STATISTICS

OF

THE AMERICAN AND FOREIGN IRON TRADES

FOR 1886.

ANNUAL STATISTICAL REPORT

OF THE

AMERICAN

IRON AND STEEL ASSOCIATION,

CONTAINING

COMPLETE STATISTICS OF THE AMERICAN IRON TRADE FOR 1886 AND PREVIOUS YEARS, AND A BRIEF REVIEW OF THE PRESENT CONDITION OF THE IRON INDUSTRY IN FOREIGN COUNTRIES.

PRESENTED TO THE MEMBERS, APRIL 25, 1887.

PHILADELPHIA:
THE AMERICAN IRON AND STEEL ASSOCIATION,
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LETTER TO THE PRESIDENT.

HON. B. F. JONES,

President of The American Iron and Steel Association, Pittsburgh, Pa.

DEAR SIR: I have the honor to submit the Annual Statistical Report of the American Iron and Steel Association for 1886, containing full statistics of our iron and steel industries and other statistics for that year, and much valuable statistical information for previous years. In the collection of the statistics for 1886 I have had the assistance of old and faithful clerks, but particularly of Mr. WILLIAM M. BENNEY. I am also under obligations to Hon. WILLIAM F. SWITZLER, the Chief of the Bureau of Statistics of the Treasury Department, and to other gentlemen whose names appear in the body of the Report, for assistance in the compilation of miscellaneous statistics.

The ordinary receipts of our treasury during the year 1886 amounted to $16,156.73, and the ordinary expenditures to $16,564.93. At the beginning of the year there was in the treasury $3,798.08, and at its close there was $3,389.88. The following is the official statement of receipts and expenditures by Mr. ANDREW WHEELER, Treasurer, during the year 1886.

Months.	Receipts.	Payments.
On hand January 1, 1886	$3,798.08	.....
January	614.38	$1,148.21
February	67.68	1,230.76
March	1,218.37	1,362.22
April	3,945.91	1,181.41
May	870.00	1,030.11
June	178.64	1,291.03
July	2,376.00	1,205.55
August	2,174.75	1,397.82
September	555.00	1,807.12
October	1,736.00	1,967.93
November	764.00	1,104.11
December	1,656.00	1,838.66
On hand December 31, 1886	.....	3,389.88
Total	$19,954.81	$19,954.81

The work of the Association during the year 1886 did not differ materially from that of preceding years. Our annual statistics for 1885 and our statistics for the first half of 1886 were promptly collected and published in the *Bulletin*. A new edition of the Directory, the Annual Report, and the weekly *Bulletin* appeared in their appropriate times and

seasons. A large amount of miscellaneous correspondence, embracing many inquiries for statistical and tariff information, was promptly disposed of. The miscellaneous and statistical correspondence of the office steadily increases from year to year. Special attention was given during the larger part of the year to the distribution of Protective tariff literature in conjunction with the Industrial League, with which the Association is closely affiliated for tariff purposes. The tracts distributed were not mere leaflets, but elaborate essays and addresses occupying not less than eight printed pages and sometimes twenty-four and thirty-two pages. No other organizations in the country than our own Association and the Industrial League have systematically and liberally distributed Protective tariff literature in recent years. This work has been resumed during the present year. Other tariff work of the Association in 1886 need not here be referred to.

The membership of the Association at the close of 1886 embraced 333 firms, companies, and individual manufacturers engaged in the manufacture of iron and steel, together with a few iron and steel merchants and a few iron ore producers,—each firm, company, and individual manufacturer being counted only as one member. Never before during our long connection with the Association has the number of contributing members in any one year been so large as in 1886. Our 333 members at the close of 1886 were found in the following States.

Massachusetts	11	Tennessee	8
Connecticut	8	Ohio	40
Rhode Island	1	Indiana	4
New York	27	Illinois	11
New Jersey	16	Missouri	8
Pennsylvania	141	Michigan	17
Delaware	6	Wisconsin	1
Maryland	3	Colorado	1
Virginia	8	Washington Territory	1
Georgia	2	Oregon	1
Alabama	7	California	3
West Virginia	4		
Kentucky	4	Total	333

It will be seen that we have a membership that is national and not sectional. Even in Pennsylvania, where a large number of our members would naturally be looked for, more than half of these members are found in the western part of the State, although our office is and always has been in its eastern part. By continuing to pursue a policy of strict impartiality in dealing with all the interests represented, and by continuing faithfully to do the same good work that has been done, there need be no fear that the Association will not be as strong in the future as it has been in the past. Very Truly Yours,

JAMES M. SWANK, *General Manager.*

No. 261 South Fourth Street, Philadelphia, March 31, 1887.

STATISTICS OF THE AMERICAN IRON TRADE FOR 1886.

GENERAL REVIEW OF THE DOMESTIC IRON TRADE IN 1886 AND DURING THE FIRST QUARTER OF 1887.

THE year 1886 was one of the most active years the American iron trade has ever experienced. The improvement in demand which had commenced in the latter part of 1885 was well maintained throughout the whole of 1886. The production of the year in all leading branches of the trade was much the largest in our history, and every ton of iron and steel that was produced may be said to have passed at once into consumption. Prices, which began to advance in the latter part of 1885, showed a hardening tendency in the early months of 1886, declining somewhat, however, with scarcely an exception, during the summer months. The decline in nails was most noticeable. In the closing months of the year all prices again advanced. During November and December, and in the first two weeks of January, the condition of the steel-rail and pig-iron markets of the country undoubtedly bordered on excitement. Steel rails advanced four dollars per ton in these months, and pig iron between two and three dollars per ton. Then came a lull in the demand for certain products, and although some prices continued to advance others showed indications of weakness. In February no signs of an excited condition of our iron and steel markets were anywhere visible, and before the month had expired substantial concessions in the prices of pig iron and old iron rails had been made. In March quotations for these products were still lower than in February. Another advance in prices does not now seem to be probable. While our prices were advancing foreign importations were rapidly increasing; the danger line in prices had been reached and passed. Prices are, however, still higher than they were last year, and production is being maintained at a rate which promises to eclipse in 1887 the remarkable production of 1886. A check upon the importation of foreign iron and steel products is, unfortunately, not likely to occur for several months.

In the main these are cheering words which we are permitted to write. In many preceding annual reports we have been compelled

to tell a different story. Many of our readers will recall with us those dark and almost hopeless days, from 1873 to 1879.

The history of the American iron trade appears to have always been marked by cycles of alternate prosperity and reaction—the latter akin to or wholly comprehensive of real adversity. A glance at the experience of the last few years will show how rapidly these cycles succeed each other. In 1871, owing partly to the stimulating influences originating in the Franco-German war of the preceding year, and partly to a revival in railroad building in our own country, prices of iron and steel steadily but slowly advanced at home and abroad. In 1872 this country was visited by an "iron famine," which rapidly advanced both foreign and domestic prices. A large part of this advance at home was well maintained until the Jay Cooke railroad panic of September 19, 1873, after which prices declined steadily in this country until the latter part of 1878, when a slight rally took place, which was succeeded in 1879 by the phenomenal "boom" of that year. This "boom" lasted until 1880, when it suddenly gave way and prices fell rapidly for several months. In 1881 and 1882 our prices were comparatively steady and fairly remunerative, but in 1883 they again began to fall, and they continued to fall through 1883 and 1884 and until the latter part of 1885, when a healthy revival in every branch of our iron and steel industries commenced, which has continued to this day, most prices now being higher than at any period since 1883. Production has, as a rule, followed the course of prices. The contrast between good times and bad times in the American iron trade in the years which have elapsed since the Franco-German war has been great indeed. If another period of low prices and lessened demand shall be the lot of our iron and steel industries in the near future we should be prepared from previous experience to meet it philosophically when it comes.

The remote causes of the revival in the prosperity of the American iron trade which began in the last half of 1885 and still continues may be difficult to discover, but one influential immediate cause is directly traceable to the meeting of the Bessemer steel-rail manufacturers at Long Branch, on August 13th, 1885, at which meeting a restriction of production for one year, to avoid the evils of overproduction and ruinous prices, was agreed upon. This action was almost immediately followed by beneficial results to the iron trade of the whole country and to many other branches of domestic industry. We are firmly convinced that if this resolution

of the Bessemer steel-rail manufacturers had been taken six months earlier the American iron trade would have commenced to revive just that much sooner than it did. The gods help those who help themselves. Precisely one year after the meeting at Long Branch referred to another meeting of the Bessemer steel-rail manufacturers was held at the same place, and the policy of regulating the production of steel rails was continued for another year.

We do not forget that the revival in railroad building and in the betterment of existing railroads, which commenced in the late months of 1885 and has continued to the present time, has been the influence which has most stimulated the demand for iron and steel. Without this revival the country would not have required in the last eighteen months near as much iron and steel as it has made. But it was the action of the Bessemer steel-rail manufacturers which put a check to the demoralization in prices which prevailed prior to their meeting at Long Branch, and this action brought about in a little while an advance in prices which at once stimulated the managers of existing railroads and the projectors of new roads to hasten their arrangements respectively for contemplated repairs and extensions and for new track and equipment. Prices had not only advanced but there was a possibility that they would still further advance; hence nothing was to be gained but much to be lost by further delay in giving orders for rails, cars, and locomotives. The country was in the main prosperous, the harvests had been bountiful, money was abundant, confidence was not lacking, the railroads were busier than they had been; why should not railroad managers and railroad projectors go ahead?

No man knows how long the extraordinary demand for iron and steel caused by the present activity in railroad building and railroad betterment will continue. The present year seems to be secure. Beyond it, and may be before its close, we have the evil of over-speculation and the practical working of the Interstate Commerce act as possible reactionary elements. What this year's crops may be is another unknown element. One thing, at least, can be counted on with certainty; there will be no change in the tariff this year to injuriously affect the general prosperity.

An incident of our industrial history for 1886 was the large number of strikes among workingmen, most of them very unwise as well as unprofitable strikes. More American workingmen were voluntarily out of employment in that year than in any previous year. The Connellsville strike at the beginning of the year, the

subsequent strike on the Missouri Pacific Railway, the frequent socialistic and other outbreaks at Chicago, the socialistic outbreak at Milwaukee, the continuance of the nailers' strike which had commenced in 1885, and various other misunderstandings between employers and employed combined to make the year memorable in the history of labor disturbances; and yet, taking it all through, it was one of great activity for all our leading industries and a year of great prosperity for most of them. These strikes did not paralyze or disastrously injure any of the industries of the country. Nor did the longshoremen's and coal-handlers' strike in January and February of the present year exercise any unfavorable influence worthy of note upon the country's prosperity. Individual workingmen and local interests have suffered, but the country at large has moved on as if nothing had happened. The explanation is that the country is so vast, its resources so ample, its population so large, and the energy of its people so great that no unfavorable influence that is not general in its character can seriously check its onward course.

The nailers' strike was the only strike of consequence in the iron trade during 1886. It commenced on June 1, 1885, and continued until June 25, 1886, or nearly thirteen months. It was, we believe, the longest strike in the history of the iron trade of this country. It affected the works embraced within the limits of the Western Nail Association, and did not affect those which are included in the Atlantic States Nail Association. The consequences of this strike were not disastrous to the employers against whom it was aimed, because a check upon the tendency to overproduction at the time was not an evil by any means, and because many of the works were enabled to run despite the strike. We are glad to be able to add that in the iron trade generally the relations which now exist between employers and employed are in the main harmonious. Wages were increased in 1886 an average of not less than 15 per cent., and in the present year a further advance averaging fully 10 per cent. has very generally taken place.

An interesting and most gratifying feature of the iron trade of 1886 was the marked advance which was made by the Southern States in the development of their resources for the manufacture of iron and steel. Many new manufacturing enterprises, based upon ample capital and judiciously located, were undertaken in that year, while other works already established were pushed to their utmost capacity, and in several instances were enlarged and other-

wise improved. The production of iron in these States in 1886 was much larger than in any preceding year. It will be larger in 1887 than in 1886, as few of the new works which were undertaken in 1886 were in active operation in that year; most of them, indeed, will not be in operation until the latter part of this year or the early part of next year. Iron ore mines, coal mines, and limestone quarries are being opened, railroad connections are being made, and contributory enterprises are being established wherever new iron works have been undertaken. The growth in the South of its iron industry has also imparted a spirit of much-needed enterprise to many other branches of industry in that section which we need not particularize. Altogether the South has experienced in 1886 a new birth; even its own journals and public men now speak of it as the New South. It gives to-day abundant promise of achieving in the near future those beneficent industrial results which have made the North so rich, so prosperous, and so aggressive. The North welcomes its rivalry in every line of industrial endeavor, as it well knows that the South greatly needs the prosperity which diversified industries only can bring. The South, however, will need to hold in check its own enthusiasm, and to beware of the mere speculator, come from what quarter he may, who has no money of his own and who cares only how he may grasp that of honest men.

PRODUCTION OF IRON AND STEEL AND IRON ORE IN 1886.

The aggregate production of iron and steel in the United States in 1886 is given in the following table in comparison with that of 1885, the percentage of increase in 1886 being also given.

PRODUCTS. Net tons. (Except nails.)	1885.	1886.	Increase per cent.
Pig iron	4,529,869	6,365,328	40
Bessemer steel ingots	1,701,762	2,541,493	49
Bessemer steel rails	1,074,607	1,763,667	64
Open-hearth steel ingots	149,381	245,250	64
Open-hearth steel rails	4,793	5,255	9
Crucible steel ingots	64,511	80,609	25
All kinds of rolled iron, except rails	1,789,711	2,259,943	26
Iron rails	14,815	23,679	60
Kegs of iron and steel cut nails	6,696,815	8,160,973	22
Blooms from ore, pig iron, and scrap	41,700	41,909	...

These figures fully justify the statement that 1886 was a phenomenal year for our iron and steel industries. Not only was the production of all leading products much larger than in any preceding year, but the increase in pig iron, Bessemer steel, Bessemer steel rails, and open-hearth steel was larger than ever before. The most notable exception to the rule of unequaled increase of production in 1886 was in cut nails. We increased our production of cut nails from 6,147,097 kegs in 1882 to 7,762,737 kegs in 1883, or 1,615,640 kegs; whereas in 1886 our increase over 1885 was only 1,464,158 kegs. Notwithstanding this exception the past year was a most remarkable year in the production of iron and steel. To fully grasp the full significance of our immense production of these articles in 1886 we need only to compare its production with that of the Centennial year, 1876, which we do in the following table.

PRODUCTS. Net tons. (Except nails.)	1876.	1886.
Pig iron	2,093,236	6,365,328
Bessemer steel ingots	525,996	2,541,493
Bessemer steel rails	412,461	1,763,667
Open-hearth steel ingots	21,490	245,250
Open-hearth steel rails	none	5,255
Crucible steel ingots	39,382	80,609
All kinds of rolled iron, except rails	1,042,101	2,259,943
Iron rails	467,168	23,679
Kegs of iron and steel cut nails	4,157,814	8,160,973
Blooms from ore, pig iron, and scrap	44,628	41,909

Our production of iron ore in 1886 was much larger than in any previous year, amounting in round numbers to ten million gross tons. The Lake Superior region still remains our most important source of domestic supply. In 1886 this district shipped 3,562,570 gross tons, an increase of 1,106,022 tons over 2,456,548 tons which were shipped in 1885.

PRICES OF IRON AND STEEL FROM 1884 TO 1887.

In the following table we give the average monthly prices of leading articles of iron and steel in the United States from July, 1884, to March, 1887. The monthly quotations are averaged from weekly quotations. This table covers the period of lowest depression in prices which has occurred since 1879, and it shows the gradual improvement in prices which has taken place since the depres-

sion. The prices quoted are for a ton of 2,240 pounds, except for bar iron and nails, which are quoted by the pound and the keg.

MONTHS.	Old iron T rails, at Philadelphia.	No. 1 anthracite foundry pig iron, at Philadelphia.	Gray forge pig iron, at Philadelphia.	Gray forge pig iron, Lake ore mixed, at Pittsburgh.	Steel rails, at mills in Pennsylvania.	Best refined bar iron, from store, Philadelphia.	All muck bar iron, at Pittsburgh.	Iron nails, (gross price,)at Pittsburgh.
July, 1884	$18.50	$20.00	$18.00	$17.00	$30.00	2.0c.	1.7c.	$2.20
August	18.25	19.50	17.50	16.75	28.00	2.0c.	1.65c.	2.15
September	18.25	19.50	17.50	16.50	27.00	1.9c.	1.65c.	2.15
October	18.00	19.50	17.50	16.50	28.00	1.9c.	1.65c.	2.05
November	18.00	19.25	17.25	16.50	28.00	1.9c.	1.65c.	2.05
December	16.75	18.50	16.50	16.50	27.00	1.9c.	1.65c.	2.05
January, 1885	17.50	18.00	16.00	16.25	27.00	1.8c.	1.65c.	2.05
February	17.50	18.00	16.00	16.00	27.00	1.8c.	1.65c.	2.25
March	17.50	18.00	16.00	16.00	26.50	1.8c.	1.65c.	2.25
April	17.75	18.00	16.00	15.50	26.00	1.8c.	1.65c.	2.25
May	17.50	17.87	15.75	15.50	27.00	1.8c.	1.65c.	2.10
June	17.50	17.75	15.00	15.00	27.25	1.8c.	1.65c.	2.15
July	17.25	17.75	15.00	15.00	27.25	1.8c.	1.6c.	2.20
August	17.25	17.75	15.00	14.50	27.25	1.8c.	1.55c.	2.15
September	17.50	18.00	15.50	14.75	29.00	1.8c.	1.6c.	2.15
October	17.50	18.25	15.50	14.75	30.50	1.8c.	1.6c.	2.75
November	19.50	18.25	15.50	14.75	33.00	1.8c.	1.65c.	2.87
December	19.75	18.25	15.75	15.25	34.50	1.8c.	1.7c.	2.70
January, 1886	22.00	18.50	16.25	16.50	34.50	1.85c.	1.7c.	2.50
February	23.00	18.50	16.50	16.50	34.50	1.9c.	1.7c.	2.50
March	22.00	18.75	16.75	16.50	34.50	1.9c.	1.7c.	2.50
April	21.00	18.50	16.50	16.50	34.50	1.9c.	1.7c.	2.40
May	20.50	18.50	16.50	16.50	34.50	1.9c.	1.7c.	2.15
June	19.50	18.25	16.00	16.25	34.50	1.9c.	1.65c.	2.05
July	19.00	18.25	16.00	15.75	34.50	1.9c.	1.65c.	1.90
August	20.00	18.25	15.75	15.50	34.25	1.9c.	1.65c.	1.90
September	21.25	18.50	16.00	15.75	34.00	1.95c.	1.65c.	2.00
October	21.75	19.00	16.25	16.50	34.00	2.0c.	1.7c.	2.00
November	22.25	19.50	16.75	17.75	34.50	2.0c.	1.75c.	2.00
December	24.75	20.00	17.50	19.00	36.00	2.0c.	1.85c.	2.10
January, 1887	25.25	21.50	18.50	20.50	38.50	2.15c.	2.0c.	2.35
February	24.00	21.50	19.00	21.00	39.50	2.25c.	2.0c.	2.60
March	23.00	21.00	19.00	20.50	39.50	2.3c.	2.0c.	2.60

Old iron rails touched their lowest point in December, 1884; No. 1 anthracite foundry pig iron and gray forge pig iron at Philadelphia in the summer of 1885; gray forge pig iron at Pittsburgh in

August, 1885; steel rails at mills in Pennsylvania in April, 1885; best refined bar iron at Philadelphia in January, 1885, which was continued all through the year; all muck bar iron at Pittsburgh in August, 1885, and iron nails at Pittsburgh in July and August, 1886. During the period covered by the table old iron rails advanced $8.50 per ton; anthracite foundry pig iron at Philadelphia, $3.75 per ton; gray forge pig iron at Philadelphia, $4 per ton; gray forge pig iron at Pittsburgh, $6.50 per ton; steel rails at mills in Pennsylvania, $13.50 per ton; best refined bar iron at Philadelphia, one-half cent per pound; all muck bar iron at Pittsburgh, a little less than one-half cent per pound; and iron nails at Pittsburgh, 70 cents per keg. It must not be supposed, however, that these enhanced prices were realized during the whole period covered by them in the table. For most of this period lower prices were received every month than the quotations given, as contracts generally stipulate for delivery months after they are made.

PRICES OF IRON ORE AND COKE IN 1886.

For several years we have regularly given the prices of Lake Superior iron ores because of their high character and their large production. They furnish a correct index to the prices of other iron ores throughout the country. The subjoined table gives the March prices at which Lake Superior iron ores have been sold for season contracts, delivered at Cleveland, per ton of 2,240 pounds, in each of the last five years.

Kinds of Ore.	1883.	1884.	1885.	1886.	1887.
Republic and Champion	$7.50	$6.00	$5.75	$6.25	$7.00
Barnum, Cleveland, and Lake Superior specular	6.50	5.75	5.00	5.50	6.50
Chapin and Menominee	6.00	5.25	4.75	5.25	6.00
Vermillion district	.....	4.75	5.00	5.75	6.75
Gogebic district	.....	.....	4.00	5.00	6.00
Hematites	4.75	4.50	4.00	4.50	5.00

Most of the Lake Superior ores are suitable for Bessemer purposes, including those of the new Vermillion and Gogebic districts. The main part of this year's product of the Lake Superior mines, estimated to amount to about 4,000,000 tons, has already been sold.

Connellsville coke is the leading furnace fuel of the country, and we have accordingly preserved from year to year the prices at which

it has been sold. In the first three months of 1885 the price on board cars at the ovens was $1.10 per ton of 2,000 pounds. On April 1st it was advanced to $1.20, which was the price for the remainder of the year and until the 1st of March, 1886, when it was advanced to $1.35. This price was continued through March and April. On the 1st of May the price was advanced to $1.50, which was continued all through the year and until the 1st of February, 1887, when it was advanced to $2, at which it now remains, having been reaffirmed at a meeting on March 21st.

IMPORTS OF IRON AND STEEL IN 1886 AND PREVIOUS YEARS.

The following table, which we have compiled from information furnished us by the Chief of the Bureau of Statistics of the Treasury Department, gives the weight in tons of 2,000 pounds of all the leading articles of iron and steel imported into the United States in the calendar years 1884, 1885, and 1886.

COMMODITIES. Net tons of 2,000 pounds.	1884.	1885.	1886.
Pig iron	206,381	164,349	405,180
Old and scrap iron	30,192	15,480	97,635
Scrap steel	8,388	2,196	11,353
Bar iron	40,998	35,251	32,647
Iron rails	94	57	7
Steel rails	3,074	2,395	46,571
Cotton-ties	17,518	20,576	11,561
Hoop, band, and scroll iron	332	103	128
Steel hoops, sheets, and plates	1,500	2,644	4,719
Steel ingots, bars, etc	24,610	33,718	167,257
Sheet, plate, and taggers' iron	7,863	6,200	6,852
Tinplates and terne plates	242,123	256,028	288,761
Iron and steel wire rods	145,525	105,148	153,401
Wire and wire rope	2,732	2,475	2,689
Anvils, forgings, etc	967	642	963
Chains	963	633	669
Total	733,260	647,895	1,230,393

We are not responsible for the general use of the net ton in the statistics of this Association, but we realize its great inconvenience, especially in tables like the above. Reducing the net tons imported in 1886 to gross tons, we have 1,098,565 gross tons in that year, against 578,478 gross tons in 1885, and 654,696 gross tons in 1884. The increase in 1886 over 1885 was almost 90 per cent.

Of the importations of leading articles of iron and steel named in the table nearly all the steel rails and tinplates and most of the pig iron came from Great Britain. Germany supplied nearly all the

wire rods and a large part of the pig iron known to commerce as spiegeleisen. These two countries also supplied us with most of the blooms and billets. Old iron was chiefly received from Great Britain, while Belgium, France, Sweden, Russia, and even Spain each contributed something to the gratification of our taste for foreign iron and steel products.

Our importations of pig iron in 1886 amounted to 361,768 gross tons, the foreign value of which was $5,454,784, or a fraction over $15 per ton. The explanation of this high foreign value is that a large part of the pig iron imported was really spiegeleisen, and a large part of the remainder was English hematite and the finer qualities of Scotch pig iron. We also imported a small quantity of high-priced Swedish pig iron. It would be desirable for statistical purposes to separate our imports of spiegeleisen from our imports of other pig iron, but no facilities for making this separation now exist. The reader who is interested in ascertaining the value in recent years of other iron and steel commodities imported will find the information desired in an elaborate table near the close of the domestic part of this report.

The classifications of iron and steel by weight by the Treasury Department have not always been the same. In the following table we give the quantities of pig, bar, band, plate, and sheet iron, rails, old iron, and tinplates imported for every year mentioned; of chains for every year but 1883; of castings, anchors, etc., for every year down to and including 1882; and of forgings, scrap steel, cotton-ties, various forms of steel, wire rods, wire, etc., for 1884, 1885, and 1886. Since 1882 the tonnage of castings annually imported has been so small that it is not included in this condensed table, which includes only leading products and does not include the weight of machinery, cutlery, fire-arms, and similar products. The imports since 1871 have been as follows.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1871	1,278,965	1875	268,477	1879	862,382	1883	777,650
1872	1,325,034	1876	228,716	1880	2,112,341	1884	733,260
1873	717,761	1877	236,777	1881	1,322,439	1885	647,895
1874	337,845	1878	236,434	1882	1,335,371	1886	1,230,393

The foreign value of the imports into the United States from all countries of iron and steel and manufactures thereof, including tinplates, machinery, cutlery, fire-arms, and all other manufactures, has been as follows from 1871 to 1886.

Years.	Values.	Years.	Values.	Years.	Values.	Years.	Values.
1871	$57,866,299	1875	$27,363,101	1879	$33,331,569	1883	$47,506,306
1872	75,617,677	1876	20,016,603	1880	80,443,362	1884	37,078,122
1873	60,005,538	1877	19,874,399	1881	61,555,077	1885	31,144,552
1874	37,652,192	1878	18,013,010	1882	67,075,125	1886	41,630,779

It will be noticed that while the imports of iron and steel were much larger in 1886 than in 1885 values were relatively much less. The outlook for 1887 is for as large importations as in 1886.

The following table shows the quantity and foreign value of the tinplates which we have annually imported since 1871.

Calendar Years.	Net tons.	Values.	Calendar Years.	Net tons.	Values.
1871	92,925	$9,946,373	1879	172,760	$13,227,659
1872	95,904	13,893,450	1880	177,015	16,478,110
1873	108,838	14,240,868	1881	204,966	14,886,907
1874	89,351	13,057,658	1882	239,665	17,975,161
1875	101,981	12,098,885	1883	247,781	18,156,773
1876	100,740	9,416,816	1884	242,123	16,858,650
1877	125,976	10,679,028	1885	256,028	15,991,152
1878	120,808	9,069,967	1886	288,761	17,504,976

IMPORTS OF IRON ORE IN 1886 AND PREVIOUS YEARS.

The following statement shows the quantities and values of iron ore imported into the United States during the calendar years 1884, 1885, and 1886, by customs districts.

Districts.	1884.		1885.		1886.	
	Gross tons.	Values.	Gross tons.	Values.	Gross tons.	Values.
Baltimore	184,521	$357,136	75,887	$155,803	358,364	$630,072
Beaufort, S. C.	1,749	5,005	.....	.....	.....	.....
Boston	2,865	7,765	212	838	.....	.....
Buffalo Creek	.....	.....	10	40	781	2,358
Cuyahoga	30,964	121,154	10,630	37,001	14,351	42,576
Detroit	10	27	100	300	.....	.....
Genesee	758	1,897	.....	.....	.....	.....
Huron	10	150	.....	.....	.....	.....
New York	29,401	82,995	18,853	44,071	59,992	140,105
Oswegatchie	.....	.....	3,172	9,470	18	60
Oswego	11,179	27,856	.....	.....	.....	.....
Perth Amboy, N. J.	50,836	124,257	21,271	32,090	23,903	65,282
Philadelphia	169,507	388,900	259,990	512,780	576,077	1,011,202
Puget Sound	2,012	4,024	180	360	3,872	7,744
Sandusky	2,177	5,387	.....	.....	.....	.....
Vermont	1,831	7,125	360	1,443	.....	.....
All other	.....	.....	121	7,097	2,075	13,038
Total	487,820	$1,133,678	390,786	$801,293	1,039,433	$1,912,437

Prior to 1879 the quantity of iron ore imported into the United States was not recorded, but it did not amount to 100,000 tons in any year. The importations since 1879 have been as follows.

Years.	Gross tons.	Years.	Gross tons.
1879	284,141	1883	490,875
1880	493,408	1884	487,820
1881	782,887	1885	390,786
1882	589,655	1886	1,039,433

The unprecedentedly large quantity of iron ore that we imported in 1886 came chiefly from Algeria, Elba, the north and south of Spain, and Cuba. The last-named country supplied us with exactly 111,710 tons. Canada supplied us with a very small quantity in that year. Philadelphia received more than one-half of the immense importation of 1886, Baltimore coming next with a very large tonnage. It is expected that the importation for 1887 will be fully equal to that of 1886.

EXPORTS OF IRON AND STEEL FROM 1871 TO 1886.

The value of the exports from the United States to all countries of domestic iron and steel and manufactures thereof in the calendar years from 1871 to 1886 was as follows.

Years.	Values.	Years.	Values.	Years.	Values.	Years.	Values.
1871	$14,185,359	1875	$17,976,833	1879	$14,223,646	1883	$22,716,040
1872	12,595,539	1876	13,641,724	1880	15,156,703	1884	19,290,895
1873	14,173,772	1877	18,549,922	1881	18,216,121	1885	16,622,511
1874	17,312,239	1878	15,101,899	1882	22,348,834	1886	14,865,087

It will be observed that our iron and steel exports were very little larger in 1886 than in 1871. They consist chiefly from year to year of manufactured articles ready for use, such as fire-arms, printing presses, hardware, saws and tools, scales and balances, sewing machines, locomotives and other steam engines, boilers, stoves and ranges, machinery, car-wheels, castings, and similar finished products. We send abroad very little pig iron and rolled iron and steel, very few steel rails, and not near as many cut nails and spikes as we might. In 1886 we exported only 8,849 gross tons of pig iron, 527 tons of iron rails, 2,117 tons of steel rails, and 105,350 kegs of cut nails and spikes. In the same year we exported just 50 locomotives, which was 15 less than in 1885. Our insignificant exports of iron ore are not included in the above table.

Although not strictly manufactures of iron and steel, our exports of agricultural implements, consisting chiefly of mowers and reapers and plows and cultivators, are entitled to mention in this connection, being largely composed of iron and steel. In 1886 they amounted in value to $2,119,772, against $2,532,286 in 1885.

That our exports of iron and steel products and of products partly manufactured of iron and steel do not increase is due in part to the enhanced cost of some of them as compared with the cost of similar products made abroad, in part to the wise protective tariffs of other countries, in part to the conservative spirit of these countries which will not permit them to adopt new methods or superior tools and implements, and in part to our lack of steamship facilities for commercial intercourse with many non-manufacturing countries which now make most of their purchases from our great manufacturing rivals because these rivals run lines of steamships to all parts of the world.

PRODUCTION OF PIG IRON IN 1886.

The total production of pig iron in the United States in 1886 was 6,365,328 net tons, or 5,683,329 gross tons. The total production in 1885 was 4,529,869 net tons, or 4,044,526 gross tons. The increase in 1886 was 1,638,803 gross tons, or over 40 per cent. This increase in production was well distributed over the year, as will be seen from the following comparative figures.

Production.	Net tons.	Gross tons.
First half of 1885	2,150,816	1,920,371
Last half of 1885	2,379,053	2,124,155
First half of 1886	2,954,209	2,637,687
Last half of 1886	3,411,119	3,045,642

Our production of pig iron in 1886 was divided among the fuels used as follows, in net tons: bituminous, 3,806,174 tons; anthracite and bituminous mixed, 1,655,851 tons; anthracite alone, 443,746 tons; charcoal, 459,557 tons. In the following table the production of pig iron in the last four years, exactly classified according to the fuel used, is given in net tons.

Fuel used.	1883.	1884.	1885.	1886.
Bituminous	2,689,650	2,544,742	2,675,635	3,806,174
Anthracite and coke	920,142	1,339,883	1,176,477	1,655,851
Anthracite alone	965,454	246,570	277,913	443,746
Charcoal	571,726	458,418	399,844	459,557
Total	5,146,972	4,589,613	4,529,869	6,365,328

It will be observed that the use of bituminous fuel, almost entirely in the form of coke, makes rapid progress from year to year, and that in the last three years we have made less pig iron with anthracite alone than with charcoal. But the use of charcoal has also declined in late years. The production of charcoal pig iron steadily increased from 1878, when it amounted to 293,399 net tons, to 1882, when it amounted to 697,906 tons, but in 1883 it declined to 571,726 tons, and in every year since 1883 it has been over 100,000 tons less than in that year.

The total production of pig iron in this country since the revival of prosperity in 1879 has been as follows, in net and gross tons.

Years.	Net tons.	Gross tons.
1880	4,295,414	3,835,191
1881	4,641,564	4,144,254
1882	5,178,122	4,623,323
1883	5,146,972	4,595,510
1884	4,589,613	4,097,868
1885	4,529,869	4,044,526
1886	6,365,328	5,683,329

Twenty-three States and one Territory made pig iron in 1886, the same number, but not the same States, as in 1884 and 1885. Maine made pig iron in 1885 and 1886 but not in 1884; California made pig iron in 1884 and 1886 but not in 1885; and Oregon made pig iron in 1884 and 1885 but not in 1886. The following table shows the production of pig iron by States in 1886, in the order of their prominence.

States.	Net tons.	States.	Net tons.
Pennsylvania	3,293,289	Georgia	46,490
Ohio	908,094	Maryland	30,502
Illinois	501,795	Connecticut	19,390
Alabama	283,859	Indiana	16,660
New York	233,618	Colorado	10,451
Tennessee	199,166	Massachusetts	8,124
Michigan	190,734	Maine	5,060
New Jersey	157,886	Texas	3,250
Virginia	156,250	Washington Territory	2,842
West Virginia	98,618	North Carolina	2,200
Missouri	74,523	California	1,750
Wisconsin	65,933		
Kentucky	54,844	Total	6,365,328

Of the total production of pig iron in 1886 Pennsylvania produced 51.7 per cent.; Ohio, 14.2 per cent.; Illinois, 7.8 per cent.; and Alabama, 4.4 per cent. No other State produced as large a

percentage as Alabama. Every State which produced pig iron in 1885 increased its production in 1886, except Virginia and Oregon. The decline in Virginia was very slight, and was almost wholly in charcoal pig iron. Pennsylvania shows a great increase, and so does Ohio. A table in the latter part of this report shows the production of each of the States in 1886 compared with previous years.

As much interest now attaches to the iron industry of the Southern States we present below a comparative table of their production of pig iron in the last seven years. This table shows that in this period of seven years the production of pig iron in the South has more than doubled. The States are arranged for 1886.

States.	Net tons.						
	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Alabama	77,190	98,081	112,765	172,465	189,664	227,438	283,859
Tennessee	70,873	87,406	137,602	133,963	134,597	161,199	199,166
Virginia	29,934	83,711	87,731	152,907	157,483	163,782	156,250
West Virginia	70,338	66,409	73,220	88,398	55,231	69,007	98,618
Kentucky	57,708	45,973	66,522	54,629	45,052	37,553	54,844
Georgia	27,321	37,404	42,440	45,364	42,655	32,924	46,490
Maryland	61,437	48,756	54,524	49,153	27,342	17,299	30,502
Texas	2,500	3,000	1,321	2,381	5,140	1,843	3,250
North Carolina	.....	800	1,150	.....	435	1,790	2,200
Total	397,301	471,540	577,275	699,260	657,599	712,835	875,179

The State which has made the most progress in the period embraced in the table is Virginia. Alabama comes next, and Tennessee next. Kentucky has gone back slightly and Maryland very largely. It is expected that the production of pig iron in the South in the present year will exceed a million net tons.

The following table shows the production of bituminous pig iron by States in 1886.

States.	Net tons.	States.	Net tons.
Pennsylvania	1,565,594	Kentucky	48,481
Ohio	891,933	Georgia	46,031
Illinois	501,795	Wisconsin	37,446
Alabama	201,749	Indiana	16,660
Tennessee	171,764	Maryland	11,125
Virginia	150,181	Colorado	10,451
West Virginia	98,618		
Missouri	54,346	Total	3,806,174

The following table shows the production of anthracite and of mixed anthracite and bituminous pig iron by States in 1886.

States.	Net tons.
Pennsylvania	1,710,968
New York	219,238
New Jersey	157,886
Maryland	11,505
Total	2,099,597

The following table shows the production of charcoal pig iron by States in 1886.

States.	Net tons.	States.	Net tons.
Michigan	190,734	Maryland	7,872
Alabama	82,110	Kentucky	6,363
Wisconsin	28,487	Virginia	6,069
Tennessee	27,402	Maine	5,060
Missouri	20,177	Texas	3,250
Connecticut	19,390	Washington Territory	2,842
Pennsylvania	16,727	North Carolina	2,200
Ohio	16,161	California	1,750
New York	14,380	Georgia	459
Massachusetts	8,124	Total	459,557

The following table shows the production of pig iron in each district of Pennsylvania since 1872.

Years.	Anthracite and mixed anthracite and coke. Net tons.				Bituminous. Net tons.			Charcoal. Net tons.	Total. Net tons.
	Lehigh Valley.	Schuylkill V.	Upper Susq.	Lower Susq.	Shenango V.	Allegheny Co.	Misc. Coke.		
1872	449,663	232,225	127,260	159,305	160,188	110,599	117,224	45,033	1,401,497
1873	389,969	236,409	129,304	157,403	160,831	158,789	111,014	45,854	1,389,573
1874	316,789	232,420	88,243	137,556	156,419	143,660	97,068	40,978	1,213,133
1875	280,360	123,184	71,731	79,717	137,025	131,856	102,520	34,491	960,884
1876	261,274	144,969	79,217	103,369	138,495	128,555	130,635	23,099	1,009,613
1877	335,039	155,434	56,776	111,252	145,179	141,749	178,271	29,636	1,153,356
1878	416,907	144,558	84,547	137,719	122,958	217,299	189,285	29,360	1,342,633
1879	456,350	191,748	125,971	165,500	150,861	267,315	214,123	35,895	1,607,763
1880	544,987	306,926	168,128	217,889	215,313	300,497	286,007	43,374	2,083,121
1881	560,190	309,049	125,785	218,329	198,968	385,453	341,104	51,908	2,190,786
1882	609,338	342,701	201,367	300,240	264,078	358,840	322,717	49,975	2,449,256
1883	575,987	337,433	165,629	337,419	290,069	592,475	301,564	38,315	2,638,891
1884	431,867	278,578	148,352	419,439	246,086	487,055	350,870	23,155	2,385,402
1885	473,963	204,841	127,278	429,166	206,995	585,696	405,409	12,148	2,445,496
1886	665,941	393,545	158,120	493,362	388,728	737,124	439,742	16,727	3,293,289

The Lehigh Valley was the leading pig-iron district in Pennsylvania from 1872 to 1883, in which latter year Allegheny county took the lead and has kept it to this time. Allegheny county is now the leading pig-iron district in the United States, yet thirty

years ago it did not have one blast furnace, and consequently did not make a pound of pig iron.

The charcoal pig-iron industry of Pennsylvania has declined rapidly in recent years. The State now makes less charcoal pig iron annually than at any previous time since about 1820.

The following table shows the production of pig iron in each district of Ohio since 1872.

Years.	Charcoal. Net tons.		Bituminous coal and coke. Net tons.				Total. Net tons.
	Miscellaneous.	Hanging Rock.	Hanging Rock.	Mahoning V.	Hocking Valley.	Miscellaneous.	
1872	8,182	87,440	23,169	152,756	.....	128,196	399,743
1873	8,133	92,365	28,601	136,972	.....	139,958	406,029
1874	6,962	85,873	26,015	121,403	.....	184,748	425,001
1875	4,558	57,413	36,899	115,993	1,250	199,780	415,893
1876	6,109	42,822	44,260	137,546	7,483	165,057	403,277
1877	1,905	40,212	44,544	136,526	23,895	153,316	400,398
1878	....	33,513	31,137	134,400	65,690	156,251	420,991
1879	.....	43,445	43,097	147,844	51,908	161,457	447,751
1880	4,336	64,854	60,316	226,877	85,719	232,105	674,207
1881	4,682	61,487	77,500	245,737	88,146	232,994	710,546
1882	3,108	55,546	77,364	258,478	78,770	225,634	698,900
1883	2,394	38,134	82,455	244,265	48,439	263,956	679,643
1884	.....	24,880	64,781	246,288	24,126	207,038	567,113
1885	.....	18,018	68,837	236,078	50,481	180,549	553,963
1886	.....	16,161	116,398	350,178	57,867	367,490	908,094

During the second quarter of this century and for some time after the charcoal iron of the Hanging Rock district of Ohio gave to the district a wide celebrity. As will be observed from an examination of the table, its charcoal iron industry, like that of Pennsylvania, has rapidly declined, coke taking its place. The Hocking Valley district has not met the expectations which were entertained of it ten years ago, but the Mahoning Valley district is pushing ahead at a rapid rate. In 1886 its production was 48 per cent. more than its production in 1885. But the greatest increase in Ohio in 1886 was in the production of those scattered furnaces which we are compelled to classify under the head of "miscellaneous;" their increase was over 100 per cent.

There was a marked increase in our production of spiegeleisen in 1886, which is included in the figures of total production of pig iron. We made 47,982 net tons in 1886, against 34,671 tons in 1885. Only New Jersey and Pennsylvania made spiegeleisen in 1885, but in 1886 Colorado made 932 net tons in addition to the production of the two other States mentioned. This State had pre-

viously made small quantities of spiegeleisen in 1883 and 1884. The Missouri Furnace Company, which was expected to engage in the manufacture of spiegeleisen in 1886, was prevented from doing so by the non-completion in that year of railroad communication with its manganiferous iron ore mines in Arkansas, but which has since been completed. The company will probably make some spiegeleisen and ferro-manganese this year. The increase in our production of spiegeleisen in 1886 is largely due to the opening up in Arkansas of the manganiferous iron ore mines of the Keystone Manganese and Iron Company, of Johnstown, Pa. The following table shows our annual production of spiegeleisen since 1875.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1875	7,832	1879	13,931	1883	24,574
1876	6,616	1880	19,603	1884	33,893
1877	8,845	1881	21,086	1885	34,671
1878	10,674	1882	21,963	1886	47,982

From 1854, when the statistics of this Association begin, until 1886 our production of pig iron has been as follows, in net tons.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1854	736,218	1865	931,582	1876	2,093,236
1855	784,178	1866	1,350,343	1877	2,314,585
1856	883,137	1867	1,461,626	1878	2,577,361
1857	798,157	1868	1,603,000	1879	3,070,875
1858	705,094	1869	1,916,641	1880	4,295,414
1859	840,627	1870	1,865,000	1881	4,641,564
1860	919,770	1871	1,911,608	1882	5,178,122
1861	731,544	1872	2,854,558	1883	5,146,972
1862	787,662	1873	2,868,278	1884	4,589,613
1863	947,604	1874	2,689,413	1885	4,529,869
1864	1,135,996	1875	2,266,581	1886	6,365,328

The number of furnaces in blast in the United States at the close of 1884 was 236; on the 1st of July, 1885, 228; on the 31st of December, 1885, 276; on the 1st of July, 1886, 314; and on the 31st of December, 1886, 331. The following table shows the number of furnaces in blast at the close of each year since 1873.

Years.	Furnaces.	Years.	Furnaces.	Years.	Furnaces.
1873	410	1878	265	1883	307
1874	365	1879	388	1884	236
1875	293	1880	446	1885	276
1876	236	1881	455	1886	331
1877	270	1882	417		

In the following table we give the number of furnaces in blast at the close of each of the last three years, classified according to the fuel used.

Kind of Fuel.	Dec. 31, 1884.	Dec. 31, 1885.	Dec. 31, 1886.
Bituminous	86	111	143
Anthracite and mixed anthracite and coke	84	105	125
Charcoal	66	60	63
Total	236	276	331

At the close of 1886 the total number of furnaces in the United States which were active or likely to be some day active was 577.

The number of new furnaces completed in 1886 and of long inactive furnaces which were rehabilitated in that year was 18, while the number reported as having been torn down or as not likely to again resume operations was 32, showing a net loss of 14 furnaces during the year, and reducing the whole number from 591 at the beginning of the year to 577 at its close. The 18 new and rehabilitated furnaces were distributed as follows: 1 in New York, 8 in Pennsylvania, 3 in Alabama, 1 in West Virginia, 3 in Tennessee, 1 in Missouri, and 1 in Wisconsin. The 32 abandoned furnaces are in the following States: New York 4, Pennsylvania 15, Virginia 4, Tennessee 2, Ohio 6, and Michigan 1.

