23	4.15	4.23	4.25	4.25	4.25	4.28	1.84	6.12
1858.	.....	.....	3.80	3.75	3.50	3.73	3.62	3.75	3.62	3.75	3.75	3.75	3.70	1.73	5.43
1859.	4.12	3.75	3.37	3.18	4.07	3.65	3.45	3.93	3.42	3.55	3.55	3.55	3.63	1.83	5.46
1860.	.....	3.50	3.75	3.45	3.37	3.50	.....	.....	.....	3.50	3.25	3.50	3.47	2.55	6.02
1861.	3.00	3.66	3.42	3.50	3.50	3.50	3.50	.....	.....	.....	.....	.....	3.44	2.25	5.69
1862.	.....	.....	.....	4.00	4.00	4.25	4.11	4.33	4.25	.....	.....	.....	4.16	2.42	6.58
1863.	5.50	6.00	6.00	5.66	5.50	5.50	5.50	5.50	5.50	5.25	5.50	5.50	5.57	3.28	8.85
1864.	5.75	5.75	5.83	6.00	6.14	6.21	.....	7.41	.....	8.36	8.36	8.63	6.84	3.39	10.23
1865.	8.56	.....	10.25	9.01	8.00	6.50	6.75	7.00	7.00	6.75	6.75	6.75	7.57	3.79	11.36
1866.	6.35	7.00	6.00	6.00	6.00	6.00	5.75	5.66	5.62	5.66	5.62	5.66	5.94	3.53	9.47
1867.	.....	.....	5.25	5.13	5.08	4.88	4.92	4.88	4.92	4.88	4.88	4.88	4.97	2.68	7.65
1868.	5.00	5.00	4.87	4.75	4.70	4.70	4.68	4.67	4.70	4.75	4.83	4.83	4.79	3.21	8.00
1869.	5.00	5.00	5.00	4.96	4.96	4.96	4.96	4.96	4.96	5.00	5.00	4.96	4.97	2.83	7.80
1870.	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	2.64	7.36
1871.	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	.....	4.72	2.73	7.45
1872.	4.70	4.65	4.62	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.75	4.75	4.66	3.06	7.72
1873.	4.75	4.75	4.83	4.93	4.93	4.85	4.85	4.85	4.88	4.88	.....	.....	4.85	3.05	7.90
1874.	4.65	4.65	4.65	4.65	4.65	4.65	4.55	4.55	4.65	4.65	4.65	4.65	4.63	2.28	6.91
1875.	4.65	4.70	4.35	4.40	4.40	4.30	4.30	4.30	4.40	4.40	4.40	4.40	4.42	2.11	6.53
1876.	4.25	4.20	4.00	3.90	3.90	3.85	3.85	3.75	3.90	3.85	3.90	3.80	3.93	1.83	5.76
1877.	4.00	4.00	3.84	3.60	3.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

QUANTITIES AND VALUES OF PIG AND ROLLED IRON IMPORTED INTO THE UNITED STATES FROM 1855 TO 1876.

Compiled from statistics supplied by Dr. Edward Young.

FISCAL YEARS	Pig Iron.		Railroad Iron. Including Steel Rails.		Bar, Rod, Hoop, Sheet, and Plate Iron.	
	Gross Tons.	Dollars.	Gross Tons	Dollars.	Gross Tons.	Dollars.
1855.....	98,925	$1,979,463	127,516	$4,993,900	144,911	$7,728,406
1856.....	59,012	1,171,085	155,495	6,179,280	137,778	6,990,744
1857.....	51,794	1,001,742	179,305	7,455,596	123,970	6,640,900
1858.....	41,986	739,949	75,745	2,987,576	91,546	4,963,811
1859.....	72,517	1,049,200	69,965	2,274,032	120,686	5,657,305
1860.....	71,493	1,005,865	122,175	3,709,376	172,532	6,407,738
1861.....	74,026	979,916	74,490	2,162,695	125,454	5,585,498
1862.....	22,247	285,323	8,611	222,967	33,170	1,581,270
1863.....	31,007	435,194	17,088	540,494	86,834	4,102,227
1864.....	102,223	1,288,424	118,714	3,904,017	123,830	5,981,150
1865.....	50,652	806,552	77,518	2,903,828	65,292	3,746,855
1866.....	102,392	1,683,186	78,007	2,806,390	79,926	3,993,356
1867.....	112,042	1,831,465	96,272	3,317,862	101,754	5,325,665
1868.....	112,133	1,778,977	151,097	4,373,162	92,359	4,788,012
1869.....	136,975	2,138,030	237,703	7,305,845	102,791	4,945,910
1870.....	153,283	2,509,280	279,765	9,669,571	89,370	4,479,524
1871.....	178,138	3,106,490	458,055	17,360,297	112,735	5,206,720
1872.....	247,528	5,122,318	531,536	22,056,635	130,200	6,900,521
1873.....	215,495	7,203,769	357,629	19,740,702	95,744	7,477,556
1874.....	92,041	3,288,022	148,018	10,758,435	40,163	4,042,078
1875.....	53,748	1,458,668	42,082	2,932,311	28,929	2,613,854
1876.....	79,455	1,918,547	4,708	321,020	30,898	2,317,125

THE ANTHRACITE COAL PRODUCTION OF PENNSYLVANIA, IN TONS OF 2,240 POUNDS.

By R. P. Rothwell, Editor of The Engineering and Mining Journal, New York.

YEARS.	THE WYOMING REGION. Luzerne and Sullivan Counties.		THE LEHIGH REGION. Carbon, Columbia, and Luzerne Counties.		THE SCHUYLKILL REGION. Schuylkill, Northumberland, Columbia, Dauphin, and Lebanon Counties.		ALL THE REGIONS.
	Shipments.	Total Production.	Shipments	Total Production.	Shipments.	Total Production.	Total Production.
Before 1820	.....	10,000	.....	3,000	.....	5,000	18,000
1820	.....	800	365	665	.....	500	1,965
1821	.....	1,000	1,073	1,473	.....	800	3,273
1822	.....	1,200	2,240	2,740	.....	1,000	4,940
1823	.....	1,300	5,823	6,523	.....	1,200	9,023
1824	.....	1,700	9,541	10,441	.....	1,500	13,641
1825	.....	2,000	28,393	29,493	5,306	7,006	38,499
1826	.....	2,700	31,280	32,780	16,835	19,335	54,815
1827	.....	4,000	32,074	34,274	29,493	32,893	71,167
1828	.....	6,200	30,233	33,233	47,181	52,481	91,914
1829	7,000	16,800	25,110	29,110	78,293	87,293	133,203
1830	42,000	58,200	41,750	46,850	89,984	104,584	209,634
1831	54,000	78,300	40,966	47,166	81,854	104,854	230,320
1832	84,500	121,700	75,000	82,700	209,271	243,771	448,171
1833	111,777	161,777	123,000	132,100	250,588	298,333	592,210
1834	43,700	53,008	106,244	128,874	226,692	274,977	456,859
1835	90,000	108,900	131,250	158,812	339,508	410,805	678,517
1836	103,861	125,360	148,211	178,891	432,045	521,478	825,729
1837	115,387	139,041	223,902	269,802	523,152	630,398	1,039,241
1838	78,207	94,083	213,615	256,979	433,875	521,951	873,013
1839	122,300	146,760	221,025	265,230	454,538	545,446	957,436
1840	148,470	177,867	225,318	269,932	467,796	560 421	1,008,220
1841	192,270	229,955	143,037	171,072	607,005	725,978	1,127,005
1842	252,599	301,856	272,546	325,692	551,504	659,047	1,286,595
1843	285,605	340,441	267,793	319,209	687,312	819,276	1,478,926
1844	365,911	435,434	377,002	448,633	853,465	1,015,623	1,899,690
1845	451,836	536,329	429,453	509,761	1,093,796	1,298,336	2,344,426
1846	518,389	614,291	517,116	612,783	1,249,154	1,480,247	2,707,321
1847	583,067	689,185	633,507	748,805	1,598,278	1,889,165	3,327,155
1848	685,196	808,531	670,321	790,979	1,672,191	1,973,185	3,572,695
1849	732,910	862,635	781,656	920,009	1,650,101	1,942,168	3,724,812
1850	827,823	972,692	690,456	811,286	1,769,691	2,079,387	3,863,365
1851	1,156,167	1,355,028	964,224	1,130,071	2,308,525	2,705,591	5,190,690
1852	1,284,500	1,502,865	1,072,136	1,254,399	2,536 653	2,967,884	5,725,148
1853	1,475,732	1,723,655	1,054,309	1,231,433	2,555,450	2,984,765	5,939,853
1854	1,603,478	1,868,052	1,207,186	1,406,372	3,066,208	3,572,132	6,846,556
1855	1,771,511	2,060,267	1,284,113	1,493,423	3,551,893	4,130,852	7,684,542
1856	1,972,581	2,288,194	1,351,970	1,568,285	3,571,800	4,143,288	7,999,767
1857	1,952,603	2,261,114	1,318,541	1,526,871	3,373,797	3,906,857	7,694,842
1858	2,186,094	2,527,125	1,380,030	1,595,315	3,236,843	3,741,790	7,864,230
1859	2,731,236	3,151,846	1,628,311	1,879,071	3,448,708	3,979,809	9,010,726
1860	2,941,817	3,388,973	1,821,674	2,098,569	3,749,632	4,319,576	9,807,118
1861	3,055,140	3,513,411	1,738,377	1,999,134	3,160,797	3,634,916	9,147,461
1862	3,145,770	3,608,198	1,351,054	1,549,658	3,432,584	3,937,175	9,095,031
1863	3,759,610	4,304,754	1,894,713	2,169,446	3,911,683	4,478,877	10,953,077
1864	3,960,836	4,526,635	2,054,669	2,348,233	4,161,970	4,756,532	11,631,400
1865	3,255,658	3,720,717	1,822,535	2,082,858	4,356,959	4,979,457	10,783,032
1866	4,736,616	5,413 958	2,128,867	2,433,280	5,464,209	6,245,599	14,092,837
1867	5,328,322	6,089,272	2,052,446	2,356,867	5,161,671	5,899,505	14,345,644
1868	5,990,813	6,846,699	2,507,582	2,865,820	5,335,737	6,097,947	15,810,466
1869	6,068,369	7,279,543	1,929,523	2,313,989	5,653,855	6,782,146	16,375,678
1870	7,554,909	8,814,024	2,990 878	3,489,364	4,728,242	5,516,312	17,819,700
1871	6,713,773	*7,690,251	2,249,356	2,568,764	6,234,974	7,120,340	17,379,355
1872	9,191,171	*10,750,050	3,610,674	4,202,824	6,126,468	7,131,209	22,084,083
1873	10,047,241	*11,744,141	3,263,168	3,801,447	6,294,454	7,335,333	22,880,921
1874	9,513,042	*10,241,032	3,868,749	4,139,561	6,810,087	7,286,793	21,667,386
1875	10,519,998	*11,062,520	2,731,311	2,867,876	6,393,441	6,713,113	20,643,509
1876†	8,100,000	*8,530,000	3,800,000	3,970,000	6,200,000	6,500,000	19,000,000
Total	125,913,797	*143,366,369	59,585,696	68,022,227	130,245,548	149,176,236	360,564,832

*Includes the Loyalsock region in Sullivan county, opened in 1871. The production of this region has been as follows: 1871, 23,122 tons; 1872, 51,327 tons; 1873, 33,058 tons; 1874, 36,286 tons; 1875, 14,582 tons; 1876 (est.), 30,000 tons.
† Figures of production for 1876 are merely approximate, the returns not yet being revised.

PRICES IN DOLLARS OF ANTHRACITE COAL FROM 1826 TO 1877.