At the close of 1886 there were 23 blast furnaces in course of erection, as follows, not counting those rebuilding: New York 4, Pennsylvania 5, Virginia 1 "alternate" stack, Alabama 9, Kentucky 1, Tennessee 1, and Ohio 2. Detailed information relating to new blast furnaces will be found in the latter part of this report.

The stocks of domestic pig iron on hand and unsold in the hands of manufacturers or their agents on the 31st of December, 1886, amounted to only 252,704 net tons. At the close of 1885 they amounted to 416,512 net tons. Low as the stocks were at the close of 1886 our statistics show that they have been lower at the close of two recent years. At the close of 1879 they amounted to 141,674 net tons, and at the close of 1881 they amounted to 210,896 net tons. Our statistics of stocks unsold do not include pig iron sold and not removed from the furnace bank, nor pig iron in the hands of speculators, brokers, or creditors. Nor do they include the very small quantities of foreign pig iron in bond at the close of the year.

The following table shows the quantity of each kind of pig iron

unsold in the hands of manufacturers or their agents at the close of each year since 1874.

YEARS.	Net tons.				Per cent. of production.
	Anthracite.	Bituminous.	Charcoal.	Total.	
1874	248,988	216,479	330,317	795,784	30
1875	274,743	165,482	320,683	760,908	34
1876	268,122	174,302	244,374	686,798	33
1877	239,493	156,818	246,040	642,351	28
1878	226,734	144,835	202,996	574,565	22
1879	33,507	39,275	68,892	141,674	5
1880	175,862	184,626	96,170	456,658	11
1881	90,351	36,495	84,050	210,896	5
1882	107,259	157,196	165,239	429,694	8
1883	178,020	171,802	183,978	533,800	10
1884	178,993	191,845	222,162	593,000	13
1885	68,178	115,982	232,352	416,512	9
1886	50,503	70,634	131,567	252,704	4

For many years we have annually estimated the consumption of pig iron in the United States by adding the home production and the unsold stocks at the beginning of the year to the quantity imported, and subtracting the stocks of domestic pig iron unsold at the close of the year. Occasionally we have also taken account of the stocks of foreign pig iron unsold and of the quantity of domestic pig iron exported. At the close of 1886 the quantity of foreign pig iron in warehouse and not sold was so small that it need not be considered, and our exports of pig iron in the same year need not be considered for a like reason. Our production in 1886 was 5,683,329 gross tons; our imports during the year amounted to 361,768 gross tons; the unsold domestic stocks with which we began the year amounted to 371,886 gross tons; and the unsold stocks with which we closed the year amounted to 225,629 gross tons. Tabulating these details we have the following as the probable consumption of pig iron in this country in 1886, in gross tons.

Domestic production in 1886	5,683,329
Imported in 1886	361,768
Stocks on hand, January 1, 1886	371,886
Total supply	6,416,983
Deduct domestic stocks on hand, December 31, 1886	225,629
Probable consumption in 1886 in gross tons	6,191,354

Our consumption of pig iron since 1874, calculated as above, but with an allowance in some years for foreign stocks and domestic exports, has been as follows.

Years.	Gross tons.	Years.	Gross tons.
1874	2,500,000	1881	4,982,565
1875	2,000,000	1882	4,963,278
1876	1,900,000	1883	4,834,740
1877	2,150,000	1884	4,229,280
1878	2,500,000	1885	4,348,844
1879	3,432,534	1886	6,191,354
1880	3,990,415		

The above statistics of our annual consumption of pig iron do not fully show our consumption of iron itself. To the figures we have given should be added the large quantities of old and scrap iron, both of domestic and foreign origin, which annually take the place of pig iron, and there should also be added the blooms from ore which are annually produced in the Catalan forges of the country. We have no means of ascertaining the quantity of domestic old and scrap iron which is annually consumed by forges, rolling mills, and foundries, but in 1886 we imported 97,635 net tons of old and scrap iron, and in the same year we made 15,878 net tons of blooms directly from the ore. This country is now the largest consumer of pig iron in the world, Great Britain not excepted, and if our consumption of old iron rails, old car wheels, and other old and scrap iron, and our blooms from ore be counted as so much pig iron, of which they take the place, we are very much the largest consumer.

PRODUCTION OF BESSEMER STEEL IN 1886.

The production of Bessemer steel ingots in the United States in 1886 was 2,541,493 net tons, or 2,269,190 gross tons, an increase of 839,731 net tons over the production of 1,701,762 net tons in 1885. The production of 1885 was the largest in our history down to that year, but the production of 1886 was 49 per cent. larger than that of 1885. Such progress as this is more than astonishing; it is really startling.

Nine States and 31 works made Bessemer steel in 1886, of which works six were Clapp-Griffiths. The whole number of converters employed was 65. The States referred to are Massachusetts, New York, Pennsylvania, West Virginia, Tennessee, Ohio, Illinois, Missouri, and Colorado.

The following table shows the production of ingots in Pennsylvania, Illinois, and the other Bessemer-steel-producing States in the first half and second half of 1886; also the total production compared with 1885. In the total production for all of the periods

mentioned is included the production of ingots by the Clapp-Griffiths process, but we add to the table a statement of the output by this process alone.

INGOTS.	First half 1886. Net tons.	Second half 1886. Net tons.	Total 1886. Net tons.	Total 1885. Net tons.
Pennsylvania	677,102	830,475	1,507,577	1,109,039
Illinois	214,413	321,189	535,602	366,659
Other States	182,148	316,166	498,314	226,064
Total	1,073,663	1,467,830	2,541,493	1,701,762
Clapp-Griffiths only	24,810	21,561	46,371	21,647

Pennsylvania made 59 per cent. of all the ingots produced in 1886, against 65 per cent. in 1885; Illinois made 21 per cent. in 1886, against 22 per cent. in 1885; other States made 20 per cent. in 1886, against 13 per cent. in 1885.

The extraordinary production of Bessemer steel in 1886 was chiefly the result of very great activity by the large plants of the country which had been established prior to that year, and all of which were then in operation. Only a small part of the production, about 100,000 tons, was due to the starting up of new works. The works of the Union Steel Company, at Chicago, which had been rebuilt in 1885 and 1886, were successfully put in operation in June of the latter year and have since turned out a large quantity of steel rails. In the latter part of 1885 the Western Steel Company leased the Vulcan Steel Works, at St. Louis, Missouri, which had been idle for some time, and early in 1886 they were successfully started on orders for steel rails and have since been well employed. A record of new Bessemer works built or building in 1886 and 1887 will be found later on in this report.

There were 11 new Bessemer steel works completed and put in operation in 1886, of which 5 were Clapp-Griffiths plants. At the close of 1886 13 plants were under contract, of which 3 were Clapp-Griffiths. Of the 11 completed works 1 is in New York, 6 are in Pennsylvania, 1 is in West Virginia, 1 in Tennessee, 1 in Ohio, and 1 in Illinois. Of the 13 works building 1 is in Massachusetts, 5 are in Pennsylvania, 1 is in Tennessee, 1 in Virginia, 1 in Ohio, 1 in Indiana, and 3 are in Illinois. The total number of completed Bessemer steel works in the United States at the close of 1886 was 33, with 69 converters, of which works 6 were Clapp-Griffiths.

The following table shows the production of Bessemer steel ingots in the United States since 1874, in net tons.

YEARS.	Net tons of 2,000 pounds.			
	Pennsylvania.	Illinois.	Other States.	Total.
1874	85,625	62,492	43,816	191,933
1875	148,374	136,336	90,787	375,517
1876	258,452	171,963	95,581	525,996
1877	328,599	111,299	120,689	560,587
1878	426,481	179,500	126,245	732,226
1879	514,165	250,980	163,827	928,972
1880	643,894	304,614	254,665	1,203,173
1881	844,501	375,763	318,893	1,539,157
1882	933,631	397,426	365,383	1,696,450
1883	1,044,396	273,325	336,906	1,654,627
1884	1,031,484	339,068	170,043	1,540,595
1885	1,109,039	366,659	226,064	1,701,762
1886	1,507,577	535,602	498,314	2,541,493

Our production of Bessemer steel rails in 1886 was as remarkable as our production of Bessemer steel. Its magnitude is best comprehended by reference to the statistics for some previous years. In 1882 this country produced 1,438,155 net tons of Bessemer steel rails, which was the highest annual product down to that year. From 1882 to 1885 the production steadily declined to 1,074,607 net tons in the latter year. In 1886 it suddenly rose to 1,749,899 net tons, an increase of 675,292 tons, or 63 per cent. The production of 1885 was 959,471 gross tons, and in 1886 it was 1,562,410 gross tons. In this statement for 1886 we do not include a few thousand tons of Bessemer steel rails rolled in iron rolling mills from purchased blooms, which will be referred to hereafter.

The following table shows the production of Bessemer steel rails (except from purchased blooms) in the first half and second half of 1886, with the total production compared with that for 1885.

RAILS.	First half 1886. Net tons.	Second half 1886. Net tons.	Total 1886. Net tons.	Total 1885. Net tons.
Pennsylvania	489,790	608,153	1,097,943	736,522
Illinois	163,978	266,997	430,975	308,242
Other States	53,679	167,302	220,981	29,843
Total	707,447	1,042,452	1,749,899	1,074,607

The increased production of 1886 as compared with 1885 commenced with the first month of the year, but it was most marked in the last six months, in which we made almost as many tons of steel rails as in the whole of the year 1885. Pennsylvania made 63 per cent. of the Bessemer steel rails produced by Bessemer works in 1886, against 68 per cent. in 1885; Illinois made 25 per cent. in

1886, against 28 per cent. in 1885; and other States made 12 per cent. in 1886, against 3 per cent. in 1885.

In our annual report for 1883 we presented a statement showing approximately the portion of our Bessemer steel production which was annually converted into forms other than rails. Observing the method then employed we have the following results for the last five years.

PRODUCTS.	Net tons.				
	1882.	1883.	1884.	1885.	1886.
Bessemer steel ingots	1,696,450	1,654,627	1,540,595	1,701,762	2,541,493
Less about 12½ per cent. oxidation and crop ends to be re-converted	212,056	206,828	192,574	212,720	317,687
Bessemer steel in finished forms	1,484,394	1,447,799	1,348,021	1,489,042	2,223,806
Bessemer steel rails, except from purchased blooms	1,334,349	1,253,925	1,116,621	1,074,607	1,749,899
Bessemer steel in other finished forms	150,045	193,874	231,400	414,435	473,907

These calculations show that since 1882 there has been a large increase in the use of Bessemer steel for miscellaneous purposes, which include steel for bridges and structural shapes generally, for car and locomotive springs, angles and other shapes for shipbuilding, agricultural implements and machinery, plates and sheets, plain bars, hoops, wire rods, cut nails, wire nails, etc. To the quantities of miscellaneous products from Bessemer steel ingots of our own production indicated above must be added the miscellaneous products obtained from old steel rails and imported blooms, billets, and slabs.

It is just twenty years since Bessemer steel was first made in this country as a commercial product. In 1867 we made 2,277 gross tons of Bessemer steel rails; the number of tons of ingots made could not have exceeded 3,000. The world has never known such marvelous growth in the development of a great industry as has been witnessed in the building up of the Bessemer steel industry of the United States in these twenty years.

PRODUCTION OF CRUCIBLE STEEL IN 1886.

In 1884 there was a very noticeable decline in our production of crucible steel, but in 1885 there was a slight improvement, and in 1886 we produced almost as much crucible steel as in 1881, which was the year of greatest production. Our production in 1886 was 80,609 net tons, against 64,511 tons in 1885, and 59,662 tons

in 1884. The product of 1886 was made in the seven States of Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, and Michigan. Tennessee and Illinois, which had made crucible steel in 1885, made none in 1886. Ohio, which had made crucible steel prior to 1885, made none in that year or in 1886. In 1886 Pennsylvania made 76 per cent. of the total production.

The following table gives in net tons the annual production of crucible steel ingots and direct castings in the United States since 1874, the quantity of the latter being proportionately very small.

YEARS.	New England.	New York.	New Jersey.	Pennsylvania.	Western States.	Southern States.	Total. Net tons.
1874	1,509	2,696	8,164	23,289	570	100	36,328
1875	1,620	2,300	7,098	26,615	1,500	268	39,401
1876	1,098	2,300	6,806	28,217	700	261	39,382
1877	1,974	2,032	6,749	27,983	1,400	292	40,430
1878	1,602	2,800	7,377	30,585	480	62	42,906
1879	1,608	2,300	8,651	43,614	605	2	56,780
1880	660	3,500	10,387	57,077	800	.....	72,424
1881	2,780	4,961	14,500	66,290	1,231	.....	89,762
1882	1,000	4,693	12,400	65,139	1,857	.....	85,089
1883	2,373	2,976	10,539	63,687	880	.....	80,455
1884	1,832	1,975	11,549	42,295	2,003	8	59,662
1885	2,795	4,375	7,572	45,789	3,060	920	64,511
1886	2,661	4,870	8,046	61,792	2,340	900	80,609

PRODUCTION OF OPEN-HEARTH STEEL IN 1886.

The production of open-hearth steel in the United States in 1886 was 245,250 net tons, or 218,973 gross tons, an increase of 95,869 net tons, or 64 per cent., upon the production of 1885, which was 149,381 net tons. The production of 1886 was much the largest in our history. Our largest production of open-hearth steel prior to 1886 was in 1882, when we made 160,542 net tons.

The following table shows the production of open-hearth steel ingots and direct castings in the United States in the first half and second half of 1886, arranged according to territorial divisions, and the total production compared with the total for 1885.

OPEN-HEARTH STEEL.	First half 1886. Net tons.	Second half 1886. Net tons.	Total 1886. Net tons.	Total 1885. Net tons.
New England, New York, and New Jersey	9,261	14,121	23,382	18,263
Pennsylvania	61,590	110,554	172,144	94,898
Other States	21,689	28,035	49,724	36,220
Total	92,540	152,710	245,250	149,381

The output of open-hearth steel in 1886 was produced by 32 old and 7 new plants, located in eight States—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Illinois, and California. Of the new open-hearth steel plants 6 are in Pennsylvania and 1 is in Ohio. Three open-hearth plants built prior to 1886 were not in operation in that year. At the close of 1886 there were also 8 new open-hearth plants which had either been built in that year but not put in operation, or were then building, or were projected by responsible parties. Of these 6 are in Pennsylvania, 1 is in Ohio, and 1 in Indiana. They will be found mentioned in detail in the latter part of this report. Pennsylvania's share of the total production of 1886 was over 70 per cent.

The quantity of direct open-hearth castings produced in 1886 was not materially larger than in previous years, and was very small relatively to the whole quantity of steel produced. The quantity of open-hearth steel rails produced in 1886 was also very small, amounting to only 5,255 net tons, which were made in Pennsylvania and California. Of the whole quantity 2,518 net tons were street rails.

The following table shows the production of open-hearth steel ingots and direct castings in the United States by States since 1874, in net tons.

YEARS.	New England, New York, and New Jersey.	Pennsylvania.	Western and Southern States.	Total. Net tons.
1874	5,300	1,700	.....	7,000
1875	3,010	4,240	1,800	9,050
1876	6,085	7,547	7,858	21,490
1877	6,652	7,771	10,608	25,031
1878	8,228	12,231	15,667	36,126
1879	14,660	19,575	22,055	56,290
1880	23,293	48,003	41,657	112,953
1881	29,600	63,363	53,983	146,946
1882	30,936	67,822	61,784	160,542
1883	20,904	69,333	43,442	133,679
1884	16,700	81,501	33,416	131,617
1885	18,263	94,898	36,220	149,381
1886	23,382	172,144	49,724	245,250

The open-hearth branch of our steel industry has made slow progress during the eighteen years which have elapsed since the first American open-hearth steel was made at the works of Cooper, Hewitt & Co., at Trenton, New Jersey, in December, 1868. But in 1886 the manufacture of open-hearth steel in this country received a decided impetus, which promises to continue throughout 1887.

PRODUCTION OF MISCELLANEOUS STEEL FROM 1874 TO 1886.

The following table gives the production of blister, puddled, and patented steel, including patented steel castings, from 1874 to the close of 1886, the product of 1886 being made in Pennsylvania, Maryland, Ohio, and Indiana, Pennsylvania leading as usual.

YEARS.	New England.	New York.	New Jersey.	Pennsylvania.	Western States.	Southern States.	Total. Net tons.
1874	376	200	.....	4,417	1,300	60	6,353
1875	1,500	.....	100	7,340	.....	3,667	12,607
1876	.....	139	652	7,601	1,700	214	10,306
1877	.....	.....	.....	9,870	2,034	20	11,924
1878	192	220	.....	8,069	75	.....	8,556
1879	950	215	.....	3,004	1,000	295	5,464
1880	72	617	.....	6,658	1,018	100	8,465
1881	200	.....	.....	2,113	734	.....	3,047
1882	.....	.....	.....	2,114	900	.....	3,014
1883	713	1,105	.....	2,558	1,222	.....	5,598
1884	.....	2,100	50	2,096	865	.....	5,111
1885	.....	.....	.....	1,446	250	.....	1,696
1886	.....	.....	.....	2,106	495	50	2,651

PRODUCTION OF ALL KINDS OF STEEL FROM 1868 TO 1886.

The following table gives in net tons the production in the United States of all kinds of steel from 1868 to 1886.

YEARS.	Net tons of 2,000 pounds.				
	Bessemer steel ingots.	Open-hearth steel ingots.	Crucible steel ingots.	All other steel.	Total.
1868	8,500	.....	21,500		30,000
1869	12,000	1,000	23,000		36,000
1870	42,000	1,500	35,000		78,500
1871	45,000	2,000	37,000		84,000
1872	120,108	3,000	29,260	7,740	160,108
1873	170,652	3,500	34,786	13,714	222,652
1874	191,933	7,000	36,328	6,353	241,614
1875	375,517	9,050	39,401	12,607	436,575
1876	525,996	21,490	39,382	10,306	597,174
1877	560,587	25,031	40,430	11,924	637,972
1878	732,226	36,126	42,906	8,556	819,814
1879	928,972	56,290	56,780	5,464	1,047,506
1880	1,203,173	112,953	72,424	8,465	1,397,015
1881	1,539,157	146,946	89,762	3,047	1,778,912
1882	1,696,450	160,542	85,089	3,014	1,945,095
1883	1,654,627	133,679	80,455	5,598	1,874,359
1884	1,540,595	131,617	59,662	5,111	1,736,985
1885	1,701,762	149,381	64,511	1,696	1,917,350
1886	2,541,493	245,250	80,609	2,651	2,870,003

Our total production in 1886 was not only the largest in our history, but it was the largest annual production in the history of

any country. It was 47 per cent. larger than our production in 1882, which was our year of next largest production.

It is scarcely worth while for statistical purposes to continue from year to year our record of the very small quantities of blister, puddled, and patented steel which this country produces. The record is only valuable in showing how little steel we annually make that is not produced by the three great Bessemer, open-hearth, and crucible processes. Our magnificent steel industry has been wholly created within the last thirty years.

PRODUCTION OF ROLLED IRON IN 1886.

By the term rolled iron we include (1) cut nails and cut spikes; (2) bar, rod, bolt, hoop, skelp, and shaped iron, and rolled axles; (3) plate and sheet iron; and (4) all sizes of iron rails. The statistics which we are about to present relate only to rolled iron and do not include rolled steel.

The total production of rolled iron in the United States in 1886 was 2,283,622 net tons, against 1,804,526 tons in 1885, a gain of 479,096 tons, or 26 per cent. The increase in 1886 embraced all forms of rolled iron, even iron rails. The days of the puddling furnace in this country are apparently very far from being ended, notwithstanding the rapid advance of steel.

Twenty-six States, Wyoming Territory, and the District of Columbia rolled iron in 1886. The same States and other divisions rolled iron in 1885, as did also New Hampshire, which State rolled steel only in 1886. Nebraska's production was in the form of combined iron and steel plate for nails, which we class as iron. The single rolling mill in Kansas was idle throughout the year, as it has been since 1882.

The production of bar, rod, bolt, hoop, skelp, and shaped iron, and rolled iron axles in 1886 amounted to 1,580,337 net tons, against 1,200,958 tons in 1885, an increase of 379,379 tons, or 31 per cent. Pennsylvania made 47 per cent. of the total production of these forms of iron in 1886, and the same proportion in 1885; Ohio made 17 per cent., which was the same as in 1885; New York and Illinois made each over 6 per cent. These four States made three-fourths of these products in each of the years 1885 and 1886.

The production of plate and sheet iron in 1886, excluding nail plate, amounted to 420,007 net tons, against 345,069 tons in 1885, an increase of 74,938 tons, or 21 per cent. Pennsylvania made nearly 73 per cent. of the total production in 1886, and Ohio made

over 10 per cent., these two States making within 17 per cent. of the whole quantity.

The production of rolled iron from 1873 to 1886 is given in detail in the following table, in net tons.

YEARS.	Net tons of 2,000 pounds.				
	Iron rails.	Bar, rod, hoop, skelp, and shaped iron.	Plate and sheet iron, except nail plate.	Iron nail plate.	Total.
1873	761,062	705,964	169,169	201,235	1,837,430
1874	584,469	687,650	176,888	245,609	1,694,616
1875	501,649	668,755	192,769	236,343	1,599,516
1876	467,168	668,956	165,255	207,890	1,509,269
1877	332,540	720,531	182,242	241,446	1,476,759
1878	322,890	830,837	182,042	219,807	1,555,576
1879	420,160	1,107,005	269,768	250,551	2,047,484
1880	493,762	1,220,724	349,657	268,525	2,332,668
1881	488,581	1,492,555	373,082	289,709	2,643,927
1882	227,874	1,545,788	412,814	307,355	2,493,831
1883	64,954	1,511,422	384,362	388,136	2,348,874
1884	25,560	1,230,094	322,584	379,069	1,957,307
1885	14,815	1,200,958	345,069	243,684	1,804,526
1886	23,679	1,580,337	420,007	259,599	2,283,622

The following table gives the production of plate and sheet iron, excluding nail plate, in the United States from 1882 to 1886, by States, in net tons.

STATES.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Maine	.....	1,350	.....	.....	.....
New Hampshire	.....	26	50	.....	.....
Massachusetts	35,688	18,626	12,791	7,991	7,426
Connecticut	.....	50	.....	.....	.....
New York, New Jersey	5,039	2,982	3,267	3,905	5,197
Pennsylvania	258,603	254,446	222,321	252,711	305,521
Delaware	12,895	12,629	10,121	8,379	9,552
Maryland, District of Columbia	16,619	11,499	9,270	6,434	6,434
Alabama	.....	.....	937	2,750	3,740
West Virginia, Kentucky	24,371	22,279	14,342	13,040	27,181
Ohio	49,182	49,987	40,230	41,390	43,603
Indiana	542	.....	.....	.....	.....
Illinois	.....	.....	.....	1,550	1,334
Missouri	6,055	6,168	6,892	4,919	6,791
Michigan	3,820	3,820	2,363	2,000	3,228
California	.....	500	.....	.....	.....
Total	412,814	384,362	322,584	345,069	420,007

The following table gives the production of all kinds of rolled iron in the United States from 1882 to 1886, by States, in net tons.

States.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Maine	10,862	10,662	9,638	8,219	8,486
New Hampshire	3,508	2,158	4,314	500	.....
Massachusetts	111,388	100,418	77,560	75,074	61,322
Rhode Island	11,877	14,405	14,000	13,723	14,168
Connecticut	20,676	18,541	15,054	15,054	15,976
New York	138,541	105,644	86,955	79,853	102,472
New Jersey	96,441	76,109	61,046	49,573	60,282
Pennsylvania	1,123,886	1,081,163	913,046	940,865	1,176,286
Delaware	38,261	35,384	28,015	28,721	34,272
Maryland and D. C.	33,807	29,099	33,856	17,581	22,539
Virginia	40,044	30,751	28,286	31,989	40,581
Alabama	9,188	8,336	17,895	24,850	32,065
Texas	.....	.....	1,000	1,000	924
West Virginia	66,107	79,894	64,632	9,992	7,874
Kentucky	61,096	58,263	29,212	21,736	38,308
Tennessee	38,770	22,454	15,217	11,344	14,510
Ohio	361,608	377,962	310,568	269,263	355,126
Indiana	71,626	55,887	39,028	35,540	42,224
Illinois	93,943	121,702	95,815	80,356	110,182
Missouri	18,145	15,833	18,580	11,547	15,800
Iowa	.....	.....	.....	800	200
Michigan	11,824	11,900	9,571	12,840	21,509
Wisconsin	64,296	40,195	53,628	38,959	60,147
Minnesota	.....	.....	200	1,200	1,000
Kansas	17,867	.....	.....	.....	.....
Nebraska	3,000	3,250	2,000	3,000	250
Colorado	4,739	7,844	5,619	5,538	6,299
Wyoming Territory	16,488	11,288	1,745	2,430	9,853
California	25,843	29,732	20,827	12,979	30,967
Total	2,493,831	2,348,874	1,957,307	1,804,526	2,283,622

Four States together made three-fourths of the total production of rolled iron in 1886, namely, Pennsylvania, over 51 per cent.; Ohio, over 15 per cent.; Illinois, nearly 5 per cent.; and New York, over 4 per cent. Massachusetts, New Jersey, and Wisconsin made somewhat less than 3 per cent. each.

The production of iron rails in 1886 amounted to 23,679 net tons, and of iron nail plate to 259,599 net tons. Both of these products are referred to in detail hereafter.

Tables of the production of rolled iron by districts in Pennsylvania and Ohio in 1886 and immediately preceding years will be found further along in this report.

The following table gives the production of all kinds of rolled iron in the United States from 1864 to 1886, in net tons.

YEARS.	Tons of 2,000 pounds.			YEARS.	Tons of 2,000 pounds.		
	Iron rails.	Other rolled iron.	Total.		Iron rails.	Other rolled iron.	Total.
1864.....	335,369	536,958	872,327	1876....	467,168	1,042,101	1,509,269
1865.....	356,292	500,048	856,340	1877....	332,540	1,144,219	1,476,759
1866.....	430,778	595,311	1,026,089	1878....	322,890	1,232,686	1,555,576
1867.....	459,558	579,838	1,039,396	1879....	420,160	1,627,324	2,047,484
1868.....	499,489	598,286	1,097,775	1880....	493,762	1,838,906	2,332,668
1869.....	583,936	642,420	1,226,356	1881....	488,581	2,155,346	2,643,927
1870.....	586,000	705,000	1,291,000	1882....	227,874	2,265,957	2,493,831
1871.....	737,483	710,000	1,447,483	1883....	64,954	2,283,920	2,348,874
1872.....	905,930	941,992	1,847,922	1884....	25,560	1,931,747	1,957,307
1873.....	761,062	1,076,368	1,837,430	1885....	14,815	1,789,711	1,804,526
1874.....	584,469	1,110,147	1,694,616	1886....	23,679	2,259,943	2,283,622
1875.....	501,649	1,097,867	1,599,516				

PRODUCTION OF ROLLED STEEL IN 1886.

For the first time we have made an attempt to ascertain the exact quantities of all forms of Bessemer, Clapp-Griffiths, and open-hearth steel which are rolled in the United States, our inquiries being limited to the single year 1886. Similar inquiries for crucible steel have not been attempted. The statistics which we have obtained of the steel rolled in 1886 from ingots made by the other three processes mentioned are as complete as the inherent difficulties of the situation would permit, but not sufficiently so to justify their presentation in the form of exact statements. Our information is, however, so comprehensive that we are enabled to reach some general conclusions which are at least of interest.

As nearly as can be ascertained our production of rolled steel in 1886 in forms other than rails, not including crucible steel, amounted to 800,000 net tons, of which about 125,000 tons were rolled from imported material. Of the total quantity rolled about 150,000 tons were in the form of nail plate, 98 per cent. of which was Bessemer and Clapp-Griffiths steel and 2 per cent. open-hearth steel. Of the 650,000 tons in other rolled forms about 150,000 tons were rolled into plates and sheets, about 80 per cent. of which was of open-hearth steel and the remainder was of Bessemer and Clapp-Griffiths steel. About 500,000 tons were rolled into bars, wire rods, railroad axles, springs, hoops, skelp, structural shapes of all kinds, etc., of which about 80 per cent. was of Bessemer and Clapp-Griffiths steel and the remainder was of open-hearth steel.

Assuming the practical accuracy of the estimated production of 800,000 net tons of rolled steel in 1886 it is easy to ascertain the

relation which our rolled-steel industry now bears to our rolled-iron industry. To the figures mentioned must be added 1,749,899 net tons of steel rails rolled by the producers of Bessemer ingots, 5,255 tons of steel rails made from open-hearth steel, and 13,768 tons of steel rails rolled in other rolling mills from purchased blooms and from old steel rails. The grand total of steel rolled into all forms in the United States in 1886, was, therefore, still excluding crucible steel, 2,568,922 net tons, or 285,300 tons more than our total production of rolled iron in the same year.

This is a proper place to mention that the difficulty of obtaining accurate and complete statistics of all our iron and steel industries increases from year to year. These industries are now so greatly expanded, so broken up into specialties, and so ramified in their management that the day is near at hand when some of the statistical details which we have heretofore published and yet give can no longer be obtained. The patience and book-keeping capabilities of the manufacturers and their clerks have their limitations, and that which is inevitable must be accepted.

PRODUCTION OF IRON AND STEEL RAILS IN 1886.

The production of all kinds of rails in the United States in 1886 was 1,792,601 net tons, against 1,094,215 tons in 1885, an increase of 698,386 tons, or nearly 64 per cent. Large as was the production of 1886 it was exceeded in 1881, when we made 1,844,100 tons. The production of 1886 was composed as follows, in net tons: Bessemer steel rails by the producers of domestic ingots, 1,749,899 tons; Bessemer steel rails from purchased blooms, chiefly foreign, and from old steel rails, 13,768 tons; open-hearth steel rails, 5,255 tons; iron rails, 23,679 tons: total, 1,792,601 tons.

Fourteen States and one Territory made rails in 1886, namely, Massachusetts, New York, New Jersey, Pennsylvania, Alabama, Texas, West Virginia, Tennessee, Ohio, Indiana, Illinois, Missouri, Colorado, and California, and Wyoming Territory. Of these States eight made Bessemer steel rails, namely, Massachusetts, New York, Pennsylvania, West Virginia, Ohio, Illinois, Missouri, and Colorado. Pennsylvania and California made all the open-hearth steel rails. The other States, New Jersey, Alabama, Texas, Tennessee, and Indiana, and Wyoming Territory, made only iron rails. But they did not make all of the iron-rail production of the year. More than half was rolled by the steel-rail producing States of Pennsylvania, Ohio, Illinois, Colorado, and California.

Of the total production of rails in 1886 Pennsylvania made over 62 per cent., against 68 per cent. in both 1885 and 1884. Illinois made 24 per cent. in 1886, against over 28 per cent. in 1885, and nearly 26 per cent. in 1884. These two States made over 86 per cent. of all the rails rolled in 1886, as compared with 96 per cent. in 1885 and 94 per cent. in 1884.

The production of street rails is included in the total production of rails. In 1886 the quantity of street rails rolled was 48,009 net tons, of which 41,786 tons were of Bessemer steel, 2,518 tons were of open-hearth steel, and 3,705 tons were of iron. In 1885 the quantity rolled was 35,990 net tons, of which 33,947 tons were of Bessemer steel, 1,543 tons were of iron, and 500 tons were of open-hearth steel. The production of 1884 was 31,357 net tons. The production of 1886 was the largest that has yet been attained. The following table shows the production of street rails since 1873.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1873	9,430	1878	9,229	1883	19,440
1874	6,739	1879	8,646	1884	31,357
1875	16,340	1880	16,894	1885	35,990
1876	13,086	1881	21,554	1886	48,009
1877	7,015	1882	22,286		

The total rail production of the United States in the last six years, in both net and gross tons, has been as follows.

	1881.	1882.	1883.	1884.	1885.	1886.
Net tons	1,844,100	1,688,794	1,360,694	1,144,851	1,094,215	1,792,601
Gross tons	1,646,518	1,507,851	1,214,905	1,022,188	976,978	1,600,537

The production of all kinds of rails in the United States since 1849 has been as follows, in net tons.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1849	24,318	1859	195,454	1869	593,586	1879	1,113,273
1850	44,083	1860	205,038	1870	620,000	1880	1,461,837
1851	50,603	1861	189,818	1871	775,733	1881	1,844,100
1852	62,478	1862	213,912	1872	1,000,000	1882	1,688,794
1853	87,864	1863	275,768	1873	890,077	1883	1,360,694
1854	108,016	1864	335,369	1874	729,413	1884	1,144,851
1855	138,674	1865	356,292	1875	792,512	1885	1,094,215
1856	180,018	1866	430,778	1876	879,629	1886	1,792,601
1857	161,918	1867	462,108	1877	764,709		
1858	163,712	1868	506,714	1878	882,685		

The following table shows the annual production in gross tons

of Bessemer steel rails in the United States since the beginning of their manufacture in 1867, together with the average annual price at which they have been sold at works in Pennsylvania and the rates of duty imposed on foreign rails.

YEARS.	Production in gross tons.	Price in currency.	Duty.
1867	2,277	$166.00	45 per cent. *ad valorem.*
1868	6,451	158.50	
1869	8,616	132.25	
1870	30,357	106.75	
1871	34,152	102.50	$28 per ton to Aug. 1, 1872; $25.20 to Mar. 3, 1875; $28 from that date to July 1, 1883.
1872	83,991	112.00	
1873	115,192	120.50	
1874	129,414	94.25	
1875	259,099	68.75	
1876	368,269	59.25	
1877	385,865	45.50	
1878	491,427	42.25	
1879	610,682	48.25	
1880	852,196	67.50	
1881	1,187,770	61.13	
1882	1,284,067	48.50	
1883	1,148,709	37.75	$17 per ton from July 1, 1883.
1884	996,983	30.75	
1885	959,471	28.50	
1886	1,574,703	34.50	
1887, (March,)	.....	39.50	

The lowest average annual price at which Bessemer steel rails have been sold in this country was reached in 1885, namely, $28.50, but sales were made at still lower figures in both 1884 and 1885. Since 1874 Bessemer steel rails have been produced as follows.

YEARS.	Net tons of 2,000 pounds.			
	Pennsylvania.	Illinois.	Other States.	Total.
1874	66,902	48,280	29,762	144,944
1875	112,843	111,189	66,831	290,863
1876	203,750	133,713	74,998	412,461
1877	250,531	89,519	92,119	432,169
1878	308,093	143,785	98,520	550,398
1879	368,187	197,881	117,896	683,964
1880	495,716	257,583	201,161	954,460
1881	688,276	346,272	295,754	1,330,302
1882	759,524	336,122	342,509	1,438,155
1883	819,544	231,355	235,655	1,286,554
1884	763,223	290,185	63,213	1,116,621
1885	736,522	308,242	29,843	1,074,607
1886	1,111,171	430,975	221,521	1,763,667

The "other States" in the above table were, in 1886, Massachusetts, New York, West Virginia, Ohio, Missouri, and Colorado.

The production of iron and steel rails in this country since the beginning of the manufacture of Bessemer steel rails in 1867 is given in detail in the following table, in net tons.

YEARS.	Net tons of 2,000 pounds.				
	Bessemer steel rails.	Open-hearth steel rails.	Total steel rails.	Iron rails, all kinds.	Total iron and steel.
1867	2,550	.....	2,550	459,558	462,108
1868	7,225	.....	7,225	499,489	506,714
1869	9,650	.....	9,650	583,936	593,586
1870	34,000	.....	34,000	586,000	620,000
1871	38,250	.....	38,250	737,483	775,733
1872	94,070	.....	94,070	905,930	1,000,000
1873	129,015	.....	129,015	761,062	890,077
1874	144,944	.....	144,944	584,469	729,413
1875	290,863	.....	290,863	501,649	792,512
1876	412,461	.....	412,461	467,168	879,629
1877	432,169	.....	432,169	332,540	764,709
1878	550,398	9,397	559,795	322,890	882,685
1879	683,964	9,149	693,113	420,160	1,113,273
1880	954,460	13,615	968,075	493,762	1,461,837
1881	1,330,302	25,217	1,355,519	488,581	1,844,100
1882	1,438,155	22,765	1,460,920	227,874	1,688,794
1883	1,286,554	9,186	1,295,740	64,954	1,360,694
1884	1,116,621	2,670	1,119,291	25,560	1,144,851
1885	1,074,607	4,793	1,079,400	14,815	1,094,215
1886	1,763,667	5,255	1,768,922	23,679	1,792,601

The following table shows the approximate consumption of rails in this country in each year since 1867, in net tons.

YEARS.	Made in United States.	Imported.		Approximate consumption. Net tons.
		Iron.	Steel.	
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	566,202		1,341,935
1872	1,000,000	381,064	149,786	1,530,850
1873	890,077	99,201	159,571	1,148,849
1874	729,413	7,796	100,515	837,724
1875	792,512	1,174	18,274	811,960
1876	879,629	287	none	879,916
1877	764,709	none	35	764,744
1878	882,685	none	10	882,695
1879	1,113,273	19,090	25,057	1,157,420
1880	1,461,837	132,459	158,230	1,752,526
1881	1,844,100	137,013	249,308	2,230,421
1882	1,688,794	41,992	182,135	1,912,921
1883	1,360,694	757	38,220	1,399,671
1884	1,144,851	94	3,074	1,148,019
1885	1,094,215	57	2,395	1,096,667
1886	1,792,601	7	46,571	1,839,179

PRODUCTION OF CUT NAILS IN 1886.

The statistics we are about to present of the production of cut nails and cut spikes in the United States in 1886 do not embrace railroad and other spikes made from bar iron, wire nails of any size, or machine-made horseshoe nails. For the sake of brevity we shall make no further reference to spikes, treating them as nails.

Our total production of cut nails in 1886 was 8,160,973 kegs of 100 pounds each, against 6,696,815 kegs in 1885, 7,581,379 kegs in 1884, and 7,762,737 kegs in 1883. The production of 1886 was the largest the country has ever attained. The increase in 1886 over 1885 was partly due to the settlement on June 25th of the nailers' strike, which had commenced on June 1, 1885, and partly to the prosperous condition of the country during the whole year, which created an increased demand for nails.

Sixteen States made cut nails in 1886, and the same States gave us the production of 1884 and 1885. The following table shows the production of 1886 compared with 1885 and 1884.

STATES.	1886—Kegs of 100 pounds.			Total 1885. Kegs.	Total 1884. Kegs.
	Iron.	Steel.	Total.		
Pennsylvania	2,271,408	297,829	2,569,237	2,457,916	2,281,676
Ohio	672,822	1,030,968	1,703,790	920,539	1,310,715
West Virginia	2,076	897,524	899,600	778,069	1,098,611
Massachusetts	505,434	11,315	516,749	654,318	557,195
Illinois	181,392	432,663	614,055	376,361	712,650
Indiana	292,673	47,319	339,992	274,271	443,234
Virginia	212,552	.....	212,552	226,437	207,678
California	224,163	.....	224,163	203,567	129,332
New Jersey	341,151	4,017	345,168	181,680	305,307
Alabama	206,500	.....	206,500	137,000	100,000
Kentucky	49,000	95,000	144,000	135,628	41,522
Tennessee	39,950	48,339	88,289	98,851	120,164
Wisconsin	135,480	70,000	205,480	86,257	162,851
Colorado	52,383	.....	52,383	64,310	55,944
Nebraska	5,000	.....	5,000	60,000	40,000
New York	.....	34,015	34,015	41,611	14,500
Total	5,191,984	2,968,989	8,160,973	6,696,815	7,581,379

In the above table we have separated by States the iron nails made in 1886 from those made of steel. Nearly all of West Virginia's production in 1886 was of steel, nearly two-thirds that of Ohio and Kentucky, about five-sevenths that of Illinois, more than one-half that of Tennessee, about one-third that of Wisconsin, about one-seventh that of Indiana, and all that of New York. Pennsylvania made fewer steel nails than she would naturally be

credited with making, while Massachusetts made about one keg in fifty of steel, and New Jersey made even a smaller proportion. Virginia, Alabama, and Colorado made only iron nails. California and Nebraska each made combined iron and steel nails, and so did one works in Massachusetts, but we classify these nails among those made of iron. The small product of Nebraska is due to the fact that her solitary nail works at Omaha ran only three weeks during the year.

In 1884 the production of steel nails in the United States (including 500 kegs of combined iron and steel) was 393,482 kegs, or 5 per cent. of the total production of nails. In 1885 the production of steel and combined iron and steel nails was 1,823,127 kegs, or 27 per cent. of the total production. In 1886 the production of steel nails alone was 36 per cent. of the total production.

In 1885, owing to the nailers' strike, which seriously affected the nail works west of the Alleghenies, the Wheeling nail district failed to supply a part of its markets, which were invaded by the nail manufacturers of Central Pennsylvania, whose production that year largely increased, while that of the Wheeling district largely decreased. In 1886, however, the Wheeling district came to the front again with a much larger production than that of Central Pennsylvania. The figures for 1884, 1885, and 1886 are as follows.

Districts.	1886—Kegs.			1885. Kegs.	1884. Kegs.
	Iron.	Steel.	Total.		
Wheeling district	17,149	1,841,402	1,858,551	1,297,136	1,991,570
Central Pennsylvania	1,347,303	142,179	1,489,482	1,472,797	1,083,996

The Wheeling district embraces four counties—Ohio and Marshall counties in West Virginia, in which counties all the nail works of the State are located, and Belmont and Jefferson counties across the river in Ohio, Wheeling being near the centre of the district. Central Pennsylvania embraces the counties drained by the Susquehanna river and its branches.

The production of cut nails in this country in each of the last fifteen years has been as follows, in kegs of 100 pounds.

Years.	Kegs.	Years.	Kegs.	Years.	Kegs.	Years.	Kegs.
1872	4,065,322	1876	4,157,814	1880	5,370,512	1884	7,581,379
1873	4,024,704	1877	4,828,918	1881	5,794,206	1885	6,696,815
1874	4,912,180	1878	4,396,130	1882	6,147,097	1886	8,160,973
1875	4,726,881	1879	5,011,021	1883	7,762,737		

The manufacture of cut nails is an American invention, originating near the close of the last century. For many years after nail-cutting machines were perfected cut nails had to contend with the competition of wrought-iron nails, but for more than fifty years very few wrought-iron nails have been made in this country for any purpose, except for shoeing horses. Our cut-nail industry has long been an important branch of our iron industry, and recently, as we have shown, it has helped to enlarge the domain of steel. It consumed over 400,000 net tons of iron and steel in 1886. Perhaps no other branch of our iron and steel industries gives employment to so many persons in proportion to the quantity of finished iron and steel produced.

But cut nails have found in wire nails a new and formidable competitor. A few years ago the manufacture of wire nails was commenced in this country, and it has since made steady and even rapid progress. The smaller sizes of wire nails are those which chiefly compete with cut nails; the same sizes also compete with tacks. In August, 1886, there were 27 wire-nail works in the United States. The production in 1886 was about 600,000 kegs of 100 pounds each. In 1887 it promises to be 1,000,000 kegs.

PRODUCTION OF BLOOMS AND BILLETS IN 1886.

Blooms and billets from ore are made chiefly in the Champlain district of New York, and blooms from pig and scrap iron are made chiefly in Pennsylvania. The make of each of these products in the last thirteen years is given below, in net tons.

YEARS.	Blooms and billets from ore.	Blooms from pig and scrap iron.	Total. Net tons.	YEARS.	Blooms and billets from ore.	Blooms from pig and scrap iron.	Total. Net tons.
1874.....	36,450	25,220	61,670	1881.....	45,369	39,237	84,606
1875.....	24,416	24,827	49,243	1882.....	48,354	42,939	91,293
1876.....	20,784	23,844	44,628	1883.....	35,237	39,521	74,758
1877.....	24,227	23,073	47,300	1884.....	29,789	27,216	57,005
1878.....	24,139	25,906	50,045	1885.....	19,887	21,813	41,700
1879.....	30,282	32,071	62,353	1886.....	15,878	26,031	41,909
1880.....	40,652	33,937	74,589				

The production of wrought iron from ore in forges, practiced chiefly in the Lake Champlain district of New York and in a very restricted way in the mountainous districts of North Carolina and Tennessee, is fast declining. The quantity of iron now made by the New York forges is very much less than a few years ago. In

North Carolina Maiden Creek Forge has rotted down; the Catawba Valley Iron Works are suspended; Owl Creek Forge, at Murphy, Cherokee county, will make no more blooms. The other forges in that State are very rarely in operation. Very little iron was made by the Tennessee forges during 1886. Click's Forge, in Greene county, Tennessee, has been abandoned and has rotted down. Nor is the manufacture of blooms from pig and scrap iron a growing industry in this country. Several Pennsylvania forges have recently been abandoned. J. C. Frederick & Co., of Quicksburgh, Shenandoah county, Virginia, inform us that Pine Forge in that county, which is owned by them, is for sale. Modern processes and these primitive methods run an unequal race.