Prices of Schuylkill White Ash Lump Coal, by the cargo, at Philadelphia. Averaged monthly from mean of weekly quotations. Tons of 2,240 lbs.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average for year.
1826....	.....	.....	.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.50	7.80	.....
1827....	7.00	7.00	7.00	7.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
1829....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.50	7.50	*7.25	.....
1830....	*7.25	*7.25	*6.00	*5.75	5.75	5.75	5.75	5.75	5.75	5.75	.....	.....	.....
1833....	.....	.....	6.00	5.50	5.25	5.25	5.25	5.25	5.17½	4.87½	4.87½	4.87½	.....
1834....	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.50	4.84
1835....	4.56	4.56	4.56	4.56	4.60	4.63	4.63	4.68	4.88	4.90	5.03	6.47	4.84
1836....	7.70	7.44	7.31	6.58	5.38	5.50	5.50	6.19	6.41	6.50	7.13	8.05	6.64
1837....	8.25	*8.25	8.04	6.78	6.50	6.38	6.10	6.00	6.00	6.09	6.13	6.13	*6.72
1838....	6.13	5.91	5.28	5.25	5.16	5.13	5.13	5.13	5.10	5.00	5.00	5.00	5.27
1839....	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1840....	5.00	5.00	5.00	5.00	5.00	4.63	4.63	4.63	4.66	4.95	5.06	5.34	4.91
1841....	6.40	7.00	6.44	5.88	5.69	5.17	5.13	5.27	5.56	5.63	5.63	5.63	5.79
1842....	5.63	5.56	5.06	4.38	4.03	3.88	3.83	3.60	3.56	3.51	3.56	3.56	4.18
1843....	*3.50	*3.25	*3.23	3.25	3.25	3.25	3.25	*3.25	3.25	*3.25	3.25	3.25	*3.27
1844....	3.50	3.33	3.10	3.02	3.00	3.03	3.13	3.21	3.26	3.26	3.27	3.26	‖3.20
1845....	3.26	3.26	3.27	3.31	3.31	3.31	3.44	3.44	3.59	3.74	3.76	3.81	3.46
1846....	3.81	3.75	3.72	3.84	3.87	3.97	4.00	*3.94	3.96	3.88	4.00	*4.00	*3.90
1847....	3.88	3.81	3.81	3.81	3.60	3.63	3.69	3.83	3.95	3.88	3.88	3.88	3.80
1848....	3.90	3.90	3.58	3.44	3.37	3.29	3.33	3.56	3.46	3.41	3.39	3.36	3.50
1849....	3.36	3.36	3.45	3.62	3.62	3.86	3.88	3.81	3.75	3.69	3.57	3.50	3.62
1850....	3.50	3.50	3.40	3.31	3.25	3.25	3.25	3.25	†4.25	4.25	4.25	4.25	3.64
1851....	4.28	4.13	3.56	3.31	3.10	3.00	3.00	3.05	3.17	3.20	3.25	3.00	3.34
1852....	3.18	3.47	3.40	3.44	3.44	3.45	3.45	3.50	3.56	3.56	3.56	3.50	3.46
1853....	3.42	3.44	3.45	3.47	3.47	3.47	3.47	3.64	4.03	4.19	4.19	4.10	3.70
1854....	4.50	4.50	4.25	4.39	4.81	5.16	5.55	6.00	6.00	5.81	5.68	5.60	5.19
1855....	5.60	5.28	4.53	4.50	4.50	4.45	4.28	4.19	4.19	4.19	4.15	4.06	4.49
1856....	4.06	4.25	4.25	4.25	4.05	4.00	4.00	4.00	4.12	4.13	4.10	4.08	4.11
1857....	3.92	3.92	3.92	3.89	3.85	3.85	3.88	3.87	3.85	3.82	3.82	3.82	3.87
1858....	3.83	3.83	3.77	3.47	3.22	3.23	3.35	3.25	3.32	3.32	3.32	3.30	3.43
1859....	3.28	3.38	3.34	3.20	3.20	3.20	3.20	3.20	3.19	3.20	3.34	3.29	3.25
1860....	3.28	3.29	3.30	3.30	3.23	3.31	3.36	3.39	3.50	3.53	3.62	3.63	3.40
1861....	3.63	3.63	3.50	3.24	3.23	3.29	3.37	3.40	3.35	3.33	3.33	3.33	3.39
1862....	3.33	3.33	3.11	2.78	2.78	3.64	4.58	4.85	4.98	5.22	5.50	5.63	4.14
1863....	5.38	5.25	4.63	4.75	5.50	5.80	6.25	6.50	6.75	7.25	7.50	7.13	6.06
1864....	7.10	6.75	6.59	7.20	7.88	8.34	9.78	‡10.75	10.13	8.90	8.88	8.38	¶8.39
1865....	8.38	8.38	8.63	8.10	6.75	6.25	6.03	6.50	8.32	9.93	8.81	8.25	7.86
1866....	7.94	7.75	5.40	5.25	5.13	5.53	5.88	5.68	5.47	5.34	5.25	5.05	5.80
1867....	5.06	5.06	4.47	4.50	4.44	4.38	4.28	4.07	4.09	4.01	4.00	4.00	4.37
1868....	4.00	3.13	3.13	3.22	3.25	3.25	3.25	3.25	4.10	4.50	5.22	6.00	3.86
1869....	5.13	5.01	4.15	3.81	3.90	5.00	6.59	7.17	6.15	6.00	5.87	5.12	5.31
1870....	5.07	4.79	4.79	4.50	4.50	4.44	4.31	4.44	4.33	4.19	3.69	3.55	4.39
1871....	4.05	**	**	**	**	4.32	4.45	4.25	4.35	4.68	4.72	4.63	4.46
1872....	4.63	3.78	3.50	3.50	3.50	3.50	3.50	3.59	3.71	3.90	3.90	3.90	3.74
1873....	3.90	3.90	4.00	4.00	4.10	4.20	4.40	4.40	4.50	4.60	4.60	4.60	4.27
1874....	††	††	4.05	4.10	4.20	4.30	4.45	4.60	4.75	4.90	5.05	5.05	4.55
1875....	‡‡	‡‡	4.10	4.10	4.10	4.40	4.50	4.50	4.55	4.55	4.55	4.55	4.39
1876....	4.55	4.15	4.25	4.25	4.30	4.15	4.20	4.35	3.20	3.00	3.00	3.00	3.87
1877....	3.00	3.00	‡2.75	‡2.75	‡2.75	.....	.....	.....	.....	.....	.....	.....	.....

PRICES OF LEHIGH COAL IN PHILADELPHIA. (From Grotjan's *Public Sale Report.*) 1822, May to December, $8.40. 1823, January to August, $10; September, $9.50; October to December, $8.40. 1824, January to April, $8.40.

* Uncertain.
† Rise due to freshet.
‡ Lowest average for month, $2.75—March, April, and May, 1877.
‖ Highest average for month, $10.75—August, 1864.
‖ Lowest average for year, $3.20—1844.
¶ Highest average for year, $8.39—1864.
** Owing to the long strike, there was no coal in first hands for sale during these months.
†† No sales made in Philadelphia.
‡‡ Miners' strike; no sales.

COAL PRODUCTION OF THE UNITED STATES IN 1870, 1874, AND 1875, IN TONS OF 2,240 POUNDS.

By R. P. Rothwell, Editor of The Engineering and Mining Journal, New York.

STATES.	Census Report, June 1, 1870.	Year ending Dec. 31, 1874.	Year ending Dec. 31, 1875.	Percentage of the whole, 1875.
Alabama, bituminous	9,821	45,000	60,000	0.13
Arkansas, "	.....	5,000	9,000	0.02
California, post-carboniferous coal	.....	214,600	166,100	0.35
Colorado, " " "	4,018	150,000	150,000	0.32
Illinois, bituminous	2,343,003	3,000,000	3,500,000	7.37
Indiana, "	390,935	812,000	800,000	1.69
Iowa, "	235,256	1,500,000	1,500,000	3.16
Kansas, "	29,410	250,000	275,000	0.58
Kentucky, "	134,449	360,000	375,000	0.79
Maryland, "	1,624,843	2,410,895	2,342,773	4.94
Michigan, "	25,134	12,000	12,000	0.02
Missouri, "	555,295	714,000	750,000	1.58
Nebraska, "	1,272	1,300	1,300	.....
Nevada, post-carboniferous coal	.....	1,000	1,000	.....
Ohio, bituminous	2,256,504	3,810,344	4,346,653	9.15
Oregon, post-carboniferous coal	.....	43,200	28,800	0.06
Pennsylvania, anthracite* and bituminous†	20,936,422	32,667,386	31,143,509	65.54
Rhode Island, anthracite	12,500	17,000	11,000	0.02
Tennessee, bituminous	119,123	350,000	360,000	0.76
Utah, post-carboniferous coal	5,178	30,000	35,000	0.07
Virginia, " "	55,181	73,100	79,200	0.17
Washington, " "	15,932	27,100	88,900	0.16
West Virginia, bituminous	543,641	1,000,000	1,100,000	2.32
Wyoming, post-carboniferous coal	44,643	260,000	278,000	0.59
N. Carolina, Georgia, and Indian Territory, bitum.	.....	60,000	100,000	0.21
Total anthracite	13,985,960	21,684,386	20,654,509	43.48
Total bituminous	15,231,668	25,330,539	26,031,726	54.78
Total post-carboniferous coal	124,952	799,000	827,000	1.74
Total of all kinds	29,342,580	47,813,925	47,513,235	100.00
* Anthracite	13,973,460	21,667,386	20,643,509	43.44
† Bituminous	6,962,962	11,000,000	10,500,000	22.10

STATISTICS OF THE FOREIGN IRON TRADE IN LATE YEARS.

REVIEW OF THE PRESENT CONDITION OF THE IRON, STEEL, AND COAL INDUSTRIES IN FOREIGN COUNTRIES; ALSO, STATISTICS OF FOREIGN RAILWAYS.

THE RAILROADS OF THE WORLD, IN ENGLISH MILES.

The following table of railway mileage for all countries is summarized from statistics collected to the close of 1875, by Dr. G. Stuermer, of Prussia, except where the year 1875 or 1876 is printed in connection with the name of a country, in which cases we have supplemented Dr. Stuermer's statistics with later and completer figures.

EUROPE.	Miles.
Germany	17,372
Austria	10,792
Great Britain (1875)	16,658
France	13,414
Belgium	2,167
Holland	1,011
Luxemburg	166
Switzerland	1,293
Italy	4,777
Spain	3,602
Portugal	641
Denmark	783
Sweden	2,465
Norway	310
Russia in Europe	11,525
Turkey in Europe	955
Roumania	766
Greece	7
Total in Europe	88,704

AFRICA.	
Egypt	950
Algiers	333
Tunis	37
Cape Colony	65
Mauritius	66
Total in Africa	1,451

ASIA.	Miles.
Russia in Asia	623
Asia Minor	249
Hindostan	6,489
Ceylon	82
Java	162
Japan	38
China (1876)	10
Total in Asia	7,653

NORTH AMERICA.	
Canada (1876)	4,929¼
United States (1876)	77,514
Mexico	377
Total in N. America	82,820¼

CENTRAL AMERICA.	
Honduras	56
Costa Rica	29
Panama	47
Total in C. America	132

WEST INDIES.	
Cuba	400
Jamaica	27
Total in West Indies	427

SOUTH AMERICA.	Miles.
Brazil (1876)	938
Argentine Republic	987
Peru	962
Chili	618
Other countries	303
Total in S. America	3,808

OCEANICA.	
Australia (1876)	1,803½
Tasmania (1876)	155½
New Zealand (1876)	549
Tahiti	2
Total in Oceanica	2,510

SUMMARY.	
Europe	88,704
Asia	7,653
Africa	1,451
North America	82,820¼
Central America	132
West Indies	427
South America	3,808
Oceanica	2,510
Total in the world	187,505¼

THE WORLD'S ANNUAL PRODUCTION OF CAST OR PIG IRON.

We present below a table, compiled from authentic sources of information, showing the production in recent years of cast or pig iron in the various iron-producing countries of the world. The total production is 13,682,750 tons. By adding the known and estimated quantities of iron produced directly from the ore in bloomaries and by other primitive processes, this total will be increased to about 14,000,000 tons, but that is the utmost limit of the present production of iron from the ore in all countries.

CAST OR PIG IRON BY COUNTRIES.	Year.	Gross tons.	Per cent. of total.
Great Britain	1875	6,365,462	46.52
United States	1876	1,868,960	13.66
Germany	1874	1,660,208	12.13
France	1876	1,449,537	10.59
Belgium	1875	541,805	3.96
Austria and Hungary	1875	455,227	3.33
Russia	1874	514,497	3.76
Sweden	1875	350,525	2.56
Luxemburg	1874	246,054	1.80
Italy	1872	26,000	.19
Spain	1872	73,000	.53
Norway	1870	3,975	.03
Mexico	1876	7,500	.06
Canada	1876	7,500	.06
Japan	1874	5,000	.04
Switzerland	1872	7,500	.06
Turkey in Europe and Asia	.....	40,000	.29
Australasia	.....	10,000	.07
All other countries	.....	50,000	.36
Total	.....	13,682,750	100.00

THE ANNUAL COAL PRODUCTION OF THE GLOBE.

We also give another table, compiled from reliable sources, showing the production of mineral coal by all countries in late years.

MINERAL COAL BY COUNTRIES.	Year.	Gross tons.	Per cent. of total.
Great Britain	1875	131,867,105	47.62
United States	1875	47,513,235	17.16
Germany	1874	46,658,000	16.85
France	1876	17,047,761	6.15
Belgium	1876	15,011,330	5.42
Austria and Hungary	1875	12,852,048	4.64
Russia	1874	1,346,900	.49
Nova Scotia	1876	709,646	.26
New South Wales	1874	1,304,567	.47
Spain	1873	570,000	.21
India	1875	500,000	.18
Turkey in Europe and Asia	.....	150,000	.05
Japan	1874	390,000	.14
Chili, China, New Zealand, and other countries	....	1,000,000	.36
Total	.....	276,920,592	100.00

In this and the preceding table the wonderful development of the coal and iron industries of Great Britain appears in startling contrast with the slow progress made by other countries in the same direction, Great Britain producing annually almost one-half of all the coal and iron which the world consumes.

GREAT BRITAIN.

The production of pig iron in the United Kingdom of Great Britain and Ireland from 1854 to 1875 is given below, from official statistics prepared by Mr. Robert Hunt, Keeper of Mining Records.

Year.	Gross tons.	Year.	Gross tons.	Year.	Gross tons.	Year.	Gross tons.
1854...	3,069,838	1860...	3,826,752	1866...	4,523,897	1872...	6,741,929
1855...	3,218,151	1861...	3,712,390	1867...	4,761,023	1873...	6,566,451
1856...	3,586,377	1862...	3,943,469	1868...	4,970,206	1874...	5,991,408
1857...	3,659,477	1863...	4,510,040	1869...	5,445,757	1875...	6 365,462
1858...	3 456,064	1864...	4,767,901	1870...	5,963,515	1876*..	6,150,000
1859...	3,712,904	1865...	4,819,254	1871...	6,627,179	(*est.)	.....

The exports of British iron and steel in 1876 were 2,218,568 tons; whereas, in 1875 they were 2,458,306 tons, and in 1874, 2,487,522 tons. The respective values were: In 1876, £20,730,679; in 1875, £25,747,271; and in 1874, £31,190,256. The total exports of iron and steel for 1876 show a decline of 239,738 tons in quantity, and £5,016,592 in value, as compared with the previous year. Messrs. W. Fallows & Co., of Liverpool, very clearly and comprehensively summarize in the following table the course of the British iron export trade during the past ten years.

Years.	Exports of Pig Iron. Tons.	Exports of Rails. Tons.	Other descriptions. Tons.	Total Exports. Tons.
1867	567,319	582,420	818,286	1,968,025
1868	552,999	583,488	905,365	2,041,852
1869	710,636	888,010	1,076,665	2,675,331
1870	753,339	1,059,392	1,012,844	2,825,575
1871	1,057,458	981,197	1,130,564	3,169,219
1872	1,331,143	945,420	1,106,199	3,382,762
1873	1,142,065	785,014	1,030,734	2,957,813
1874	776,116	782,665	928,741	2,487,522
1875	947,827	545,981	964,498	2,458,306
1876	905,029	413,656	899,883	2,218,568

The following table shows in greater detail the course of the British iron export trade from 1871 to 1876, including leading shipments to the United States.

PRINCIPAL ARTICLES ONLY TO ALL COUNTRIES.	Quantities in Tons.					
	1871.	1872.	1873.	1874.	1875.	1876.
Pig iron	1,057,458	1,331,143	1,142,065	776,116	947,827	905,029
Bar, angle, bolt, and rod	349,084	313,600	286,845	258,953	276,068	227,714
Railroad of all sorts	981,197	945,420	785,014	782,655	545,981	413,656
Wire of iron and steel (exc. telegraph)	26,200	33,540	29,445	36,692	43,221	44,959
Hoops, sheets, and plates	200,337	207,495	201,570	168,430	204,483	192,387
Tinned plates	119,606	118,083	120,638	122,960	138,363	132,397
Cast or wrought, and all other mfrs. (except ordnance) unenumerated	243,298	269,607	282,000	257,069	239,869	243,482
Iron, old, for remanufacture	139,812	107,521	60,339	43,141	21,610	22,814
Steel, unwrought	39,189	44,969	39,418	31,440	29,858	25,845
Manufactures of steel, or steel and iron	13,038	11,384	10,479	10,056	11,026	10,285
Total of iron and steel	3,169,219	3,382,762	2,957,813	2,487,522	2,458,306	2,218,568
To the United States (included above).						
Pig iron	190,183	195,151	102,624	43,568	51,362	41,113
Bar, angle, bolt, and rod	64,301	64,583	22,676	4,729	3,264	2,572
Railroad of all sorts	512,277	467,304	186,300	11,267	7,029	582
Hoops, sheets, and plates	41,520	31,407	18,272	8,381	11,025	7,015
Cast or wrought, unenumerated	10,671	13,468	22,571	20,058	7,816	4,179
Steel, unwrought	21,133	23,821	19,339	13,562	10,681	7,465
Total	840,085	795,734	371,782	101,565	91,177	62,926

PRINCIPAL ARTICLES ONLY TO ALL COUNTRIES.	Values in Pounds Sterling.					
	1871.	1872.	1873.	1874.	1875.	1876.
Pig iron	3,229,408	6,712,579	7,118,037	3,673,734	3,449,916	2,844,830
Bar, angle, bolt, and rod	2,921,777	3,632,818	3,755,980	3,054,547	2,725,907	1,943,966
Railroad of all sorts	8,084,619	10,225,492	10,418,852	9,638,236	5,453,836	3,706,261
Wire of iron and steel (except telegraph)	446,159	672,914	692,470	769,927	780,037	736,099
Hoops, sheets, and plates	2,399,203	3,414,906	3,722,889	2,975,409	3,304,148	2,857,753
Tinned plates	2,900,625	3,806,973	3,953,042	3,714,810	3,686,607	2,888,697
Cast or wrought, and all other mfrs. (exc. ordnance) unenumerated	3,588,364	4,772,364	5,478,759	5,122,588	4,342,492	4,018,372
Iron, old, for remanufacture	672,696	656,262	399,522	245,381	102,837	97,156
Steel, unwrought	1,198,428	1,478,737	1,462,857	1,203,719	1,073,733	879,257
Manufactures of steel, or steel and iron	682,855	623,122	728 831	791,905	827,758	758,288
Total of iron and steel	26,124,134	35,996,167	37,731,239	31,190,256	25,747,271	20,730,679
Steam-engines	2,064,004	2,594,996	2,927,617	3,255,685	2,631,333	1,937,579
Other machinery and mill-work	3,902,037	5,606,116	7,092,312	6,535,229	6,427,314	5,259,965
To the United States (included above).						
Pig iron	594,086	1,017,123	693,694	213,979	195,319	169,371
Bar, angle, bolt, and rod	534,205	745 681	308,226	74,064	55,798	28,236
Railroad of all sorts	3,976,857	4,812,866	2,434,135	147,970	67,521	9,109
Hoops, sheets, and plates	409,686	427,603	303,584	131,388	138,603	83,107
Cast or wrought, unenumerated	180,005	308,551	443,387	352,022	143,638	88,422
Steel, unwrought	620,537	769,858	707,635	503,058	382,652	247,368
Total	6,315,376	8,081,682	4,890,661	1,422,481	983,531	625,613

Messrs. T. W. & J. Walker, of London and Wolverhampton, publish the following comparative table of prices of British iron in June, 1872, and April, 1877.

KINDS OF IRON.	June, 1872.			April, 1877.			Decrease.
	£	s.	d.	£	s.	d.	
Iron bars (Welsh) f. o. b. Liverpool	12	0	0	6	10	0	46 per cent.
Iron bars (Staffordshire) f. o. b. Liverpool	13	5	0	7	2	6	47 "
Iron hoops	14	5	0	7	10	0	48 "
Iron sheets	17	15	0	8	17	6	50 "

Messrs. Fallows & Co. give the following list of lowest prices of iron which have prevailed in Great Britain at various periods between 1851 and 1876, the exceptionally high prices of 1873 being included.

Years.	Welsh Bar in Liverpool.	Rails in Wales.	Scotch Pig. f. o. b. Glasgow.	South Staff. "List" Iron.
	£ s. d. £ s. d.	£ s. £ s.	£ s. £ s. d.	£ s. £ s.
1851	4 17 6 @ 5 7 6	4 15 @ 5 0	1 18 @ 2 3 9	6 15
1862	5 10 0 @ 6 10 0	5 10 @ 6 0	2 9 @ 2 16 0	7 15
1868	5 15 0 @ 6 10 0	5 10 @ 6 0	2 11 @ 2 14 0	7 15
1873	11 10 0 @ 13 0 0	11 0 @ 12 0	5 1 @ 7 5 0	12 5 @ 16 15
1876	6 12 6 @ 7 10 0	5 0 @ 6 5	2 16 @ 3 6 6	9 15 @ 10 15

The following table shows the prices in shillings at which British iron has been sold from 1871 to 1876. This table, which we have compiled with care from British sources, shows the average prices, per ton of 2,240 pounds, of Scotch pig iron free on board at Glasgow, best Staffordshire bar iron at works, and Welsh iron rails at works.

Month.	Scotch Pig Iron. Mixed Numbers.						Bar Iron. Best Staffordshire.						Welsh Rails.					
	1871.	1872.	1873.	1874.	1875.	1876.	1871.	1872.	1873.	1874.	1875.	1876.	1871.	1872.	1873.	1874.	1875.	1876.
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
January	51	74	129	106	74	62	160	200	240	280	200	180	155	175	215	210	150	132
February	52	75	138	94	73	60	160	220	260	280	200	181	125	180	215	202	140	127
March	53	85	132	87	73	59	160	240	300	280	200	195	125	180	220	189	140	125
April	55	92	118	75	68	58	160	240	300	270	197	200	130	200	240	185	140	125
May	56	95	115	85	64	58	160	240	300	270	197	206	130	210	240	170	140	126
June	57	99	111	94	59	57	160	250	300	260	197	206	130	210	230	160	140	120
July	59	121	109	81	60	56	160	290	280	241	185	191	135	215	230	157	140	119
August	62	126	109	85	63	56	160	310	280	241	185	186	135	215	210	155	140	120
Septemb'r	60	129	115	83	63	56	170	310	280	261	185	186	135	220	210	148	140	114
October	61	120	113	84	62	57	170	270	280	236	188	183	135	220	210	147	135	115
November	67	97	107	85	61	58	170	230	280	226	200	180	135	220	210	145	130	115
December	70	107	105	83	63	58	180	230	280	220	200	180	140	200	210	140	125	107
Average	58	102	117	87	65	58	164	252	281	255	194	190	134	203	220	167	138	120

The production of Cleveland pig iron in late years has been as follows:—1867, 1,147,900; 1868, 1,233,418; 1869, 1,459,508; 1870, 1,695,377; 1871, 1,884,239; 1872, 1,968,972; 1873, 1,999,421; 1874, 2,001,233; 1875, 2,047,763; 1876, 2,075,565 tons.

The stocks on hand at the close of each of the years above named were as follows:—1867, 174,400; 1868, 152,900; 1869, 115,600; 1870, 117,345; 1871, 68,331; 1872, 41,628; 1873, 80,328; 1874, 89,737; 1875, 74,258; 1876, 182,541 tons.

At the close of April last the stocks of Cleveland pig iron in the hands of makers exceeded 225,000 tons, the highest quantity ever

known. The prices of Cleveland pig iron declined during the year 1876 from 57s. No. 1, 53s. No. 3, 52s. No. 4 forge, down to 48s. 6d. No. 1, 45s. No. 3, 42s. No. 4 forge, closing at 50s. No. 1, 46s. 6d. No. 3, 45s. No. 4 forge. Prices at the middle of April, 1877, were as follows:—No. 1, 45s. 6d.; No. 3, 42s.; gray forge, 40s.

The decline in the North of England iron rail trade since the termination of the flush times which were ushered in by the Franco-Prussian war is quite remarkable, and is well indicated in the following exhibit of the business of the first quarter of 1876 and 1877, respectively:—Quarter, 1876, quantity sold, 38,237 tons; average price, £6 14s. 5d. Quarter, 1877, quantity sold, 7,232 tons; average price, £6 2s. 7d. Thus, in this great branch of the English iron industries, the amount sold in three months fell off over 30,000 tons, although the price was less by more than 11s. per ton. A late English journal, referring to the rail trade of the North of England, says:—"Whilst the regular output of the associated works in the North used three years ago to be nearly 27,000 tons of rails monthly, it is now only about 2,500 tons—less than could be turned out weekly by three only of the works in the district."

The Welsh iron trade is no better off than that of the North of England. Late in 1876 Mr. George T. Clark, the President of the British Iron Trade Association, said in a paper which he read before the Association at Leeds:—"At no period during the last half century has the iron trade of South Wales and Monmouthshire been so depressed as during the last twelve months. At all the works there has been a great reduction of make, and, besides smaller establishments, four very large and important works have suspended operations, and have been at a dead stand for many months." Still later, the same high authority declared in an official "memorandum," which recited the condition of the iron trade in all of Great Britain:—"Of the extreme depression of the trade there can be no doubt, and that it is greater and more serious than has ever before been experienced. Indeed, the iron rail trade in South Wales and the North of England may be said to be, not languishing, but absolutely dead." About the 1st of May of the present year Mr. Robert Crawshay, proprietor of the Cyfarthfa works, in South Wales, remarked in an address to his workmen:—"The times are now so bad that I believe every works which is going is losing money. I know I have lost money for years, and have not made a single farthing by the works ever since they have been in my sole possession. I have very little hope, if any, of ever seeing Cyfarthfa

what it has been. The coal trade is also nearly as bad as the iron trade; every ton of coal I lose money on by selling—an actual loss of so much per ton, and I am obliged to find money every month from other sources to pay you your wages. My losses have been very great."

Messrs. J. E. Swan & Brothers say of the production of Scotch pig iron in 1876: This has increased 53,000 tons in the year, and amounted to 1,103,000 tons, against 1,050,000 tons in 1875, and is within 103,000 tons of the make in 1870, which was the heaviest on record. Concerning prices they say: The highest figure paid for warrants was on 11th January, 66s. 6d. per ton; the lowest accepted on 25th August, 55s. 9d. per ton; and the average was 58s. 6d., against 65s. 9d. in 1875, or 7s. 3d. per ton less. Special brands have not varied much, excepting No. 1 Coltness, which ranged between 66s. 6d. and 85s. per ton, f. o. b. Glasgow. From English journals we learn that the price of warrants at the middle of April, 1877, was 54s. 3d. Special brands were as follows:—Coltness, No. 1, 65s. 6d.; Gartsherrie, No. 1, 61s. 6d.; Summerlee, No. 1, 59s. 6d.; Glengarnock, No. 1, 59s. 6d.; Eglinton, No. 1, 56s. 6d.

The production of Scotch pig iron in the early years of its history and the prices obtained for it are given in the following summary:—Production in 1788, 1,500 tons; 1805, 9,000 tons; 1820, 20,000 tons; 1825, 29,000 tons; 1839, 197,000 tons. Price of pig iron in 1810, £9 5s.; 1815, £7 15s.; 1820, £7; 1825, £11; 1830, £5; 1835, £4 15s.; 1840, £3 15s.; 1849, £2 5s. 6d.; 1859, £2 11s. 10d.; 1861, £2 9s 3d.; 1869, £2 13s. 3d.

In the following table is given a statement of the production of Scotch pig iron from 1845 to 1876, with the stock on hand at the close of each year.

YEARS	Furnaces in blast, Dec. 31.	Make in gross tons.	Stock on hand Dec. 31. Tons.	YEARS	Furnaces in blast Dec. 31.	Make in gross tons.	Stock on hand Dec. 31. Tons.
1845.....	88	475,000	245,000	1861...	121	1,035,000	535,000
1846.....	98	570,000	149,000	1862...	125	1,080,000	645,000
1847.....	100	510,000	80,000	1863...	134	1,160,000	756,000
1848.....	103	580,000	98,000	1864...	134	1,160,000	760,000
1849.....	112	690,000	210,000	1865...	136	1,164,000	652,000
1850.....	105	595,000	270,000	1866...	98	994,000	510,000
1851.....	112	760,000	350,000	1867...	112	1,031,000	473,000
1852.....	113	775,000	450,000	1868...	121	1,068,000	568,000
1853.....	114	710,000	210,000	1869...	129	1,150,000	620,000
1854.....	117	770,000	120,000	1870...	126	1,206,000	665,000
1855.....	121	825,000	98,000	1871...	126	1,160,000	490,000
1856.....	128	832,000	88,000	1872...	115	1,090,000	194,000
1857.....	123	915,000	160,000	1873...	123	993,000	120,000
1858.....	132	945,000	295,000	1874...	121	806,000	96,000
1859.....	125	950,000	330,000	1875...	114	1,050,000	170,000
1860.....	131	1,000,000	427,000	1876...	116	1,103,000	363,000

The following is a summary of the condition of the blast furnaces of England, Scotland, and Wales at the close of December, 1876.