The following table shows the proportion of ore blooms and billets made in New York in the past twelve years as compared with the production of the whole country, and the proportion of the country's production of pig and scrap blooms which was made in Pennsylvania in the same time.

YEARS.	Net tons of 2,000 pounds.			
	Ore blooms and billets made in New York.	Total make of ore blooms and billets.	Pig and scrap blooms made in Pennsylvania.	Total make of pig and scrap blooms.
1875	23,666	24,416	19,032	24,827
1876	20,202	20,784	13,401	23,844
1877	23,466	24,227	16,517	23,073
1878	22,829	24,139	15,121	25,906
1879	27,290	30,282	23,956	32,071
1880	34,351	40,652	24,319	33,937
1881	39,892	45,369	28,342	39,237
1882	43,911	48,354	29,408	42,939
1883	31,347	35,237	28,190	39,521
1884	27,745	29,789	19,992	27,216
1885	18,981	19,887	15,462	21,813
1886	15,507	15,878	20,836	26,031

The production of both products from 1865 to 1886 has been as follows, in net tons.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1865	63,977	1873	62,564	1881	84,606
1866	73,555	1874	61,670	1882	91,293
1867	73,073	1875	49,243	1883	74,758
1868	75,200	1876	44,628	1884	57,005
1869	69,500	1877	47,300	1885	41,700
1870	62,259	1878	50,045	1886	41,909
1871	63,000	1879	62,353		
1872	58,000	1880	74,589		

PRODUCTION OF IRON ORE IN 1886.

It is not possible to obtain from year to year the exact production of iron ore in the United States, but knowing the quantity of pig iron and ore blooms produced and the quantity of iron ore imported, and making due allowance also for iron ore used in fettling in iron rolling mills, it is possible to make an accurate estimate of the quantity of iron ore produced. We estimate the home production of iron ore in 1886 at 10,000,000 gross tons. Our imports of iron ore in 1886 amounted to 1,039,433 gross tons. Our consumption of iron ore in 1886 was therefore over 11,000,000 gross tons.

In the following table we give in gross tons the production of iron ore in 1886 in the principal iron-ore districts of the country. The total number of tons included in the table is 5,972,137, which is nearly 60 per cent. of the estimated production of the whole country in 1886. Most of the figures given in the table represent shipments from the mines, and take no account of the ore that is left in the stock piles from year to year. This explanation applies particularly to all the Lake Superior mines, the Missouri mines, the Cornwall mines, the New Jersey mines, and to some of the important New York mines. In a series of years production and shipments are equalized.

Districts.	Gross tons.		
	1884.	1885.	1886.
Lake Superior mines of Michigan and Wisconsin	2,455,924	2,231,064	3,258,174
Vermillion Lake mines of Minnesota	62,124	225,484	304,396
Missouri mines	233,225	169,162	379,776
Cornwall, Pennsylvania	412,320	508,864	688,054
New Jersey mines	393,710	330,000	500,501
Chateaugay mines, near Lake Champlain, New York	214,394	143,278	214,800
Crown Point mines, New York	290,500	235,799	60,084
Port Henry mines, New York			298,868
Other Lake Champlain mines, New York			15,000
Hudson River Ore and Iron Company, New York	90,000	55,000	75,000
Tilly Foster mines, New York	35,964	18,910	17,728
Forest of Dean mines, New York	20,370	18,274	18,000
Salisbury region, Connecticut	25,000	32,000	36,000
Cranberry mines, North Carolina	3,998	17,839	24,106
Tennessee Coal, Iron, and Railroad Company's Inman mines, Tennessee	70,757	94,319	81,650
Total of above mines	4,308,286	4,079,993	5,972,137

The following table gives in detail the quantity of iron ore shipped from the mines of the Lake Superior region (Michigan, Wisconsin, and Minnesota) in each of the last four years.

Districts.	Gross tons.			
	1883.	1884.	1885.	1886.
Marquette Range, Michigan	1,293,364	1,557,389	1,430,422	1,621,887
Menominee Range, Michigan and Wisconsin	1,047,863	895,634	680,435	880,006
Gogebic Range, Michigan and Wisconsin	not opened.	1,022	119,766	756,281
Vermillion Lake, Minnesota	not opened.	62,124	225,484	304,396
Miscellaneous mines, Michigan	.....	1,879	441	.....
Total	2,341,227	2,518,048	2,456,548	3,562,570

The total shipments of iron ore from the mines of the Lake Superior region since the beginning of its development, thirty-three years ago, have been as follows.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1854	3,000	1865	236,208	1876	992,764
1855	1,449	1866	278,796	1877	1,014,687
1856	36,343	1867	473,567	1878	1,111,110
1857	25,646	1868	491,449	1879	1,375,691
1858	15,876	1869	617,444	1880	1,908,647
1859	68,832	1870	830,940	1881	2,314,502
1860	114,401	1871	779,607	1882	2,966,375
1861	49,909	1872	900,901	1883	2,341,227
1862	124,169	1873	1,162,458	1884	2,518,048
1863	203,055	1874	919,557	1885	2,456,548
1864	243,127	1875	891,257	1886	3,562,570

The total shipments of iron ore from the Lake Superior region during the thirty-three years covered by the above table amounted to 31,030,160 gross tons.

We are indebted to the editors of the Marquette *Mining Journal* for the foregoing statistics of the Lake Superior region. For the statistics of the Missouri mines we are indebted to Professor W. B. Potter, of Washington University, St. Louis. To Mr. A. L. Inman, of Plattsburgh, and other gentlemen we are under obligations for New York and other statistics.

The shipments of iron ore in 1886 from the mines of the Cornwall Ore Bank Company, in Lebanon county, Pennsylvania, were the largest in their history, amounting to 688,054 gross tons. We are indebted to Mr. J. Taylor Boyd, the general superintendent of the mines, for the statistics for 1886 and other recent years.

The following table shows the production of iron ore, in gross tons, by the Cornwall ore mines from the time they were first opened in 1740 to January 1, 1887. These mines, which are generally referred to as the Cornwall Ore Bank, have produced more iron ore than any other single iron-ore property in the country.

	Tons.	cwt.
From 1740 to 1790, three furnaces, each 2,000 tons yearly, about	300,000	00
From 1790 to 1848, six furnaces, each 2,000 tons yearly, about	700,000	00
From April 1, 1848, to January 1, 1853	173,190	11
From January 1, 1853, to February 1, 1864, (date of formation of Cornwall Ore Bank Company,)	1,351,717	05

From the formation of the Cornwall Ore Bank Company, as follows.

	Tons.	cwt.		Tons.	cwt.
1864, (11 months,)	165,915	02	1877	171,588	19
1865	114,802	11	1878	179,299	03
1866	216,659	16	1879	268,488	06
1867	202,755	03	1880	231,172	18
1868	165,843	03	1881	249,050	01
1869	173,428	16	1882	309,680	11
1870	174,407	17	1883	363,143	10
1871	176,054	15	1884	412,319	17
1872	193,317	01	1885	508,864	06
1873	166,782	06	1886	688,054	07
1874	112,429	04			
1875	98,924	17	Total from 1864	5,480,884	00
1876	137,901	11			

Grand total from 1740 to January 1, 1887, (gross tons,) 8,005,791 16

The following table, compiled from statistics furnished to us by Professor George H. Cook, State Geologist, gives the production of iron ore in New Jersey at various periods from 1790 to 1886.

Years.	Gross tons.	Years	Gross tons.
1790	10,000	1875	390,000
1830	20,000	1876	285,000
1855	100,000	1878	409,674
1860	164,900	1879	488,028
1864	226,000	1880	745,000
1867	275,067	1881	737,052
1870	362,636	1882	932,762
1871	450,000	1883	521,416
1872	600,000	1884	393,710
1873	665,000	1885	330,000
1874	525,000	1886	500,501

PRODUCTION OF COAL IN 1886.

From Mr. John H. Jones, the anthracite coal accountant, we learn that the total production of anthracite coal in Pennsylvania in 1886, excepting that consumed by employés and for steam and heating purposes about the mines, was 32,136,362 gross tons, against 31,623,530 tons in 1885. Of the total production in 1886, 17,031,826 tons, or 53 per cent., was from the Wyoming region; 5,723,129 tons, or 17.81 per cent., was from the Lehigh region; and 9,381,407 tons, or 29.19 per cent., was from the Schuylkill region. Pennsylvania produces virtually all our anthracite coal.

Mr. Frederick E. Saward, the editor of the *Coal Trade Journal*, annually compiles the statistics of the production of bituminous coal in the United States. He estimates the total production of bituminous coal in 1886 as amounting to 74,643,671 gross tons, which, added to the anthracite production, gives us a total production of 106,780,033 gross tons in 1886, against 102,124,554 tons in 1885, and 99,443,062 tons in 1884. We give below Mr. Saward's estimate of bituminous coal production in the several States and Territories in 1884, 1885, and 1886, to which is added the production of anthracite coal in these years.

Coal—gross tons.	1884.	1885.	1886.
Alabama	2,000,000	2,225,000	2,500,000
Arkansas	150,000	175,000	175,000
California	200,000	150,000	150,000
Colorado	1,200,000	1,350,000	1,437,811
Dakota	50,000	75,000	30,000
Georgia	200,000	200,000	200,000
Idaho	20,000	40,000	40,000
Illinois	10,101,005	9,791,874	9,250,000
Indiana	2,260,000	2,375,000	3,000,000
Indian Territory	400,000	500,000	400,000
Iowa	3,903,458	3,585,737	4,000,000
Kansas	1,100,000	1,300,000	1,500,000
Kentucky	1,550,000	1,700,000	1,600,000
Maryland	2,469,051	2,462,485	2,152,713
Michigan	35,000	30,000	40,000
Missouri	2,500,000	2,750,000	3,000,000
Montana	50,000	75,000	50,000
New Mexico	220,557	306,207	275,000
Ohio	9,000,000	9,000,000	9,500,000
Oregon	60,000	100,000	100,000
Pennsylvania, Anthracite	30,718,293	31,623,530	32,136,362
Pennsylvania, Bituminous	25,000,000	25,000,000	27,000,000
Tennessee	1,200,000	1,440,597	1,700,000
Texas	125,000	175,000	125,000
Utah	250,000	250,000	200,000
Virginia	300,000	650,000	1,000,000
Washington Territory	380,698	410,667	378,147
West Virginia	3,000,000	3,483,457	4,000,000
Wyoming Territory	1,000,000	900,000	840,000
Total	99,443,062	102,124,554	106,780,033

In the census years 1870 and 1880 the production of coal in this country was as follows.

Years—gross tons.	Bituminous coal.	Anthracite coal.	Total.
Census year 1870	15,356,621	13,985,960	29,342,581
Census year 1880	38,193,414	25,580,189	63,773,603

The shipments of bituminous coal and coke from Southwestern Pennsylvania through the locks and pools of the Monongahela Navigation Company amounted in 1886 to 113,099,147 bushels, or 4,297,767 gross tons, against 85,923,107 bushels, or 3,265,078 tons, in 1885. The shipments in 1886 were the largest in the history of the company. Of the shipments last year 109,895,147 bushels were coal and 3,204,000 bushels were coke.

The shipments of bituminous coal from the Cumberland mines in Western Maryland and the Piedmont mines in West Virginia amounted in 1886 to 2,592,467 gross tons, against 2,865,974 tons in 1885, and 2,934,979 tons in 1884. The shipments in 1886 were 273,507 tons less than in 1885.

The shipments of bituminous coal from the Clearfield region of Pennsylvania in 1886 amounted to 2,973,213 gross tons, of which 943,617 tons were shipped over the Beech Creek Railroad and 2,029,596 tons over the lines of the Pennsylvania Railroad.

IRON AND STEEL SHIPBUILDING IN 1886.

Hon. C. B. Morton, United States Commissioner of Navigation, has furnished us with a detailed statement of the number and tonnage of iron and steel vessels launched from American shipyards in the fiscal year ended June 30, 1886. The whole number launched was only 26, and their aggregate gross tonnage was 14,907 tons. This is the smallest number since 1879 and the smallest tonnage since 1877.

The vessels launched in the fiscal year 1886 were built within the jurisdiction of the following ports: New York, three, with an aggregate tonnage of 1,807 tons; Philadelphia, twelve, with a tonnage of 5,875 tons; Wilmington, four, with a tonnage of 2,199 tons; Detroit, one, with a tonnage of 1,924 tons; Cleveland, two, with a tonnage of 2,280 tons; Buffalo, one, with a tonnage of 17.21 tons; Pittsburgh, one, with a tonnage of 134.28 tons; Alexandria, Va., one, with a tonnage of 573.47 tons; and Dubuque, one, with a tonnage of 96.72 tons. The vessel built at Detroit and one of those built at Cleveland are reported to have been constructed of steel; all the others were of iron. It is proper to state, however, that the Government statisticians have usually made no distinction between iron and steel vessels, counting them all as if built of iron.

The following table gives the number and tonnage of all iron and steel vessels built in the United States since 1868, in which

year our iron shipbuilding industry may be said to have had its beginning. The table does not include any vessels built for the United States Navy.

Fiscal Years.	Sailing.		Steam.		Total.	
	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.
1868	.....	.....	.....	2,801	.....	2,801
1869	.....	1,039	.....	3,545	.....	4,584
1870	.....	679	.....	7,602	.....	8,281
1871	.....	2,067	20	13,412	.....	15,479
1872	.....	.....	20	12,766	20	12,766
1873	.....	.....	26	26,548	26	26,548
1874	.....	.....	23	33,097	23	33,097
1875	.....	.....	20	21,632	20	21,632
1876	.....	.....	25	21,346	25	21,346
1877	.....	.....	7	5,927	7	5,927
1878	.....	.....	32	26,960	32	26,960
1879	.....	.....	24	22,008	24	22,008
1880	1	44	30	25,538	31	25,582
1881	1	36	41	28,320	42	28,356
1882	.....	.....	43	40,097	43	40,097
1883	1	2,033	34	37,613	35	39,646
1884	3	4,432	31	31,200	34	35,632
1885	1	731	47	43,297	48	44,028
1886	3	692	23	14,215	26	14,907

Since the close of the last fiscal year there appears to be more animation in our iron and steel shipbuilding industry than the year itself experienced. Of the causes of the slow progress of this American industry the country is already well informed.

UNITED STATES RAILROAD STATISTICS FROM 1830 TO 1886.

The publishers of Poor's Manual of the railroads of the United States give the total mileage of new railroad built in this country in 1886 as 8,648 miles, against a total of 3,131 miles built in 1885. The mileage of 1886 has only been exceeded by that of 1881 and 1882.

Present indications point to the construction in 1887 of a larger mileage of new railroad than was built in 1886.

The following is Mr. H. V. Poor's table of the railroad mileage of the United States from 1830 to 1886, a period of fifty-seven years. The figures given in this table denote only the length of the railroad lines in the country, without regard to the number of tracks or miles of sidings constructed. The figures for 1886 are subject to revision, but Mr. Poor writes us that the final result will not vary more than 100 miles from the present estimate.

YEARS.	Miles in Operat'n.	Annual Increase.	YEARS.	Miles in Operat'n.	Annual Increase.	YEARS.	Miles in Operat'n.	Annual Increase.
1830.....	23	.....	1849.....	7,365	1,369	1868.....	42,229	2,979
1831.....	95	72	1850.....	9,021	1,656	1869.....	46,844	4,615
1832.....	229	134	1851.....	10,982	1,961	1870.....	52,914	6,070
1833.....	380	151	1852.....	12,908	1,926	1871.....	60,293	7,379
1834.....	633	253	1853.....	15,360	2,452	1872.....	66,171	5,878
1835.....	1,098	465	1854.....	16,720	1,360	1873.....	70,268	4,097
1836.....	1,273	175	1855.....	18,374	1,654	1874.....	72,385	2,117
1837.....	1,497	224	1856.....	22,016	3,642	1875.....	74,096	1,711
1838.....	1,913	416	1857.....	24,503	2,487	1876.....	76,808	2,712
1839.	2,302	389	1858.....	26,968	2,465	1877.....	79,088	2,280
1840.....	2,818	516	1859.....	28,789	1,821	1878.....	81,717	2,629
1841.....	3,535	717	1860.....	30,635	1,846	1879.....	86,463	4,746
1842.....	4,026	491	1861.....	31,286	651	1880.....	93,349	6,886
1843.....	4,185	159	1862.....	32,120	834	1881.....	103,145	9,796
1844.....	4,377	192	1863.....	33,170	1,050	1882.....	114,713	11,568
1845.....	4,633	256	1864.....	33,908	738	1883.....	121,454	6,741
1846.....	4,930	297	1865.....	35,085	1,177	1884.....	125,379	3,925
1847.....	5,598	668	1866.....	36,801	1,716	1885.....	128,510	3,131
1848.....	5,996	398	1867.....	39,250	2,449	1886.....	137,158	8,648

STATISTICS OF IMMIGRATION FOR 1886 AND PREVIOUS YEARS.

The following table, for which we are indebted to the Bureau of Statistics of the United States Treasury Department, exhibits the total number of immigrants into the United States in the calendar years 1885 and 1886, except from the Dominion of Canada and Mexico since July 1, 1885.

Countries.	1885.	1886.
Great Britain and Ireland:		
England and Wales	45,641	59,765
Ireland	49,793	52,912
Scotland	10,174	13,916
Total from the United Kingdom	105,608	126,593
Germany	107,668	86,301
France	3,138	4,085
Austria	10,885	17,593
Bohemia and Hungary	14,752	22,523
Russia, Finland, and Poland	20,052	33,216
Sweden and Norway	33,200	46,081
Denmark	5,870	6,634
Netherlands	2,499	2,667
Italy	15,485	30,565
Switzerland	5,126	4,518
All other countries	26,227	12,111
Grand total	350,510	392,887

There being no law of Congress providing for the collection of statistics of immigration across our frontiers by railroad cars and

other land vehicles, it is found impracticable to collect fully and accurately the statistics of immigrants arriving from the British North American Provinces and from Mexico. The arrivals of immigrants from these countries since July 1, 1885, are excluded from all official tables of immigration.

The following table shows the total number of immigrants who have arrived in the United States since 1861, with the exception mentioned for the last half of 1885 and the whole of 1886.

Calendar years.	Immigrants.	Calendar years.	Immigrants.	Calendar years.	Immigrants.
1861	89,722	1871	346,938	1881	720,045
1862	89,005	1872	437,750	1882	730,349
1863	174,524	1873	422,545	1883	570,316
1864	193,195	1874	260,814	1884	461,346
1865	247,453	1875	191,231	1885	350,510
1866	314,917	1876	157,440	1886	392,887
1867	310,965	1877	130,502		
1868	289,145	1878	153,207	Total	8,620,664
1869	385,287	1879	250,565		
1870	356,303	1880	593,703		

SUMMARY OF FOREGOING STATISTICS FOR 1886.

Production of Pig Iron in 1886, net tons	6,365,328
Production of Spiegeleisen in 1886, included in Pig Iron, net tons	47,982
Production of Bar, Rod, Bolt, Hoop, Skelp, and Shaped Iron in 1886, net tons	1,580,337
Production of Plate and Sheet Iron except Nail Plate in 1886, net tons	420,007
Production of Iron and Steel and Combined Iron and Steel Cut Nails and Spikes in 1886, kegs of 100 pounds	8,160,973
Production of Steel Nails only in 1886, kegs of 100 pounds	2,968,989
Production of all Rolled Iron, including Iron Nails and excluding Rails, in 1886, net tons	2,259,943
Production of Bessemer Steel Rails in 1886, net tons	1,763,667
Production of Open-hearth Steel Rails in 1886, net tons	5,255
Production of Iron Rails in 1886, net tons	23,679
Total production of Rails in 1886, net tons	1,792,601
Production of Iron and Steel Street Rails in 1886, included above, net tons	48,009
Production of Bessemer Steel Ingots in 1886, net tons	2,541,493
Production of Open-hearth Steel Ingots in 1886, net tons	245,250
Production of Crucible Steel Ingots in 1886, net tons	80,609
Production of Blister and Patented Steel in 1886, net tons	2,651
Production of all kinds of Steel in 1886, net tons	2,870,003
Production of Iron Blooms in 1886, net tons	41,909
Value of Imports of Iron and Steel in 1886	$41,630,779
Value of Exports of Iron and Steel in 1886	$14,865,087
Imports of Iron Ore in 1886, gross tons	1,039,433
Domestic Production of Iron Ore in 1886, gross tons	10,000,000
Production of Anthracite Coal in 1886, gross tons	32,136,362
Total Domestic Production of Coal in 1886, gross tons	106,780,033
Miles of Railroad completed in 1886	8,648
Total number of miles of Railroad December 31, 1886	137,158
Iron and Steel Ships built in the fiscal year 1886	26
Immigrants in the calendar year 1886	392,887

FOREIGN COMMERCE OF THE UNITED STATES SINCE 1861.

THE BALANCE OF TRADE FOR TWENTY-SIX YEARS.

Official Figures from the Bureau of Statistics of the Treasury Department.

THE following table, compiled from the reports of the Bureau of Statistics, shows the imports and exports of the United States in each fiscal year, ended June 30th, from 1861 to 1886, and during the first seven months of the fiscal year 1887. The phrases "net imports" and "domestic exports" indicate that all merchandise and specie imported and re-exported are excluded from the table. The column headed "Balance of Trade" shows the difference between the net imports and domestic exports of merchandise without reference to the movement of specie. A + mark before the amount indicates that the balance of trade was in favor of the United States; when no mark occurs the balance of trade is against this country.

FISCAL YEARS.	MERCHANDISE. *Gold Value.*		BALANCE OF TRADE.	SPECIE.		SPECIE BALANCE.
	Net imports.	Domestic exports.		Net imports.	Domestic exports.	
1861.....	$274,656,325	$204,899,616	$69,756,709	$40,348,401	$23,799,870	+$16,548,531
1862.....	178,330,200	179,644,024	+ 1,313,824	10,572,063	31,044,651	20,472,588
1863.....	225,375,280	186,003,912	39,371,368	1,421,056	55,993,562	54,572,506
1864.....	301,113,322	143,504,027	157,609,295	8,192,633	100,473,562	92,280,929
1865.....	209,656,525	136,940,248	72,716,277	6,784,970	64,618,124	57,833,154
1866.....	423,470,646	337,518,102	85,952,544	7,299,395	82,643,374	75,343,979
1867.....	381,041,764	279,786,809	101,254,955	16,178,299	54,976,196	38,797,897
1868.....	344,873,441	269,389,900	75,483,541	4,150,241	83,745,975	79,595,734
1869.....	406,555,379	275,166,697	131,388,682	5,585,462	42,915,966	37,330,504
1870.....	419,803,113	376,616,473	43,186,640	12,147,315	43,883,802	31,736,487
1871.....	505,802,414	428,398,908	77,403,506	7,231,395	84,403,359	77,171,964
1872.....	610,904,622	428,487,131	182,417,491	6,664,395	72,798,240	66,133,845
1873.....	624,689,727	505,033,439	119,656,288	10,777,909	73,905,546	63,127,637
1874.....	550,556,723	569,433,421	+ 18,876,698	21,524,187	59,699,686	38,175,499
1875.....	518,846,825	499,284,100	19,562,725	12,625,704	83,857,129	71,231,425
1876.....	445,938,766	525,582,247	+ 79,643,481	9,469,070	50,038,691	40,569,621
1877.....	438,518,130	589,670,224	+151,152,094	27,746,915	43,134,738	15,387,823
1878.....	422,895,034	680,709,268	+257,814,234	23,143,074	27,061,885	3,918,811
1879.....	433,679,124	698,340,790	+264,661,666	12,853,594	17,555,035	4,701,441
1880.....	656,262,441	823,946,353	+167,683,912	85,239,284	9,347,893	+75,891,391
1881.....	624,213,229	883,925,947	+259,712,718	105,395,594	14,226,944	+91,168,650
1882.....	707,337,049	733,239,732	+ 25,902,683	36,535,182	43,480,271	6,945,089
1883.....	703,565,144	804,223,632	+100,658,488	18,292,239	21,623,181	3,330,942
1884.....	652,148,936	724,964,852	+ 72,815,916	20,518,514	50,225,635	29,707,121
1885.....	562,020,520	726,682,946	+164,662,426	25,386,908	24,376,110	+ 1,010,798
1886.....	621,875,835	665,964,529	+ 44,088,694	18,054,363	51,924,117	33,869,754
1887*.....	379,213,477	449,744,917	+ 70,531,440	43,994,133	11,759,283	+32,234,850

*Seven months ended January 31, 1887.

NOTE.—The Canadian reports of imports into the Dominion of Canada from the United States indicate that in addition to the above "Domestic Exports" there was exported in the fiscal year 1886 merchandise of the value of $17,027,875.

IRON AND STEEL WORKS BUILT AND BUILDING IN 1886 AND 1887.

NEW BLAST FURNACES BUILDING OR CONTRACTED FOR IN MARCH, 1887, NOT INCLUDING NEW FURNACES TO TAKE THE PLACE OF OLD ONES.

States and Companies.	Location.	No. of stacks.	Size of stacks.	Fuel.	When to be completed.
New York.					
Troy Steel and Iron Co.	Troy	3	18 x 80	Anth. and coke.	April, 1887.
Pennsylvania.					
Valentine Ore Land Ass'n	Bellefonte	1	15 x 70	Coke.	July 1, 1887.
P. F. Collins & Co.	"	1	15 x 70	"	June 1, 1887.
Robt. Hare Powel's Sons & Co.	Saxton	1	17 x 70	"	May 1, 1887.
Laughlin & Co. Limited	Pittsburgh	1	20 x 80	"	May 1, 1887.
Carnegie Bros. & Co. Limited	Braddock	(G) 1	22 x 80	"	May, 1887.
Virginia.					
Low Moor Iron Co	Low Moor	1*	18 x 80	"	June 1, 1887.
Pulaski Iron Co	Pulaski	1	17 x 75	"	Sept. 1, 1887.
Alabama.					
De Bardeleben C. and I. Co.	Bessemer	2	17 x 75	"	July 1, 1887.
Pioneer Mining and Mfg. Co.	Birmingham	1	17 x 75	"	Oct. 1, 1887.
Tennessee C., I., and R. R. Co.	Ensley City	4	20 x 80	"	Oct. 1, 1887. Dec. 1, 1887.
Coalburg Coal and Coke Co.	Birmingham	1	17 x 75	"	Feb. 1, 1888.
Sloss Iron and Steel Co	"	2†	17 x 75	"	Spring, 1888.
Lady Ensley Furnace Co.	Sheffield	1	18 x 75	"	Oct. 1, 1887.
Sheffield Furnace Co.	"	1	17 x 75	"	July 1, 1887.
Ala. and Tenn. C. and I. Co.	"	3	18 x 75	"	January to July, 1888.
Woodstock Iron Co.	Anniston	2	16 x 75	"	Dec. 1, 1887.
Gadsden-Alabama Iron Co.	Gadsden	1	17 x 75	"	Oct., 1887.
Decatur Land, Improvement, and Furnace Co.	Decatur	1	12 x 60	Charcoal.	July, 1888.
W. B. Wood Furnace Co.	Florence	1†	17 x 75	Coke.	April, 1888.
Tennessee.					
Tennessee C., I., and R. R. Co.	So. Pittsburg	1	17 x 75	"	Oct., 1887.
Nashville I., S., and Char. Co.	Nashville	2	12 x 60	Charcoal.	Jan., 1888.
Kentucky.					
Ashland C. and I. Rwy. Co.	Ashland	1	15½ x 64	Coke.	June, 1887.
Ohio.					
Etna Iron Works.	Ironton	1	18 x 86	"	1887-1888.
Cleveland Rolling Mill Co.	Cleveland	1	20 x 80	"	Sept., 1887.
N. Y. and Perry C. and I. Co.	Shawnee	1	15 x 65	"	Sept., 1887.
Hecla Iron and Mining Co.	Ironton	1	10½ x 52	Charcoal.	Sept., 1887.
Wisconsin.					
Ashland Iron and Steel Co.	Ashland	1	12 x 60	"	Fall, 1887.

*An alternate stack. †Bids received but contracts not awarded in March.

For a list of projected furnaces see note on page 59.

NEW BLAST FURNACES COMPLETED SINCE JANUARY 1, 1886, NOT INCLUDING NEW FURNACES TO TAKE THE PLACE OF OLD ONES.

States and Companies.	Location.	No. of stacks.	Size of stacks.	Fuel.	When blown in.
New York.					
Chateaugay Ore and Iron Co...	Plattsburgh.	1	10 x 60	Charcoal.	Feb., 1887.
Pennsylvania.					
Carnegie Bros. & Co. Limited..	Braddock.....	(F) 1	22 x 80	Coke.	Oct. 18, 1886.
Alabama.					
Williamson Iron Co.....	Birmingham	1	13⅔ x 65	"	Oct., 1886.
Woodward Iron Co.....	Wheeling.....	1	17 x 75	"	Jan. 25, 1887.
Tennessee.					
Aetna Iron Co.....	Aetna.....	1	11 x 55	Charcoal.	Nov. 13, 1886.
Michigan.					
Charles Himrod & Co.....	Iron River...	1	11 x 56	"	Feb. 2, 1886.
Wisconsin.					
York Iron Co.....	Black River Falls.	1	11 x 55	"	July, 1886.

NEW BESSEMER AND OPEN-HEARTH STEEL WORKS BUILDING OR CONTRACTED FOR IN MARCH, 1887.

States and Companies.	Location.	Character.	Converters or furnaces.	When to be completed.
Massachusetts.			*Gross tons.*	
Tremont Nail Co.....	W. Wareham	Clapp-Griffiths..	two 3-ton.	June 1, 1887.
Pennsylvania.				
Columbia Iron and Steel Co...	Uniontown...	Bessemer.....	two 5-ton.	May, 1887.
Duquesne Steel Co.....	Pittsburgh...	"	two 6-ton.	April, 1887.
North Branch Steel Co	Danville	"	two 4-ton.	May 1, 1887.
Lickdale Iron Co.....	Lebanon	Clapp-Griffiths..	two 3-ton.	June, 1887.
Bethlehem Iron Co.....	Bethlehem...	Open-Hearth.	two 15-ton. four — ton.	Spring, 1887. .....
A. & P. Roberts & Co.....	Philadelphia	" "	two 15-ton.	Spring, 1887.
Phœnix Iron Co.....	Phœnixville	" "	two 15-ton.	Jan., 1888.
Sharon Steel Casting Co.....	Sharon.....	" " ...*	one 15-ton.	Spring, 1887.
Virginia.				
Old Dominion I. and N. Works	Richmond...	Bessemer.....	two 3-ton.	May 1, 1887.
Tennessee.				
Roane Iron Co	Chattanooga	"	one 5-ton.	May, 1887.
Ohio.				
Columbus Steel Co.....	Columbus....	Open-Hearth....	two 15-ton.	April, 1887.
Indiana.				
Chicago Steel Mfg. Co.....	Hammond...	Bessemer.....	two 4½-ton.	May, 1887.
Indianapolis Rolling Mill Co..	Indianapolis	Open-Hearth....	two 15-ton.	March, 1887.
Illinois.				
Belleville Nail Co..... ...	Belleville.....	Bessemer.....	two 4-ton.	May 1, 1887.
Centralia I. and N. Works.....	Centralia.....	"	one 2-ton.	May 15, 1887.
Springfield Iron Co.....	Springfield...	"	two 4-ton.	June 1, 1887.

*To be followed by another furnace of same size.

BESSEMER AND OPEN-HEARTH STEEL WORKS COMPLETED SINCE JANUARY 1, 1886, NOT INCLUDING IMPROVEMENTS TO OLD WORKS.

States and Companies.	Location.	Character.	Converters or furnaces.	When completed.
New York.			*Gross tons.*	
Witherbees, Sherman & Co.	Port Henry	Clapp-Griffiths	one 3-ton.	Feb. 16, 1886.
Pennsylvania.				
Pottstown Iron Co.	Pottstown	Bessemer	two 10-ton.	July 1, 1886.
		Open-Hearth	one 10-ton.	
Glasgow Iron Co.	Glasgow	Clapp-Griffiths	two 3-ton.	May 11, 1886.
McCormick & Co.	Harrisburg	" "	one 3-ton.	*April 27, 1886.
Pottsville Iron and Steel Co.	Pottsville	" "	two 3-ton.	Feb. 2, 1886.
Spang Steel and Iron Co. Ltd.	Pittsburgh	" "	two 3-ton.	March, 1887.
Apollo Iron and Steel Co.	Apollo	Open-Hearth	two 15-ton.	June 15, 1886.
Smith Bros. & Co.	Pittsburgh	" "	one 15-ton.	Sept. 20, 1886.
National Tube Works Co.	McKeesport	" " †	one 10-ton.	Nov. 1, 1886.
Everson, Hammond & Co. Ltd.	Pittsburgh	" " ‡	one 10-ton.	Jan., 1886.
Carnegie, Phipps & Co.	"	" "	four 30-ton.	Oct. 20, 1886.
Anderson, DuPuy & Co.	"	" "	one 20-ton.	June, 1886.
Jones & Laughlins Limited.	"	Bessemer	two 7-ton.	Aug. 19, 1886.
Shoenberger & Co.	"	"	one 7-ton.	Mar. 15, 1886.
Graff, Bennett & Co.	"	Open-Hearth	two 15-ton.	Fall, 1886.
West Virginia.				
Wheeling Steel Works.	Wheeling	Bessemer	two 5-ton.	Aug. 12, 1886.
Tennessee.				
South Tredegar Iron Co.	Chattanooga	"	one 2-ton.	April 19, 1886.
Ohio.				
Laughlin and Junction S. Co.	Mingo Junc.	"	two 5-ton.	Feb. 8, 1886.
Jefferson Iron Works.	Steubenville	"	two 3-ton.	Jan., 1887.
Ohio Iron Co.	Zanesville	Open-Hearth	one 10-ton.	Nov., 1886.
Illinois.				
Western Nail Co.	Belleville	Clapp-Griffiths	two 3-ton.	Jan. 21, 1886.

*Experimental blow. †Capacity of furnace to be increased to 15 tons. ‡Since increased to 20 tons.

NOTE.—We do not in these tables enumerate the furnaces recently built or now being built to take the place of old stacks, but only new enterprises and new stacks added to old plants. Among *projected* enterprises we enumerate the Rome Land, Iron, and Improvement Company, which intends to build an 11 x 50 charcoal furnace at Rome, Georgia; the Tuskaloosa Coal, Iron, and Land Company, which intends to build a 17 x 75 coke furnace at Tuskaloosa, Alabama; the Calera Furnace and Charcoal Company, which is said to have capital subscribed for a charcoal furnace at Calera, Alabama; the Selma Land, Improvement, and Furnace Company, which expects to build a furnace at Selma, Alabama; a projected furnace at Montgomery, Alabama, in which the Moses Brothers are interested; six projected furnaces at Florence, Alabama, including a 17 x 75 coke stack by the Florence Coal, Coke, and Iron Company; another charcoal and three coke furnaces projected at Decatur, Alabama; and two more large furnaces at Bessemer, Alabama.

The Pennsylvania Steel Company has purchased a large tract of land at Sparrow's Point, on the Patapsco River, a few miles below Baltimore, in Maryland, on which it will erect two large blast furnaces, to be finished in 1888.

The Champion Steel and Iron Works, at Springfield, Ohio, propose to erect a small open-hearth steel plant, to consist of one 6-ton furnace. The Ætna Iron and Steel Works, at Crown Point, Indiana, do not expect to do any work on their small projected Bessemer plant this season. The Norton Iron Works, at Ashland, Kentucky, will probably decide in April whether or not to erect a Bessemer plant.

MISCELLANEOUS STATISTICS.

THE ANNUAL PRODUCTION OF PIG IRON IN THE UNITED STATES SINCE 1854.

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

YEARS.	Net tons of 2,000 pounds.			
	Anthracite and mixed anthracite and coke.	Charcoal.	Coke and raw bituminous.	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
1877	934,797	317,843	1,061,945	2,314,585
1878	1,092,870	293,399	1,191,092	2,577,361
1879	1,273,024	358,873	1,438,978	3,070,875
1880	1,807,651	537,558	1,950,205	4,295,414
1881	1,734,462	638,838	2,268,264	4,641,564
1882	2,042,138	697,906	2,438,078	5,178,122
1883	1,885,596	571,726	2,689,650	5,146,972
1884	1,586,453	458,418	2,544,742	4,589,613
1885	1,454,390	399,844	2,675,635	4,529,869
1886	2,099,597	459,557	3,806,174	6,365,328

IN 1854, when the above table begins, this country made more pig iron with charcoal than with anthracite coal, and the manufacture of pig iron with bituminous coal had but just commenced. The very next year charcoal was passed by anthracite, and in 1869 it was passed by bituminous coal. Anthracite continued, however, to be the leading fuel until 1875, when it too was passed by bituminous coal, which has since continued to be the favorite blast-furnace fuel, and is doubtless destined to so remain.

PRODUCTION OF ALL KINDS OF PIG IRON IN 1882, 1883, 1884, 1885, AND 1886, BY STATES.

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

STATES.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Maine	4,100	4,400	.....	440	5,060
Vermont	1,210	.....	.....	.....	.....
Massachusetts	10,335	10,760	4,902	869	8,124
Connecticut	24,342	19,976	14,174	17,500	19,390
New York	416,156	331,964	239,486	160,157	233,618
New Jersey	176,805	138,773	82,935	73,667	157,886
Pennsylvania	2,449,256	2,638,891	2,385,402	2,445,496	3,293,289
Maryland	54,524	49,153	27,342	17,299	30,502
Virginia	87,731	152,907	157,483	163,782	156,250
North Carolina	1,150	.....	435	1,790	2,200
Georgia	42,440	45,364	42,655	32,924	46,490
Alabama	112,765	172,465	189,664	227,438	283,859
Texas	1,321	2,381	5,140	1,843	3,250
West Virginia	73,220	88,398	55,231	69,007	98,618
Kentucky	66,522	54,629	45,052	37,553	54,844
Tennessee	137,602	133,963	134,597	161,199	199,166
Ohio	698,900	679,643	567,113	553,963	908,094
Indiana	10,000	9,950	2,568	6,634	16,660
Illinois	360,407	237,657	327,568	327,977	501,795
Michigan	210,195	173,185	172,834	143,121	190,734
Wisconsin	85,859	51,893	52,815	24,632	65,933
Missouri	113,644	103,296	60,043	51,408	74,523
Minnesota	8,126	8,000	.....	.....	.....
Utah Territory	57	.....	.....	.....	.....
Colorado	23,718	24,680	15,837	5,481	10,451
Oregon	6,750	7,000	3,640	3,832	.....
California	987	5,327	2,157	.....	1,750
Washington Territory	.....	2,317	540	1,857	2,842
Total	5,178,122	5,146,972	4,589,613	4,529,869	6,365,328

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

STATES.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
New York	385,440	306,284	215,998	145,475	219,238
New Jersey	176,805	138,773	82,935	73,667	157,886
Pennsylvania	1,453,646	1,416,468	1,278,236	1,235,248	1,710,968
Maryland	26,247	24,071	9,284	.....	11,505
Total	2,042,138	1,885,596	1,586,453	1,454,390	2,099,597

PRODUCTION OF PIG IRON.—(CONTINUED.)

CHARCOAL PIG IRON.

STATES.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Maine	4,100	4,400	.....	440	5,060
Vermont	1,210	.....	.....	.....	.....
Massachusetts	10,335	10,760	4,902	869	8,124
Connecticut	24,342	19,976	14,174	17,500	19,390
New York	30,716	25,680	23,488	14,682	14,380
Pennsylvania	49,975	38,315	23,155	12,148	16,727
Maryland	28,277	23,807	15,123	10,432	7,872
Virginia	26,133	16,879	14,829	12,648	6,069
North Carolina	1,150	.....	435	1,790	2,200
Georgia	15,565	13,045	9,615	5,797	459
Alabama	55,541	57,385	59,448	77,573	82,110
Texas	1,321	2,381	5,140	1,843	3,250
Kentucky	17,165	13,981	7,882	4,707	6,363
Tennessee	37,611	35,299	18,806	31,173	27,402
Ohio	58,654	40,528	24,880	18,018	16,161
Michigan	210,195	173,185	172,834	143,121	190,734
Wisconsin	55,369	39,349	25,812	19,629	28,487
Missouri	54,327	34,112	31,558	21,785	20,177
Minnesota	8,126	8,000	.....	.....	.....
Utah Territory	57	.....	.....	.....	.....
Oregon	6,750	7,000	3,640	3,832	.....
California	987	5,327	2,157	.....	1,750
Washington Territory	.....	2,317	540	1,857	2,842
Total	697,906	571,726	458,418	399,844	459,557

BITUMINOUS COAL AND COKE PIG IRON.

STATES.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Pennsylvania	945,635	1,184,108	1,084,011	1,198,100	1,565,594
Maryland	.....	1,275	2,935	6,867	11,125
Virginia	61,598	136,028	142,654	151,134	150,181
Georgia	26,875	32,319	33,040	27,127	46,031
Alabama	57,224	115,080	130,216	149,865	201,749
West Virginia	73,220	88,398	55,231	69,007	98,618
Kentucky	49,357	40,648	37,170	32,846	48,481
Tennessee	99,991	98,664	115,791	130,026	171,764
Ohio	640,246	639,115	542,233	535,945	891,933
Indiana	10,000	9,950	2,568	6,634	16,660
Illinois	360,407	237,657	327,568	327,977	501,795
Wisconsin	30,490	12,544	27,003	5,003	37,446
Missouri	59,317	69,184	28,485	29,623	54,346
Colorado	23,718	24,680	15,837	5,481	10,451
Total	2,438,078	2,689,650	2,544,742	2,675,635	3,806,174

STOCKS OF ALL KINDS OF PIG IRON UNSOLD AT THE CLOSE OF 1882, 1883, 1884, 1885, AND 1886.

These statistics, collected directly from the manufacturers by The American Iron and Steel Association, represent only stocks in the hands of makers or their agents. They do not include stocks in the hands of consumers, brokers, creditors, or speculators, nor foreign pig iron held in bond.

States and Districts.		Net tons of 2,000 pounds.				
		1882.	1883.	1884.	1885.	1886.
New England		9,866	12,437	11,433	8,997	9,218
New York		37,788	65,901	69,347	32,796	28,202
New Jersey		12,178	25,615	11,809	4,126	1,632
Lehigh Valley	Pennsylvania.	24,969	50,600	61,365	16,109	2,193
Schuylkill Valley	Pennsylvania.	24,029	25,448	29,696	15,617	17,816
Upper Susquehanna	Pennsylvania.	11,173	8,839	12,216	4,933	2,383
Lower Susquehanna	Pennsylvania.	7,935	14,324	10,643	10,136	4,409
Shenango Valley	Pennsylvania.	22,045	27,195	34,246	17,347	13,371
Allegheny County	Pennsylvania.	17,272	27,240	15,780	16,335	.....
Miscellaneous bituminous	Pennsylvania.	33,194	30,822	43,606	23,280	18,125
Charcoal	Pennsylvania.	10,241	11,336	14,297	13,452	12,905
Total for Pennsylvania		150,858	195,804	221,849	117,209	71,202
Maryland		7,280	10,899	7,637	10,145	5,455
Virginia		16,116	21,172	28,644	22,501	7,620
Georgia, Texas, and North Carolina		8,948	9,429	12,582	8,810	5,726
Alabama		20,068	9,531	21,436	17,693	14,025
West Virginia		4,268	1,900	1,168	4,300	4,680
Kentucky		11,186	8,216	9,724	5,819	4,218
Tennessee		13,392	30,047	29,240	18,667	14,488
Hanging Rock	Ohio.	40,094	35,364	24,461	19,601	14,661
Mahoning Valley	Ohio.	24,672	19,307	16,977	8,938	1,463
Hocking V. and miscellaneous	Ohio.	22,487	18,465	11,600	11,407	7,945
Total for Ohio	Ohio.	87,253	73,136	53,038	39,946	24,069
Michigan and Indiana		29,573	36,405	60,715	68,479	41,953
Illinois		896	.....	4,200	3,834	300
Wisconsin and Minnesota		5,801	6,340	7,366	9,425	6,002
Missouri		14,223	21,641	37,588	38,058	7,682
Pacific States		.....	5,327	5,224	5,707	6,232
Grand total		429,694	533,800	593,000	416,512	252,704

STOCKS ACCORDING TO FUEL USED.

Bituminous	157,196	171,802	191,845	115,982	70,634
Anthracite and anth. and coke mixed	107,259	178,020	178,993	68,178	50,503
Charcoal	165,239	183,978	222,162	232,352	131,567
Total	429,694	533,800	593,000	416,512	252,704

THE IRON AND STEEL PRODUCTION OF ALLEGHENY COUNTY, PENNSYLVANIA.

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

Allegheny county, in Pennsylvania, which includes the city of Pittsburgh within its limits, is well known as the leading iron and steel producing county in the United States. It has long occupied this position, but additional prominence has been given to it in very recent years by the substitution of natural gas for coal in all its rolling mills and steel works. It is the centre of activity in this country in the use of this new and superior fuel. The following table gives the production of iron and steel in this county since 1874, in net tons.

ROLLING MILLS.

YEARS.	Number of iron rolling mills.	Product of iron rails, bar, angle, bolt, rod, and hoop. Tons.	Product of iron sheet and plate, except nail plate. Tons.	Product of iron nails. Kegs of 100 pounds.	Total rolled iron, including nails. Net tons.
1874.....	31	194,114	52,361	562,995	274,625
1875.....	31	171,178	45,773	442,359	239,069
1876.....	31	189,511	31,488	538,874	247,943
1877.....	31	208,342	30,254	597,806	268,486
1878.....	31	226,687	33,445	444,013	282,333
1879.....	32	286,882	52,265	294,942	353,894
1880.....	30	287,253	80,899	419,098	389,107
1881.....	30	405,119	75,767	485,916	505,182
1882.....	31	336,628	71,038	459,228	430,627
1883.....	32	367,106	73,850	627,896	472,351
1884.....	31	318,813	68,669	459,512	410,457
1885.....	31	315,810	88,178	176,258	412,801
1886.....	30	414,116	125,633	73,691	543,434

BLAST FURNACES AND STEEL WORKS.

YEARS.	Number of blast furnaces.	Make of pig iron. Net tons.	Number of steel works.*	Net tons crucible steel ingots.	Net tons all other steel, including Bessemer ingots.	Total make of steel. Net tons.
1874.....	11	143,660	11	17,915	6,000	23,915
1875.....	11	131,856	14	22,942	15,498	38,440
1876.....	11	128,555	14	25,009	54,467	79,476
1877.....	12	141,749	14	24,747	82,401	107,148
1878.....	12	217,299	14	27,866	106,948	134,814
1879.....	13	267,315	18	40,142	130,781	170,923
1880.....	15	300,497	17	52,136	169,819	221,955
1881.....	15	385,453	17	61,256	247,345	308,601
1882.....	16	358,840	18	59,596	258,501	318,097
1883.....	16	592,475	20	59,128	346,402	405,530
1884.....	17	487,055	22	38,885	289,376	328,261
1885.....	17	585,696	24	42,139	364,905	407,044
1886.....	18	737,124	26	58,208	561,550	619,758

* Bessemer steel works included; a few of these works are also iron rolling mills.

THE MANUFACTURE OF ROLLED IRON IN PENNSYLVANIA IN 1882, 1883, 1884, 1885, AND 1886, BY DISTRICTS.

In the following table the Philadelphia district covers Philadelphia county and the Pencoyd Iron Works; Eastern Pennsylvania comprises the eastern counties outside of the Philadelphia district as far west as the limits of Chester, Berks, Schuylkill, and Carbon counties; Central Pennsylvania comprises the counties west of those just named, extending to the western limits of Bedford, Blair, Centre, and Clinton counties; Western Pennsylvania comprises all counties west of those just named, except Allegheny.

BAR, ROD, BOLT, HOOP, SKELP, AND SHAPED IRON, AND ROLLED AXLES.

Districts.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Philadelphia	75,180	70,819	62,404	63,754	70,654
Eastern Pennsylvania	128,221	113,539	85,847	69,963	104,783
Central Pennsylvania	100,800	89,496	72,383	88,730	118,986
Allegheny county	332,309	366,507	316,091	314,687	412,501
Western Pennsylvania	48,539	34,865	29,000	27,196	40,676
Total	685,049	675,226	565,725	564,350	747,600

PLATE AND SHEET IRON, EXCEPT NAIL PLATE.

Philadelphia	9,428	9,139	8,173	7,168	9,569
Eastern Pennsylvania	132,906	116,067	93,991	104,081	124,878
Central Pennsylvania	27,536	33,070	31,343	34,779	27,996
Allegheny county	71,038	73,850	68,669	88,178	125,633
Western Pennsylvania	17,695	22,320	20,145	18,505	17,445
Total	258,603	254,446	222,321	252,711	305,521

IRON CUT NAILS AND SPIKES. (One net ton equals 20 kegs.)

Philadelphia, Eastern Pennsylvania	26,368	25,596	25,367	34,092	28,772
Central Pennsylvania	37,072	50,606	54,200	69,762	67,365
Allegheny county	22,961	31,395	22,975	8,813	3,685
Western Pennsylvania	11,069	13,931	11,542	5,298	13,748
Total	97,470	121,528	114,084	117,965	113,570

IRON RAILS.

Philadelphia	.....	.....	.....	.....	.....
Eastern Pennsylvania	26,756	13,964	3,597	220	334
Central Pennsylvania	44,269	14,475	4,302	4,488	7,646
Allegheny county	4,319	599	2,722	1,123	1,615
Western Pennsylvania	7,420	925	295	8	.....
Total	82,764	29,963	10,916	5,839	9,595

TOTAL ROLLED IRON.

Philadelphia (except nails)	84,608	79,958	70,577	70,922	80,223
Eastern Pennsylvania	314,251	269,166	208,802	208,376	258,767
Central Pennsylvania	209,677	187,647	162,228	197,759	221,993
Allegheny county	430,627	472,351	410,457	412,801	543,434
Western Pennsylvania	84,723	72,041	60,982	51,007	71,869
Total	1,123,886	1,081,163	913,046	940,865	1,176,286

THE MANUFACTURE OF ROLLED IRON IN OHIO IN 1882, 1883, 1884, 1885, AND 1886, BY DISTRICTS.

In the following table the Lake counties are those bordering on Lake Erie; the Mahoning Valley comprises the counties in the northeastern part of Ohio; the Interior counties cover the counties south and west of the two first-named districts, except the counties along the Ohio river, which are classed in a district by themselves.

BAR, ROD, BOLT, HOOP, SKELP, AND SHAPED IRON, AND ROLLED AXLES.

DISTRICTS.	Net tons of 2,000 pounds.				
	1882.	1883.	1884.	1885.	1886.
Lake counties	40,359	47,912	31,435	38,582	42,208
Mahoning Valley	128,466	140,875	113,188	118,670	169,075
Interior counties	37,182	28,905	26,891	33,805	42,906
Ohio River counties	47,926	45,555	27,297	19,548	23,236
Total	253,933	263,247	198,811	210,605	277,425

PLATE AND SHEET IRON, EXCEPT NAIL PLATE.

Lake counties	15,021	15,956	14,421	12,169	9,969
Mahoning Valley	10,813	7,238	7,140	6,750	11,439
Interior counties	.....	140	800	2,100	3,000
Ohio River counties	23,348	26,653	17,869	20,371	19,195
Total	49,182	49,987	40,230	41,390	43,603

IRON CUT NAILS AND SPIKES. (One net ton equals 20 kegs.)

Lake counties	.....	.....	.....	.....	.....
Mahoning Valley	8,130	8,977	3,738	3,291	9,933
Interior counties	.....	.....	.....	.....	.....
Ohio River counties	31,713	53,508	61,798	13,305	23,708
Total	39,843	62,485	65,536	16,596	33,641

IRON RAILS.

Lake counties	6,368	850	.....	.....	.....
Mahoning Valley	.....	.....	.....	.....	.....
Interior counties	11,431	494	5,125	427	312
Ohio River counties	851	899	866	245	145
Total	18,650	2,243	5,991	672	457

TOTAL ROLLED IRON.

Lake counties	61,748	64,718	45,856	50,751	52,177
Mahoning Valley	147,409	157,090	124,066	128,711	190,447
Interior counties	48,613	29,539	32,816	36,332	46,218
Ohio River counties	103,838	126,615	107,830	53,469	66,284
Total	361,608	377,962	310,568	269,263	355,126

TOTAL PRODUCTION OF IRON AND STEEL IN THE UNITED STATES FROM 1875 TO 1886.

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

PRODUCTS.	Net tons of 2,000 pounds.											
	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Pig iron	2,266,581	2,093,236	2,314,585	2,577,361	3,070,875	4,295,414	4,641,564	5,178,122	5,146,972	4,589,613	4,529,869	6,365,328
Spiegeleisen, included above	7,832	6,616	8,845	10,674	13,931	19,603	21,086	21,963	24,574	33,893	34,671	47,982
Rolled iron, including iron nails and iron rails	1,599,516	1,509,269	1,476,759	1,555,576	2,047,484	2,332,668	2,643,927	2,493,831	2,348,874	1,957,307	1,804,526	2,283,622
Rolled iron, including iron nails and excluding rails	1,097,867	1,042,101	1,144,219	1,232,686	1,627,324	1,838,906	2,155,346	2,265,957	2,283,920	1,931,747	1,789,711	2,259,943
Kegs of cut nails and spikes	4,726,881	4,157,814	4,828,918	4,396,130	5,011,021	5,370,512	5,794,206	6,147,097	7,762,737	7,581,379	6,696,815	8,160,973
Bessemer steel rails	290,863	412,461	432,169	550,398	683,964	954,460	1,330,302	1,438,155	1,286,554	1,116,621	1,074,607	1,763,667
Open-hearth steel rails	.....	.....	.....	9,397	9,149	13,615	25,217	22,765	9,186	2,670	4,793	5,255
Iron rails	501,649	467,168	332,540	322,890	420,160	493,762	488,581	227,874	64,954	25,560	14,815	23,679
Rails of all kinds	792,512	879,629	764,709	882,685	1,113,273	1,461,837	1,844,100	1,688,794	1,360,694	1,144,851	1,094,215	1,792,601
Crucible steel ingots	39,401	39,382	40,430	42,906	56,780	72,424	89,762	85,089	80,455	59,662	64,511	80,609
Open-hearth steel ingots	9,050	21,490	25,031	36,126	56,290	112,953	146,946	160,542	133,679	131,617	149,381	245,250
Bessemer steel ingots	375,517	525,996	560,587	732,226	928,972	1,203,173	1,539,157	1,696,450	1,654,627	1,540,595	1,701,762	2,541,493
Miscellaneous steel	12,607	10,306	11,924	8,556	5,464	8,465	3,047	3,014	5,598	5,111	1,696	2,651
Steel of all kinds	436,575	597,174	637,972	819,814	1,047,506	1,397,015	1,778,912	1,945,095	1,874,359	1,736,985	1,917,350	2,870,003
Blooms from ore and pig iron	49,243	44,628	47,300	50,045	62,353	74,589	84,606	91,293	74,758	57,005	41,700	41,909

AVERAGE PRICES 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 Mr. William G. Neilson, 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. After 1849 the standard of quotations was No. 1 anthracite foundry pig iron.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	$	$	$	$	$	$	$	$	$	$	$	$	$
1799...	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼
1800...	36½	36½	36½	36½	36½	36½	36¾	36½	36½	36½	36	34½	35⅝
1801...	33⅝	33½	33½	33½	33½	33¼	31	32½	32½	32½	32½	32½	32⅝
1802...	32½	32½	32½	32½	32	31½	30½	29½	29	29	29	28½	30⅝
1803...	28¼	28	28¼	28¾	29	29	29¼	29¾	30	30	30	30	29⅛
1804...	30	30	30	30	30	30	30	30	30	29½	29	29	29¾
1805...	29	29	29	29	29	29½	31	32	32	32½	33	33½	30⅛
1806...	35	35½	35½	35½	35½	35½	35½	35½	35½	36	36½	37	35¾
1807...	37	37	37	37½	38	40	40	40	40	40	40	40	38¾
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	38½	41½	43½	45	45	45	45	45	46	47½	47½	44
1812...	47½	47½	47½	47½	47½	47½	47½	47½	47½	47½	47½	47½	47½
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	53⅜
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	42⅜
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	42¼	43½	44	47½	50	50	50	50	49	47	45	46¾
1826...	45	45	45	45¾	46¾	47½	47½	47½	47½	47½	47½	47½	46¾
1827...	47½	47½	47½	46¾	36½	35¾	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	38⅛
1834...	35	31	30	30	30	30	30	30	30	30	29½	28½	30⅛
1835...	29¼	29¼	29¼	30¼	30¼	30	30	30	30	30½	30¾	31¾	30⅛
1836...	32	32½	35	39½	41	41¼	41¼	42	45	47	49	50¼	41⅛
1837...	51½	52½	52¼	51	49	47	42	39	35¼	34¾	35½	36	41⅛
1838...	35	35¼	35¼	34	31	31¼	32	32	31½	31½	31½	31½	32¼
1839...	31¾	32	33	34	34	34	33½	33½	33¼	32¾	32	32	30
1840...	32	32	31½	30¼	30½	30¼	30	29½	29	29	29	29	30⅛
1841...	29	29	29	29	29	28½	28	28	28	28	28¼	28¾	28½
1842...	29¼	29¼	29	28½	28¼	28½	28	27½	27¼	27¼	27½	27¾	28
1843...	28¾	29	29	28	28	26	25	25½	25½	25½	25½	26	26⅜
1844...	27	27	26½	26¼	28	29½	29½	29½	29¾	30	29¾	30	28⅛
1845...	30	29¾	32	35	36½	35	33	32	30½	30½	31	32½	32⅛
1846...	33	33	32½	32½	32½	31¼	31¾	30	29½	30	29½	30½	31⅛
1847...	30½	30½	30	30½	30	29¾	29½	30½	33	33¼	35½	34¾	31⅛
1848...	31½	32	30½	29½	29½	29	28	27	26	26	25½	25½	28½
1849...	25½	25½	25½	25½	25	24½	23¼	23½	23¾	24	24¼	24¼	24½

AVERAGE PRICES PER GROSS TON OF No. 1 ANTHRACITE FOUNDRY PIG IRON AT PHILADELPHIA SINCE 1842.

Compiled by The American Iron and Steel Association.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.	YEARS.
	$	$	$	$	$	$	$	$	$	$	$	$	$	
1842..	.....	.....	.....	.....	27	27	26⅓	24½	25⅛	25	25	25	.....	..1842
1844..	24	24	24	24	24	26½	26½	26⅓	27¼	28	27½	26¾	25¾	..1844
1845..	26¾	26½	27¾	33⅛	34⅛	33	31	28⅓	27	26⅞	28⅓	28	29¼	..1845
1846..	28	28	28¼	28	28½	28	29	26¼	27¼	27	28½	28½	27¾	..1846
1847..	28½	28⅛	28⅝	29	29	28⅝	28	28½	30½	33¾	35¾	33¾	30¼	..1847
1848..	31	28½	27¼	26⅜	26½	26½	25⅜	25⅜	25½	25	25	24⅞	26½	..1848
1849..	25	24½	24⅜	24	23½	23	22¾	22½	21⅜	21½	20	21	22¾	..1849
1850..	21	21	20⅜	20⅞	20⅞	20½	20	20⅜	21	21	21	21¾	20⅞	..1850
1851..	21½	22	22	22	21½	21½	21	21	21	21	21	21	21⅜	..1851
1852..	21¼	21¼	20⅜	20⅜	20¼	20½	20¼	21¼	23¼	26½	27¾	28¼	22⅝	..1852
1853..	32¾	36⅞	35⅝	35⅞	35⅞	36	36	36	36¾	37½	37⅝	36¾	36¼	..1853
1854..	37	36¼	37	38	38	38	38	38	37¾	36½	35½	32⅞	36⅞	..1854
1855..	31⅛	29½	27½	26¾	26½	26⅛	26⅛	26½	28	28⅝	28½	27¾	27¾	..1855
1856..	27½	27½	27⅝	28	28	27⅝	27	27	27	26⅞	26	26	27⅛	..1856
1857..	26¼	26½	26⅝	27¾	27⅞	27¾	27¼	26¾	26⅜	25¾	23½	23¾	26⅝	..1857
1858..	23½	22½	22½	22½	22½	22⅛	21⅜	21½	22	21½	21¾	22½	22¾	..1858
1859..	22¾	23⅝	24½	23⅞	23½	23¼	23	23⅛	22⅞	23¼	23¼	23¼	23⅜	..1859
1860..	23	23	23⅜	22⅜	22¾	22¾	22¾	22½	22¼	22⅜	22¾	22½	22¾	..1860
1861..	22⅛	21¾	21¾	21⅜	21⅛	20½	19⅞	18¾	18¾	18⅝	18⅜	19⅝	20¼	..1861
1862..	20	20¾	20¾	21½	21½	22¾	24	24⅜	24½	25¼	30½	31⅛	23⅞	..1862
1863..	32	33¼	35½	36	34¾	33½	32¾	31¾	33	35¾	41¾	43½	35¼	..1863
1864..	43⅛	48⅝	50⅛	54½	57¼	57⅝	69⅛	*73⅝	72¼	63¾	61½	59⅝	‡59¼	..1864
1865..	58¼	53⅛	50⅜	45½	39⅛	35	35⅝	40⅛	44⅛	49⅜	51	50⅜	46⅛	..1865
1866..	50⅜	49	46½	41¾	41⅜	43⅞	46½	47¼	48⅛	48¾	49½	49⅝	46⅞	..1866
1867..	48¾	46½	44¾	41	42¾	43	43½	44	44½	44½	43¾	42¼	44⅛	..1867
1868..	38⅜	36¾	37⅜	38½	37	37	38⅛	39½	40⅜	41⅜	42⅞	43¼	39¼	..1868
1869..	42	40¼	41½	40	39⅛	40⅞	41⅝	41⅜	40¾	40½	39¾	39½	40⅝	..1869
1870..	36¼	34½	34½	33¼	33¼	32½	32¾	33½	33¼	32¾	31½	31¼	33¼	..1870
1871..	30½	30⅞	34¼	35⅜	35½	35	35¾	36	36½	36⅜	37¼	37¼	35⅛	..1871
1872..	37	40¾	47	49½	49½	53¾	51½	52¾	53⅞	53½	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..	25⅜	26½	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..	20¾	20	20	19½	19	18¾	18¼	18	18¼	18½	18	18	18⅞	..1877
1878..	18½	18½	18½	18½	18	17¼	17¼	17½	17½	17	†16½	17	‡17⅝	..1878
1879..	17¼	17½	17⅜	18	18½	18¾	19¼	20¾	24¼	30	28	30½	21½	..1879
1880..	40	41	37½	31	25	23	23½	25	23¼	23	24½	25	28½	..1880
1881..	25	25½	26	25	25	24	24½	24½	25¼	25½	25¾	26	25¼	..1881
1882..	26	26	25¾	25½	25½	25½	25½	25½	26	26¼	26	25¾	25¾	..1882
1883..	25	24½	24	23½	22	21	21⅜	22	22	21⅜	21	21	22⅜	..1883
1884..	20½	20½	20½	20	20	20	20	19⅜	19⅜	19½	19¼	18½	19⅞	..1884
1885..	18	18	18	18	17⅞	17¾	17¾	17¾	18	18¼	18¼	18¼	18	..1885
1886..	18½	18½	18¾	18½	18½	18¾	18¼	18¼	18½	19	19½	20	18¾	..1886
1887..	21½	21½	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..1887

* Highest average for month, $73⅝—August, 1864. † Lowest average for month, $16½—November, 1878. ‡ Highest average for year, $59¼—1864. ⁋ Lowest, $17⅝—1878.

AVERAGE WHOLESALE STORE PRICES OF BEST REFINED ROLLED BAR IRON AT PHILADELPHIA SINCE 1844.

Compiled by The American Iron and Steel Association. Per ton of 2,240 lbs.

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	95 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	95 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...	48 72	47 60	47 04	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	45 55
1878...	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	42 56	42 56	42 56	44 24
1879...	40 32	42 56	44 80	44 80	44 80	44 80	47 04	49 28	57 12	67 20	67 20	72 24	51 85
1880...	80 64	85 12	82 32	71 68	56 00	51 07	50 02	53 76	54 88	52 64	52 64	53 76	60 38
1881...	56 00	56 00	56 00	56 00	53 76	53 76	54 88	57 12	60 48	62 72	64 96	64 96	58 05
1882...	64 96	67 20	67 20	62 72	58 24	60 48	60 48	60 48	60 48	60 48	58 24	56 00	61 41
1883...	53 76	52 64	51 52	50 40	50 40	50 40	50 40	49 28	49 28	49 28	49 28	47 04	50 30
1884...	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	42 56	42 56	42 56	42 56	44 05
1885...	40 32	40 32	40 32	40 32	40 30	40 32	40 32	40 32	40 32	40 32	40 32	40 32	40 32
1886...	41 44	42 56	42 56	42 56	42 56	42 56	42 56	42 56	43 68	44 80	44 80	44 80	43 12
1887...	48 16	50 40	51 52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

The highest price in any month in the above table was reached in August, 1864, $170; the lowest price in any month was in January, 1879, and throughout 1885, $40.32.

AVERAGE PRICES OF STANDARD SECTIONS OF IRON RAILS AT MILLS IN EASTERN PENNSYLVANIA FROM 1847 TO 1882.

PER TON OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.	Average price of gold.
	$	$	$	$	$	$	$	$	$	$	$	$	$	
1847...	.....	71⅜	70⅛	70	70	70	69½	69½	67½	67	67½	67½	.....	100
1848...	63	63	63	63	63	63	63	61⅞	61⅛	61	61	61	62¼	100
1849...	61	57½	53¾	53⅓	54¼	53½	53½	53¼	52	51½	51½	51½	55⅞	100
1850...	47	47½	48	49	49	50	46	46¾	47½	48	48	48	47¾	100
1851...	43	45	47½	45	45	48	46	45½	45	45	46	46¼	45⅝	100
1852...	46½	46½	46½	46½	46½	46½	46½	46½	47¾	49½	51	61	48⅜	100
1853...	74⅛	77½	77½	77½	77½	77½	77½	77½	77½	77½	77½	77½	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	62⅞	100
1856...	62½	62½	63¾	65	65	65	65	65	65	65	65	64	64⅜	100
1857...	65½	65½	64½	65¾	67	67	67	67	67	67	58½	50	64¼	100
1858...	50	50	50	50	50	50	50	50	50	50	50	50	50	100
1859...	49¾	49¾	49¼	50⅜	50¼	50¼	49¾	48¾	48¾	48¾	48¾	48¾	49⅜	100
1860...	48¾	48¾	48¾	48¾	48¾	48¾	48¾	46	47	47½	47½	46¼	48	100
1861...	44	44	44	44	44	44	44	43⅛	43	41⅜	36½	36¼	42⅜	100
1862...	36½	36½	41½	41½	41½	41½	41½	41⅝	43	43¾	46	46	41¾	113
1863...	72½	69¾	72¼	73½	73½	78¾	81½	73⅞	72½	79½	87½	87½	76⅞	145
1864...	94	101¼	105	111	120	127½	141½	152½	153¾	140	133¾	132	126	202
1865...	125⅝	121¼	116¼	108½	90¼	84¼	82½	86¼	90	92½	95	91	98⅝	157
1866...	90	90	87¾	84¾	84	85¾	86⅜	87	87⅝	87⅞	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	78⅞	140
1869...	76¾	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	69½	71	71	71	71	71	71	71	71	70⅜	112
1872...	71⅜	75⅝	81⅛	83⅞	90½	90	89	87¾	88¾	88¾	88¾	85½	85⅛	112
1873...	83⅛	83	83	82	80	78	76	75	75	70	68	66	76⅜	113
1874...	66	64	62	60	60	60	60	58	58	55	52	50	58¾	112
1875...	50	50	50	49	49	49	48½	47	46½	46	45½	43¾	47¾	114
1876...	43½	43	42½	42	42	41	41	41	40	40	39¼	39	41¼	110
1877...	38	38	38	37½	37	34½	34½	34	33	32½	33	33	35¼	105
1878...	33½	33½	33½	33½	33½	33½	34	34	34	34	34	34	33¾	102
1879...	34	34½	35	35½	37½	38½	40	41	44	48	53	54	41¼	100
1880...	65	68	66	60	50	46¼	45	46	46	46	46½	45¼	49¼	100
1881...	46½	47½	47	47	46½	46½	46¾	47	47¾	47½	47¾	48	47⅛	100
1882...	48½	48½	47½	47	44¾	44¾	45	45	44	44	44	44	45½	100

Since the beginning of 1883 the manufacture of iron rails in the United States has been almost entirely superseded by the manufacture of steel rails. Such iron rails as have since been made in this country have been chiefly street rails and light rails for mines and tramways, the prices of which, if added to the above table, would be misleading. During the years from 1883 to 1887 there were no market quotations for standard sections of iron rails, there being virtually no demand for them.

AVERAGE PRICES IN DOLLARS OF STEEL RAILS AT WORKS IN PENNSYLVANIA SINCE 1868.—PER TON OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

YEARS.	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	143¼	135	134	130¼	128	130	130	130	130½	130¼	120	132¾
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	120½
1874...	117½	117½	115	98⅜	98½	96¼	91	89¼	78¼	78¼	75⅜	75⅜	94¼
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...	49	49	49	49	47¼	46½	45¼	44¾	44	42¼	40½	40½	45½
1878...	41	41½	41½	42	43½	43	43½	42½	42½	42½	42	41	42¼
1879...	41	42	43	42½	42	43	44	48	50	55	61	67	48¼
1880...	75	85	82	75	65	63¾	62½	63¾	61¼	60	59	58	67½
1881...	60	62	62½	63	63	60	61	60	60	60	61½	60	61⅛
1882...	58	55	54	52¾	48¾	48¼	48	47	45	44¼	42	39	48½
1883...	40	39½	39	38½	38	38	38	38	37½	37	35	34½	37¾
1884...	34	34	34	34	33	32	30	28	27	28	28	27	30¾
1885...	27	27	26½	26	27	27¼	27¼	27¼	29	30½	33	34½	28½
1886...	34½	34½	34½	34½	34½	34½	34½	34¼	34	34	34½	36	34½
1887...	38½	39½	39½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

GROWTH OF OUR PIG-IRON INDUSTRY SINCE 1810.

The following table shows the production of pig iron in the United States from 1810 to 1886, in tons of 2,240 pounds. The figures for 1810, 1840, 1850, 1860, and 1870 have been compiled from the census reports and are for census years; for 1880 and 1886 they have been taken from the records of the American Iron and Steel Association. The figures for 1820 and 1830 are derived from trustworthy sources, but are not official. In the years last mentioned the census statistics do not give the quantities of pig iron produced.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1810.....	53,908	1840.....	286,903	1870.....	1,832,875
1820.....	20,000	1850.....	564,755	1880.....	3,835,191
1830.....	165,000	1860.....	987,559	1886.....	5,683,329

AVERAGE WHOLESALE STORE PRICES OF CUT NAILS PER KEG AT PHILADELPHIA SINCE 1860.

Compiled from original data for The American Iron and Steel Association by William E. S. Baker, Secretary of The Duncannon Iron Company, of Duncannon, Pa. Office at 122 Race Street, Philadelphia.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	$	$	$	$	$	$	$	$	$	$	$	$	$
1860...	3 25	3 25	3 25	3 25	3 25	3 25	3 25	3 25	3 00	3 00	2 75	2 75	3 13
1861...	2 75	2 75	2 75	2 75	2 75	2 75	2 75	2 75	2 75	2 75	2 75	2 75	2 75
1862...	3 00	3 00	3 00	3 15	3 25	3 25	3 50	3 50	3 50	3 50	4 00	5 00	3 47
1863...	5 00	5 25	5 25	5 25	5 25	5 25	5 00	5 00	5 00	5 00	5 00	5 25	5 13
1864...	5 30	5 50	6 90	7 00	7 00	7 00	8 50	10 00	10 00	9 50	9 00	8 50	7 85
1865...	8 50	8 50	8 00	7 50	6 00	5 50	5 25	5 25	7 00	8 00	7 75	7 75	7 08
1866...	7 75	7 75	7 50	7 25	6 75	6 60	6 50	6 50	6 75	6 75	6 75	6 75	6 97
1867...	6 75	6 75	6 50	6 00	5 75	5 75	5 75	5 75	5 50	5 50	5 50	5 50	5 92
1868...	5 25	5 25	5 25	5 25	5 00	5 00	5 00	5 00	5 00	5 25	5 25	5 50	5 17
1869...	5 50	5 25	5 00	4 75	4 50	4 50	4 50	4 50	5 00	5 00	5 00	4 75	4 87
1870...	4 75	4 50	4 25	4 25	4 25	4 50	4 50	4 50	4 50	4 25	4 25	4 25	4 40
1871...	4 25	4 50	4 50	4 50	4 75	4 75	4 50	4 25	4 25	4 50	4 75	4 75	4 52
1872...	4 75	5 00	5 00	5 50	5 50	5 50	5 50	5 50	5 75	6 00	6 00	5 50	5 46
1873...	5 00	5 25	5 25	5 25	5 25	5 00	4 75	4 75	4 75	4 75	4 50	4 25	4 90
1874...	4 15	4 00	4 00	4 10	4 10	4 10	4 10	4 10	4 00	3 75	3 75	3 75	3 99
1875...	3 65	3 65	3 65	3 50	3 50	3 50	3 50	3 25	3 25	3 25	3 25	3 10	3 42
1876...	3 00	3 00	2 75	2 75	2 75	3 00	3 00	3 25	3 25	3 00	3 00	3 00	2 98
1877...	2 90	2 80	2 80	2 75	2 60	2 50	2 50	2 40	2 40	2 40	2 40	2 40	2 57
1878...	2 40	2 50	2 50	2 50	2 40	2 30	2 25	2 20	2 20	2 20	2 15	2 15	2 31
1879...	2 15	2 15	2 10	2 25	2 25	2 25	2 25	2 40	3 00	3 50	3 70	4 25	2 69
1880...	4 90	5 25	5 25	4 75	3 40	2 90	2 80	3 00	3 15	3 00	2 90	2 90	3 68
1881...	2 90	2 90	3 00	3 15	3 05	3 00	3 00	3 05	3 15	3 30	3 30	3 30	3 09
1882...	3 40	3 40	3 40	3 30	3 25	3 35	3 40	3 50	3 65	3 65	3 65	3 65	3 47
1883...	3 40	3 35	3 20	3 10	3 10	3 10	3 00	3 00	3 00	2 90	2 85	2 75	3 06
1884...	2 60	2 60	2 60	2 60	2 60	2 50	2 40	2 30	2 20	2 10	2 10	2 10	2 39
1885...	2 10	2 25	2 30	2 30	2 30	2 30	2 20	2 20	2 25	2 40	2 60	2 75	2 33
1886...	2 65	2 45	2 40	2 40	2 25	2 10	2 10	2 20	2 20	2 20	2 10	2 15	2 27
1887...	2 30	2 50	2 55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

The above figures are the jobbers' store prices in car-load lots. The maximum price was reached in August and September, 1864, $10 per keg. The minimum price, $2.10 per keg, was touched in March, 1879, at the close of 1884 and beginning of 1885, and during June, July, and November of 1886. In 1879 and 1884 several makers closed out their stocks, with a view of suspending production, at 20 cents to 25 cents below our lowest figure of $2.10.

PRICES IN DOLLARS OF ANTHRACITE COAL SINCE 1826.

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

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
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	4.80	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	3.25	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	5.00	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	3.28	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	5.15	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	.....	.....	.....	.....	4.52	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	2.40	2.47	2.40	2.40	2.35	2.35	2.40	2.59
1878	3.25	3.50	3.25	3.25	3.30	3.30	3.30	3.30	3.30	3.30	3.05	2.50	3.22
1879	2.50	2.50	2.25	2.25	2.50	2.50	2.50	2.75	2.75	3.00	3.25	3.65	2.70
1880	3.90	4.25	4.35	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.53
1881	4.65	4.65	4.58	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.53
1882	4.50	4.50	4.50	4.50	4.50	4.50	4.65	4.75	4.75	4.75	4.75	4.75	4.61
1883	4.75	4.75	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.54
1884	4.50	4.50	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.42
1885	4.40	4.40	4.40	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.10
1886	4.40	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
1887	4.00	4.00	4.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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.

THE ANTHRACITE COAL PRODUCTION OF PENNSYLVANIA.

Prepared from original and authentic statistics by John H. Jones, Philadelphia.

YEARS.	WYOMING REGION.		LEHIGH REGION.		SCHUYLKILL REGION.		TOTAL.
	Gross tons.	Per cent.	Gross tons.	Per cent.	Gross tons.	Per cent.	Gross tons.
1830.....	43,000	24.60	41,750	23.90	89,984	51.50	174,734
1831.....	54,000	30.54	40,966	23.17	81,854	46.29	176,820
1832.....	84,000	23.12	70,000	19.27	209,271	57.61	363,271
1833.....	111,777	22.91	123,001	25.22	252,971	51.87	487,749
1834.....	43,700	11.60	106,244	28.21	226,692	60.19	376,636
1835.....	90,000	16.05	131,250	23.41	339,508	60.54	560,758
1836.....	103,861	15.18	148,211	21.66	432,045	63.16	684,117
1837.....	115,387	13.27	223,902	25.75	530,152	60.98	869,441
1838.....	78,207	10.59	213,615	28.92	446,875	60.49	738,697
1839.....	122,300	14.94	221,025	27.01	475,077	58.05	818,402
1840.....	148,470	17.18	225,313	26.07	490,596	56.75	864,379
1841.....	192,270	20.03	143,037	14.90	624,466	65.07	959,773
1842.....	252,599	22.79	272,540	24.59	583,273	52.62	1,108,412
1843.....	285,605	22.60	267,793	21.19	710,200	56.21	1,263,598
1844.....	365,911	22.43	377,002	23.12	887,937	54.45	1,630,850
1845.....	451,836	22.45	429,453	21.33	1,131,724	56.22	2,013,013
1846.....	518,389	22.11	517,116	22.07	1,308,500	55.82	2,344,005
1847.....	583,067	20.23	633,507	21.98	1,665,735	57.79	2,882,309
1848.....	685,196	22.18	670,321	21.70	1,733,721	56.12	3,089,238
1849.....	732,910	22.60	781,556	24.10	1,728,500	53.30	3,242,966
1850.....	827,823	24.64	690,456	20.56	1,840,620	54.80	3,358,899
1851.....	1,156,167	25.98	964,224	21.68	2,328,525	52.34	4,448,916
1852.....	1,284,500	25.72	1,072,136	21.47	2,636,835	52.81	4,993,471
1853.....	1,475,732	28.41	1,054,309	20.29	2,665,110	51.30	5,195,151
1854.....	1,603,478	26.73	1,207,186	20.13	3,191,670	53.14	6,002,334
1855.....	1,771,511	26.80	1,284,113	19.43	3,552,943	53.77	6,608,567
1856.....	1,972,581	28.47	1,351,970	19.52	3,602,999	52.01	6,927,550
1857.....	1,952,603	29.39	1,318,541	19.84	3,373,797	50.77	6,644,941
1858.....	2,186,094	31.96	1,380,030	20.18	3,273,245	47.86	6,839,369
1859.....	2,731,236	34.98	1,628,311	20.86	3,448,708	44.16	7,808,255
1860.....	2,941,817	34.56	1,821,674	21.40	3,749,632	44.04	8,513,123
1861.....	3,055,140	38.41	1,738,377	21.85	3,160,747	39.74	7,954,264
1862.....	3,145,770	39.97	1,351,054	17.17	3,372,583	42.86	7,869,407
1863.....	3,759,610	39.30	1,894,713	19.80	3,911,683	40.90	9,566,006
1864.....	3,960,836	38.92	2,054,669	20.19	4,161,970	40.89	10,177,475
1865.....	3,254,519	33.72	2,040,913	21.14	4,356,959	45.14	9,652,391
1866.....	4,736,616	37.29	2,179,364	17.15	5,787,902	45.56	12,703,882
1867.....	5,325,000	40.99	2,502,054	19.27	5,161,671	39.74	12,988,725
1868.....	5,968,146	43.25	2,502,582	18.13	5,330,737	38.62	13,801,465
1869.....	6,141,369	44.28	1,949,673	14.06	5,775,138	41.66	13,866,180
1870.....	7,974,660	49.28	3,239,374	20.02	4,968,157	30.70	16,182,191
1871.....	6,911,242	44.02	2,235,707	14.24	6,552,772	41.74	15,699,721
1872.....	9,101,549	46.27	3,873,339	19.70	6,694,890	34.03	19,669,778
1873.....	10,309,755	48.57	3,705,596	17.46	7,212,601	33.97	21,227,952
1874.....	9,504,408	47.18	3,773,836	18.73	6,866,877	34.09	20,145,121
1875.....	10,596,155	53.75	2,834,605	14.38	6,281,712	31.87	19,712,472
1876.....	8,424,158	45.53	3,854,919	20.84	6,221,934	33.63	18,501,011
1877.....	8,300,377	39.85	4,332,760	20.80	8,195,042	39.35	20,828,179
1878.....	8,085,587	45.92	3,237,449	18.40	6,282,226	35.68	17,605,262
1879.....	12,586,293	48.14	4,595,567	17.58	8,960,829	34.28	26,142,689
1880.....	11,419,279	48.72	4,463,221	19.05	7,554,742	32.23	23,437,242
1881.....	13,951,383	48.96	5,294,676	18.58	9,253,958	32.46	28,500,017
1882.....	13,971,371	47.98	5,689,437	19.54	9,459,288	32.48	29,120,096
1883.....	15,604,492	49.08	6,113,809	19.23	10,074,726	31.69	31,793,027
1884.....	15,677,753	51.04	5,562,226	18.11	9,478,314	30.85	30,718,293
1885.....	16,236,470	51.34	5,898,634	18.65	9,488,426	30.01	31,623,530
1886.....	17,031,826	53.00	5,723,129	17.81	9,381,407	29.19	32,136,362

The shipments of anthracite coal from the mines of Pennsylvania commenced in 1820, in which year 365 gross tons, or one ton for every day in the year, were shipped from the Lehigh region. During the ten years beginning with 1820 only 359,190 gross tons of coal were shipped, of which 7,000 tons came from the Wyoming region, 166,131 tons from the Lehigh region, and 186,059 tons from the Schuylkill region. The details of shipments for subsequent years are given in the table.

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE CALENDAR YEARS 1883, 1884, 1885, AND 1886.

GOLD VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

COMMODITIES.	1883.		1884.		1885.		1886.	
	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.
Pig iron	361,366	$5,745,999	206,381	$3,200,451	164,349	$2,553,298	405,180	$5,454,784
Scrap iron	72,000	1,014,863	30,192	340,420	15,480	151,714	97,635	1,056,387
Scrap steel	.....	*.....	8,388	144,177	2,196	23,911	11,353	145,649
Bar iron	47,409	1,914,474	40,998	1,588,464	35,251	1,401,213	32,647	1,250,456
Iron rails	757	21,231	94	2,110	57	1,040	7	166
Steel rails	38,220	1,047,609	3,074	67,669	2,395	55,654	46,571	887,267
Cotton-ties	.....	*.....	17,518	516,262	20,576	570,263	11,561	288,360
Hoop, band, and scroll iron	1,003	39,436	332	22,552	103	6,630	128	2,949
Steel bands, sheets, and plates	.....	*.....	1,500	120,171	2,644	129,649	4,719	224,879
Steel ingots, bars, etc	.....	*.....	24,610	1,310,362	33,718	1,249,123	167,257	3,298,707
Sheet, plate, and taggers' iron	9,114	684,315	7,863	651,052	6,200	547,775	6,852	518,417
Tinplates	247,781	18,156,773	242,123	16,858,650	256,028	15,991,152	288,761	17,504,976
Wire rods	.....	.....	145,525	4,555,699	105,148	2,908,772	153,401	3,940,849
Wire and wire rope	.....	*.....	2,732	426,373	2,475	437,020	2,689	512,389
Anvils, axles, and forgings	.....	*.....	967	105,231	642	78,488	963	105,072
Chains	.....	*.....	963	86,690	633	63,728	669	70,883
Cutlery	.....	2,061,603	.....	1,704,169	.....	1,444,545	.....	1,822,511
Files, file-blanks, rasps, and floats	.....	*.....	.....	46,472	.....	44,040	.....	57,478
Fire-arms	.....	1,258,940	.....	1,429,612	.....	827,930	.....	936,554
Machinery	.....	1,685,370	.....	1,185,026	.....	970,051	.....	1,697,883
Needles	.....	*.....	.....	364,908	.....	322,186	.....	335,514
Other manufactures of iron and steel	.....	13,875,693	.....	2,351,602	.....	1,366,370	.....	1,518,649
Total	.....	$47,506,306	.....	$37,078,122	.....	$31,144,552	.....	$41,630,779
Iron ore	549,780	$1,207,991	546,358	$1,133,678	437,680	$801,293	1,164,165	$1,912,437

* Included in "other manufactures of iron and steel."

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1883, 1884, 1885, AND 1886.—GOLD VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

COMMODITIES.	1883.		1884.		1885.		1886.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
Pig iron.....Net tons.	4,221	$111,414	4,301	$92,336	6,975	$123,605	9,911	$161,072
Bar iron..... "	1,201	72,054	932	52,872	933	48,048	906	44,999
Band, hoop, and scroll iron..... "	.....	*.....	93	8,780	186	11,626	202	10,427
Car-wheels.....No.	18,217	181,236	11,889	109,255	9,122	78,268	13,411	102,498
Castings, not elsewhere specified.....	.....	385,262	.....	293,494	.....	340,707	.....	323,554
Cutlery.....	.....	103,732	.....	94,671	.....	103,224	.....	116,948
Fire-arms.....	.....	1,357,686	.....	1,427,600	.....	2,191,286	.....	757,430
Steel ingots, bars, and rods.....Net tons.	.....	*.....	94	18,330	122	14,387	87	13,531
Builders' hardware.....	.....	*.....	.....	1,043,668	.....	1,279,773	.....	1,307,364
Machinery.....	.....	5,935,543	.....	4,131,810	.....	3,957,393	.....	3,848,448
Nails and spikes.....Net tons.	5,724	388,070	3,948	247,497	4,561	260,459	5,268	286,980
Iron plates and sheets..... "	.....	*.....	424	37,127	327	22,628	1,087	66,618
Steel plates and sheets..... "	.....	*.....	35	3,469	13	2,846	267	12,921
Printing presses, and parts of.....	.....	250,407	.....	196,953	.....	175,105	.....	197,343
Iron rails.....Net tons.	579	31,806	1,254	46,644	306	8,017	590	18,510
Steel rails..... "	2,006	102,864	5,504	176,891	8,382	270,375	2,371	68,798
Saws and tools.....	.....	1,388,562	.....	1,234,473	.....	1,096,235	.....	1,231,250
Scales and balances.....	.....	319,041	.....	397,563	.....	234,749	.....	267,996
Sewing machines, and parts of.....	.....	3,362,971	.....	3,264,935	.....	2,759,514	.....	2,270,165
Fire-engines.....No.	.....	8,310	9	28,273	6	6,440	4	10,893
Locomotives..... "	275	2,650,944	189	2,057,271	65	370,639	50	336,237
Stationary engines.....	147	165,866	115	157,883	119	104,588	217	213,890
Boilers and parts of engines.....	.....	294,415	.....	299,047	.....	245,488	.....	320,714
Stoves, and parts of.....	.....	232,713	.....	198,883	.....	206,031	.....	202,282
Wire.....Net tons.	.....	*.....	2,509	274,273	3,292	294,847	4,335	353,956
Other manufactures of iron and steel.....	.....	5,373,144	.....	3,396,897	.....	2,416,233	.....	2,320,263
Total.....	.....	$22,716,040	.....	$19,290,895	.....	$16,622,511	.....	$14,865,087
Agricultural implements, additional.....	.....	$3,689,909	.....	$3,382,556	.....	$2,532,286	.....	$2,119,772
Iron ore.....Net tons.	2,969	10,692	4,182	12,255	1,090	8,269	2,286	8,957

* Included in "other manufactures of iron and steel."

STATISTICS OF THE FOREIGN IRON TRADE FOR 1886.

GENERAL SUMMARY FOR 1886 AND FOR PART OF 1887.