Cleveland	built	116	in blast	88
Northeast of England	"	47	"	23
Northwest of England	"	92	"	51
South Staffordshire	"	147	"	55
North Staffordshire	"	40	"	26
Shropshire	"	23	"	15
Yorkshire—West Riding	"	49	"	28
Derbyshire	"	57	"	35
Northamptonshire	"	20	"	11
Lincolnshire	"	20	"	9
Gloucester, Wilts, etc	"	18	"	7
North Wales	"	12	"	3
South Wales and Monmouth	"	165	"	62
Scotland	"	157	"	116
Charcoal furnaces	"	5	"	2
Total		968		531

During the year 1876 Great Britain imported 675,190 gross tons of iron ore, against 458,693 tons in 1875. The value of the ore imported in 1876 was £798,205, or about 23 shillings and 8 pence per ton. The value of the ore imported in 1875 was £583,571, or about 25 shillings and 5 pence per ton. The ore was largely used for Bessemer purposes.

The production of mineral coal in the United Kingdom of Great Britain and Ireland from 1854 to 1876 is given as follows by Mr. Robert Hunt, Keeper of Mining Records, except for 1876, which is taken from the report of the Inspectors of Mines for that year:

YEAR.	Gross tons.	YEAR.	Gross tons.	YEAR.	Gross tons.	YEAR.	Gross tons.
1854...	64,661,401	1860...	80,042,698	1866...	101,630,544	1872...	123,497,316
1855...	61,453,079	1861...	83,635,214	1867...	104,500,480	1873...	127,016,747
1856...	66,645,450	1862...	81,638,338	1868...	103,141,157	1874...	125,043,257
1857...	65,394,707	1863...	86,292,215	1869...	107,427,557	1875...	131,867,105
1858...	65,008,649	1864...	92,787,873	1870...	110,431,192	1876...	134,125,168
1859...	71,979,765	1865 ..	98,150,587	1871...	117,352,028	.....	.....

The extent of the British coal deposits is referred to as follows by Dr. C. W. Siemens in his inaugural address, delivered March 20, 1877, before the Iron and Steel Institute of Great Britain:—"According to the report of the Coal Commissioners, published in 1871, there were then 90,207 million tons of coal available in Great Britain, at depths not greater than 4,000 feet, and in seams not less than one foot thick, besides a quantity of concealed coal estimated at 56,273 millions of tons, making a total of 146,480 millions. Since that

period, there have been raised 600 millions of tons up to the close of 1875, leaving 145,880 millions of tons, which, at the present rate of consumption of nearly 132 millions of tons annually, would last 1,100 years. Statistics show that during the last twenty years there has been a mean annual increase in output of about 3½ million tons, and a calculation made at this rate of increase would give 250 years as the life of our coal fields." Another high authority, the *Colliery Guardian*, submits a calculation showing that in the great coal fields of England and Wales alone there yet remain 70,116,000,000 tons of coal, a quantity sufficient to yield 132,000,000 tons per annum, the amount raised in 1875, for over 530 years to come. And when these are exhausted there are yet other mines to be opened.

The exports of coal and coke from Great Britain in 1876 were 16,265,839 tons, against 14,544,916 tons in 1875, and 13,927,205 tons in 1874. The increase per cent. in the export of coal and coke in 1876, as compared with 1875, is 11.8. About one-eighth part of the total production of the coal fields of Great Britain is annually exported. A large portion of this quantity goes to Russia, Scandinavia, Germany, France, and Italy.

From the *Nautical Magazine* it appears that 719 sailing ships, giving a gross total of 251,338 tons, were built at British ports in 1876, against 600 sailing ships, with a total of 256,296 tons, in 1875. The steamships built in 1876 amounted to 348, with a total of 222,155 tons, while in 1875 there were built 380 new steamers, with a total of 311,883 tons. In sailing ships, therefore, there is an increase in the number built, but a decrease in tonnage, while the steamships show a decrease, both in number and tonnage. The figures for the four years ending with 1876 are as follows:

	1873.	1874.	1875.	1876.
Sailing ships	441	570	600	719
" " tonnage	90,585	205,951	256,296	251,338
Steamers	460	402	380	348
" tonnage	536,744	426,065	311,883	222,155

In a review of the work done in the shipbuilding yards on the Clyde during the past year, the *Scotsman* states that the total amount of tonnage launched—204,770 tons—is under that of 1875 by 23,430 tons, and is 52,000 tons below the aggregate for 1874, and 56,700 tons below that of 1873; but considering the general dullness of trade the result is not considered altogether unsatisfactory. The number of vessels launched was 266, against 276 in 1875, 225 in 1874, and 194 in 1873. Perhaps the most marked feature of the

trade during the year has been the continued decrease in the number and size of the steam vessels turned out, their place being taken by iron sailing ships, which, for the first time for many years, exceeded in tonnage as well as number the screw steamers launched. The change that has taken place in this respect since the great decline in the iron and coal trades is brought out in a comparison of the figures of 1873 with those of the present year. While, in 1873, 125 screw steamers of 218,000 tons in the aggregate were built, in 1876 only 83 vessels of this class, of 73,000 tons in all, were turned out. On the other hand, the 12 iron sailing ships of 1873, aggregating 19,000 tons, had increased in 1876 to 97 vessels of 96,000 tons.

In the United Kingdom the total length of railway open for traffic on the 31st of December, 1875, was 16,658 miles, of which 8,898 miles were laid with two or more lines, and 7,760 miles with a single line of rails. They were distributed as follows:—In England, 11,789 miles, including 4,460 miles of single line; in Scotland, 2,721 miles, including 1,661 miles of single line; in Ireland, 2,148 miles, including 1,639 miles of single line. There was an increase of 209 miles in 1875, namely, from 16,449 miles to 16,658 miles, or at the rate of 1.27 per cent. The length of new lines opened for traffic during the six years, 1870 to 1875, inclusive, amounted to 1,513 miles.

The British emigration to Australia is described as remarkably steady, and not counteracted by any great reverse movement. Thus, 32,196 persons went to the Australian colonies in 1876, while only about 2,200 returned. Formerly Ireland was the great source of British emigration to all countries, but now England is far in the van, sending abroad 73,000 last year, to 25,500 from Ireland and 10,000 from Scotland. The emigration from Ireland is said to have been the smallest of any year since the Irish famine.

We just learn that about 700,000 tons of Bessemer steel were made in Great Britain last year.

GERMANY.

The German government has published the statistics of the production of iron in Germany in 1874, as follows:—During that year there were 324 blast furnaces, which worked for a total of 2,801 months, or, upon an average, for about eight months and twenty days each out of a possible total of twelve months. The quantity of iron ore used amounted to 4,342,184 tons, of which 4,130,090 tons were

produced in Germany itself. The total quantity of pig iron and cast iron of first quality produced was 1,660,208 tons. The mean working population employed in the trade was 22,765, of which number 853 were women. A table is appended to these returns giving the quantities and values of the pig and cast iron produced during the last ten years. From 960,879 tons and a value of £4,129,142 in 1865, the totals increased without intermission until 1871, in which year they were 1,420,830 tons and £5,946,589. In the following year, when the production of Alsace-Lorraine was included for the first time, there was a further increase to 1,807,345 tons and £10,585,049, the rise in value, as will be seen, being considerably greater than the rise in quantity. There was an increase again in 1873 to 1,983,163 tons and £11,283,936, but a fall in 1874 to 1,660,208 tons, as stated above. The reaction of prices was also very considerable, as the 1,660,208 tons realized but £7,243,589, or about £4 8s. per ton, as compared with nearly £6 in 1873.

We have the preliminary statistics of the production of iron and steel in Prussia in 1876, which we preface with the remark that Prussia produces annually the larger part of all the iron and steel produced in the German empire. The production of pig iron in 1876 was 25,649,281 cwt., against 27,966,730 cwt. in 1875, showing a decline of 2,317,449 cwt., or about 8 per cent. Compared with 1874, however, the production of 1876 somewhat surpasses it, and it is considerably exceeded only by the two exceptional years 1872 and 1873. The production of rod iron in 1876 was 16,287,640 cwt., against 16,840,236 cwt. in 1875; and of steel, in 1876, 7,058,028 cwt., against 7,296,161 cwt. in 1875. The decrease against the preceding year is, in the case of rod iron, 552,596 cwt., or 3.2 per cent.; in the case of steel, 238,133 cwt., or also 3.2 per cent. We also have the preliminary statistics of the production of coal in Prussia in 1876. According to these statistics, the production of coal and brown coal in 1876 has risen to a hitherto unprecedented height. In 1875, which year showed the highest production up to that time, 668,385,989 cwt. of coal were raised, while in 1876 the production rose to 689,200,689 cwt.—20,814,700 cwt. more, or 3.1 per cent. The production of brown coal amounted in 1876 to 178,098,674 cwt., and exceeded that of 1875, which was 166,805,182 cwt., by 11,293,492 cwt., or 6.8 per cent.

The number of Bessemer steel converters in Germany at the present time is stated to be 78, of which 66 are in Prussia, 4 in Saxony, 4 in Bavaria, and 4 in Alsace-Lorraine.

Until within the last year or two Germany had made rapid progress in building up industries which are closely identified with the iron industry. A year ago an English publication said: "Thirty-six years ago there was not a single locomotive or railway-wagon works in the kingdom; but all locomotives were imported from England, save some few from America. At the present time there exist in Berlin, Hanover, Chemnitz, Cassel, Carlsruhe, Esslingen, and other towns, extensive locomotive works, which produce together nearly 1,500 locomotives yearly, representing a value of about three million sterling. Borsig, of Berlin, turned out 1,031 locomotives within the six years from the 1st of April, 1867, to the 1st of April, 1873, of which 300 were sent to Russia, and 30 to Austria, Holland, and Java. Borsig has, up to 1875, exceeded the number of 1,700 locomotives. Unfortunately, Borsig has cut some of our own locomotive constructors out during the past two years in Sweden, and in a most formidable manner too, having sold more than fifty locomotives there. Germany manufactures yearly upwards of 30,000 railway wagons, representing a value of 4½ million pounds sterling, many being for export, principally for Russia. In this branch iron has replaced wood to a great extent, and they possess many specialties; for instance, the almost universal use of cast steel instead of iron; of cast-steel axles of splendid quality (first made in Carlswerk); Krupp invented an ingenious process of fixing on cast-steel wheel tires, and Meier, of Bochum, casts splendid cast-steel disc wheels in one piece."

The deplorable condition into which the German iron trade has fallen within the last two years, in part through the lack of Protection, is shown in a table prepared by the Berlin *Zeitung*, stating that, of 32 iron and steel companies enumerated, only 6 show any dividend whatever for the year 1875–6, and the aggregate accounts published for that period show a balance of loss on the year's operations of $1,795,000 on a capital of about $75,000,000, which is worse than the corresponding balance at the close of 1874–5, the loss in that case being $975,000. In Krupp's works there were 12,100 hands employed in the spring of 1875; in September, 1876, there were 9,000. The wages for 12 hours were 4s.; in September they were 3s. 4d. In the works of Hörde 2,800 men were employed in 1875, who worked six double shifts every week; in 1876 there were 1,500 men, working five double shifts. The Gute-Hoffnung-Hütte, at Oberhausen, employed in March, 1873, 7,175 hands; in October, 1874, 5,876; in January, 1876, 4,142. In the Bochum steel works

4,600 men were employed in 1873, while in the first two months of 1876 the number was 2,250. The Siegen plate mills reduced the number of their men by a full third during the month of April last. The large railway-carriage works of Cramer and Klett, in Nuremburg, which formerly had 6,000 men in its employ, has now only 400.

Since the removal of the iron duties on the 1st of January last, the depression in the German iron trade has largely increased. In May of the present year an English journal published the following information:—"The crisis in Germany continues in unabated severity. April was the worst month known in Dortmund for years past. The common estimate is that business is at about a third of its former dimensions. Where any business is stirring, as in building irons, the competition of English, French, and Belgian makers is severely felt. On May 1st the oldest foundry in Rhineland and Westphalia closed its gates,—the St. Antonienhütte, in Sterkrade,—after a hitherto uninterrupted career of success of more than a century in duration. In Siegene, the Heedorf furnace has been blown out, leaving only six furnaces in the whole locality in blast. The Hörde Company has discharged another 100 men, employing now about half the normal number. The company owns eighty-four puddling furnaces, of which only ten are at work, and only three out of its eight blast furnaces are in blast. The Upper Silesian trade is hampered by the cost of carriage, which makes competition with England difficult." The Middlesbrough (England) *Iron and Coal Trades Review*, in its issue for May 11th, referring to the recent defeat of the bill in the German Reichstag reimposing duties on iron and steel, says with the most commendable frankness:—"The iron trade of Germany, *already in a state of extreme prostration, has received another blow* by the rejection, by an unexpectedly large majority, of the bill introduced in Parliament for the resumption of Protective duties on iron imports. *As ironmasters throughout the country looked upon the bill more or less as a sheet-anchor which was to save them from ruin, the fact of its having proved a failure tends to produce increased depression and stagnation.*" It is probable, however, that the exultation of our English friends will be short-lived. The Berlin correspondent of the London *Times* reports that the German government contemplate moving for a special federal commission to prepare a bill for a joint reform of tariff and taxation. Prince Bismarck is said to desire to reintroduce Protectionism and indirect taxes to a certain extent.