FROM 1883 to the latter part of 1886 there was a constant tendency toward restricted production in some of the iron-producing countries of Europe, and toward lower prices in all of them. The times were hard. The general situation was worse in 1884 than in 1883, worse in 1885 than in 1884, and worse in the greater part of 1886 than in 1885. The depression during the four years mentioned was, however, most felt in Great Britain. That country produces about one-half of all the iron and steel that is made in Europe, and more than any other country except Belgium depends on foreign markets to take its surplus of these products. In recent years Great Britain finds an increasing difficulty in sending any part of this surplus to Continental countries because of the protective tariffs which most of them have established, which have increased the home supply of iron and steel and lowered the prices at which the home products could be sold. For many years the United States has taken more of Great Britain's surplus than any other country, but even our large purchases have not saved her iron and steel industries from one of the most severe depressions they have ever experienced, extending, as we have said, from 1883 to 1886. In these four years her exports of iron and steel have greatly declined, and all the other evidences of a severe depression have been conspicuously and often painfully manifested.

A feature of the European iron trade in 1886 which particularly affected the steel-rail-producing countries was the disruption of the steel-rail-makers' association early in April. This association was organized about the beginning of 1884 by the British, Belgian, and German steel-rail manufacturers, for the purpose of regulating prices and securing an equitable distribution of orders. It came to an end because it was found to be no longer possible to continue the attempt to reconcile the conflicting interests involved in such a combination. While it lasted it maintained remunerative prices, although it restricted the production of many works, especially in Great Britain; when it collapsed prices in the three countries men-

tioned at once fell to very low figures, recovering slightly at the close of the year. The prices of the association had, however, not been fully maintained for some time prior to its dissolution. As one result of the sharp competition which followed the disruption of the association Herr Krupp secured near the close of the year a large order for steel rails for the Australian colony of Victoria, much to the disgust of British bidders.

The London *Iron* gives us the following comprehensive view of the course of the British iron trade in 1886.

The year just closed upon us may be described as one of hope as regards the iron trade of Great Britain. Certainly anticipation of better things, rather than realization, has been the lot of those connected with it. In 1885 it was thought that the worst had been experienced, and that it would be well-nigh impossible to surpass the desperate condition of trade prevalent during that year, but 1886 has proved that to the deepest depths there is a deeper still. In only one direction could a ray of light be discerned, and that was the improvement which the exports of iron and steel began to exhibit. In almost all the other leading phases of the trade the condition of things grew blacker and blacker. Prices went from bad to worse, although there had seemed scarcely any margin for further shrinkage. Whether in pig iron, steel rails, merchant or shipbuilding iron values continued to decline. At the same time production, in iron at least, fell off largely, but, notwithstanding this, stocks of pig iron in the two principal centres of production increased rapidly. So far as steel was concerned, however, it formed a pleasing contrast, the low prices which ruled stimulating the output to a very considerable extent.

Anticipations had been indulged in towards the close of 1885 that the turn of the year would bring improvement, but these were doomed to disappointment. The opening weeks of 1886 were characterized by much dullness, and the long continued depression only became intensified. Prices of pig iron broke away, that of Scotch, which was 41s. at the beginning of the year, touching 38s. 4½d. about the middle of February, the lowest figure recorded for thirty-four years. At the same time the value of Cleveland iron declined, although not in so great a degree. No. 3 pig iron touched 30s. towards the end of February, showing a fall of 1s. per ton within the two months, and recording the lowest price yet then known. Unprecedented as this price was looked on at the time it was destined to be surpassed, and after some rumors of a proposed restriction of the output, which came to nothing, had steadied the market for a bit, the price fell off once more, the lowest point, viz., 29s., being reached in July. The end of the year, however, found prices in both cases about 3s. per ton higher than at the beginning.

The improvement which came to the British iron trade in the

latter part of 1886 was the result of increased exports to the United States, concerning which we quote from *Iron* as follows: "In short, if it had not been for the increased quantities of iron and steel taken by the United States last year, the aggregate of the exports from this country, so far from exhibiting any improvement, would have revealed a loss of close upon 150,000 tons for the year."

The London *Statist* puts the influence of the increased demand from the United States upon the British iron trade in the closing months of 1886 in these words: "With the single exception of the American trade there has so far been no improvement in the demands for English iron. Other countries have taken less than in previous years."

Referring to the same subject the London *Economist* says: "It is pretty well known that the late revival in the English iron trade was largely, if not exclusively, due to an increased demand from the United States, which set in during the latter part of 1886."

The Belgian iron trade experienced in 1886 a lower range of prices than it had known for many years, although production was well maintained, owing to increased exports due to low prices. The fall in the prices of Belgian iron and steel was constant from 1881 to 1886, and it was only arrested when 1886 was nearing its close. Prices of rolled iron would have gone still lower but for the concerted action of Belgian ironmasters, who agreed upon a scale of prices and a reduction of the output, which agreement was observed. All prices were, however, favorably affected by the improvement in the demand for iron and steel which took place in the closing months of the year. The depression in the iron trade of Belgium in the early part of 1886 was shared by other industries, and particularly by the coal producers and their workmen. The dissatisfaction among the miners, caused by want of employment and low wages, found expression in the deplorable riots which took place in the Charleroi district during the latter part of March.

The German iron trade was greatly depressed during the larger part of 1886, and for the first time in many years the German production of pig iron declined. But the depression was most felt in the exceedingly low prices which prevailed, which were the result of Belgian and English competition. The severity of this competition is illustrated by the course of the steel-rail market. At the beginning of 1886 the average price of rails per ton for home contracts was 135 marks, and previously it was 144 marks. In the summer of 1886 a contract for several thousand tons of

steel rails was given to Herr Krupp at 117 marks per ton, which was the English offer and which he was compelled to meet. In September the John Cockerill Company, of Belgium, offered to supply 5,000 tons of rails for the Left Rhenish Railway at 101 marks per ton, while the German offers ranged between 104½ and 107½ marks. Westphalian pig iron touched 36½ marks in the summer of 1886, compared with 50 marks in 1885 and 41 marks at the beginning of 1886. The experience of the German iron trade in 1886 was, therefore, as the London *Iron* remarks, "a fight for the retention of the home market." Toward the latter part of the year the iron trade of Germany began to revive, both in demand and prices.

The French iron trade in 1886 was characterized by the organized and determined resistance of French manufacturers to the demands of consumers for lower prices, and by a combined and judicious check upon production. The production of the year in most branches was consequently less than in 1885. Prices had steadily declined from 1883 to 1885, and at the beginning of 1886 the low prices of 1885 were reduced. The action of the manufacturers in resisting a further decline in prices was rendered imperative by sheer necessity. In March, April, and May merchant bars in the Nord were sold by manufacturers at 110 francs per ton. Subsequently, owing to the perfect understanding existing between the ironmasters of the whole country, bars were raised to 125 and 130 francs, and even to 140 francs. The year closed with bars at 130 francs. However, the fact that production decreased is one of considerable significance, as may be observed of the iron trade of Germany for the same year.

The iron trade of Austria was dull and lifeless during the greater part of 1886, reviving somewhat in the closing months. Prices were discouragingly low in the early months of the year. *Iron* says: "Prices were made somewhat stronger in the course of the year by arrangements between the principal makers as to the common sale of their products, as well as subsequently by the formation of the Austrian iron syndicate, to which the greater portion of the more important iron works gave their adhesion, and which took upon itself to regulate the output as well as prices." In May the Austrian minister of commerce urged the various railroad directors to give out orders for the rolling stock they required. The needs of the Hungarian iron trade induced the government to request the Prussian state railroads to terminate the existing agree-

ment as to mutual railroad rates, so that they could be raised to prevent the German iron trade from competing with that of Hungary in the countries of the lower Danube.

In the other and less prominent iron-producing countries of the Continent the condition of the iron trade in 1886 was especially marked by very low prices during the greater part of the year.

In the last few months of 1886 an improvement began in all European iron markets, which was due largely to the increased demand of the United States for iron and steel; but it was more noticeable in Great Britain than on the Continent. Since the beginning of the new year this improvement has been partly interrupted on the Continent by political excitement and war rumors, but in Great Britain it has been continued with less disappointing results, although even in that country prices for pig iron and some other products are lower now than at the beginning of the year. The present situation in all European iron-producing countries may be briefly summarized as being much better than at the beginning of 1886, and nearly as favorable as at the close of the year.

We will now proceed to give such particulars as have come to hand of the production of iron and steel and coal in foreign countries in 1886, to which we will add for comparison such statistics of the production in preceding years as are accessible.

GREAT BRITAIN.

Coal.—The production of coal in Great Britain in 1886, according to the reports of Her Majesty's Inspectors of Mines, was 157,518,482 gross tons, against 159,351,418 tons in 1885, 160,757,779 tons in 1884, and 163,737,327 tons in 1883. A steady decline in production since 1883 will be noticed. The following table shows the annual production of coal in Great Britain since 1854.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1854.....	64,661,401	1863...	86,292,215	1872...	123,497,316	1881...	154,184,300
1855.....	64,453,079	1864...	92,787,873	1873...	127,016,747	1882...	156,499,977
1856.....	66,645,450	1865...	98,150,587	1874...	125,043,257	1883...	163,737,327
1857.....	65,394,707	1866...	101,630,544	1875...	131,867,105	1884...	160,757,779
1858.....	65,008,649	1867...	104,500,480	1876...	133,344,766	1885...	159,351,418
1859.....	71,979,765	1868...	103,141,157	1877...	134,610,763	1886...	157,518,482
1860.....	80,042,698	1869...	107,427,557	1878...	132,607,866		
1861.....	84,013,941	1870...	110,431,192	1879...	134,008,228		
1862.....	81,638,338	1871...	117,352,028	1880...	146,818,622		

The exports of coal and coke from Great Britain to foreign

countries in 1886 amounted to 23,284,960 tons, against 23,767,275 tons in 1885. France still remains the leading foreign consumer of British coal, taking last year 4,079,140 tons. Germany took the next largest quantity, 2,858,196 tons, and Italy the next, 2,858,104 tons. The prices of coal in Great Britain in 1886 were lower than they had been for many years.

The following table gives the exports of coal from Great Britain to foreign countries (not including coal for the use of British steamers engaged in the foreign trade) from 1868 to 1886.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1868.....	10,967,062	1873...	12,617,566	1878...	15,494,633	1883...	22,775,634
1869.....	10,744,945	1874...	13,927,205	1879...	16,442,296	1884...	23,343,755
1870.....	11,702,649	1875...	14,544,916	1880...	18,719,971	1885...	23,767,275
1871.....	12,747,989	1876...	16,299,077	1881...	19,587,063	1886...	23,284,960
1872.....	13,198,494	1877...	15,420,050	1882...	20,934,448		

Iron Ore.—Great Britain is a large importer of iron ore, which she receives principally from Bilbao, in Spain. Her total imports of iron ore in 1886 amounted to 2,875,176 tons, against 2,817,597 tons in 1885, and 2,728,672 tons in 1884. The following table gives the imports of iron ore into Great Britain from 1874 to 1886.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1874.....	754,000	1879.....	1,083,692	1884.....	2,728,672
1875.....	458,000	1880.....	2,634,401	1885.....	2,817,597
1876.....	672,000	1881.....	2,449,277	1886.....	2,875,176
1877.....	1,140,000	1882.....	3,282,496		
1878.....	1,173,860	1883.....	3,178,310		

In 1866 British imports of Spanish iron ores amounted to only 27,619 tons, and in 1870 they amounted to only 179,083 tons.

The quantity of iron ore mined by Great Britain in 1886 has not yet been ascertained. In 1885 it amounted to 15,417,982 tons, and in 1884 to 16,137,887 tons.

Pig Iron.—According to Mr. J. S. Jeans, the Secretary of the British Iron Trade Association, the production of pig iron in Great Britain in 1886 amounted to 6,870,665 tons, as compared with 7,250,657 tons in 1885, a decrease of 379,992 tons. The decrease in 1885 on the production of 1884 amounted to 278,309 tons, so that the decrease in the two years has been 658,301 tons. The production of 1886 was the smallest of any year since 1879, and was only 128,736 tons above the production of 1872. In all the

leading iron-producing districts, except Lancashire, West Cumberland, Lincolnshire, and Northamptonshire, there was a falling off in 1886 as compared with 1885. The most remarkable decline occurred in South Wales, where the reduction on 1885 was not less than 131,711 tons.

The following table shows the growth of the pig-iron industry of Great Britain from 1740 to 1886.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1740.....	17,000	1840...	1,396,400	1862...	3,943,469	1876...	6,555,997
1788.....	68,000	1842...	1,099,138	1863...	4,510,040	1877...	6,608,664
1796.....	125,000	1844...	1,999,608	1864...	4,767,901	1878...	6,381,051
1806.....	259,000	1845...	1,512,500	1865...	4,819,254	1879...	5,995,337
1818.....	325,000	1847...	1,999,508	1866...	4,523,897	1880...	7,749,233
1820.....	400,000	1852...	2,700,000	1867...	4,761,023	1881...	8,377,364
1823.....	454,866	1854...	3,069,838	1868...	4,970,206	1882...	8,493,287
1825.....	581,367	1855...	3,218,151	1869...	5,445,757	1883...	8,490,224
1827.....	690,000	1856...	3,586,377	1870...	5,963,515	1884...	7,528,966
1828.....	703,184	1857...	3,659,477	1871...	6,627,179	1885...	7,250,657
1830.....	678,417	1858...	3,456,064	1872...	6,741,929	1886...	6,870,665
1833.....	700,000	1859...	3,712,904	1873...	6,566,451		
1835.....	1,000,000	1860...	3,826,752	1874...	5,991,408		
1839.....	1,347,790	1861...	3,712,390	1875...	6,365,462		

At the close of 1886 the stocks of unsold pig iron in Great Britain amounted to 2,491,506 tons, against 2,352,169 tons at the close of 1885, showing an increase of 139,337 tons. These are the largest stocks of pig iron that have ever been held in Great Britain at the close of any year. The stocks held at the close of 1886 were exactly 50 per cent. larger than the stocks on hand at the close of 1882.

The total number of furnaces erected and standing in Great Britain at the close of 1886 was 857, of which 375 were in blast and 482, or 56 per cent. of the whole number, were out of blast. Mr. Jeans says: "This is probably a larger proportion of the total furnace plant of the United Kingdom than has ever before been idle at one and the same time."

Bessemer Steel.—The production of Bessemer steel ingots in Great Britain in 1886 is reported by Mr. Jeans to have been 1,570,520 gross tons, which was an increase of 266,393 tons on the production of 1,304,127 tons in 1885. Every district in the United Kingdom increased its production in 1886.

The production of Bessemer steel rails in Great Britain in 1886 amounted to 730,343 gross tons, against 706,583 tons in 1885, an increase of 23,760 tons. While there was an aggregate increase

in the production of steel rails in 1886 there was a large decrease in South Wales, amounting to 90,579 tons. The production of Bessemer steel rails in Great Britain in 1886 represented about one-half the total production of Bessemer ingots.

The production of Bessemer steel ingots and rails in Great Britain in the last ten years, compared with the production of the United States in the same period, was as follows.

YEARS.	Great Britain—gross tons.		United States—gross tons.	
	Ingots.	Rails.	Ingots.	Rails.
1877	750,000	508,400	500,524	385,865
1878	807,527	633,733	653,773	491,427
1879	834,511	519,718	829,439	610,682
1880	1,044,382	739,910	1,074,262	852,196
1881	1,441,719	1,023,740	1,374,247	1,187,770
1882	1,673,649	1,235,785	1,514,687	1,284,067
1883	1,553,380	1,097,174	1,477,345	1,148,709
1884	1,299,676	784,968	1,375,531	996,983
1885	1,304,127	706,583	1,519,430	959,471
1886	1,570,520	730,343	2,269,190	1,574,703

It will be noticed that the United States made more Bessemer steel ingots than Great Britain in 1880, 1884, 1885, and 1886, and more Bessemer steel rails in each year since 1878. In 1886 the United States made 44 per cent. more Bessemer steel ingots than Great Britain, and 115 per cent. more Bessemer steel rails.

Open-hearth Steel.—The production of open-hearth steel in Great Britain in 1886 is reported by Mr. Jeans to have amounted to 694,150 gross tons, an increase of 110,232 tons on the production of 583,918 tons in 1885. In 1885 the production was 108,668 tons in excess of the output of 1884, so that within the last two years the quantity of open-hearth steel manufactured in Great Britain has increased 218,900 tons. This increase is more than equal to the total quantity of open-hearth steel produced in 1879, and is more than double the total quantity produced in 1875. Of the total production of open-hearth steel in 1886 Scotland produced 244,900 tons and South Wales produced 194,500 tons.

The production of open-hearth steel in Great Britain has always been much larger than in the United States. The latter country is, however, second only to Great Britain in the production of this kind of steel.

Crucible Steel.—Mr. Jeans states that "nearly 100,000 tons of finished steel" are annually made in Great Britain by this process.

Which Country makes the most Steel?—If we consider the various kinds of steel which are made by the two great steel-making countries above mentioned the United States will be found to be ahead of its European rival. We summarize the production of ingots in both countries in 1886 in gross tons as follows.

Ingots—gross tons.	Great Britain.	United States.
Bessemer steel	1,570,520	2,269,190
Open-hearth steel	694,150	218,973
Crucible steel	about 100,000	71,972
Other steel	nominal if any	2,367
Total	2,364,670	2,562,502

These figures show that the United States is now the first steel-producing country in the world, an honor, however, which we could not claim until now, although of Bessemer steel ingots alone we have in more than one year made more than Great Britain. We passed our great rival in 1886 in the total production of steel, leaving her behind, as our table shows, 197,832 gross tons.

Manufactured Iron.—Mr. Jeans says that the production of puddled iron in the United Kingdom in 1886 amounted to 1,616,701 tons, which is a decrease of 294,424 tons on the make of 1885. The greatest falling off has occurred in the South Staffordshire district, where the production was 110,602 tons less than in 1885. The next greatest decline, amounting to 64,647 tons, has taken place in the North of England, while South Wales shows a decrease in output amounting to 49,419 tons. The falling off which occurred in 1886 was, however, less than that which took place in each of the two preceding years. Mr. Jeans says: "The total decline of production since 1882 has been 1,224,833 tons, while the increase in the production of steel, taking the Bessemer and open-hearth processes together, has been 155,000 tons in the same interval. This means that in 1886 there was 1,069,833 tons less of finished materials produced than there was in the year 1882." During the last six years the production of puddled iron in Great Britain has been as follows.

Years.	Gross tons.	Years.	Gross tons.
1881	2,681,150	1884	2,237,535
1882	2,841,534	1885	1,911,125
1883	2,730,504	1886	1,616,701

Iron and Steel Shipbuilding.—The depression in British iron and

steel shipbuilding which has existed for many years was most marked in 1886. The tonnage of new ships built in 1886 was lower than that of any previous year since 1870. The total tonnage of new iron and steel vessels built and launched in 1886 was 481,233 tons, against 540,371 tons in 1885, 750,000 tons in 1884, 1,250,000 tons in 1883, 1,200,000 tons in 1882, and 1,000,000 tons in 1881. The decrease in 1886 was entirely in iron vessels, the tonnage of steel vessels built in 1886 amounting to 267,000 tons, against 223,288 tons in 1885. This displacement of iron by steel vessels has been growing rapidly since 1880, and for the first time last year the latter were abreast of the former, the steel tonnage being over 55 per cent. of the whole tonnage.

Exports of Iron and Steel.—The total exports of iron and steel from Great Britain in 1886 amounted to 3,389,197 tons, against 3,130,682 tons in 1885, and 3,496,991 tons in 1884. The following table shows the quantities of each kind of iron and steel which have been exported from Great Britain in the last five years.

ARTICLES.	Gross tons of 2,240 pounds.				
	1882.	1883.	1884.	1885.	1886.
Pig iron	1,758,072	1,564,048	1,269,576	960,931	1,044,257
Bar, angle, bolt, and rod iron	313,155	288,271	296,489	264,472	243,386
Railroad iron, all kinds	936,949	971,165	728,540	714,276	739,651
Wire, and manufactures of, except telegraph wire	86,653	62,620	52,968	55,093	40,174
Hoops, sheets, and boiler and armor plates	342,599	347,782	348,298	330,954	307,135
Tinplates and sheets	265,039	269,375	288,614	298,386	334,775
Cast and wrought iron	328,262	355,842	376,367	347,963	355,879
Old iron	132,033	97,475	68,141	85,236	144,828
Steel unwrought	172,329	73,131	56,934	60,481	165,833
Manufactures of steel or steel and iron combined	18,461	13,599	11,064	12,890	13,279
Total exports	4,353,552	4,043,308	3,496,991	3,130,682	3,389,197
Total values	£31,598,306	£28,590,216	£24,496,065	£21,710,738	£21,722,951

About one-fourth of the entire quantity of iron and steel exported by Great Britain in 1886 was sent to the United States. In 1887 this proportion promises to be still larger.

GERMANY.

Coal.—The following table gives the production of coal of all kinds in Germany from 1861 to 1885—"stone coal" and "brown coal and lignite" combined.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1861.....	19,217,400	1868.....	33,274,400	1875.....	48,532,400	1882.....	65,448,211
1862.....	21,035,800	1869.....	34,379,600	1876.....	49,154,700	1883.....	70,223,456
1863.....	23,110,600	1870.....	34,880,600	1877.....	48,454,700	1884.....	72,030,901
1864.....	26,167,100	1871.....	38,391,300	1878.....	51,034,800	1885.....	78,266,288
1865.....	28,327,800	1872 ...	43,059,300	1879.....	54,170,200		
1866	28,624,600	1873.....	47,131,800	1880.....	59,118,035		
1867.....	30,982,500	1874.....	46,286,300	1881.....	61,540,485		

Iron Ore.—The total production of iron ore in Germany in 1885 was 6,509,377 metric tons, and in the adjoining Duchy of Luxemburg the production was 2,648,489 tons, making unitedly 9,157,-866 tons. To the iron ore produced in Germany and Luxemburg during 1885 there must be added 852,316 tons of imported iron ore. In the same year there were exported 1,771,158 tons.

Pig Iron.—The production of pig iron in Germany and in the Grand Duchy of Luxemburg in 1886 was 3,339,803 metric tons, against 3,687,433 tons in 1885. The make of 1886 was thus less than that of 1885 by 347,630 tons. This is the first time for many years that there has been a decrease in the production of pig iron in Germany. The following table gives the production of pig iron by Germany and Luxemburg from 1834 to 1886.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1834.....	110,000	1875.....	2,029,389	1882.....	3,380,806
1844.....	171,000	1876.....	1,846,345	1883.....	3,469,719
1854.....	369,000	1877.....	1,932,725	1884.....	3,600,612
1864.....	905,000	1878.....	2,147,641	1885.....	3,687,433
1872.....	1,988,394	1879.....	2,226,587	1886.....	3,339,803
1873.....	2,240,574	1880.....	2,729,038		
1874.....	1,906,262	1881.....	2,914,009		

The figures for 1886 are given upon the authority of the German Iron and Steel Manufacturers' Union; the remainder are official government statistics.

Steel.—We are without the statistics of Germany's production of steel in 1886. The latest authoritative figures at hand are for 1883, in which year Germany and Luxemburg made 1,060,591 metric tons of finished steel. It is not probable that this total has since been greatly increased in any one year.

Exports.—The exports of pig iron from Germany and Luxemburg in 1886 amounted to 345,387 metric tons, as compared with 276,764 tons in 1885. Of manufactured iron and steel the exports in 1886 amounted to 864,775 tons, as compared with 772,686 tons

in 1885. In both items, therefore, there was a material advance during 1886. The principal increase occurred in iron and steel wire, of which 238,497 tons were sent abroad in 1886, as compared with 193,027 tons in 1885. The exports of section iron increased from 17,873 tons in 1885 to 30,972 tons in 1886. The exports of bar iron advanced from 144,466 tons to 177,293 tons.

FRANCE.

Coal.—The production of coal and lignite in France in 1886 was 20,014,597 metric tons, against 19,510,530 tons in 1885. The quantity of lignite mined in each year was about half a million tons. France is a large importer of coal from other countries, principally from Great Britain, Belgium, and Germany. In 1886 the total imports of coal and coke amounted to 9,425,487 tons, against 9,943,469 tons in 1885.

Iron Ore.—France is a large importer of iron ore. The imports of iron ore in 1886 amounted to a total of 1,158,581 tons, as compared with 1,419,521 tons in 1885, and 1,412,724 tons in 1884. Germany, Spain, Algeria, and Belgium supply nearly all of the imported ore, and in the order mentioned.

Pig Iron.—The production of pig iron in France in 1886 was 1,507,850 tons, against 1,630,648 tons in 1885, a decrease of 122,798 tons. The production in 1886 was the lowest in many years, as the following table of production since 1819 will show.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1819.....	112,500	1868.....	1,235,308	1875.....	1,416,397	1882.....	2,039,067
1830.....	266,361	1869.....	1,380,965	1876.....	1,449,537	1883.....	2,069,430
1840.....	347,773	1870.....	1,178,114	1877.....	1,400,000	1884.....	1,855,247
1850.....	415,653	1871.....	859,641	1878.....	1,417,072	1885.....	1,630,648
1860.....	898,353	1872.....	1,217,838	1879.....	1,400,286	1886.....	1,507,850
1866.....	1,260,348	1873.....	1,366,971	1880.....	1,733,102		
1867.....	1,229,044	1874.....	1,423,307	1881.....	1,894,861		

Manufactured Iron.—The production of manufactured iron in France in 1886 was 767,214 metric tons, against 782,431 tons in 1885.

Steel.—The total production of steel in finished forms in 1886 was 466,913 metric tons, against 553,839 tons in 1885, a decrease of 86,926 tons. The production of steel rails alone in 1886 was 237,315 tons, against 314,454 tons in 1885. Nearly three-fourths of all the steel made in France is produced by the Bessemer pro-

cess, nearly one-fourth by the Martin process, and the remainder is puddled, cemented, and crucible steel.

Imports and Exports.—France is a large importer of pig iron; in 1885 the imports amounted to about 185,000 tons, of which Great Britain furnished nearly one-half; Germany, Belgium, and Spain supplying the remainder. Other imports of iron and steel do not annually amount to 100,000 tons. The exports of iron and steel from France slightly exceeded 100,000 tons in 1885, steel rails forming the principal item, of which 65,666 tons were exported, Italy being the largest customer and Belgium coming next. It was recently announced that the Terre-Noire and Bessèges works had obtained an order for 20,000 tons of rails for the United States of Colombia. French iron and steel exports are increasing.

BELGIUM.

Coal.—The production of coal in Belgium in 1886 amounted to 17,253,144 metric tons, against 17,437,603 tons in 1885, 18,051,499 tons in 1884, and 18,177,754 tons in 1883. Belgium annually exports over 4,000,000 tons of coal, principally to France. The following table gives the production of coal in Belgium in the fifteen years from 1872 to 1886.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1872.....	15,658,948	1877.....	13,938,523	1882.....	17,485,000
1873.....	15,778,401	1878.....	14,899,175	1883.....	18,177,754
1874.....	14,669,029	1879.....	15,447,292	1884.....	18,051,499
1875.....	15,011,331	1880.....	16,866,698	1885.....	17,437,603
1876.....	14,329,578	1881.....	16,873,951	1886.....	17,253,144

Iron Ore.—Belgium produces very little iron ore from year to year; her supply of iron ore is obtained principally from the Grand Duchy of Luxemburg and from Spain. The imports of iron ore into Belgium in 1886 amounted to 1,365,939 tons, against 1,393,601 tons in 1885, and 1,488,140 tons in 1884. The exports of iron ore from Belgium in 1886 were 105,868 tons, compared with 156,589 tons in 1885, and 190,988 tons in 1884.

Pig Iron.—The production of pig iron in Belgium in 1886 was 697,110 metric tons, against 712,876 tons in 1885, 750,812 tons in 1884, 783,433 tons in 1883, 727,000 tons in 1882, and 624,736 tons in 1881.

Manufactured Iron.—The production of manufactured iron in Belgium in 1886 was 470,022 tons, against 469,249 tons in 1885.

Steel.—The production of steel of all kinds in Belgium in 1886 was 139,215 tons, against 155,012 tons in 1885.

Exports and Imports.—The exports of iron and steel from Belgium amounted to 470,327 tons in 1886, against 409,719 tons in 1885, and 423,010 tons in 1884. In 1886 the imports of iron and steel (nearly all pig and scrap iron) amounted to 116,427 tons, against 134,339 tons in 1885, and 160,870 tons in 1884.

SPAIN.

Summary.—Official statistics state that the production of iron ore in Spain in 1883 was 4,526,279 metric tons; of pig iron, 139,920 tons; and of wrought iron, 2,304 tons. The total exports of Spanish iron ore in 1882 amounted to 4,025,234 tons, valued at £2,415,140; in 1883 they amounted to 4,225,938 tons, valued at £2,535,562. These are the latest statistics at hand for the country at large.

Exports from Bilbao.—The feature of the exports from the port of Bilbao for 1886 is the large increase in the shipments of pig iron. The exports of iron ore, though still large, do not show an increase on the figures of 1885; but the shipments of pig iron were five times larger than in 1885. The exports of pig iron are given as 100,628 tons, of which 57,999 tons were for foreign ports and 42,629 tons for home consumption (coasting trade). It was chiefly in the shipments to foreign ports that the increase took place, and principally to Italy. The *Bilbao Maritimo* says that important orders for pig iron have been received from Italy for the current year. The *Economista* of Madrid gives the following table of the exports of iron ore from Bilbao for several years past.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1878	1,224,730	1881	2,500,532	1884	3,155,432
1879	1,117,836	1882	3,692,542	1885	3,298,982
1880	2,345,598	1883	3,378,234	1886	3,160,647

Notwithstanding the active movement in the trade of Bilbao during 1886, and especially in pig iron, the *Economista* says that the year was a most unfortunate one for the iron industry, owing to low prices. In the first few months of 1887 there was an increase over 1886 in the shipments of both pig iron and iron ore. Down to the 2d of April the shipments of iron ore amounted to 1,073,113 tons, or 226,902 tons more than in the corresponding period of 1886. The pig iron shipped from Bilbao this year down

to the same date amounted to 19,467 tons foreign and 13,305 tons coastwise, the total being 32,772 tons.

The shipments of iron ore from Bilbao to Great Britain amounted to 2,151,137 tons in 1886, 2,050,185 tons in 1885, and 1,990,993 tons in 1884. A commencement has been made with shipments to the United States, 42,337 tons having been forwarded in 1886, as compared with 7,304 tons in 1885, and 2,259 tons in 1884. It will be observed that the shipments to Great Britain are increasing. They amounted in 1886 to 68 per cent. of the whole exports of the year.

Steel for the Government.—A royal decree has been promulgated, ordering that 3,000 tons of steel per annum shall be produced in the manufactories of the country for war purposes.

The Old Glory Returning to Spain.—There is a new Bessemer steel plant at Bilbao, with two 9-ton converters, which manufactures steel rails, and there are now in operation eight large modern blast furnaces, making Bessemer pig iron. That Spain should now have Bessemer steel works and manufacture Bessemer pig iron for shipment to other countries is a fact of great importance. A few years ago these achievements could not have been looked for.

SWEDEN.

We are again indebted to Professor Richard Åkerman, of Stockholm, for official statistics of the iron and steel industries of Sweden. The figures for 1882, 1883, 1884, and 1885 are as follows.

ARTICLES.	Metric tons.			
	1882.	1883.	1884.	1885.
Iron ore	892,863	885,124	909,553	873,362
Pig iron, all made with charcoal	398,945	422,627	430,534	464,737
Bar iron and rods	259,462	255,853	264,944	257,369
Bessemer iron and steel	47,358	50,878	53,123	52,021
Martin iron and steel	13,405	16,800	19,354	26,743
Other kinds of steel	1,430	1,827	1,764	1,786
Plates	15,805	17,439	17,534	16,494
Nails	8,143	8,197	9,720	10,577
Number of furnaces in blast	185	191	178	179
Total time for all furnaces in blast, days	40,157	41,229	40,361	42,460
Average production per furnace per day, tons	9.93	10.25	10.67	10.95
Average time per furnace in blast, days	217	216	227	237

It appears that the production of bituminous coal in the southern part of Sweden is steadily growing, having increased almost fourfold since 1872. About 1,200 persons were employed in min-

ing coal in 1885. The coal industry of Sweden is, however, very small compared with that of its neighbors.

NORWAY.

The following is an official statement of the iron industry of Norway. We place it on record chiefly to show that the "Norway iron" of commerce is practically a lost product. Norway imports more iron than she makes.

AVERAGE ANNUAL PRODUCTION.	Metric tons.		
	Iron ore.	Pig iron.	Wrought iron.
1851-55	23,400	9,090	5,430
1856-60	22,000	8,830	4,820
1861-65	24,500	7,720	4,500
1866-70	20,200	5,240	2,140
1871-75	25,750	1,950	550
1876-80	12,900	1,040	450
1882	1,950	740	400

RUSSIA.

Coal.—The production of coal in Russia in 1882 was 3,742,380 metric tons.

Pig Iron.—The production of pig iron in Russia in 1882 was 498,400 tons, against 462,027 tons in 1881, and 441,285 tons in 1880.

Steel.—The production of steel in Russia in 1882 was 225,140 tons, against 285,082 tons in 1881, and 295,568 tons in 1880.

Steel Rails in Russia.—The new Russian Minister of Finance, Vishnigradsky, has signalized his accession to power by ordering that for the future the bounty on steel rails manufactured in Russia is only to be paid on those that can be proved to have been made of Russian metal. Heretofore the bounty has been paid indiscriminately to firms using Russian iron and those using metal imported from abroad, although theoretically it was supposed to be paid only to the former.

New Steel Works in South Russia.—A Russian correspondent writes that the construction of ironclads at Sebastopol and Nicolaeff is exercising considerable influence on the development of iron and steel works and rolling mills in the province of Ekaterinoslav. A little more than two years ago the semi-official Briansk Company increased its capital by nearly a quarter of a million sterling in order to erect new works in the Krivoy Rog district, as

a branch establishment to its colossal works at Briansk. During the past winter 1,000 men have been employed day and night hastening their completion, in response to the pressure of the government and the commencement of rival undertakings by foreign firms. The Krivoy Rog district is said to contain the richest deposits of iron ore in the world. The new Briansk establishment is located within twenty miles of the town of Ekaterinoslav, close to the works the Messrs. Cockerill are erecting. The works of the Briansk Company are expected to be finished by the end of April. At the outset they will be chiefly occupied in manufacturing steel plates for the South Russian ironclads, and steel rails for the new East Russian railroads. The works lie close to the railroad, and are connected with those at Briansk by canal and river. Judging by appearances the iron trade of Russia is rapidly shifting from the Urals and St. Petersburg to the provinces contiguous to the Black Sea, and the development of the southern fleet will hasten this movement. Reports are current that two more ironclads are to be commenced this year at Sebastopol.

AUSTRIA AND HUNGARY.

Coal.—The production of coal in the Austrian Empire in 1885 was 17,892,819 metric tons, of which 10,514,153 tons were "brown coal."

Pig Iron.—The latest authoritative statement we have seen of the production of pig iron in the Austrian Empire is by Professor F. Kupelweiser, for the year 1884. He gives the total production as 734,346 metric tons, of which Austria proper produced 539,621 tons and Hungary produced 194,725 tons.

Steel.—The total production of steel in the Austrian Empire in 1885 was 278,803 metric tons, of which 226,398 tons were Bessemer and 52,405 tons were open-hearth.

ITALY.

The Italian Government, aided by enterprising Italian citizens, is making earnest efforts to build up an iron and steel industry in Italy that will favorably compare with that of other countries. The country possesses an abundance of the best iron ore, but is not supplied with an abundance of mineral fuel. The Terni Blast Furnace and Steel Works Company has an immense capital, amounting to millions of dollars, of which the government has advanced $640,000. The Armstrong Company has received advances on

account of the works at Puzzuoli amounting to about $1,350,000. As a result of these enterprises it is expected that Italy will produce the largest masses of iron and steel in the form of guns, armor-plate, hoisting machinery, etc., as well as steel rails and other products. Steel rails are now made by the Terni company.

The production of pig iron in Italy in 1884 was 18,405 metric tons, and the number of furnaces in blast was 13. In the same year the production of wrought iron and steel was 124,774 tons, to produce which required 222 works. Doubtless some of these works were foundries, machine shops, and similar establishments.

NEW SOUTH WALES.

The development of the coal fields of New South Wales has been as follows since 1829.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1829.....	780	1860.....	368,861	1880.....	1,466,180	1884.....	2,749,109
1840.....	20,256	1865.....	585,525	1881.....	1,769,597	1885.....	2,878,863
1850.....	71,216	1870.....	868,564	1882.....	2,109,282		
1855.....	137,076	1875.....	1,329,729	1883.....	2,521,457		

STATISTICS

OF THE

AMERICAN AND FOREIGN IRON TRADES

FOR 1887.

ANNUAL STATISTICAL REPORT

OF THE

AMERICAN

IRON AND STEEL ASSOCIATION,

CONTAINING

COMPLETE STATISTICS OF THE AMERICAN IRON TRADE FOR 1887, COMPARED WITH 1886, AND A BRIEF REVIEW OF THE PRESENT CONDITION OF THE IRON INDUSTRY IN FOREIGN COUNTRIES.

PRESENTED TO THE MEMBERS, MAY 1, 1888.

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Mr. J. M. Swank

STATISTICS OF THE FOREIGN IRON TRADE FOR 1887.

LETTER TO THE PRESIDENT.

HON. B. F. JONES,

President of The American Iron and Steel Association, Pittsburgh, Pa.

DEAR SIR: I have the honor to submit herewith the Annual Statistical Report of the American Iron and Steel Association for 1887, containing full statistics of our iron and steel industries and other valuable industrial and commercial statistics for that year. Elaborate tables relating to the iron and steel industries of the United States and Great Britain in previous years, the production and prices of anthracite coal in the United States in previous years, railroad mileage in the United States and immigration into the United States in previous years, etc., etc., many of which have heretofore formed a part of the Annual Report, have been embodied in a new compilation, styled a Statistical Abstract, which will be forwarded to our members hereafter. By this division of statistical information it is believed that the Annual Report will in the future more fully embody the purpose which its name expresses. The Statistical Abstract represents the past; the Annual Report speaks for the immediate present. I feel sure that all friends of the Association will approve the change which has been made.

When I took charge of the office of the American Iron and Steel Association on the 1st day of January, 1873, I did not dream, nor, I think, did any member of the Association dream, that the iron and steel industries of this country could make such magnificent forward strides in the next fifteen years as they have accomplished. With the great progress which these industries have made in these years it has been my constant endeavor that this Association should keep full pace. The record of all that it has done in this eventful period can never be known by those who have not personally participated in its work, but of that part of its work which has met the public eye it may, I hope, be said that it has met all reasonable expectations. The publication of the Statistical Abstract and the consequent elimination from the Annual Report of many elaborate tables are changes which mark not only the rapid growth of our iron and steel industries in fifteen years, but also the great development in that time of the important statistical work of the Association.

The work of the Association during 1887 was of the same general character as that of previous years. The annual statistics for 1886 were collected and published in the Annual Report, which appeared on April 25th. The semi-annual statistics were collected and published in *The Bulletin* in July. A revision of the Directory occupied a large part of the time of our clerical force during the last four months of the year, and in December the revised edition was printed and mailed to our members and correspondents. *The Bulletin* appeared regularly during the year. The distribution of tariff tracts was continued in every

month. The statistical, miscellaneous, and tariff correspondence of the Association greatly increased during 1887. Promptness in replying to all letters requesting information has always been a rule of this office, and the extent of this correspondence at certain seasons of the year, especially when Congress is in session, involves a great deal of hard work. The whole business of the office has more than doubled since 1880. Within the past year we have been compelled to add a large library-room to our office accommodations.

The regular and systematic distribution of tariff tracts has been a leading feature of the work of the Association since 1877. Millions of well-printed tracts have since been sent into almost every part of the Union—the most going where they were most needed. In 1886 the number distributed was 364,500, and in 1887 it amounted to 109,500. During the first four months of 1888 the number of tracts distributed amounted to 657,487. These tracts have in every instance been written and printed to promote the general welfare, and not that alone of our iron and steel industries. But for them the Protective policy would not be nearly so strong in this country to-day as it is. Few know—not even the members of this Association know—what these tracts have done to educate our whole people to believe in Protection as a principle which is forever to be defended. Applications for these tracts from tariff clubs, Senators and Representatives in Congress, college professors, newspaper editors, and others have come to us for many years in nearly every mail. Were we to undertake to copy these applications into *The Bulletin* from week to week its columns could not contain them. The work of printing and distributing tariff tracts will be continued throughout the whole of the present year.

The membership of the Association in 1887 remained substantially the same as in recent years. Payments were made into our treasury by 322 companies, firms, and individuals located or residing in every iron-making State in the United States.

The receipts of the Association in 1887 amounted to $20,547.07, and the expenditures to $19,797.05. The receipts in 1886 were $16,156.73, and the expenditures were $16,564.93. At the beginning of 1887 there was in our treasury $3,389.88, and at the beginning of 1888 there was $4,139.90.

In the collection of the statistics for 1887 I have had the assistance of Mr. WILLIAM M. BENNEY, and in the important work of revising the Directory I have had in addition the assistance of Dr. WILLIAM M. SWEET. Both gentlemen are old and experienced clerks in our office. I am also under obligations to Hon. WILLIAM F. SWITZLER, the Chief of the Bureau of Statistics of the Treasury Department, and to other gentlemen whose names appear in the body of the Report, for assistance in the compilation of commercial and miscellaneous industrial statistics.

Very Respectfully,

JAMES M. SWANK, *General Manager.*

No. 261 SOUTH FOURTH STREET, PHILADELPHIA, May 1, 1888.

IRON AND STEEL NECROLOGY.

THE mortality among iron and steel manufacturers in this country in 1887 and thus far in 1888, and among others directly connected with our iron and steel industries, has been so great that the preservation of the names of the deceased and of the dates of their death finds a proper place in this Report. We add the names of a few foreigners who have been identified with the manufacture of iron and steel.

(1887.) Hon. John S. Newberry, at Detroit, Mich., January 2d, aged 60 years.——John Roach, shipbuilder, at New York, January 10th, aged 71 years.——Sir Joseph Whitworth, at Monte Carlo, January 22d, aged 83 years.——Hon. Edward Breitung, at Eastman, Ga., March 3d.——Major John W. Duncan, at Altoona, Pa., March 15th, aged about 60 years. ——John Lord Hayes, LL.D., Secretary of the National Association of Wool Manufacturers, at Cambridge, Mass., April 18th, aged 75 years. In early life Mr. Hayes was part owner and superintendent of the Katahdin Iron Works, in Maine.——James R. Thompson, President of the Jersey City Steel Company, at New York, April 18th, aged 64 years.—— Franklin A. Comly, at Fort Washington, near Philadelphia, April 23d, aged 74 years.——Barlow W. Van Voorhis, President of the Manhattan Iron Works Company, of Manhattanville, New York City, April 27th, aged 67 years.——Henry Mendinhall, President of the Diamond State Iron Company, at Wilmington, Delaware, April 28th, of apoplexy, aged 50 years.——W. C. DePauw, President of the New Albany Rail Mill Company, at Chicago, May 5th, aged 60 years.——Albert Alling, General Manager and Treasurer of the Barnum and Richardson Manufacturing Company, at Chicago, May 27th.——J. J. Keller, one of the proprietors of the Capon Iron Works, W. Va., at Winchester, Va., June 7th. ——George C. Reis, of New Castle, Pa., killed by cars at his furnace at Iron River, Mich., July 12th, aged about 60 years.——Alfred Krupp, at Essen, Germany, July 14th, aged 75 years.——Charles T. Parry, of Burnham, Parry, Williams & Co., Philadelphia, at Beach Haven, N. J., July 18th, aged about 65 years.——Horace Abbott, near Baltimore, August 8th, aged 81 years.——Robert Hunt, F. R. S., compiler of the "Mineral Statistics of the United Kingdom," at London, October 17th, aged 80 years. ——David Morgan, President of the Republic Iron Company, of Marquette, Mich., at Asheville, N. C., October 30th, aged 68 years.——Titus Salt, at Saltaire, England, Secretary and Treasurer of the Dayton Coal and Iron Company, of Dayton, Tenn., November 19th, aged 45 years. ——Stephen Robbins, of S. Robbins & Son, at Philadelphia, December 4th, aged 68 years.——Springer Harbaugh, at St. Paul, December 8th, aged about 72 years.——William Mulligan, at New York, December 11th, aged 61 years.——Charles Rutter, at Pottstown, Pa., December 27th, in his 78th year. He was a descendant of Thomas Rutter, who

made at Manatawny early in the 18th century the first iron that was made in Pennsylvania.

(1888.) Charles Knapp, at Washington, D. C., January 7th, in his 73d year. He was a member of the firm of Mackintosh, Hemphill & Co., of Pittsburgh.——John W. Crawford, in California, January 7th. He was for many years engaged in the iron trade at New Castle, Pa.——Peter Shoenberger, a son of George K. Shoenberger, in January, aged 39 years. ——James Noble, father of the Noble Brothers, of Anniston, Ala., at Rome, Ga., in January, aged 83 years.——William Ward, Sr., at Girard, Ohio, January 24th, aged 82 years. He was a pioneer iron manufacturer of the Mahoning Valley, and was for years identified with the iron interests of Niles.——Harvey Rowland, one of the proprietors of the Oxford Iron and Steel Works, at Frankford, Philadelphia, January 30th, in his 73d year.——Horace G. Cleveland, of the iron commission firm of Cleveland, Brown & Co., at Cleveland, Ohio, February 3d.—— Barnabas H. Bartol, at Philadelphia, February 10th, in his 72d year. In early life he was superintendent of the West Point Foundry, at Cold Spring, N. Y., and later superintended the Southwark Foundry, at Philadelphia.——William Kelly, the American inventor of the Bessemer steel process, at Louisville, Ky., February 11th, aged 78 years. He was a native of Pittsburgh, Pa.——John B. Seidel, at Lebanon, Pa., February 15th, aged 75 years. He was engaged in the manufacture of iron for 41 years, but retired from business some years ago.——George Henry Corliss, the inventor of the Corliss engine, February 21st, in his 71st year. He was born at Easton, N. Y., June 2, 1817.——Garrett Roach, of the firm of John Roach's Sons, at New York, February 24th.—— John Stambaugh, President of the Brier Hill Iron and Coal Company, at New York City, March 5th, aged 62 years.——Josiah E. Rutter, Secretary and Treasurer of the Lickdale Iron Company, at Lebanon, Pa., March 9th.——Captain Robert E. Blankenship, president of the Old Dominion Iron and Nail Works Company, killed by a freight train at Richmond, Va., March 13th, in his 53d year.——Colonel Charles Scranton, at Oxford, N. J., March 16th. He had been identified with the coal and iron industries for nearly half a century. His death was the result of an accident caused by jumping from a train of cars at Oxford.—— Robert Hadfield, in England, March 20th, aged 57 years. He was the founder of the Hecla Works, Sheffield, noted for their steel castings. ——Professor James C. Booth, at Haverford College, near Philadelphia, March 21st, aged about 78 years. He was the founder of the firm of Booth, Garrett & Blair, iron and steel chemists.——Charles E. Wright, State Geologist of Michigan, at Marquette, Mich., March 22d, aged 44 years.——Alfred Hunt, President of the Bethlehem Iron Company, at Moorestown, N. J., March 27th, in his 71st year.

STATISTICS OF THE AMERICAN IRON TRADE FOR 1887.

GENERAL REVIEW OF THE DOMESTIC IRON TRADE IN 1887 AND DURING THE FIRST QUARTER OF 1888.

THE year 1887 was the most active year in the history of the American iron trade, far exceeding all previous years, including the remarkable year 1886, in the production and consumption of iron and steel in nearly all their leading forms. The following table shows the production in 1887 in comparison with 1886 and 1885.

Products. Net tons of 2,000 pounds. (Except nails.)	1885.	1886.	1887.	Increase over 1886. Per cent.
Pig iron	4,529,869	6,365,328	7,187,206	13
Bessemer steel ingots	1,701,762	2,541,493	3,288,357	29
Bessemer steel rails	1,074,607	1,763,667	2,354,132	33
Open-hearth steel ingots	149,381	245,250	360,717	47
Open-hearth steel rails	4,793	5,255	19,203	265
Crucible steel ingots	64,511	80,609	84,421	4
Rolled iron, except rails	1,789,711	2,259,943	2,565,438	13
Iron rails	14,815	23,679	23,062	—2
Kegs of cut nails (100 lbs.)	6,696,815	8,160,973	6,908,870	—15
Pig, scrap, and ore blooms	41,700	41,909	43,306	3

These figures tell a story of truly wonderful progress, such as has been witnessed in no other great industry in this country, and in no other ironmaking country. In the two years from 1885 to 1887 we increased our production of pig iron 58 per cent., our production of Bessemer steel ingots 93 per cent., our production of Bessemer steels rails 119 per cent., our production of open-hearth steel ingots 141 per cent., and our production of rolled iron 43 per cent. Marvelous as was our production of pig iron, Bessemer and open-hearth steel, and steel rails in 1886 and 1887, it is perhaps no less remarkable that, with so large a production of steel in these years, we should also have so greatly increased our production of rolled iron in the same years. The puddling furnace is more than holding its own in this country against the encroachments of steel.

The stationary character of our almost extinct iron-rail industry

is explained by the great superiority of steel rails; it is a wonder that it survives at all. The decline in the production of cut nails in 1887 as compared with 1886 is accounted for by the growing tendency to substitute wire nails for cut nails for many purposes. Our production of wire nails in 1887 was about 1,250,000 kegs of 100 pounds. In 1886 it was about 600,000 kegs.

The extraordinary production of iron and steel in the United States in 1886 and 1887 was mainly the result of the increased demand for these products caused by the construction in these two years of over 21,000 miles of new railroad, the mileage for 1886 being 8,999 miles, and for 1887 being in round numbers 12,500 miles. These new railroads required steel rails, and they also required tools, locomotives, cars, and bridges, into the construction of which iron and steel would largely or wholly enter. Other influences contributed in a minor degree to the production of 1886 and 1887, chiefly growing out of the general prosperity of the country, which created an increased activity in all manufacturing, mining, agricultural, and other enterprises which require the use of iron and steel. The business of the established trunk railroads was so heavy in these two years that there was found to be on many lines a great deficiency of rolling stock, and new cars and locomotives were freely ordered. The prosperity of these roads also justified the purchase of large quantities of steel rails for the improvement of their roadbeds, and many rails were bought and laid down. The increased weight of trains in late years has called for stronger iron and steel bridges, and many of these were substituted for lighter bridges in 1886 and 1887. The modern tendency to substitute iron and steel structural shapes for wood in the erection of public and private buildings was everywhere very noticeable in 1886 and 1887. The General Government materially aided our iron and steel industries in these two years by its liberal expenditures for public buildings and a new navy. In the two years mentioned the population of the country was increased by immigration nearly a million persons, who required iron and steel for many domestic and other purposes. Too little account is usually taken of the increased demand in this country from year to year for iron and steel which is created by our large immigration and by the growth of our population from natural causes. Finally, our iron and steel industries were materially helped in the two years mentioned by the demand for iron and steel to be used in the erection of many new iron and steel works, particularly in the Southern States.

While our production of iron and steel in 1887 was unexampled in magnitude, the general range of prices was kept within reasonable bounds. This was wholly due to our greatly increased capacity for producing iron and steel; the demand for these products was so great that, if this capacity had been much less than it was, prices would have been largely speculative, values would have been fictitious, foreigners would have absolutely controlled our markets, and we would have had a repetition in all particulars of the disappointing experience of the boom year 1880.

Nothwithstanding the great activity in our production of iron and steel in 1887, the year was not one of uniform prosperity, although it was one of fairly uniform activity. Our production of pig iron in the last half of 1887 was considerably larger than in the first half, our production of Bessemer and open-hearth steel was slightly larger, and our production of Bessemer steel rails was almost as large. Prices, however, fell steadily throughout the greater part of the year, reaching at its close much lower figures than prevailed at the beginning. The shrinkage in prices was most marked in steel rails, which fell at Pennsylvania mills from an average of $39.50 per ton in February and March to an average of $32 in December. Gray forge pig iron at Pittsburgh fell from $21 to $17 per ton during the year. Nails at Pittsburgh fell from $2.60 to $1.85 per keg. No. 1 foundry pig iron at Philadelphia experienced the least variation in price, declining only one dollar per ton from January to December.

The shrinkage in prices in 1887, notwithstanding the enormous consumption of the year, was chiefly caused by the general conviction about the middle of the year that the remarkable industrial and speculative activity of the preceding year and a half could not much longer be maintained, especially the phenomenal demand for steel rails for new railroads. This opinion has since been fully justified. A decided reaction in the building of new railroads has taken place, and notices of new manufacturing enterprises and the booming of towns and cities occupy much less space in the newspapers now than they did a year ago. Another cause of the shrinkage in prices of iron and steel in 1887 was the importation of large quantities of foreign iron and steel in 1886 and 1887, the full effects of which were not felt until the summer of 1887. A short corn crop and a slight financial scare in September, the latter caused by the accumulation of funds in the National Treasury, also tended to depress prices. In December the President's message, recommending

an enlargement of the free list and a reduction in duties, acted as a further depressing influence.

Our imports of iron and steel in 1887 amounted to 1,783,251 gross tons, against 1,098,565 gross tons in 1886, 578,478 gross tons in 1885, and 654,696 gross tons in 1884. We have never imported so large a quantity of iron and steel in any year as in 1887, except in the boom year 1880, when the imports amounted to 1,886,019 gross tons. The imports in 1887 were over 62 per cent. greater than in 1886. In 1886 they were almost 90 per cent. greater than in 1885. In 1880 our iron and steel manufacturers suffered so severely from the effects of the heavy importations of that year that it was generally remarked that this country would never again repeat that year's experience; yet we virtually repeated it in 1887.

The production of pig iron in the Southern States in 1887 did not equal the general expectation, being only about 50,000 net tons in excess of the production in 1886. But the fact is not so fully considered as it should be that the South during the past two years has in reality only been getting ready to greatly increase its production of pig iron. It has within that time undertaken the erection of more than thirty large blast furnaces, but of these only eight were completed down to the close of 1887, namely, two in Virginia, four in Alabama, and one in each of the States of Kentucky and Tennessee. At the close of 1887 twenty furnaces were under construction in Alabama, three in Tennessee, two in Maryland, and one in Virginia. Some of these will be finished in 1888.

Our production of iron ore in 1887 was larger than in 1886 or any previous year, amounting in round numbers to 11,300,000 gross tons. The Lake Superior region shipped 4,660,652 gross tons in 1887, against 3,568,357 tons in 1886, and 2,466,532 tons in 1885. The imports of iron ore in 1887 amounted to 1,194,301 gross tons, against 1,039,433 tons in 1886. Our total consumption of iron ore in 1887 was about 12,500,000 tons.

The manufacturers of pig iron were compelled to pay high prices for Lake Superior iron ore and Connellsville coke all through the year. No. 1 specular and magnetic Bessemer ore at Cleveland ranged from $7 to $7.50 from January to December. The advance on all grades in 1887 averaged over one dollar per ton as compared with 1886. Connellsville coke was advanced from $1.50 to $2 on the 1st of February, and this price was continued until the close of the year. Concessions upon these prices have since been made, the price falling to $1.00 and even less in April.

During the first quarter of 1888 the situation as it existed at the close of 1887 has not improved but has grown slightly worse. Production and prices have both declined. The demand for steel rails has greatly declined, some of the mills having been wholly idle since about the middle of December, and others during a part of the intervening time. The price of steel rails at Pennsylvania mills during the first quarter of 1888 has been $31.50 per ton. The production of both pig iron and steel rails in 1888 must be much less than in 1887, and will probably be less than in 1886.

The outlook at the present moment is not encouraging. In addition to the depressing influences already alluded to, which originated in 1887, there is now in progress at Washington a movement to overthrow our Protective policy, embodied in the Mills tariff bill, the issue of the contest being in doubt. Early in the year a war of railroad freight rates was inaugurated in the West, and it has not yet wholly terminated. An extensive railroad strike has been in progress on the Chicago, Burlington, and Quincy Railroad since February 27th, which has greatly retarded business in the West and shaken general confidence. On the 12th of March a genuine Northwestern blizzard visited the North Atlantic States, entirely stopping railroad traffic for several days. In the latter part of the month and in the early part of April severe storms and high floods visited the West and Northwest, doing great damage. These severe meteorological changes have injuriously affected all business. As a result of all the influences mentioned, whether originating this year or last, the earnings of all the trunk and granger railroads of the country have declined thus far in 1888.

It would not, however, be correct to assume that the first quarter of the new year closes with general depression in our iron and steel industries. The shrinkage in demand is most marked in steel rails, and is next most noticeable in pig iron, bar iron, and wrought-iron pipe. But the consumption of pig iron for miscellaneous purposes is still large, and the steel-rail manufacturers have already entered orders for a large quantity of steel rails which will be needed in 1888 for renewals and extensions as well as for some new railroads which must be built. The bridge works of the country, the foundries, the machine shops, the car-builders and car-wheel manufacturers, the locomotive builders, and many other consumers of iron and steel are still very busy.

We do not recall one serious strike in the iron trade of this country during 1887. There was dissatisfaction with the wages

paid at various places, but the difficulties were soon healed. A protracted strike of miners and coke-drawers in the Connellsville coke district in the spring and early summer seriously interfered with the supply of coke to blast furnaces, about 50 of which were banked or blown out for several weeks. In September a strike of miners occurred in the Lehigh anthracite region, which interfered with the production of pig iron in the region mentioned during the next six months. The miners are now at work. A strike of the miners in the Schuylkill anthracite region in January and February last interfered with the supply of fuel to blast furnaces in the valley during the few weeks the strike lasted. On the 1st of February there were 21 blast furnaces which had been banked or blown out in consequence of the Lehigh and Schuylkill strikes.

Wages in the iron trade were generally advanced at the beginning of 1887, but with falling markets it was too much to expect that this advance could be maintained in 1888, and wages have accordingly been generally reduced about 10 per cent. since the new year opened. They are, however, higher than in 1885 and about as high as in 1886. The reduction has in most cases been accepted with good grace. Intelligent workingmen realize that the country is not so prosperous in 1888 as it was in 1886 and 1887, and that as prices of manufactured products decline wages must also fall. Nevertheless, all workingmen are not so thoughtful and discreet as they should be, and it is one of the unpleasant facts which the impartial statistician of this age of wonderful industrial activity is compelled to record that many workingmen will not see, or seeing will not acknowledge, the full meaning of steadily declining market quotations. Hence there are workingmen in our iron and steel industries to-day who unwisely hesitate to accept a reduction in their wages, or who accept it with bad grace.

PRICES OF IRON AND STEEL.

In the following table we give the average prices in the United States of leading articles of iron and steel from January, 1885, to April 16, 1888. The monthly quotations are averaged from weekly quotations. The prices are per ton of 2,240 pounds, except for bar iron and nails, which are quoted by the pound and the keg. The period covered by this table embraces the bad year 1885, when prices were lower than in any previous year since 1879, the rise in prices in 1886 and in the early part of 1887, and the gradual decline which subsequently took place and which still continues.

Months.	Old iron T rails, at Philadelphia.	No. 1 anthracite foundry pig iron, at Philadelphia.	Gray forge pig iron, at Philadelphia.	Gray forge pig iron, Lake ore mixed, at Pittsburgh.	Steel rails, at mills in Pennsylvania.	Best refined bar iron, from store, Philadelphia.	All muck bar iron, at Pittsburgh.	Iron nails, (gross price,)at Pittsburgh.
January, 1885	$17.50	$18.00	$16.00	$16.25	$27.00	1.8c.	1.65c.	$2.05
February	17.50	18.00	16.00	16.00	27.00	1.8c.	1.65c.	2.25
March	17.50	18.00	16.00	16.00	26.50	1.8c.	1.65c.	2.25
April	17.75	18.00	16.00	15.50	26.00	1.8c.	1.65c.	2.25
May	17.50	17.87	15.75	15.50	27.00	1.8c.	1.65c.	2.10
June	17.50	17.75	15.00	15.00	27.25	1.8c.	1.65c.	2.15
July	17.25	17.75	15.00	15.00	27.25	1.8c.	1.6c.	2.20
August	17.25	17.75	15.00	14.50	27.25	1.8c.	1.55c.	2.15
September	17.50	18.00	15.50	14.75	29.00	1.8c.	1.6c.	2.15
October	17.50	18.25	15.50	14.75	30.50	1.8c.	1.6c.	2.75
November	19.50	18.25	15.50	14.75	33.00	1.8c.	1.65c.	2.87
December	19.75	18.25	15.75	15.25	34.50	1.8c.	1.7c.	2.70
January, 1886	22.00	18.50	16.25	16.50	34.50	1.85c.	1.7c.	2.50
February	23.00	18.50	16.50	16.50	34.50	1.9c.	1.7c.	2.50
March	22.00	18.75	16.75	16.50	34.50	1.9c.	1.7c.	2.50
April	21.00	18.50	16.50	16.50	34.50	1.9c.	1.7c.	2.40
May	20.50	18.50	16.50	16.50	34.50	1.9c.	1.7c.	2.15
June	19.50	18.25	16.00	16.25	34.50	1.9c.	1.65c.	2.05
July	19.00	18.25	16.00	15.75	34.50	1.9c.	1.65c.	1.90
August	20.00	18.25	15.75	15.50	34.25	1.9c.	1.65c.	1.90
September	21.25	18.50	16.00	15.75	34.00	1.95c.	1.65c.	2.00
October	21.75	19.00	16.25	16.50	34.00	2.0c.	1.7c.	2.00
November	22.25	19.50	16.75	17.75	34.50	2.0c.	1.75c.	2.00
December	24.75	20.00	17.50	19.00	36.00	2.0c.	1.85c.	2.10
January, 1887	25.25	21.50	18.50	20.50	38.50	2.15c.	2.0c.	2.35
February	24.00	21.50	19.00	21.00	39.50	2.25c.	2.0c.	2.60
March	23.00	21.00	19.00	20.50	39.50	2.3c.	2.0c.	2.60
April	22.75	20.75	18.50	20.25	39.25	2.3c.	2.0c.	2.35
May	21.85	20.85	18.00	19.00	39.00	2.3c.	2.0c.	2.15
June	22.60	21.00	17.85	18.50	39.00	2.2c.	2.0c.	2.05
July	23.50	21.00	17.60	18.50	38.50	2.2c.	1.9c.	2.00
August	24.00	21.00	17.25	18.50	37.00	2.2c.	1.9c.	2.00
September	22.75	21.00	17.00	18.50	36.00	2.2c.	1.9c.	2.00
October	22.00	20.50	17.00	18.25	34.25	2.15c.	1.9c.	2.00
November	22.00	20.50	17.00	17.75	32.50	2.1c.	1.9c.	1.85
December	22.00	20.50	16.75	17.00	32.00	2.1c.	1.85c.	1.90
January, 1888	21.75	21.00	16.75	17.00	31.50	2.2c.	1.85c.	1.90
February	22.00	20.75	17.00	16.75	31.50	2.2c.	1.80c.	1.90
March	21.50	20.50	17.00	16.50	31.50	2.1c.	1.80c.	1.90
April 16	21.00	20.00	16.75	16.00	31.50	2.0c.	1.75c.	1.90

IMPORTS OF IRON AND STEEL.

The following table, compiled from information supplied by the Chief of the Bureau of Statistics of the Treasury Department, gives the weight of all the leading articles of iron and steel imported into the United States in the last four calendar years.

Commodities. Net tons of 2,000 pounds.	1884.	1885.	1886.	1887.
Pig iron	206,381	164,349	405,180	523,625
Scrap iron	30,192	15,480	97,635	351,028
Scrap steel	8,388	2,196	11,353	29,716
Bar iron	40,998	35,251	32,647	40,565
Iron rails	94	57	7	270
Steel rails	3,074	2,395	46,571	154,099
Cotton-ties	17,518	20,576	11,561	24,276
Hoop, band, and scroll iron	332	103	128	35
Steel hoops, sheets, and plates	1,500	2,644	4,719	26,885
Steel ingots, bars, etc	24,610	33,718	167,257	347,818
Sheet, plate, and taggers' iron	7,863	6,200	6,852	8,012
Tinplates and terne plates	242,123	256,028	288,761	317,896
Iron and steel wire rods	145,525	105,148	153,401	167,272
Wire and wire rope	2,732	2,475	2,689	3,247
Anvils, forgings, etc	967	642	963	1,474
Chains	963	633	669	1,023
Total	733,260	647,895	1,230,393	1,997,241

The foreign value of the imports into the United States from all countries of iron and steel and manufactures thereof represented in the foregoing table, including also machinery, cutlery, fire-arms, and other manufactures of iron and steel the weight of which is not obtainable, was $56,420,607 in 1887 and $41,630,779 in 1886. The foreign value of the imports of iron ore in 1887 was $2,206,958, and in 1886 it was $1,912,437. Our total imports of iron and steel and iron ore in 1886 and 1887 exceeded $100,000,000 in foreign value. The imports of pig iron in 1887 include 176,153 net tons, or 157,279 gross tons, of spiegeleisen.

Our imports of iron and steel in the present year promise to be smaller than in 1887, but the aggregate will still be very large. Low as prices now are in this country, foreign manufacturers can send many of their iron and steel products to our ports, pay the duties levied upon them, and successfully compete with our own manufacturers. In the first two months of the present year we imported iron and steel and manufactures thereof amounting in foreign value to $7,129,770. The imports of iron and steel in February were larger than in January, the figures being 89,755 gross tons in February, against 77,683 gross tons in January.

IMPORTS OF IRON ORE.

The following statement shows the quantities and values of iron ore imported into the United States during the calendar years 1885, 1886, and 1887, by customs districts.

Districts.	1885.		1886.		1887.	
	Gross tons.	Values.	Gross tons.	Values.	Gross tons.	Values.
Baltimore	75,887	$155,803	358,364	$630,072	401,035	$686,891
Boston	212	838	.....	.....	412	1,356
Buffalo Creek	10	40	781	2,358	.....	.....
Cuyahoga	10,630	37,001	14,351	42,576	6,893	21,262
Detroit	100	300	.....	.....	.....	.....
New York	18,853	44,071	59,992	140,105	53,520	95,465
Oswegatchie	3,172	9,470	18	60	84	600
Perth Amboy, N. J.	21,271	32,090	23,903	65,282	45,289	118,214
Philadelphia	259,990	512,780	576,077	1,011,202	675,680	1,250,672
Puget Sound	180	360	3,872	7,744	1,229	2,458
Vermont	360	1,443	.....	.....	.....	.....
All other	121	7,097	2,075	13,038	10,159	30,040
Total	390,786	$801,293	1,039,433	$1,912,437	1,194,301	$2,206,958

Our imports of iron ore are principally derived from Spain, Elba, Algeria, and Cuba. From Cuba we imported 97,711 gross tons of iron ore in 1887, (against 111,710 tons in 1886,) of which 77,807 tons were received at the port of Philadelphia and 19,904 tons were received at the port of Baltimore. All the Cuban ores were shipped by the Juragua Iron Company Limited. Shipments of iron ore from Cuba are expected to increase in 1888.

EXPORTS OF IRON AND STEEL.

The value of the exports from the United States to all countries of domestic iron and steel and manufactures thereof in the calendar years 1871 to 1887 was as follows.

Years.	Values.	Years.	Values.	Years.	Values.	Years.	Values.
1871	$14,185,359	1876	$13,641,724	1881	$18,216,121	1886	$14,865,087
1872	12,595,539	1877	18,549,922	1882	22,348,834	1887	16,235,922
1873	14,173,772	1878	15,101,899	1883	22,716,040		
1874	17,312,239	1879	14,223,646	1884	19,290,895		
1875	17,976,833	1880	15,156,703	1885	16,622,511		

Our iron and steel exports consist chiefly of finished articles, ready for use, such as fire-arms, printing-presses, hardware, axes, saws, and other tools, shovels, scales and balances, sewing machines, locomotives and other steam engines, boilers, stoves and ranges, machinery, car-wheels, castings, and similar finished products. In

1887 we exported only 6,796 gross tons of pig iron, 26 tons of iron rails, 523 tons of steel rails, and 132,660 kegs of cut nails and spikes. In the same year we exported 55 locomotives, which was 5 more than in 1886. Our insignificant exports of iron ore are not included in the above table.

Although not strictly manufactures of iron and steel, our exports of agricultural implements, consisting chiefly of mowers and reapers and plows and cultivators, are entitled to mention in this connection, being largely composed of iron and steel. In 1887 they amounted in value to $2,427,835, against $2,119,772 in 1886.

PRODUCTION OF PIG IRON.

The total production of pig iron in the United States in 1887 was 7,187,206 net tons, or 6,417,148 gross tons. The total production in 1886 was 6,365,328 net tons, or 5,683,329 gross tons. The increase in 1887 over 1886 was 733,819 gross tons, or about 13 per cent. The production in the first half of 1887 was 3,415,210 net tons, and in the second half it was 3,771,996 net tons, or 3,049,295 and 3,367,853 gross tons respectively.

Our production of pig iron in 1887 was divided among the fuels used as follows, in net tons: bituminous, 4,270,635 tons; anthracite and bituminous mixed, 1,919,640 tons; anthracite alone, 418,749 tons; charcoal, 578,182 tons. In the following table the production of pig iron in the last five years, exactly classified according to the fuel used, is given in net tons.

Fuel used.	1883.	1884.	1885.	1886.	1887.
Bituminous	2,689,650	2,544,742	2,675,635	3,806,174	4,270,635
Anthracite and coke	920,142	1,339,883	1,176,477	1,655,851	1,919,640
Anthracite alone	965,454	246,570	277,913	443,746	418,749
Charcoal	571,726	458,418	399,844	459,557	578,182
Total	5,146,972	4,589,613	4,529,869	6,365,328	7,187,206

The steady advance of bituminous fuel, almost entirely in the form of coke, is forcibly shown in this table. The use of all raw bituminous coal in the manufacture of pig iron is now confined to a few furnaces in Ohio, Kentucky, and Indiana. The decline in the use of unmixed anthracite since 1883 is very noticeable. Charcoal made a creditable advance in 1887, but the production of charcoal pig iron in that year was still very far below that of 1882, when it reached 697,906 tons.

Twenty-two States and one Territory made pig iron in 1887. The same States and the same Territory made pig iron in 1886.

California also made pig iron in 1886, but made none in 1887. The following table shows the production of pig iron by States in 1887 in the order of their prominence.

States.	Net tons.	States.	Net tons.
Pennsylvania	3,684,618	Georgia	40,947
Ohio	975,539	Maryland	37,427
Illinois	565,453	Colorado	25,291
New York	296,572	Connecticut	21,741
Alabama	292,762	Indiana	13,211
Tennessee	250,344	Massachusetts	11,114
Michigan	213,543	Maine	4,397
Virginia	175,715	Texas	4,383
New Jersey	172,554	North Carolina	3,640
Missouri	138,643	Washington Territory	1,586
Wisconsin	133,508		
West Virginia	82,311	Total	7,187,206
Kentucky	41,907		

Pennsylvania produced 51.2 per cent. of the total production of pig iron in 1887; Ohio, 13.5 per cent.; Illinois, 7.8 per cent.; New York, 4.1 per cent.; and Alabama, 4 per cent. Every other State fell below 4 per cent. Maine, Georgia, West Virginia, Kentucky, Indiana, and Washington Territory made less pig iron in 1887 than in 1886, while all the other States in the table increased their production in that year over 1886. A table in the latter part of this report shows the production of each of the States in recent years.

The total production of pig iron in this country since the revival of prosperity in 1879, following the long depression caused by the panic of 1873, has been as follows, in net and gross tons.

Years.	Net tons.	Gross tons.	Years.	Net tons.	Gross tons.
1880	4,295,414	3,835,191	1884	4,589,613	4,097,868
1881	4,641,564	4,144,254	1885	4,529,869	4,044,526
1882	5,178,122	4,623,323	1886	6,365,328	5,683,329
1883	5,146,972	4,595,510	1887	7,187,206	6,417,148

The following table shows the production of bituminous pig iron by States in 1887.

States.	Net tons.	States.	Net tons.
Pennsylvania	1,742,931	West Virginia	82,311
Ohio	956,995	New York	52,496
Illinois	565,453	Georgia	40,947
Tennessee	204,120	Kentucky	35,706
Alabama	197,539	Colorado	25,291
Virginia	166,259	Indiana	13,211
Missouri	97,891	Maryland	3,500
Wisconsin	85,985	Total	4,270,635

The following table shows the production of anthracite and of mixed anthracite and bituminous pig iron by States in 1887.

States.	Net tons.
Pennsylvania	1,929,777
New York	217,585
New Jersey	172,554
Maryland	18,473
Total	2,338,389

The following table shows the production of charcoal pig iron by States in 1887.

States.	Net tons.	States.	Net tons.
Michigan	213,543	Pennsylvania	11,910
Alabama	95,223	Massachusetts	11,114
Wisconsin	47,523	Virginia	9,456
Tennessee	46,224	Kentucky	6,201
Missouri	40,752	Maine	4,397
New York	26,491	Texas	4,383
Connecticut	21,741	North Carolina	3,640
Ohio	18,544	Washington Territory	1,586
Maryland	15,454	Total	578,182

The following table shows the production of pig iron in the Southern States since 1881.

States.	Net tons of 2,000 pounds.						
	1881.	1882.	1883.	1884.	1885.	1886.	1887.
Alabama	98,081	112,765	172,465	189,664	227,438	283,859	292,762
Tennessee	87,406	137,602	133,963	134,597	161,199	199,166	250,344
Virginia	83,711	87,731	152,907	157,483	163,782	156,250	175,715
West Virginia	66,409	73,220	88,398	55,231	69,007	98,618	82,311
Kentucky	45,973	66,522	54,629	45,052	37,553	54,844	41,907
Georgia	37,404	42,440	45,364	42,655	32,924	46,490	40,947
Maryland	48,756	54,524	49,153	27,342	17,299	30,502	37,427
Texas	3,000	1,321	2,381	5,140	1,843	3,250	4,383
North Carolina	800	1,150	.....	435	1,790	2,200	3,640
Total	471,540	577,275	699,260	657,599	712,835	875,179	929,436

The production of pig iron in the States here mentioned was 397,301 net tons in 1880. In the seven years which have since elapsed these States have much more than doubled their production. Alabama and Tennessee have made the most progress since 1881, Virginia coming next.

The following table shows the production of pig iron in each district of Pennsylvania since 1872.

Years.	Anthracite and mixed anthracite and coke. Net tons.				Bituminous. Net tons.			Charcoal. Net tons.	Total. Net tons.
	Lehigh Valley.	Schuylkill V.	Upper Susq.	Lower Susq.	Shenango V.	Allegheny Co.	Misc. Coke.		
1872	449,663	232,225	127,260	159,305	160,188	110,599	117,224	45,033	1,401,497
1873	389,969	236,409	129,304	157,403	160,831	158,789	111,014	45,854	1,389,573
1874	316,789	232,420	88,243	137,556	156,419	143,660	97,068	40,978	1,213,133
1875	280,360	123,184	71,731	79,717	137,025	131,856	102,520	34,491	960,884
1876	261,274	144,969	79,217	103,369	138,495	128,555	130,635	23,099	1,009,613
1877	335,059	155,434	56,776	111,252	145,179	141,749	178,271	29,636	1,153,356
1878	416,907	144,558	84,547	137,719	122,958	217,299	189,285	29,360	1,342,633
1879	456,350	191,748	125,971	165,500	150,861	267,315	214,123	35,895	1,607,763
1880	544,987	306,926	168,128	217,889	215,313	300,497	286,007	43,374	2,083,121
1881	560,190	309,049	125,785	218,329	198,968	385,453	341,104	51,908	2,190,786
1882	609,338	342,701	201,367	300,240	264,078	358,840	322,717	49,975	2,449,256
1883	575,987	337,433	165,629	337,419	290,069	592,475	301,564	38,315	2,638,891
1884	431,867	278,578	148,352	419,439	246,086	487,055	350,870	23,155	2,385,402
1885	473,963	204,841	127,278	429,166	206,995	585,696	405,409	12,148	2,445,496
1886	665,941	393,545	158,120	493,362	388,728	737,124	439,742	16,727	3,293,289
1887	722,939	520,375	165,086	521,377	409,102	897,849	435,980	11,910	3,684,618

The Lehigh Valley was the leading pig-iron district in Pennsylvania from 1872 to 1883, in which latter year Allegheny county took the lead of all pig-iron districts and has kept it to this time. The Lehigh Valley made great progress in 1886 and 1887, but the Schuylkill Valley made much greater progress. The charcoal pig-iron industry of Pennsylvania continues to decline.

The following table shows the production of pig iron in each district of Ohio since 1872. The charcoal pig-iron industry of this State has also greatly declined in late years.

Years.	Charcoal. Net tons.		Bituminous coal and coke. Net tons.				Total. Net tons.
	Miscellaneous.	Hanging Rock.	Hanging Rock.	Mahoning V.	Hocking Valley.	Miscellaneous.	
1872	8,182	87,440	23,169	152,756	.....	128,196	399,743
1873	8,133	92,365	28,601	136,972	.....	139,958	406,029
1874	6,962	85,873	26,015	121,403	.....	184,748	425,001
1875	4,558	57,413	36,899	115,993	1,250	199,780	415,893
1876	6,109	42,822	44,260	137,546	7,483	165,057	403,277
1877	1,905	40,212	44,544	136,526	23,895	153,316	400,398
1878	.....	33,513	31,137	134,400	65,690	156,251	420,991
1879	.....	43,445	43,097	147,844	51,908	161,457	447,751
1880	4,336	64,854	60,316	226,877	85,719	232,105	674,207
1881	4,682	61,487	77,500	245,737	88,146	232,994	710,546
1882	3,108	55,546	77,364	258,478	78,770	225,634	698,900
1883	2,394	38,134	82,455	244,265	48,439	263,956	679,643
1884	.....	24,880	64,781	246,288	24,126	207,038	567,113
1885	.....	18,018	68,837	236,078	50,481	180,549	553,963
1886	.....	16,161	116,398	350,178	57,867	367,490	908,094
1887	1,300	17,244	126,487	364,236	62,323	403,949	975,539

For the first time we are enabled this year to present complete statistics of the production of Bessemer pig iron in the United States. The following table gives the production of this kind of pig iron by States in 1887.

States.	Net tons.	States.	Net tons.
Pennsylvania	1,842,449	New York	62,626
Illinois	549,111	Colorado	23,295
Ohio	331,144	Maryland	18,473
Missouri	122,725	Michigan	12,766
Wisconsin	109,585	Tennessee	11,500
West Virginia	73,070		
New Jersey	63,773	Total	3,220,517

The following table shows the production of Bessemer pig iron in 1887 by districts in Pennsylvania and Ohio.

Districts.	Net tons.	Districts.	Net tons.
Pennsylvania.		Allegheny County	560,063
Lehigh Valley	234,952	Miscellaneous bituminous	202,771
Schuylkill Valley	188,839		
Upper Susquehanna Valley	99,973	*Ohio.*	
Lower Susquehanna Valley	405,850	Mahoning Valley	73,204
Shenango Valley	150,001	Miscellaneous bituminous	257,940

A large part of the production of Bessemer pig iron in the Lehigh and Schuylkill valleys and in Maryland, New York, and New Jersey is made from foreign ores, or foreign mixed with native ores. The larger part of the Bessemer pig iron produced in the Lower Susquehanna Valley and a small part of that made in the Schuylkill Valley are made exclusively from Cornwall ore. This ore is also used in connection with other ores in these and other districts, but the larger part of the output of the Cornwall mines is used in the Lebanon Valley, of Pennsylvania, which is included in our tables with the Lower Susquehanna Valley.

The production of spiegeleisen in the United States in 1887 was 47,598 net tons, which was not quite equal to the production of 1886, when we made 47,982 tons. The Missouri Furnace Company did not, as was expected, become a manufacturer of spiegeleisen in 1887. Railroad communication was completed last year with the Arkansas manganiferous iron-ore mines of the St. Louis Manganese Company, in which the Missouri Furnace Company is interested, but all the ore shipped in 1887 (926 gross tons) was sent to the Edgar Thomson furnaces, at Braddock, Pa. The following table shows our production of spiegeleisen since 1875.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1875	7,832	1880	19,603	1885	31,671
1876	6,616	1881	21,086	1886	47,982
1877	8,845	1882	21,963	1887	47,598
1878	10,674	1883	24,574		
1879	13,931	1884	33,893		

UNSOLD STOCKS OF PIG IRON.

The stocks of domestic pig iron on hand and unsold in the hands of manufacturers or their agents on December 31, 1887, and which were not intended for the consumption of the manufacturers, amounted to 338,142 net tons. Considering the very large production of pig iron in 1887, the unsold stocks held at the close of the year were very small, although more than the quantity held on December 31, 1886, which amounted to 252,704 net tons. Our statistics of stocks unsold do not include pig iron sold and not removed from the furnace bank, nor pig iron in the hands of speculators, brokers, or creditors. Nor do they include the very small quantities of foreign pig iron in bond at the close of each year.

The following table shows the quantity of each kind of pig iron unsold in the hands of manufacturers or their agents at the close of each year since 1874.

Years.	Net tons of 2,000 pounds.				Per cent. of production.
	Anthracite.	Bituminous.	Charcoal.	Total.	
1874	248,988	216,479	330,317	795,784	30
1875	274,743	165,482	320,683	760,908	34
1876	268,122	174,302	244,374	686,798	33
1877	239,493	156,818	246,040	642,351	28
1878	226,734	144,835	202,996	574,565	22
1879	33,507	39,275	68,892	141,674	5
1880	175,862	184,626	96,170	456,658	11
1881	90,351	36,495	84,050	210,896	5
1882	107,259	157,196	165,239	429,694	8
1883	178,029	171,802	183,978	533,809	10
1884	178,993	191,845	222,162	593,000	13
1885	68,178	115,982	232,352	416,512	9
1886	50,503	70,634	131,567	252,704	4
1887	114,107	127,978	96,057	338,142	4.7

A table in the latter part of this report shows the quantity of unsold pig iron by States at the close of 1887 and previous years.

NUMBER OF FURNACES IN BLAST.

The number of furnaces in blast in the United States at the close of 1884 was 236; on the 30th of June, 1885, 228; on the 31st

of December, 1885, 276; on the 30th of June, 1886, 314; on the 31st of December, 1886, 331; on the 30th of June, 1887, 306; and on the 31st of December, 1887, 339. The following table shows the number of furnaces in blast at the close of each year since 1873.

Years.	Furnaces.	Years.	Furnaces.	Years.	Furnaces.
1873	410	1878	265	1883	307
1874	365	1879	388	1884	236
1875	293	1880	446	1885	276
1876	236	1881	455	1886	331
1877	270	1882	417	1887	339

In the following table we give the number of furnaces in blast at the close of each of the last four years, classified according to the fuel used.

Kind of Fuel.	1884.	1885.	1886.	1887.
Bituminous	86	111	143	147
Anthracite and mixed anthracite and coke	84	105	125	118
Charcoal	66	60	63	74
Total	236	276	331	339

At the close of 1887 the total number of furnaces in the United States which were active or likely to be some day active was 583, and 30 new furnaces were in course of erection.

CONSUMPTION OF PIG IRON.

For many years we have annually estimated the consumption of pig iron in the United States by adding the home production and the unsold stocks at the beginning of the year to the quantity imported, and subtracting the stocks of domestic pig iron unsold at the close of the year. Occasionally, when they have been of sufficient importance, we have also taken account of the stocks of foreign pig iron unsold and of the quantity of domestic pig iron exported.

At the close of 1887 the quantity of foreign pig iron in bonded warehouse and not sold was so small that it need not be considered, and our exports of pig iron in the same year need not be considered for a like reason. Our production in 1887 was 6,417,148 gross tons; our imports during the year amounted to 467,522 gross tons; the unsold domestic stocks with which we began the year amounted to 225,629 gross tons; and the unsold stocks with which

we closed the year amounted to 301,913 gross tons. Tabulating these details we have the following as the probable consumption of pig iron in this country in 1887, in gross tons.

Domestic production in 1887	6,417,148
Imported in 1887	467,522
Stocks on hand, January 1, 1887	225,629
Total supply	7,110,299
Deduct domestic stocks on hand, December 31, 1887	301,913
Probable consumption in 1887, in gross tons	6,808,386

Our consumption of pig iron since 1874, calculated as above, but with an allowance in some years for foreign stocks and domestic exports, has been as follows.

Years.	Gross tons.	Years.	Gross tons.
1874	2,500,000	1881	4,982,565
1875	2,000,000	1882	4,963,278
1876	1,900,000	1883	4,834,740
1877	2,150,000	1884	4,229,280
1878	2,500,000	1885	4,348,844
1879	3,432,534	1886	6,191,354
1880	3,990,415	1887	6,808,386

The above statistics of our annual consumption of pig iron do not fully show our consumption of iron itself. To the figures we have given should be added the large quantities of old and scrap iron, both of domestic and foreign origin, which annually take the place of pig iron, and there should also be added the blooms from ore which are annually produced in the Catalan forges of the country. We have no means of ascertaining the quantity of domestic old and scrap iron which is annually consumed by forges, rolling mills, and foundries, but in 1887 we imported 351,028 net tons of old and scrap iron, and in the same year we made 15,088 net tons of blooms directly from the ore. Our heavy importations of manufactured iron and of steel in all forms should also be added.

PRODUCTION OF BESSEMER STEEL.

The production of Bessemer steel ingots in the United States in 1887, including that of the Clapp-Griffiths converters, was 3,288,357 net tons, or 2,936,033 gross tons, a gain of 746,864 net tons, or 29 per cent., over the production of 2,541,493 net tons in 1886. In 1885 we produced 1,701,762 net tons of Bessemer steel ingots, which was the largest tonnage in one year in our history to that

date; in 1887, only two years later, we produced nearly double the tonnage of 1885. Over seven-eighths of our total steel production in 1887 was made by the Bessemer process.

Eleven States contributed to the production of Bessemer steel in 1887, against 9 in 1886, Virginia and Indiana having commenced last year to make this kind of steel. The eleven States referred to are Massachusetts, New York, Pennsylvania, Virginia, West Virginia, Tennessee, Ohio, Indiana, Illinois, Missouri, and Colorado. Forty-one works, having 86 converters, including seven Clapp-Griffiths plants with 14 converters, were employed during 1887 in the production of Bessemer steel.

The following table shows the production of Bessemer steel ingots in Pennsylvania, Illinois, and the other Bessemer-steel-producing States in the first half and second half of 1887; also the total production compared with 1886. In the production for all of the periods mentioned is included the production of ingots by the Clapp-Griffiths process, but we add to the table a statement of production by this process alone.

Ingots.	First half 1887. Net tons.	Second half 1887. Net tons.	Total 1887. Net tons.	Total 1886. Net tons.
Pennsylvania	911,871	840,574	1,752,445	1,507,577
Illinois	389,784	467,729	857,513	535,602
Other States	335,917	342,482	678,399	498,314
Total	1,637,572	1,650,785	3,288,357	2,541,493
Clapp-Griffiths only	31,043	37,636	68,679	46,371

Pennsylvania made 53 per cent. of all the ingots produced in 1887, against 59 per cent. in 1886 and 65 per cent. in 1885. Illinois made 26 per cent. in 1887, against 21 per cent. in 1886 and 22 per cent. in 1885. The other States made over 20 per cent. in 1887, against a little less than 20 per cent. in 1886 and 13 per cent. in 1885. It will be observed that Illinois and other States are gaining upon Pennsylvania in the production of Bessemer steel.

Eleven new Bessemer steel works were completed in 1887, of which 3 were Clapp-Griffiths plants. All but one of these works were put in operation in that year. At the close of 1887 there were 3 Bessemer plants in course of erection, and one Clapp-Griffiths plant had been removed from Port Henry, New York, and was being put up at Pittsburgh by Messrs. Graff, Bennett & Co. The 11 new works are located as follows: Massachusetts, 1; Pennsylvania, 3; Virginia, 1; Tennessee, 1; Ohio, 2; Indiana, 1; and

Illinois, 2. Of the 3 works now building 2 are in Pennsylvania and 1 is in Illinois. The total number of completed Bessemer steel works in the United States at the close of 1887 was 43, with 89 converters, of which works 8 were Clapp-Griffiths.

The following table shows the production of Bessemer steel ingots in the United States since 1874 in net tons of 2,000 pounds.

Years.	Net tons of 2,000 pounds.			
	Pennsylvania.	Illinois.	Other States.	Total.
1874	85,625	62,492	43,816	191,933
1875	148,374	136,356	90,787	375,517
1876	258,452	171,963	95,581	525,996
1877	328,599	111,299	120,689	560,587
1878	426,481	179,500	126,245	732,226
1879	514,165	250,980	163,827	928,972
1880	643,894	304,614	254,665	1,203,173
1881	844,501	375,763	318,893	1,539,157
1882	933,631	397,436	365,383	1,696,450
1883	1,044,396	273,325	336,906	1,654,627
1884	1,031,484	339,068	170,043	1,540,595
1885	1,109,039	366,659	226,064	1,701,762
1886	1,507,577	535,602	498,314	2,541,493
1887	1,752,445	857,513	678,399	3,288,357

The following table shows the production of Bessemer steel rails in the United States in the first half and second half of 1887, with the total production compared with that of 1886. In this statement we do not include for either year a few thousand tons of Bessemer steel rails rolled in iron rolling mills from purchased blooms, which will be referred to hereafter.