FRANCE.

The production of pig iron in France in 1876 was 1,449,537 metrical tons, against 1,416,397 tons in 1875, and 1,423,307 tons in 1874. A metrical ton is the equivalent of 2,204 English pounds. The production of rolled iron in 1876 was 848,408 metrical tons, against 904,990 tons in 1875, and 862,254 tons in 1874. The decrease in the production of rolled iron in 1876 is stated to be almost entirely due to the decline in the demand for iron rails. The production of steel in 1876 was 261,878 tons, against 239,205 tons in 1875, and 217,072 tons in 1874. In 1865 the total production of steel in France was only 40,574 tons.

The large orders that have been lately given out to French works for steel rails will undoubtedly greatly increase their production in 1877. These orders aggregate over 500,000 tons, but the delivery of a large part of them extends over several years. Some of these orders, as reported, are so remarkable, that we make room for a notice of them.

Early in the fall of 1876 the Paris, Lyons and Mediterranean Railway contracted for 215,000 tons of Bessemer rails, deliverable at stated intervals within five years. This large order was divided among five large French steel works, and the price agreed upon was £9 15s. per gross ton, deliverable at the works: 75,000 tons to the Chatillon and Commentry works, 40,000 tons each to the Terrenoire works and Creusot works, and 30,000 tons each to the Denain works and Firminy works. In November, 1876, the Eastern Railway of France contracted with the Creusot works for 20,000 tons of steel rails, deliverable during 1877 at Gray, a station 100 miles distant, at £9 4s. 6d. per gross ton. Since the beginning of the present year the Western Railway of France has contracted for 120,000 tons of Bessemer rails at much lower rates than those paid by the Paris, Lyons and Mediterranean Railway. The order is divided among the Creusot, Marine, Fourchambault, and Terrenoire works, and the prices are as follows, all the rails to be delivered at Paris:—Marine, 30,000 tons, at £9 2s. 6d.; Fourchambault, 25,000 tons, at £8 17s. 6d.; Creusot, 20,000 tons, at £8 17s. 6d.; ditto, 15,000 tons, at £8 12s. 6d.; Terrenoire, 30,000 tons, at £8 12s. 6d. The outside dates of delivery are, Creusot (35,000 tons), 1878–1881; Terrenoire (30,000 tons), 1878–1881; Marine (30,000 tons), 1877–1880; Fourchambault (25,000 tons), 1878–1880. The prices paid are equivalent to about £8 at the works. In addition to the above,

an order for 18,000 tons of steel rails, which has just been given out by the Eastern Railway Company of France, is to be shared between the Creusot, the Terrenoire, and the Denain works. Terrenoire will supply 9,000 tons at between £8 7s. 6d. and £8 14s. 6d. per ton, according to the periods of delivery; Creusot is to deliver 6,000 tons in 1879 at £8 5s. 6d. per ton; and Denain will furnish 3,000 tons this year at £8 17s. 3d. per ton. An English journal remarks that, "at such prices as these the French works do not appear to have much to fear from foreign competition." Still later, we see it stated that the Creusot works have contracted to supply 20,000 tons of steel rails to Russia.

It is reported by a Parisian paper that the proprietors of the Maubeuge Forges have received from the Eastern Railway Company of France an order for 10,000 tons of iron rails at £7 4s. a ton.

The imports of iron and steel into France in 1876 were less than in 1875, while the exports were greater. The total imports in 1876 were 8,970 tons less than in 1875. The total exports were 206,248 tons in 1876, against 202,277 tons in 1875, which was an increase of 3,971 tons over those of 1875. The imports of ores reached 848,285 tons in 1876, against 832,798 tons in 1875, being an increase of two per cent. over 1875; the exports of ores in 1876, 105,171 tons, show a decline of 42 per cent. on 1875, when the exports were 179,668 tons. The increase in imported ores is divided among Belgium, Luxemburg, and Spain. Algiers sent 35,000 tons less than in 1875, and Italy 3,000 tons less. The falling off in the exports of French ores is attributed to the laying cold of Belgian furnaces.

The following table shows the production and consumption of iron and steel rails in France for the ten years from 1865 to 1874.

YEARS.	Iron Rails.		Steel Rails.	
	Production.	Consumption.	Production.	Consumption.
1865	208,785	151,972	9,751	?
1866	171,007	125,974	10,790	3,687
1867	172,482	140,621	19,893	10,967
1868	186,028	124,734	42,601	25,759
1869	216,627	133,479	52,400	50,225
1870	132,611	81,433	42,520	41,189
1871	100,372	64,207	32,447	22,613
1872	159,048	101,686	82,222	52,194
1873	151,478	124,717	102,083	64,097
1874	152,545	125,667	155,647	102,227

We learn from an official return that the production of coal last year in France amounted to 17,047,761 tons, as compared with 16,949,031 tons in 1875. The increase effected in the production last

year was thus inconsiderable. While, however, the production of 1876 was 17,047,761 tons, the corresponding production in 1856 did not exceed 7,925,700 tons, so that great progress must be said to have been made by French coal mining during the last twenty years. Of the total coal product of 1876, there were 1,123,161 tons of anthracite.

It appears that in twelve months ending June 30, 1876, there were 441¼ miles of new railway opened in France.

The value to French commerce of the Protective policy which has for many years formed a part of the fiscal system of France is shown in the following brief extract from the report in 1876 of the Minister of Agriculture and Commerce to the President of the French Republic:—"In 1859 the movement of our imports and exports was limited to a total of 3,907 millions; it has gradually increased to 5,730 millions in 1865; to 6,228 millions in 1869; to 7,342 millions in 1873, and, finally, to 7,625 millions in 1874. In fourteen years the increase is very nearly 100 per cent."

BELGIUM.

From M. Julien Deby's "Report on the Progress of the Iron and Steel Industries in Foreign Countries," contributed to the second volume of the *Journal* of the Iron and Steel Institute of Great Britain for 1876, we find much valuable information concerning the iron and coal industries of Belgium, the important features of which we condense as follows:

Out of a total number of 74 blast furnaces existing in the kingdom, 42 were in blast and 32 out of blast during the year 1875. Only 3, out of 54, iron works were completely closed, while at the same time 179 puddling furnaces, out of a grand total of 676, were not fired during this period. Four shops where iron is worked up, out of a total of 61, closed their establishments, as did also 46, out of a total of 177, iron foundries, scattered in the various provinces. The number of tons (1,000 kilos each) of pig iron produced in Belgium in 1875 is stated to have been 541,805, with a market value of 40,775,742 fr. (£1,631,030). The total production of wrought iron is put down at 436,440 tons, with a market value of 89,886,188 fr. (£3,595,447). The output of pig in the preceding year had been 532,790 tons, and that of wrought iron 478,164 tons, showing a slight increase in pig iron for 1875, with a corresponding decrease in the production of wrought iron.

The total quantity of iron ores imported into Belgium from January 1, 1875, to January 1, 1876, amounted to 660,000 tons, this being 144,000 tons less than during the year 1874–5, and 79,000 tons less than during the year 1873–4. This total comprises 515,500 tons of ores from the grand duchy of Luxemburg, the remainder comprising high grade ores from Spain, Africa, and France. Pig iron is stated to have been imported to the amount of 210,821 tons, this figure being higher by 60,000 tons than the commercial movement of the two preceding years. Great Britain figures here for 91,413 tons, and Luxemburg for 78,389 tons. The manufactured iron introduced into Belgium from foreign countries was inconsiderable. It comprised 14,932 tons.

The Belgian exports of iron ores in 1876 amounted to 163,439 tons, being slightly in excess of the quantities shipped in the years 1874 and 1875. The exports of pig iron were insignificant as usual, not exceeding 9,523 tons, of which France alone consumed 5,384 tons. The wire exports are indicated at 2,112 tons. The reduction in the rail exports was severely felt. Its gradual decrease is shown in the following figures:—1874, exports of rails, 92,673 tons; 1875, 60,398 tons; 1876, 43,028 tons. The greatest consumers of Belgian rails in 1876 were: Russia, 10,682 tons; Holland, 11,964 tons; Italy, 7,907 tons; and Switzerland, 5,903 tons. In 1876 Belgium exported rails to no fewer than seventeen different countries, including 460 tons to a new market, "The Transvaal Republic." The exports of Belgian sheets and plates have slightly, although gradually, declined, the totals being: 1874, 25,358 tons; 1875, 22,923 tons; 1876, 20,095 tons. Great Britain figures last year as a purchaser of Belgian sheets and plates to the amount of 2,478 tons. Heavy rolled and merchant iron was exported to the total amount of 97,800 tons, against 96,426 tons in 1875; England figuring here for 24,994 tons, principally beams and girders, against 21,407 tons in 1875, and 22,461 tons in 1874. The export of Belgian wrought-iron nails in 1876 reached 11,564 tons. If we add to the above figures 13,806 tons of iron manufactures of various kinds, and 3,145 tons of castings, we obtain a grand total of 201,089 tons for the export trade of Belgium during 1876. For comparison we give here the total exports of iron and steel for the last three years: 1874, 276,974 tons; 1875, 222,096 tons; 1876, 201,089 tons.

The Belgian exports of steel were very small in comparison with those of iron, and consisted of 181 tons of cast steel, 3,751 tons of rolled steel, principally rails, and 1,596 tons of various articles made

from steel, mostly hardware. The exports of fire-arms amounted to the important official sum of 15,095,695 fr. (£603,827), the principal purchasers of the same having been France, Prussia, England, and Turkey.

The total production of coal in Belgium in 1876 amounted to 15,011,330 tons, valued at 229,840,126 fr. (£9,193,605). The Belgian collieries employ 110,720 workmen, whose average daily wage is 3.85 fr. or about 3s. sterling. The total indicated horse-power of the engines employed in these collieries is 92,328. The total number of collieries in the country worked at present amounts to 175, comprising 463 shafts, 332 of which are in actual operation.

We observe that the John Cockerill Company has just obtained an order for 5,000 tons of steel rails for delivery to a Spanish line.

NORWAY.

The official statistics of the production of iron and steel in Norway for the ten years from 1861 to 1870, inclusive, were given by Mr. Forbes, in 1875, in the *Journal* of the Iron and Steel Institute of Great Britain, and are the latest statistics of the kind which we have been able to discover. We reproduce the leading facts contained in his statement. It will be seen that Norway has in these ten years made no progress in the manufacture of iron or steel. It is a fair presumption that the succeeding years will show no better results when their statistics are obtained.

PRODUCTS.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.
Iron ore.....tons.	24,385	24,160	19,155	43,470	49,720	24,580	18,785	19,895	16,800	21,155
Cast iron..... "	7,575	7,590	7,375	8,165	7,985	6,320	7,145	4,755	3,985	3,975
Wrought iron,"	3,895	4,205	4,180	3,875	4,010	3,890	3,470	1,570	930	845
Steel..... "	65	95	230	230	230	250	240	245	260	265

The ton used in the above table is the Norwegian ton of 2,000 pounds, which is equal to 2,200 English pounds. The imports and exports of iron and steel by Norway are not large—the former not exceeding 20,000 tons annually, and the latter scarcely aggregating 2,000 tons in any one year. The exports of iron ores have, however, increased from 335 tons in 1861 to 15,115 tons in 1870.

SWEDEN.

This interesting iron-producing country is conceded by all observers to have made the best display of iron products that was

made at Philadelphia; not that the products themselves were invariably the best, but that the display was in every respect the most finished, the most artistic, the most compact, and the most comprehensive.

Through the courtesy of Professor Richard Akerman, of the School of Mines at Stockholm, we are in possession of his exhaustive report "On the State of the Iron Manufacture in Sweden at the Beginning of 1876," and of the government publication containing the official statistics of Swedish mining and metallurgy for 1875, from which we compile the following statistics for the years 1873, 1874, and 1875.

COMMODITIES PRODUCED.	1873. Metrical tons.	1874. Metrical tons.	1875. Metrical tons.
Iron ore	832,857	926,825	822,290
Pig iron	339,685	332,154	343,551
Castings direct from blast furnaces	6,187	5,843	6,974
Bar, band, rod, and wire iron, etc	175,460	167,719	189,820
Bessemer metal	15,685	21,312	19,367
Other ingot metal and steel	1,308	1,646	2,016
Plates	7,913	8,626	9,077
Nails	7,710	7,044	8,313
Rails	2,927	3,376	1,847
Tools and various iron manufactures	19,353	15,277	16,108
Total	1,409,085	1,489,822	1,419,363

The remarkable uniformity of the results obtained in the three years above represented will not escape notice. The imports and exports of iron and steel during 1873 and 1874 were as follows:

COMMODITIES.	1873.		1874.	
	Exports. Met'l tons.	Imports. Met'l tons.	Exports. Met'l tons.	Imports. Met'l tons.
Iron ore	23,869	1	25,310	191
Pig iron	57,905	14,817	41,872	16,665
Cast goods	452	265	726	271
Blooms	10,449	1,037	8,570	10
Bar iron	95,408	3,498	88,564	2,626
Hoop and rod iron	20,554	1,753	18,534	2,564
Rails	196	48,549	240	59,479
Plates	818	4,154	830	2,535
Anchors and cables	85	933	102	945
Hammers and anvils	8	95	8	186
Nails	3,462	675	1,636	961
Iron and steel scrap	5,249	745	3,497	1,182
Bessemer and Martin metal and steel	4,150	198	7,366	226
Iron and steel wire	528	427	884	220
Tinned plates	6	1,155	7	751
Total	223,089	78,302	198,146	88,812
Tools, machines, and railway material	£56,146	£648,156	£93,928	£933,100

The following statistics of the exports of Swedish iron in 1875 and 1876 are made public through other channels, from which it will be seen that the exports in these two years have been lighter than in the two preceding years.

COMMODITIES EXPORTED.	1875. Metrical tons.	1876. Metrical tons.
Pig iron	48,400	26,229
Blooms	12,315	12,958
Bar iron	105,400	102,341
Band and hoop iron	26,885	26,702
Plates	774	1,289
Nails	1,195	1,217
Total	194,969	170,736

In the year 1874 there were in operation in Sweden 217 blast furnaces. In 1875 there were 224 furnaces in blast, and 101 out of blast. The fuel used in the blast furnaces is almost exclusively charcoal. Most of the pig iron made is refined with charcoal in hearths by the Lancashire method: a small quantity is also refined by other direct processes. In 1874 there were 727 hearths at work in the whole country. Puddling is carried on at only a few works, where the iron produced is manufactured, and the principal reason why there is so little puddling done is the scarcity of coal in Sweden and the expense of importing it.

LUXEMBURG.

In 1873 the grand duchy of Luxemburg produced 257,411 tons of pig iron, and in 1874 it produced 246,054 tons. Its other iron products are inconsiderable. In 1874 it produced 1,413 tons of wrought iron, 5,000 tons of bars, 2,200 tons of rails, and 2,740 tons of various iron ware. The production of pig iron in this small country, which has a population of only about 200,000 inhabitants, has shown a remarkable increase since 1864, when it was only 27,000 tons.

RUSSIA.

The following interesting information concerning the iron and coal industries of Russia is condensed from a communication written in 1876 to a German technical journal.

On looking closely into the condition of the Russian iron manufacture, we find it in a very defective condition, compared with that

of Western Europe. Very different results ought to be shown. But fuel is scanty, wood is dear, and the ways between the mine and the furnace and the furnace and the centres of population are frequently long and always difficult. The following statistics are compiled from official returns for 1874. In that year the government works in the Ural, in Olonetz, Poland, and South Russia produced: cast iron, 202,501 tons; wrought iron, 8,994 tons; steel, 1,151 tons; shot and shell, 8,203 tons; steel cannon, 146 tons; iron cannon, 241 tons; various other goods, 106½ tons; armor-plates, 169 tons. Private works produced in the Ural: cast iron, 227,419 tons; wrought iron, 164,164 tons; steel, 1,121 tons; Central Russia: cast iron, 54,090 tons; wrought iron, 29,596 tons; Poland: cast iron, 22,155 tons; wrought iron, 13,064 tons; South Russia: cast iron, 7,062 tons; wrought iron, 7,121 tons; other parts of the empire: cast iron, 1,270 tons; wrought iron, 6,194 tons; steel, 4,193 tons. Total production of cast iron in 1874 in Russia, 514,497 tons. In 1871 it was about 360,000 tons.

Although both East and West Siberia are rich in ores, they lie fallow, and a large proportion of the make of the Ural goes to Siberia. Siemens puddling furnaces are found here and there in Russian iron establishments. At some rolling-mills heavy work has been done; stout boiler-plate has been made, and armor-plates, 15 inches thick, and weighing 1,300 pood, have been rolled. A pood is 36.11 English pounds. The rail manufacture is in a low condition. The largest rail-making house is that of Pantiloff, at St. Petersburg. It produces an annual average of 1,000,000 pood of rails and 200,000 pood of other articles. The works employ about 2,000 men; the coal used, as well as the cast and wrought iron, is imported from England. Of the former, 20,000 tons, and of the latter 11,000 are worked up annually, together with from 6,000 to 8,000 tons of old rails and scrap. The largest owner of mining property in Russia is Mr. Paul Demidoff. The whole city of Nige Tagilsk, in the Ural, belongs to him; his head offices, wherein is transacted the business of thirteen mines and works, are here. His possessions extend over a million and a half of acres, and consist of mines of iron ore, manganese, copper, lead, gold, platinum, and diamonds. Bar iron and boiler-plates are the chief products; steel is unimportant: the total make is 21,700 tons. Steelmaking is beginning to make progress in Russia, especially the making of crucible steel, which is used for steel cannon. The Imperial Perne and Obukhof steel works, at St. Petersburg, are under the control of the

admiralty. The manufacture is carried on in strict accordance with the most advanced requirements of science. The Bessemer system has not yet been generally introduced: Pantiloff was the first to adopt it in Russia; he was followed by Demidoff, Bernadacky, and Obukhof. The last two have also adopted the Siemens-Martin system.

Concerning coal in Russia, the same writer says: A further step in advance is the discovery of the suitability of the Ural coal for the manufacture of coke. Up to quite a recent period attempts had been made to get blast-furnace fuel from the coal on the western declivity of the Ural, but in vain. In 1874 coal was raised in the basin of Moscow to the extent of 20,000,000 pood, or about twenty times the amount raised ten years ago. The coal from this basin is already used for heating locomotives, for factory purposes, and for smelting. It is very friable, and the loss in working is therefore considerable. Anthracite mining in the basin of the Donetz is being very slowly developed, the high rates of wages and the difficulty of sale being the principal impediments. In the government of Ekaterinoslav coal-mining is being developed on the western side, where there are iron works. Foreign competition makes itself perceptible here, foreign coal being landed at Sebastopol and taken up the country by rail. In the eastern division the coal trade is falling off, from the decline in demand and the difficulty of transport. The latter hindrance, however, will be removed when the Donetz Railway is opened. In the Caucasus the extraction of coal is on a very low footing. The amount raised per annum does not exceed 200,000 pood, the greater part of which goes to the works at Tkvibul. In the Privisljansk district the extraction of coal has been making progress since 1870. Last year 20,000,000 pood were raised.

From another source we learn that the principal coal fields in European Russia are the following: (1) The Ural chain, the production of which is limited. The seams that have been worked are from 3 to 7 feet in thickness, and the coal analyzes about 65 per cent. of carbon and 15 per cent. of ash. (2) The Moscow field, embracing an area of 12,000 square miles; seams from 3½ to 7 feet thick; carbon, about 60 per cent., and ash, 18 per cent. (3) The Southern field, also about 12,000 square miles in extent; partly bituminous, and partly anthracite; seams from 3½ to 5½ feet in thickness; the coal is richer in carbon and contains less ash than that of the other districts. (4) The Polish field; 80 square miles in area;

nine seams of coal, eight of which range from 3 to 6½ feet in thickness, but the ninth has a thickness of about 20 feet; the coal varies much in purity. Besides these four districts, there are deposits of coal in Turkestan, in the Caucasus, and in Siberia, of which little is known. The rate of increase in the production of coal and iron ore in Russia has been as follows:

	Coal.	Iron ore.		Coal.	Iron ore.
1840.....tons,	8,064	112,419	1868.....tons,	444,067	651,422
1850..... "	48,366	161,282	1870..... "	697,267	786,502
1860..... "	129,032	180,768	1871..... "	817,008	819,736

The importation of coal into Russia has also been increasing during the above periods, the importation from Great Britain in 1871 being 872,588 tons, and about a fourth as much from other countries. The imported English and other coal exceeds the quantity raised in the country.

From still other notices of the iron works of Russia we learn the following particulars of the production of iron and steel in the Russian empire for the years 1871 to 1873:—1871, pig iron, 359,700 tons; wrought iron, 251,800 tons; 1872, pig iron, 398,900 tons; wrought iron, 268,140 tons; 1873, pig iron, 384,000 tons; wrought iron, 255,000 tons. It will be seen that the production of cast iron in 1874 (514,497 tons) was much in excess of the pig iron production in preceding years. The production of steel has increased from 3,489 tons in 1864 to 8,195 tons in 1874. The number of furnaces in activity in 1873 are reported to have been as follows:—Blast furnaces, 245; puddling furnaces, 522; reheating furnaces, 700; puddling and reheating furnaces, 20; refinery furnaces, 840; steel furnaces, 472; cupolas, 191; air-melting furnaces, 88.

On the 30th of May, 1876, the Russian government increased the encouragement which had previously been extended to the Russian iron trade by adopting regulations of which the following is a synopsis: The free importation of rails for railways shall be hereafter prohibited so far as the charters of such railways are not at variance with this prohibition. All future concessions for railways shall contain a clause enforcing the acquisition in Russia of not less than one-half of the iron or steel rails requisite; on condition, moreover, that the quantity of rails imported from abroad shall not be admitted without payment of the regular duty. For each pood (36 pounds) of steel rails manufactured by private order of railway companies, a premium shall be established for twelve years, as follows:—During the first eight years 35 copecks (1s. 3d.) for each

pood of steel rails; 30 copecks (1s.) per pood during the course of the ninth year; 25 copecks (10d.) during the tenth; and 20 copecks (8d.) during the eleventh and twelfth years. The charters of all new railways shall contain a clause making obligatory the acquisition in Russia of such a proportion of the whole quantity of steel rails required as shall be found necessary by the Ministry of Public Works.

More recently Russia has greatly intensified her Protective policy by increasing the duties on imported locomotives and tenders; by requiring all newly-projected railway companies to purchase in Russia all their locomotives, freight cars, and first, second, and third class passenger cars; and by granting premiums for five years to all Russian locomotive-builders who shall build locomotives exclusively of parts made in Russian railway rolling-stock works. The premium granted for each locomotive, together with its tender, is fixed at 2,400 roubles for each four-wheeled locomotive, 2,600 roubles for each six-wheeled, and 3,000 roubles for each eight-wheeled locomotive. A rouble is the equivalent of about 75 cents of American money.

AUSTRIA AND HUNGARY.

From the official report of the Austrian Commission to the Philadelphia Exhibition, which we have just received from the author, Professor Franz Kupelwieser, we obtain the following correct statistics of the production of pig or cast iron and coal in the Austro-Hungarian empire from 1870 to 1875. The tons used are metrical tons.

YEARS.	Coal.			Pig or Cast Iron.		
	Austria. Tons.	Hungary. Tons.	Total. Tons.	Austria. Tons.	Hungary. Tons.	Total. Tons.
1870	7,206,810	1,149,135	8,355,945	278,570	124,383	402,953
1871	8,520,714	1,472,822	9,993,536	291,704	132,902	424,606
1872	8,971,019	1,586,011	10,557,030	312,755	106,859	419,614
1873	10,259,820	1,634,254	11,894,074	370,989	163,469	534,458
1874	10,880,593	1,899,164	12,279,757	332,157	151,701	483,858
1875	11,400,890	1,451,158	12,852,048	303,459	151,768	455,227

The production of Bessemer steel in Austro-Hungary increased from 3,500 tons in 1865 to 75,000 tons in 1873. There are 30 Bessemer converters in the whole empire. Iron ores are mined in all the provinces of the empire, but mainly in Styria, Carinthia, Hungary, Bohemia, and Moravia. All divisions of the empire,

Saltzburg and the Bukowina excepted, possess collieries, but the largest quantities of pit coal and brown coal are mined in Bohemia, Moravia, and Silesia.

The announcement is made that the John Cockerill Company of Belgium has just leased the Hungarian government iron works at Diosgyör, in Hungary, for a term of twelve years. The leasing company undertakes to organize the works on a footing which will enable it to manufacture 15,000 tons of steel rails in the first year, and double that quantity in the second year. The works are to use only Hungarian iron or old rails, supplied by the Hungarian government. At the expiration of the lease the works are to revert to the Hungarian government, without any indemnity being paid to the leasing company. The leasing company undertakes to produce 50,000 tons of steel rails at the works in the first five years. At the expiration of the fifth year the obligation of the Hungarian government to supply itself with rails from the company's works expires. The company is to receive £6 per ton for steel rails, and to pay the government £2 per ton for old iron rails.

SWITZERLAND.

Switzerland is very deficient in good iron ores and in mineral fuel. The Ludwig von Roll Iron Company of Solothurn owns three charcoal blast furnaces at Gerlafingen, Clus, and Olten, and one coke blast furnace at Choindez, which smelt iron ores, containing 43 per cent. of iron, and it produces from them about 3,500 tons of castings and 4,000 tons of forge pig iron, which is converted into wrought iron in charcoal forges.

SPAIN.

This country, which possesses rare capabilities for the production of iron and steel, but which, however, are almost wholly ignored by its people, is estimated to have produced but 73,000 metrical tons of pig iron in 1872, while producing in the same year, mainly for shipment, 781,468 tons of iron ore. In 1874 there were exported 699,050 tons of iron ore. Catalan forges are still used for the production of wrought iron, principally in Catalonia and the Basque Provinces. The imports of coal into Spain in 1875 are given as 690,762 tons, altho' under its own soil lie large deposits of the same kind of fuel. In the same year 11,360 tons of rails were imported, against 23,365 tons in 1874, and 13,438 tons in 1873. In 1874

Spain imported 40,251 tons of bar iron, against 27,385 tons in 1873. The country which exports its raw materials or does not develop them, and which goes abroad for what it should produce at home, is destined to remain poor and dependent, while its civilization, if not reactionary, will certainly be stationary.

ITALY.

This kingdom is more noted for the richness of its iron ores, principally those of Elba, than for the enterprise of its people in turning them into iron. In 1875 there were exported from Italy to France 129,315 metrical tons of iron ore, against 155,770 tons in 1874, and 182,225 tons in 1873. The exports to other countries were comparatively small. A few cargoes have been sent to the United States to be converted into Bessemer pig iron, two of these cargoes arriving in the spring of 1877. The total quantity of iron ore mined in Italy in 1872 was 167,000 tons, valued at £83,500. In the same year 53,000 tons of iron ore were smelted in Italy, producing 26,000 tons of cast iron in 32 blast furnaces, of which 21 were in Lombardy, 3 in Piedmont, 7 in Tuscany, and 1 at Tolfa. All of the furnaces, we believe, used charcoal. Several new charcoal furnaces have since been built. In 1872 there were also produced in Italy 48,909 tons of wrought iron and steel, principally in old-fashioned forges from the ore, although puddling, heating, and even Siemens furnaces have been introduced. Italy does not produce enough iron to supply its own wants. In justice to Italy, however, it must be mentioned that it is but poorly supplied with coal and wood.

TURKEY.