Rails.	First half 1887. Net tons.	Second half 1887. Net tons.	Total 1887. Net tons.	Total 1886. Net tons.
Pennsylvania	650,032	571,257	1,221,289	1,097,943
Illinois	323,993	404,533	728,526	430,975
Other States	170,055	170,327	340,382	220,981
Total	1,144,080	1,146,117	2,290,197	1,749,899

Pennsylvania made a little over 53 per cent. of the Bessemer steel rails produced by Bessemer works in 1887, against 63 per cent. in 1886 and 68 per cent. in 1885; Illinois made nearly 32 per cent. in 1887, against 25 per cent. in 1886 and 28 per cent. in 1885; and other States made nearly 15 per cent. in 1887, against 12 per cent. in 1886 and 3 per cent. in 1885.

Chicago made more tons of Bessemer steel ingots in 1887 than Allegheny county, Pennsylvania, including the production of the

Clapp-Griffiths plants and the Pittsburgh Steel Casting Company. And it made many more tons of Bessemer steel rails. The figures are as follows: Chicago—ingots, 531,054 gross tons; rails, 439,345 tons. Allegheny county—ingots, 518,694 gross tons; rails, 287,363 tons. Joliet is a near neighbor of Chicago, in the same State, and Johnstown, Pa., is a near neighbor of Allegheny county. Adding the production of Bessemer ingots and rails at Joliet in 1887 to the figures for Chicago, and adding the production of Johnstown to that of Allegheny county, we have the following totals. Chicago and Joliet—ingots, 748,271 gross tons; rails, 642,580 tons. Allegheny county and Johnstown—ingots, 728,797 gross tons; rails, 414,027 tons.

In our Annual Report for 1886 we presented a statement showing approximately the portion of our Bessemer steel production which was annually converted into forms other than rails. Observing the method then employed we have the following results for the last six years.

Products.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
Bessemer steel ingots.....	1,696,450	1,654,627	1,540,595	1,701,762	2,541,493	3,288,357
Less about 12½ per cent. oxidation and crop ends..	212,056	206,828	192,574	212,720	317,687	411,045
Finished Bessemer steel.....	1,484,394	1,447,799	1,348,021	1,489,042	2,223,806	2,877,312
Bessemer steel rails, except from purchased blooms....	1,334,349	1,253,925	1,116,621	1,074,607	1,749,899	2,290,197
Bessemer steel not in rails...	150,045	193,874	231,400	414,435	473,907	587,115

The above results, however, do not represent the total quantity of Bessemer steel going into miscellaneous products; to obtain this there must be added the miscellaneous products obtained from old steel rails and imported blooms, billets, and slabs. We give hereafter a table of rolled steel in 1887, excluding rails.

PRODUCTION OF OPEN-HEARTH STEEL.

The production of open-hearth steel in the United States in 1887 was 360,717 net tons, or 322,069 gross tons, an increase of 115,467 net tons, or 47 per cent., upon the production of 1886, which was 245,250 net tons. The production of open-hearth steel was greatly increased in 1886 over any previous year, but in 1887 this branch of our steel industry made much more rapid progress than in 1886.

The following table shows the production of open-hearth steel

ingots and direct castings in the United States in the first half and second half of 1887 and the total production compared with 1886.

Open-hearth Steel.	First half 1887. Net tons.	Second half 1887. Net tons.	Total 1887. Net tons.	Total 1886. Net tons.
New England, New York, and New Jersey	9,553	8,889	18,442	23,382
Pennsylvania	128,669	142,041	270,710	172,144
Other States	32,178	39,387	71,565	49,724
Total	170,400	190,317	360,717	245,250

The production of open-hearth steel in 1887 was produced by 39 plants, located in nine States—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, and California. Indiana made open-hearth steel for the first time in 1887. The total number of completed open-hearth steel works in the United States at the close of 1887 was 50, with 94 furnaces; the number of works in course of erection at the close of the year was 3, with 10 furnaces. One of these has since been completed—that of the Henderson Steel and Manufacturing Company, at Birmingham, Alabama. The first steel of any kind made in Alabama was produced by this plant on February 27, 1888.

The quantity of open-hearth steel rails produced in 1887 was 19,203 net tons, which were made in Massachusetts, Pennsylvania, Ohio, Indiana, and California. Only 100 net tons were street rails.

The following table shows the production of open-hearth steel ingots and direct castings in the United States by States since 1874, in net tons. The proportion of direct castings is very small.

Years.	New England, New York, and New Jersey.	Pennsylvania.	Western and Southern States.	Total. Net tons.
1874	5,300	1,700	.....	7,000
1875	3,010	4,240	1,800	9,050
1876	6,085	7,547	7,858	21,490
1877	6,652	7,771	10,608	25,031
1878	8,228	12,231	15,667	36,126
1879	14,660	19,575	22,055	56,290
1880	23,293	48,003	41,657	112,953
1881	29,600	63,363	53,983	146,946
1882	30,936	67,822	61,784	160,542
1883	20,904	69,333	43,442	133,679
1884	16,700	81,501	33,416	131,617
1885	18,263	94,898	36,220	149,381
1886	23,382	172,144	49,724	245,250
1887	18,442	270,710	71,565	360,717

PRODUCTION OF CRUCIBLE STEEL.

The production of crucible steel in the United States in 1887 was 84,421 net tons, or 75,376 gross tons, against 80,609 net tons, or 71,972 gross tons, in 1886. The product of 1887 was made in ten States—Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Tennessee, Ohio, Illinois, and Michigan.

The following table gives in net tons the annual production of crucible steel ingots and direct castings in the United States since 1874, the quantity of the latter being proportionately very small.

Years.	New England.	New York.	New Jersey.	Pennsylvania.	Western States.	Southern States.	Total. Net tons.
1874	1,509	2,696	8,164	23,289	570	100	36,328
1875	1,620	2,300	7,098	26,615	1,500	268	39,401
1876	1,098	2,300	6,806	28,217	700	261	39,382
1877	1,974	2,032	6,749	27,983	1,400	292	40,430
1878	1,602	2,800	7,377	30,585	480	62	42,906
1879	1,608	2,300	8,651	43,614	605	2	56,780
1880	660	3,500	10,387	57,077	800	.....	72,424
1881	2,780	4,961	14,500	66,290	1,231	.....	89,762
1882	1,000	4,693	12,400	65,139	1,857	.....	85,089
1883	2,373	2,976	10,539	63,687	880	.....	80,455
1884	1,832	1,975	11,549	42,295	2,003	8	59,662
1885	2,795	4,375	7,572	45,789	3,060	920	64,511
1886	2,661	4,870	8,046	61,792	2,340	900	80,609
1887	2,925	5,000	7,499	65,766	2,431	800	84,421

PRODUCTION OF MISCELLANEOUS STEEL.

The production of steel in the United States in 1887 by various minor processes amounted to 6,265 net tons, against 2,651 net tons in 1886. Blister, puddled, and "patented" steel, including "patented" steel castings, are embraced in these figures. Of the production of 1887 Pennsylvania made 5,490 tons, the Western States 525 tons, and the Southern States 250 tons.

PRODUCTION OF ROLLED IRON.

By the term rolled iron we include (1) cut nails and cut spikes; (2) bar, rod, bolt, hoop, skelp, and shaped iron, and rolled axles; (3) plate and sheet iron; and (4) all sizes of iron rails. The statistics which we now present relate only to rolled iron and do not include rolled steel or hammered axles.

The total production of rolled iron in the United States in 1887 was 2,588,500 net tons, against 2,283,622 tons in 1886, a gain of 304,878 tons, or over 13 per cent. Twenty-six States and Wyoming Territory rolled iron in 1887.

The following table gives the production of all kinds of rolled iron in the United States from 1882 to 1887, by States, in net tons.

States.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
Maine	10,862	10,662	9,638	8,219	8,486	8,097
New Hampshire	3,508	2,158	4,314	500	.....	4,680
Massachusetts	111,388	100,418	77,560	75,074	61,322	45,853
Rhode Island	11,877	14,405	14,000	13,723	14,168	12,622
Connecticut	20,676	18,541	15,054	15,054	15,976	13,849
New York	138,541	105,644	86,955	79,853	102,472	112,688
New Jersey	96,441	76,109	61,046	49,573	60,282	73,844
Pennsylvania	1,123,886	1,081,163	913,046	940,865	1,176,286	1,361,270
Delaware	38,261	35,384	28,015	28,721	34,272	43,864
Maryland and D. C.	33,807	29,099	33,856	17,581	22,539	20,790
Virginia	40,044	30,751	28,286	31,989	40,581	49,967
Alabama	9,188	8,336	17,895	24,850	32,065	24,443
Texas	.....	.....	1,000	1,000	924	1,131
West Virginia	66,107	79,894	64,632	9,992	7,874	61,997
Kentucky	61,096	58,263	29,212	21,736	38,308	
Tennessee	38,770	22,454	15,217	11,344	14,510	16,547
Ohio	361,608	377,962	310,568	269,263	355,126	408,263
Indiana	71,626	55,887	39,028	35,540	42,224	46,904
Illinois	93,943	121,702	95,815	80,356	110,182	143,206
Missouri	18,145	15,833	18,580	11,547	15,800	14,354
Iowa	.....	.....	.....	800	200	200
Michigan	11,824	11,900	9,571	12,840	21,509	29,717
Wisconsin	64,296	40,195	53,628	38,959	60,147	38,265
Minnesota	.....	.....	200	1,200	1,000	1,400
Kansas	17,867	.....	.....	.....	.....	.....
Nebraska	3,000	3,250	2,000	3,000	250	.....
Colorado	4,739	7,844	5,619	5,538	6,299	4,664
Wyoming Territory	16,488	11,288	1,745	2,430	9,853	7,699
California	25,843	29,732	20,827	12,979	30,967	42,186
Total	2,493,831	2,348,874	1,957,307	1,804,526	2,283,622	2,588,500

Pennsylvania made over 52 per cent. of the total production of rolled iron in 1887; Ohio, over 15 per cent.; Illinois, over 5 per cent.; and New York, over 4 per cent.; no other State produced as much as 3 per cent.

The production of iron nails in 1887 was very much less than in 1886, while that of iron rails was about the same; the increased production of rolled iron in 1887 was therefore wholly in such forms as plates and sheets, bars, rods, skelp, and shaped iron.

The production of iron rails in 1887 amounted to 23,062 net tons, and of iron nail plate to 170,979 net tons. Both of these products are referred to in detail hereafter.

The production of rolled iron in the United States from 1873 to 1887 is given in detail in the following table, in net tons.

Years.	Net tons of 2,000 pounds.				
	Iron rails.	Bar, rod, hoop, skelp, and shaped iron.	Plate and sheet iron, except nail plate.	Iron nail plate.	Total.
1873	761,062	705,964	169,169	201,235	1,837,430
1874	584,469	687,650	176,888	245,609	1,694,616
1875	501,649	668,755	192,769	236,343	1,599,516
1876	467,168	668,956	165,255	207,890	1,509,269
1877	332,540	720,531	182,242	241,446	1,476,759
1878	322,890	830,837	182,042	219,807	1,555,576
1879	420,160	1,107,005	269,768	250,551	2,047,484
1880	493,762	1,220,724	349,657	268,525	2,332,668
1881	488,581	1,492,555	373,082	289,709	2,643,927
1882	227,874	1,545,788	412,814	307,355	2,493,831
1883	64,954	1,511,422	384,362	388,136	2,348,874
1884	25,560	1,230,094	322,584	379,069	1,957,307
1885	14,815	1,200,958	345,069	243,684	1,804,526
1886	23,679	1,580,337	420,007	259,599	2,283,622
1887	23,062	1,917,403	477,056	170,979	2,588,500

The following table gives the production of plate and sheet iron, excluding nail plate, in the United States from 1882 to 1887, by States, in net tons.

States.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
Maine	.....	1,350	.....	.....	.....	.....
New Hampshire	.....	26	50	.....	.....	.....
Massachusetts	35,688	18,626	12,791	7,991	7,426	3,789
Connecticut	.....	50	.....	.....	.....	.....
New York / New Jersey	5,039	2,982	3,267	3,905	5,197	7,243
Pennsylvania	258,603	254,446	222,321	252,711	305,521	359,998
Delaware	12,895	12,629	10,121	8,379	9,552	12,512
Maryland	16,619	11,491	9,264	6,381	6,389	5,940
District of Columbia	.....	8	6	53	45	.....
Alabama	.....	.....	937	2,750	3,740	4,621
West Virginia / Kentucky	24,371	22,279	14,342	13,040	27,181	22,159
Ohio	49,182	49,987	40,230	41,390	43,603	53,599
Indiana	542	.....	.....	.....	.....	675
Illinois	.....	.....	.....	1,550	1,334	.....
Missouri	6,055	6,168	6,892	4,919	6,791	3,000
Michigan	3,820	3,820	2,363	2,000	3,228	3,520
California	.....	500	.....	.....	.....	.....
Total	412,814	384,362	322,584	345,069	420,007	477,056

The production of bar, rod, bolt, hoop, skelp, and shaped iron, and rolled iron axles in 1887 amounted to 1,917,403 net tons, against 1,580,337 tons in 1886, an increase of 337,066 tons, or 21 per cent. Pennsylvania made nearly 48 per cent. of the total pro-

duction of these forms of iron in 1887, against 47 per cent. in both 1886 and 1885; Ohio made 17 per cent. in 1887, which was the same as in 1886 and 1885; Illinois made over 7 per cent. in 1887, against over 6 per cent. in 1886; and New York made over 5 per cent. in 1887, against over 6 per cent. in 1886.

The production of plate and sheet iron in 1887, excluding nail plate, amounted to 477,056 net tons, against 420,007 tons in 1886, an increase of 57,049 tons, or over 13 per cent. Pennsylvania made over 75 per cent. of the total production in 1887, and Ohio made over 11 per cent., these two States making within less than 14 per cent. of the whole quantity.

PRODUCTION OF ALL ROLLED STEEL.

We embodied in our last Annual Report the results of an attempt to ascertain the exact quantities of all forms of Bessemer, Clapp-Griffiths, and open-hearth steel which are rolled in the United States, our inquiries being limited to the year 1886. Similar inquiries for crucible steel were not made. We found that our production of rolled steel in 1886 in forms other than rails, not including crucible steel, amounted to about 800,000 net tons, of which about 125,000 tons were rolled from imported material. We are now enabled to present full details of the production of all forms of rolled steel in 1887, including the comparatively small quantity of rolled crucible steel. Excluding rails the production of rolled steel in 1887 was as follows, in net tons.

States.	Net tons of 2,000 pounds.			
	Steel nail plate.	Other steel plates and sheets.	Other rolled steel.	Total rolled steel except rails.
New England	2,143	7,029	8,438	17,610
New York	.....	4,313	15,081	34,037
New Jersey	253		14,390	
Pennsylvania	38,992	153,132	389,660	581,784
Delaware and Maryland	.....	2,327	900	3,227
Virginia	1,886	.....	498	2,384
West Virginia and Kentucky	46,366	4,275	5,070	55,711
Tennessee	1,303	.....	.....	1,303
Ohio	57,870	24,791	68,791	151,452
Indiana	8,847	.....	4,015	12,862
Illinois	13,151	.....	10,139	23,290
Mo., Mich., Wis., and Col	2,635	2,835	8,686	14,156
California	1,019	.....	3,321	4,340
Total	174,465	198,702	528,989	902,156

The grand total of steel rolled into all forms in the United States in 1887 was 3,275,491 net tons, or 2,924,545 gross tons, made up as follows: steel rails rolled by the producers of Bessemer ingots, 2,290,197 net tons; steel rails rolled in other rolling mills from purchased blooms and from old steel rails, 63,935 net tons; open-hearth steel rails, 19,203 net tons; miscellaneous products, 902,156 net tons. Our total production of rolled steel in 1887 was 613,385 gross tons larger than that of rolled iron in the same year.

PRODUCTION OF IRON AND STEEL RAILS.

The production of all kinds of rails in the United States in 1887 was 2,396,397 net tons, or 2,139,640 gross tons, against 1,792,601 net tons, or 1,600,537 gross tons, in 1886, an increase of 603,796 net tons, or nearly 34 per cent. Our production of rails in 1887 was by far the largest of any year in our history. The production of 1887 was composed as follows, in net tons: Bessemer steel rails by the producers of domestic ingots, 2,290,197 net tons, or 2,044,819 gross tons; Bessemer steel rails from purchased blooms, chiefly foreign, and from old steel rails, 63,935 net tons, or 57,085 gross tons; open-hearth steel rails, 19,203 net tons, or 17,145 gross tons; iron rails, 23,062 net tons, or 20,591 gross tons: total, 2,396,397 net tons, or 2,139,640 gross tons.

Fifteen States and one Territory made rails in 1887, namely, Massachusetts, New York, Pennsylvania, Alabama, Texas, West Virginia, Kentucky, Tennessee, Ohio, Indiana, Illinois, Missouri, Wisconsin, Colorado, and California, and Wyoming Territory. Of these States twelve made Bessemer steel rails, namely, Massachusetts, New York, Pennsylvania, West Virginia, Tennessee, Ohio, Indiana, Illinois, Missouri, Wisconsin, Colorado, and California. The open-hearth steel rails were made in Massachusetts, Pennsylvania, Ohio, Indiana, and California, Massachusetts and Pennsylvania making two-thirds of all. The iron rails were made in Pennsylvania, Alabama, Texas, Kentucky, Tennessee, Ohio, Indiana, Illinois, Colorado, Wyoming Territory, and California.

Of the total production of rails in 1887 Pennsylvania made 54 per cent., against over 62 per cent. in 1886 and 68 per cent. in both 1885 and 1884. Illinois made 30 per cent. in 1887, against 24 per cent. in 1886, over 28 per cent. in 1885, and nearly 26 per cent. in 1884. These two States made 84 per cent. of all the rails rolled in 1887, as compared with over 86 per cent. in 1886, 96 per cent. in 1885, and 94 per cent. in 1884.

The production of street rails is included in the total production of rails. In 1887 the quantity of street rails rolled was 57,362 net tons, of which 55,662 tons were of Bessemer steel, 100 tons were of open-hearth steel, and 1,600 tons were of iron. In 1886 the quantity rolled was 48,009 net tons, of which 41,786 tons were of Bessemer steel, 2,518 tons were of open-hearth steel, and 3,705 tons were of iron. The following table shows the production of street rails since 1873.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1873	9,430	1878	9,229	1883	19,440
1874	6,739	1879	8,646	1884	31,357
1875	16,340	1880	16,894	1885	35,990
1876	13,086	1881	21,554	1886	48,009
1877	7,015	1882	22,286	1887	57,362

The total rail production of the United States in the last seven years, in both net and gross tons, has been as follows.

Tons.	1881.	1882.	1883.	1884.	1885.	1886.	1887.
Net	1,844,100	1,688,794	1,360,694	1,144,851	1,094,215	1,792,601	2,396,397
Gross	1,646,518	1,507,851	1,214,905	1,022,188	976,978	1,600,537	2,139,640

Since 1874 our total production of Bessemer steel rails by Bessemer steel works and by iron rolling mills from purchased blooms has been as follows.

Years.	Net tons of 2,000 pounds.			
	Pennsylvania.	Illinois.	Other States.	Total.
1874	66,902	48,280	29,762	144,944
1875	112,843	111,189	66,831	290,863
1876	203,750	133,713	74,998	412,461
1877	250,531	89,519	92,119	432,169
1878	308,093	143,785	98,520	550,398
1879	368,187	197,881	117,896	683,964
1880	495,716	257,583	201,161	954,460
1881	688,276	346,272	295,754	1,330,302
1882	759,524	336,122	342,509	1,438,155
1883	819,544	231,355	235,655	1,286,554
1884	763,223	290,185	63,213	1,116,621
1885	736,522	308,242	29,843	1,074,607
1886	1,111,171	430,975	221,521	1,763,667
1887	1,276,845	728,526	348,761	2,354,132

The "other States" in the above table were, in 1887, Massachusetts, New York, West Virginia, Tennessee, Ohio, Indiana, Missouri, Wisconsin, Colorado, and California.

PRODUCTION OF IRON AND STEEL CUT NAILS.

The statistics we are about to present of the production of iron and steel cut nails and cut spikes in the United States in 1887 do not embrace railroad and other spikes made from bar iron, wire nails of any size, or machine-made horseshoe nails. For the sake of brevity we shall make no further reference to spikes, treating them as nails.

Our total production of cut nails in 1887 was 6,908,870 kegs of 100 pounds each, against 8,160,973 kegs in 1886, 6,696,815 kegs in 1885, and 7,581,379 kegs in 1884. The production of 1886 was the largest the country has ever attained. The decrease in the production of cut nails in 1887 was mainly due to the increased competition of wire nails. In 1886 the production of wire nails was about 600,000 kegs, made by 27 wire-nail works; in 1887 the production is estimated at 1,250,000 kegs, made by 47 works. The smaller sizes of wire nails are those which chiefly compete with cut nails.

Fourteen States made cut nails in 1887. The following table shows the production of iron and steel nails respectively in 1887 and the total production of that year compared with the total production of 1886 and 1885.

States.	1887—Kegs of 100 pounds.			Total 1886. Kegs.	Total 1885. Kegs.
	Iron.	Steel.	Total.		
Pennsylvania	1,458,324	779,841	2,238,165	2,569,237	2,457,916
Ohio	514,737	1,157,391	1,672,128	1,703,790	920,539
West Virginia	.....	827,325	827,325	899,600	778,069
Indiana	222,096	176,944	399,040	339,992	274,271
New Jersey	341,060	5,057	346,117	345,168	181,680
Illinois	12,049	263,023	275,072	614,055	376,361
Massachusetts	224,599	42,854	267,453	516,749	654,318
California	237,811	20,382	258,193	224,163	203,567
Virginia	212,808	37,711	250,519	212,552	226,437
Kentucky	59,720	100,000	159,720	144,000	135,628
Wisconsin	54,560	24,380	78,940	205,480	86,257
Alabama	54,000	.....	54,000	206,500	137,000
Colorado	17,408	28,317	45,725	52,383	64,310
Tennessee	10,406	26,067	36,473	88,289	98,851
New York	.....	.....	.....	34,015	41,611
Nebraska	.....	.....	.....	5,000	60,000
Total	3,419,578	3,489,292	6,908,870	8,160,973	6,696,815

The displacement of iron nails by steel nails has progressed very rapidly. In 1884 the production of steel nails in the United States (including 500 kegs of combined iron and steel) was only 393,482

kegs, or 5 per cent. of the total production of nails. In 1885 the production of steel and combined iron and steel nails was 1,823,127 kegs, or 27 per cent. of the total production. In 1886 the production of steel nails alone was 2,968,989 kegs, or 36 per cent. of the total production; and in 1887, as the above table shows, the quantity of steel nails produced exceeded that of iron nails, being over 50 per cent. of the total production. California made no combined iron and steel nails in 1887; the only combined iron and steel nails produced in 1887 were made in Massachusetts, 40,356 kegs, and we have classed them in the table with iron nails.

The two leading cut-nail producing districts of the United States are known as the Wheeling and Central Pennsylvania districts. The Wheeling district embraces four counties, all bordering on the Ohio river—Ohio and Marshall counties in West Virginia, in which counties all the nail works of the State are located, and Belmont and Jefferson counties across the river in Ohio, the city of Wheeling being near the centre of the district. Central Pennsylvania embraces the counties drained by the Susquehanna river and its branches. The following table shows the production of these two districts in the last three years.

Districts.	1887—Kegs.			1886. Kegs.	1885. Kegs.
	Iron.	Steel.	Total.		
Wheeling district	24,000	1,824,116	1,848,116	1,858,551	1,297,136
Central Pennsylvania	962,340	260,060	1,222,400	1,489,482	1,472,797

PRODUCTION OF BLOOMS AND BILLETS.

Blooms and billets from ore are made chiefly in the Champlain district of New York, and blooms from pig and scrap iron are made chiefly in Pennsylvania. The make of each of these products in the last fourteen years is given below, in net tons.

Years.	Blooms and billets from ore.	Blooms from pig and scrap iron.	Total. Net tons.	Years.	Blooms and billets from ore.	Blooms from pig and scrap iron.	Total. Net tons.
1874	36,450	25,220	61,670	1881	45,369	39,237	84,606
1875	24,416	24,827	49,243	1882	48,354	42,939	91,293
1876	20,784	23,844	44,628	1883	35,237	39,521	74,758
1877	24,227	23,073	47,300	1884	29,789	27,216	57,005
1878	24,139	25,906	50,045	1885	19,887	21,813	41,700
1879	30,282	32,071	62,353	1886	15,878	26,031	41,909
1880	40,652	33,937	74,589	1887	15,088	28,218	43,306

The production of wrought iron from ore in forges is now almost entirely confined to the Lake Champlain district of New York. Forges of this kind were once numerous in the mountainous districts of North Carolina and Tennessee, but now barely a half dozen forges are ever active in both these States. Those which are occasionally active make a very few tons of blooms which are hammered into bar iron for local use.

The following table shows the proportion of ore blooms and billets made in New York in the past thirteen years as compared with the production of the whole country, and the proportion of the country's production of pig and scrap blooms which was made in Pennsylvania in the same time.

Years.	Net tons of 2,000 pounds.			
	Ore blooms and billets made in New York.	Total make of ore blooms and billets.	Pig and scrap blooms made in Pennsylvania.	Total make of pig and scrap blooms.
1875	23,666	24,416	19,032	24,827
1876	20,202	20,784	13,401	23,844
1877	23,466	24,227	16,517	23,073
1878	22,829	24,139	15,121	25,906
1879	27,290	30,282	23,956	32,071
1880	34,351	40,652	24,319	33,937
1881	39,892	45,369	28,342	39,237
1882	43,911	48,354	29,408	42,939
1883	31,347	35,237	28,190	39,521
1884	27,745	29,789	19,992	27,216
1885	18,981	19,887	15,462	21,813
1886	15,507	15,878	20,836	26,031
1887	15,043	15,088	21,982	28,218

PRODUCTION OF IRON ORE.

We have estimated the consumption of iron ore in the United States in 1887 in the blast furnaces and ore forges and for fettling purposes at 12,500,000 gross tons, against a little over 11,000,000 tons in 1886. Our imports of iron ore in 1887 amounted to 1,194,301 gross tons; this amount subtracted from the amount consumed would leave, in round numbers, 11,300,000 tons as the production of domestic mines in 1887, against 10,000,000 tons in 1886.

No attempt is made by any agency to obtain complete statistics of the production of iron ore in the whole of the United States from year to year. The Marquette *Mining Journal*, Professor W. B. Potter, the Inspector of Mines of Ohio, and Professor George H. Cook cover the ground for the Lake Superior region, Missouri, Ohio, and New Jersey, respectively; Mr. J. Taylor Boyd for the

Cornwall mines of Pennsylvania, and this Association regularly obtains the statistics from a number of minor iron-ore districts; but the tonnage accounted for by all these agencies in 1886 amounted to only about six-tenths of the estimated total production.

We have endeavored to obtain reports for 1887 from a larger number of districts in which iron-ore mining is an important industry, with results as given in the table below. The authorities above named have furnished us with the statistics for their respective territories. Nearly all the figures given in the table represent shipments from the mines, and take no account of the ore that is left in the stock piles from year to year.

Production of Iron Ore in Leading Districts.	Gross tons.	
	1886.	1887.
Lake Superior mines of Michigan and Wisconsin	3,263,961	4,344,651
Vermilion Lake mines of Minnesota	304,396	394,252
Missouri mines	379,776	427,785
Cornwall, Pennsylvania	688,054	667,210
New Jersey mines	500,501	547,889
Chateaugay mines, near Lake Champlain, New York	214,800	219,390
Crown Point mines, New York	60,084	64,940
Port Henry mines, New York	298,868	428,522
Other Lake Champlain mines, New York	15,000	29,000
Hudson River Ore and Iron Company, New York	75,000	142,422
Tilly Foster mines, New York	17,728	14,316
Forest of Dean mines, New York	18,000	21,164
Salisbury region, Connecticut	36,000	30,000
Cranberry mines, North Carolina	24,106	45,032
Tennessee Coal, Iron, and Railroad Company's Inman mines	81,650	102,601
Ohio, (whole State)	344,484	377,465
Alleghany county, Virginia (Statistics not collected in 1886)	.....	150,000
Preston county, West Virginia " " " " "	.....	15,408
Calhoun, Etowah, and Shelby counties, Alabama " "	.....	129,000
Total of the above districts	6,322,408	8,151,047

The following table shows the development in the last four years of iron-ore production in the Lake Superior region. It has been compiled from the *Mining Journal's* revised statistics, just received.

Districts.	Gross tons.			
	1884.	1885.	1886.	1887.
Marquette Range, Michigan	1,558,033	1,430,422	1,627,383	1,860,043
Menominee Range, Michigan and Wisconsin	895,634	690,435	880,006	1,199,343
Gogebic Range, Michigan and Wisconsin	1,022	119,756	756,572	1,285,265
Vermilion Lake, Minnesota	62,124	225,484	304,396	394,252
Miscellaneous mines, Michigan	1,879	441	.....	.....
Total	2,518,692	2,466,538	3,568,357	4,738,903

PRODUCTION OF COAL.

From Mr. John H. Jones, Chief of the Bureau of Anthracite Coal Statistics, Philadelphia, we learn that the total production of anthracite coal in Pennsylvania in 1887, excepting that consumed by employés and for steam and heating purposes about the mines, was 34,641,018 gross tons, against 32,136,362 tons in 1886. Of the total production in 1887, 19,684,929 tons, or 56.82 per cent., were from the Wyoming region; 4,347,061 tons, or 12.55 per cent., were from the Lehigh region; and 10,609,028 tons, or 30.63 per cent., were from the Schuylkill region. The production of the Lehigh region last year was much less than in 1886, caused by the strike of the miners in that region on September 10th, which continued throughout the rest of the year and only terminated in March, 1888. The decreased output of this region was, however, more than made up by the increased output of the Schuylkill and Wyoming regions, especially of the latter.

Mr. Frederick E. Saward, the editor of the *Coal Trade Journal*, estimates the total production of bituminous coal in the United States in 1887 as amounting to 85,505,721 gross tons, which, added to the ascertained anthracite production for the year, gives us a total estimated production of 120,146,739 gross tons. The production of coal of all kinds in the United States in 1886 was obtained by Mr. Charles A. Ashburner for the volume of "Mineral Resources of the United States," compiled by Mr. David T. Day, Chief of the Division of Mining Statistics and Technology of the United States Geological Survey. Mr. Ashburner gives the total production of 1886 as 100,663,752 gross tons. The difference between the ascertained production of 1886 and Mr. Saward's estimated production of 1887 is 19,482,987 gross tons, which indicates an increased production of about 20 per cent. in 1887. This increase was almost entirely in bituminous coal, as the increase in anthracite coal was only about 2,500,000 gross tons. The greatly increased production in 1887 of pig iron manufactured with coke and with coke mixed with anthracite will account for a large part of the increased production of bituminous coal in that year.

The shipments of bituminous coal and coke from Southwestern Pennsylvania through the locks and pools of the Monongahela Navigation Company amounted in 1887 to 78,912,900 bushels, or 2,998,690 gross tons, against 113,099,147 bushels, or 4,297,767 tons, in 1886. The shipments in 1886 were the largest in the history of the company. The decrease in shipments in 1887 of 34,186,247

bushels is explained by the low stage of water in the Monongahela river in the last four months of 1887. The water was lower than in any previous year since 1879. Of the shipments last year 76,631,900 bushels were coal and 2,281,000 bushels were coke.

The shipments of bituminous coal from the Cumberland mines of Western Maryland and the Piedmont mines of West Virginia amounted in 1887 to 3,375,796 gross tons, against 2,592,467 tons in 1886, and 2,865,974 tons in 1885. The shipments from these regions in 1887 were the largest yet attained in any one year.

The shipments of bituminous coal from the Clearfield region of Pennsylvania in 1887 amounted to 4,260,874 gross tons, against 2,973,213 tons in 1886. Of the shipments last year 1,351,864 tons were shipped over the Beech Creek Railroad and 2,909,010 tons over the lines of the Pennsylvania Railroad.

In the census years 1870 and 1880 the production of coal in this country was as follows.

Years—gross tons.	Bituminous coal.	Anthracite coal.	Total.
Census year 1870.....	15,356,621	13,985,960	29,342,581
Census year 1880.....	38,193,414	25,580,189	63,773,603

IRON AND STEEL SHIPBUILDING.

Hon. C. B. Morton, United States Commissioner of Navigation, has furnished us with a detailed statement of the number and tonnage of iron and steel vessels of the merchant marine launched from American shipyards in the fiscal year ended June 30, 1887. The whole number launched was only 29, and their aggregate gross tonnage was 34,353.59 tons. This is an increase of but 3 in number over 1886. The ships built in 1887, however, were of much greater average size than those built in 1886, as the tonnage was more than doubled.

The vessels launched in the fiscal year 1887 were built within the jurisdiction of the following ports: New York, 5, with an aggregate tonnage of 3,950.28 tons; Philadelphia, 16, with a tonnage of 21,037.90 tons; Wilmington, Del., 4, with a tonnage of 3,207.67 tons; Cleveland, 2, with a tonnage of 3,577.69 tons; Buffalo, 1, with a tonnage of 2,500.30 tons; and San Francisco, 1, with a tonnage of 79.75 tons. Of the above vessels 6, with a tonnage of 4,001.06 tons, were reported built of steel, namely, 1 at New York of 88.08 tons, the 1 at Buffalo of 2,500.30 tons, 1 at Philadelphia of 88.90

tons, 2 at Wilmington of 1,244.03 tons, and the 1 at San Francisco of 79.75 tons.

The following table gives the number and tonnage of all iron and steel vessels built in the United States since 1868. The table does not include any vessels built for the United States Navy.

Fiscal Years.	Sailing.		Steam.		Total.	
	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.
1868	.....	.....	.....	2,801	.....	2,801
1869	.....	1,039	.....	3,545	.....	4,584
1870	.....	679	.....	7,602	.....	8,281
1871	.....	2,067	20	13,412	.....	15,479
1872	.....	.....	20	12,766	20	12,766
1873	.....	.....	26	26,548	26	26,548
1874	.....	.....	23	33,097	23	33,097
1875	.....	.....	20	21,632	20	21,632
1876	.....	.....	25	21,346	25	21,346
1877	.....	.....	7	5,927	7	5,927
1878	.....	.....	32	26,960	32	26,960
1879	.....	.....	24	22,008	24	22,008
1880	1	44	30	25,538	31	25,582
1881	1	36	41	28,320	42	28,356
1882	.....	.....	43	40,097	43	40,097
1883	1	2,033	34	37,613	35	39,646
1884	3	4,432	31	31,200	34	35,632
1885	1	731	47	43,297	48	44,028
1886	3	692	23	14,215	26	14,907
1887	1	92	28	34,261	29	34,353

UNITED STATES RAILROAD STATISTICS.

The publishers of Poor's Manual of the railroads of the United States give the total mileage of new railroad built in this country in 1887 as 12,516 miles, against a total of 8,999 miles built in 1886. The mileage of 1887 was greater than that of any previous year in the history of the country. The total number of miles of railroad in operation in the United States at the close of 1887 was 150,502. These figures refer only to the actual length of the railroad lines, and do not include extra tracks or sidings. The figures for 1887 are subject to revision, but Mr. Poor informs us that the final result will not materially differ from the mileage given above.

STATISTICS OF IMMIGRATION.

The following table, for which we are indebted to the Bureau of Statistics of the United States Treasury Department, exhibits the total number of immigrants into the United States, except from Canada and Mexico, in the calendar years 1886 and 1887.

Countries.	1886.	1887.
Great Britain and Ireland:		
England and Wales	59,110	83,084
Ireland	52,742	72,549
Scotland	13,890	21,930
Total from the United Kingdom	125,742	177,563
Germany	85,926	111,201
France	4,075	5,559
Austria-Hungary:		
Bohemia and Hungary	22,495	18,878
Other Austria	17,483	20,175
Russia	26,787	25,742
Poland, (whether Russian, Austrian, or Prussian not stated)	6,396	4,958
Sweden and Norway	45,375	69,199
Denmark	6,557	9,295
Netherlands	2,667	5,268
Italy	30,464	46,161
Switzerland	4,518	6,551
All other countries	8,146	8,731
Grand total	386,631	509,281

SUMMARY OF FOREGOING STATISTICS.

	1886.	1887.
Production of Pig Iron, net tons	6,365,328	7,187,206
Production of Spiegeleisen, included in Pig Iron, net tons	47,982	47,598
Production of Bar, Rod, Hoop, Skelp, and Shaped Iron, net tons	1,580,337	1,917,403
Production of Plate and Sheet Iron, except Nail Plate, net tons	420,007	477,056
Production of Bar, Rod, Hoop, Skelp, and Shaped Steel, net tons	500,000	528,989
Production of Plate and Sheet Steel, except Nail Plate, net tons	150,000	198,702
Production of Cut Nails and Spikes, kegs of 100 pounds	8,160,973	6,908,870
Production of Steel Nails only, kegs of 100 pounds	2,968,989	3,489,292
Production of all Rolled Iron, including Iron Nails and excluding Rails, net tons	2,259,943	2,565,438
Production of all Rolled Steel, including Steel Nails and excluding Rails, net tons	800,000	902,156
Production of Bessemer Steel Rails, net tons	1,763,667	2,354,132
Production of Open-hearth Steel Rails, net tons	5,255	19,203
Production of Iron Rails, net tons	23,679	23,062
Total production of Rails, net tons	1,792,601	2,396,397
Production of Street Rails, included above, net tons	48,000	57,362
Production of Bessemer Steel Ingots, net tons	2,541,493	3,288,357
Production of Open-hearth Steel Ingots, net tons	245,250	360,717
Production of Crucible Steel Ingots, net tons	80,609	84,421
Production of Blister and "Patented" Steel, net tons	2,651	6,265
Production of all kinds of Steel, net tons	2,870,003	3,739,760
Production of Iron Blooms, net tons	41,909	43,306
Value of Imports of Iron and Steel	$41,630,779	$56,420,607
Value of Exports of Iron and Steel	$14,865,087	$16,235,922
Imports of Iron Ore, gross tons	1,039,433	1,194,301
Domestic Production of Iron Ore, gross tons	10,000,000	11,300,000
Production of Anthracite Coal, gross tons	32,136,362	34,641,018
Total Domestic Production of Coal, gross tons	100,663,752	120,146,739
Iron and Steel Ships built in the fiscal year ended June 30	26	29
Miles of new Railroad completed	8,999	12,516
Total number of miles of Railroad December 31	137,986	150,502
Immigrants in the calendar year ended December 31	386,631	509,281

PRODUCTION OF ALL KINDS OF PIG IRON IN 1882, 1883, 1884, 1885, 1886, AND 1887, BY STATES.

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

TOTAL PRODUCTION OF PIG IRON.

States.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
Maine	4,100	4,400	.....	440	5,060	4,397
Vermont	1,210	.....	.....	.....	.....	.....
Massachusetts	10,335	10,760	4,902	869	8,124	11,114
Connecticut	24,342	19,976	14,174	17,500	19,390	21,741
New York	416,156	331,964	239,486	160,157	233,618	296,572
New Jersey	176,805	138,773	82,935	73,667	157,886	172,554
Pennsylvania	2,449,256	2,638,891	2,385,402	2,445,496	3,293,289	3,684,618
Maryland	54,524	49,153	27,342	17,299	30,502	37,427
Virginia	87,731	152,907	157,483	163,782	156,250	175,715
North Carolina	1,150	.....	435	1,790	2,200	3,640
Georgia	42,440	45,364	42,655	32,924	46,490	40,947
Alabama	112,765	172,465	189,664	227,438	283,859	292,762
Texas	1,321	2,381	5,140	1,843	3,250	4,383
West Virginia	73,220	88,398	55,231	69,007	98,618	82,311
Kentucky	66,522	54,629	45,052	37,553	54,844	41,907
Tennessee	137,602	133,963	134,597	161,199	199,166	250,344
Ohio	698,900	679,643	567,113	553,963	908,094	975,539
Indiana	10,000	9,950	2,568	6,634	16,660	13,211
Illinois	360,407	237,657	327,568	327,977	501,795	565,453
Michigan	210,195	173,185	172,834	143,121	190,734	213,543
Wisconsin	85,859	51,893	52,815	24,632	65,933	133,508
Missouri	113,644	103,296	60,043	51,408	74,523	138,643
Minnesota	8,126	8,000	.....	.....	.....	.....
Utah Territory	57	.....	.....	.....	.....	.....
Colorado	23,718	24,680	15,837	5,481	10,451	25,291
Oregon	6,750	7,000	3,640	3,832	.....	.....
California	987	5,327	2,157	.....	1,750	.....
Washington Ty.	.....	2,317	540	1,857	2,842	1,586
Total	5,178,122	5,146,972	4,589,613	4,529,869	6,365,328	7,187,206

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

States.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
New York	385,440	306,284	215,998	145,475	219,238	217,585
New Jersey	176,805	138,773	82,935	73,667	157,886	172,554
Pennsylvania	1,453,646	1,416,468	1,278,236	1,235,248	1,710,968	1,929,777
Maryland	26,247	24,071	9,284	.....	11,505	18,473
Total	2,042,138	1,885,596	1,586,453	1,454,390	2,099,597	2,338,389

PRODUCTION OF PIG IRON.—(CONTINUED.)

CHARCOAL PIG IRON.

States.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
Maine	4,100	4,400	.....	440	5,060	4,397
Vermont	1,210	.....	.....	.....	.....	.....
Massachusetts	10,335	10,760	4,902	869	8,124	11,114
Connecticut	24,342	19,976	14,174	17,500	19,390	21,741
New York	30,716	25,680	23,488	14,682	14,380	26,491
Pennsylvania	49,975	38,315	23,155	12,148	16,727	11,910
Maryland	28,277	23,807	15,123	10,432	7,872	15,454
Virginia	26,133	16,879	14,829	12,648	6,069	9,456
North Carolina	1,150	.....	435	1,790	2,200	3,640
Georgia	15,565	13,045	9,615	5,797	459	.....
Alabama	55,541	57,385	59,448	77,573	82,110	95,223
Texas	1,321	2,381	5,140	1,843	3,250	4,383
Kentucky	17,165	13,981	7,882	4,707	6,363	6,201
Tennessee	37,611	35,299	18,806	31,173	27,402	46,224
Ohio	58,654	40,528	24,880	18,018	16,161	18,544
Michigan	210,195	173,185	172,834	143,121	190,734	213,543
Wisconsin	55,369	39,349	25,812	19,629	28,487	47,523
Missouri	54,327	34,112	31,558	21,785	20,177	40,752
Minnesota	8,126	8,000	.....	.....	.....	.....
Utah Territory	57	.....	.....	.....	.....	.....
Oregon	6,750	7,000	3,640	3,832	.....	.....
California	987	5,327	2,157	.....	1,750	.....
Washington Ty	.....	2,317	540	1,857	2,842	1,586
Total	697,906	571,726	458,418	399,844	459,557	578,182

BITUMINOUS COAL AND COKE PIG IRON.

States.	Net tons of 2,000 pounds.					
	1882.	1883.	1884.	1885.	1886.	1887.
New York	.....	.....	.....	.....	.....	52,496
Pennsylvania	945,635	1,184,108	1,084,011	1,198,100	1,565,594	1,742,931
Maryland	.....	1,275	2,935	6,867	11,125	3,500
Virginia	61,598	136,028	142,654	151,134	150,181	166,259
Georgia	26,875	32,319	33,040	27,127	46,031	40,947
Alabama	57,224	115,080	130,216	149,865	201,749	197,539
West Virginia	73,220	88,398	55,231	69,007	98,618	82,311
Kentucky	49,357	40,648	37,170	32,846	48,481	35,706
Tennessee	99,991	98,664	115,791	130,026	171,764	204,120
Ohio	640,246	639,115	542,233	535,945	891,933	956,995
Indiana	10,000	9,950	2,568	6,634	16,660	13,211
Illinois	360,407	237,657	327,568	327,977	501,795	565,453
Wisconsin	30,490	12,544	27,003	5,003	37,446	85,985
Missouri	59,317	69,184	28,485	29,623	54,346	97,891
Colorado	23,718	24,680	15,837	5,481	10,451	25,291
Total	2,438,078	2,689,650	2,544,742	2,675,635	3,806,174	4,270,635

STOCKS OF ALL KINDS OF PIG IRON UNSOLD AT THE CLOSE OF 1883, 1884, 1885, 1886, AND 1887.

These statistics, collected directly from the manufacturers by The American Iron and Steel Association, represent only stocks in the hands of makers or their agents. They do not include stocks in the hands of consumers, brokers, creditors, or speculators, nor foreign pig iron held in bond.

States and Districts.		Net tons of 2,000 pounds.				
		1883.	1884.	1885.	1886.	1887.
New England		12,437	11,433	8,997	9,218	7,930
New York		65,901	69,347	32,796	28,202	35,019
New Jersey		25,615	11,809	4,126	1,632	22,211
Lehigh Valley	Pennsylvania.	50,600	61,365	16,109	2,193	31,519
Schuylkill Valley	Pennsylvania.	25,448	29,696	15,617	17,816	19,103
Upper Susquehanna Valley	Pennsylvania.	8,839	12,216	4,933	2,383	6,589
Lower Susquehanna Valley	Pennsylvania.	14,324	10,643	10,136	4,409	7,023
Shenango Valley	Pennsylvania.	27,195	34,246	17,347	13,371	29,955
Allegheny County	Pennsylvania.	27,240	15,780	16,335	.....	33,841
Miscellaneous bituminous	Pennsylvania.	30,822	43,606	23,280	18,125	17,269
Charcoal	Pennsylvania.	11,336	14,297	13,452	12,905	8,876
Total for Pennsylvania	Pennsylvania.	195,804	221,849	117,209	71,202	154,175
Maryland		10,899	7,637	10,145	5,455	1,167
Virginia		21,172	28,644	22,501	7,620	2,755
Georgia, Texas, and North Carolina		9,429	12,582	8,810	5,726	4,093
Alabama		9,531	21,436	17,693	14,025	14,248
West Virginia		1,900	1,168	4,300	4,680	4,835
Kentucky		8,216	9,724	5,819	4,218	4,324
Tennessee		30,047	29,240	18,667	14,488	7,726
Hanging Rock	Ohio.	35,364	24,461	19,601	14,661	7,672
Mahoning Valley	Ohio.	19,307	16,977	8,938	1,463	12,365
Hocking V. and miscellaneous	Ohio.	18,465	11,600	11,407	7,945	12,970
Total for Ohio	Ohio.	73,136	53,038	39,946	24,069	33,007
Michigan and Indiana		36,405	60,715	68,479	41,953	39,319
Illinois		.....	4,200	3,834	300	.....
Wisconsin and Minnesota		6,340	7,366	9,425	6,002	845
Missouri		21,641	37,588	38,058	7,682	5,329
Pacific States		5,327	5,224	5,707	6,232	1,159
Grand total		533,800	593,000	416,512	252,704	338,142

STOCKS ACCORDING TO FUEL USED.

Bituminous	171,802	191,845	115,982	70,634	127,978
Anthracite and anth. and coke mixed	178,020	178,993	68,178	50,503	114,107
Charcoal	183,978	222,162	232,352	131,567	96,057
Total	533,800	593,000	416,512	252,704	338,142

IRON AND STEEL PRODUCTION OF ALLEGHENY COUNTY, PENNSYLVANIA.

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

Allegheny county, in Pennsylvania, which includes the city of Pittsburgh within its limits, is well known as the leading iron and steel producing county in the United States. It has long occupied this position, and additional prominence has been given to it in very recent years by the substitution of natural gas for coal in all its rolling mills and steel works. The following table gives the production of iron and steel in this county since 1874, in net tons.

ROLLING MILLS.

Years.	Number of iron rolling mills.	Product of iron rails, bar, angle, bolt, rod, and hoop. Tons.	Product of iron sheet and plate, except nail plate. Tons.	Product of iron nails. Kegs of 100 pounds.	Total rolled iron, including nails. Net tons.
1874	31	194,114	52,361	562,995	274,625
1875	31	171,178	45,773	442,359	239,069
1876	31	189,511	31,488	538,874	247,943
1877	31	208,342	30,254	597,806	268,486
1878	31	226,687	33,445	444,013	282,333
1879	32	286,882	52,265	294,942	353,894
1880	30	287,253	80,899	419,098	389,107
1881	30	405,119	75,767	485,916	505,182
1882	31	336,628	71,038	459,228	430,627
1883	32	367,106	73,850	627,896	472,351
1884	31	318,813	68,669	459,512	410,457
1885	31	315,810	88,178	176,258	412,801
1886	30	414,116	125,633	73,691	543,434
1887	31	501,291	152,522	8,000	654,213

BLAST FURNACES AND STEEL WORKS.

Years.	Number of blast furnaces.	Make of pig iron. Net tons.	Number of steel works.*	Net tons crucible steel ingots.	Net tons all other steel, including Bessemer ingots.	Total make of steel. Net tons.
1874	11	143,660	11	17,915	6,000	23,915
1875	11	131,856	14	22,942	15,498	38,440
1876	11	128,555	14	25,009	54,467	79,476
1877	12	141,749	14	24,747	82,401	107,148
1878	12	217,299	14	27,866	106,948	134,814
1879	13	267,315	18	40,142	130,781	170,923
1880	15	300,497	17	52,136	169,819	221,955
1881	15	385,453	17	61,256	247,345	308,601
1882	16	358,840	18	59,596	258,501	318,097
1883	16	592,475	20	59,128	346,402	405,530
1884	17	487,055	22	38,885	289,376	328,261
1885	17	585,696	24	42,139	364,905	407,044
1886	18	737,124	26	58,208	561,550	619,758
1887	20	897,849	26	60,393	761,038	821,431

* Bessemer steel works included; a few of these works are also iron rolling mills.

THE MANUFACTURE OF ROLLED IRON IN PENNSYLVANIA IN 1883, 1884, 1885, 1886, AND 1887, BY DISTRICTS.

In the following table the Philadelphia district covers Philadelphia county and the Pencoyd Iron Works; Eastern Pennsylvania comprises the eastern counties outside of the Philadelphia district as far west as the limits of Chester, Berks, Schuylkill, and Carbon counties; Central Pennsylvania comprises the counties west of those just named, extending to the western limits of Bedford, Blair, Centre, and Clinton counties; Western Pennsylvania comprises all counties west of those just named, except Allegheny.

BAR, ROD, BOLT, HOOP, SKELP, AND SHAPED IRON, AND ROLLED AXLES.

Districts.	Net tons of 2,000 pounds.				
	1883.	1884.	1885.	1886.	1887.
Philadelphia	70,819	62,404	63,754	70,654	85,999
Eastern Pennsylvania	113,539	85,847	69,983	104,783	120,709
Central Pennsylvania	89,496	72,383	88,730	118,986	156,483
Allegheny county	366,507	316,091	314,687	412,501	500,244
Western Pennsylvania	34,865	29,000	27,196	40,676	55,574
Total	675,226	565,725	564,350	747,600	919,009

PLATE AND SHEET IRON, EXCEPT NAIL PLATE.

Philadelphia	9,139	8,173	7,168	9,569	11,108
Eastern Pennsylvania	116,067	93,991	104,081	124,878	134,711
Central Pennsylvania	33,070	31,343	34,779	27,996	41,963
Allegheny county	73,850	68,669	88,178	125,633	152,522
Western Pennsylvania	22,320	20,145	18,505	17,445	19,694
Total	254,446	222,321	252,711	305,521	359,998

IRON CUT NAILS AND SPIKES. (One net ton equals 20 kegs.)

Philadelphia, Eastern Pennsylvania	25,596	25,367	34,092	28,772	19,648
Central Pennsylvania	50,606	54,200	69,762	67,365	48,117
Allegheny county	31,395	22,975	8,813	3,685	400
Western Pennsylvania	13,931	11,542	5,298	13,748	4,751
Total	121,528	114,084	117,965	113,570	72,916

IRON RAILS.

Philadelphia	.....	.....	.....	.....	.....
Eastern Pennsylvania	13,964	3,597	220	334	148
Central Pennsylvania	14,475	4,302	4,488	7,646	8,052
Allegheny county	599	2,722	1,123	1,615	1,047
Western Pennsylvania	925	295	8	.....	100
Total	29,963	10,916	5,839	9,595	9,347

TOTAL ROLLED IRON.

Philadelphia (except nails)	79,958	70,577	70,922	80,223	97,107
Eastern Pennsylvania	269,166	208,802	208,376	258,767	275,216
Central Pennsylvania	187,647	162,228	197,759	221,993	254,615
Allegheny county	472,351	410,457	412,801	543,434	654,213
Western Pennsylvania	72,041	60,982	51,007	71,869	80,119
Total	1,081,163	913,046	940,865	1,176,286	1,361,270

THE MANUFACTURE OF ROLLED IRON IN OHIO IN 1883, 1884, 1885, 1886, AND 1887, BY DISTRICTS.

In the following table the Lake counties are those bordering on Lake Erie; the Mahoning Valley comprises the counties in the northeastern part of Ohio; the Interior counties cover the counties south and west of the two first-named districts, except the counties along the Ohio river, which are classed in a district by themselves.

BAR, ROD, BOLT, HOOP, SKELP, AND SHAPED IRON, AND ROLLED AXLES.

Districts.	Net tons of 2,000 pounds.				
	1883.	1884.	1885.	1886.	1887.
Lake counties	47,912	31,435	38,582	42,208	41,073
Mahoning Valley	140,875	113,188	118,670	169,075	200,364
Interior counties	28,905	26,891	33,805	42,906	49,089
Ohio River counties	45,555	27,297	19,548	23,236	34,395
Total	263,247	198,811	210,605	277,425	324,921

PLATE AND SHEET IRON, EXCEPT NAIL PLATE.

Lake counties	15,956	14,421	12,169	9,969	12,594
Mahoning Valley	7,238	7,140	6,750	11,439	18,668
Interior counties	140	800	2,100	3,000	3,013
Ohio River counties	26,653	17,869	20,371	19,195	19,324
Total	49,987	40,230	41,390	43,603	53,599

IRON CUT NAILS AND SPIKES. (One net ton equals 20 kegs.)

Lake counties	.....	.....	.....	.....	.....
Mahoning Valley	8,977	3,738	3,291	9,933	10,393
Interior counties	.....	.....	.....	.....	.....
Ohio River counties	53,508	61,798	13,305	23,708	15,344
Total	62,485	65,536	16,596	33,641	25,737

IRON RAILS.

Lake counties	850	.....	.....	.....	135
Mahoning Valley	.....	.....	.....	.....	2,000
Interior counties	494	5,125	427	312	647
Ohio River counties	899	866	245	145	1,224
Total	2,243	5,991	672	457	4,006

TOTAL ROLLED IRON.

Lake counties	64,718	45,856	50,751	52,177	53,802
Mahoning Valley	157,090	124,066	128,711	190,447	231,425
Interior counties	29,539	32,816	36,332	46,218	52,749
Ohio River counties	126,615	107,830	53,469	66,284	70,287
Total	377,962	310,568	269,263	355,126	408,263

TOTAL PRODUCTION OF IRON AND STEEL IN THE UNITED STATES FROM 1876 TO 1887.

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

Products.	Net tons of 2,000 pounds.											
	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.
Pig iron	2,093,236	2,314,585	2,577,361	3,070,875	4,295,414	4,641,564	5,178,122	5,146,972	4,589,613	4,529,869	6,365,328	7,187,206
Spiegeleisen, included above	6,616	8,845	10,674	13,931	19,603	21,086	21,963	24,574	33,893	34,671	47,982	47,598
Rolled iron, including iron nails and iron rails	1,509,269	1,476,759	1,555,576	2,047,484	2,332,668	2,643,927	2,493,831	2,348,874	1,957,307	1,804,526	2,283,622	2,588,500
Rolled iron, including iron nails and excluding rails	1,042,101	1,144,219	1,232,686	1,627,324	1,838,906	2,155,346	2,265,957	2,283,920	1,931,747	1,789,711	2,259,943	2,565,438
Kegs of cut nails and spikes	4,157,814	4,828,918	4,396,130	5,011,021	5,370,512	5,794,206	6,147,097	7,762,737	7,581,379	6,696,815	8,160,973	6,908,870
Bessemer steel rails	412,461	432,169	550,398	683,964	954,460	1,330,302	1,438,155	1,286,554	1,116,621	1,074,607	1,763,667	2,354,132
Open-hearth steel rails	.....	.....	9,397	9,149	13,615	25,217	22,765	9,186	2,670	4,793	5,255	19,203
Iron rails	467,168	332,540	322,890	420,160	493,762	488,581	227,874	64,954	25,560	14,815	23,679	23,062
Rails of all kinds	879,629	764,709	882,685	1,113,273	1,461,837	1,844,100	1,688,794	1,360,694	1,144,851	1,094,215	1,792,601	2,396,397
Crucible steel ingots	39,382	40,430	42,906	56,780	72,424	89,762	85,089	80,455	59,662	64,511	80,609	84,421
Open-hearth steel ingots	21,490	25,031	36,126	56,290	112,953	146,946	160,542	133,679	131,617	149,381	245,250	360,717
Bessemer steel ingots	525,996	560,587	732,226	928,972	1,203,173	1,539,157	1,696,450	1,654,627	1,540,595	1,701,762	2,541,493	3,288,357
Miscellaneous steel	10,306	11,924	8,556	5,464	8,465	3,047	3,014	5,598	5,111	1,696	2,651	6,265
Steel of all kinds	597,174	637,972	819,814	1,047,506	1,397,015	1,778,912	1,945,095	1,874,359	1,736,985	1,917,350	2,870,003	3,739,760
Blooms from ore and pig iron	44,628	47,300	50,045	62,353	74,589	84,606	91,293	74,758	57,005	41,700	41,909	43,306

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE CALENDAR YEARS 1884, 1885, 1886, AND 1887.– GOLD VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

Commodities.	1884.		1885.		1886.		1887.	
	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.
Pig iron	206,381	$3,200,451	164,349	$2,553,298	405,180	$5,454,784	523,625	$7,281,824
Scrap iron	30,192	340,420	15,480	151,714	97,635	1,056,387	351,028	4,589,753
Scrap steel	8,388	144,177	2,196	23,911	11,353	145,649	29,716	341,073
Bar iron	40,998	1,588,464	35,251	1,401,213	32,647	1,250,456	40,565	1,400,015
Iron rails	94	2,110	57	1,040	7	166	270	5,701
Steel rails	3,074	67,669	2,395	55,654	46,571	887,267	154,099	2,982,830
Cotton-ties	17,518	516,262	20,576	570,263	11,561	288,360	24,276	600,454
Hoop, band, and scroll iron	332	22,552	103	6,630	128	2,949	35	985
Steel hoops, sheets, and plates	1,500	120,171	2,644	129,649	4,719	224,879	26,885	851,903
Steel ingots, bars, etc	24,610	1,310,362	33,718	1,249,123	167,257	3,298,707	347,818	6,543,935
Sheet, plate, and taggers' iron	7,863	651,052	6,200	547,775	6,852	518,417	8,012	529,019
Tinplates	242,123	16,858,650	256,028	15,991,152	288,761	17,504,976	317,896	18,699,145
Wire rods	145,525	4,555,699	105,148	2,908,772	153,401	3,940,849	167,272	4,326,617
Wire and wire rope	2,732	426,373	2,475	437,020	2,689	512,389	3,247	582,548
Anvils, axles, and forgings	967	105,231	642	78,488	963	105,072	1,474	153,134
Chains	963	86,690	633	63,728	669	70,883	1,023	98,801
Cutlery	.....	1,704,169	.....	1,444,545	.....	1,822,511	.....	2,050,515
Files, file-blanks, rasps, and floats	.....	46,472	.....	44,040	.....	57,478	.....	74,190
Fire-arms	.....	1,429,612	.....	827,930	.....	936,554	.....	1,053,573
Machinery	.....	1,185,026	.....	970,051	.....	1,697,883	.....	1,970,543
Needles	.....	364,908	.....	322,186	.....	335,514	.....	331,342
Other manufactures of iron and steel	.....	2,351,602	.....	1,366,370	.....	1,518,649	.....	1,952,707
Total	.....	$37,078,122	.....	$31,144,552	.....	$41,630,779	.....	$56,420,607
Iron ore	546,358	$1,133,678	437,680	$801,293	1,164,165	$1,912,437	1,337,617	$2,206,958

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1884, 1885, 1886, AND 1887.—GOLD VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

Commodities.	1884.		1885.		1886.		1887.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
Pig iron.....Net tons.	4,301	$92,336	6,975	$123,605	9,911	$161,072	7,612	$129,918
Bar iron..... "	932	52,872	933	48,048	906	44,999	962	54,485
Band, hoop, and scroll iron..... "	93	8,780	186	11,626	202	10,427	167	10,947
Car-wheels.....No.	11,889	109,255	9,122	78,268	13,411	102,498	9,729	86,136
Castings, not elsewhere specified.....	.....	293,491	.....	340,707	.....	323,554	.....	199,639
Cutlery.....	.....	94,671	.....	103,224	.....	116,948	.....	136,546
Fire-arms.....	.....	1,427,600	.....	2,191,286	.....	757,430	.....	558,170
Steel ingots, bars, and rods.....Net tons.	94	18,330	122	14,387	87	13,531	111	16,028
Builders' hardware.....	.....	1,045,668	.....	1,279,773	.....	1,307,364	.....	1,353,833
Machinery.....	.....	1,131,810	.....	3,957,393	.....	3,818,448	.....	4,900,747
Nails and spikes.....Net tons.	3,918	217,497	4,561	260,459	5,268	286,980	6,633	423,188
Iron plates and sheets..... "	424	37,127	327	22,628	1,087	66,618	394	25,412
Steel plates and sheets..... "	35	3,469	13	2,846	267	12,921	57	6,289
Printing-presses, and parts of.....	.....	196,953	.....	175,105	.....	197,343	.....	179,501
Iron rails.....Net tons.	1,254	46,611	206	8,017	590	18,510	29	2,250
Steel rails..... "	5,501	176,891	8,382	270,375	2,371	68,798	586	20,496
Saws and tools.....	.....	1,231,473	.....	1,096,235	.....	1,231,250	.....	1,397,433
Scales and balances.....	.....	397,563	.....	234,749	.....	267,996	.....	242,745
Sewing machines, and parts of.....	.....	3,264,935	.....	2,759,514	.....	3,270,165	.....	2,307,357
Fire-engines.....No.	9	28,273	6	6,410	4	10,893	1	2,000
Locomotives..... "	189	2,057,271	65	370,639	50	336,237	55	367,248
Stationary engines..... "	115	157,883	119	104,588	218	213,890	213	173,511
Boilers and parts of engines.....	.....	299,047	.....	245,488	.....	320,714	.....	245,194
Stoves, and parts of.....	.....	198,883	.....	206,031	.....	202,282	.....	211,596
Wire.....Net tons.	2,509	274,273	3,292	291,847	4,335	353,956	5,039	386,199
Other manufactures of iron and steel.....	.....	3,396,897	.....	2,416,233	.....	2,320,263	.....	2,766,054
Total.....	.....	$19,290,895	.....	$16,622,511	.....	$14,865,087	.....	$16,235,922
Agricultural implements, additional.....	.....	$3,382,556	.....	$2,532,286	.....	$2,119,772	.....	$2,427,835
Iron ore.....Net tons.	4,182	12,255	1,090	8,269	1,995	3,777	3,431	6,253

STATISTICS OF THE FOREIGN IRON TRADE FOR 1887.

GENERAL SUMMARY FOR 1887 AND FOR PART OF 1888.

In our last Annual Report reference was made to the depression in the iron and steel industries of Europe which commenced in 1883 and continued until the latter part of 1886, when a general improvement began, the demand increasing and prices advancing. This improvement was largely due to the active demand for iron and steel which then prevailed in the United States, the iron and steel manufacturers of Great Britain, Germany, and Belgium receiving large orders for their products from this country, some of which were not filled, however, until 1887. The improvement in the iron and steel industries of Great Britain was most noticeable.

The year 1887 witnessed in the main a continuance of the improved condition of the iron and steel industries of both Great Britain and the Continent. The demand for iron and steel very generally increased, large quantities going to the United States. Prices, however, fluctuated considerably during the year, although in the aggregate they were better maintained than in immediately preceding years.

The London *Economist* thus reviews the condition of the British iron trade in 1887: "The past year opened with marked activity and great expectations, but it was not long until these were doomed to disappointment, as it was found that the purchases made at the close of 1886 were largely speculative and based solely on the prospective demand from the United States. So soon as these purchases were pressed upon the market prices quickly fell, and the advance was entirely lost by the month of April. The trade remained comparatively quiet during the succeeding months, and it was not till December that any decided activity manifested itself. During this interval prices were depressed, and the low quotations ruling for pig-iron warrants attracted the attention of speculators who had witnessed the great rise in copper and tin. These purchases, coming upon an oversold market, caused a very smart rise in prices, from which, as might be expected, there was some little reaction. This advance quickly drew out shipbuilding and oth-

er orders, and a very large business was done during the closing month of the year."

The London *Iron* presents the following summary of the year's business in iron and steel in Great Britain: "The year which has just closed upon us has been, on the whole, an uneventful one, and will be looked back upon by members of the trade with mixed feelings. To some it must have proved a time fraught with no inconsiderable amount of uncertainty and anxiety, while to others it has brought a good deal of activity and a full amount of work, the event depending upon whether the individual was engaged in the iron trade pure and simple or in the steel trade. In either case, however, the opinion will be general that, while things might have been worse, they might well have been a good deal better. 1887 has witnessed a continued steady and rapid encroachment by steel into almost every department where iron once held undisputed sway."

British exports of iron and steel increased very greatly in 1887, resulting chiefly from the extraordinary demand from the United States. There was also a marked increase in iron and steel shipbuilding on the Clyde and elsewhere in the United Kingdom.

Concerning the Continental iron trade in 1887 the same paper says: "If we except France, the iron trade of which, from various causes, has suffered to some extent from depression and irregularity, the past year has been one of greater prosperity, due to a growing business and a more pronounced steadiness of prices. In the beginning of the year the Austrian iron trade was in a state of comparative activity. Although prices were not so high as they had been in the early months of the previous year a rising tendency set in soon after the new year.——The year 1886 closed with the Belgian iron trade in a healthy condition, there being sufficient work in hand to keep well going, and a certain prospect of booking fresh orders before the old ones were worked off. This state of affairs has continued uninterruptedly during the past year, the condition for prosperity necessary for Belgium, a steady foreign trade, having been present from the commencement to the close of the year. The Belgian exports have maintained the expansion which commenced in 1886.——If we were to judge by the production during the first six months of the past year the French iron trade was in about the same condition last year as during 1886.——German iron manufacturers may look back with satisfaction upon 1887, for it has proved a year of comparative prosperity to them. We say comparative prosperity, because, whilst the year has turned out far better

than its immediate predecessors, trade has not been so profitable as in former years. Looked at from the point of view of production it is the best on record. We are not yet in a position to accurately gauge the extent of the German export trade during the past year, but from published figures of the exports for a portion of the year and from other evidence we shall be safe in stating that they will show an improvement for 1887. Prices have risen somewhat during the year."

During the first three months of the present year the condition of the European iron and steel industries has remained substantially the same as at the close of 1887. At the beginning of the second quarter orders were numerous and prices were well maintained in most of the leading European ironmaking countries. Exports to the United States have, however, declined during the past few months, Great Britain and Germany suffering the most in this particular.

During the past year the sentiment in favor of protecting home industry has made steady progress in most European countries. France, Germany, Austria, Italy, and Russia now have tariffs which afford very fair protection to their farmers and manufacturers, and in each of these countries there is observable to-day a firmer devotion to the protective principle than existed a few years ago. In addition to these countries a strong sentiment in favor of protection has been developed in Spain, Holland, and Sweden. The government of Sweden has passed into the hands of a protectionist ministry, and an increase of protective duties is certain to follow.

In Great Britain the movement in favor of fair trade, which is another name for protection, is more formidable to-day than at any previous period since it was inaugurated a few years ago. It received an unexpected indorsement in the address of Mr. Daniel Adamson, President of the British Iron and Steel Institute, at the Manchester meeting of the Institute, in September, 1887. We make the following extracts from Mr. Adamson's address.

Since our last meeting in May this year the commercial aspect which so seriously affected the iron and steel trades shows a somewhat more cheerful prospect, but, before trade becomes fairly and reasonably remunerative to the capitalist and owner of works, a further considerable improvement will have to take place. How this is to be brought around I am afraid no strong evidence exists, unless we place our hopes on a further development of railways in India, with a new extended application in Burmah and China. But, supposing such does take place in

the near future, England must still be under great disadvantages by the relative trading position she occupies when compared with the larger States of Europe and America. To illustrate this position may I invite you to examine with me one single mercantile transaction that may and does take place between this country and Belgium in particular but which has also its influence on other countries? Take one transaction of a merchant buying, say, 1,000 tons of wrought iron or steel girders from our friends at Middlesborough-on-Tees, either to be used near there or delivered into Manchester. To fairly compare our position presume the same merchant purchases 1,000 tons of Belgian girder iron or steel for importation into London or Manchester. The money value of this 1,000 tons of girder metal we will put down as £5,000. The home manufacturer in the production of 1,000 tons of iron and steel is bound by the laws of the land to contribute a large sum for imperial taxes towards the ninety million pounds sterling now annually required to carry on the government of this country. The same manufacturer has further to contribute for domestic or local taxation another large amount, called for under the direction of some corporate body or local board. The merchant, however, orders this 1,000 tons of girder metal from Belgium for, say, £4,980. Thus the trade is given to a foreign country; but in addition the foreign manufacturer, or the merchant, or both, pockets the difference that the home producer has been compelled to pay in taxes on the 1,000 tons of metal, thereby placing Great Britain and the British ironmaster at a disadvantage equivalent to a considerable item of profit; whereas in no form or shape does the Belgian ironmaster pay one farthing towards the taxes required to carry on the commerce and government of the country where he has found a market. So long as we tax ourselves for the benefit of a foreign producer, and pay all the cost incident to the carrying on of our country, and enable the merchant to import manufactured goods at a greater profit than he could realize by purchasing at home, so long will our great trade remain depressed and our foreign competitor rejoice at our want of foresight. . . . .

This oppression on the local or home manufacturer operates in every direction against the prosperity of the country. The same argument will apply to all manufactured goods imported free, and it is of serious import whether a more accurate adjustment of the commerce of the country is not only practicable but in reality an indispensable condition. . . . .

Looking at this matter all around it does not appear to me to be a just business for Englishmen to pay the cost of carrying on the state for the benefit of our neighbors on the Continent and in America. . . . . We tell the Belgian ironmaster he can find a market free of toll in England, as the British ironmaster, in the generosity of his heart, in practice declares he will pay all the taxes incident to the country for the benefit and advantage of foreign competitors. John Bull must be something more than a generous soul to so assist in destroying his own trade and the manufacturing industries of his beloved but suffering country.

We now proceed to give such particulars as have come to hand of the production of iron and steel, iron ore, and coal in foreign countries in 1887 and previous years.

GREAT BRITAIN.

Coal.—The production of coal in Great Britain in 1887, according to the reports of Her Majesty's Inspectors of Mines, was 162,119,812 gross tons, against 157,518,482 tons in 1886, 159,351,418 tons in 1885, 160,757,779 tons in 1884, and 163,737,327 tons in 1883. A decline in production since 1883 will be noticed. The production of that year was the largest in the history of the British coal trade. For official statistics of the production of British coal in late years we are indebted to Mr. Richard Meade, of the Home Office of Her Majesty's Government.

The following table gives the exports of coal from Great Britain to foreign countries (not including coal for the use of British steamers engaged in the foreign trade) from 1868 to 1887.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1868.....	10,967,062	1873...	12,617,566	1878...	15,494,633	1883....	22,775,634
1869.....	10,744,945	1874...	13,927,205	1879...	16,442,296	1884....	23,343,755
1870.....	11,702,649	1875...	14,544,916	1880...	18,719,971	1885....	23,770,957
1871.....	12,747,989	1876...	16,299,077	1881...	19,587,063	1886....	23,283,389
1872.....	13,198,494	1877...	15,420,050	1882...	20,934,448	1887....	24,454,607

During 1887 the whole number of persons employed in and about all the coal and other mines of Great Britain amounted to 568,026, of whom 5,725 were females above ground. The number of persons employed in and about the coal mines alone was 526,277, of whom 4,183 were females above ground.

Iron Ore.—The quantity of iron ore mined by Great Britain in 1886 amounted to 14,110,013 gross tons, against 15,417,982 tons in 1885, 16,137,887 tons in 1884, and 17,383,046 tons in 1883.

The imports of iron ore into Great Britain in 1887 amounted to 3,762,936 gross tons, against 2,875,176 tons in 1886, 2,817,597 tons in 1885, and 2,728,672 tons in 1884. The following table gives the imports of iron ore into Great Britain from 1874 to 1887.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1874.....	754,000	1879.....	1,083,692	1884.....	2,728,672
1875.....	458,000	1880.....	2,634,401	1885.....	2,817,597
1876.....	672,000	1881.....	2,449,277	1886.....	2,875,176
1877.....	1,140,000	1882.....	3,282,496	1887.....	3,762,936
1878.....	1,173,860	1883.....	3,178,310		

Production of Iron and Steel in 1887.—We are in receipt of the Statistical Report of Mr. J. S. Jeans, Secretary of the British Iron Trade Association, for 1887, from which we compile the statistics which follow relating to the production of the iron and steel industries of Great Britain in that year.

Pig Iron.—The total quantity of pig iron produced in Great Britain in 1887, including spiegeleisen and ferro-manganese, was 7,441,927 gross tons, against 6,870,665 tons (according to Mr. Jeans) in 1886, an increase of 571,262 tons. In the United States the increased production of pig iron in 1887 over 1886 was 733,819 gross tons, or 162,557 tons more than in Great Britain. It is to be noted, however, that in 1887 the steady annual decline in the production of pig iron in Great Britain which had been in progress since 1882 was arrested, and that the increase in that year was very considerable. The production of pig iron in Great Britain since 1882, when the maximum was reached, has been as follows, the figures for 1887 being those of Mr. Jeans, and for the other years being the official government statistics, which appear each year later than Mr. Jeans's reports.

Years.	Gross tons.	Years.	Gross tons.
1882	8,586,680	1885	7,415,469
1883	8,529,300	1886	7,009,754
1884	7,811,727	1887	7,441,927

At the close of 1886 the stocks of unsold pig iron in Great Britain amounted to 2,491,506 gross tons, and at the close of 1887 they amounted to 2,616,366 tons, an increase of 124,860 tons. The stocks held at the close of 1887 were the largest in the history of the British iron trade.

The number of furnaces in Great Britain at the close of 1887 was 855, of which 403 were in blast and 452 were out of blast.

Bessemer Steel.—The production of Bessemer steel ingots in Great Britain in 1887 was 2,064,403 gross tons, which was an increase of 493,883 tons on the production of 1,570,520 tons in 1886. Every district in the United Kingdom increased its production in 1887. The production in 1885 was 1,304,127 tons. Large as was the increase in the production of Bessemer steel ingots from 1885 to 1887, it was more than equaled by that of the United States. The production of Great Britain in 1887 was the largest in its history. Two new Bessemer steel works were put in operation in 1887—one in Scotland and the other in South Wales. Of the total production in 1887 about 375,000 tons were made by the basic process.

The production of Bessemer steel rails in Great Britain in 1887 amounted to 1,021,847 gross tons, against 730,343 tons in 1886, an increase of 291,504 tons. The production of Bessemer steel rails by Great Britain in 1887 was *less than half that of the United States*, the latter country having produced in that year from ingots made in its own works 2,044,819 gross tons of Bessemer steel rails. The largest annual production of Bessemer steel rails by Great Britain was in 1882, when it amounted to 1,235,785 gross tons. Nearly one-half of the ingots produced in 1887 were converted into forms other than rails, a goodly proportion of which found their way into the United States in the form of billets, blooms, and slabs.

The whole number of Bessemer converters in Great Britain in 1887 was 112, of which 28½ were not in operation. The average production of the converters in operation was 24,635 gross tons.

Open-hearth Steel.—The production of open-hearth steel in Great Britain in 1887 amounted to 981,104 gross tons, an increase of 286,954 tons on the production of 694,150 tons in 1886. In 1886 the production was 110,232 tons greater than that of 1885, and in 1885 it was 108,668 tons in excess of that of 1884. Of the total production of open-hearth steel in 1887 Scotland produced 334,314 tons and South Wales produced 225,520 tons.

The production of open-hearth steel has always been much larger in Great Britain than in the United States. The latter country is, however, second only to Great Britain in the production of this kind of steel.

Crucible Steel.—Mr. Jeans states that "nearly 100,000 tons of finished steel" are annually made in Great Britain by this process.

The Rival Steel Makers.—The production of steel by all processes in Great Britain and the United States in 1887 was as follows, in gross tons.

Ingots—gross tons.	Great Britain.	United States.
Bessemer steel	2,064,403	2,936,033
Open-hearth steel	981,104	322,069
Crucible steel	about 100,000	75,376
Other steel	nominal if any	5,593
Total	3,145,507	3,339,071

In 1886 the United States surpassed Great Britain in the production of steel by 197,832 gross tons, and in 1887 this leadership in production was maintained.

Manufactured Iron.—Mr. Jeans says that the production of puddled iron in Great Britain in 1887 amounted to 1,701,312 gross

tons, against 1,616,701 tons in 1886, an increase of 84,611 tons. The United States annually rolls more puddled iron than Great Britain.

Iron and Steel Shipbuilding.—The depression in British iron and steel shipbuilding which had existed for many years, and which was most marked in 1886, was checked in 1887. The tonnage of new ships built in 1886 was lower than that of any previous year since 1870. The total tonnage of new iron and steel vessels built and launched in 1887 was about 600,000 tons, against 481,233 tons in 1886. Thus far in 1888 the indications are that the tonnage of the whole year will equal that of 1887. The most prosperous year in British shipbuilding was 1883, when the tonnage of vessels built and launched amounted to 1,250,000 tons.

Exports of Iron and Steel.—The total exports of iron and steel from Great Britain in 1887 amounted to 4,146,907 tons, against 3,388,494 tons in 1886, and 3,130,682 tons in 1885. The following table shows the quantities of iron and steel which have been exported from Great Britain in the last five years.

Articles.	Gross tons of 2,240 pounds.				
	1883.	1884.	1885.	1886.	1887.
Pig iron	1,564,048	1,269,576	960,931	1,044,552	1,159,500
Bar, angle, bolt, and rod iron	288,271	296,489	264,472	242,947	263,097
Railroad iron, all kinds	971,165	728,540	714,276	739,603	1,012,681
Wire, and manufactures of, except telegraph wire	62,620	52,968	55,093	40,341	46,449
Hoops, sheets, and boiler and armor plates	347,782	348,298	330,954	307,756	351,418
Tinplates and sheets	269,375	288,614	298,386	334,692	354,773
Cast and wrought iron	355,842	376,367	347,963	353,923	369,769
Old iron	97,475	68,141	85,236	144,860	289,299
Steel unwrought	73,131	56,934	60,481	166,367	286,323
Manufactures of steel or steel and iron combined	13,599	11,064	12,890	13,453	13,598
Total exports	4,043,308	3,496,991	3,130,682	3,388,494	4,146,907
Total values	£28,590,216	£24,496,065	£21,710,738	£21,817,720	£25,000,336

Large as were the exports in 1887 they were exceeded in 1882, when they amounted to 4,353,552 gross tons, valued at £31,598,306. Since the beginning of the present year the exports of iron and steel have declined. The total exports of pig iron, old iron, unwrought steel, tinplates, hoops, plates, and sheets, bar, angle, bolt, and rod iron, rails, and cast and wrought iron during March last amounted to 295,418 tons, against 342,934 tons in March, 1887, and

255,210 tons in March, 1886. The total exports of the same articles in the first quarter of 1888 amounted to 866,005 gross tons, against 893,433 tons in the first quarter of 1887, and 698,673 tons in the first quarter of 1886. The exports of the same articles to the United States in the first quarter of 1888 amounted to 144,558 gross tons, against 240,695 tons in the fourth quarter of 1887, and 355,242 tons in the third quarter. The heaviest exports of these articles from Great Britain to the United States in 1887 were in March, when they amounted to 134,782 gross tons.

The total exports from Great Britain to the United States of the articles mentioned above amounted to 1,282,445 gross tons in 1887, which was more than one-fourth of the total British exports of iron and steel and manufactures thereof in that year. The value of the articles mentioned which were exported to the United States in 1887 was £7,512,232. From 1880 to 1887, both years included, we imported more iron and steel products from Great Britain than all the British colonies in Asia, Africa, Australia, and America.

GERMANY.

Coal.—The production of coal and lignite in Germany in 1886 was 73,637,596 metric tons, of which about 21 per cent., or 15,616,984 tons, was lignite. The total production was almost exactly the same as that of 1885, which amounted to 73,673,286 tons.

Iron Ore.—The production of iron ore in Germany and Luxemburg in 1886 was 8,489,231 metric tons, against 9,136,340 tons in 1885. Germany is a large importer of iron ore.

Pig Iron.—The production of pig iron in Germany and the Grand Duchy of Luxemburg in 1887 was 3,907,364 metric tons, against 3,528,658 tons in 1886, showing an increase in 1887 of 378,706 tons. Germany adopted a Protective tariff in 1879, and her annual production of pig iron has since been as follows.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1879	2,226,587	1882	3,380,806	1885	3,687,433
1880	2,729,038	1883	3,469,719	1886	3,528,658
1881	2,914,009	1884	3,600,612	1887	3,907,364

The figures for 1887 are given upon the authority of the German Iron and Steel Manufacturers' Union; the remainder are official government statistics.

Imports and Exports.—The imports of pig iron and old iron into Germany in 1887 amounted to 163,937 metric tons, and the exports to 272,842 tons.

Wages.—An English journal, *Martineau & Smith's Hardware Trade Journal*, for March 31, 1888, gives the average monthly wages in the German iron trade in 1879, 1886, and 1887 as follows.

	1879.	1886.	1887.
Forges	61s. 5d.	63s. 7d.	65s. 8d.
Machine works	63s. 6d.	67s. 7d.	67s. 8d.

FRANCE.

Coal.—The production of coal in France in 1886 was 19,558,928 metric tons, and of lignite, 455,669 tons; total, 20,014,597 tons. The figures for 1885 were as follows: coal, 19,068,548 tons; lignite, 441,982 tons; total, 19,510,530 tons. France annually imports about 10,000,000 tons of coal and coke.

Iron Ore.—France is a large importer of iron ore. The quantity imported in 1887 amounted to 1,154,625 metric tons. In the same year 281,129 tons were exported.

Pig Iron.—The production of pig iron in France in 1887 was 1,580,851 metric tons, against 1,516,574 tons in 1886, and 1,630,648 tons in 1885.

Finished Iron.—The production of finished iron in France in 1887 amounted to 774,250 metric tons, of which only 319 tons were iron rails.

Steel.—The production of steel of all kinds in France in 1887 was 440,956 metric tons, of which 18,322 tons were puddled and forged steel, 809 tons were cemented steel, 7,174 tons were crucible steel, and 414,651 tons were Bessemer and open-hearth finished products. The quantity of steel rails produced was 192,482 tons.

BELGIUM.

Coal.—The production of coal in Belgium in 1887 was 19,216,031 metric tons, against 17,253,144 tons in 1886.

Pig Iron.—The production of pig iron in Belgium in 1887 was 754,481 metric tons, against 697,110 tons in 1886.

Steel.—The production of steel of all kinds in Belgium in 1886 was 139,215 tons, against 125,461 tons in 1885.

Imports and Exports.—The Belgian imports of iron ore in 1887 amounted to 1,435,782 metric tons, and the imports of pig iron to 142,015 tons. Belgium annually exports large quantities of coal.

SPAIN.

Production.—In 1885 there were 38 iron works in operation in Spain. They produced 159,225 metric tons of pig iron and 1,901

tons of bar iron. Steel was produced at one small works, the quantity being 361 tons. In 1886 and 1887 a large Bessemer steel plant was built at Bilbao. In 1885 the production of coal in Spain was 945,904 tons, including 26,464 tons of brown coal.

Exports.—The exports of iron ore from Bilbao during 1887 amounted to 4,198,696 tons, against 3,185,228 tons in 1886. Of the total exports in 1887 Great Britain received 2,855,667 tons and the United States 152,077 tons. The exports to Great Britain in 1886 amounted to 2,151,137 tons, and to the United States to 42,337 tons. In 1886 and 1887 Spain exported large quantities of pig iron.

SWEDEN AND NORWAY.

We are annually indebted to the courtesy of Professor Richard Åkerman, of Stockholm, for official statistics of the iron and steel industries of Sweden. The figures for 1882, 1883, 1884, 1885, and 1886 are as follows, those for 1887 not having been compiled.

Articles.	Metric tons.				
	1882.	1883.	1884.	1885.	1886.
Iron ore	892,863	885,124	909,553	873,362	872,479
Pig iron, all made with charcoal	398,945	422,627	430,534	464,737	442,457
Bar iron and rods	259,462	255,853	264,944	257,369	237,130
Bessemer iron and steel	47,358	50,878	53,123	52,021	54,121
Martin iron and steel	13,405	16,800	19,354	26,743	22,361
Other kinds of steel	1,430	1,827	1,764	1,786	1,749
Plates	15,805	17,439	17,534	16,494	13,579
Nails	8,143	8,197	9,720	10,577	10,289
Number of furnaces in blast	185	191	178	179	164
Total time for all furnaces in blast, days	40,157	41,229	40,361	42,460	39,777
Average daily product per furnace, tons	9.93	10.25	10.67	10.95	11.12
Average time per furnace in blast, days	217	216	227	237	242.5

ITALY.

Iron Ore.—The total quantity of iron ore mined on the island of Elba and on the mainland of Italy in 1886 was 220,014 metric tons, against 200,955 tons in 1885, and 225,368 tons in 1884. In 1886 the island of Elba alone produced 186,377 tons.

Pig Iron.—In 1885 there were ten blast furnaces in blast in Italy, and they produced 15,991 metric tons of pig iron, against thirteen furnaces and 18,405 tons in 1884. In 1886 the production of pig iron fell to 12,291 tons.

Steel.—The production of steel in Italy at the new works recently established amounted to 23,760 metric tons in 1886, against 6,370 tons in 1885, and 4,645 tons in 1884.

AUSTRIA AND HUNGARY.

Pig Iron.—The total production of pig iron in the Austrian Empire in 1884 was 734,346 metric tons, of which Austria proper produced 539,621 tons and Hungary produced 194,725 tons.

Steel.—The total production of steel in the Austrian Empire in 1885 was 278,803 metric tons, of which 226,398 tons were Bessemer and 52,405 tons were open-hearth.

RUSSIA.

Pig Iron.—The production of pig iron in Russia in 1882 was 498,400 tons, against 462,027 tons in 1881, and 441,285 tons in 1880.

Steel.—The production of steel in Russia in 1882 was 225,140 tons, against 285,082 tons in 1881, and 295,568 tons in 1880.

DOMINION OF CANADA.

There were in the Dominion of Canada in 1887 the following iron and steel works. Londonderry, Nova Scotia—Two coke blast furnaces and a refined bar mill, with puddling furnaces, forge, etc. Three Rivers, Quebec—One charcoal blast furnace. Drummondville, Quebec—Two charcoal blast furnaces. New Glasgow, Nova Scotia—One open-hearth steel furnace and rolling mill. Halifax, Nova Scotia, (one,) St. John, New Brunswick, (three,) Montreal, (four,) Hamilton, Ontario, (two,) in all ten rolling mills for reworking scrap and puddled bars, mostly into nail plate. New Glasgow, (one,) Hamilton, (one,) in all two forges for working scrap, mostly into car axles. Montreal—One rolling mill for making butt-welded pipe. We have no statistics of the production of iron or steel in the Dominion in recent years.

From Mr. Edwin Gilpin's "Report of the Department of Mines" for 1886 we learn that the production of coal in Nova Scotia in that year was 1,502,611 gross tons, against 1,352,205 tons in 1885. The production of coke in 1886 was 31,604 tons, against 30,185 tons in 1885. The production of iron ore in 1886 was 44,388 tons, against 48,129 tons in 1885.

THE BASIC PROCESS.

The production of basic steel during the year ended October 31, 1887, was 1,702,252 tons, of which England produced 364,526 tons; Germany, Luxemburg, and Austria, 1,102,496 tons; France, 174,271 tons; and Belgium and other countries, 60,959 tons.