Small quantities of pig and wrought iron are made at Samakow, Raoutcha, Palanka, and other places in the Balkan mountains, and in Bosnia and Servia, principally by a primitive and wasteful method which embraces a furnace to smelt the ore with charcoal and a refinery hearth and hammer—all driven by water-power. At Samakow there are twelve blast furnaces, producing about 12,000 tons of iron annually, and at Raoutcha about 5,000 tons are produced. In other parts of the Turkish territory, both in Europe and Asia, there are rude iron enterprises. In the Lebanon mountains iron ore of great richness is smelted in several charcoal furnaces, the product of which is converted into horseshoes, nails, etc., for

home consumption. Coal is said to have been found recently in these mountains under conditions favoring its development. Abundance of coal is found on the shores of the Black sea. In fact, Turkey is rich in iron ore and coal, but its people lack the energy necessary to their proper development, and they lack a Protective tariff.

In a letter written late in 1876 to the Secretary of the American Iron and Steel Association, the Hon. Horace Maynard, American Minister at Constantinople, communicated the following information:—"In this country I find a specie currency, cheap transportation, and a duty of 8 per cent. only, payable in cash or in kind, which is practically Free Trade. Yet in time of peace the government was obliged to postpone the interest on the public debt. The natural wealth is very great, and the people are not wanting in industry, yet the ships of war are built and equipped on the Thames, heavy ordnance finds its way here from Essen, small arms and fixed ammunition from Providence and New Haven, dry goods and hardware from Liverpool, bricks from Leghorn, tiles from Marseilles, and so on to the end." The American consular agent in Philippopolis, Bulgaria, gives the following account of the effect of Free Trade legislation in that part of Turkey:—"Sadder still than the state of agriculture in the district of Philippopolis," he says, "is the condition of industry. Forty years ago the manufacture of the coarse woolen cloths called *abbas*, and of the woolen braid called *ghaitan*, as well as the production of ready-made clothes, had attained an importance which marked out this district as one of the most industrial provinces of European Turkey. Since the Crimean war, however, the light duties levied by the Turkish fisc on foreign goods —a policy by which Turkey has sought to win the support of the Western European powers—have gradually diminished the production of these staple articles."

GREECE.

Greece contains, on the Island of Seriphos, in the Grecian Archipelago, considerable quantities of iron ore of a quality suitable for conversion into Bessemer pig iron, several cargoes of which were taken to England as early as 1873 and satisfactorily smelted with English coke. Since then we understand that the trade with England in this Greek ore has been continued. An unsuccessful attempt was made a few years ago to smelt the ore in Greece with native lignites.

BESSEMER ESTABLISHMENTS IN EUROPE.

M. Deby gives the following table of the grand total of Bessemer works and converters in Europe at the beginning of the year 1877.

COUNTRIES.	Works.	Converters.
Great Britain	21	105
Germany	19	78
France	8	28
Austria	12	30
Sweden	19	38
Belgium	2	6
Russia	2	4
Total	83	289

To which we add for the United States, 11 establishments and 22 converters, making a total for the whole world of 94 establishments and 311 converters, with a producing capacity annually of at least 2,500,000 tons of steel. M. Deby estimates the capacity of the European works at over 2,000,000 tons, and we know that the American works can easily add 500,000 tons. It may here be remarked that the superiority of American over European Bessemer practice is everywhere conceded.

EUROPEAN TARIFFS.

From the London *Iron* for January 13, 1877, we take the following table of the rates of duty levied by European countries at that date per cwt. on iron and steel products. We prefix the comments of *Iron:*

"It may not be without its use thus early in the fourth quarter of the present century to look out on the progress made abroad in the adoption of Free Trade ideas. The view is not an encouraging one. There is the great exception of the German empire, which has crowned the work it has been doing for some years by throwing down all restrictions on the importation of iron and its products, and gives the world an additional reason to be thankful for the consolidation into one of a congeries of states which singly would have preserved their Protective systems. But all the rest of the Continental states, large as our importations are from each, tax our goods, particularly the products of our mines, on touching their frontier. In the following table we give the amounts per cwt. charged as import

duty by the various countries mentioned. Germany, of course, does not figure in it. Holland adopts the principle of an *ad valorem* duty, ordinary goods, however, being free."

COMMODITIES.	France.	Austria.	Russia.	Belgium.	Holland.	Denmark.	Switzerland.	Italy.
	s. d.	s.d. s.d.	s.d s.d.	s. d.		s.d. s.d.	s. d.	s. d.
Pig iron .....cwt.	0 10	0 6	0 6	0 2½	...	.....	0 3	.....
Bars..... "	2 5	2 6	5 0	0 5	...	0 5½	0 10	1 10
Angles..... "	2 5	3 6	14 9	0 5	...	0 7	0 10	1 10
Castings..... "	1 7	1 2	5 0 to 24 6	0 10	5%	2 5	0 10	1 10
Screw bolts, spikes, "	3 2	4 0	24 6 to 44 3	1 7	5%	2 5 to 7 3	1 2	4 6
Anchors and chains,"	3 2	3 6	9 9 to 29 6	.....	1%	2 5	2 9	.....
Rails, iron..... "	2 5	2 6	2 0	0 5	...	0 7	0 10	1 10
" steel..... "	3 7	2 6	4 4 to 13 3	0 5	...	0 7	0 10	1 10
Tires, iron..... "	4 0	3 6	9 8	0 5	5%	0 7 to 2 5	1 2	1 10
" steel..... "	4 0	3 6	13 3	1 7	5%	0 7 to 2 5	1 7	5 6
Axles, iron..... "	4 0	2 6 to 4 0	9 8	0 5	5%	2 5	1 2	2 9
" steel..... "	6 0	2 6 to 4 0	13 3	1 7	5%	2 5	2 0	9 3
Railway springs, steel..... "	4 5	4 0	13 3	1 8	5%	7 0	1 7	6 0
Forgings, iron..... "	4 0	2 6 to 4 0	9 8	0 5	5%	2 5	1 2	4 6
" steel..... "	6 0	2 6 to 4 0	13 3	1 7	5%	2 5	1 7	9 3
Locomotives, without tender..... "	16 0	4 0	7 3	1 7	1%	£56 7 6	1 7	3 2
Steam-engines..... "	2 5	2 6	3 0	1 7	1%	2 5	1 7	2 5
Machine tools, mostly cast iron, "	2 5	2 6	3 0	1 7	1%	2 5	1 7	.....
Agricultural machinery..... "	2 5	.....	.....	1 7	1%	2 5	1 7	1 7

The *British Trade Journal*, in its issue for May last, is no more hopeful than its cotemporary, above quoted. It says:—"It is discouraging to observe that the great principles of Free Trade make such comparatively slow headway in European countries, to say nothing of America. In every country there are eminent men who fully recognize the blessings of unrestricted commerce and energetically proclaim them. And yet Great Britain is the only country in which the custom house is solely employed for the collection of legitimate revenue—as the medium of indirect taxation of the mildest character."

ALGERIA.

M. Rocour, in a paper recently published, describing the iron mine of Mokta-el-Hadid, near Bona, in Algeria, says that the completion of the various works in connection with the deposits of iron ore in the North of Spain will restrict the market for Algerian ore to consumers in the Mediterranean basin, so that the opinion of the directors, that the production had reached a maximum in 1874, may be accepted as well founded. That this production is not likely to be further augmented is also rendered probable, according to M.

Rocour, when it is considered that the future of the mine must depend upon subterranean works, which would cost a large sum of money. Nevertheless, we read that the French company which owns the Bona mines has already commenced to enter on underground working, after extracting 3,000,000 tons. In 1874 the company was able to ship 430,000 tons of ore, and in 1875 there were mined 418,868 tons and delivered to purchasers 399,512 tons. In 1876 it raised 388,802 tons, or 30,000 tons less than in 1875: the ore in stock was calculated at 126,000 tons in March last. The same company is also engaged in mining coal, 86,448 tons of which were shipped in 1875. Although the Bona iron mine may be abandoned, as has been supposed to be probable, within the next few years, the company will doubtless open other mines of equal or approximate richness. In 1875 it had 1,420 workmen employed. Other companies are mining iron ores in Algeria, and great progress is thought to have been made by some of them in 1876. At Atélik, near Bona, pig iron has in late years been produced from spathic iron ore and coke made from native coal.

MOROCCO.

Morocco contains extensive deposits of iron ore and other valuable minerals. The iron ore deposits were worked as long ago as the days of the Carthaginians, and the remains of their iron works may still be seen at the foot of Jebel Hadyd, fifteen or sixteen miles northeast of Mogadore. It is proposed in England to reopen the Morocco iron mines, but at present no practical results may be looked for.

INDIA.

It would seem that at no distant day we shall witness the mining of coal and the manufacture of iron on a liberal scale in India, the iron ores to be smelted with coal or coke. In the latter part of the year 1876 Mr. J. W. Lowe, of Manchester, England, wrote as follows:—"I left India in April, and at that time the Bengal Ironworks Company (whose works and lands are situated in the Burrakur district, about 100 miles from Calcutta) had successfully commenced business, and had two large blast furnaces continuously at work, worked with coal dug by them from land upon part of which the works have been erected, and with limestone procured in the immediate neighborhood. The Bengal Coal Company, whose lands are

adjoining the above, in their report dated June 2, state that owing to the successful manufacture of iron in India there seems every reason to anticipate an increased demand for coal, and with the view of meeting such demand several additional ovens have been constructed at those mines which have been proved by experience to yield coal of the quality most suitable for coking, etc. In 1875 the government of India reported most favorably upon the results obtained from 100 tons of coal supplied to them by the Bengal Iron Company from the Burrakur district for the purpose of being tested in England in actual smelting operations. As no difficulty has been experienced in procuring at a reasonable price the necessary limestone for fluxing, the manufacture of iron in India, and certainly in Bengal, may now, I think, be considered a success."

A more recent writer, in a letter to the London *Iron* of February 24, 1877, gives the following additional information concerning the works of the Bengal Iron Company:—"Ground was broken on March 1st, 1875. The furnaces, two in number, are built on the open-topped principle, without taking the gas off. They are each 50 feet high, with a square base, built of stone found near the site. There are two hot-air stoves for each furnace, fired by coal in the ordinary way; two vertical blowing-engines of 180 horse-power nominal, but capable of working up to 300; two donkey-engines for filling the boilers, etc., with a spare one in case of accident, and a pair of horizontal winding-engines of 20 horse-power, for raising the materials to the furnaces. Steam is supplied to the whole of these from seven egg-ended boilers. The hoist is 75 feet high. The first cast was made just thirteen months after the ground was broken, and, although at present only one of the furnaces is going, as much as twenty-five tons per day is turned out. At a short distance a large foundry is all but completed, which consists of three divisions, two of which are for castings, while the third contains an engine and boiler house, a machine-shop, and a smith's shop, the whole block being 154 feet by 90 feet. There is an abundant supply of limestone for fluxing. The coal cokes well and is in abundance also, and easily worked, and the ironstone now being smelted is picked off the fields, the supplies underneath never having been touched. The industry promises to be a great success, and there is already over £100,000 sunk in the undertaking, government not contributing a penny of it."

Sanguine observers and writers do not hesitate to predict that in the near future iron will be manufactured in large quantities in the

Wardha Valley, Central Provinces, where iron ore, coal, and limestone are found in abundance and of excellent quality. This, they say, is destined to become "The Indian Black Country."

The iron ore deposits of India are very extensive, and have been worked for ages by the natives, who have by the most primitive methods produced the finest quality of iron and steel. The iron ores of the Madras district in India are largely magnetic, and analyze 70 per cent. of metallic iron, equaling in quality the finest Swedish iron ores.

In 1860 an ironmaking enterprise was undertaken by the Indian government at Burwai, in the Indore territory, which proved unsuccessful. The works and buildings, together with the machinery, cost £12,500. A further amount was expended in collecting a large quantity of iron ore and charcoal, and in the production of firebrick. The object was to manufacture pig and wrought iron with charcoal. The works were completed about the close of 1862. The blast furnace had scarcely commenced working before it was discovered that native skill was incompetent to keep it going. At this point the government withdrew its support, and decided that the works should be sold, and advertised for sale. No purchaser having presented himself, the £20,000 sunk from first to last in the works has thus far proved a dead loss to the Indian treasury. The London *Mining Journal* says:—"Indian officialism was too parsimonious and too impatient; it first starved the enterprise and then abandoned it before it had given it a fair trial." At the Vienna Exhibition the Salem iron works showed samples of white charcoal pig iron, as did also the Porto Novo iron works of Madras.

The area of the coal fields of India is estimated at 2,000 square miles, but the annual production of coal has probably never exceeded 500,000 tons. An analysis of Indian coal shows: volatile combustible matter, 33.75; coke, 56.7 (consisting of 43.70 per cent. of fixed carbon and 13 per cent. of ash); water, 9.55, driven off at 212° Fahr.; sulphur, 0.25.

JAPAN.

Until recently the few thousand tons of iron and steel annually made in Japan have been obtained by a bloomary process from the magnetic iron sand which is found on the island of Jesso and from the magnetic and hematite iron ores of other parts of the empire. The sand analyzes 90 per cent. and some of the ores 60 per cent. of

metallic iron. At Nakakosaka, in the province of Hitachi, not far from Tokio, there is an extensive bed of very rich magnetic iron ore from eight to eighteen feet in thickness, near which a Japanese company have erected a charcoal blast furnace, with the assistance of two English engineers, Messrs. E. H. M. Gower and J. A. R. Waters. In March, 1876, this furnace commenced to make iron, with satisfactory results, since which date we are without further particulars. At Heigori, in Rikeishiu, where magnetic iron ore, containing 60 per cent. of metallic iron, exists in abundance, and in beds from twelve to fifteen feet thick, two charcoal blast furnaces have been erected by the Japanese government, which would probably be put in operation during 1876. These furnaces were designed by the late Mr. David Forbes, F. R. S.; and Mr. Casley, of Stockton-on-Tees, England, has had charge of their erection. They are each 57 feet high and 10 feet wide at the bosh, and are supplied with all the modern improvements, including the Whitwell hot-air stoves, the Lurmann closed breast, vertical blowing-engines, etc. A still more ambitious enterprise has been undertaken at Heigori, by the Japanese government, which embraces the erection of a rolling-mill, with English machinery, for converting the pig iron to be made at the blast furnaces into all forms of iron products. This mill will contain 12 puddling and 7 reheating furnaces, a forge train, plate, rail, bar, and guide trains, steam-hammer, shears, hot-iron saw, roll lathe, cranes, and all modern appliances. It was expected to be ready to begin work late in 1876. Coal of good quality will be procured by steamer at Nagasaki. The furnaces and the rolling-mill are connected by a narrow-gauge railway.

The production of coal in Japan in 1874 is estimated by Mr. J. G. H. Godfrey, chief engineer of the mining office, at 390,000 tons, and the production of iron at 5,000 tons. The production of iron in 1871 was officially stated at Vienna in 1873 to have been 9,370 tons.

CHINA.

China contains immense deposits of iron ore, coal, and limestone, but thus far, we believe, there has not been erected within Chinese dominions a single blast furnace or other modern device for making iron or steel. There are, however, some primitive iron works in the country, but of course no valuable information concerning them is accessible. In 1876 the first railroad was constructed in China—a narrow-gauge road, ten miles long, from Shanghai to Woosung.

AUSTRALASIA.

In several of the British colonies in the Australasian division of the South Pacific ocean iron ore has been discovered and iron works have been established. The Fitzroy Bessemer Steel, Hematite Iron, and Coal Company, Limited, some years ago built a blast furnace at Nattai, near Sydney, in New South Wales, which, after much ill luck, was again put in operation in February, 1876, and during the year made iron at the rate of 160 tons a week. The furnace was started with a mixed fuel of anthracite and coke. Fifty tons of the iron made at this furnace were sent to San Francisco. Several years ago the same furnace sent a part of its pig iron to the same market. This company proposes the erection of a rolling-mill. Another iron company in New South Wales is the Lithgow Valley Iron Smelting Company, whose works are 77 miles from Sydney, at which city were exhibited in 1876 bars and pig iron of its manufacture. Iron ores abound in other localities of New South Wales, and the colony is rich in excellent coking coal.

In South Australia there are said to be deposits of iron ore of "wonderful richness and enormous extent." It is stated that "native iron has been found so pure that it has, without any preparation, been welded on to a piece of manufactured iron and stood well." A furnace was established a few years ago, at which pig iron was successfully made, but it is not now in operation.

In Victoria 130 tons and 10 cwts. of iron ore were mined in 1874, but we do not learn that any iron works have yet been erected in this colony.

In Tasmania, or Van Diemen's Land, the Tamar Hematite Iron Company has built a furnace, which went into operation with good prospects of success on the 1st of January, 1875. Another furnace appears to have been established and put in operation by the British and Tasmanian Charcoal Iron Company.

In New Zealand the Titanic Steel Company has established iron works at Taranaki, but at the date of last advices the company had not yet made any iron.

In all Australasia there were 2,508 miles of railroad in 1876, distributed as follows:—South Australia, 300½ miles; New South Wales, 484 miles; Victoria, 699 miles; Queensland, 282 miles; West Australia, 38 miles; Tasmania, 155½ miles; New Zealand, 549 miles. The South Australian government has just contracted for 26,000 tons of iron and steel rails, to be made in England.

CANADA.

The statistics of the iron industry of this country are not regularly collected, and we regret that we are unable to present many facts additional to those contained in our report for 1874, when, as the result of much trouble in collecting information, we gave the total iron production of the country as not exceeding 10,000 tons annually. We are certain that this product has not since been exceeded. No less than seventeen blast furnaces have been erected at different times in four provinces of what is now the Dominion of Canada, but most of these have been abandoned. A disastrous attempt to make Siemens-Martin steel at Quebec has recently been made. The principal ironmaking establishment in the Dominion is at Londonderry, in Nova Scotia, where there are under one management three blast furnaces, two foundries, a rolling-mill, and steel works. One of the furnaces is an old charcoal stack, and the other two were built in 1876 to use coke. This establishment, to which belong the iron mines at Acadia, is now owned by a strong company, of which Dr. C. W. Siemens is the head, and which is entitled "The Steel Company of Canada, Limited." It will make Siemens-Martin steel. In 1876 there were produced by this company 15,274 tons of iron ore, which was nearly four times as much as in the previous year. The production in 1875 was 4,467 tons; in 1874, 2,469 tons; and in 1873, 3,485 tons. The production of coal in Nova Scotia in 1876 was 709,646 tons, against 781,165 tons in 1875, 872,720 tons in 1874, 1,051,467 tons in 1873, and 880,950 tons in 1872.

The quantity of iron of all descriptions imported into Canada from Great Britain amounted in the year 1870 to 153,475 tons, and in 1874 to 163,576 tons. Yet Canada might have produced all this iron, and more, instead of the 10,000 tons with which we have above credited it. Canada has iron ore in abundance, and where it does not have coal it can easily and cheaply obtain it from the United States. But it holds fast to a Free Trade policy, and between the competition of Great Britain, which built up its industries by Protection, and the competition of the United States, which is now developing all its resources by the same instrumentality, Canadian industries, including the branches of crude and finished ironmaking, are ground between the upper and the nether millstone. Professor Goldwin Smith lately said that "Canadian manufactures are dying." The reason is plain.

From an official statement, prepared by Mr. Brydges, which has just been published, we learn that there were opened in the Dominion of Canada in the fiscal year which ended June 30, 1876, 330¾ miles of new railway, which increased the total mileage of Canadian railways to 4,929¼ miles, to which may be added 228 miles in the United States owned by Canadian companies. The gauge of the total mileage is divided as follows: 5 feet 6 inches, 618¼ miles; 4 feet 8½ inches, 3,938½ miles; 3 feet 6 inches, 600½ miles: total, 5,157¼ miles. Of the total mileage, 2,373¾ miles are laid with steel rails; 2,758 miles with iron rails; and 25½ miles with wooden rails. As compared with the preceding year, there was an increase in the fiscal year 1876 of 319 miles of steel rails, and 11¾ miles of iron rails; showing the growing popularity in Canada of steel rails. All the railways of Canada are single track, except 79 miles of double track on the Great Western Railway.

BRITISH AMERICA.

It is officially stated that the various collieries of Vancouver Island produced and sold 140,185 tons of coal in 1876, against a total output of 110,145 tons in 1875; of which the mines of the Vancouver Coal Company and the Wellington Colliery furnished the greater part.

MEXICO.

From a paper recently prepared for *The Engineering and Mining Journal* of New York we glean the following particulars concerning the iron industry of Mexico.

An iron company was organized in 1866 at Comauja, a village of 2,000 inhabitants on the boundary line between the states of Jalisco and Guanajuato. The company built a small blast furnace at Laucedo, four leagues east of Lagos, but the establishment was removed to its present site on the outskirts of the village, where ground was broken in 1870. It embraces a carpenter shop and foundry, steam-engines, hammers, bloomary fires and bar mill, and a blast furnace, all under one roof. But one is most struck with the elegant cut-stone columns, with capitals and bases of the Roman Doric order, that support the roof. The carpenter shop is well supplied with necessary tools. The foundry has two cranes and one cupola, and all the usual fixtures, of the best workmanship. The cupola is extremely well built; it is said to melt 1,000 pounds of iron per hour, with 500 pounds of charcoal. All varieties of

castings are made, such as sugar-boilers, sugar-mills, rolls, bannister railings, cog-wheels, etc. Castings are usually made from the blast furnace direct, and, when it is not working, from the cupola. The blast furnace is a brick stack, ornamentally yet strongly bound, and is a very pretty structure. Hearth, 26 by 26 inches; bosh, 6½ feet; height, 26½ feet; two tuyeres, 2½ inches diameter. The stock is hoisted by hand-power and windlass up an inclined plane. Charcoal is used for fuel, and the ores are brown hematites of varying richness. The furnace produces from 80 to 100 quintals a day, or from four to five tons. The estimated cost of each ton of pig iron is $19.58 in labor and materials. The blast-engine is about 60 horse-power. This engine is also connected with the cupola and bloomary fires. Near it is a smaller one of 15 horse-power that runs a 1,000-pound trip-hammer. Two bloomary fires are placed at the side of the boilers, and a flue conveys the waste heat under them, but it is insufficient. The bloomaries are very elaborately built. A seven horse-power portable engine will supply them with blast when the main engine is not working. The bloomaries have recently been put in operation. The present production of the two fires is 25 tons a week. On April 17th, 1876, they were hardly well under way. A partition wall divides the bloomary from the bar mill, the sides of which are built, but it is not yet roofed. The rolls, engine, and other machinery have been on hand for two years, but are not yet placed. Puddling furnaces are to be used. The establishment is liberally supplied with lathes and all the necessary tools for construction and repair. These works are said to have already cost $450,000. The castings produced sell from 6 to 7 cents a pound, and give great satisfaction; but it is reported that the reputation of the works was much damaged by the sale of a few tons of bar iron two years ago, which was so bad that it was returned and the money refunded. Taken all in all, it may be said that the Comauja works are projected on a large scale, but that their management thus far has not been productive of profit or been specially brilliant.

There is a blast furnace in the State of Durango, about which no information is given. In the district of Mexico, within 200 miles of the city, there are the following works: Apulco and Trinidad, which have been idle a long time. Zacualtipan has been stopped on account of litigation: it is probably now in operation. At Zimpan there is a blast furnace, and a bar mill capable of rolling all sizes of iron from ¼ inch up to 3 inches round; the united capacity is 2,000 tons of bar iron per annum. The quality is first-class.

Other iron enterprises in Mexico were noticed in the annual report of the Secretary of this Association for 1874. Near the city of Durango is the famous mountain of Mercado, which is almost entirely formed of iron ore. At the Philadelphia Exhibition in 1876 specimens of bar iron, etc., were exhibited by several Mexican rolling-mills—Tula, Encarnacion, and Guadalupe. Collections of bituminous coal and iron ore were also exhibited. Statistics of the Mexican iron industry are wanting, but it is probable that the production of iron in the country has never in any one year exceeded 7,500 tons.

SOUTH AMERICA.

A comprehensive report on the condition of the empire of Brazil was published in 1876, from which we condense the following concerning iron and coal.

There are some places in the empire where iron ore is found under the most favorable conditions. Incalculable quantities exist in Mines Geræs, and a large proportion of some of the mountains is composed of oligistic, magnetic, and micaceous iron. In the northern provinces, and in some of the others as well, there are enormous quantities of iron, more or less decomposed, in the argillaceous deposits which cover the plains and the slopes of the hills. The report goes so far as to assert that in Brazil there are iron mines which, owing to the complete absence of pyrites, are incontestably superior to the famous mines of Sweden. The magnetic ore of Brazil contains 72.5 per cent. of iron; the oligistic, the martite, and the best micaceous, 70 per cent.; the proportion falling in the inferior qualities as low as 25 and 20 per cent. Iron, from its abundance and good quality, is by itself one of the most important elements of the wealth of the empire. In general the deposits can be easily and economically worked, being for the most part near extensive forests, which, when cut down, spring up again in from six to ten years, and which, therefore, always furnish excellent fuel, near abundant streams and falls, which provide immense water-power for working machinery. Taking advantage of these favorable circumstances, many private individuals have obtained very profitable results from iron mining. The most important iron works in South America are on the banks of the small river Ypanema, one of the affluents of the Sorocaba. This establishment possesses valuable resources: ore of excellent quality, carbonate of lime for fluxes, refractory clay for building furnaces, sufficient water-power for the

more important machinery, and very good forests, which can furnish a daily supply of fifteen metrical tons of charcoal—a quantity sufficient to keep the furnaces constantly at work. By obtaining machinery and some skilled workmen from Europe, the Brazilian government is doing its utmost to make this establishment a successful one.

Recent research proves the existence of coal in some of the provinces of Brazil. The Condioto and Arroio dos Ratos mines, in the province of San Pedro do Rio Grande do Sul, are considered the most important. The former was granted to an English company, which is about to construct a line of railway for conveying the coal. The latter is also in the hands of an English company, which has its railroad already built, and supplies the steamers on Lake dos Patos, and on some of the rivers. Concessions have been granted for working other valuable deposits, and it is hoped that in a few years this great element of industry and civilization will help to increase the prosperity of the empire. Of lignites there are abundant deposits in most of the provinces, and mining grants have lately been made for working some of them.

Fair samples of iron ore and bituminous coal from Brazil were exhibited at the Philadelphia Exhibition. At the Vienna Exhibition Dr. Souza Mursa exhibited the products of the iron works at San João de Ipanâma, province of Santo Paulo. At these works charcoal pig iron was then made from red hematite and magnetic iron ore, and refined in forges or bloomaries.

Near Caraccas, in Venezuela, red specular iron ore has been found. Titanic iron ore has also been found in the Argentine Republic.

Brazil, through the enlightened policy of the Emperor, Dom Pedro II., is making rapid progress in the development of its railway system. Recently, the San Paulo and Rio de Janeiro Railway has been partially opened for traffic—that is, for a distance of 107 miles. About 37½ miles more still remain to be completed. This line has a gauge of 3 feet 4 inches. The Sorocaba Railway, which has also a gauge of 3 feet 4 inches, has been completed and opened for traffic to the Ypanema iron works. The Paulista Company's extension from Campinas to Rio Claro, which has a gauge of 5 feet 3 inches, has been opened throughout. The Baldwin Locomotive Works, of Philadelphia, have recently closed a contract for nineteen locomotives for Brazil. Fourteen of these are for the Dom Pedro II. Railway, and five are for a narrow-gauge road. A line of steamers should connect Brazil with the United States.